MODERN

OPERA HOUSES AND THEATRES.

MODERN OPERA HOUSES AND THEATRES.

EXAMPLES SELECTED FROM PLAYHOUSES RECENTLY ERECTED IN EUROPE

WITH DESCRIPTIVE TEXT, A TREATISE ON THEATRE PLANNING AND CONSTRUCTION, AND SUPPLEMENTS ON STAGE MACHINERY, THEATRE FIRES, AND PROTECTIVE LEGISLATION;

BY

EDWIN O. SACHS

ARCHITECT

VOLUME III.

INCLUDING THREE SUPPLEMENTS,

WITH

TWENTY PLATES AND EIGHT HUNDRED AND SIXTY ILLUSTRATIONS

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NOTE TO VOLUME III.

WITH the issue of the present Volume, which includes three Supplements, my work, 'Modern Opera Houses and Theatres,' sees its completion. Though I have, no doubt, a feeling of satisfaction in concluding this contribution to architectural literature and illustration on a subject which I hold has a very great future, it is not without regret that I terminate what has been a most congenial occupation for my leisure hours during the past eight years. The devotion of the time spared from the claims of professional practice to the study of the particular class of building with which I am associated, combined the pleasures of relaxation with the agreeable thought that my work might serve as a medium of advice to those directly or indirectly connected with the housing of the drama. The many days spent in the company of some of the great masters whose playhouses are here dealt with, the interchange of views and experiences with experts and others both at home and abroad, besides being most instructive were in the highest degree enjoyable.

Though this concluding volume embraces much beyond what was originally intended, and the whole work aims at greater comprehensiveness, yet much of value is necessarily left unsaid and unillustrated. I had to choose between writing a text-book, or a generally descriptive treatise, and in attempting the latter, I have excluded detailed explanations and records, except with regard to the three important questions treated in the Supplements. It was not my intention to address myself only to the architectural expert, but also to the actor, theatre manager, lessee, public official, critic and playgoer. Anything, therefore, other than a wide treatment of the subject would have been out of place, save in the few instances where matters of an essentially technical character had to be considered. My Supplement on 'Stage Construction' is intended to be more technical than my Treatise on Theatre Planning, whilst those on Theatre Fires and Legislation aim simply at recording stern, even if sometimes unpalatable, facts. Elsewhere, however, I have attempted to appeal to all those whose varying interests centre around the drama, while avoiding the technical phraseology that often irritates the layman.

As was only to be expected in a work of this description, I have had to close individual sections at different times. Thus, whilst my Treatise was finished only a few weeks before publication, the Supplement on Theatre Fires was concluded in June 1897, when I made some of the statistics public after the sad fire of last year at the Charity Bazaar, Paris. My Supplement on Stage Construction was ended in June 1898, when, owing to the particular interest accorded at the moment to questions of stage machinery, I issued some copies separately. Supplement III., on Theatre Legislation, was in the printer's hands last August. It may be remembered that Volume I. appeared in May 1896, and Volume II. in July 1897. Thus the actual publication of 'Modern Opera Houses and Theatres' has been spread over three years. As I have already remarked, this involved many changes, both in the programme of the work and the personnel of those who have assisted me in the fulfilment of my task; but I trust that, speaking generally, the more comprehensive character of the volumes as compared with what was first promised will meet with approval.

To the names of those who have particularly helped me in the preparation of this book, mentioned in the Preface of the first Volume, I would add that of Ewan Campbell, whose untiring efforts in the general arrangement and in the revision of both illustrations and text have materially facilitated its completion. I also desire to express my appreciation of the careful printing of the letterpress by William Clowes and Sons, under the resourceful supervision of C. B. Coupland.

As a last word I would again express my great indebtedness to all who have helped me directly and indirectly, not forgetting the original subscribers who encouraged me with their confidence when the work was in its initial stage.

E. O. S.

11 WATERLOO PLACE, PALL MALL, LONDON, S.W.
October 29th, 1898.

MUNICIPAL THEATRE, PALERMO.
Fig. 1. Auditorium, Ceiling.

CONTENTS OF VOLUME III.

A TREATISE ON THEATRE PLANNING.

ILLUSTRATIONS DERIVED FROM OTHER PUBLICATIONS.

COURT OPERA HOUSE, VIENNA: CHANDELIER	"DAS HOF-OPERNHAUS, WIEN."
NATIONAL OPERA HOUSE, PARIS: PLANS AND SECTIONS OF DRESSING-ROOMS	"LE NOUVEL OPÉRA," PAR CHARLES GARNIER, PARIS.
NATIONAL OPERA HOUSE, PARIS: PLANS AND SECTIONS OF WARDROBE-ROOMS	"LE NOUVEL OPÉRA," PAR CHARLES GARNIER, PARIS.
RENAISSANCE THEATRE, PARIS: GENERAL VIEW, PLANS AND SECTIONS . .	"REVUE GÉNÉRALE D'ARCHITECTURE."
MUNICIPAL THEATRE, RHEIMS: FRONT ELEVATION, PLANS	"TRAITÉ DE LA CONSTRUCTION DES THÉÂTRES," PAR ALPHONSE GOSSET.
STURMHOEFEL MODEL THEATRE: PLANS	"SCENE DER ALTEN UND BÜHNE DER NEUZEIT," VON A. STURMHOEFEL.

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COURT THEATRE, VIENNA.
FIG. 2. LOUNGE, SMALL CHANDELIER.

LIST OF ILLUSTRATIONS.

A Treatise on Theatre Planning.

INTRODUCTION.

GENERAL ARRANGEMENT.

AUDITORIUM ARRANGEMENT.

EXAMPLES OF AUDITORIUM.

COURT THEATRE, VIENNA.

VIEW OF AUDITORIUM LOOKING TOWARDS PROSCENIUM; VIEW OF AUDITORIUM FROM PROSCENIUM.

PEOPLE'S THEATRE, VIENNA.

VIEW OF AUDITORIUM.

MUNICIPAL THEATRE, SALZBURG.

VIEW OF AUDITORIUM.

'CRITERION' THEATRE, LONDON.

VIEW OF AUDITORIUM.

SKELETON PLANS OF AUDITORIUM.

EXAMPLES FROM VOLUME I.

COURT THEATRE, VIENNA; NATIONAL OPERA HOUSE, BUDA-PESTH; 'GERMAN' THEATRE, PRAGUE; 'NEW' THEATRE, BERLIN; 'LINDEN' VARIETY THEATRE, BERLIN; COURT OPERA HOUSE, DRESDEN; MUNICIPAL THEATRE, HALLE; 'WAGNER' OPERA HOUSE, BAYREUTH; PEOPLE'S THEATRE, WORMS; D'OYLY CARTE'S OPERA HOUSE, LONDON; DALY'S THEATRE, LONDON; 'TRAFALGAR' THEATRE, LONDON; 'PALACE' VARIETY THEATRE, MANCHESTER; 'EMPIRE' VARIETY THEATRE, BRISTOL; MUNICIPAL THEATRE, AMSTERDAM; 'FLEMISH' THEATRE, BRUSSELS; NATIONAL THEATRE, CHRISTIANIA; COURT OPERA HOUSE, STOCKHOLM; PROPOSED COURT OPERA HOUSE, ST. PETERSBURG; MUNICIPAL THEATRE, ODESSA; MUNICIPAL THEATRE, TIFLIS.

EXAMPLES FROM VOLUME II.

COURT OPERA HOUSE, VIENNA; 'RAIMUND' THEATRE, VIENNA; CZECH NATIONAL THEATRE, PRAGUE; MUNICIPAL THEATRE, SALZBURG; MUNICIPAL THEATRE, LAIBACH; NATIONAL OPERA HOUSE, PARIS; NATIONAL OPÉRA COMIQUE, PARIS; 'EDEN' VARIETY THEATRE, PARIS; 'LESSING' THEATRE, BERLIN; MUNICIPAL OPERA HOUSE, FRANKFORT; MUNICIPAL THEATRE, ESSEN; MUNICIPAL THEATRE, ROSTOCK; MUNICIPAL THEATRE, BROMBERG; 'HER MAJESTY'S' THEATRE, LONDON; 'LYRIC' THEATRE, LONDON; 'GARRICK' THEATRE, LONDON; 'EMPIRE' VARIETY THEATRE, LONDON; 'OXFORD' VARIETY THEATRE, LONDON; 'GRAND' THEATRE, LEEDS; 'NEW' THEATRE, CAMBRIDGE; MEMORIAL THEATRE, STRATFORD-ON-AVON; NATIONAL THEATRE, ATHENS; MUNICIPAL THEATRE, ROTTERDAM; MUNICIPAL THEATRE, PALERMO; 'LIRICO' THEATRE, MILAN; PEOPLE'S THEATRE, TURIN; NATIONAL THEATRE, BUCHAREST; MUNICIPAL THEATRE, BILBAO; MUNICIPAL THEATRE, GENEVA; MUNICIPAL THEATRE, ZÜRICH.

OTHER EXAMPLES.

PEOPLE'S THEATRE, BUDA-PESTH; MUNICIPAL THEATRE, FIUME; MUNICIPAL THEATRE, PRESSBURG; MUNICIPAL THEATRE, BRÜNN; 'RENAISSANCE' THEATRE, PARIS; MUNICIPAL THEATRE, ANGERS; THEATRE, MONTPELLIER; THEATRE, ST. LÔ; COURT THEATRE, WIESBADEN; COURT THEATRE, SCHWERIN; MUNICIPAL THEATRE, CARLSBAD; MUNICIPAL THEATRE, AUGSBURG; 'HAYMARKET' THEATRE, LONDON; 'CRITERION' THEATRE, LONDON;

SKELETON PLANS OF AUDITORIUM—*contd.*

OTHER EXAMPLES—*continued.*

'SHAFTESBURY' THEATRE, LONDON; 'EMPIRE' VARIETY THEATRE, EDINBURGH; THEATRE, PAISLEY; 'NEW' THEATRE, CHELTENHAM; THEATRE, LINCOLN; THEATRE, ST. HELEN'S; 'PRINCE OF WALES'' THEATRE, LONDON; 'DAL VERME' THEATRE, MILAN; 'FILODRAMMATICO' THEATRE, MILAN; 'MANZONI' THEATRE, TURIN; MUNICIPAL THEATRE, NIJNI-NOVGOROD; MUNICIPAL THEATRE, IRKUTSK; TEMPORARY THEATRES, RUSSIA.

SKELETON SECTIONS OF AUDITORIUM.

EXAMPLES FROM VOLUME I.

COURT THEATRE, VIENNA; NATIONAL OPERA HOUSE, BUDA-PESTH; 'GERMAN' THEATRE, PRAGUE; 'NEW' THEATRE, BERLIN; 'LINDEN' VARIETY THEATRE, BERLIN; COURT OPERA HOUSE, DRESDEN; MUNICIPAL THEATRE, HALLE; 'WAGNER' OPERA HOUSE, BAYREUTH; PEOPLE'S THEATRE, WORMS; D'OYLY CARTE'S OPERA HOUSE, LONDON; DALY'S THEATRE, LONDON; 'TRAFALGAR' THEATRE, LONDON; 'GRAND' THEATRE, ISLINGTON; 'ALHAMBRA' VARIETY THEATRE, LONDON; 'PALACE' VARIETY THEATRE, MANCHESTER; 'GRAND' THEATRE, WOLVERHAMPTON; 'EMPIRE' VARIETY THEATRE, BRISTOL; 'FLEMISH' THEATRE, BRUSSELS; NATIONAL THEATRE, CHRISTIANIA; COURT OPERA HOUSE, STOCKHOLM; PROPOSED COURT OPERA HOUSE, ST. PETERSBURG; MUNICIPAL THEATRE, ODESSA; MUNICIPAL THEATRE, TIFLIS.

EXAMPLES FROM VOLUME II.

'RAIMUND' THEATRE, VIENNA; CZECH NATIONAL THEATRE, PRAGUE; MUNICIPAL THEATRE, LAIBACH; MUNICIPAL THEATRE, SALZBURG; NATIONAL OPERA HOUSE, PARIS; 'EDEN' VARIETY THEATRE, PARIS; 'LESSING' THEATRE, BERLIN; MUNICIPAL OPERA HOUSE, FRANKFORT; MUNICIPAL THEATRE, ROSTOCK; MUNICIPAL THEATRE, BROMBERG; 'HER MAJESTY'S' THEATRE, LONDON; LYRIC' THEATRE, LONDON; 'GARRICK' THEATRE, LONDON; 'EMPIRE' VARIETY THEATRE, LONDON; 'OXFORD' VARIETY THEATRE, LONDON; 'GRAND' THEATRE, LEEDS; SHAKESPEARE MEMORIAL THEATRE, STRATFORD-ON-AVON; 'NEW' THEATRE, CAMBRIDGE; NATIONAL THEATRE, ATHENS; MUNICIPAL THEATRE, ROTTERDAM; MUNICIPAL THEATRE, PALERMO; 'LIRICO' THEATRE, MILAN; CASINO THEATRE, MONTE CARLO; NATIONAL THEATRE, BUCHAREST; MUNICIPAL THEATRE, BILBAO; MUNICIPAL THEATRE, GENEVA; MUNICIPAL THEATRE, ZÜRICH.

EXAMPLES OF BOX-FRONT LINES.

DIAGRAMS OF BOX-FRONT LINES.

COURT THEATRE, VIENNA; NATIONAL OPERA HOUSE, PARIS; MUNICIPAL THEATRE, RHEIMS; MUNICIPAL THEATRE, ANGERS; MUNICIPAL THEATRE, MONTPELLIER; 'NEW' THEATRE, BERLIN; 'LINDEN' VARIETY THEATRE, BERLIN; 'CONCORDIA' VARIETY THEATRE, BERLIN; MUNICIPAL THEATRE, HALLE; D'OYLY CARTE'S OPERA HOUSE, LONDON;

EXAMPLES OF BOX-FRONT LINES.—*contd.*

DIAGRAMS OF BOX-FRONT LINES—*continued.*

'HER MAJESTY'S' THEATRE, LONDON; DALY'S THEATRE, LONDON; 'LYRIC' THEATRE, LONDON; 'EMPIRE' VARIETY THEATRE, EDINBURGH; 'PALACE' VARIETY THEATRE, MANCHESTER; SHAKESPEARE MEMORIAL THEATRE, STRATFORD-ON-AVON; THEATRE, ST. HELEN'S; PEOPLE'S THEATRE, TURIN; NATIONAL OPERA HOUSE, STOCKHOLM; ST. MICHAEL'S THEATRE, ST. PETERSBURG.

RELATIVE POSITIONS OF BOX-FRONT LINES.

'LINDEN' VARIETY THEATRE, BERLIN; MUNICIPAL OPERA HOUSE, FRANKFORT; D'OYLY CARTE'S OPERA HOUSE, LONDON; 'OXFORD' VARIETY THEATRE, LONDON; MUNICIPAL THEATRE, AMSTERDAM; MUNICIPAL THEATRE, ROTTERDAM.

ALTERATION IN BOX-FRONT LINES.

COURT THEATRE, VIENNA.

EXAMPLES OF ORCHESTRAS.

TYPES OF ORCHESTRA LINES.

DIAGRAMS.

PLANS AND SECTIONS OF ORCHESTRA WELLS.

'RAIMUND' THEATRE, VIENNA; CZECH NATIONAL THEATRE, PRAGUE; NATIONAL OPERA HOUSE, PARIS; 'LINDEN' VARIETY THEATRE, BERLIN; COURT OPERA HOUSE, DRESDEN; MUNICIPAL THEATRE, ESSEN; 'WAGNER' OPERA HOUSE, BAYREUTH; 'TRAFALGAR' THEATRE, LONDON; MUNICIPAL THEATRE, BILBAO.

COURT THEATRE, WIESBADEN.

MOVABLE FLOOR, PLAN AND SECTIONS.

EXAMPLES OF PROSCENIUM OPENINGS.

ELEVATIONS OF PROSCENIUM FRAMES.

COURT THEATRE, VIENNA; COURT OPERA HOUSE, VIENNA; 'RAIMUND' THEATRE, VIENNA; CZECH NATIONAL THEATRE, PRAGUE; MUNICIPAL THEATRE, LAIBACH; NATIONAL OPERA HOUSE, PARIS; 'LINDEN' VARIETY THEATRE, BERLIN; MUNICIPAL OPERA HOUSE, FRANKFORT; MUNICIPAL THEATRE, HALLE; DALY'S THEATRE, LONDON; 'ALHAMBRA' VARIETY THEATRE, LONDON; 'OXFORD' VARIETY THEATRE, LONDON; MUNICIPAL THEATRE, AMSTERDAM; PEOPLE'S THEATRE, TURIN; COURT OPERA HOUSE, STOCKHOLM; MUNICIPAL THEATRE, TIFLIS; MUNICIPAL THEATRE, ZÜRICH.

VIEWS OF PROSCENIUM FRAMES.

'HER MAJESTY'S' THEATRE, LONDON; MUNICIPAL THEATRE, BROMBERG; 'FLEMISH' THEATRE, BRUSSELS.

VIEWS OF PROSCENIUM CORNERS.

'GERMAN' THEATRE, VIENNA; 'EMPIRE' VARIETY THEATRE, BRISTOL; 'NEW' THEATRE, BERLIN; 'FILODRAMMATICO' THEATRE, MILAN.

COURT THEATRE, VIENNA.

VIEWS OF PROSCENIUM BOXES.

EXAMPLES OF CEILINGS.

PLANS OF CEILING ARRANGEMENT.

COURT THEATRE, VIENNA; COURT OPERA HOUSE, VIENNA; CZECH NATIONAL THEATRE, PRAGUE; 'LESSING' THEATRE, BERLIN; COURT OPERA HOUSE, DRESDEN; MUNICIPAL THEATRE, AMSTERDAM; MUNICIPAL THEATRE, GENEVA.

CHANDELIERS AND LUSTRES.

COURT THEATRE, VIENNA; COURT OPERA HOUSE, VIENNA; CZECH NATIONAL THEATRE, PRAGUE MUNICIPAL THEATRE, HALLE; MUNICIPAL THEATRE, BROMBERG.

COMMUNICATION.

EXAMPLES OF STAIRCASES.

TYPES OF STAIRS.

DIAGRAMS.

NATIONAL OPERA HOUSE, BUDA-PESTH.

PLAN, ENTRANCE LEVEL; PLAN, FIRST TIER LEVEL.

'GERMAN' THEATRE, PRAGUE.

PLAN, ENTRANCE LEVEL.

NATIONAL OPERA HOUSE, PARIS.

PLAN, FIRST TIER LEVEL.

NATIONAL OPERA COMIQUE, PARIS.

PLAN, ENTRANCE LEVEL; PLAN, FIRST TIER LEVEL.

MUNICIPAL OPERA HOUSE, FRANKFORT.

PLAN, ENTRANCE LEVEL; PLAN, FIRST TIER LEVEL.

COURT OPERA HOUSE, DRESDEN.

PLAN, ENTRANCE LEVEL; PLAN, FIRST TIER LEVEL.

MUNICIPAL THEATRE, ESSEN.

PLAN, ENTRANCE LEVEL; PLAN, FIRST TIER LEVEL.

COURT OPERA HOUSE, STOCKHOLM.

PLAN, ENTRANCE LEVEL; PLAN, FIRST TIER LEVEL.

NATIONAL THEATRE, BUCHAREST.

PLAN, ENTRANCE LEVEL; PLAN, FIRST TIER LEVEL.

EXAMPLES OF VESTIBULES.

COURT THEATRE, VIENNA.

VIEW OF BOX OFFICE; VIEW OF VESTIBULE.

CZECH NATIONAL THEATRE, PRAGUE.

VIEW OF VESTIBULE.

'HER MAJESTY'S' THEATRE, LONDON.

VIEW OF BOX OFFICE.

SHAKESPEARE MEMORIAL THEATRE, STRATFORD-ON-AVON.

VIEW OF VESTIBULE AND STAIRCASE.

MUNICIPAL THEATRE, ZÜRICH.

VIEW OF VESTIBULE.

EXAMPLES OF LOUNGES.

SKETCH PLANS.

COURT THEATRE, VIENNA; 'RAIMUND' THEATRE, VIENNA; NATIONAL OPERA HOUSE, BUDA-PESTH; 'GERMAN' THEATRE, PRAGUE; NATIONAL OPERA HOUSE, PARIS; 'EDEN' VARIETY THEATRE, PARIS; MUNICIPAL THEATRE, RHEIMS; 'NEW' THEATRE, BERLIN; COURT OPERA HOUSE, DRESDEN; D'OYLY CARTE'S OPERA HOUSE, LONDON; DALY'S THEATRE, LONDON; 'EMPIRE' VARIETY THEATRE, LONDON; MUNICIPAL THEATRE, PALERMO; NATIONAL THEATRE CHRISTIANIA; NATIONAL THEATRE, BUCHAREST; MUNICIPAL THEATRE, ODESSA.

COURT OPERA HOUSE, VIENNA.

VIEW OF SALOON TO UPPER TIERS; VIEW OF ANTE-ROOM TO STATE BOX.

CZECH NATIONAL THEATRE, PRAGUE.

VIEW OF ANTE-ROOM TO ROYAL BOX.

SERVICE.

EXAMPLES OF SERVICE ARRANGEMENT.

TYPES OF DRESSING-ROOM BLOCKS.

SKETCH PLANS.

NATIONAL OPERA HOUSE, PARIS.

SMALL DRESSING-ROOM, PLAN, SECTION; LARGE DRESSING-ROOM, PLAN, SECTION; WARDROBE-ROOM, PLAN OF FLOOR, PLAN OF GALLERY, SECTIONS; OUTSIDE SERVICE LIFT, PLAN AND ELEVATION.

EXAMPLES OF SERVICE ARRANGEMENT.

PROPOSED COURT OPERA HOUSE, ST. PETERSBURG.

SCENE-STORE, PLAN.

MUNICIPAL THEATRE, AMSTERDAM.

PROPERTY SERVICE LIFT, PLAN AND SECTION; PASSENGER SERVICE LIFT, SECTIONS.

COURT OPERA HOUSE, VIENNA.

SCENE-STORE, PLAN AND SECTIONS.

CONSTRUCTION.

EXAMPLE OF METAL FRAMING.

COURT THEATRE, VIENNA.

AUDITORIUM, PLANS OF AREA, FIRST TIER AND SECOND TIER; PLAN OF CEILING; PLAN OF ROOF; LONGITUDINAL SECTION; TRANSVERSE SECTION; DETAILS.

EXAMPLE OF CANTILEVER WORK.

D'OYLY CARTE'S OPERA HOUSE, LONDON.

AUDITORIUM, PLANS OF FIRST TIER, SECOND TIER, THIRD TIER; DETAILS; ROOF PLAN, DETAILS; STAGE, PLANS OF 'GRIDIRON' AND ROOF, DETAILS.

EQUIPMENT.

LIGHTING.

STAGE LIGHTING.

FACE LIGHTED FROM BELOW AND ABOVE; ACTOR SEEN FROM AREA AND THIRD TIER; DIAGRAMS.

COURT THEATRE, VIENNA.

VIEW OF MAIN SWITCH ROOM.

HEATING AND VENTILATION.

COURT THEATRE, VIENNA.

VIEWS OF MAIN VENTILATION DUCTS; VIEWS OF MIXING CHAMBER; VIEW OF HEATING AND VENTILATION CONTROL ROOM.

SAFETY OF LIFE.

EXAMPLES OF FIRE-RESISTING CURTAINS.

DIAGRAM OF FIRE-RESISTING CURTAIN.

PLAN, ELEVATION, SECTIONS AND DETAILS.

'QUEEN'S' THEATRE, MANCHESTER (*destroyed* 1890).

FIRE-RESISTING CURTAIN, VIEW AFTER FIRE.

EXAMPLES OF FIRE-RESISTING CURTAINS.

DRAWINGS OF FIRE-RESISTING CURTAINS.

MUNICIPAL THEATRE, HALLE; 'LYRIC' THEATRE, LONDON; MUNICIPAL THEATRE, AMSTERDAM; MUNICIPAL THEATRE, ROTTERDAM; CARL PFAFF'S SYSTEM.

CONCLUSION.

SKETCH PLANS.

COURT THEATRE, VIENNA; 'RAIMUND' THEATRE, VIENNA; MUNICIPAL THEATRE, LAIBACH; OLD AND NEW OPERA HOUSES, DRESDEN; PEOPLE'S THEATRE, WORMS; 'WAGNER' THEATRE, BAYREUTH; SUMMER THEATRE, PIRAEUS; PROPOSED COURT OPERA HOUSE, ST. PETERSBURG; MUNICIPAL THEATRE, ODESSA.

COURT THEATRE, VIENNA.

DECORATION OF FIRE-RESISTING CURTAIN.

GERMAN THEATRE, VIENNA.

AUDITORIUM, VIEW OF CEILING.

MUNICIPAL THEATRE, SALZBURG.

AUDITORIUM, VIEW OF CEILING.

MUNICIPAL THEATRE, BROMBERG.

VIEW OF PROSCENIUM.

MUNICIPAL THEATRE, ZÜRICH.

AUDITORIUM, VIEW OF CEILING.

COURT THEATRE, VIENNA.

Fig. 3. Auditorium, Proscenium Curtain.

Modern Opera Houses and Theatres.

VOLUME III.

INTRODUCTION.

In the Introduction to the first volume of this work, I indicated the main groups into which theatres may be divided—namely, Court Theatres, National and Government Theatres, Municipal Theatres, Subscription Theatres with or without Court, Government, or Municipal subsidies, and Private Theatres with or without similar assistance.

Now, in the present introductory chapter, I propose to give further information as to the general conditions and particular requirements to be satisfied by those who would build a playhouse, especially with regard to its financial aspect, the staff employed, and the like. It is not, however, my intention at this part of my subject to follow out in detail each of the five groups with its various subdivisions, but rather to give the whole question a general treatment which shall include theatres of every class. So much that is controversial has been written of late respecting the various methods of conducting a playhouse, that I am loath to enter into the matter minutely, or to pass a summary judgment on an open question. Disregarding, therefore, the mass of literature existing on this subject, and the old controversy as to the advantages or disadvantages of private playhouses compared with the institutions enjoying monetary assistance or official patronage, I shall take this opportunity of clearly marking once again the differences which the varying aims and objects of theatres create in their architectural treatment.

In the first place I would strongly impress on those interested in the Drama, that the private theatre in this country is mainly a money-making concern, and that, as such, financial interests must dominate it, no matter whether the class of entertainment provided be of a high standard, or of the lowest. The purpose of the different entertainments is, as a rule, absolutely the same, and the instances in which principles are placed before profits are very rare.

As far as the architect is concerned, he has only to consider whether the promoter thinks it advisable to invest freely or in a niggardly fashion when determining the building fund; whether the expressed object of the establishment is to supply the demands of the educated, or the less instructed classes of the community; whether the building is to be erected at the smallest possible cost while affording the greatest possible accommodation, and to be decorated only in that commonplace way characteristic of such establishments, or if something out of the ordinary is required. Yet there is no reason whatever why a private theatre conceived with all due regard for a fitting architectural treatment, should not prove a profitable investment to the owner, assuming, of course, that the erection of the building is a straightforward financial transaction. I will even go farther, and assert that the demand for dramatic representations is so considerable in all countries that, no matter what may be the competition, good plays well acted will always find a market, and that the best market is a well equipped playhouse of architectural merit. The owner of theatre property, when he does not undertake the production of plays himself, should always be able, with a little discrimination, to select a lessee fully capable of bringing him a return for the money sunk in the building, if only his theatre is suitably situated, well built and fitted, and if the arrangement of the lease be free from complications.

When, however, as is frequently the case in the Metropolis, the erection of a playhouse is in itself a delicate financial manœuvre of questionable character, and promoted on speculative lines which involve heavy expenses for commissions and mortgages, the commercial status of the establishment is too often unsound from the very commencement, and over-capitalisation prevents any possibility of financial success for the owners. In such cases it is not, perhaps, until the property has passed through the bankruptcy court, or has fallen into the hands of mortgagees, that it at length takes up a sounder position. In fact, financial complications are the main cause of the unsatisfactory playhouses in London. For, quite apart from the general lack of interest both in architecture as such, and in the conception of a playhouse on worthy lines, financial obstacles generally prohibit any but the most economic procedure in its erection. In other words, the architect is forced to put into his work only the smallest degree of substantiality compatible with existing regulations, and the minimum amount of decoration requisite for advertisement.

That theatre construction might assume a notable position in the architecture of the Metropolis, if placed in capable hands and financed on a sound basis, admits of no doubt. The prevailing disregard for questions of design as compared with financial considerations cannot fail to result in ugly buildings, though it is quite possible to prevent a playhouse from becoming an eyesore in spite of a restricted building fund. It is simply a question of making use of such opportunities as are afforded, and of placing the design in good hands. Take the 'New' Theatre, Berlin, illustrated in Volume I., or any of the playhouses designed by Ernest Runtz, institutions in which no one certainly expects to find a high standard of dramatic art, and the truth of my argument is apparent. Compare merely the façades of the Norwich, Peckham, Middlesbrough and Hastings Theatres—the last two being variety establishments—on the following pages, with similar illustrations of other average theatres in London or the provinces. Could there be a greater difference in the spirit of the work? Remembering, too, that the cost of these four theatres is only 23,000*l.*, 30,000*l.*, 21,000*l.* and 23,000*l.* respectively, it can hardly be said that the finer architectural rendering is due to any lavish expenditure.

To explain my references in these volumes to the architect who is primarily a financial agent, I ought, perhaps, to tell what is but too often the story of a London playhouse. An architect has discovered an excellent site for a theatre. Either alone or together with a few friends he obtains an option of ground, prepares plans for a theatre which shall have a maximum seating, and hence earning capacity, and, after these have been approved by a local authority and a negotiable theatre property thereby created, he sets about to find a syndicate to buy the option and plans, and carry out the work. If this syndicate is not inclined to find the whole of the cost, a second syndicate often has to be formed contemporaneously to advance the necessary mortgage-money as the building proceeds. If either the original syndicate or the mortgage syndicate is adverse to taking up the matter without having a lessee, a manager or actor-manager has to be found who possesses the confidence of these syndicates. But this gentleman may not wish to risk too much of his own money—if he has any—in taking over the lease, and a third syndicate—i.e. the lessee's syndicate—has then to be formed to take over the management. It is not improbable that an enthusiastic and moneyed manager who is anxious to have a new theatre may have participated in all three syndicates, even to some considerable extent, with a view to securing the premises he desires. In fact I have known several cases lately where he has become a part lessee, a part owner and a part mortgagee.

But we meet with still other cases in which the complications by no means end at this point, and in addition a caterer has to be found, or a syndicate formed to work the refreshment bars, more particularly when the establishment is destined to provide the lighter forms of entertainment. Another syndicate may have to be established to act for the builder; for not every builder cares to undertake work of this description for syndicates with, perhaps, 'limited liability'; and there may even be second mortgages and other developments. Not infrequently, too, we find the builder, the decorator, or some of the other tradesmen participating in one of the syndicates, in order to obtain contracts on easy terms. I even know instances where the builder has actually a controlling influence over the architect and lessee, and treats the whole arrangement in the same speculative light as he would the development of residential property in the suburbs. With but few exceptions, however, it is the architect who is the prime mover in the transaction. The idea of placing a theatre on a certain site originates with him, and, as I have elsewhere remarked, the talents and facilities of a smart company promoter with a sufficient backing from speculators to carry through the enterprise, are of far more value to him in the transaction than any reputation for architectural design. Of course I have quite omitted any mention of fresh syndicates which, from time to time, make their appearance with the view of running special plays, either in connection with the lessee, or independently, by taking a sub-lease of the property for a short term.

I think, however, I should modify any particular reproach which I may have cast on our Metropolis and provincial centres, by saying that there certainly are some isolated instances where a theatre manager or an investor has built his theatre with his own money and at his own initiative. Still, wherever theatre erection is in the hands of private persons, such financial complications as those above mentioned seem characteristic of the institution. Neither are they confined to our own country, for wherever I have gone into the question in Continental countries where private theatres are to be found, I have noticed the same state of affairs. One of the latest instances comes from Germany, where an ugly playhouse would meet with little favour, and where we hence have the case of the architect promoter being in every way an artist, capable of executing sound architectural work. He has in fact on the occasion in question produced a theatre which is really unique among private playhouses as regards architectural merit. But the financial transaction connected with it would have been held disgraceful even in London. The only satisfaction to be got from the whole matter is to be found in the excellent design produced in spite of the architect having to play the part of company promoter, designer, contractor and mortgagee at one and the same time. I do not think I would be wrong in saying that he took up this scheme solely for the sake of the opportunity to show his powers as a theatre designer, and this fact may extenuate his faults in some people's eyes. It is curious that such cases should be possible, but, nevertheless, they certainly are, and I am under the impression that we also have among us two, if not more, architects who have participated in financing theatres chiefly with a view of showing their talents. But, of course, it is obvious that these instances are exceptional. Architects, worthy of their calling, rarely allow themselves to be inveigled into modern forms of company promotion.

The interest in the architectural rendering of a theatre on the part of the average London theatre architect who takes up the position of financial agent, is very small, if it exist at all, and I well recollect the late C. J. Phipps, who had considerable ability for design if he had wished to use it, telling me that in the course of an important theatrical enterprise with which he had been recently connected, he had really little time to give to the rendering or decoration of the structure in question. And this was in a case where he was anxious to exert himself in this direction, and erect himself a monument even at the risk of being termed extravagant or a faddist. The financial worries of that promotion commenced quite four years before a stone was laid, and continued throughout its execution. Almost the whole of his attention had to be given to monetary questions. There is little use in blaming our architects as a body because English theatre architecture remains at a very low level. Our so-called 'eminent' theatre architects really stand outside the profession, and the few architects who have done good work in connection with our playhouses are exceedingly careful to avoid being classified in that category.

But the details of private theatre finance are not a suitable subject for these pages, except in so far as they concern the conception of a playhouse. It may be taken, however, that the syndicate system, whether applied to the original construction or to the management of an establishment, is equally vicious. Individual enterprise, if not backed by sufficient capital, is, no doubt, difficult to lead to a successful issue; but where such a private undertaking is on a really sound basis—i.e. sound commercially, there is not the slightest doubt that theatres of considerable merit can be produced, though they may lack that refinement which is more possible where funds are ample and time not so pressing as is usually the case.

In these volumes it is a far more pleasurable task to speak of the Court and National Theatres of the Continent, and to give some facts as to their resources, not generally known in countries where private enterprise reigns supreme. I am the more anxious to add a few particulars to those already given regarding the initiation and maintenance of institutions of this kind, seeing that it is by no means impossible that, when some of the still existing prejudices against the stage have been overcome, we shall follow the example set in other countries, and have our Subscription, if not Municipal, Court, or National playhouses. In such a case the businesslike methods of the Teutonic countries should serve as a model, and I will hence chiefly refer to German and Austrian theatres when dealing with the subject.

What, then, is the extent of the subsidy granted to a Court or National theatre? What form does it take, either in money or in kind? I have already shown, in Volume I., the great similarity between the Court and National theatre, explaining, however, that in the one case the establishment is supported by the reigning family, whilst in the other the support comes from the national exchequer. I have shown too, that a Court theatre is established by a reigning family, and is generally managed for them by some Court official, while, of course, the National or Government theatre is similarly managed by a Government official. Financial calculations in regard to these institutions have to be met in this way. As these establishments are nowadays open to the public excepting on State occasions, and with the exception of such parts as are reserved either for royalty or official use, the income can, to a great extent, be based on the sale of tickets of admission, with the addition of a suitable subsidy, which, of course, need not be so large as if the whole expenses of the establishment were defrayed by the owner and no money were taken at the door. There are no profits to make, and the amount of the subsidy is generally so calculated as just to prevent deficits. In fact, as far as the playgoer is concerned, he obtains an entertainment at less than cost price, the owner making up the difference.

To give some idea of the nature of the subsidies, I would in the first instance turn to the Prussian capital. At Berlin the Court Opera House and the Court Playhouse together receive a regular subsidy of, approximately, 45,000*l.* per annum, whilst the buildings are at the same time maintained, lighted and heated free of charge. This subsidy is included in the national budget of the Prussian Diet; or, to speak exactly, the subsidy is a national one, though paid through the King's chamberlain. The King, however, has of late supplemented the subsidy from his privy purse according to circumstances to the extent of another 10,000*l.*, making a total of 55,000*l.* for the two institutions. The buildings are in both cases old ones, Schinkel's Court Playhouse dating from 1821 and the Court Opera House from 1845; but the nation, which is the owner of the structures and the ground they stand on, has voted considerable sums for their improvement from time to time. Their equipment in the way of stage appliances and lighting, for instance, is quite modern, and hence allows for economical working. The stage of the Court Playhouse is the subject of some comment in Supplement I., where it is illustrated in Figs. 101 to 106, pages 63 to 65.

The subsidy of the Court Opera House and the Court Theatre at Vienna is 25,000*l.* in each case; but I am under the impression that this figure does not cover the full extent of the subsidy, as a deficit has almost invariably to be met by the Emperor. In fact a total expenditure of 60,000*l.* on these two Austrian institutions would be nearer the actual figure. As to the character of the two Vienna establishments, a good idea should be obtained from the illustrations in Volumes I. and II. respectively. Various particulars will also be found in this volume, the stages being described in the Supplement on Stage Construction. The opening date of the 'Hofburg' Theatre was September 1888, and of the Court Opera House, May 1869. The actual initial outlay for these two buildings was met by a special fund from the Emperor's Treasury, raised, if I am rightly informed, from the proceeds of levelling the old fortifications of the city, and laying them out for building purposes.

In respect to the aid given by the King of Saxony, I believe his contribution is generally 24,000*l.* for the two Dresden theatres, the one again being an opera house, and the other intended primarily for dramatic performances. In this instance, so far from there being any deficit to make up, the management is generally able to form a small reserve fund, and the economies of recent years have amounted to as much as 2000*l.* per annum. This, however, in plain English, really means that the subsidy is 2000*l.* in excess of the requirements. To this money subsidy must also be added the gratuitous provision, or rather the loan, of an orchestra, of which the members are either royal pensioners or hold life engagements direct from the King's Chamberlain. I am not informed of the exact manner in which the funds were raised for the actual construction, but it can be safely assumed that the Government of Saxony met the greater part, if not the whole of the outlay in one form or another, and that the subsidy is also considered in voting the King's Civil List. It is only in the minor States, where there are difficulties of revenue, that the privy purses of the princely or ducal holders of the throne have to meet the subsidy in its entirety. It should not be forgotten that this is frequently a very heavy burden, as there is considerable competition in questions of art between the various sovereign houses. I have referred to the Dresden Court Opera House at length in Volume I.; the building has only recently been again the subject of considerable improvement in its equipment.

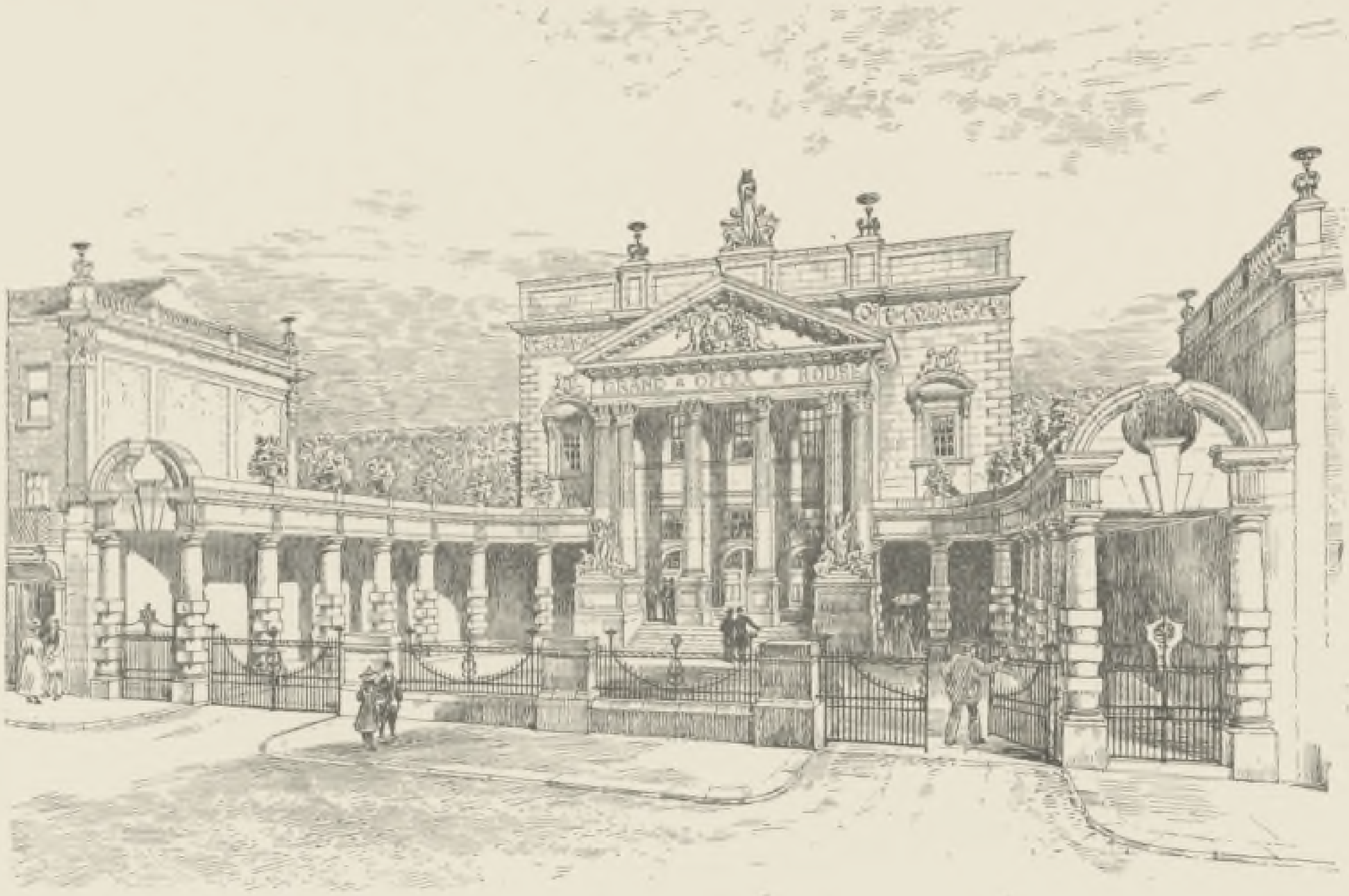
The contribution of the Regent of Bavaria to his two playhouses is 25,000*l.*, one moiety of this sum being paid in cash, and the other taking the form of the maintenance of the royal orchestra, which is placed almost entirely at the disposal of the theatre. The Court Theatre at Stuttgart requires a subsidy of 15,000*l.*, and the one at Carlsruhe receives a like sum from the Grand Duke of Baden, whilst at Darmstadt 14,000*l.* is provided. The last named examples may be taken as typical of minor residential centres on the Continent, and it might be well to note that Stuttgart has a population of about 126,000, Carlsruhe 61,000, and Darmstadt just under 43,000.

In the French Republic the Government Theatre, of course, takes the place of Court institutions, and we there find the subsidies allotted amounting to 32,000*l.* per annum to the National Opera House, 12,000*l.* to the Opéra Comíque, 9600*l.* to the Comédie Française, and 4000*l.* to the Odéon. These playhouses also have other supplementary assistance, but, in common with all theatres in France, they are mulcted of a so-called Poor tax levied on every ticket sold, while provision has also to be made by the management for pension funds. Of course it is needless to say that these subsidies are of considerable age, in fact, I believe the subsidy to the National Opera House alone was as much as 40,000*l.* in 1828, when it was paid by the reigning monarch. I have referred to the subsidy of the Comédie Française, but this establishment cannot exactly be considered as a National Theatre managed on the same lines as the other Government institutions. Its circumstances—too well known to be described at length—are unique, and though, of course, the official administrator of the Government must be regarded as the nominal head of this playhouse, the executive duties practically lie in the hands of a committee of actor-members, who are, if I may say so, the shareholders of the undertaking.

Provincial theatres, if subsidised, as a rule receive assistance from municipalities or district councils, and not from the reigning family or government. Thus the two Municipal theatres at Frankfort receive a subsidy of 10,000*l.*, and the two German and the Czech theatres at Prague together 15,000*l.*, in both cases contributed by the civic authorities.

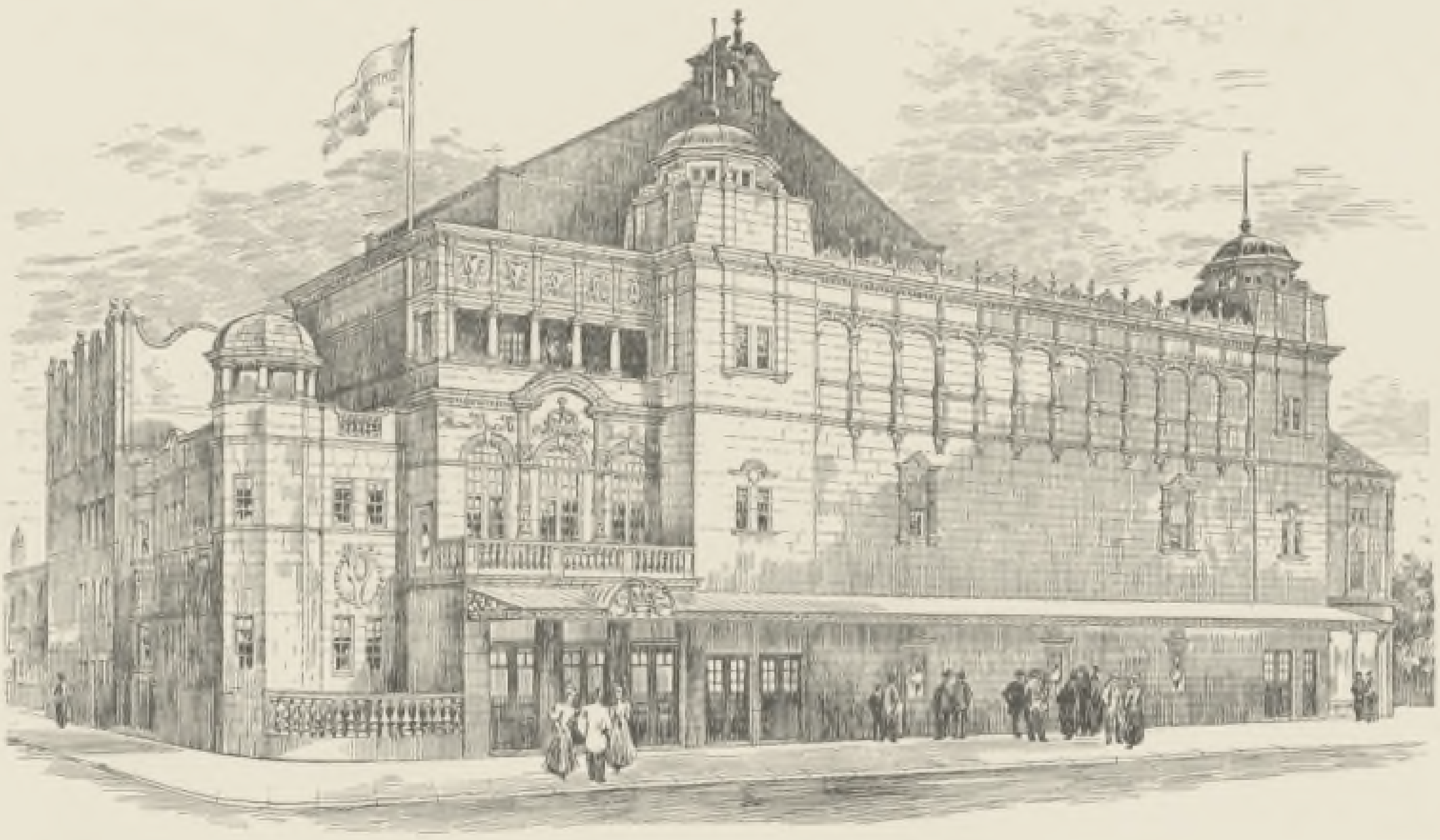
The only provincial theatres which to my knowledge receive Court or Government subsidies are those of Hanover, Wiesbaden and Cassel, which together receive close on 100,000*l.* from the King of Prussia's privy purse, and the principal theatre at Warsaw, which, I believe, receives a subsidy from the Russian Government. But that these three theatres in Prussia should receive such considerable assistance from the privy purse is due to the special conditions on which the towns in question were incorporated with Prussia after the war of 1866, their theatres having previously had subsidies from the reigning sovereigns of the principalities absorbed by the war. In Warsaw the subsidy was given for political reasons, chiefly the encouragement of the Russian language. Thus Prussia alone has five establishments receiving Crown subsidies, whilst in Austria, Bavaria and Saxony there are in each case two Court theatres. France, again, has no less than four playhouses enjoying Government subsidies, whilst, speaking of countries not dealt with under this heading, the Czar's Imperial Theatre Administration alone manages five theatres, three at St. Petersburg and two at Moscow.

As to the provincial examples here mentioned, the Opera House, Frankfort, has already been shown in Volume II. It dates from November 1880, the initiative to its construction having come from a private body of subscribers. The Municipal Comedy House in this city is an old building, and is to be replaced by a new structure in the near future. In



THEATRE, NORWICH.
(Fig. 4.)

Theater, Norwich. Théâtre, Norwich.



'CROWN' THEATRE, PECKHAM, LONDON.
(Fig. 5.)

Theater, Peckham, London. Théâtre, Peckham, Londres.

Edwin O. Sachs ed:

ARCHITECTURAL RENDERING.

respect to the establishments at Prague, one of the Czech and also one of the German theatres were illustrated in Volumes I. and II. respectively. I would only add that they bear the dates of 1883 and 1888. Of the Wiesbaden Court Theatre a plan is presented in the following chapter. The other playhouses at Hanover, Cassel and Warsaw belong to an earlier epoch than is covered by this work.

As theatres of this description are not carried on with a view to profit, the whole principle of their finance lies in the income and expenditure being made to tally; and where the income is particularly satisfactory the administrator is able to go to the luxury of providing a more numerous staff, better artists, or of improving his scenery and equipment. This official, as far as Court institutions are concerned, by-the-bye, is generally appointed directly by the reigning sovereign, and receives a fixed salary irrespective of profit or loss. He is also mostly free from restrictions as regards the acceptance of plays, the engagement of his company, and the choice of programme, the only account that he has to render being directly to the sovereign, who but rarely interferes in his work. His position is practically that of an independent manager, but it must not be confused with such exceptional appointments as those of, say, the directors of the National Opera House, Paris, who are nothing more or less than lessees, who, for a certain subsidy, have to comply with certain regulations as to productions, etc.

Speaking of the administrator's work, I am afraid I should here at once say that the establishment of theatres of this description generally assumes very extensive dimensions, and exemplifies the disadvantages of over-staffing, so common to Government institutions. This has to be taken into account by the architect, particularly where the establishment includes, as is frequently the case on the Continent, the necessary *personnel* for all such departments as the wardrobe-room, the armoury, etc., the whole of the dressmaking and property-making being, perhaps, also carried on under the same roof. The system of direct employment has, no doubt, certain advantages, but it is very cumbersome, and greatly complicates matters. Where all the work is carried on in the theatre, too, a considerable risk from fire is also involved. The German and Austrian theatres are particularly prone to this form of direct employment; France, on the contrary, is the reverse.

To show the size which a staff may reach, I would here give the following details of the *personnel* at the Vienna Court Opera House, from which it will be seen that out of a total of seven hundred and fifty-six persons employed in this establishment, only three hundred and ninety are performers, the remaining three hundred and sixty-six not appearing on the stage.

Taking first the performers—i.e. the acting members of the opera company proper, the ballet and orchestra in permanent employ, and excluding the many supers who are engaged for short terms only, we find the figure given above allows for the following appointments:—

Artists: 32 soloists (17 men, 15 women); 112 chorus singers (19 first tenors, 10 second tenors, 11 first basses, 11 second basses with 2 pupils, 33 sopranos with 3 pupils, 20 altos and one pupil).

Ballet: 112 dancers (men: 5 soloists, 2 pantomimists, 24 dancers, 2 pupils; women: 1 first dancer, 1 second dancer, 9 soloists, 3 pantomimists, 3 'coryphées,' 32 dancers with 30 pupils).

Supers: 3 super leaders.

Orchestra: 109 musicians: (4 leaders, 2 solo violins, 15 first violins, 15 second violins, 10 altos, 10 violoncellos, 10 counter-basses, 2 harps, 4 flutes, 4 oboes, 4 clarionets, 4 bassoons, 8 horns, 8 bugles, 5 trombones, 1 tuba, 1 kettledrum and big drum, 1 side drum, cymbal and triangle).

Bugle Band: 32 stage musicians, better known as the 'Fanfare.'

Of the non-performers on the permanent staff, the administration comprises thirty-six persons—responsible to the master of court ceremonies—and is made up as follows:—

The intendant-general, the director of the opera and his assistant, a chancellor or business-manager, a general secretary, a controller-general or treasurer, an office-manager, an accountant, a superintendent of the building and his assistant, a chief of the medical service and four assistant surgeons, an editor, one head clerk, together with two clerks and two junior clerks for the secretary's office, a cashier, four clerks and two boys for the treasury, and further two private secretaries, a librarian, a store-clerk, and three messenger boys.

On the stage a staff of twenty-nine is employed for the management of the opera company, ballet and orchestra:—

A general manager with an art adviser, an opera manager, a ballet manager and a ballet mistress, a super-manager with an assistant, a chorus manager, three solo rehearsers, a chorus rehearser, three ballet rehearsers, a stage manager and two assistants, two prompters, a chorus librarian, an orchestra manager, a piano-tuner, an instrument-maker, three call boys and two orchestra boys.

The mounting of the plays is in the hands of a staff of eighty-six persons, and the duties include the arrangement and working of the scenery. The theatre having an old wooden stage requires a very large complement of stage hands and carpenters, which is at times augmented by labourers not in permanent employ. The permanent staff comprises:—

An inspector-general of scenery with an assistant, a scene-painter, a stage engineer-in-chief and an assistant, a stage carpenter-in-chief with a book-keeper; two fly-men, four wing-men, one trap-hand, two joiners, a scene-store clerk and a storekeeper, two stage foremen, thirty-seven stage hands, a foreman carpenter, eight carpenters, four canvas hands and a watchman.

For the lighting of the entire block, including the stage, a staff of eighteen is employed, comprising:—

A lighting inspector, a chief mechanic and an assistant, thirteen mechanics and three labourers.

For the properties the staff figures at eight:—

A property-keeper, five assistants, two armourers.

The dressmaking and costume storage is in the hands of a permanent staff of sixty-three, but this number is sometimes augmented by occasional assistants. The staff includes:—

A head-costumier, a store-keeper, three assistant store-keepers, three dressers and four female dressers for soloists; twelve female dressers for the small parts and the chorus, a cutter for men's clothes, two cutters for women's costumes, a shirt-cutter, a preparer, two hands for sewing machine, ten tailors, fifteen seamstresses, an ironer, a linen keeper and material keeper, a shoemaker, a costume cleaner, an errand boy.

The hairdressing department includes a men's hairdresser and two assistants, a ladies' hairdresser and three assistants; seven persons in all.

The staff employed in the care of the house and attendance on its equipment comprises one hundred and eighteen persons:—

An architect, a chief controller, an inspector of cloakrooms, two principal door-keepers, six ordinary door-keepers, three attendants for the Court boxes, six box attendants, fifty-five persons employed as attendants in the auditorium or in the cloak-rooms, two waiters, a locksmith, the controller's book-keeper, a messenger, a mechanic and two stokers, a plumber, two foremen cleaners, six sweepers, nine female sweepers, a chimney-sweep, two foremen firemen and sixteen firemen.

Staffing of this description reminds one again of the Czar's Imperial Theatre Administration just mentioned, which comprises a Court Playhouse for Russian drama, a Court Playhouse for French comedy, and a Court Opera House for Russian opera, opéra comique and ballet, at St. Petersburg, together with a Court Opera House and a Court Playhouse at Moscow. The three first-named theatres have four companies of performers, and the latter, three companies. At St. Petersburg the Russian dramatic company alone has a staff of ninety-one executants, whilst the Russian opera company has a staff of thirty-three artists, with a chorus of one hundred and twenty; the ballet company comprises two hundred and twelve dancers, and the French comedy company fifty-five performers. At Moscow the figures are, for the opera, fifty artists with a chorus of one hundred and twenty, for the drama ninety, and for the ballet one hundred and seventy-nine. These companies have again seven separate orchestras, and whilst the two opera orchestras have one hundred musicians each, the ballet orchestras have sixty-five musicians respectively. The three orchestras attached to the dramatic companies in which the number of musicians is altered from time to time to meet the different requirements, together count a staff of forty-one performers.

I do not wish to give the particulars regarding the staff of non-performers at these Russian theatres in the same way as I have that of the Court Opera House, Vienna, but it should be mentioned that the staff, quite irrespective of the *personnel* in attendance at each of the houses and on the different companies, includes a central administration, with sectional administrations at St. Petersburg and Moscow, and in each city large numbers of assistants at the different scene and wardrobe stores. The administration goes so far as to do its own cartage, having stables with one hundred horses, its own printing office, paint rooms and photographic studio. The work of the individual companies is materially assisted by a dramatic school being attached to the administration, and this school has generally one hundred pupils for the ballet, twenty for the drama, and ten for the opera, the sexes being equally divided. Taken altogether, this Czar's Theatre Administration, with its enormous staff, has no parallel in the world.

It will be remembered that I spoke of the length of the 'run' of a play as not only materially influencing the character of the institution in which it was presented, but also the whole conception of the building and its equipment. Now, to those who are used to the practice in the Metropolis of 'running' a play for any period between a week and two or three years, it may be of interest to know what the programme of performances is elsewhere. We associate many of our most successful theatres with two or perhaps three plays per annum, whilst in lighter forms of entertainments there may be 'runs' of seven hundred to a thousand nights. Only in a few instances do we find two or three plays being given in turn at the same house and by the same company; and this exception, too, is generally due solely to the non-success of a production, which has compelled the manager to arrange a stop-gap in the form of a series of his previous performances. Of course at the Covent Garden Opera House we have a constant change of bill, though the repertory is, as a rule, a somewhat limited one; but the Opera is the only exception, unless we count exceptional series of representations by foreign companies who rent a London theatre for a short season. Matters stand very differently on the other side of the Channel.

Taking some of the Continental theatres I have already mentioned, we find that, as far as Opera is concerned,

VARIETY THEATRE, MIDDLESBROUGH.

(FIG. 6.)

Spezialitaeten Theater, Middlesbrough. Théâtre des Variétés, Middlesbrough.

VARIETY THEATRE, HASTINGS.

(FIG. 7.)

Spezialitaeten Theater, Hastings. Théâtre des Variétés, Hastings.

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the Court Opera House at Berlin presented no less than sixty different works during the season of 1895-6, these works comprising fifty-two operas and eight ballets. At the Court Opera House, Vienna, the same season saw the presentation of seventy-four works, comprising fifty-three operas and twenty-one ballets. At Carlsruhe, where there is only one Court Theatre to fulfil the purposes both of an opera house and dramatic establishment, no less than ninety-seven works were given in the season of 1895-6, this number being composed of forty-seven operas, forty-nine dramas and one ballet. At Darmstadt, where a Court Theatre occupies the same position, there were one hundred and nine works, including forty-eight operas, two comic operas, five ballets, forty-seven dramas, and seven productions of a lighter form of entertainment; whilst at Stuttgart the total was one hundred and twenty-eight, comprising fifty-three operas, five ballets and seventy dramas. The Court Theatres in the provincial towns of Hanover and Wiesbaden, which are similarly situated in regard to accommodation for the two classes of production, have a record of one hundred and nine, and one hundred and four works, respectively. At Munich again, where there are two playhouses at the disposal of the Court administration—though in reality one is primarily an opera house and one a playhouse—we find that, in a season of eleven months, the combined opera and comedy companies presented no less than one hundred and fifty-two works including fifty-six operas. To those who are used to the London methods, some of these figures must, indeed, appear exaggerated, when the difficulties of management, rehearsal and mounting are considered; while the mere technical difficulties which have to be surmounted are enormous. But as a matter of fact, with the exception of a lack of elaboration in the scenery, the results are generally speaking satisfactory.

But it is not only the Court Theatre which gives its patrons the variety I have indicated; for the Municipal Opera House, Frankfort, exceeded the record of other similar establishments, by presenting no less than eighty-eight works in the season of 1895-6, sixty of these being operas, eleven comic operas, four ballets, and thirteen spectacular pieces. The Subscription Theatre at Prague presented fifty-nine works, of which forty-five were operas, twelve comic operas, and two ballets, whilst the Czech National Theatre, in the same city, at which both opera and drama are performed, gave a programme of one hundred and twenty-seven works, of which forty-eight were operas, six ballets, and seventy-three dramas. Without giving actual records, I may add that the private theatre in Continental countries has to provide repertories, which though, perhaps, not so extensive as the Municipal establishments of the same standard, are yet very considerable. All these representations include a comparatively large number of new productions, both Court and Municipal institutions being ever ready both to bring out old plays which have not been seen before in their establishments, and to risk a trial of the work of novices. What is more, the new productions are not necessarily restricted to the theatres of the capital, or the capitals of principalities; at least, this is not the case in Central Europe. In France and Russia, as in England, it is true, the success of a production is often gauged by its reception in the metropolis. But this is not everywhere the case; and in German-speaking countries some of the most successful operas have been first performed in provincial centres of very secondary importance.

I do not wish here to make comparisons and present figures regarding the representations, say, at the Opera House in Paris, at 'La Scala' in Milan, and other well-known playhouses, as this would be of little practical use, where the requirements of individual communities must be met in a special manner. In Austria and Germany there is almost a craze for variety in presentation. There are many ardent theatre-goers nearly all desirous of seeing a large number of plays in the course of the year, and as there can be no question of the smaller towns possessing a number of theatres, it follows that the few existing establishments try to meet the public demands to the best of their ability. And given such a demand and the fulfilment of it on the lines mentioned, it is obvious that in the construction of new playhouses the architect has to be most particular in the facilities he provides for working the establishment. Every department is affected by this constraint. Change of plan becomes necessary from the managerial offices to the bill-poster's department, from the stage-carpenter's office to the wardrobe-keeper's room; and, as I have already indicated, it is where direct employment is most favoured—and is even to a certain extent essential, owing to constant change—that very heavy demands for space are made in laying down the lines of a new building.

In closing these remarks regarding production, I will add some particulars as to the Czar's Theatre Administration at St. Petersburg and Moscow. The companies for Russian drama at St. Petersburg and Moscow, during the year gave respectively some two hundred and fifty, and two hundred performances. In the two hundred and fifty performances one hundred and five different plays were presented, of which twenty-seven were new productions, whilst in the two hundred performances seventy-three works were presented, including seventy-two new productions. As to the presentation of Russian opera in the Court establishments of both cities, the repertory was by no means so large, for we hear of twenty-two and twenty-three works being presented respectively, for a hundred and twenty and a hundred and twenty-five performances. Nor do the ballet companies show such a large repertory, for we have forty-five performances at St. Petersburg, with thirteen different ballets, and fifty performances at Moscow, with nine ballets. On the other hand, the French comedy company presented sixty-four pieces, of which twenty-one were new productions, at one hundred and thirty-three performances. I have here spoken of performances as distinct from seasons, as in the Czar's establishments we often find only three or four performances a week, and the season is only of nine months' duration with a break of seven weeks over Lent. In other Continental countries the season is generally ten or eleven months in duration, with but a few days' cessation before Easter.

Having referred to the manner in which the presentation of so many works in the course of a season must inevitably influence the design of a theatre, I would call attention to the fact that where such a repertory is provided, the company has, as a rule, at least five or six pieces in rehearsal at the same time, which necessitates a far larger amount of space for rehearsal purposes than is customary elsewhere. Large rehearsal rooms are shown in many of the plates in Volumes I. and II. Not infrequently these rehearsal rooms are sufficiently large to allow the adoption of the full dimensions of the proscenium. In many cases their length is slightly over proscenium width, and the depth is sufficient for, say, three 'entries.' The 'entries' are marked on the floor, and thus the stage proper is relieved of much of the preliminary work that would otherwise interfere with the preparation and mounting. A large number of rooms for solo rehearsal are also required, and accommodation for the large staff which, as I have shown in respect to the Vienna Opera House, has the direct management of, and attendance on the company. It will be remembered that, for a staff of thirty-two singers, there were no less than three solo rehearsers. Moreover, there were also chorus rehearsers and three ballet rehearsers, quite irrespective of the various leaders, general managers, stage managers and the like. Even the orchestra requires considerable accommodation, and we often see a large orchestra rehearsing room in addition to the ordinary band-room. Where so many presentations and so much rehearsal is required, the comfort and convenience of the actor have to be studied to a far greater extent than elsewhere. Thus two green-rooms are often required for the leaders as well as separate green-rooms for small parts, choruses, etc., and the dressing-rooms have to be well considered and further provision made for ante-rooms, waiting-rooms, etc. Altogether it should not be forgotten that the ordinary programme for this perpetual change inflicts on the staff as a rule very many morning and afternoon rehearsals quite apart from the performances, and if an individual artist is not taking part in the performance, he is expected to be found, nevertheless, rehearsing at the theatre in the proper rehearsal room. Of course, management of this description requires considerable precision, and with the necessity of precision, the possibility of rapid intercommunication by speaking-tubes, telephone, signals, lifts and easy staircases. The practical arrangement of the back of the house in such an establishment, and the forethought in all matters of equipment, are of great importance to ensure economy in time and money.

Speaking of economy, there is this curious feature in the management of these Continental establishments—viz., that with the exception of a few individual stars, and in spite of the very heavy work which has to be encountered by the actor, the remuneration is comparatively small—small even in comparison to the local money value and social conditions. As a matter of fact, I hold, that the economy in remuneration is, to a considerable extent, influenced by the system of long permanent appointments at most of the theatres abroad, and the existence of a pension fund in connection with most Court, Government and Municipal theatres. I do not, however, wish to go into the question of financial management, and quote salaries, establishment expenses, authors' fees, etc.; yet, so as to give some idea of the general expenditure of a playhouse in a German-speaking country, I will show the balance-sheet of the Municipal Theatre administration at Frankfort, a city very centrally situated, not inexpensive, and where the municipal subsidy is by no means considered liberal. There are two theatres—a new opera house well equipped and essentially modern, and the old playhouse, which is at present by no means in a good condition. Just this contrast between a modern and somewhat old establishment we give as the happy medium to obtain financial results from. The season, it should be remembered, is eleven months, involving about three hundred performances at the Opera House, and two hundred and fifty performances at the Comedy Theatre. The two sides of the ledger balance very nearly, as should be the case where a performance is presented at cost price. That there should be a small balance on the right-hand side of the ledger is a sign of good management. I give this balance-sheet without prejudice, and I am presenting this one only with the express view of not inviting comparisons.

Receipts.	Marks.	Expenses.	Marks.
Subsidy provided by the Municipality	200,000.00	Remuneration to permanent staff	1,000,885.58
Cash takings at the door	533,176.09	Supers and additional musicians	23,982.80
Subscriptions	443,712.12	Musical scores and library	5,638.15
Cloak-room fees	24,773.00	Authors' fees (an average of 3½ per cent.)	33,537.50
Refreshment bars	3,100.00	Maintenance, lighting and heating	74,292.61
Admittance to view the building	708.60	Costumes and accessories	27,433.10
Interest on capital invested, etc.	4,525.68	Scenery	5,423.42
		Printing, bill-posting and various	7,717.93
		Administrative expenses	26,438.27
		Surplus	4,648.13
Total	1,209,995.49	Total	1,209,995.49

It is not my intention to analyse the above figures, and yet I cannot but point out how small, comparatively, is the amount paid for royalties and authors' rights if we consider the large number of plays produced and the relation of the percentage to the gross takings. One matter we must also bear in mind when reading these figures, and this is in respect to the mounting of the plays produced. I am afraid that neither the English author nor the English audience would be satisfied with such a meagre, not to say shabby, *mise en scène* as is generally presented by the Continental manager. No matter what may be the merits of the individual actor or singer, or the merits of the general presentation of the play, it cannot be overlooked that, although the stages are generally admirably adapted on the Continent for obtaining excellent scenic effects, the scenic artists and the stage management generally give very pitiable results from the London point of view.

As to the popularity of the theatre in German-speaking countries, I think it is recognised that it takes a more important position in social life than can be understood in this country. In all classes the desire for playgoing is most marked, and the intelligent artisan is quite as much a critical playgoer as the members of the more educated classes of the community. The popularity of the play is, of course, facilitated by the fact of its enjoyment being obtainable at a reasonable figure—reasonable, too, in comparison with the generally greater value of money in a Continental country. We should also not forget that, no matter whether the theatre be National, Court or Municipal, it is possible to subscribe to a series of performances at reduced rates, which system influences, to a certain extent, the regular attendance of patrons.

In respect to the relative price of seats in different countries, the stall in London costs ten shillings and sixpence in all West End theatres, though this price is increased at the Opera to a guinea or more, and also at other houses to fifteen shillings or more on special occasions when companies are visiting from abroad. Prices are lower at the minor and suburban theatres. But taken as a whole, we reckon stalls at ten shillings and sixpence and the lowest priced seat at one shilling. In Paris, a stall which practically takes the same position as our own costs fourteen francs at the Grand Opera and about seven francs at the better Parisian theatres, both subsidised and otherwise; the price of the cheapest seat at the Opera is two francs, and at the other houses from one franc fifty centimes to two francs fifty centimes. At Vienna, the prices fluctuate slightly, according to the nature of the performance, but the average may be taken as four florins for a stall; at Berlin it is six marks; and at the National Opera House at Buda-Pesth it is three florins. At the Court playhouses of Munich, Dresden and Stuttgart, the price may be taken as fluctuating between four and five marks; at Darmstadt and Carlsruhe between three marks and three marks fifty pfennigs. Again, the Municipal establishments at Frankfort charge five marks for a stall, and the Prague theatres three florins. The reduction on subscription may be taken generally at ten per cent.

But however interesting might be a full description of the position—economic or otherwise—occupied by the Drama in different countries, I am afraid such particulars would lead too far. The details already given would almost appear out of place, were it not for the fact that the conditions of theatre management so materially influence the conception of the playhouse, and that without some understanding of the varied circumstances under which the institutions referred to in these volumes are conducted, it is difficult to judge the relative merit of the different plans or their architectural rendering.

In conclusion, let me emphasise the fact that the lower standard of theatre construction in the British Isles, as compared with that of the Continental countries, must be accounted for to a considerable extent by the conditions of theatrical enterprise, and the circumstances under which the Drama is presented. Let me also state that though I trust there may at some future date be a material improvement in the construction of the private theatre, where the financial basis is sounder than is at present generally the case, and where the commission for the design is placed in better hands, yet it is useless to expect the home of the play to occupy a high position as a public monument in a country where there is scarcely any recognition of the existence of dramatic art by the State, and where its official or pecuniary assistance by the municipal authority is still a question under academic discussion.

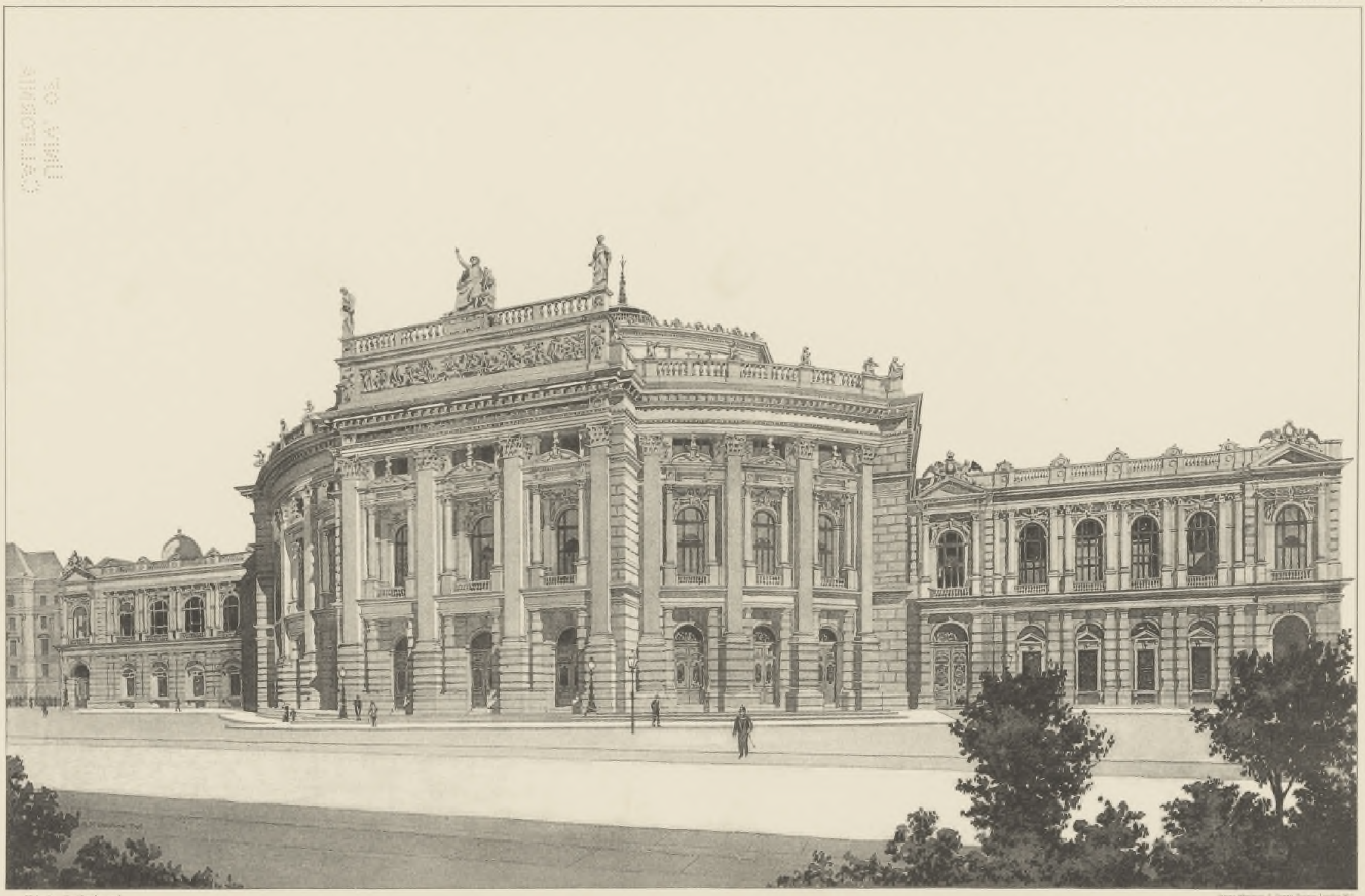
As I indicate elsewhere, there is a growing feeling, both in London and in many of our large provincial centres, that the presentation of plays merits the recognition and encouragement of the public authority, whether the latter represent the central government or an individual community. There is even some hope that the London County Council may soon seriously consider the advisability of officially supporting Opera and Drama. But before we blindly introduce Continental methods in respect to national and municipal theatrical management or subsidy, it should be remembered that our method of carrying on public business or establishing public institutions is essentially different from the practice observed abroad. In countries where practically every institution for the common weal is either official or in the receipt of official support, it is quite in keeping with national usage that dramatic performances should either be presented by some public department or under the auspices and with the help of some public authority. But in a country where the most elementary necessities of common welfare, such as the establishment of hospitals, still remain to a very great extent dependent on the voluntary effort and support of individual citizens, would it not seem somewhat anomalous if the whole machinery of the public authority and its funds were at once utilised in the interests of dramatic art, without there at least having first been some serious attempt, on the part of those who are desirous of obtaining the patronage and financial support of the official body, to organise the institution, and raise the major portion of the funds considered necessary?

Surely, if we think of some of the provincial centres of much-governed Germany, and find, for instance, that in respect to the Frankfort Municipal Opera House, just referred to, it was not until the wealthier citizens had raised some fifty thousand pounds that the Municipality stepped in to assist the idea with a suitable site and certain financial aid, it would not be out of place if our public authorities, whether metropolitan or provincial, demanded a similar tangible expression of interest before contributing either to a Municipal Opera House or to any other similar establishment. Would this not be the course adopted if some section of a community were desirous of obtaining a piece of land to serve as a public park? Would they not require certain funds to be at first voluntarily raised before contributing either to the initial outlay or the maintenance? And has this not been the case with many of the most successful institutions referred to in these volumes, and in connection with towns far less able to afford individual contributions for such purposes as are here under consideration? Even as regards the *bonâ fide* People's Theatre, have we not seen a town like Worms, in South Germany, with only twenty-three thousand inhabitants at the time, raising as much as twelve thousand pounds in subscriptions prior to the Municipality contributing some five thousand pounds or allowing the municipal savings bank to take a mortgage on the property?

Whilst strongly advocating Court, Government and Municipal aid in the interests of the Drama, surely the first really public home, either for the Drama or Opera in a country such as ours should naturally take the form of a Subscription Theatre, raised by voluntary contributions in which the various authorities interested could participate. For the public authority itself to at once become a theatrical entertainer would in no way accord with our traditions, even if the majority of those represented by the official body were in favour of establishments managed on these lines. Do we not simply require, in the first instance, some official encouragement and support of dramatic art? Will it not be time enough after the development of some scheme of according encouragement and support to Drama and Opera to consider any steps relating to the establishment of a National Theatre or Municipal playhouses from the public funds?

There is no doubt that, as Sir Henry Irving—who has done so much for Drama in the English-speaking world—lately declared at Cambridge University, the theatre should distinctly be in some degree encouraged by the State or by Municipalities. But for our mode of thought, I would ask whether, to begin with, some form of recognition, encouragement or aid would not be more appropriate and satisfactory than the establishment of playhouses owned and managed by the public authority? Would not the immediate step from the almost complete official neglect of Drama and Opera to the actual public ownership and management of playhouses be too great?

COURT THEATRE, VIENNA.
FIG. 8. GENERAL VIEW.



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COURT THEATRE, VIENNA.

Gottfried Semper, Baron Hasenauer.

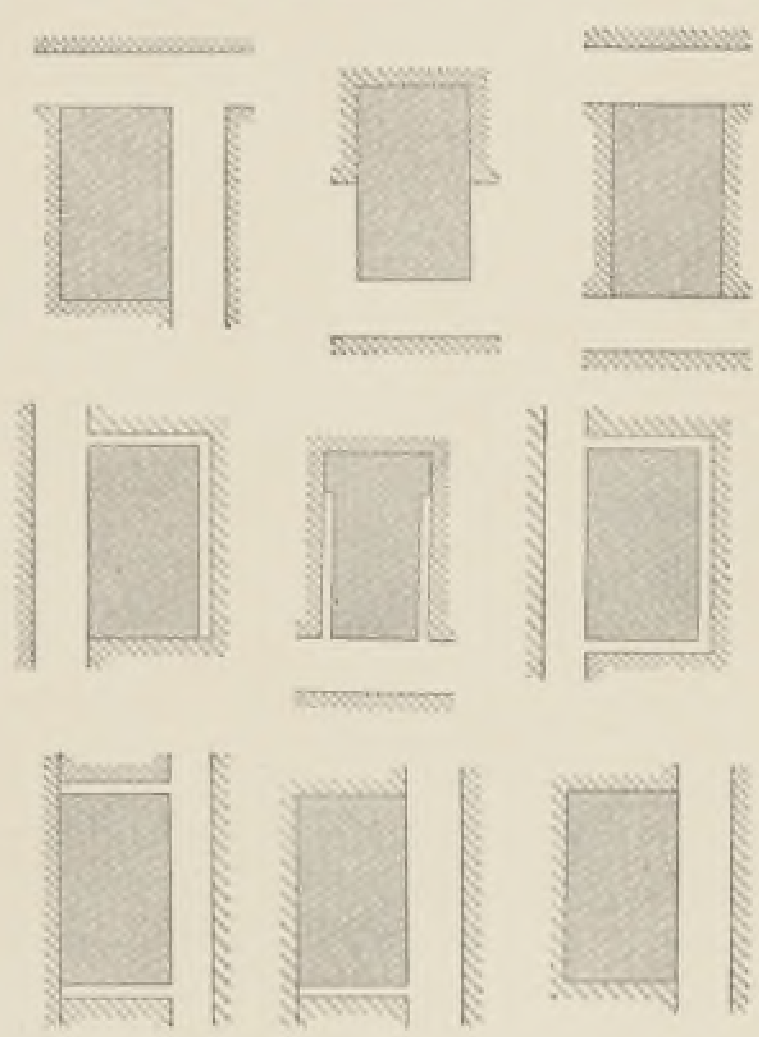
CHAPTER I.

GENERAL ARRANGEMENT.

In order to avoid the possible assumption that I propose dealing with theatre planning by laying down rules or principles of design, or that I mean even to deal in detail with all the many sections of a modern playhouse, I would at once state that nothing is further from my mind. I wish to set up neither a standard nor a theory of any kind as to the practice to be followed in varying circumstances. To those who require information in that form, I cannot do better than recommend any one of the several text-books issued from time to time on this subject. In compiling a work of this description I prefer to deal with the subject solely under general aspects, and only there go into detail where elucidation appears essential, or where some point raised refers to a controversial question. I do not wish to traverse old ground unnecessarily, nor do I wish to speak of questions of construction or of equipment which are common to any other class of public building equally with the playhouse. The only three subjects, in fact, which I think here require really thorough treatment in detail are, the question of stage construction, which has so far been considerably neglected; the question of theatre safety, which requires the stern figures of statistics and analysis to prove the urgency of better protective methods; and lastly, the question of legislative enactments, the perusal of which gives a picture of what is, at present, officially considered essential for a modern building in the interests of the general public. These three subjects are separately dealt with in the Supplements to this volume. If I had chosen to enlarge the sections on acoustics, warming, ventilation, lighting or even decoration and furnishing, on the same lines, I am afraid this work would have become far too bulky; and though it might have assumed a more encyclopædic character, I doubt whether it would have retained its intended position as a record solely of modern development in theatre design and equipment. And then questions of acoustics, ventilation, etc., are common to other buildings besides playhouses; they do not refer solely to the theatre, as do Stage Construction, Theatre Fires and Theatre Legislation.

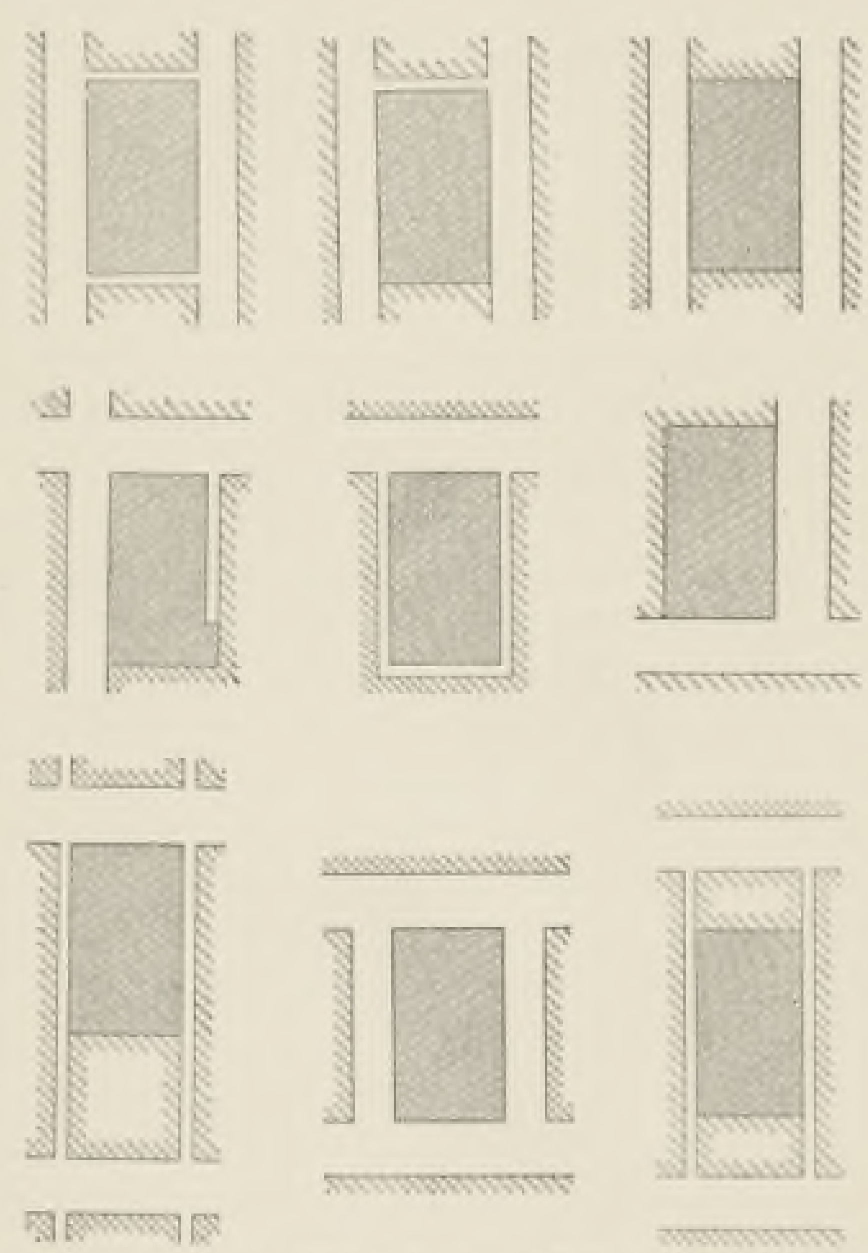
COURT THEATRE, VIENNA. Fig. 9. Site Plan.

Now speaking generally, when a theatre scheme is proposed, I hold the location of the building should always be given most earnest consideration. Hence, I would open this chapter with some remarks on theatre sites. When I say the site should receive first consideration, I am not speaking simply with reference to any questions relating to the structure, but quite as much, if not more, in the interests of the Art that has to be housed in the theatre, and the general well-being of the institution. Looking at the theatres of Europe as a whole, we may justly say that few other buildings are so dependent on their situation, and that the site of a playhouse generally declares its character. Of course there are exceptions. We know from experience in the Metropolis that a good or amusing play will attract large audiences to the veriest slums. We know, too, that in London any feeling with regard to the location of a theatre as a matter of æsthetic sentiment hardly exists. Yet a playhouse which is conspicuously situated in a good thoroughfare has certain attractions, even to the British public, which cannot be rivalled in any way by a theatre difficult of access or situated in an obnoxious neighbourhood. But I am here speaking of Europe as a whole, and the Metropolis and our provincial centres form but a small part of that whole. In every Continental country it is a first essential from the point of view of Art that the playhouse should be well located. One of the most prominent sites in the best part of the town is generally allotted to the Drama, as is but due to a highly cherished institution, the home of which is regarded as a public monument. There is no question in that case of the business advantages of a good position, or the aid afforded by a good site to convenient and safe planning The choice of so good a situation may be solely due to what might be termed sentimental reasons; but nevertheless, whether from sentimental, business, or structural reasons, there is no doubt that the conspicuous character of the theatres of Europe as a whole is largely dependent on their location.



DIAGRAMS OF LOCATION. Figs. 10 to 18. Site Plans.

If this treatise were intended to serve as an exposition of the elementary principles of theatre design, I should have to commence, as is the case in all text-books on the subject, with some such categorical assertion as, that an isolated site is absolutely essential for the purposes of good planning. But I will assume that the many arguments in favour of an isolated site, both as regards good planning and the safety of the audience, have already been recognised, and that any deviation from the principle of isolation is to be attributed entirely to questions of circumstance. I will thus not enter into this question otherwise than to applaud its principle. There is no doubt whatever that absolute isolation facilitates clear and straightforward planning, and thus contributes to the safety of the audience; and further, that complete isolation means a decrease of the risk from panic or fire from without. To my mind, however, the sentimental reasons for entire isolation are even more important than the structural reasons, for I would go so far as to say that, though the advantage of having a theatre entirely detached is great, it is quite possible to build a playhouse with due regard to straightforward planning and the safety of the audience even if the isolation be not entire. For instance, the fact of the back wall of the stage in a theatre being a party wall only to a slight extent affects the risk of fire and panic from without; and yet it is obvious that the fact of the building backing on some adjoining property, materially affects its standing as an architectural monument. When referring, in Volume II., to the new National Opéra Comique at Paris, which is being completed from the designs of Louis Bernier, I felt bound to say that in the selection of the site the French Government has given us an exception to the good traditions of France in the location of its public buildings. It is just because in France true sentiment in art matters reaches a high standard that we are surprised to find the national home of a revered art thus placed. For structural reasons there would be no very great disadvantage if even the front wall of this theatre were a party wall to adjoining property, but I am sure—although the façade here in question, as I have already said, is a particularly commonplace one—sentimental reasons would be strongly against such a position.



DIAGRAMS OF LOCATION. Figs. 19 to 27. Site Plans.

Structurally, therefore, I hold that, as far as good planning for the safety of the audience is concerned, there would be no objection to both front and back walls being party walls, as I have shown in one of my diagrams on this page, Fig. 21. The reason why I put forward this somewhat unusual proposition is, that no matter what be the character of the theatre or the sentimental aspect of its location, it is of the first importance in the matter of planning, that there should be ample opportunities for exit on both sides. It is not of such importance that the site be an absolutely isolated one.

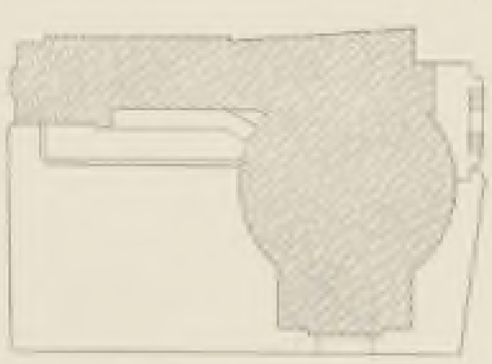
For ideal reasons, no doubt, it would be preferable if the theatre were placed on a corner site, and had its front and one side of the boundary facing a public thoroughfare. This is one of the favourite positions for new theatres erected according to the recent regulations of the London County Council, which say that at least one-half of the boundary of the theatre should abut on a public way. But from the fireman's point of view, I certainly do not hold that the mere general definition of half the boundary is sufficient. The essence of straightforward theatre planning is symmetry and safety, which are practically impossible when one side is blocked by adjoining property,

CASINO THEATRE, MONTE CARLO.
FIG. 28. SITE PLAN.

'LESSING' THEATRE, BERLIN.
FIG. 29. SITE PLAN.

'GERMAN' THEATRE, VIENNA.
FIG. 30. SITE PLAN.

NATIONAL OPERA HOUSE, PARIS.
FIG. 31. SITE PLAN.



PEOPLE'S THEATRE, WORMS.
FIG. 32. SITE PLAN.

MUNICIPAL THEATRE, BROMBERG.
FIG. 33. SITE PLAN.

'HER MAJESTY'S' THEATRE, LONDON.
FIG. 34. SITE PLAN.

D'OYLY CARTE'S OPERA HOUSE, LONDON.
FIG. 35. SITE PLAN.

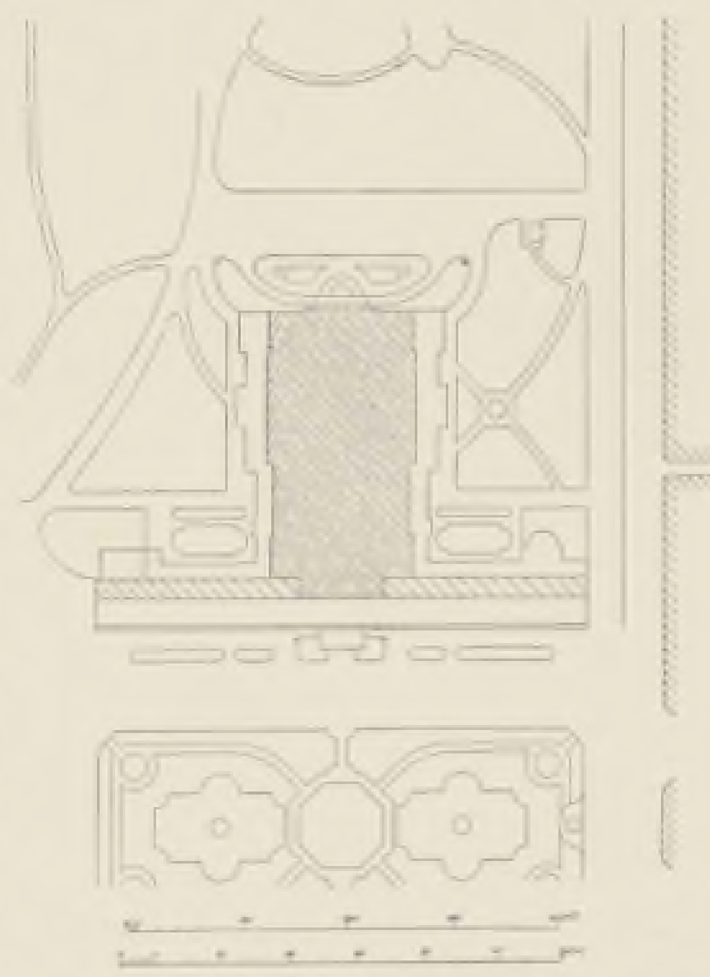
'GARRICK' THEATRE, LONDON.
FIG. 36. SITE PLAN.

From a fireman's point of view anything is better than having one side blocked, even in the case of small theatres, where, perhaps, only one pair of staircases is required, which could both open on to the front. Thus a situation like that shown in Fig. 11, on page 12, would not be disadvantageous, inasmuch as the front and the front part of both sides are free. It is with a view to having both sides free that we find such makeshifts resorted to as the arrangement of alleys from the main thoroughfare, running up one side, or up two sides, or around the theatre, as in the case of Figs. 13, 14, 15, 22, 23, 25 and 27, on page 12. But, of course, an open thoroughfare is always preferable to an alley or 'cul-de-sac,' and in fact an open thoroughfare on both sides of the theatre is, to my mind, the *sine quâ non* for a good plan.

MUNICIPAL OPERA HOUSE, FRANKFORT.
FIG. 37. SITE PLAN.

Now, in the eighteen diagrams on page 12 I have made an effort to show some of the more common varieties of theatre positions, from the simplest form of an isolated site surrounded by thoroughfares, as in Fig. 26, to the more complicated forms where a building is surrounded by adjoining property, and is only approached by alleys, as in Fig. 27. All these variations and many more are to be constantly found in this country, though in the Metropolis, as I have already indicated, a building erected at the present time would only be allowed where at least half the boundary faces a public approach. Sites as shown in Figs. 10, 11, 19, 20, 21, 22 and 24 are thus alone permissible. But from an æsthetic point of view I grant that, failing a site entirely free, the site where the back wall is a party wall, or the corner site, can alone be considered in any way satisfactory.

To amplify these remarks, I have been at pains to arrange a sheet showing the location of some of the playhouses referred to in these volumes, and have also added in the text a few similar illustrations. Perhaps one of the most ideal sites is that of the 'Hofburg' Theatre, shown in Fig. 9, page 11, fronting on a large open square, standing in what I might term a 'recess' of the boulevard frontage, and facing public buildings of architectural importance, yet not too near the theatre itself in any way to dwarf its impressive appearance. The National Opera House, Paris, though standing on an isolated site, is not placed well; for, as will be seen from Fig. 31, page 13, the streets which surround it are too narrow for the enormous block, and the vistas obtained from the thoroughfares which serve for approach are too limited to permit of the spectator obtaining a good perspective. Compared with the Paris example, I should much prefer the site of the Frankfort Opera House, shown in Fig. 37, on this page, which stands in a large square, and is backed, to a certain extent, by grounds and shrubbery, having broad thoroughfares both at the front and sides. I should also prefer such locations as those of the 'Lessing' Theatre at Berlin or the 'German' Theatre in Vienna—see Figs. 29 and 30 on page 13—which, though on somewhat irregular sites, are so placed as to allow a good vista. The Municipal Theatre at Bromberg, Fig. 33, on the same page, has also been well placed considering the peculiarities of the locality. It faces a broad thoroughfare, and has an open space on one side and a street on the other, although its stage backs on to adjoining property. When speaking of Bromberg I would compare with it the position of the 'New' Theatre at Berlin, of which the site plan is given on page 26 in Volume I. Here, too, the same architect who is responsible for the Bromberg theatre overcame the difficulties of site by the skilful arrangement of his block in particularly unfavourable circumstances. He actually obtained a very fair vista, in spite of the narrow alleys by which the building is approached. The 'People's' Theatre at Worms, of which a plan is given in Fig. 32, page 13, stands on an entirely free site in its own grounds, part of them, as will be remembered from Volume I., being used as a beer-garden. When mentioning the private grounds of this theatre, I would again call attention to the site plan of the 'Wagner' Opera House at Bayreuth, page 30, Volume I., which is one of the few theatres standing entirely in its own grounds, no part of it whatsoever being in touch with a public thoroughfare. At Worms, of course, the building has some of its frontages on thoroughfares, and the same must be said of the museum entrance to the Shakespeare Memorial Theatre at Stratford-on-Avon, which otherwise practically stands in its own grounds. But as regards location generally, the 'Wagner' Opera House at Bayreuth is uniquely placed.



COURT THEATRE, WIESBADEN. FIG. 38. SITE PLAN.

When alluding to the 'New' Theatre at Berlin, I referred to the difficult circumstances in which an architect is

(Figs. 39 to 92.)

Edwin O. Sachs ed:

GENERAL ARRANGEMENT: COMPARATIVE BLOCK PLANS FROM EXAMPLES IN VOLUMES I. AND II.

sometimes placed. As an instance where considerable difficulties were experienced, I would mention the peculiar conditions prevailing at the Court Theatre at Wiesbaden, of which the site plan is given in Fig. 38, page 14. The situation there seen is that of a theatre standing in a public park, a most enviable location; but, curiously enough, the requirements of the authorities necessitated the principal façade being hidden by an existing colonnade, the historical associations of which prevented its being broken into sufficiently to allow of proper architectural treatment. Another example of the curious circumstances in which theatres are often built is the Casino Theatre, Monte Carlo, of which the position in connection with the Casino building is shown in Fig. 28, page 13. No theatre in the world faces so beautiful a prospect, and yet it is exceedingly difficult to obtain a satisfactory view of this building, as the ground sinks so abruptly that the structure can only be seen at a very steep angle. It is also curious to observe how the architect has placed his auditorium in relation to the Casino building, for it should be remembered that the theatre was added after the completion of the latter. One side of the auditorium is high above the terrace level which it fronts, and the other side abuts on the main hall of the Casino.

Lastly, I would add some examples of theatre sites in London. The best playhouse site of which we can boast is no doubt that of D'Oyly Carte's Opera House, now better known as the 'Palace' Theatre of Varieties, which faces the junction of important cross-roads, having a main thoroughfare on one side and two minor thoroughfares at the back and other side. It is isolated, and, thanks to the very clever architectural treatment, creates a pleasing impression in spite of its curious plan. Fig. 35, page 13, describes its location. There is but one other theatre on a really isolated site in the West End of London, namely, the 'Shaftesbury' Theatre, in the vicinity of the example just mentioned. This building stands on a rectangular site facing the main thoroughfare just referred to, but otherwise surrounded by comparatively narrow ones. The best corner site in the Metropolis is undoubtedly that of 'Her Majesty's' Theatre in the Haymarket, presented in Fig. 34, page 13. It faces the broad thoroughfare of the Haymarket, and has a street of fair dimensions on the one open side. Far more in accordance with the customary arrangements of theatres in the Metropolis is the block plan of the 'Garrick' Theatre (Fig. 36), which, though enjoying the unusual advantage of a considerable frontage to a public road, is built in on its other three sides. It is not my purpose to illustrate any further examples of the curiously irregular sites in the Metropolis, the more so as most of them would not be permissible under the new regulations, but I think that the first three sites dealt with may be taken as among the best theatre sites in London, and may suffice for comparison with the manner in which theatres are located on the Continent, even in difficult circumstances.

In conclusion, I would only repeat that, even from the most prosaic and mercenary point of view, it is of the utmost value to the London manager that his theatre should be well placed in a good locality. There is not the slightest doubt that, given the same play and the same actors and management, the building in a good position in an accessible neighbourhood, and the building badly placed in a position difficult to reach, must show very different financial results. As far as the appearance of a theatre is concerned, there is no doubt that the isolated site, preferably with a broad vista, is the only location for a playhouse if it is to fulfil the functions of a public building and a fitting home for the Drama. As regards structure pure and simple and the safety of the audience, isolation has no doubt advantages in facilitating good planning and minimising the risk of fire from without. But absolute isolation is not quite as essential as is generally assumed. A theatre can be quite satisfactory in plan with its back wall a party wall, or, as a matter of fact, with its back and front wall in contact with neighbouring property, provided only that the sides are open to thoroughfares.

Now, in the preceding pages I have dwelt on the great importance of selecting a suitable site, and it would be no exaggeration to say that the site practically determines the plan of a modern playhouse. To my mind it governs the conception even to a greater extent than any actual question of funds. For whether the funds be lavished or stinted, the embodiments of any particular scheme should be practically identical for a given site. The funds only serve as a guidance in the elaboration of a design, the selection of materials, and the substantiality, equipment and decoration of the structure. No matter how abundant they may be, they can never effect the development of an ideal scheme on an unsuitable site. Nor can the disadvantages of a cramped position, involving an unsatisfactory plan, ever be outweighed by any amount of beauty in detail.

Though advocating suitable sites, I do not wish to argue the impossibility of conceiving a good plan under difficult conditions, nor can I ignore in a volume of this description that in very many cases theatres must be built on unsuitable sites. Hence also I cannot avoid all reference to such examples as may serve as models on the one hand, or as warnings on the other, to architects who are hampered by difficulties of location. Yet, on the whole, I prefer to speak of a playhouse which is not hampered by such circumstances, and therefore to refer to examples which have been designed to take up a position in every way suited to the dignity of that art which they are intended to house.

Looking at the subject of theatre planning in its broadest aspect, I find it advisable to devote the main chapter of this treatise to the general arrangement of the building, and owing to the treatment of a subject of this description being impossible without constant reference to examples of buildings carried out to fulfil particular purposes, I have thought it advisable to materially supplement the illustrations already presented by further drawings and views. To my mind, these illustrations in themselves are of more importance than my remarks. They have been specially selected to serve for easily readable object lessons.

PARTICULARS:	AMSTERDAM, Municipal Theatre.	ATHENS, National Theatre.	BAYREUTH, 'Wagner' Opera House.	BERLIN, 'Lessing' Theatre.	BERLIN, 'Linden' Variety Theatre.	BERLIN, 'New' Theatre.	BILBAO, Municipal Theatre.
Width of Proscenium Opening at Curtain Line	36' 0" 11·00 m.	31' 0" 9·50 m.	42' 6" 13·00 m.	32' 0" 9·75 m.	40' 0" 12·25 m.	26' 3" 8·00 m.	52' 6" 16·00 m.
Height of Proscenium Opening at Curtain Line	36' 0" 11·00 m.	25' 6" 7·75 m.	37' 9" 11·50 m.	32' 9" 10·00 m.	32' 0" 9·75 m.	31' 0" 9·50 m.	37' 9" 11·50 m.
Curtain Line to Front of First Tier	55' 9" 17·00 m.	43' 6" 13·25 m.	Curtain Line to Distinguished Strangers' Box, 90' 9", 29·50 m.; to Nearest Seat, 26' 3", 8·00 m.	52' 6" 16·00 m.	68' 9" 21·00 m.	52' 6" 16·00 m.	55' 9" 17·00 m.
Curtain Line to Front of Second Tier	—	47' 6" 14·50 m.		57' 6" 17·50 m.	72' 3" 22·00 m.	59' 0" 18·00 m.	—
Curtain Line to Front of Third Tier	62' 3" 19·00 m.	—		—	—	—	55' 9" 17·00 m.
Curtain Line to Furthest Seat	75' 6" 23·00 m.	75' 6" 23·00 m.	108' 3" 33·00 m.	78' 9" 24·00 m.	78' 9" 24·00 m.	80' 3" 24·50 m.	74' 9" 22·75 m.
Sunlight Opening above Area	50' 9" 15·50 m.	36' 0" 11·00 m.	50' 9" 15·50 m.	39' 3" 12·00 m.	50' 9" 15·50 m.	45' 0" 14·00 m.	49' 3" 15·00 m.
Highest Seat above Street	56' 6" 17·25 m.	37' 9" 11·50 m.	41' 0" 12·50 m.	34' 0" 10·50 m.	21' 3" 6·50 m.	37' 0" 11·25 m.	75' 6" 23·00 m.
Lowest Seat above Street	12' 3" 3·75 m.	3' 3" 1·00 m.	1' 6" 0·50 m.	0' 9" 0·25 m.	1' 6" 0·50 m.	0' 9" 0·25 m.	26' 3" 8·00 m.
Width inside Containing Walls	80' 3" 24·50 m.	60' 6" 18·50 m.	91' 9" 28·00 m.	65' 0" 19·75 m.	63' 9" 19·50 m.	54' 3" 16·50 m.	78' 9" 24·00 m.
Curtain Line to Containing Back Wall	55' 9" 17·00 m.	42' 6" 13·00 m.	75' 6" 23·00 m.	59' 0" 18·00 m.	34' 3" 10·50 m.	40' 0" 12·25 m.	55' 9" 17·00 m.
Curtain Line to Furthest Wall of Back Stage	—	59' 0" 18·00 m.	115' 9" 35·25 m.	—	—	62' 3" 19·00 m.	79' 6" 24·25 m.
Gridiron Floor above Stage at Curtain Line	62' 3" 19·00 m.	46' 9" 14·25 m.	96' 9" 29·50 m.	60' 0" 18·25 m.	46' 9" 14·25 m.	58' 3" 17·75 m.	62' 3" 19·00 m.
Cellar Floor below Stage at Curtain Line	21' 3" 6·50 m.	14' 0" 4·25 m.	32' 6" 10·00 m.	16' 3" 5·00 m.	10' 6" 3·25 m.	15' 6" 4·75 m.	27' 9" 8·50 m.
Stage Floor at Curtain Line above Street	16' 3" 5·00 m.	7' 3" 2·25 m.	0' 9" 0·25 m.	4' 0" 1·25 m.	5' 0" 1·50 m.	3' 3" 1·00 m.	29' 6" 9·00 m.
Cost of Structure	75,000*l.*	31,000*l.*	50,000*l.*	40,000*l.*	75,000*l.*	?	40,000*l.*
Period of Erection	2 years 4 months	1892–1895	4 years	12 months.	13 months	13½ months	3 years 10 months
Date of Completion	Sept. 1894	1895	1876	Sept. 1888	March, 1892	Nov. 1892	May, 1890
Seating Capacity	1113	1100	1645	1100	2500	800	1600

PARTICULARS:	BRISTOL, 'Empire' Variety Theatre.	BROMBERG, Municipal Theatre.	BRUSSELS, 'Flemish' Theatre.	BUCHAREST, National Theatre.	BUDA-PESTH, National Opera House.	CAMBRIDGE, 'New' Theatre.	CHRISTIANIA, National Theatre.
Width of Proscenium Opening at Curtain Line	35' 0" 10·75 m.	27' 9" 8·50 m.	29' 6" 9·00 m.	35' 0" 10·75 m.	43' 6" 13·25 m.	28' 6" 8 75 m	34' 0" 10·50 m.
Height of Proscenium Opening at Curtain Line	35' 0" 10·75 m.	31' 0" 9·50 m.	26' 3" 8·00 m.	39' 3" 12·00 m.	41' 0" 12·50 m.	26' 6" 8·00 m.	32' 9" 10·00 m.
Curtain Line to Front of First Tier	46' 9" 14·25 m.	42' 6" 13·00 m.	49' 3" 15·00 m.	52' 6" 16·00 m.	72' 3" 22·00 m.	34' 0" 10·50 m.	58' 3" 17·75 m.
Curtain Line to Front of Second Tier	55' 9" 17·00 m.	45' 0" 13·75 m.	52' 6" 16·00 m.	59' 0" 18·00 m.	—	37' 0" 11·25 m.	61' 0" 18·75 m.
Curtain Line to Front of Third Tier	—	—	55' 9" 17·00 m.	62' 3" 19·00 m.	75' 3" 23·00 m.	—	—
Curtain Line to Furthest Seat	88' 6" 27·00 m.	65' 6" 20·00 m	68' 9" 21·00 m.	68' 9" 21·00 m.	96' 9" 29·50 m.	60' 0" 18·25 m.	97' 6' 29·75 m.
Sunlight Opening above Area	48' 3" 14·75 m.	39' 3" 12·00 m.	49' 3" 15·00 m.	54' 0" 16·50 m.	60' 6" 18·50 m.	40' 0" 12·25 m.	48' 3" 14·75 m.
Highest Seat above Street	41' 9" 12·75 m.	36' 0" 11·00 m.	49' 3" 15·00 m.	46' 0" 14·00 m.	55' 9" 17·00 m.	37' 9" 11·50 m.	45' 9" 14·25 m.
Lowest Seat above Street	2' 6" 0·75 m. (*below*)	0' 9" 0·25 m.	7' 3" 2·25 m.	1' 6" 0·50 m. (*above Terrace*)	9' 9" 3·00 m.	3' 3" 1·00 m. (*below*)	5' 0" 1·50 m.
Width inside Containing Walls	70' 6" 21·50 m.	51' 9" 15·75 m.	52' 6" 16·00 m.	65' 6" 20·00 m.	88' 6" 27·00 m.	54' 0" 16·50 m.	68' 9" 21·00 m.
Curtain Line to Containing Back Wall	32' 9" 10·00 m.	44' 3" 13·50 m.	36' 0" 11·00 m.	55' 9" 17 00 m	65' 0" 19·75 m.	35' 0" 10·75 m.	47' 6" 14·50 m.
Curtain Line to Furthest Wall of Back Stage	—	59' 0" 18·00 m.	—	—	131' 3" 40·00 m.	—	75' 6" 23·00 m.
Gridiron Floor above Stage at Curtain Line	47' 6" 14·50 m.	52' 6" 16·00 m.	55' 9" 17·00 m.	72' 3" 22·00 m.	79' 6" 24·25 m.	53' 6" 16·25 m.	62' 3" 19·00 m.
Cellar Floor below Stage at Curtain Line	4' 0" 1·25 m.	14' 9" 4·50 m.	18' 0" 5·50 m.	19' 6" 6·00 m.	36' 0" 11·00 m.	10' 0" 3·00 m.	16' 3" 5·00 m.
Stage Floor at Curtain Line above Street	0' 9" 0·25 m. (*below*)	3' 3" 1·00 m	9' 9" 3·00 m.	5' 0" 1·50 m.	13' 0" 4·00 m.	0' 9" 0·25 m.	8' 3" 2·50 m.
Cost of Structure	26,000*l.*	23,000*l.*	?	75,000*l.* (to 1897)	266,000*l.*	15,500*l.*	About 80,000*l.*
Period of Erection	10 months	18 months	3 years	?	9 years	6 months	?
Date of Completion	Jan. 1893	Oct. 1896	Oct. 1887	(? 1898)	Sept. 1884	Jan. 1896	(? 1898)
Seating Capacity	1350 (2000)	777	?	?	1250	1400	1400

I—III

PARTICULARS:	DRESDEN, Court Opera House.	ESSEN, Municipal Theatre.	FRANKFORT, Municipal Opera House.	GENEVA, Municipal Theatre.	HALLE, Municipal Theatre.	LAIBACH, Municipal Theatre.	LEEDS, 'Grand' Theatre.
Width of Proscenium Opening at Curtain Line	42' 6" 13·00 m.	24' 6" 7·50 m.	40' 0" 12·25 m.	39' 3" 12·00 m.	32' 9" 10·00 m.	31' 0" 9·50 m.	30' 3" 9·25 m.
Height of Proscenium Opening at Curtain Line	47' 6" 14·50 m.	23' 0" 7·00 m	32' 0" 9·75 m.	39' 3" 12·00 m.	32' 9" 10·00 m.	31' 0" 9·50 m.	40' 0" 12·25 m.
Curtain Line to Front of First Tier	68' 9" 21·00 m.	48' 3" 14·75 m.	68' 9" 21·00 m.	53' 6" 16·25 m.	53' 6" 16·25 m.	46' 0" 14·00 m.	55' 0" 16·75 m.
Curtain Line to Front of Second Tier	—	50' 9" 15·50 m.	72' 3" 22·00 m.	—	56' 6" 17·25 m.	46' 9" 14·25 m.	—
Curtain Line to Front of Third Tier	—	—	—	59' 0" 18·00 m.	—	—	61' 0" 18·75 m.
Curtain Line to Furthest Seat	105' 0" 32·00 m.	78' 9" 24·00 m.	78' 9" 24·00 m.	65' 6" 20·00 m.	87' 0" 26·50 m.	67' 0" 20·50 m.	91' 0" 27·75 m.
Sunlight Opening above Area	63' 9" 19·50 m.	44' 3" 13·50 m.	50' 9" 15·50 m.	52' 6" 16·00 m.	44' 3" 13·50 m.	40' 0" 12·25 m.	55' 0" 16·75 m.
Highest Seat above Street	67' 0" 20·50 m.	44' 3" 13·50 m.	21' 3" 6·50 m.	46' 0" 14·00 m.	49' 3" 15·00 m.	34' 0" 10·50 m.	54' 3" 16·50 m.
Lowest Seat above Street	13' 0" 4·00 m.	3' 3" 1·00 m.	1' 6" 0·50 m.	9' 0" 2·75 m.	9' 0" 2·75 m.	3' 3" 1·00 m.	5' 9" 1·75 m.
Width inside Containing Walls	97' 6" 29·75 m.	55' 9" 17·00 m.	63' 9" 19·50 m.	78' 9" 24·00 m.	65' 0" 19·75 m.	59' 0" 18·00 m.	70' 9" 21·50 m.
Curtain Line to Containing Back Wall	77' 0" 23·50 m.	42' 6" 13·00 m.	34' 0" 10·50 m	50' 9" 15·50 m.	49' 3" 15·00 m.	32' 0" 9·75 m.	47' 6" 14·50 m.
Curtain Line to Furthest Wall of Back Stage	116' 3" 35·50 m.	—	—	—	67' 0" 20·50 m.	49' 3" 15·00 m.	65' 0" 19·75 m.
Gridiron Floor above Stage at Curtain Line	82' 0" 25·00 m.	62' 3" 19·00 m.	46' 9" 14·25 m.	77' 0" 23·50 m.	68' 9" 21·00 m.	54' 3" 16·50 m.	59' 0" 18·00 m.
Cellar Floor below Stage at Curtain Line	23' 0" 7·00 m.	14' 9" 4·50 m.	10' 6" 3·25 m.	30' 3" 9·25 m.	16' 3" 5·00 m.	16' 3" 5·00 m.	26' 0" 8·00 m.
Stage Floor at Curtain Line above Street	16' 3" 5·00 m.	6' 6" 2·00 m.	5' 0" 1·50 m.	13' 0" 4·00 m.	12' 3" 3·75 m.	6' 6" 2·00 m.	10' 0" 3·00 m.
Cost of Structure	210,000*l.*	20,000*l.*	230,000*l*	100,000*l.*	61,000*l.*	20,000*l.*	60,000*l.*
Period of Erection	7 years	2 years	7 years	5 years	2 years	2 years	About a year
Date of Completion	1878	1892	Nov. 1880.	Oct. 1879	Autumn, 1886	1892	Nov. 1876
Seating Capacity	1700 (2000)	800	2000	1200 (1300)	1141 (1231)	1000	2600 (3200)

PARTICULARS:	LONDON, 'Alhambra' Variety Theatre.	LONDON, Daly's Theatre.	LONDON, D'Oyly Carte's Opera House.	LONDON, 'Empire' Variety Theatre.	LONDON, 'Garrick' Theatre.	LONDON, 'Grand' Theatre.	LONDON, 'Her Majesty's' Theatre.
Width of Proscenium Opening at Curtain Line	39' 3" 12·00 m.	31' 0" 9·50 m.	34' 0" 10·50 m.	32' 0" 9·75 m.	31' 0" 9·50 m.	29' 6" 9·00 m.	35' 0" 10·75 m.
Height of Proscenium Opening at Curtain Line	40' 0" 12·25 m.	31' 0" 9·50 m.	34' 0" 10·50 m.	35' 0" 10·75 m.	32' 9" 10·00 m.	31' 0" 9·50 m.	29' 6" 9·00 m.
Curtain Line to Front of First Tier	63' 9" 19·50 m.	35' 0" 10·75 m.	40' 0" 12·25 m.	53' 0" 16·25 m.	34' 0" 10·50 m.	40' 9" 12·50 m.	34' 0" 10·25 m.
Curtain Line to Front of Second Tier	—	—	—	—	?	40' 9" 12·50 m.	40' 0" 12·25 m.
Curtain Line to Front of Third Tier	67' 0" 20·50 m.	46' 0" 14·00 m.	52' 6" 16·00 m.	64' 6" 19·75 m.	37' 0" 11·25 m.	—	?
Curtain Line to Furthest Seat	101' 9" 31·00 m.	68' 6" 20·75 m.	88' 6" 27·00 m.	88' 0" 26·75 m.	50' 0" 15·25 m.	65' 6" 20·00 m.	79' 0" 24·00 m.
Sunlight Opening above Area	80' 3" 24·50 m.	56' 0" 17·00 m.	50' 9" 15·50 m.	54' 0" 16·50 m.	44' 0" 13·50 m.	49' 3" 15·00 m.	50' 0" 15·25 m.
Highest Seat above Street	56' 6" 17·25 m.	40' 0" 12·25 m.	56' 6" 17·25 m.	32' 9" 10·00 m.	23' 6" 7·25 m.	39' 3" 12·00 m.	45' 0" 13·75 m.
Lowest Seat above Street	0' 9" 0·25 m.	15' 6" 4·75 m. (*below*)	6' 6" 2·00 m. (*below*)	15' 9" 4·75 m. (*below*)	16' 6" 5·00 m. (*below*)	1' 6" 0·50 m. (*below*)	0' 9" 0·25 m. (*below*)
Width inside Containing Walls	62' 3' 19·00 m.	60' 0" 18·25 m	67' 3" 20·50 m.	67' 0" 20·50 m.	50' 0" 15·25 m.	51' 9" 15·75 m	69' 6" 21·25 m.
Curtain Line to Containing Back Wall	39' 3" 12·00 m.	42' 6" 13·00 m.	46' 0" 14·00 m.	47' 0" 14·25 m.	40' 0" 12·25 m.	40' 9" 12·50 m.	49' 0" 15·00 m.
Curtain Line to Furthest Wall of Back Stage	—	—	—	62' 0" 19·00 m.	—	—	—
Gridiron Floor above Stage at Curtain Line	62' 3" 19·00 m.	63' 0" 19·00 m.	67' 3" 20·50 m.	47' 0" 14·25 m.	45' 0" 13·75 m.	50' 0" 15·25 m.	54' 0" 16·50 m.
Cellar Floor below Stage at Curtain Line	9' 9" 3·00 m.	10' 0" 3·00 m.	21' 3" 6·50 m.	18' 0" 5·50 m.	19' 6" 6·00 m.	17' 0" 5·25 m.	19' 9" 6·00 m.
Stage Floor at Curtain Line above Street	3' 3" 1·00 m.	11' 3" 3·50 m. (*below*)	1' 6" 0·50 m. (*below*)	12' 3" 3·75 m. (*below*)	13' 0" 4·00 m. (*below*)	1' 6" 0·50 m.	2' 6" 0·75 m.
Cost of Structure	?	40,000*l.*	150,000*l.*	?	?	16,000*l.*	About 60,000*l.*
Period of Erection	About a year	About 2 years	About 2 years	?	?	About a year	About a year.
Date of Completion	Dec. 1883	1893	1891	1882	1889	Dec. 1884	April, 1897
Seating Capacity	1800 (4000)	1500	2000 (2300)	3000	1100	2800	1500 (1700)

PARTICULARS:	LONDON, 'Lyric' Theatre.	LONDON, 'Oxford' Variety Theatre.	LONDON, 'Trafalgar' Theatre.	MANCHESTER, 'Palace' Variety Theatre.	MILAN, 'Lirico' Theatre.	MONTE CARLO, Casino Theatre.	ODESSA, Municipal Theatre.
Width of Proscenium Opening at Curtain Line	30' 0" 9·25 m.	29' 6" 9·00 m.	26' 3" 8·00 m.	36' 0" 11·00 m.	41' 0" 12·50 m.	39' 3" 12·00 m.	49' 3" 15·00 m.
Height of Proscenium Opening at Curtain Line	28' 0" 8·50 m.	24' 6" 7·50 m.	29' 6" 9·00 m.	32' 9" 10·00 m.	30' 3" 9·25 m.	31' 0" 9·50 m.	50' 0" 15·25 m.
Curtain Line to Front of First Tier	38' 0" 11·50 m.	46' 6" 14·25 m.	32' 9" 10·00 m.	42' 6" 13·00 m.	67' 3" 20·50 m.	63' 9" 19·50 m.	84' 6" 25·75 m.
Curtain Line to Front of Second Tier	44' 9" 13·75 m.	50' 6" 15·50 m.	—	52' 3" 16·00 m.	—	—	—
Curtain Line to Front of Third Tier	47' 6" 14·50 m.	—	36' 0" 11·00 m.	—	71' 3" 21·75 m.	—	90' 3" 27·50 m.
Curtain Line to Furthest Seat	75' 0" 22·75 m.	62' 6" 19·00 m.	54' 0" 16·50 m.	66' 3" 20·25 m.	83' 9" 25·50 m.	80' 3" 24·50 m.	109' 0" 33·25 m.
Sunlight Opening above Area	42' 3" 12·75 m.	44' 3" 13·50 m.	43' 3" 13·25 m.	68' 0" 20·75 m.	79' 6" 24·25 m.	62' 3" 19·00 m.	65' 6" 20·00 m.
Highest Seat above Street	35' 0" 10·75 m.	28' 0" 8·50 m.	27' 9" 8·50 m.	32' 9" 10·00 m.	46' 9" 14·25 m.	33' 6" 10·25 m.	54' 3" 16·50 m.
Lowest Seat above Street	9' 0" 2·75 m. *(below)*	0' 9" 0·25 m. *(below)*	14' 9" 4·50 m. *(below)*	11' 6" 3·50 m. *(below)*	2' 6" 0·75 m. *(below)*	9' 9" 3·00 m.	4' 0" 1·25 m.
Width inside Containing Walls	70' 0" 21·25 m.	56' 0" 17·00 m.	42' 6" 13·00 m.	63' 3" 19·25 m.	65' 6" 20·00 m.	44' 3" 13·50 m.	95' 0" 29·00 m.
Curtain Line to Containing Back Wall	40' 0" 12·25 m.	17' 0" 5·25 m.	36' 0" 11·00 m.	39' 3" 12·00 m.	72' 3" 22·00 m.	26' 3" 8·00 m.	65' 6" 20·00 m.
Curtain Line to Furthest Wall of Back Stage	?	41' 0" 12·50 m	—	—	—	—	105' 0" 32·00 m.
Gridiron Floor above Stage at Curtain Line	50' 0" 15·25 m.	37' 6" 11·50 m.	58' 3" 17·75 m.	62' 3" 19·00 m.	60' 6" 18·50 m.	—	88' 6" 27·00 m.
Cellar Floor below Stage at Curtain Line	16' 0" 4·75 m.	14' 0" 4·25 m.	8' 0" 2·50 m.	14' 9" 4·50 m.	11' 6" 3·50 m.	17' 3" 5·25 m.	24' 6" 7·50 m.
Stage Floor at Curtain Line above Street	5' 9" 1·75 m. *(below)*	3' 3" 1·00 m.	11' 6" 3·50 m. *(below)*	7' 3" 2·25 m. *(below)*	5' 9" 1·75 m.	12' 3" 3·75 m. *(above Terrace)*	8' 3" 2·50 m.
Cost of Structure	43,000*l*.	?	21,000*l*.	40,500*l*.	?	?	93,000*l*.
Period of Erection	10 months	6 months.	16 months	2½ years	?	?	3 years
Date of Completion	Dec. 1888	1893	Aug. 1892	May 1891	1894	1879	Oct. 1887
Seating Capacity	1600	1200 (2000)	1300	3675	?	600	?

PARTICULARS:	PALERMO, Municipal Theatre.	PARIS, 'Eden' Variety Theatre.	PARIS, National Opera Comique.	PARIS, National Opera House.	PRAGUE, Czech National Theatre.	PRAGUE, 'German' Theatre.	ROSTOCK, Municipal Theatre.
Width of Proscenium Opening at Curtain Line	43' 6" 13·25 m.	37' 9" 11·50 m.	33' 6" 10·25 m.	52' 6" 16·00 m.	37' 0" 11·25 m.	46' 0" 14·00 m.	32' 9" 10·00 m.
Height of Proscenium Opening at Curtain Line	48' 3" 14·75 m.	37' 9" 11·50 m.	42' 6" 13·00 m.	45' 0" 13·75 m.	39' 3" 12·00 m.	36' 0" 11·00 m.	24' 6" 7·50 m.
Curtain Line to Front of First Tier	87' 0" 26·50 m.	65' 6" 20·00 m.	49' 3" 15·00 m.	83' 6" 25·50 m.	60' 6" 18·50 m.	72' 3" 22·00 m.	47' 6" 14·50 m.
Curtain Line to Front of Second Tier	—	—	—	—	—	—	—
Curtain Line to Front of Third Tier	86' 9" 26·50 m.	—	55' 9" 17·00 m.	84' 6" 25·75 m.	63' 9" 19·50 m.	77' 0" 23·50 m.	53' 3" 16·25 m.
Curtain Line to Furthest Seat	98' 6" 30·00 m.	78' 9" 24·00 m.	73' 9" 22·50 m.	101' 9" 31·00 m.	91' 0" 27·75 m.	101' 9" 31·00 m.	68' 9" 21·00 m.
Sunlight Opening above Area	65' 0" 19·75 m.	65' 0" 19·75 m.	57' 6" 17·50 m.	67' 3" 20·50 m.	69' 6" 21·25 m.	50' 9" 15·50 m.	44' 3" 13·50 m.
Highest Seat above Street	70' 6" 21·50 m.	18' 9" 5·75 m.	68' 9" 21·00 m.	72' 3" 22·00 m.	75' 6" 23·00 m.	46' 0" 14·00 m.	42' 6" 13·00 m.
Lowest Seat above Street	14' 9" 4·50 m.	2' 6" 0·75 m.	15' 6" 4·75 m.	20' 6" 6·25 m.	7' 3" 2·25 m.	5' 0" 1·50 m.	1' 6" 0·50 m.
Width inside Containing Walls	119' 9" 36·50 m.	101' 9" 31·00 m.	57' 6" 17·50 m.	173' 0" 52·75 m.	68' 9" 21·00 m.	75' 6" 23·00 m.	62' 3" 19·00 m.
Curtain Line to Containing Back Wall	91' 0" 27·75 m.	78' 9" 24·00 m.	42' 6" 13·00 m.	87' 0" 26·50 m.	44' 3" 13·50 m.	53' 3" 16·25 m.	44' 3" 13·50 m.
Curtain Line to Furthest Wall of Back Stage	119' 6" 36·50 m.	—	—	156' 9" 47·75 m.	62' 3" 19·00 m.	82' 0" 25·00 m.	57' 3" 17·50 m.
Gridiron Floor above Stage at Curtain Line	106' 0" 32·25 m.	67' 3" 20·50 m.	73' 0" 22·25 m.	119' 0" 36·25 m.	88' 6" 27·00 m.	63' 0" 19·25 m.	57' 3" 17·50 m.
Cellar Floor below Stage at Curtain Line	37' 0" 11·25 m.	18' 0" 5·50 m.	23' 0" 7·00 m.	46' 9" 14·25 m.	32' 9" 10·00 m.	14' 0" 4·25 m.	15' 6" 4·75 m.
Stage Floor at Curtain Line above Street	20' 6" 6·25 m.	1' 6" 0·50 m.	18' 0" 5·50 m.	24' 6" 7·50 m.	10' 6" 3·25 m.	7' 3" 2·25 m.	5' 0" 1·50 m.
Cost of Structure	270,000*l*.	220,000*l*.	(? 180,000*l*.)	1,500,000*l*.	(? 108,000*l*.)	43,200*l*.	30,000*l*.
Period of Erection	21 yrs. (*intermittent*)	2 years	?	14 years	2 years	18 months	2 years
Date of Completion	1896	Jan. 1883	(? 1898)	Jan. 1875	1883	1888	1895
Seating Capacity	3200	1000 (2500)	1500	2156	1700 (2000)	1800	1020

PARTICULARS:	ROTTERDAM, Municipal Theatre.	ST. PETERSBURG, Court Opera House (Proposed).	SALZBURG, Municipal Theatre.	STOCKHOLM, Court Opera House.	STRATFORD-ON-AVON, Shakespeare Memorial Theatre.	TIFLIS, Municipal Theatre.	TURIN, People's Theatre.
Width of Proscenium Opening at Curtain Line	36' 0 11·00 m.	60' 6" 18·50 m.	32' 0" 9·75 m.	37' 0" 11·25 m.	27' 0" 8·25 m.	42' 6" 13·00 m.	32' 9" 10·00 m.
Height of Proscenium Opening at Curtain Line	37' 9" 11·50 m.	45' 0" 13 75 m.	24' 6" 7·50 m.	40' 0" 12·25 m.	28' 0" 8·50 m.	36' 0" 11·00 m.	25' 6" 7·75 m.
Curtain Line to Front of First Tier	60' 0" 18·25 m.	90' 3" 27·50 m.	50' 9" 15·50 m.	59' 9" 18 25 m.	37' 9" 11·50 m.	62' 3" 19·00 m.	55' 9" 17·00 m.
Curtain Line to Front of Second Tier	—	—	51' 9" 15·75 m.	—	37' 9" 11·50 m.	62' 3" 19·00 m.	—
Curtain Line to Front of Third Tier	62' 3" 19·00 m	—	—	67' 3" 20·50 m.	—	—	—
Curtain Line to Furthest Seat	78' 9" 24·00 m.	124' 9" 38·00 m.	65' 6" 20·00 m.	92' 9" 28·25 m.	47' 0" 14·25 m.	85' 3" 26·00 m.	68' 9" 21·00 m.
Sunlight Opening above Area	52' 6" 16·00 m.	88' 6" 27·00 m.	38' 6" 11·75 m.	55' 9" 17·00 m.	43' 6" 13·25 m.	46' 9" 14·25 m.	49' 3" 15·00 m.
Highest Seat above Street	50' 9" 15·50 m.	78' 9" 24·00 m.	26' 3" 8·00 m.	53' 3" 16·25 m.	32' 0" 9·75 m.	43' 6" 13·25 m.	17' 0" 5·25 m.
Lowest Seat above Street	9' 9" 3·00 m.	13' 0" 4·00 m.	2' 6" 0·75 m.	8' 3" 2·50 m.	5' 0" 1·50 m.	6' 6" 2·00 m.	1' 6" 0·50 m. *(below)*
Width inside Containing Walls	82' 0" 25·00 m.	134' 6" 41·00 m.	68' 9" 21·00 m.	89' 6" 27·25 m.	52' 9" 16·00 m.	85' 3" 26·00 m.	50' 9" 15·50 m.
Curtain Line to Containing Back Wall	56' 6" 17·25 m.	105' 0" 32·00 m.	29' 6" 9·00 m.	67' 3" 20·50 m.	29' 0" 8·75 m.	55' 0" 16·75 m.	27' 9" 8·50 m.
Curtain Line to Furthest Wall of Back Stage	63' 9" 19·50 m.	200' 0" 61·00 m.	50' 9" 15·50 m.	88' 6" 27·00 m.	41' 0" 12·50 m.	79' 6" 24·25 m.	—
Gridiron Floor above Stage at Curtain Line	62' 3" 19·00 m.	131' 3" 40·00 m.	50' 9" 15·50 m.	85' 3" 26·00 m.	45' 6" 13·75 m.	57' 6" 17·50 m.	42' 6" 13·00 m.
Cellar Floor below Stage at Curtain Line	16' 3" 5·00 m.	29' 6" 9·00 m.	9' 9" 3·00 m	29 6" 9·00 m.	18' 0" 5·50 m.	14' 0" 4·25 m.	13' 0" 4·00 m.
Stage Floor at Curtain Line above Street	12' 3" 3·75 m.	16' 3" 5·00 m.	5' 9" 1·75 m.	11' 6" 3·50 m.	8' 0" 2·50 m.	3' 3" 1·00 m.	4' 0" 1·25 m. *(below)*
Cost of Structure	58,000*l.*	?	25,000*l.*	250,000*l.*	11.500*l.*	(? 38,000*l.*)	?
Period of Erection	3 years	?	?	?	2 years	16 yrs. *(intermittent)*	?
Date of Completion	Sept. 1887	?	1893	(? 1898)	April, 1879	1896	1891
Seating Capacity	1250	2100 (2800)	630 (1000)	1250	900	1350	?

PARTICULARS:	VIENNA, Court Opera House.	VIENNA, Court Theatre.	VIENNA, 'Raimund' Theatre.	WOLVERHAMPTON, 'Grand' Theatre.	WORMS, People's Theatre.	ZÜRICH, Municipal Theatre.	NOTES.
Width of Proscenium Opening at Curtain Line	47' 6" 14·50 m.	41' 9" 12·75 m.	47' 6" 14·50 m.	33' 6" 10·25 m.	29' 6" 9·00 m.	37' 9" 11·50 m.	*All the foregoing dimensions are only approximate, and are confined to quarter parts of feet and metres. Slight disparities in conversion from feet to metres and vice versâ will thus be explained.*
Height of Proscenium Opening at Curtain Line	39' 3" 12·00 m.	42' 6" 13·00 m.	36' 9" 11·25 m.	27' 0" 8·25 m.	23' 0" 7·00 m.	29' 6" 9·00 m.	
Curtain Line to Front of First Tier	87' 0" 26·50 m.	65' 6" 20·00 m.	41' 0" 12·50 m.	33' 6" 10·25 m.	26' 3" 8·00 m.	63' 9" 19·50 m.	
Curtain Line to Front of Second Tier	—	—	46' 0" 14·00 m.	—	—	—	
Curtain Line to Front of Third Tier	87' 0" 26·50 m.	71' 0" 21·75 m.	—	38' 6" 11·75 m.	—	62' 3" 19·00 m.	
Curtain Line to Furthest Seat	101' 9" 31·00 m.	91' 9" 28·00 m.	75' 6" 23·00 m.	65' 6" 20·00 m.	112' 3" 34·00 m.	85' 3" 26·00 m.	
Sunlight Opening above Area	63' 9" 19·50 m.	60' 6" 18·50 m.	59' 0" 18·00 m.	36' 9" 11·25 m.	47' 6" 14·50 m.	42' 6" 13·00 m.	
Highest Seat above Street	63' 9" 19·50 m.	68' 9" 21·00 m.	42' 6" 13·00 m.	33' 6" 10·25 m.	31' 0" 9·50 m	41' 0" 12·50 m.	
Lowest Seat above Street	9' 9" 3·00 m.	14' 9" 4·50 m.	3' 3" 1·00 m. *(below)*	3' 3" 1·00 m. *(below)*	4' 0" 1·25 m.	5' 0" 1·50 m.	
Width inside Containing Walls	98' 6" 30·00 m.	101' 9" 31 00 m.	78' 0" 23·75 m.	60' 6" 18·50 m.	49' 3" 15·00 m	67' 0" 20·50 m.	
Curtain Line to Containing Back Wall	85' 3" 26·00 m.	78' 0" 23·75 m.	39' 3" 12·00 m	39' 3" 12·00 m.	28' 6" 8 75 m.	46' 0" 14·00 m.	
Curtain Line to Furthest Wall of Back Stage	164' 0" 50·00 m.	109' 9" 33·50 m.	—	—	—	73' 9" 22·50 m.	
Gridiron Floor above Stage at Curtain Line	85' 3" 26·00 m.	90' 3" 27·50 m.	78' 9" 24·00 m.	52' 6" 16·00 m.	51' 9" 15·75 m.	57' 6" 17·50 m.	*Notes of interrogation indicate that reliable particulars were not obtainable.*
Cellar Floor below Stage at Curtain Line	39' 3" 12·00 m.	36' 0" 11·00 m.	19' 6" 6·00 m.	13' 9" 4·25 m.	14' 0" 4·25 m.	12' 3" 3·75 m.	
Stage Floor at Curtain Line above Street	14' 9" 4 50 m.	17' 0" 5·25 m.	*(Street level)*	*(Street level)*	8' 3" 2·50 m	8' 3" 2·50 m.	
Cost of Structure	500,000*l.*	550,000*l.*	37.500*l.*	13,800*l.*	22,450*l.*	?	
Period of Erection	7 years	14 years	6 months	9 months	2 years	15 months	
Date of Completion	May, 1869	Sept. 1888	1893	Dec. 1894	1889	Oct. 1891	
Seating Capacity	1720 (2880)	1475	1600	2150	1180 (1400)	1238	

That there exists no standard, no average requirement, no general specification applicable to all theatres, must have been apparent from what I have said elsewhere. The circumstances of their erection, their constitution, their objects, are too different to allow this. It is no mere question of variation in size applied to any one purpose, or difference of purpose applied to any particular size. The diversity in every respect is too great.

As I have already explained in the first volume, when dealing solely with the main classes of National, Court, Municipal, Subscription and Private theatres, the modifications of purpose and circumstance in each category would require the most complicated classification. It should be remembered that any one section of the above grouping, say the Variety establishment among private theatres, assumes many forms. Take this Metropolis, and look at the difference in Variety houses, such as the 'Empire' Theatre and 'Alhambra' Theatre, as distinguished from the 'Oxford' Theatre, or from the so-called 'syndicate' Halls, or again, from the minor establishments, and then remember the innumerable small Variety houses which rather require classification as assembly or concert rooms, until we come to the very smallest class, which comprises the mere addition to some public house or hotel. Then compare such Metropolitan establishments with the various institutions to be found on the Continent. Yet, for all practical purposes, every one of these different classes of Variety establishments may be considered a playhouse proper, and may have much in it that is identical with even the greatest of opera houses. Surely it will be thus seen that any attempt at classification of requirements or the laying down of certain principles is impossible; and it is for this reason that most of the numerous model theatres which have been conceived are impracticable for general use. They may be model in the fulfilment of certain requirements laid down with the view of meeting a special purpose, they may afford rapid means of exit in case of fire, or excellent seeing and hearing accommodation for an unusually large audience, they may be economically built, or easily convertible to some other specific purpose according to the designer's aim; but to imagine that any one of these model theatres can serve as a standard by which architects should be guided in designing their playhouses for other specific purposes, is almost ridiculous. The model theatre, whether an English or a foreign one, is no doubt an exceedingly interesting study, affording a pleasant subject for discussion to specialists and others, and in some instances it has even influenced certain designs, but I doubt whether it is often of much direct practical service.

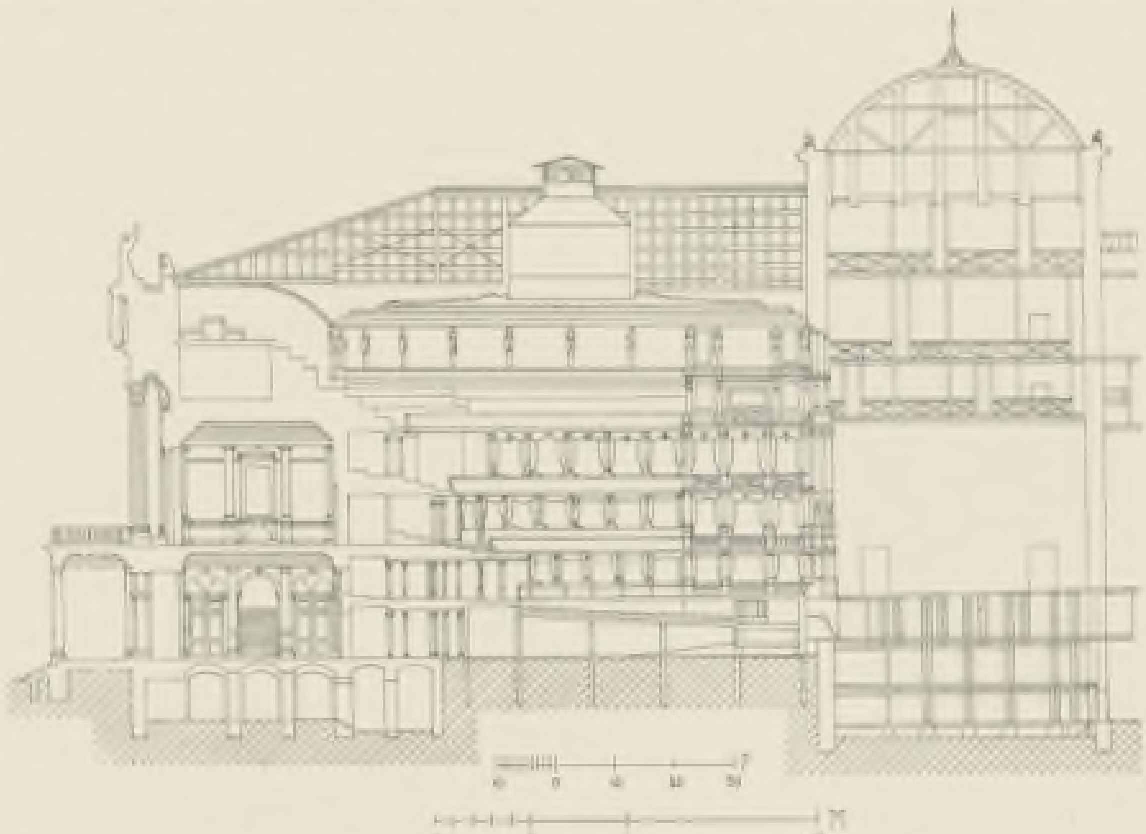
PEOPLE'S THEATRE, BUDA-PESTH. FIG. 93. GENERAL VIEW.

Now, quite irrespective of the purpose of any playhouse or its general conception, the question of size or scale is one of those points which has been too generally neglected in the designing of the playhouse; yet this is a question that calls for the utmost attention, not only on the part of the architect, but also on the part of the owners of the property.

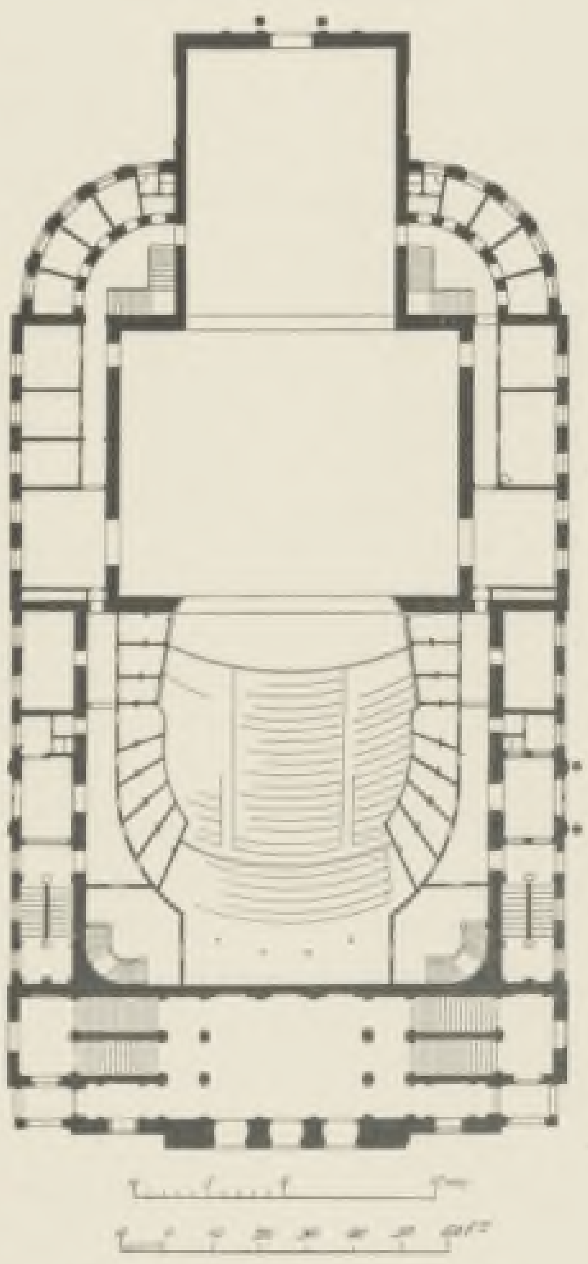
It is principally with the view of showing the comparative sizes of well-known playhouses that I have collected in the form of a plate the block plans of examples illustrated in the first two volumes of this work. The arrangement of this plate (Fig. 39 to Fig. 92) shows three distinct features, the first being the relative size of the various playhouses described, the second being the relative size of the auditorium compared with the stage, and the third being the relative size of the stage and auditorium as compared with the general offices in the body of the structure. It would, of course, be possible to go further afield, and by the study of this plate to make a comparison of the sizes of the various Municipal theatres, or the Municipal theatres in relation to the Court theatres and so on. But for my present purpose I am content to point out those curious differences in the main dimensions which are so seldom appreciated by the architect, much less by the manager and the general public. The mere expression, "the Paris Opera House is large," or "very large," conveys but little even to the expert; but if from a plate of this description it can be seen that many theatres, including, say, our latest example, 'Her Majesty's,' could be bodily transferred to the stage of the Paris Opera House, and that the Shakespeare Memorial Theatre could be easily accommodated in the auditorium of that building, it becomes possible to appreciate the respective dimensions of the playhouses of different countries.

It will be noticed that on this plate I have grouped the whole of the examples presented in Volume I. in two lines, and similarly the whole of the examples exhibited in Volume II., the former being distinguished from the latter by a slight difference in the engraving. I have placed in a central position the proposed great Opera House of St. Petersburg, which has not yet been executed, but which, in this position, serves to indicate more clearly the large sum which the Czar contemplates spending, should he finally determine that the building be carried out. In grouping the various block plans of these theatres in line, I have been careful to select the line of the proscenium curtain as that common to each of the individual establishments. By thus arranging them it will be also possible to obtain an insight into the relative amount of space devoted in each building to that part commonly known as 'in front of the curtain,' and the other commonly called 'the back of the house.' Even on such a point these questions of size and proportion are highly instructive.

But to facilitate further reference as regards the general proportions of these buildings, I have collected in four pages (pages 16 to 19) the dimensions of examples already given in Volumes I. and II., and I have tabulated them in such a manner as to allow of easy comparison, adding such facts as were obtainable in respect to the cost and the length of time, constant or intermittent, that was occupied in the building operations. I have also added the seating accommodation, which gives an idea of the capacity of the building, and may serve, in addition, as a basis for those who wish to calculate the relative proportion of the cost of a structure to the size of the audience. The dimensions, as I have already had occasion to observe in an earlier volume, are only approximate; but they should fulfil the purpose for which they are here intended. The reason that they are only approximate is, that whilst they have at times been taken from figured working drawings, or from the actual dimensions recorded on the spot, they have frequently had to be scaled from the roughest of general sketches, or from drawings of not quite reliable character. There has also been the difficulty of different scales, discrepancies in the conversion of feet, metres and other measures, and the fact that all dimensions have been purposely confined to quarter parts of feet and metres respectively. Similarly, figures as to cost can only be given approximately, and their reliability is not guaranteed, since the sources of information were particularly difficult of access, and in many instances the owners thought it inadvisable for business reasons to publish the correct figures regarding a building. The same holds good for the period of erection, which, however, may be assumed to be generally given lower than was actually the case, as it is mostly in the interests of those who give this information to minimise the time occupied in building operations. I might almost say the same with regard to seating capacity, for no manager is anxious for the maximum accommodation to become public property. Only in the case of those countries where the number had to be certified to meet the local requirements, just as the number of passengers has to be certified on board ship, can the figures be considered absolutely correct. In some cases where there is a possible variation either through the additional standing room, or the absence of limitations to the seating of the cheaper parts of the house, I have put what I consider to be the outside figures, but that the numbers can vary most materially will be seen, for instance, in those given for the 'Alhambra' Theatre, London, where one thousand eight hundred is the minimum and four thousand the maximum. It is, of course, assumed that one thousand eight hundred is the ordinary limit, and four thousand the capacity on a night when the whole of the gangways and the promenade are occupied.



PEOPLE'S THEATRE, BUDA-PESTH. FIG. 94. LONGITUDINAL SECTION.



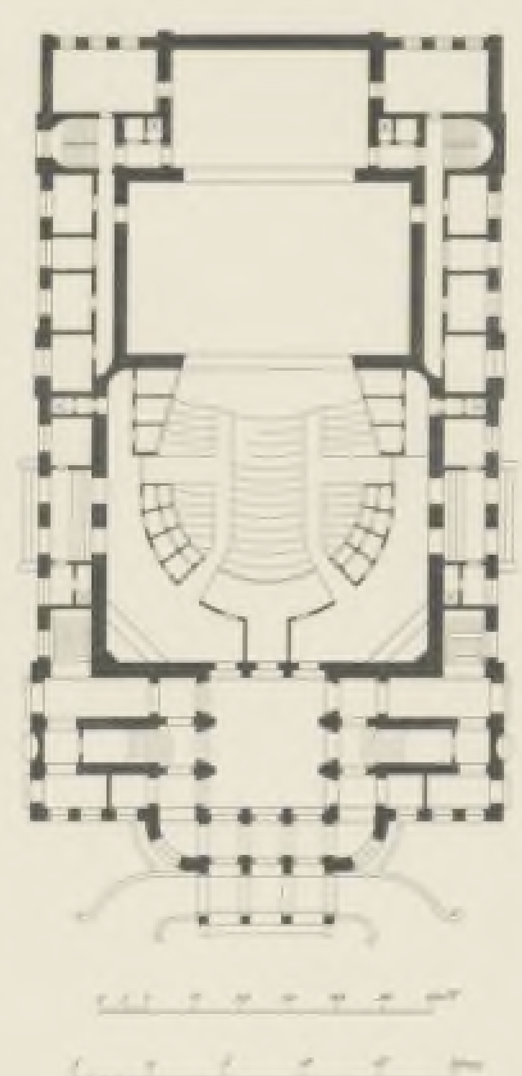
PEOPLE'S THEATRE, BUDA-PESTH.
FIG. 95. PLAN, AREA.

I need not here, however, analyse the stories told by each of these tables, or more particularly by the comparison of individual figures, yet I think I should call attention to the enormous difference in the time of construction of buildings costing identical sums. Then, as to such questions as that of the ratio of cost compared with seating capacity, take, for instance, the Buda-Pesth Opera House, with a capacity of only 1250, and costing 266,000*l.*, or the 'Hofburg' Theatre at Vienna, costing 550,000*l.* for an audience of 1755. Or again, compare the Paris Opera House with its audience of 2156, costing about 1,500,000*l.*, and such a theatre as that at Wolverhampton, costing 13,800*l.*, and holding almost exactly the same number, i.e. 2150. For yet another point—one of dimension—take the relative height from street level to the highest seat in the auditorium; or yet again, look at that prime factor in theatre design—the width of the proscenium opening, and compare it with the relative accommodation and cost. But it is the question of proportion and capacity which, in the first place, merit the attention of those interested in theatre enterprise. For the size of a building—its size as compared with its purpose, its size compared with buildings fulfilling similar purposes—is one of the keynotes of theatre design. If the questions of size and proportion are duly studied, and particularly the question of the space available for the auditorium as compared with the offices, or for the stage compared with the auditorium, it will be seen that the architect will always have the opportunity of doing work on a sound basis, no matter how poor the architectural elaboration or how unpractical any particular detail, both of which points can, if necessary, be remedied after completion. In the theatre, above all other buildings, questions of size and proportion are most important.

MUNICIPAL THEATRE, PRESSBURG.
FIG. 96. FRONT ELEVATION.

It is this consideration of questions of size and proportion which has made Ferdinand Fellner and Herman Helmer of Vienna, such successful theatre architects. For quite apart from any question of excellence in plan, their appreciation of proportion has resulted in their overcoming the many difficulties which they have met with from time to time, and has allowed them to rise far above those who, though of more prominence in regard to successful architectural conception and the application of architectural detail, have not been able to grasp the principles of general outline. Having mentioned the work of Fellner and Helmer as successfully embodying the principles of proportion applied to the modern playhouse, I would open this series of supplementary examples with some further instances of their designs. I would, however, premise that I do not intend to criticise in detail the buildings presented in this chapter, but simply to draw attention to such features of interest in connection with them as merit primary attention. Nor need I, in this instance, attempt to go over the long list of theatres built by the Vienna firm, since, as I have indicated before, their numerous playhouses can be classified into a few main groups, of which any one structure may serve as a model, the remainder merely exhibiting such slight modifications as local requirements have necessitated. I am hence only presenting illustrations of buildings representing different groups of the Fellner and Helmer type.

Putting aside what I would term the preliminary group of their work, i.e. that group which embodies the first few theatres erected from their designs, which I am afraid is of little interest to the student, I am presenting on pages 20 to 23, in Figs. 93 to 99, plans of their playhouses at Fiume, Pressburg and Buda-Pesth, which may be taken as characteristic of what I would call the second group. These buildings, of course, include considerable variations in the number of tiers and other primary arrangements, each of the three buildings, perhaps, forming, with other examples not illustrated here, certain subdivisions. But in all three exceedingly straightforward planning is observed, and the main lines have great similarity. The arrangement of staircases, too, which is considered a main feature in all Fellner and Helmer work, takes the form of a pair of grand staircases placed on either side of the main vestibule, and the carcass of these stairs is in each case designed to take a second staircase, leading to an upper tier. It is true, we have supplementary staircases near the proscenium at Fiume, and similar supplementary staircases nearer the front of the building at Buda-Pesth, whilst secondary staircases of this description will not be found at Pressburg; but these latter are of no great importance in determining a group. And the grouping of the Fellner and Helmer examples depends primarily on their general lines, not on the purpose to which the structures are put. For instance, both the theatres at Fiume and Pressburg are Municipal establishments, provided for populations of no extraordinary figure, i.e. about 21,000 and 48,000, and the seating accommodation afforded is approximately 1400 in each case. On the other hand, the People's Theatre at Buda-Pesth owes its initiation to public subscription. It stands in the capital city of Hungary, which has a population of 360,000, and the intention of its promoters was that its character should be essentially popular. Thus we find that its dimensions are larger than those of the examples just referred to, that its seating capacity is 2400, including standing room for about 800, and that the great depth of the stage allows particularly well of scenic effects. Nor does the cost govern the grouping; for of the expenditure incurred on these theatres, the building fund at Pressburg is said to have been 28,000*l*., whilst the People's Theatre at Buda-Pesth involved an outlay of 56,000*l*.



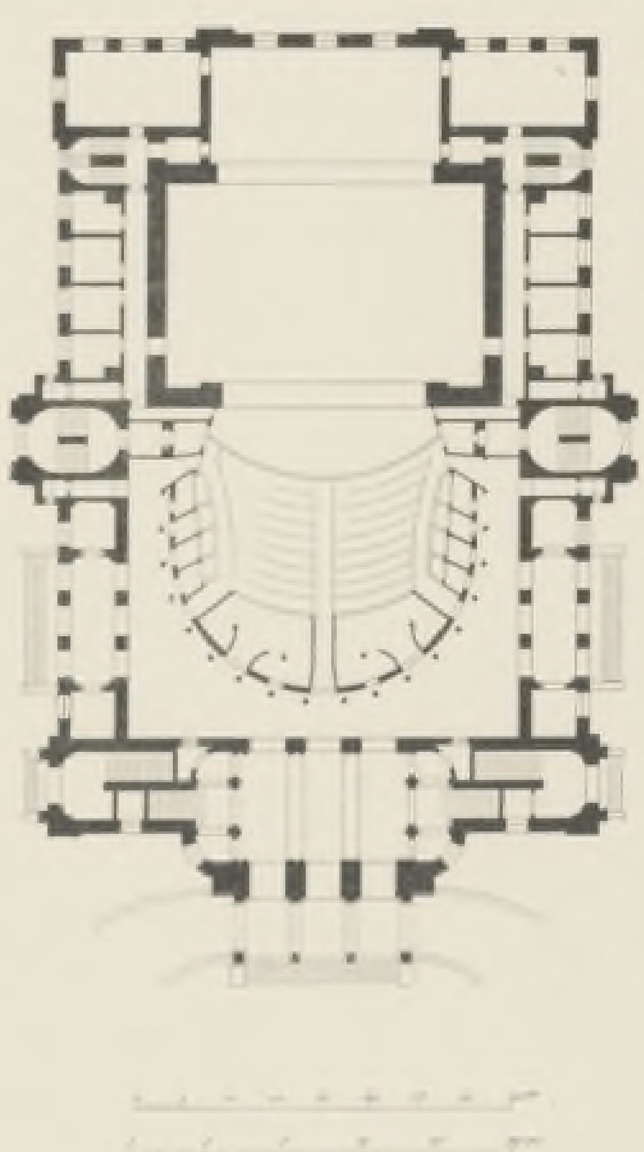
MUNICIPAL THEATRE, PRESSBURG.
FIG. 97. PLAN, AREA.

As I have said, I do not wish to describe these examples in detail, and yet I would take the opportunity of remarking on the clearness of the lines, and the manner in which each block, as far as general arrangement is concerned, is most carefully divided up into sections, holding respectively the stage, the auditorium, and the offices. This division is most evident on the exterior. As regards the architectural treatment, however, I am afraid I must repeat what I have said of the Fellner and Helmer work in Volume I. The weakness here displayed is a defect in nearly all their theatre designs; and though of recent years there may have been some improvement in individual cases, the average in no way approaches the general character of their planning. Here, as with the exterior of all their earlier playhouses, the architectural rendering is particularly unsatisfactory. As far, however, as the interior decoration at Fiume, Pressburg and Buda-Pesth is concerned, there is nothing to complain of, although it does not reach the high standard found in many of the more recent efforts of the same architects.

MUNICIPAL THEATRE, FIUME.
FIG. 98. FRONT ELEVATION.

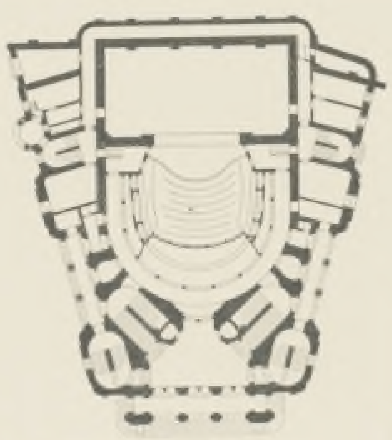
Of special features, I would still point out in respect to the plans of the Fiume and Pressburg theatres, that part of the audience leaving the area of the auditorium, when it has once reached the main corridor, can easily pass out into the open. For besides the ordinary main entrance, there are special exits both on the right and the left of the auditorium, which, with the aid of a few steps, bring the spectators to street level. Yet another feature in these buildings is that the position of the service staircase at the back of the house is the same in both. The manner in which the dressing-rooms and corridors are arranged in connection with it, also calls for comment. But of course it will be seen from all Fellner and Helmer's work, that wherever feasible, the stage is surrounded by a corridor, and, in fact, as far as their work in Austria is concerned, such corridors are compulsory.

At Buda-Pesth the facilities for exit just referred to above are not quite on the same lines as at Fiume and Pressburg, nor have the service staircases been placed in the same position. Here, however, they call for particular comment, inasmuch as they show a way of avoiding loss of space by arranging the dressing-rooms on a radial system with a staircase in the centre. Of course this method is primarily applicable in such circumstances as exist at Buda-Pesth, but the principle could also be easily adopted with modifications under other conditions. It will be observed that the staircase has a well-hole to which a top-light can be applied. This is by no means unsatisfactory, though in the more modern codes of regulations, as will be seen from Supplement III., it has rightly been made compulsory to place staircases of this description on outer walls, with a view of having the windows direct into the open. Better ventilation is thus obtained for the staircase in the event of fire, and facilities for escape are also afforded should any part of it become blocked. But it is not always possible to put stairs on outside walls, and then such an alternative as this will be found very useful.

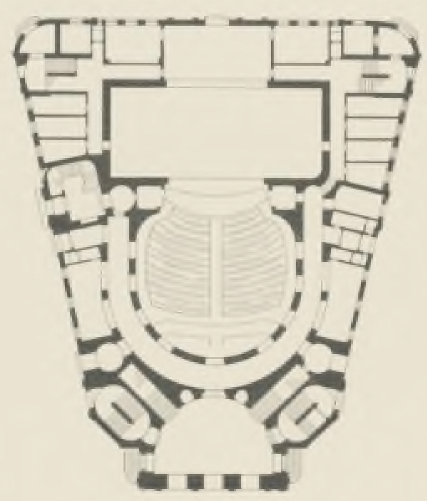


MUNICIPAL THEATRE, FIUME.
FIG. 99. PLAN, AREA.

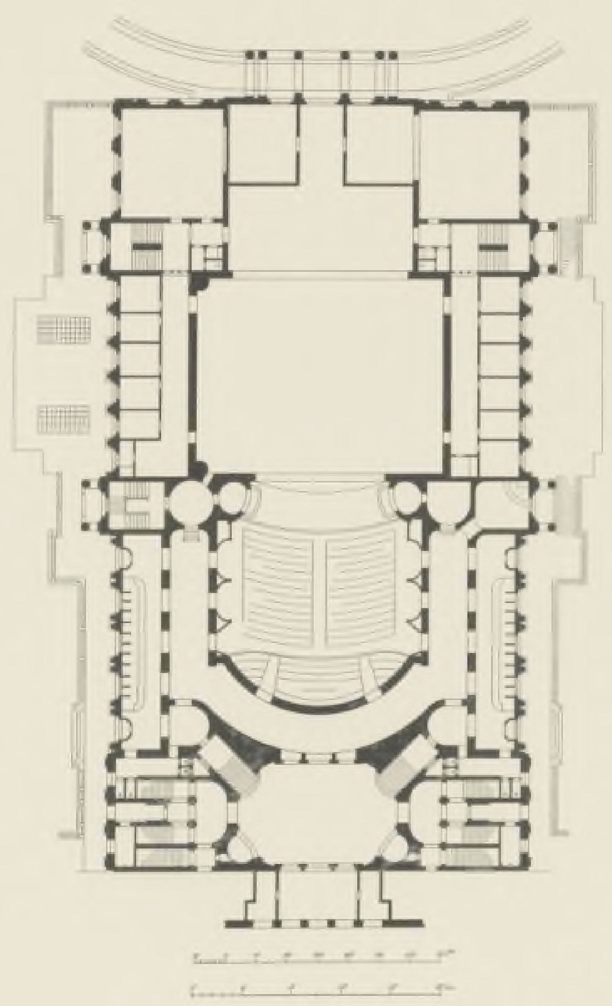
Turning now to a third group, we find a type of playhouse which, though mainly rectangular in plan, yet has a most important modification in this respect in the staircase arrangement. This modification, whilst being economical and practical as far as the general design is concerned, also gives a very satisfactory effect in the vestibule approach and on the exterior. The 'German' Theatre at Vienna, shown in Figs. 104 and 106 on pages 24 and 25, is an example of this group in its purest form, and I would add that this is a two-tier house, having to accommodate an audience of nearly 2000, the date of its erection being 1889. The manner in which the staircase accommodation has been arranged in this instance must be considered particularly clever, especially when we remember that, though what is termed 'tricky' in planning, the scheme duly complies with the regulations as to staircase facilities, and, what is more, affords a route of exit which is quite straightforward. The audience situated on an upper tier need not traverse some circuitous route to gain the open, as is so often the case where 'tricky' planning is adopted in the Metropolis. I am showing a section of this theatre, as the successful manner in which the architects have worked out their design merits every attention. But I will not further deal with this building, as I have already very fully presented, in Volume I., the 'German' Theatre at Prague, the design of which may be termed a development of the same principle, if not a mere modification of it. The Vienna and Prague playhouses belong obviously to the same group, although the last-named example is a three-tier house, whilst the former only has two tiers. This third tier necessitates the provision of an extra pair of staircases, and obliges these staircases to be placed in such a manner that the effect obtained at the People's Theatre in Vienna, as far as the exterior is concerned, has been nullified. Perhaps I should, however, also call attention to the fact that it is far more



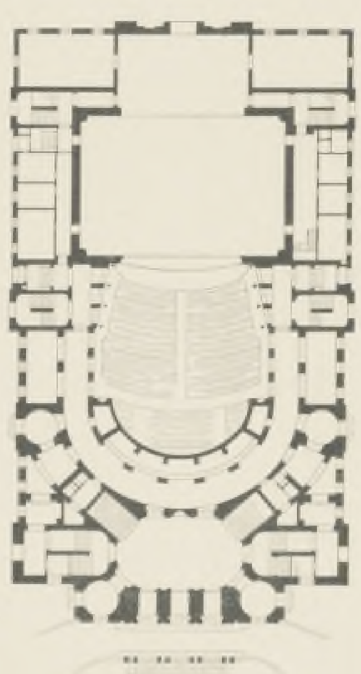
MUNICIPAL THEATRE, CARLSBAD.
FIG. 100. PLAN, AREA.



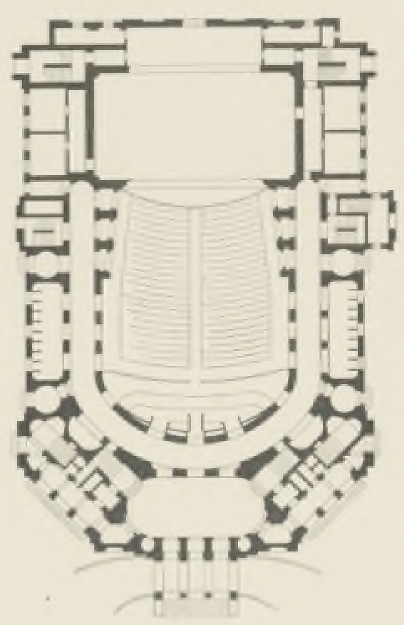
MUNICIPAL THEATRE, SALZBURG.
FIG. 101. PLAN, AREA.



COURT THEATRE, WIESBADEN.
FIG. 102. PLAN, AREA.



MUNICIPAL THEATRE, ZÜRICH.
FIG. 103. PLAN, AREA.



'GERMAN' THEATRE, VIENNA.
FIG. 104. PLAN, AREA.

satisfactory to have the arrangement for exit and entrance to the area as shown in the Vienna theatre. The rows of doors on either side of the seats cannot fail materially to lessen the crush in case of rapid exit, as compared with the few outlets from this part of the auditorium at Prague.

In further reference to this group I must also call attention to the example at Zürich, which I have already described in Volume II., and of which I am again showing the plan in Fig. 103, page 24, to the same scale as the other Fellner and Helmer plans here presented. I am doing this for the purpose of easy reference, as where comparisons are desired the niceties and differences of design can be recognised so much better where the same scale of reproduction is utilised. In fact, I am intentionally extending that principle of identical scales which I have adopted in the plates of the first two volumes, to individual sections of this treatise. What I have said as to the similarity of design is only too obvious, directly several examples are shown side by side as in this group, drawn in the same manner and to the same scale. In fact, if we compare the three last-named instances, or even study the decorative similarity, the sameness somewhat palls on one, and the architects must consider themselves fortunate that their work is distributed over so large an area as the stretch of country between Odessa, Berlin, Zürich and the Adriatic. Perhaps I should here add that the 'German' Theatre at Vienna, for an audience of two thousand, cost almost 38,000*l.*, figures that might well be compared with those of the examples already named.

MUNICIPAL THEATRE, CARLSBAD.
Fig. 105. Longitudinal Section.

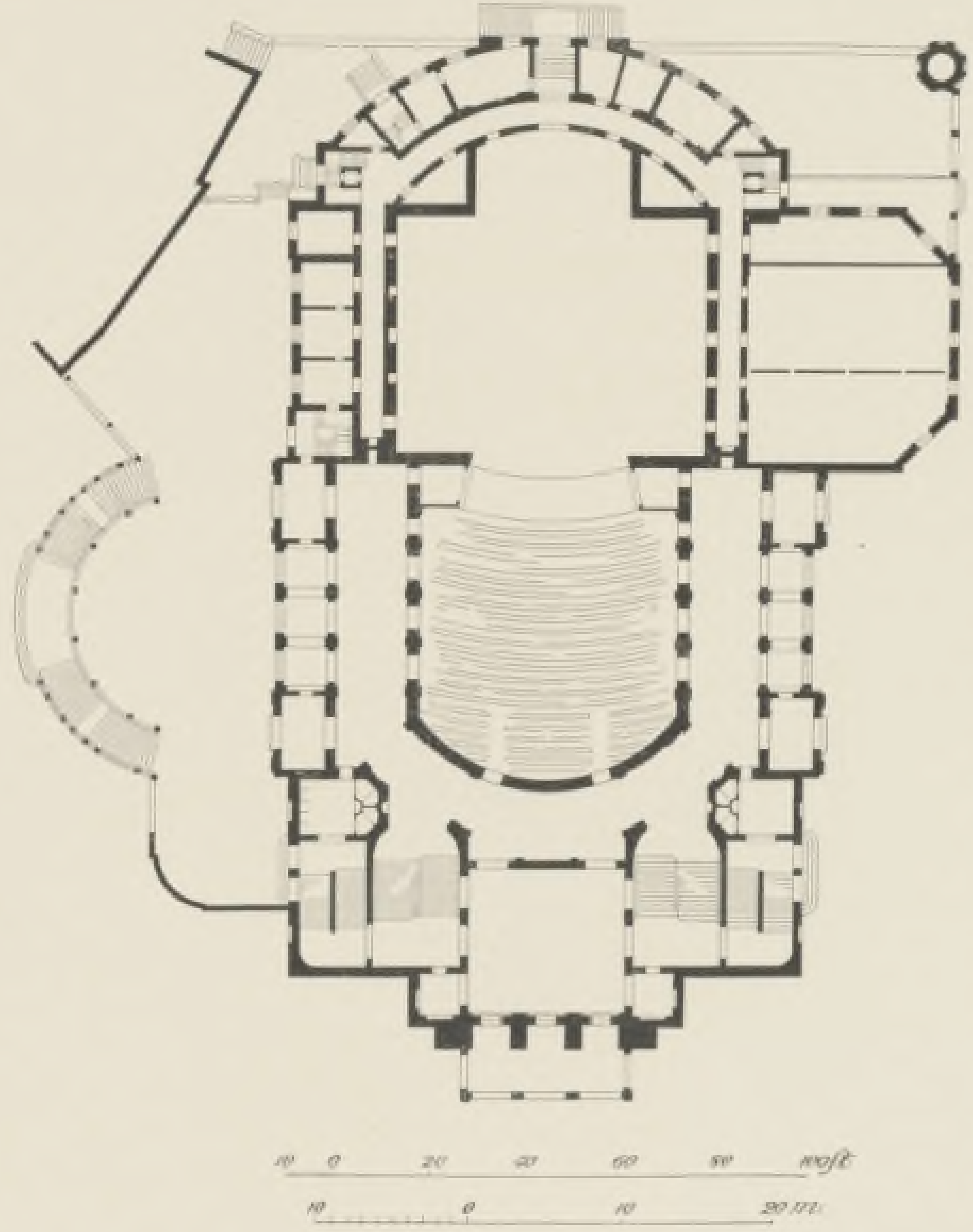
Now, a fourth group of the Fellner and Helmer work might be taken to embrace such theatres as Carlsbad and Salzburg, plans of which are shown in Figs. 100 and 101 on page 24. Of Salzburg I have already spoken at some length in Volume II., and I am only now referring to this theatre in order to point out that whilst this group, which is remarkable for the triangular effect of the buildings composing it, shows one type common to all its members, a very clear subdivision must yet be made between the three-tier house and the two-tier. Salzburg has two tiers and Carlsbad has three, and hence I show a section of the latter, from which will be seen the method adopted by the architects to overcome the difficulty of raising their uppermost seats to a considerable height, when the limited area of the ground at their disposal prevents their spreading out the auditorium on the lines to which I have referred. Of course it will be seen that in these triangular buildings the difficulties are far more considerable than in a structure where a rectangular plan is possible.

I could extend my groupings and subdivisions, and even formulate the principles of design adopted by the architects with comparisons of superficial area, seating capacity and cost, but I prefer to speak of these theatres in a more general manner. I would now merely point out that my grouping is by no means intended to be on hard and fast lines, but simply a natural subdivision according to the principles of outline which they embody.

'GERMAN' THEATRE, VIENNA. Fig. 106. Longitudinal Section.

While speaking of Fellner and Helmer, I cannot refrain from mentioning two examples, which do not, however, fall under any particular group, though each may well serve as a pattern for its specific purpose. The first is that of the Municipal Theatre, Odessa, to which I have frequently referred, and which was described in Volume I. This theatre was, it will be remembered, designed on the radial principle of Gottfried Semper, being directly developed from his work and embodying many of his ideas. The other is the theatre at Wiesbaden, a Court establishment, built under peculiar financial circumstances, and on a site offering considerable difficulty, the level of the main entrance being considerably higher than the ground on which the block stands. A plan is shown on page 24, Fig. 102, which I think explains itself, and I would only add that its seating capacity is 1400, and its cost was approximately 90,000*l.* There are, of course, other instances of work by the Vienna specialists which do not fall under any particular group, but it would lead too far to deal with them individually, and I must hence limit myself to mentioning the above two instances under this category and to the Castle Theatre at Totis, which I refer to elsewhere under 'miniature private theatres.'

In the two main divisions of the preceding volumes I distinguished between theatres erected in German-speaking countries and Latin countries. Now, the whole of the work of Ferdinand Fellner and Hermann Helmer is essentially intended to meet the requirements of German-speaking nations, or nations where German methods predominate in the presentation of dramatic art. In no example of their work which has come to my notice have I found anything that would lead me to assume that the requirements of Latin countries have been demanded in the districts where these architects have held commissions, and, as a matter of fact, their designs have been but rarely influenced by what has been done in the theatres of France or Italy. Only at Zürich I pointed out some slight French influence in the arrangement of the area, which mounted steeply at the back until it was gradually absorbed by what would generally be termed the first tier. In the Municipal Theatre at Odessa a slight tendency towards the methods of theatre construction as practised in Italy may also be observed. But these slight exceptions only the more accentuate the rule that the theatres erected by the Vienna firm are essentially intended for Teutonic peoples, and that, in fact, they embody, in a most marked degree, the common modern requirements of the average German or Austrian community.

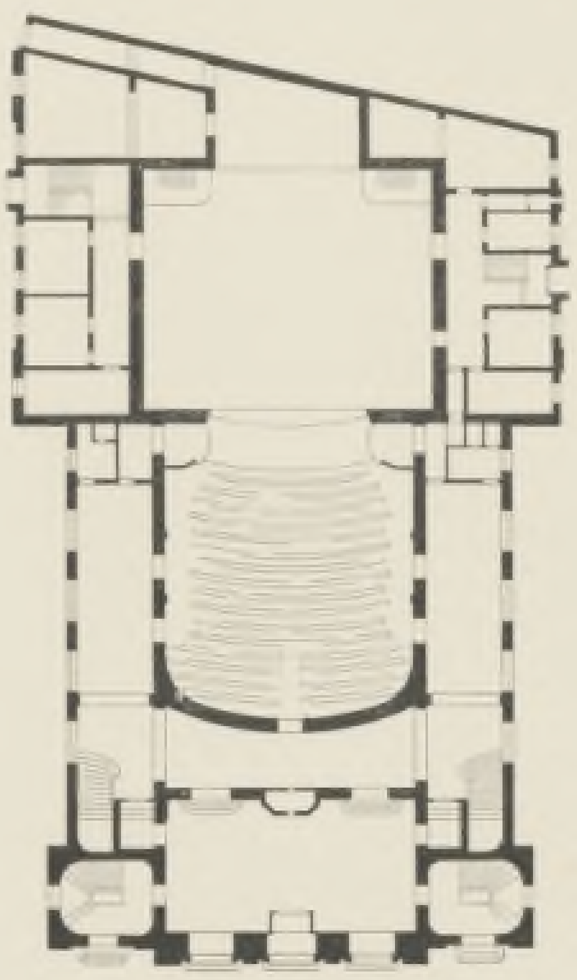


MUNICIPAL THEATRE, HALLE.
FIG. 107. PLAN, AREA.

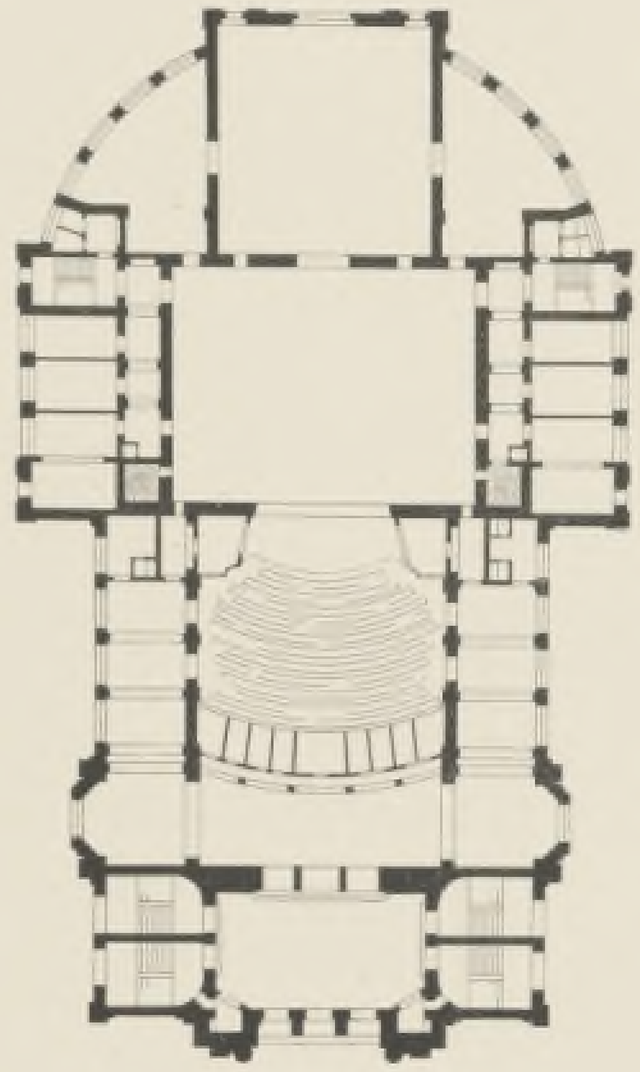
Now that I have, in the preceding pages, been dealing with a type of playhouse so essentially Teutonic in feeling, I would take the opportunity of again calling attention to the characteristics of the work of Heinrich Seeling. Though I have dealt with each individual playhouse designed by this architect in the two previous volumes, and have shown plans to the scale of one to two hundred and fifty, I am reproducing them on the smaller scale on which I have just presented the work of the Austrian specialists, not only to facilitate comparison with the designs of the latter, but also to have an opportunity of grouping compactly the five Seeling plans for comparison among themselves.

It is not necessary for me to speak of the Municipal theatres at Halle, Essen, Rostock, Bromberg, and the 'New' Theatre at Berlin, even as briefly as I have referred in this chapter to the work of Fellner and Helmer, for I think my remarks in the preceding volumes should suffice to indicate the character of this particular group in modern theatre design. Though perhaps not so clever in plan as the playhouses of the Austrian specialists, these theatres, possessing a striking individuality of their own, and being free from that displeasing sameness which leads one to speak of the designs in the sense of patterns, are certainly of higher architectural merit. One no doubt misses that brilliant arrangement of staircases which marks the Fellner and Helmer design, and perhaps also the economy of space; but there is no doubt that as far as clearness is concerned the lines of Seeling's work are quite equal to those of Fellner and Helmer, whilst his grouping is yet more distinguished, and tells more of the purpose of the building. His rendering of the exterior is certainly far above that of the examples referred to in the preceding pages by the Austrian firm. It may, as I have said, be occasionally coarse, but there is much merit in the general conception, and in detail it is stamped with the personality of the architect, which is more than one can say of the hackneyed architectural rendering of Fellner and Helmer.

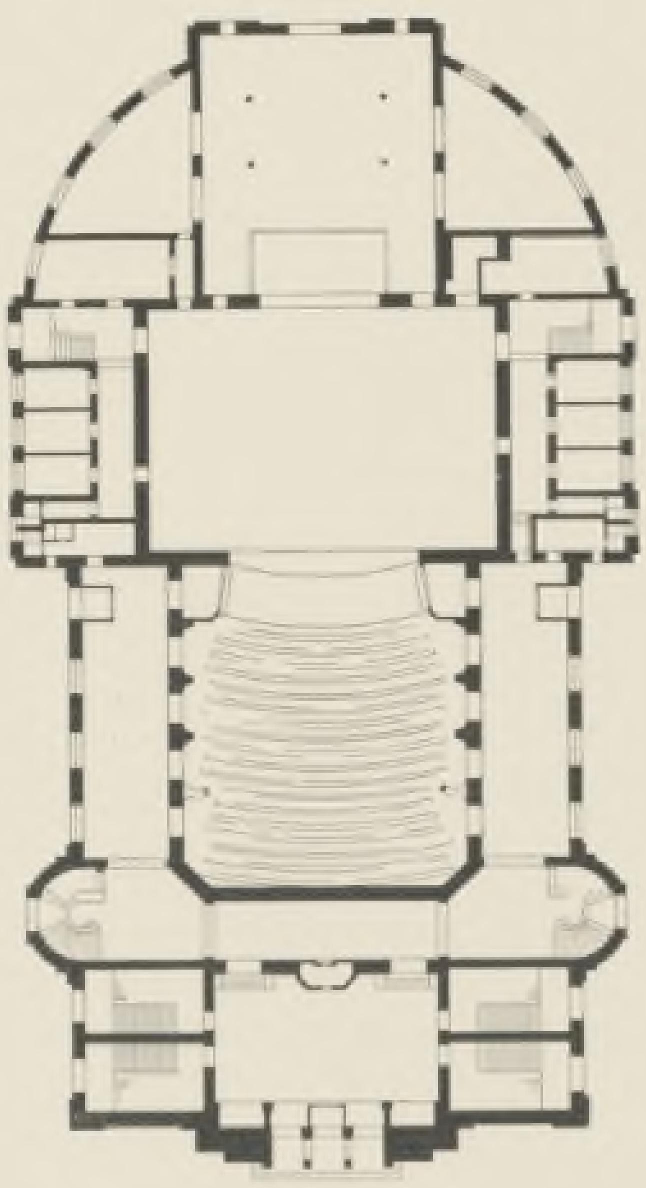
Before leaving this group of work, I would take the opportunity to point out how slight the difference is in Germany between the arrangement of the playhouse of average dimensions which enjoys a subsidy from the public authorities, and one such as the 'New' Theatre, at Berlin, which is essentially a private institution, intended as a money-making concern, and managed as such. Even the architectural rendering, when one looks into the matter closely, is almost of equal standing with that of the public building. In other words, we find that the provider of public entertainment in the capital of Prussia gives his patrons identical accommodation, identical facilities, and the same refined surroundings as are associated with the institutions in the important provincial centres, which enjoy the aid and patronage



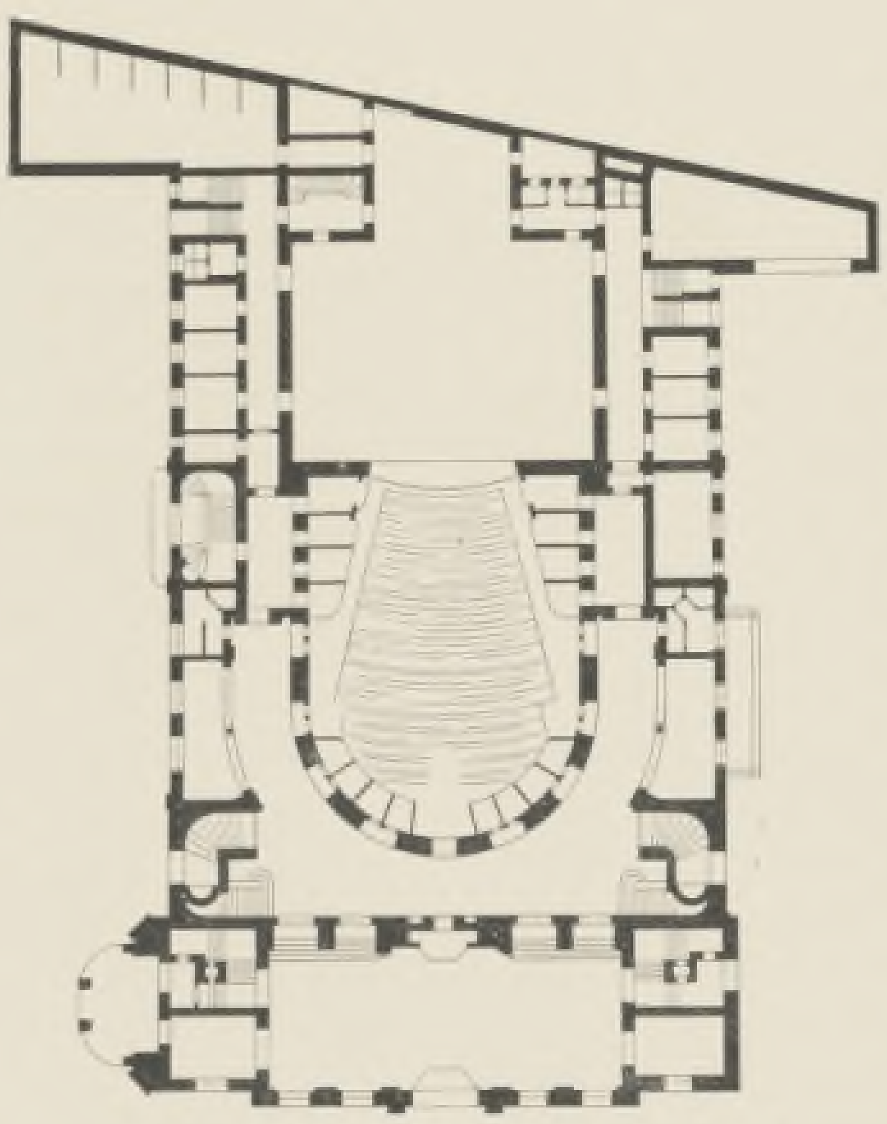
MUNICIPAL THEATRE, BROMBERG.
FIG. 108. PLAN, AREA.



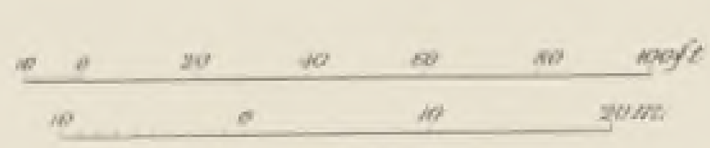
MUNICIPAL THEATRE, ESSEN.
FIG. 109. PLAN, AREA.



'NEW' THEATRE, BERLIN.
FIG. 110. PLAN, AREA.



MUNICIPAL THEATRE, ROSTOCK.
FIG. 111. PLAN, AREA.



of the community as represented by the municipality. This comparison will serve to support my earlier arguments as to the possibility of architectural pretension in private theatres, if founded on a sound financial basis.

Now, it will be remembered that in the first volume I grouped examples which show Anglo-Saxon influence with those in which Teutonic influence predominates. Great Britain, Russia, Scandinavia and the Netherlands were represented in the same division with Germany and Austria, whilst France, Italy and Spain represented the Latin countries. I have in this chapter been grouping my examples, not by countries, but according to the architects who may be said to have created certain types of theatre construction. As we have in Austria and Germany the Fellner and Helmer type and the Seeling type, so we have in this country the Phipps type and the Matcham type. And as I have before grouped the theatres showing Anglo-Saxon influence with those exhibiting Teutonic characteristics, I will take these English types next in rotation.

'PRINCE OF WALES'' THEATRE, LONDON.
FIG. 112. PLAN, FIRST TIER.

Now, though there is no denying that our two leading types are the Phipps and Matcham types, yet if we consider the buildings either in course of construction or nearing completion as I am writing these words, we find a new group rapidly coming to the front in the Runtz theatres. We have, it is true, yet another type, though of less prominence, in the embodiment of the so-called 'Safety' principles of Alfred Darbyshire, applied at Manchester and at Exeter. But in this type, though admirable in respect of clearness of plan, the principles have not yet been sufficiently practised to give it the importance of the others named, and hence I would prefer to speak of the Exeter example as an individual instance of theatre design, in the same manner as I spoke of the 'Palace' Variety Theatre at Manchester. Of course there are other architects who have built theatres in Great Britain, and some other groups of theatres by architects who call themselves theatre specialists; but their work does not show the individuality of the Matcham, Phipps or Runtz types, and the more important examples of such work have been already fully illustrated in the preceding volumes.

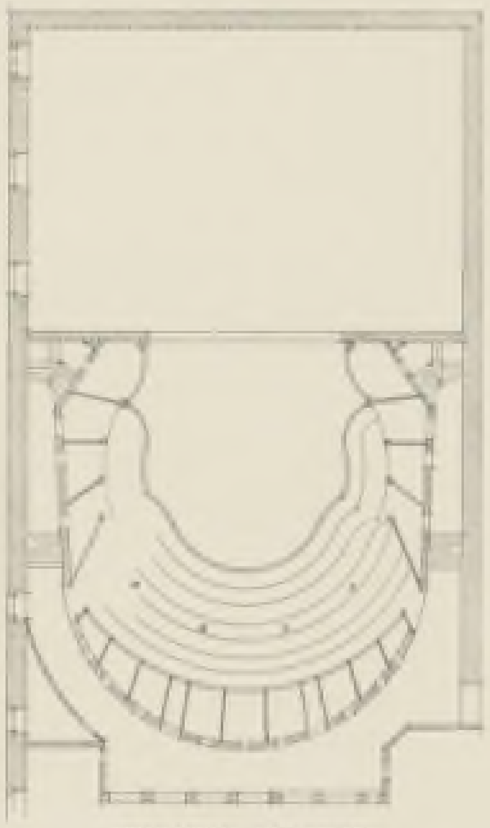
No matter if the types be bad or good, with any six examples of work by C. J. Phipps and Frank Matcham, we could characterise the methods of theatre construction practised in this country during the last twenty years; whilst in Ernest Runtz's examples we have the pleasure of contemplating the private theatre of Great Britain as it should be, in spite of financial or local difficulties. The playhouses of C. J. Phipps and Frank Matcham illustrate the work of the theatre architect for whom, as I have said, it is of primary importance to have espcial facilities and knowledge in financial operations. The examples of Ernest Runtz are those of an architect in the best sense, who is willing to apply his talents both as an artist and a man of business to private theatre enterprise. In the one instance, no doubt, we have 'tricky' planning, economies of space and clever construction; but in the other, whilst we also find the economy of space, the planning and construction are those of an architect. In the work of C. J. Phipps and Frank Matcham there is no architectural feeling in the treatment either of exterior or of interior; architectural grouping or even careful detail is a thing unknown. Of all their many buildings only one or two present a rendering that stands somewhat above the low standard characteristic of their work. In the Runtz type the grouping of the block is as much part and parcel of the design as the determination of the width of the proscenium opening, and the architectural rendering, as far as design and individuality are concerned, leaves little to be desired.

'GRAND' THEATRE, WOLVERHAMPTON.
FIG. 113. PLAN, FIRST TIER.

It has not been my custom to make extensive comparisons of work by different architects in the course of these volumes, but where theatre architecture has fallen to such a low level as is the case in this country, I cannot avoid emphasising the difference between the wholesale manufacture of eye-sores and the erection of buildings of architectural pretension. It is so rarely that I have had the pleasure of being able to point out the excellence of any specific instance of theatre architecture in England, that I think the opportunity should be embraced. And as this volume may serve for reference to those who have not yet been associated with the playhouse, it is as well for once to make a point of distinguishing the difference between good and bad, all the more so where the

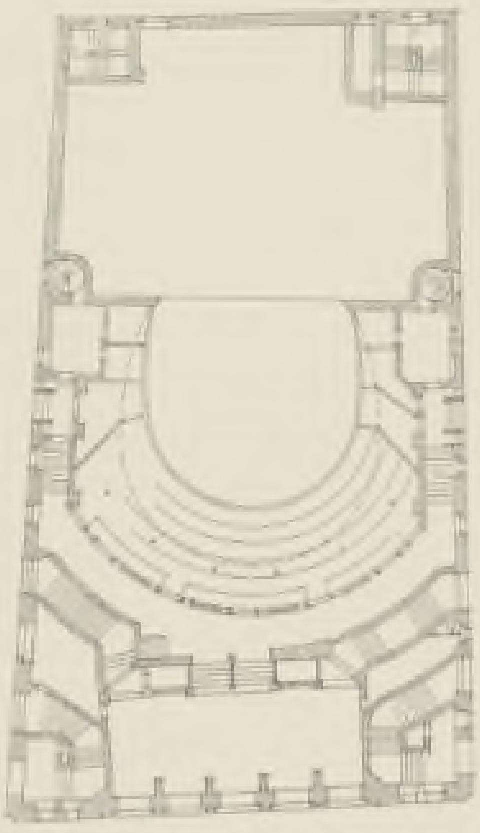
'LYCEUM' THEATRE, EDINBURGH.
FIG. 114. PLAN, FIRST TIER.

THEATRE, BRISTOL.
FIG. 115. PLAN, FIRST TIER.



THEATRE, GLASGOW.
FIG. 116. PLAN, FIRST TIER.

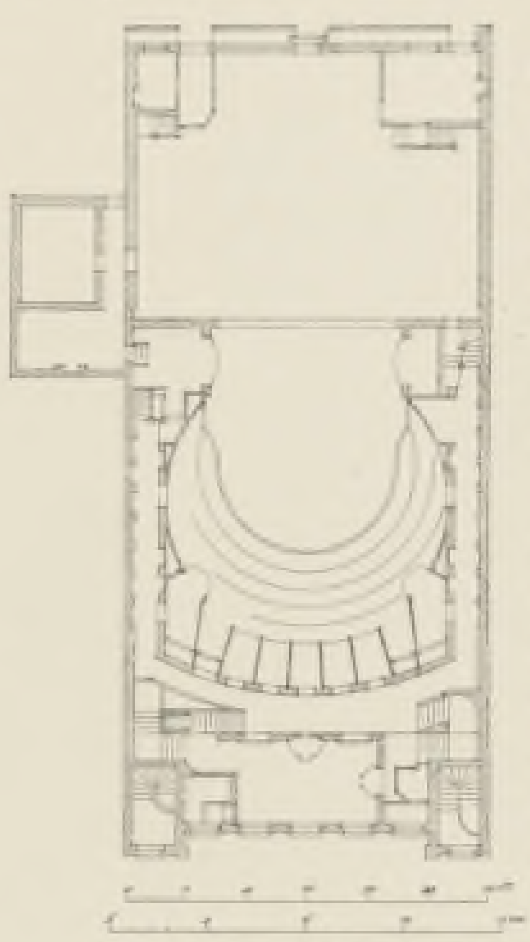
THEATRE, NOTTINGHAM.
FIG. 117. PLAN, FIRST TIER.



'SHAFTESBURY' THEATRE, LONDON.
FIG. 118. PLAN, FIRST TIER.

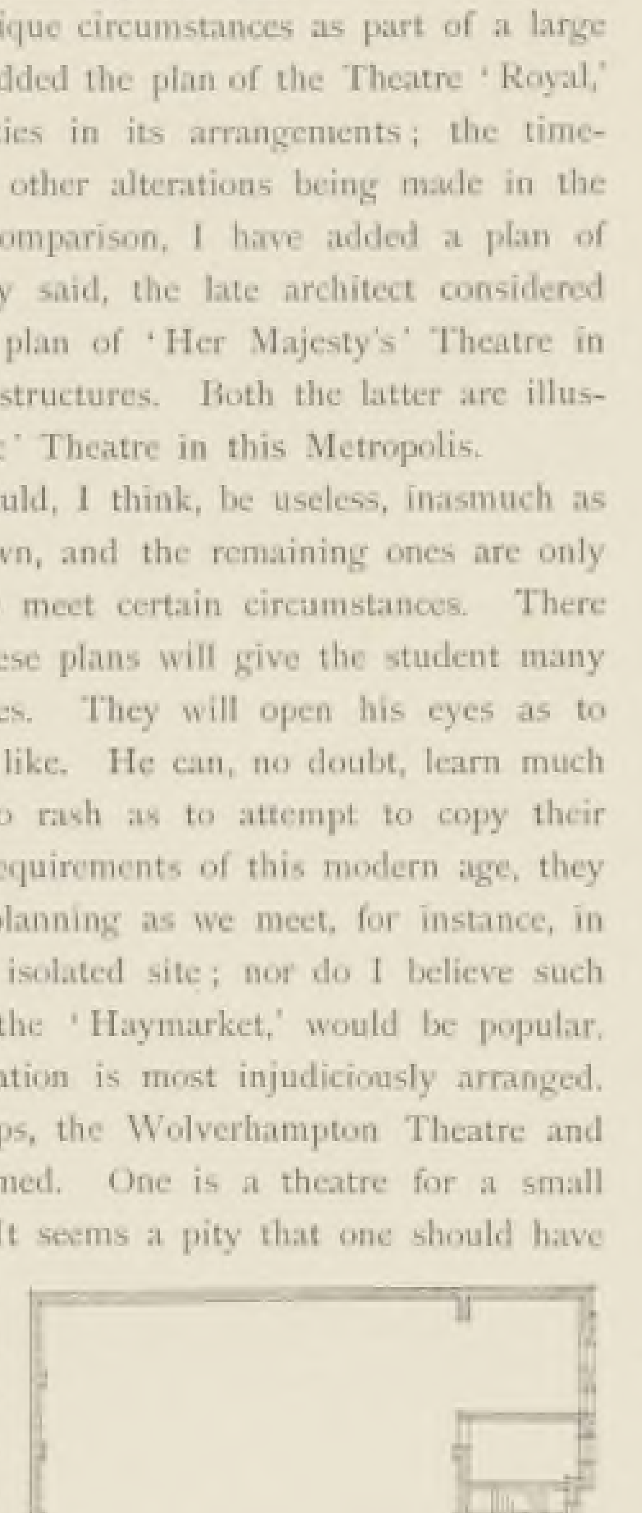
unsatisfactory work complained of might so well have been avoided, not only to the benefit of the architects, but of English architecture generally.

Taking next the examples of work from the designs of C. J. Phipps, I have grouped on page 29 the general arrangement of his playhouses, selecting important examples of buildings carried out respectively at Edinburgh, Glasgow, Nottingham, Bristol, and in the Metropolis. I have supplemented this selection by showing the plan of the 'Prince of Wales'' Theatre in London, Fig. 112, built under unique circumstances as part of a large block of offices, shops and club-rooms. I have also added the plan of the Theatre 'Royal,' Haymarket, Fig. 119, which similarly had peculiarities in its arrangements; the time-honoured pit being relegated to an upper tier, and other alterations being made in the customary disposition of the seating. By way of comparison, I have added a plan of the Wolverhampton theatre—which, as I have already said, the late architect considered his best example of provincial work—and, lastly, the plan of 'Her Majesty's' Theatre in London, which is by far the most successful of his structures. Both the latter are illustrated in the preceding volumes, as well as the 'Lyric' Theatre in this Metropolis.



'HAYMARKET' THEATRE, LONDON.
FIG. 119. PLAN, FIRST TIER.

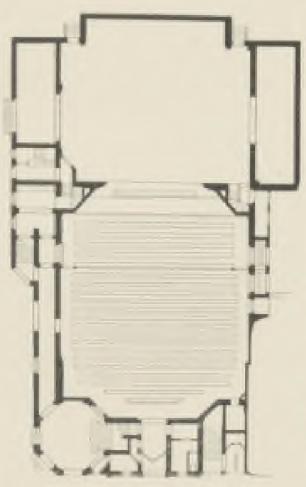
To describe in detail any of these examples would, I think, be useless, inasmuch as the two which take precedence are already well known, and the remaining ones are only instructive as regards what has been done at times to meet certain circumstances. There is not the slightest doubt that the careful study of these plans will give the student many ideas and many useful hints for overcoming difficulties. They will open his eyes as to certain economic requirements, tricks of plan and the like. He can, no doubt, learn much from them. And yet I trust that no one will be so rash as to attempt to copy their lines, for I am afraid that with the ever-increasing requirements of this modern age, they will not give satisfaction, nor should such staircase planning as we meet, for instance, in the 'Shaftesbury' Theatre be permitted, even on an isolated site; nor do I believe such re-arrangement of the seating as was practised in the 'Haymarket,' would be popular. Such makeshifts as we adopt are distinctly dangerous, and the staircase accommodation is most injudiciously arranged. Of all the many examples of theatre architecture from designs of the late C. J. Phipps, the Wolverhampton Theatre and 'Her Majesty's' alone call for favourable comment, as far as the planning is concerned. One is a theatre for a small provincial town, the other is a theatre to meet the ordinary West End requirements. It seems a pity that one should have to say this of the work of a man whose lifetime was principally occupied in the erection of playhouses, but I am sure I am only echoing the opinion of the deceased specialist in saying this; for no one knew better than the architect himself the position his work would take in any record of the world's playhouses of the last fifty years. He would, no doubt, have done much better work if he had not thought it impolitic to devote himself to architecture and art in carrying out his theatre enterprises, and if he had been able to accord more time to the planning of his buildings than was possible under the circumstances in which he carried on his profession.



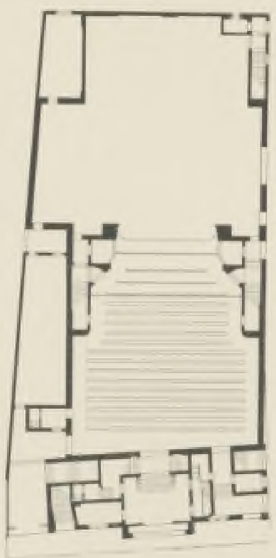
'HER MAJESTY'S' THEATRE, LONDON.
FIG. 120. PLAN, FIRST TIER.

Before leaving the work of C. J. Phipps I should perhaps add, with a view to indicating the approximate capacity of some of his buildings, that the 'Shaftesbury' Theatre will hold an audience of 1700, and the 'Prince of Wales's' Theatre, 1000, whilst the 'Haymarket,' London, will hold an audience of 1000, and the 'Lyceum' Theatre, at Edinburgh, 2500. I would also remark that in the later examples of his work there was an ever-increasing tendency to give the auditorium the maximum width possible in relation to the proscenium opening, and further, to adopt a plain segmental curve for the box-front lines. This is indeed a contrast to his earlier examples, in which a comparatively narrow and deep auditorium was considered most convenient, with the box-front lines in the shape of a horseshoe.

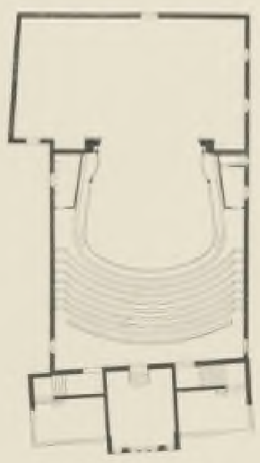
In the work of Frank Matcham, I need hardly say that there has never been any pretence of architectural rendering, and that his reputation for the successful construction of playhouses is based entirely on his economic planning. That this is the case there can be little doubt, and that in construction it is less 'tricky' than the work of the specialist previously named, goes without saying. There is no doubt, too, that his plans have a certain individuality, and that his scheme generally serves the unambitious purpose of the occupiers in a satisfactory manner. However, to fully illustrate such theatres in a volume dealing with theatre architecture in its best sense would be as anomalous as to include the ordinary 'jerry-builder's' cottages in a volume on domestic architecture. It has been my purpose to select typical and interesting examples of theatre architecture in all parts of Europe, and if I did not include such work as that of C. J. Phipps and



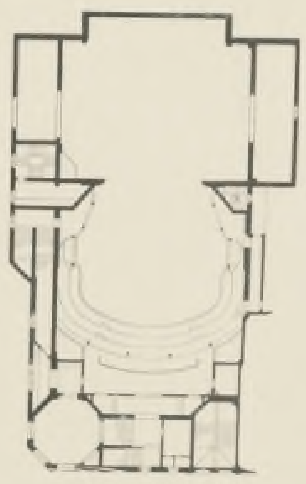
THEATRE, CHELTENHAM.
FIG. 121. PLAN, AREA.



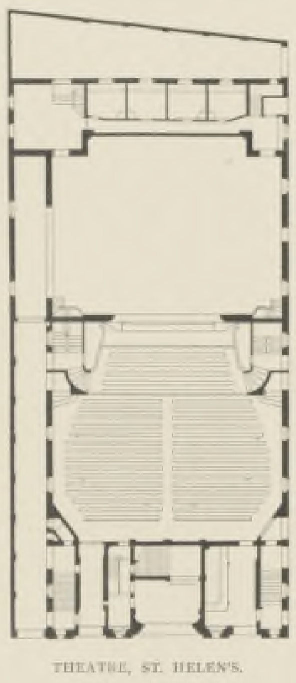
THEATRE, PAISLEY.
FIG. 123. PLAN, AREA.



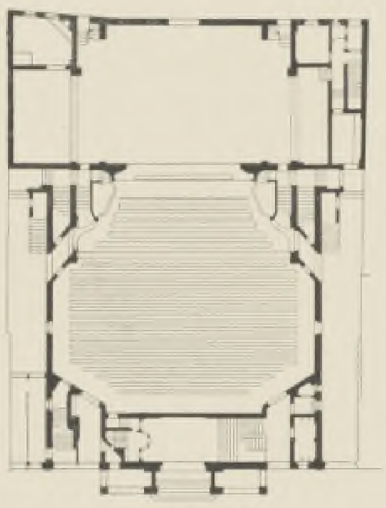
THEATRE, PAISLEY.
FIG. 124. PLAN, FIRST TIER.



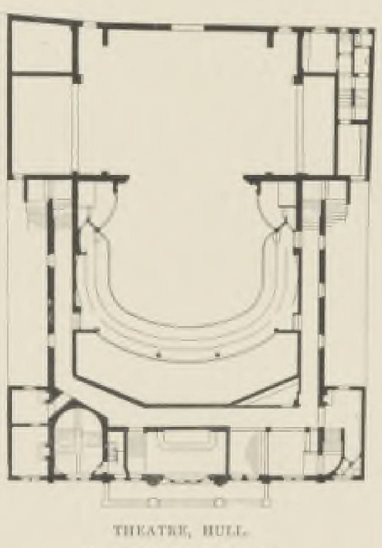
THEATRE, CHELTENHAM
FIG. 122. PLAN, FIRST TIER.



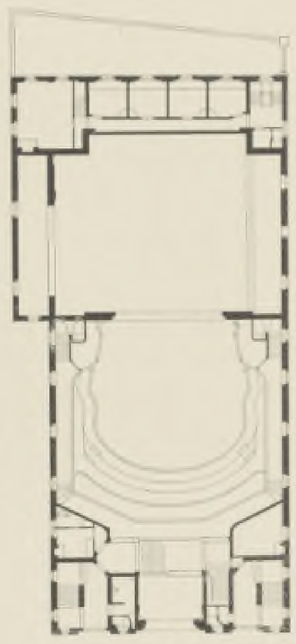
THEATRE, ST. HELEN'S.
FIG. 125. PLAN, AREA.



THEATRE, HULL.
FIG. 127. PLAN, AREA.



THEATRE, HULL.
FIG. 128. PLAN, FIRST TIER.



THEATRE, ST. HELEN'S.
FIG. 126. PLAN, FIRST TIER.

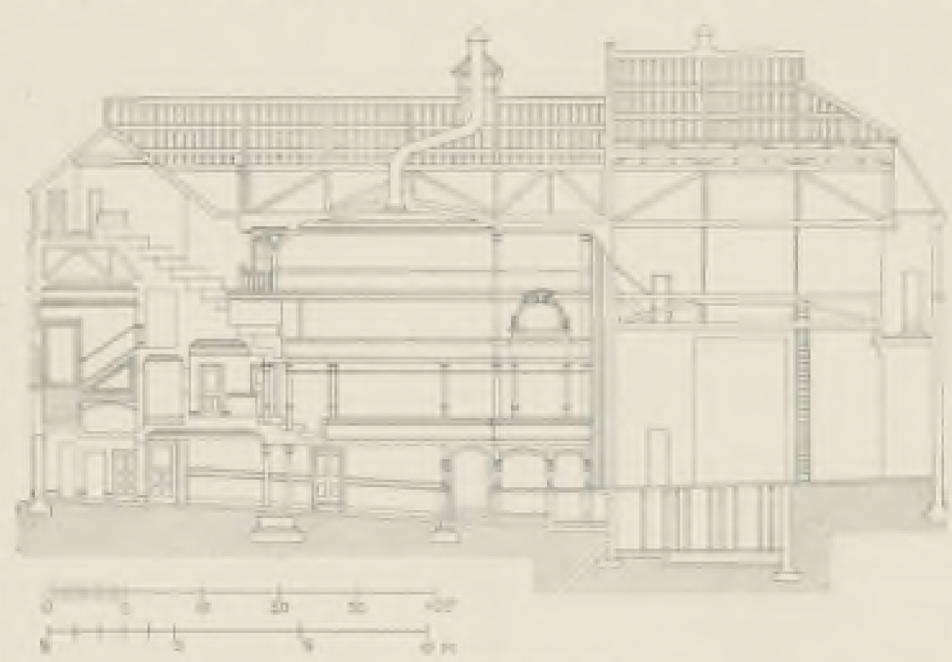
Frank Matcham in these volumes, I am afraid England would have to stand almost entirely unrepresented. That such work is typical cannot be denied, and I am sure it is interesting in comparison with the other examples which predominate in these volumes.

By reproducing the drawings to an approximately identical scale it will here be seen, from page 31 to 35, that the principles of economy embodied in the Matcham type can be adapted to large and small theatres alike, and it is with a view to showing more clearly his forms of economy in construction that I have here supplemented my examples with sections engraved to a somewhat larger scale than elsewhere in this chapter. To go into detail would be as superfluous as to criticise minutely the examples shown in this chapter of work by the late C. J. Phipps. If I may, however, discriminate between individual instances of Frank Matcham's work, I would note that no matter what recent examples of greater importance have been executed by the same architect, the 'Grand' Theatre, at Islington, erected in 1884, already shown in the first volume, still holds its own, whilst the 'Paragon' Theatre, London, perhaps stands next in interest. To summarise, I would only repeat what I have already said of this architect, by stating that he has done a large amount of theatre work, principally in the provinces, which is marked by good seating accommodation, economy in space and cost, and rapidity in execution; but it is not distinguished for worthy conception, much less for careful architectural rendering, either within or without.

THEATRE, PAISLEY.
FIG. 129. LONGITUDINAL SECTION.

Having so frequently had occasion to put the work of Ernest Runtz forward as a model of what can be achieved with limited means, and in the unique circumstances of theatrical enterprise in England, I naturally take particular pleasure in calling attention to the plans of three of his theatres depicted on the following pages, and also to a view of his theatre at Norwich, shown in the Introduction. I have already mentioned the cost of these buildings, but would repeat it for comparison with the accommodation. The Marine Palace at Hastings holds 1500 and cost 23,000*l.* The 'Empire' Theatre at Middlesbrough, with accommodation for an audience of 1600, had a building fund of 21,000*l.* At Norwich this fund was 23,000*l.*, with a seating capacity of 1750, and at Peckham the figures were 2000 and 30,000*l.* respectively. It will not be denied that the Variety Theatre at Hastings, Figs. 138 to 140, page 36, in particular furnishes an example of careful economy. Practically the whole of the superficial area is taken up by the auditorium, and only a small proportion is relegated to the offices; and yet the latter are clearly conceived and roomy, while there is no sign of any makeshift having had to be anywhere adopted. The manner in which the bar accommodation is placed on the first tier particularly calls for comment, and also the provision of the upper tier with a large balcony furnishing an additional means of escape, the value of which cannot be over-estimated. On both the first and second tiers the entrances from the staircases are placed absolutely symmetrically in relation to the auditorium, and we should not forget that this building has for its main frontage one side of the auditorium, whilst the further side is blocked by rising ground.

How the conception of this building has been thought out hand-in-hand with the architectural treatment, will be seen by reference to Fig. 7, in the Introduction, and, quite apart from any question of merit, I should here like to call attention to the clear expression of the interior purpose on the principal façade. It is true that, owing to the position of the building, it has been necessary to show such entrances as that of a scene-door; but the way in which the principal saloon, the large balcony and other features are marked, distinguishes the structure as a piece of architecture of a character to which we are generally unaccustomed.



THEATRE, CHELTENHAM.
FIG. 130. LONGITUDINAL SECTION.

Naturally, the lighter forms of entertainment have to be catered for at Hastings, and, similarly, at Middlesbrough, and, of course, the class of performance has materially influenced the planning of the block, particularly in the position of the saloons and foyers. Now at Middlesbrough, see Figs. 144 to 146, on page 37, we have to deal with a larger building, conceived in a broader spirit than the one we have just referred to, and this breadth also makes itself conspicuous in the saloons just mentioned. The whole disposition of the first tier saloon, for instance, in such a manner that a view of the stage can be obtained from it, is particularly pleasing, and this principle has also been adopted to a minor extent in the saloon of the upper tier. The method in which the main entrance is arranged also calls for comment, not to mention the rapid exit facilities at the back of the pit, and from the front of the stalls. The means of intercommunication are particularly good, whilst the position of two blocks of main staircases, marked architecturally on the exterior, has great advantages. Again, if we turn to the Introduction, and study the perspective of the block, we find that quite unwonted attention has been paid to the architectural treatment of the exterior, not forgetting the true advantage of the characterisation of the interior on the façades. The staircases, as I have said, are duly marked, as well as the main saloon, the main entrances and other important features. Perhaps, indeed, I should say that they claim particular attention, the general arrangement of the block not being quite symmetrical, or at least not so symmetrical as to allow all entrances and exits to be of equal distance from the centre line of the proscenium. These are no doubt approximately symmetrical in the general meaning of that term, but not to the nicety, for instance, of the following example.

THEATRE, HULL.
FIG. 131. LONGITUDINAL SECTION.

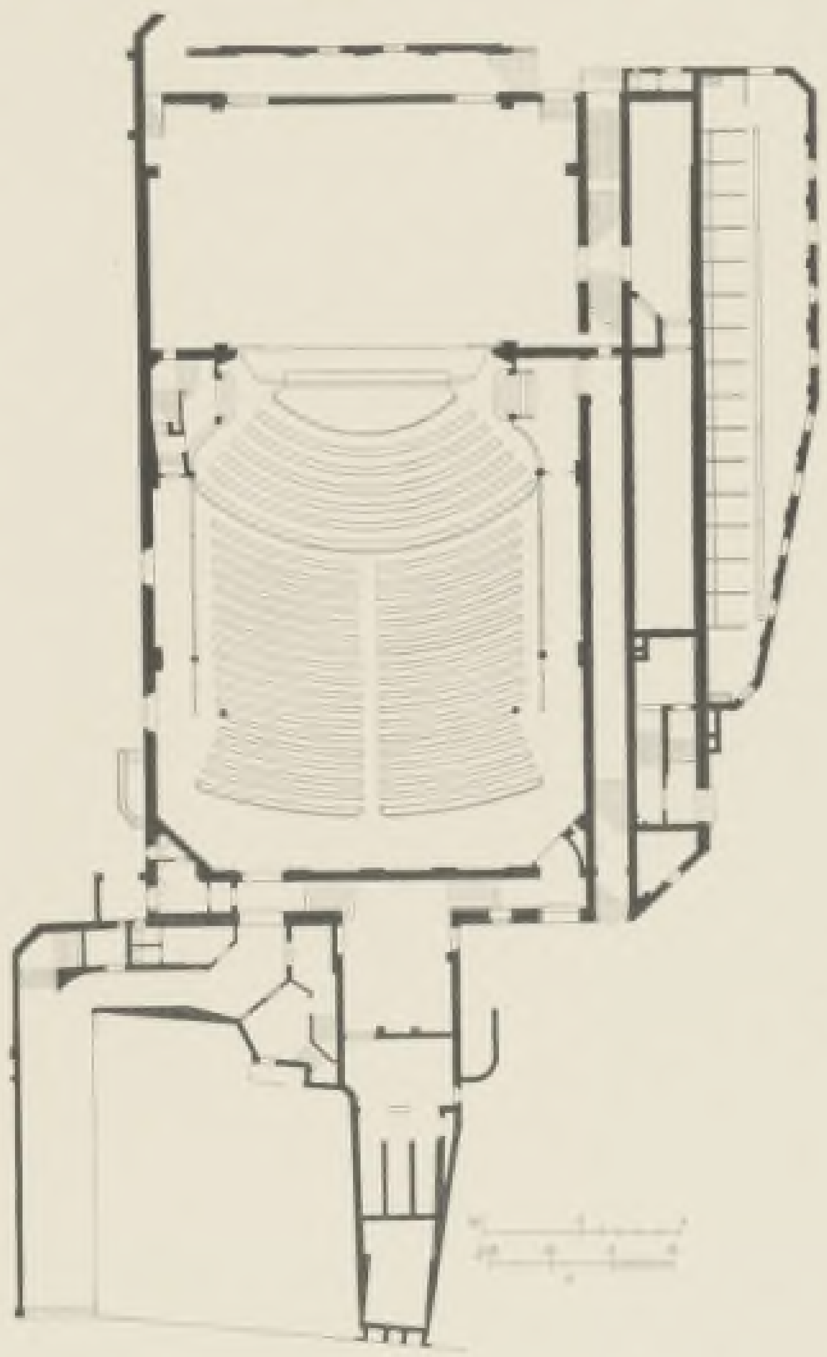
This example is the 'Crown' Theatre, Peckham (Figs. 141 to 143, page 37), which is intended, in a sense, to serve the purpose of a suburban theatre. At Hastings, it will be remembered, the building had to have one side of the auditorium on the principal front, whilst at Middlesbrough there were no difficulties as to site, in fact, everything was in favour of the architect's requirements. Now, at Peckham we again have a favourable site, coupled, however, with certain peculiarities which necessitated the principal façade being on the broadest frontage, and also prevented absolute symmetry in the general planning of the block. Nevertheless, as I have already indicated, the entrances and exits of the stalls, pit and tiers are absolutely symmetrical, and the whole conception of the plan shows admirable breadth in spite of some complicated requirements. If we turn to the plates in the Introduction, we perceive that the characterisation of the interior arrangements on the façades is again fully evident.

But in this case it is not so much the conception of the building that is notable as one or two of the features of the playhouse, such as the width of the stage. Of course it might be said that the scene-docks are not to be included in the width of the stage proper, and, in many respects, this argument is true. But where the scene-docks have been obviously placed so as to give the stage an unusual width in order to facilitate the presentation ot certain effects, I think they may well be counted as part of the stage itself. The extreme width of the stage may thus be taken as nearly 120 feet, whilst the proscenium opening measures 35 feet. Such relative dimensions should materially assist in working the class of entertainment to be provided at this establishment. Unfortunately, however, the site did not allow the architect to give the stage a greater depth than 38 feet, nor was there the possibility of adding a back-stage. Then the arrangement of the foyer and saloon on the first tier is certainly remarkable for its considerable architectural pretensions, although this part of the structure occupies only a secondary position in the block. Reference to the first tier plan, Fig. 142, will show how the foyer and saloon are placed en suite, and quite apart from the effective appearance thereby created, such a minor, though very practical consideration as the extent of the bar frontage thus obtained is a point well calling for attention. The saloon for the stalls, it will be seen, has a similar advantage of a good bar frontage, and if I lay stress on a detail of this description, it is to emphasise that small matters of this kind must on no account be neglected, although not treated of specially in these chapters. The 'Crown' Theatre, I should perhaps mention, will probably see its inauguration concurrently with the publication of this volume, and will be the first theatre completed of the series here under consideration. The other examples, at Hastings and Middlesbrough, will be opened approximately towards the end of this year, whilst the building at Norwich is to be finished in 1899. The non-completion of the work at the time of writing precludes my referring to the interior decoration of these instances.

THEATRE, ST. HELENS.
FIG. 132. LONGITUDINAL SECTION.

But I am afraid I am extending my particulars too much into detail, and transgressing the rule that I have made for myself in this respect. Yet it naturally affords me considerable satisfaction to dwell on work of excellence in a department where I have generally had only too much cause for complaint, and this must be taken as my excuse for dealing with the Runtz type somewhat more fully than the other English examples. What, however, are the distinguishing features of this type? I think the answer will safely be, an absolute clearness of plan, no matter what the disadvantages of the ground, the greatest possible symmetry in the auditorium and staircase arrangement, a broad conception in the treatment of the auditorium, foyers and saloons, and an architectural treatment, both within and without, that tends to make the structure a public building in the true sense of that term, and a monument of which the community may be proud.

In the examples of buildings executed under the directions of J. C. Phipps and Frank Matcham, I have dealt with the two principal types of theatre design characteristic of the Metropolis and our provincial centres. In the instances of designs by Ernest Runtz I have shown the type which I trust may mark the advent of a new era in our playhouses. Before closing my remarks on theatres in Great Britain, I now only wish to take the opportunity of mentioning two



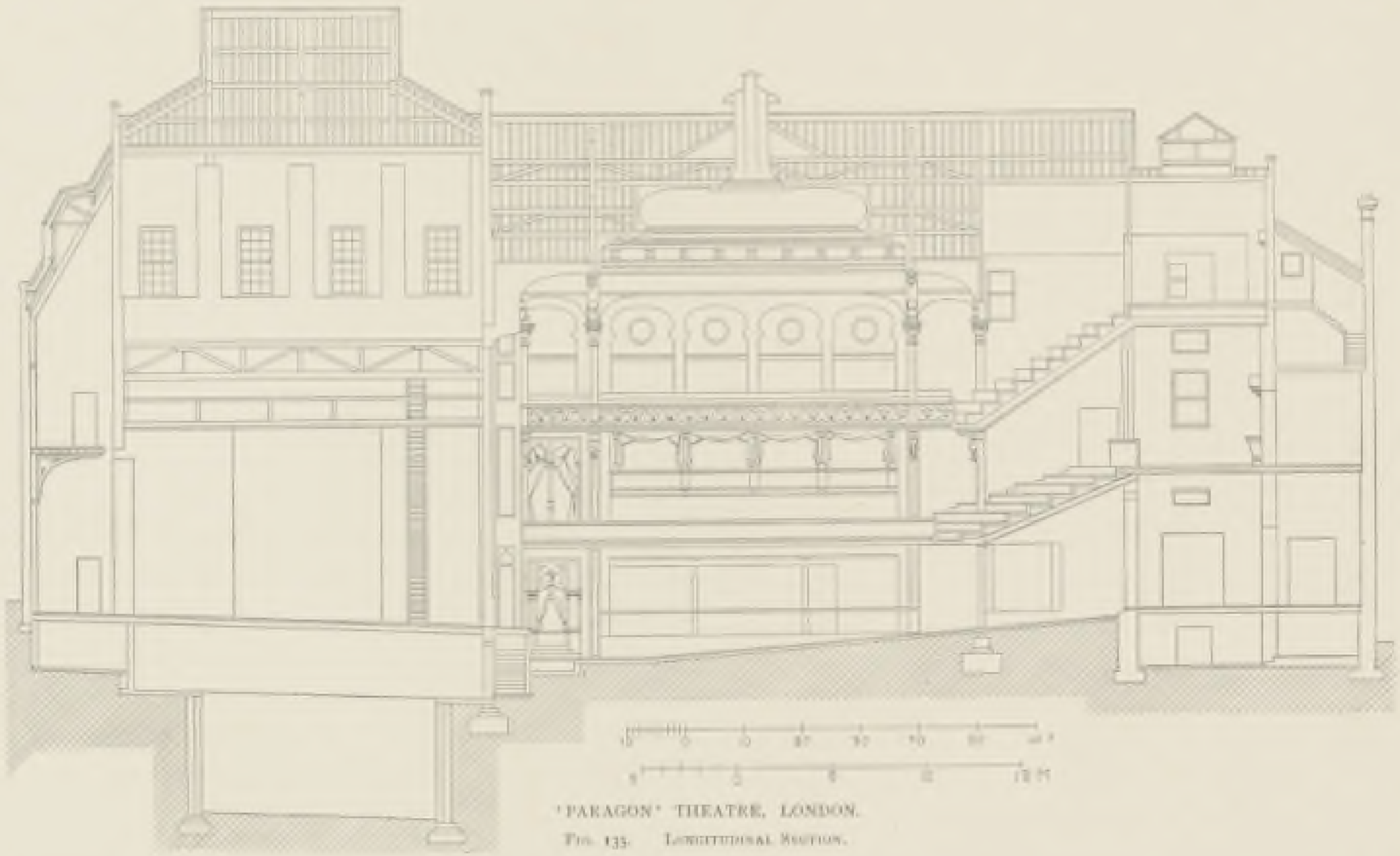
'EMPIRE' VARIETY THEATRE, EDINBURGH.
FIG. 133. PLAN, AREA.

'EMPIRE' VARIETY THEATRE, EDINBURGH.
FIG. 134. PLAN, FIRST TIER.

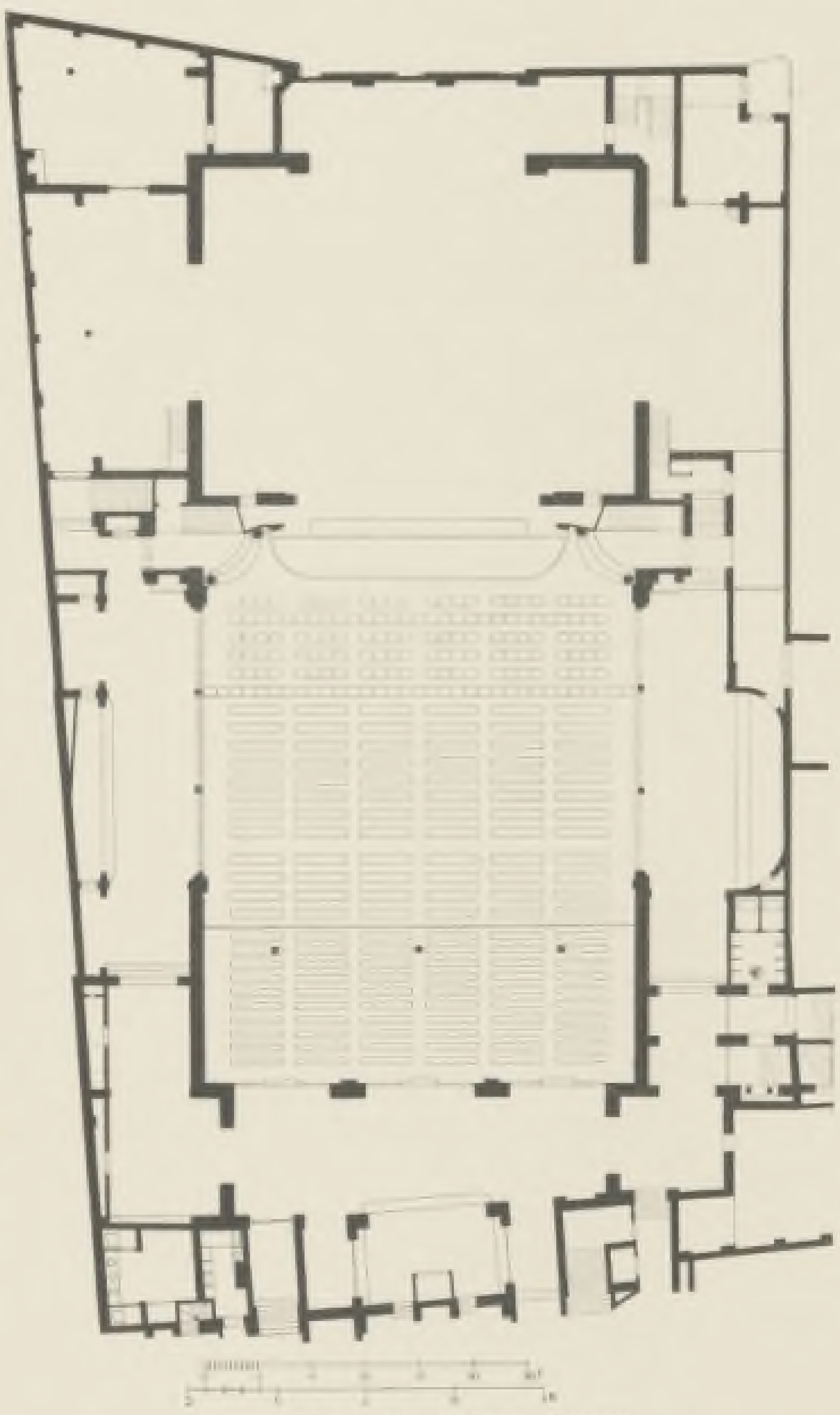
examples of the special groups to which I have referred, although I have noted that they cannot rightly be regarded as types in the full sense of the term, owing to the fact of little work having been executed on identical lines.

In Volume I., it will be remembered, I spoke at some length of the great advantages in the plan of the 'Palace' Variety Theatre, Manchester. The general conception was excellent, while the clear planning, with its ample exits leading directly into the open, was a point to which I particularly called attention. Now, under a small collection of what I term 'Model' Theatres I am showing a plan for a 'Safety' theatre, conceived by Alfred Darbyshire in conjunction with Sir Henry Irving, and generally known as the Irving 'Safety' Theatre plan. It is this plan that was adopted at Manchester, where, owing to the simplicity of the site, the architect was able to adopt his principles with but little modification. As with all model theatres, there is the expression of one main argument, which, however excellent in principle, cannot always find application, owing to the exigencies of the ground or other obstacles. At Manchester, both the site and the circumstances were particularly favourable, but with the theatre next under consideration the same cannot be said. For the example given in Figs. 147 to 149, page 38, is that of the Theatre 'Royal,' Exeter, a new playhouse, standing on the site occupied by that unfortunate structure which was the scene of the lamentable Exeter catastrophe. A plan of the old building will be found in Supplement II. on 'Theatre Fires' (see Fig. 15, page 137), together with some particulars of the historic conflagration.

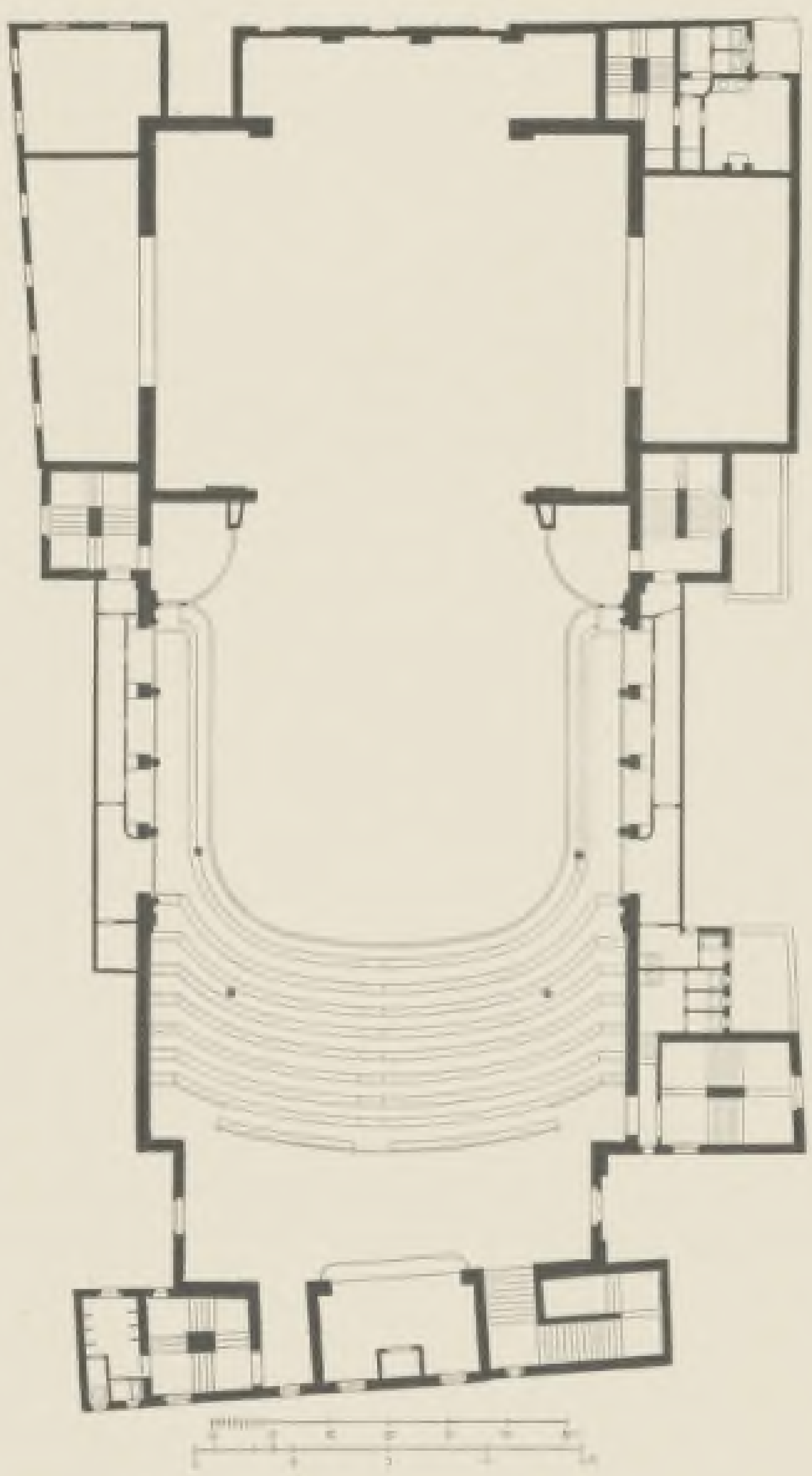
Now, as will be seen by turning to page 50, one of the essential demands in the Irving 'Safety' Theatre plan is



'PARAGON' THEATRE, LONDON.
FIG. 135. LONGITUDINAL SECTION.

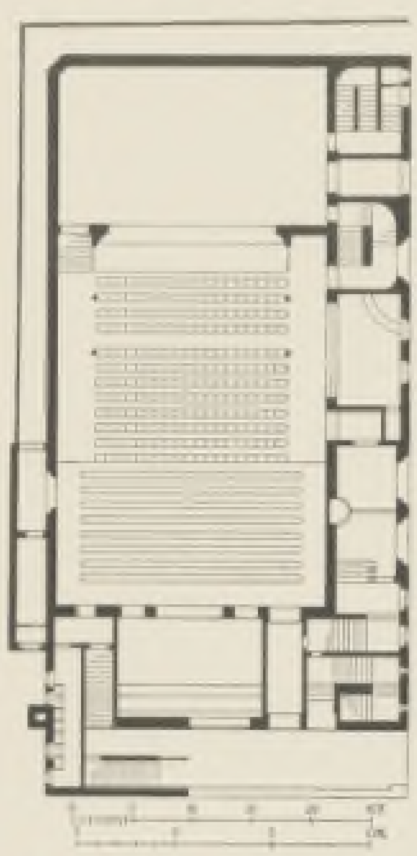


'PARAGON' THEATRE, LONDON.
FIG. 136. PLAN, AREA.



'PARAGON' THEATRE, LONDON.
FIG. 137. PLAN, FIRST TIER.

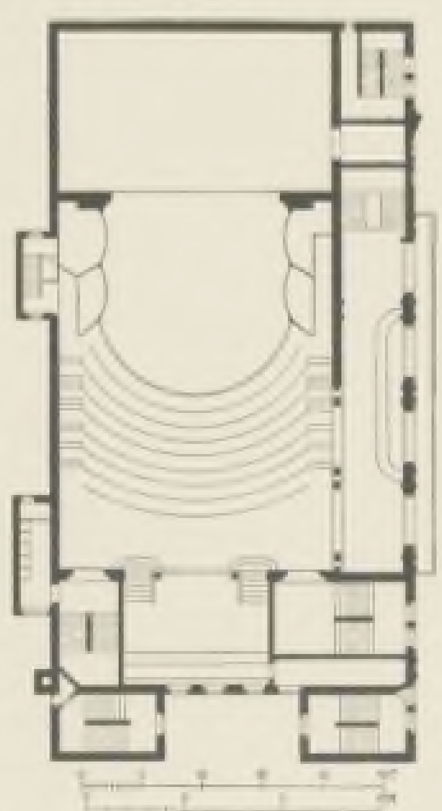
a site which is open on both sides. Furthermore, symmetry should be the main essence of any conception of this description. At Exeter it would be impracticable to give symmetry, as otherwise the auditorium, already very narrow, would not have sufficient width. Moreover, one side of the site is blocked by adjoining premises, and the front part of the site is anything but rectangular in plan. Given such adverse circumstances, model principles cannot be applied without considerable modification; and to what extent the modifications have to be made, will be easily ascertainable by comparing the plans on page 38 with those of the Irving 'Safety' Theatre plan on page 50. Yet I present this example of the Irving 'Safety' Theatre for two reasons; on the one hand, to show how model designs have to be modified by practical circumstances; and on the other hand, how an architect having adopted certain decided principles as to the safety of the audience, will attempt to apply them in practice at any sacrifice.



VARIETY THEATRE, HASTINGS.
FIG. 138. PLAN, AREA.

I think, however, that Alfred Darbyshire should be congratulated on the manner in which he has overcome difficulties, and yet left the playhouse an unmistakable example of his special type. How, after the experiences of the Exeter fire, the erection of any shop whatsoever should have been permitted under the same roof as this theatre is, nevertheless, beyond comprehension. For exactly as in the days when the promoters commissioned C. J. Phipps to build the unfortunate theatre which was destroyed by fire, and handicapped his work by the number of 'lock-up' shops they demanded, so here, even after that serious lesson, the architect had to arrange for three shops at the cost of interfering with his general scheme, and certainly to the disadvantage of the theatre as a whole. We have, in fact, in the scheme of the shops in the Exeter theatre, one of those characteristic instances of how even the most terrible of catastrophes will not prevent bad planning on the same site. The new Opéra Comique, Paris, it will be remembered, was another case in point.

The other example which I wish to introduce is the 'Criterion' Theatre in this Metropolis, which was built from the design of Thomas Verity. This theatre, to put it quite plainly, is simply a cellar; for in spite of a slight difference in the level of the ground at the main entrance compared with the back of the building, we must assume that the major portion of the audience and practically the whole of the auditorium and stage are below street level. It forms a type in itself, inasmuch as we fortunately have no other theatres built on the same principle. And yet I like to term this building a type, as it is in reality a type of the principle advocated many years ago in this country, that it is quite permissible to put a theatre anywhere and everywhere, and, provided a good rental could be depended on, the cellar of a restaurant was by no means an unsuitable location. Its erection dates from the years prior to the regulations of the London County Council controlling the construction of theatres. It would, of course, not comply now with a clause given on page 149 of Supplement III., which states that a theatre may not be under any other building, nor with the regulation which determines the depth of the area below the street level. Indeed, as far as entrances and exits, the general arrangement, and even the location are concerned, the building would of course be quite inadmissible to-day. But, nevertheless, we have seen that a theatre can, and actually has been built under other buildings, and that the British public, even at the present day, raise no objections to the character of the playhouse as long as they are satisfied with the play and the acting.

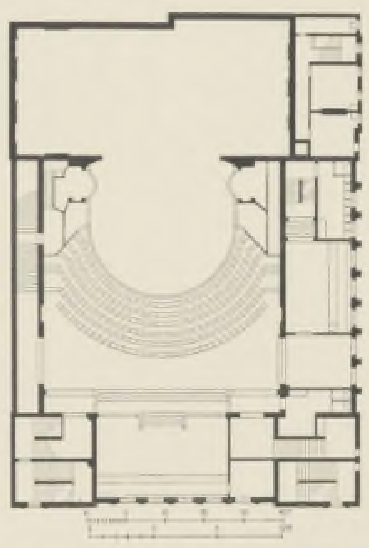


VARIETY THEATRE, HASTINGS.
FIG. 139. PLAN, FIRST TIER.

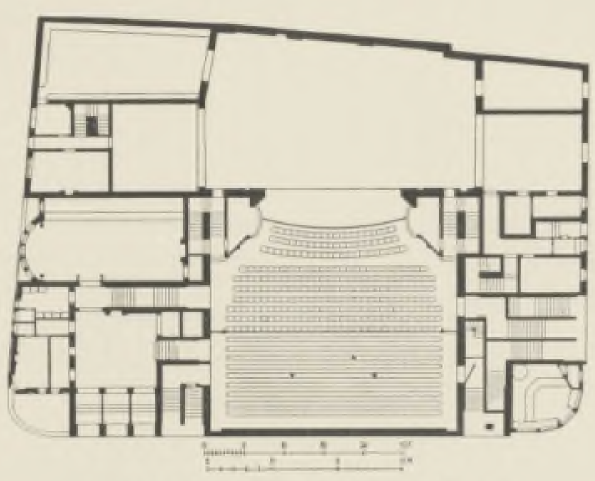
VARIETY THEATRE, HASTINGS.
FIG. 140. PLAN, SECOND TIER.

It has been the rare fortune of this building to have housed a company under Charles Wyndham, an actor who has been eminently successful, both as regards the presentation and the selection of his plays. The theatre has also been fortunate as regards decoration and upholstery, for the absence of all loudness and glaring colour appeals to many as welcome relief. It has further had the advantage that it is a very homely theatre, since after we have reached the bottom of the cellar, and taken a seat in the stalls, or have only descended one story to a seat in the gallery, there is an air of comfort which is absent from many other establishments, and which I attribute, to a great extent, to the compactness of the auditorium, and the manner in which this compactness brings the actor and audience in touch with one another. I think the building only holds at most 1000, a figure I cannot but impress upon actor-managers, or actors, who desire to have an auditorium for chamber drama, as it is by no means far from the correct limit to the number of spectators, if they are properly to enjoy this particular form of acting. As a matter of fact, I have said eight hundred seats elsewhere, and this figure is perhaps nearer the mark.

But to return to the principles of plan with which I have to deal in this volume. I am afraid that the idea of

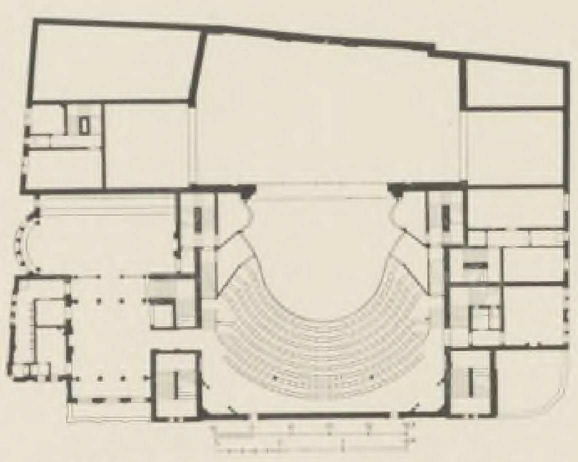


VARIETY THEATRE, MIDDLESBROUGH.
FIG. 145. PLAN, FIRST TIER.

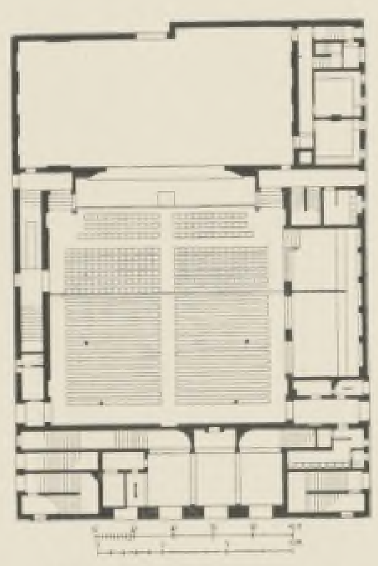


'CROWN' THEATRE, PECKHAM. FIG. 141. PLAN, AREA.

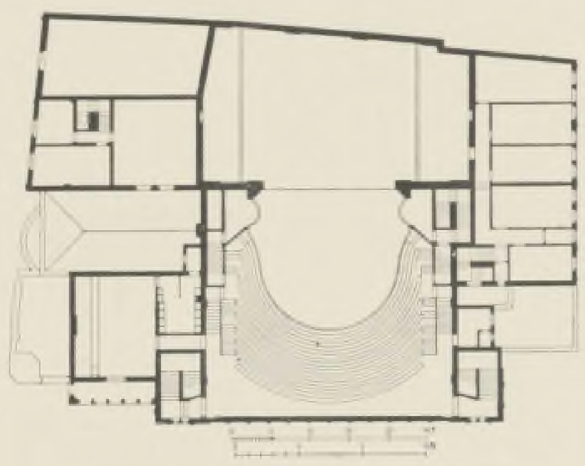
VARIETY THEATRE, MIDDLESBROUGH.
FIG. 146. PLAN, SECOND TIER.



'CROWN' THEATRE, PECKHAM. FIG. 142. PLAN, FIRST TIER.



VARIETY THEATRE, MIDDLESBROUGH.
FIG. 144. PLAN, AREA.



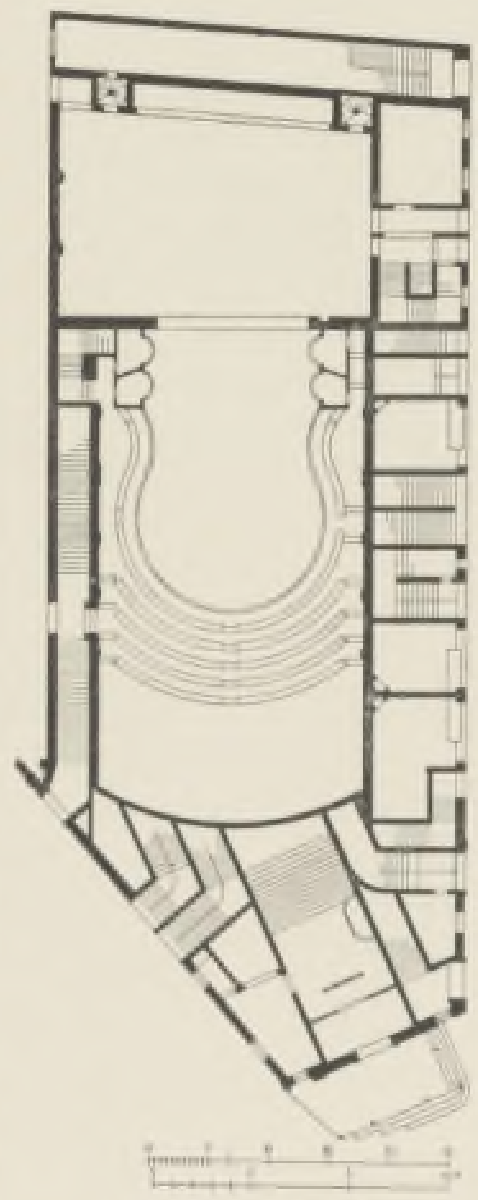
'CROWN' THEATRE, PECKHAM. FIG. 143. PLAN, SECOND TIER.

putting the theatre inside a building used for another purpose cannot be sufficiently condemned, not only because such a location is derogatory to the dignity of the Drama, but also from the point of view of the fireman who has to consider the safety of the public. I am giving a full set of plans on page 39, Figs. 150 to 152, as well as a view of the auditorium on page 61, as this underground type is in many ways unique. Fortunately, however, in giving them, I have the satisfaction of knowing that no such theatre can again be built in the Metropolis, nor in fact in any other capital of a civilised country. Excepting as regards the dimensions of the auditorium, the presentation of this example only affords negative results, and should be primarily treated as a curiosity.

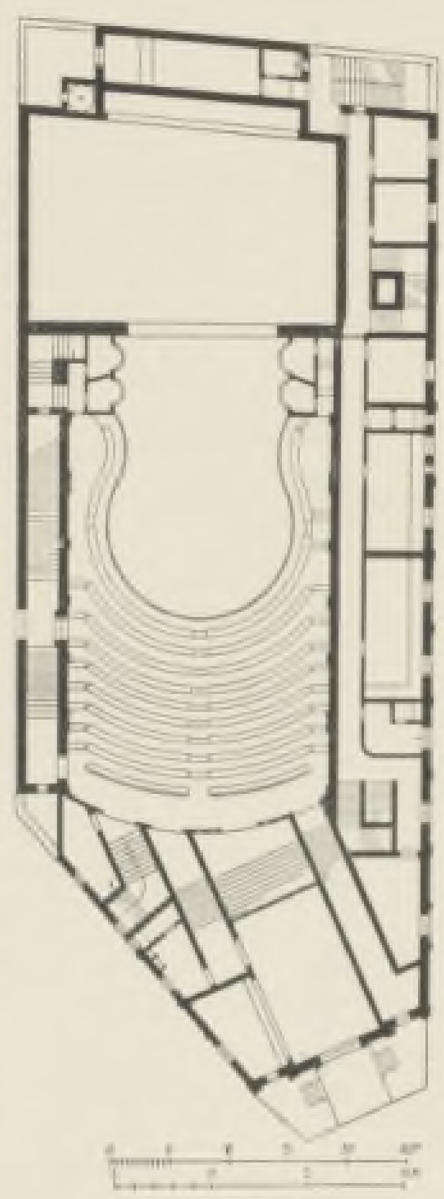
THEATRE, EXETER.
FIG. 147. PLAN, AREA.

Having now shown an example of a theatre which is practically a cellar—and which, though no doubt congenial to many on account of its compact and well-furnished auditorium, illustrates more forcibly than any words that lack of sentiment as regards the housing of the Drama common to these Isles—it would be manifestly unfair if I did not say that some slight feeling of shame regarding the present state of affairs is at last becoming apparent. Particularly during recent months the modern playhouse has had the consideration of men prominently associated with the stage, and such lectures as those of Sir Henry Irving, at Cambridge University, or of H. Beerbohm Tree, before the Royal Institution, are doing much to call attention to the subject.

These lectures, I should add, are no doubt primarily given with the intention of showing how advantageous it would be for the Drama if the State or our local authorities were to assist dramatic art in any one of the many ways so long practised in Continental countries, but with the arguments for Court, Government or Municipal aid, for Endowment or Subscription, the question of the better housing of the Drama naturally goes hand in hand. For should dramatic art be favoured by official recognition, how much more necessary would it then be to attain a higher standard of theatre construction than is to be found with private theatre enterprise to-day. A theatre owned by any of the authorities named, or a theatre publicly subscribed for or endowed, would have to rise above the characteristic English types which I have presented in these volumes. Even the Runtz type, though adequate for the private theatre, would require more dignity in plan and rendering if erected for a public object. Nor for a playhouse to which an annual official grant was given would the characteristics of the best of our private establishments suffice. In any case, an institution enjoying official patronage would have to be a public building in the true sense of the word. The gradually awaking sentiment, however, assisted by the stern requirements of severer local regulations for theatre construction, materially tends to give us theatres of a more dignified character than we are wont to find in London or in the provinces, whilst, no doubt, the marked increase in this Metropolis in the erection of suburban establishments should in due course also affect the designs of the future. I mention the influence which the suburban theatre should have, inasmuch as the lesser value of land outside the West End induces promoters to place their buildings on sites which, both in location and size, are more in accordance with the requirements of the institution. And, as I have said elsewhere, on the site greatly depends the characterisation of a playhouse, for if placed well, even with the smallest of building funds, a worthy architectural rendering should be obtainable.

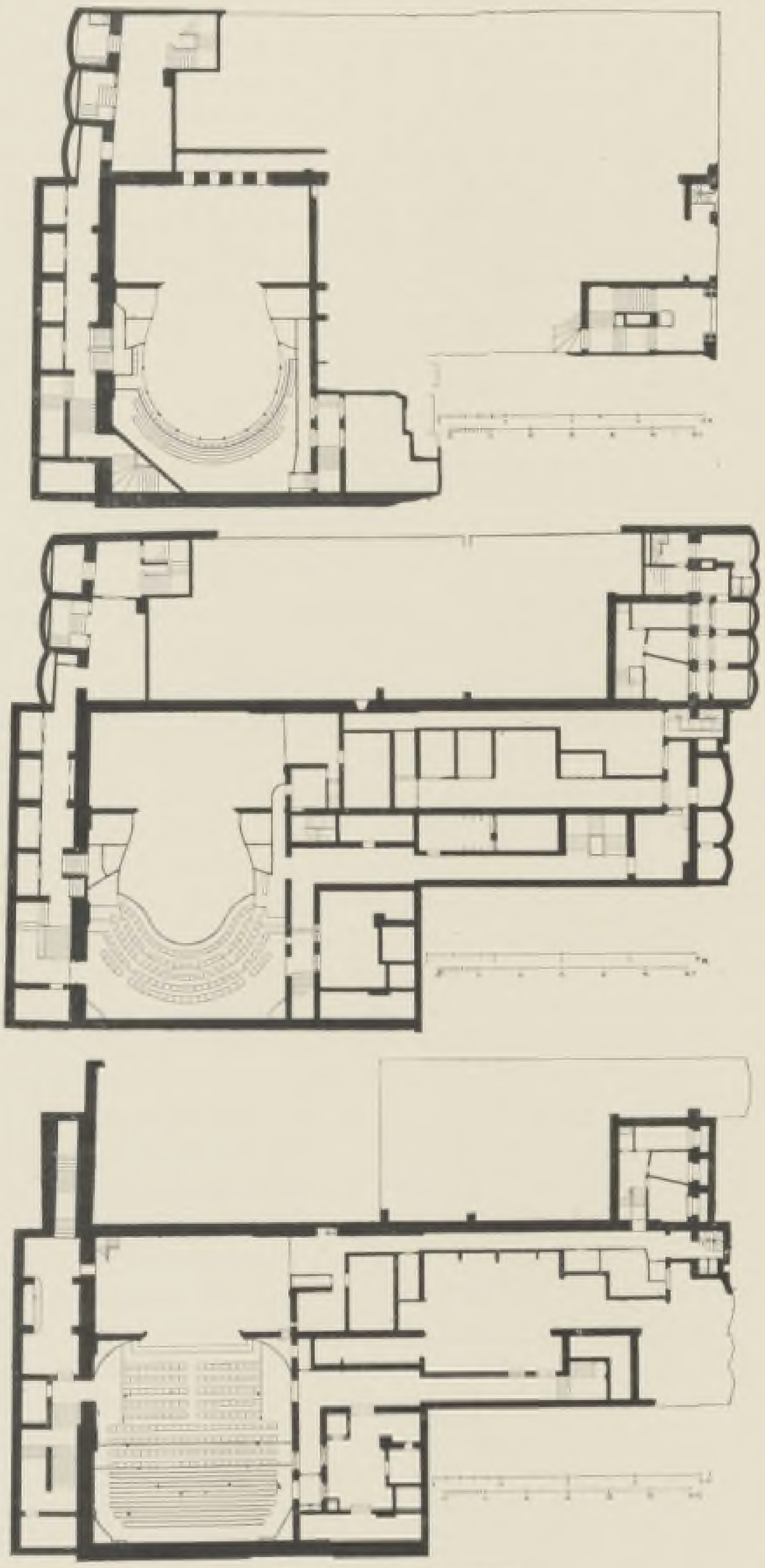


THEATRE, EXETER.
FIG. 148. PLAN, FIRST TIER.



THEATRE, EXETER.
FIG. 149. PLAN, SECOND TIER.

Given such sites as have recently served for many of our suburban theatres, I cannot, however, refrain from pointing out the endless opportunities for good design which have been missed. In plan and in architectural rendering alike, with but very few exceptions, the score of buildings which are forming an outer ring around London are lamentable, and this for no other reason than either the lack of interest on the part of those responsible for the design on the architectural side of their work, or, what is worse, their incompetence. Intricate planning or lack of dignity may, perhaps, be slightly excusable on the cramped and unsuitable sites of the West End. The absence of architectural merit may, perhaps, in some degree be attributed to the difficult conditions of construction, assuming that those entrusted with the work really paid proper attention to these matters as distinct from the financial aspects of the building. But in the suburbs no excuses of this description are possible, for even the financial conundrums which have to be answered in the theatre of the West End are mostly capable of simpler solution, and should not encroach too largely on the designer's time. It is in the suburbs, too, that we have the few instances of the owner of the building paying for his establishment with his own money, without any mortgage complications, and though the architect may have been the promoter and have brought the site and a suitable set of plans to his notice, yet in these cases the ordinary relations of client and architect are more nearly approached. To speak quite plainly, the fact that these suburban theatres, though often excellently located, have become such hideous and poorly planned structures, strikingly proves that, with some few exceptions, suburban theatre construction is in the wrong hands. And, what is worse, these suburban buildings being generally on prominent sites the monstrosity of the various eye-sores becomes more conspicuous, and the faults of plan more ridiculous. Of all the theatres built outside the West End since the completion of the 'Grand' Theatre, Islington, illustrated in Volume I., I have, in fact, only been able to discover the 'Crown' Theatre, Peckham, already referred to, as calling for inclusion in this volume; and that building, though typical of the work by Ernest Runtz, is not quite characteristic of the ordinary suburban requirements. The other instances have not even enough individuality to allow them to be classed as a type of theatre construction, as is the case with some other groups of buildings, say, the unsatisfactory French play-houses of the last decades. The 'Metropole' Theatre, Camberwell—which was due to the initiative of the manager, J. B. Mulholland, as distinct from the theatre architect who generally figures so prominently in modern promotions—was the first of the new series of modern playhouses springing up around London, and is, perhaps, most characteristic of the conditions that have to be fulfilled. We must attribute mainly to J. B. Mulholland the ideas which have been of late so extensively applied by others, and which have led to the decentralisation of dramatic establishments in this Metropolis and the erection of the many new structures which embody this remarkable development of theatrical enterprise.



'CRITERION' THEATRE, LONDON.
FIGS. 150 TO 152. PLANS, AREA, FIRST TIER, SECOND TIER.

To conclude my reference to examples of play-houses in Great Britain, it may be interesting to simply recapitulate the names of the architects whose work is represented in these volumes. In the first place there have been the three specific types of design by C. J. Phipps, Frank Matcham, and Ernest Runtz, together with the characteristic work by Alfred Darbyshire. Then there have been Thomas Verity with F. T. Verity, Oswald C. Wylson with Charles Long, and John Perry with F. H. Reed, as the designers of certain Variety theatres. Some of the London work by Walter Emden and Spencer Chadwick has been shown, and an instance by George Corson, in a provincial centre. Lastly, I would mention F. Unsworth as the author of that unique example, the Shakespeare Memorial Theatre, and T. E. Collcut as a collaborator in the erection of D'Oyly Carte's Opera House, which was erected under such peculiar circumstances.

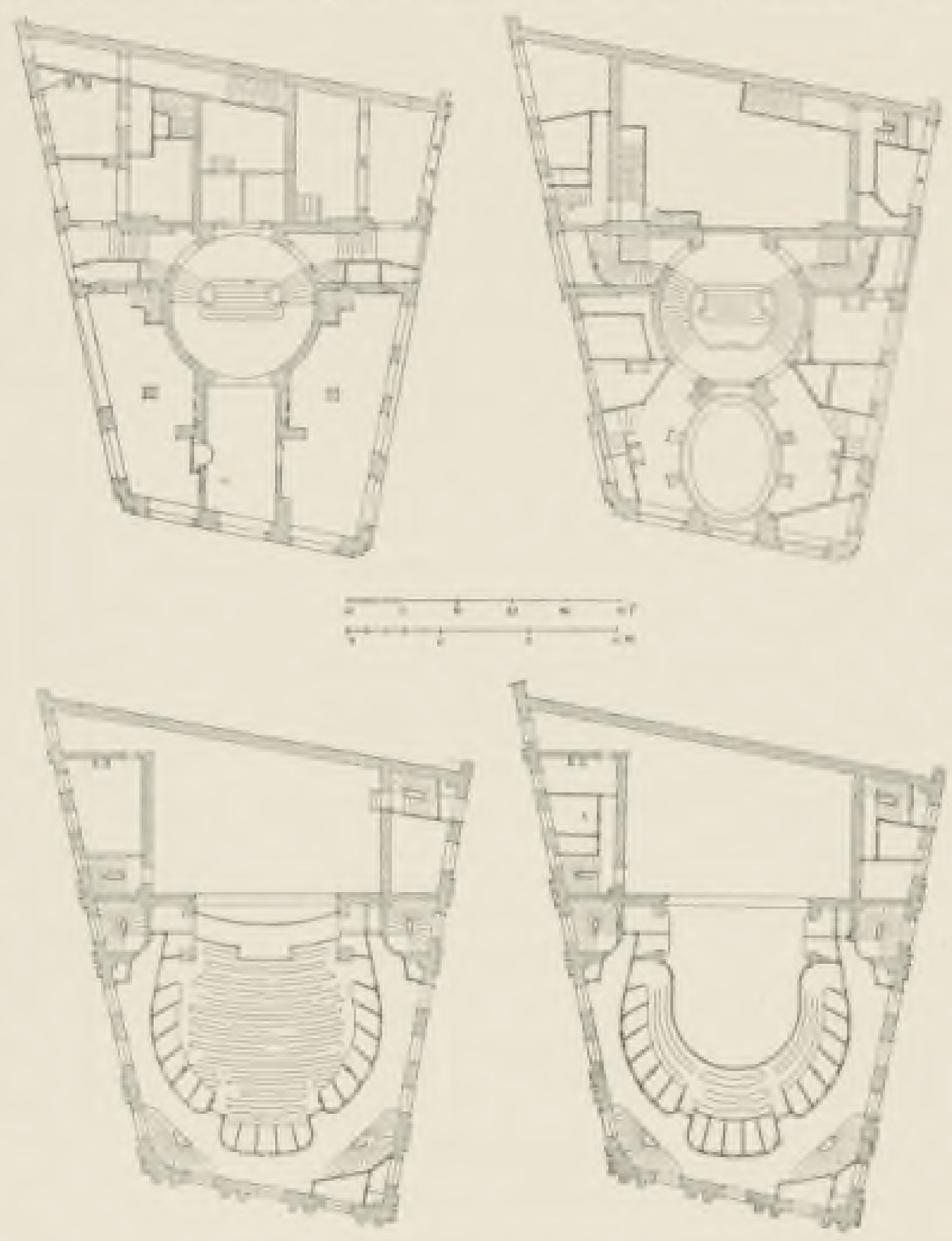
In Volume II. I was obliged to state that as far as France, Italy and Spain are concerned, there is little to learn in modern theatre design. The Latin countries can scarcely be said to have made any progress of late in this class of building.

In France and Spain I am unable even to point to the work of any individual theatre architect, satisfactory or unsatisfactory, and characterise it as typical of what is being done. This is due not only to the stagnation of theatre enterprise in these countries, but also to the fact that neither France nor Spain can, at the moment, be said to have any architects who are specialists in this class of building. Charles Garnier, no doubt, had a very considerable knowledge of theatre requirements, but he is by no means to be regarded in the light of a specialist; for besides the National Opera House, Paris, the Casino Theatre at Monte Carlo alone afforded him a further opportunity of being associated with theatre construction. He was an architect to whose lot had fallen the commission for that wonderful structure in Paris. To confuse him with the 'Fellners and Helmers,' the 'Matchams' or 'Phipps' of Europe, would be as ridiculous as to call his work typical. In fact, neither in France nor Spain is the specialist to be found. No architect of recent years has had more than one, or, at the most, two playhouses to erect, and, perhaps, this is the reason of their general mediocrity, for no class of building more requires system, and the specialisation common to the modern era, than the theatre.

'RENAISSANCE' THEATRE, PARIS.
FIG. 153. LONGITUDINAL SECTION.

In Italy, on the other hand, we can speak, perhaps, of one specialist in the person of Achille Sfondrini, the master-builder, whose 'Lirico' Theatre, at Milan, I have already presented in the preceding volume. Unfortunately, however, though in many respects broader in conception than the work of Frank Matcham or C. J. Phipps, I am afraid that the achievements of this eccentric designer cannot find a place in this chapter. For, in the first place, there are no plans available from which to take copies, as he sets out his work on the spot, much as the old masters are supposed to have done. And, secondly, though no doubt interesting both in the positive and negative sense, and certainly indicative of the decadence in theatre design which has affected Italy above all countries, I hold that the example measured up for and presented in Volume II. suffices to illustrate Sfondrini's work.

Seeing, then, that there is no work characteristic of any individual architect to deal with when speaking of the Latin countries, I must limit myself to the exposition of isolated examples by various designers. If, however, I were now to describe these as typical of the last twenty-five years of French or Italian theatre architecture, or even simply state that they exemplify the Latin type of to-day, I should not be making a mistake. For, to take the French instances given, they are, in reality, very typical of what every average French architect does when commissioned to erect a theatre. One might be tempted to say that they are of a stock pattern; for it will be seen that they have much in common with one another, more particularly in the auditorium. The arrangement of the offices is left largely to circumstances, with the one exception that, if possible, a long and narrow foyer is provided. But, unfortunately, there is almost always a distinct attempt to fill up the corners of the passages around the auditorium with semicircular staircases, and, speaking generally, there is little appreciation of the advantages of good staircase accommodation as far as the safety of the audience is concerned. In fact, almost throughout the general plan there is little to learn except in a negative sense. In the auditorium alone the architectural conception may be studied with advantage, and the ceiling, which is as a rule supported by four pairs of columns, generally calls for comment. This feature of four pairs of columns, which already characterised the auditorium of the earlier playhouses of France, will be almost invariably found throughout the country. It will

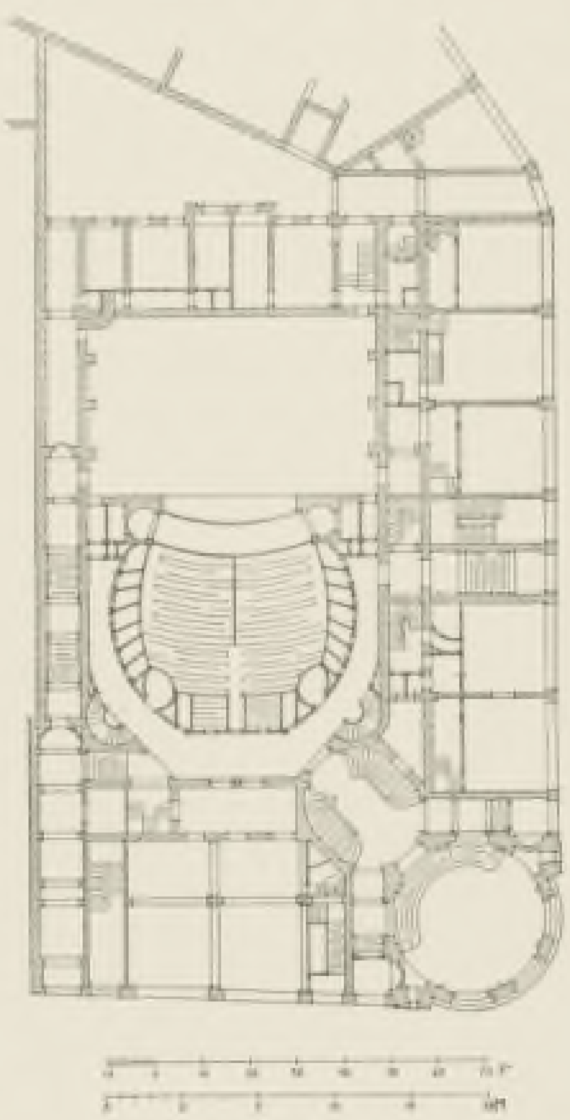


'RENAISSANCE' THEATRE, PARIS.
FIGS. 154-157. PLANS, STREET LEVEL, LOUNGE LEVEL, AREA, FIRST TIER.

even be found at the Paris Opera House and the new Opéra Comique, both which instances show some independence in the conception of this part of the house. Architecturally speaking, I would say that this feature calls for praise; but as far as modern and practical requirements are concerned, it cannot be too strongly condemned, inasmuch as the columns at the back of the auditorium intercept the view, and the arch-like, though certainly architecturally correct, finish which is generally to be found at the topmost tier is distinctly prejudicial to the seeing and hearing powers of that part of the audience which is placed at so great a height. Taken in detail or speaking generally, the French type, as representative of what is being done by Latin nations, is unserviceable, and does not even fulfil the requirements of to-day.

'RENAISSANCE' THEATRE, PARIS.
Fig. 158. General View.

But after generalising in this manner, and again emphasising the fact that I attribute the unsatisfactory state of affairs in France to the circumstance that there are no French architects who are recognised specialists, I would next call attention to the examples here presented. Two of these show us instances of private theatre enterprise in Paris, while two are characteristic examples of municipal institutions in provincial centres. As regards the former, it will, no doubt, be remembered that Paris has four playhouses in receipt of Government support, i.e. the National Opera House, the Opéra Comique, the Théâtre Français and the Odéon Theatre. All the other theatres in the French capital have a purely commercial basis, as with us. They may, however, be said to have the peculiar disadvantage of being in competition with subsidised institutions, just as the private theatres in Berlin or Vienna may be said to compete with the respective Court establishments. The two private theatres here illustrated are the 'Renaissance' Theatre and the 'Vaudeville,' the first being essentially a comedy house, and the latter intended for the presentation of the lighter forms of entertainment. Both, as will be seen from Figs. 153 to 160, have the structural disadvantage of being under the same roof with business premises; the 'Renaissance' Theatre, for instance, has several large shops, which reach through two stories underneath the auditorium; whilst, at the 'Vaudeville' Theatre, the frontages of the site are almost entirely occupied with a set of small lock-up shops.



'VAUDEVILLE' THEATRE, PARIS.
Fig. 159. Plan, Area.

Now, in the case of the 'Renaissance' Theatre, which stands on a site of limited area and difficult outline, the inclusion of the shops has brought with it the inconvenience and danger of placing the area floor twenty-five feet above street level, which, as the auditorium has four tiers, means that the highest seat is seventy feet above the pavement. The only other theatre illustrated in this work where this unfortunate arrangement has been adopted, was the Municipal Theatre at Bilbao, which I severely condemned in Volume II. on account of this defect. I was there dealing with a playhouse opened in 1890, within two years after the Oporto Theatre fire, whilst in the case of the 'Renaissance' Theatre the inauguration took place in 1873. What I consider to be a disgraceful arrangement as far as the safety of the audience is concerned, in a building opened in 1890, may, perhaps, be more excusable in the structure of 1873; inasmuch as immunity from risk was not considered to the same extent in the seventies as during the last decade. But a design of this description is bad, even for 1873; for we must not forget that the architect could already refer to the teachings of Charles Garnier, and there was even then some slight feeling on the subject among the Paris controlling authorities. But I am afraid I have somewhat digressed from my more general description by entering into a detail of this kind. I would hence conclude my reference to this example by simply noting the unsatisfactory staircase accommodation, and, further, that the seating capacity is for an audience of one thousand. As to the cost of the block, the figure is considered to be approximately 24,000*l*. The architect was Charles de Lalange.

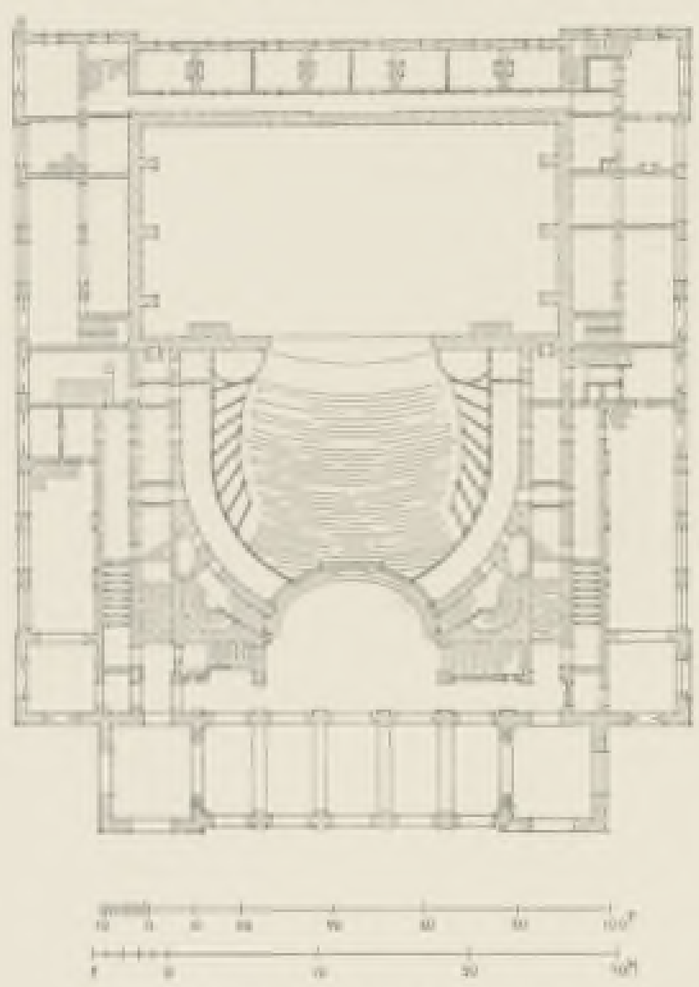
'VAUDEVILLE' THEATRE, PARIS.
Fig. 160. Elevation.

In respect to the Vaudeville Theatre, I must leave the plan, which is given on this page, to explain itself, simply emphasising the difficulties created on the corner site by the many lock-up shops. Yet it should be noted that, under the circumstances, the arrangement of the corner entrance is very effective, and the manner in which a broad passage has been provided on that side of the auditorium which abuts on adjoining property is well conceived. The staircase facilities are also far more satisfactory than is to be expected under the prevailing conditions. On the other hand, the service arrangements leave much to be desired. The architect of this building was A. Magne.

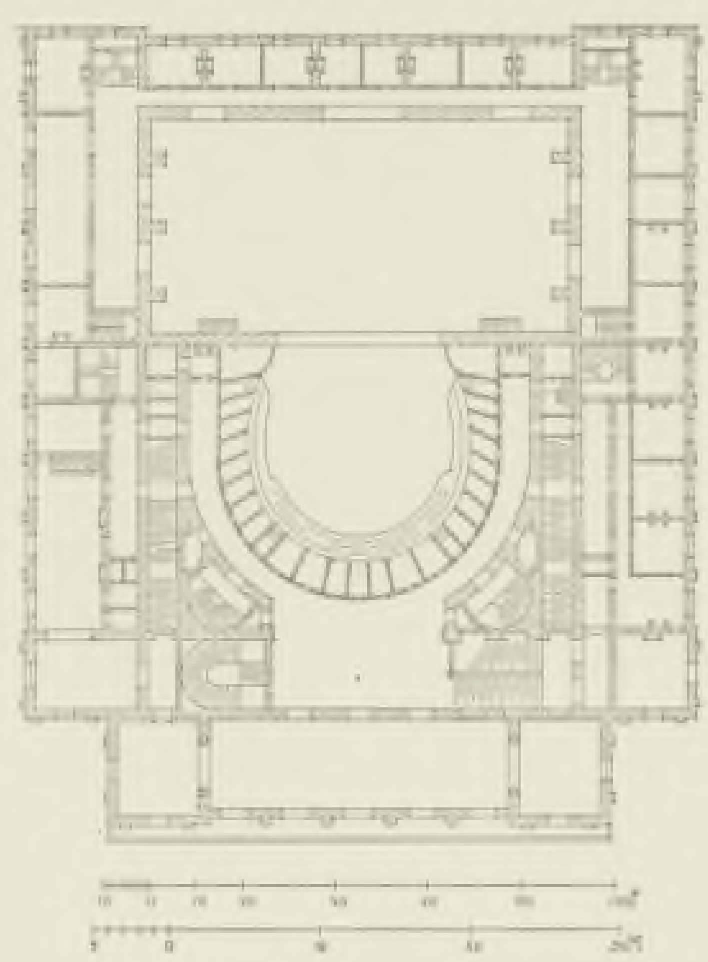
MUNICIPAL THEATRE, RHEIMS.
FIG. 161. FRONT ELEVATION.

In the same way as the two private establishments just mentioned are characteristic of the private playhouse of Paris, so are, even to a greater degree, the two which stand in the provincial centres of Angers and Rheims representative of French Municipal Theatres (see Figs. 161 to 166). The population of Rheims is about 98,000, whilst the population of Angers is 68,000, facts which, combined with the distinguishing features of the two localities, might account, to a certain extent, for the difference in elaboration. I say the word elaboration advisedly, for in principle there is no great variety in the modern provincial theatres of France, while there exists, of course, the obvious sameness in the two examples here noted. Take, for instance, the lines of the auditorium, so common in all French theatres, the semicircular staircases in the corner—that usual defect already remarked upon—the long staircases set out in one long flight with intermediate landings at the different tiers. Then, again, there is the elongated foyer, and the French characteristics in respect to the supports for the auditorium ceiling. In fact, the only essential difference that we find in the conception of the auditorium at Rheims is, that the columns are not grouped in four pairs, but arranged in regular sequence.

Deviations of the latter description in the Municipal Theatre, Rheims, are probably due to the greater ingenuity of the architect Alphonse Gosset, who made a far more exhaustive study of the subject of theatre construction than any of his French contemporaries, excepting, of course, Charles Garnier. He has embodied the results of his research in a monograph, descriptive of the Rheims Theatre and the principles of design he there adopted. Taken altogether, Alphonse Gosset's work at Rheims may well be accorded precedence among recent Municipal Theatres in France, and certainly stands out above any work completed in that country since Garnier's Opera House, excepting, perhaps, the 'Eden' Variety Theatre at Paris, but it far surpasses the new Opéra Comique. In every direction the Rheims example shows the application of a far greater knowledge of theatre construction and a far more appropriate architectural rendering than we have been used to in France of late, and it is only to be regretted that having this advantage over his contemporaries, Alphonse Gosset was not able to free himself from the shackles of custom and commonplace, by giving us a theatre more in accord with the results of his research. But perhaps those who gave him the commission had a word to say on the subject, and he may not have had the free hand he desired. Nevertheless, the Rheims Municipal Theatre certainly demands attention, and its architectural pretensions, both on the exterior and interior, are above the average. In respect to capacity, this theatre holds an audience of 1250, and cost about 56,000*l*. Its date of opening was 1873, i.e. the same year as that of the 'Renaissance' Theatre, Paris, which makes one wonder all



MUNICIPAL THEATRE, RHEIMS.
FIG. 162. PLAN, AREA.



MUNICIPAL THEATRE, RHEIMS.
FIG. 163. PLAN, FIRST TIER.

the more at the injudicious planning of the latter. In fact, it is most remarkable when we consider that the theatre at Rheims, as it now stands, was designed as far back as 1867. The monograph referred to, it might be well to add, was published in 1886.

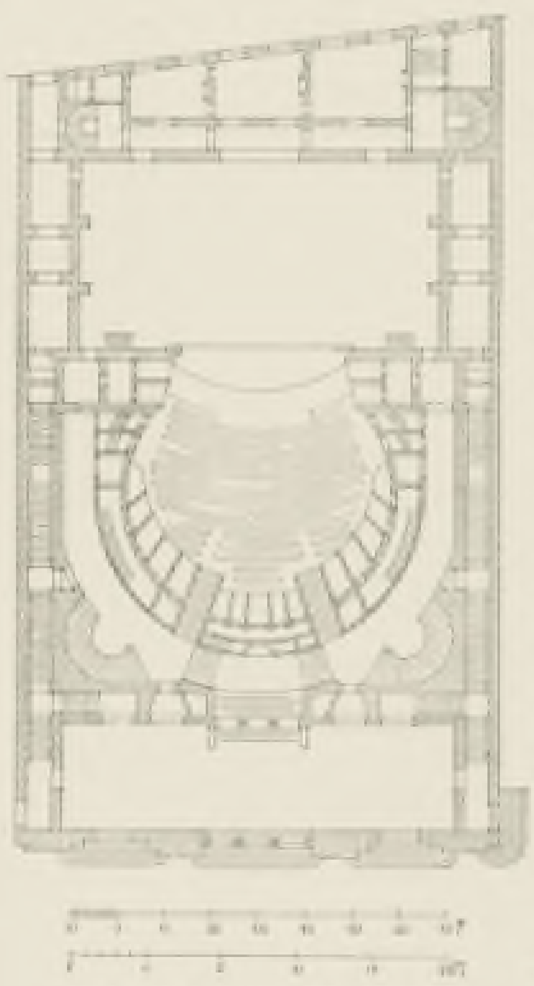
In respect to the Municipal Theatre at Angers, on this page, I would only point out that, bearing in mind that the building has adjoining structures on both sides, the rendering of the main façade calls for comment. The designer of this building is again A. Magne, who designed the 'Vaudeville' Theatre referred to above. It was opened in 1871, and accommodates an audience of 1200 at the cost of 48,000*l.*

MUNICIPAL THEATRE, ANGERS.
Fig. 164. General View.

Now in respect to Spain, I do not propose exhibiting any further examples in these volumes beyond the Municipal Theatre at Bilbao. For, to put it quite plainly, the few playhouses which have been erected in that country of recent years, are not only small institutions of quite inferior standing, and of bad design and construction, but the circumstances under which they are established prevent them from even being interesting in a negative sense. In the Municipal Theatre, Bilbao, the best instance of modern theatre construction to be found on the Peninsula, were mainly embodied the worst features of the Paris 'Renaissance' Theatre of 1873, though, fortunately, it had some redeeming qualities.

MUNICIPAL THEATRE, ANGERS.
Fig. 165. Longitudinal Section.

Italy also, apart from the theatres already noticed and the work of Achille Sfondrini, the eccentric master-builder, of which I show no further instances beyond the 'Lirico' Theatre, Milan, can furnish but little to call for consideration in these volumes. Yet, two buildings may merit a passing reference, one as a good instance of the usual built-in theatre found in different parts of the country, and the other because its arrangement not only disregards Italian traditions, but also shows considerable outside influence applied to meet local conditions.



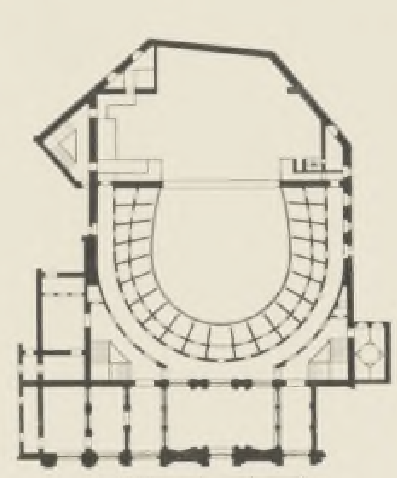
MUNICIPAL THEATRE, ANGERS.
Fig. 166. Plan, Area.

The first of these examples, which may be seen on page 44 (Figs. 171 and 172), is the 'Manzoni' Theatre at Milan, which was opened in 1872, and which is managed somewhat on the lines of a Subscription theatre. I would especially draw attention to its fulfilment, in a typical manner, of the ordinary Italian requirements of to-day. The second example is the 'Dal Verme' Theatre in the same city, of which I am presenting two plans, a transverse section and the front elevation in Figs. 167 to 170 on the same page.

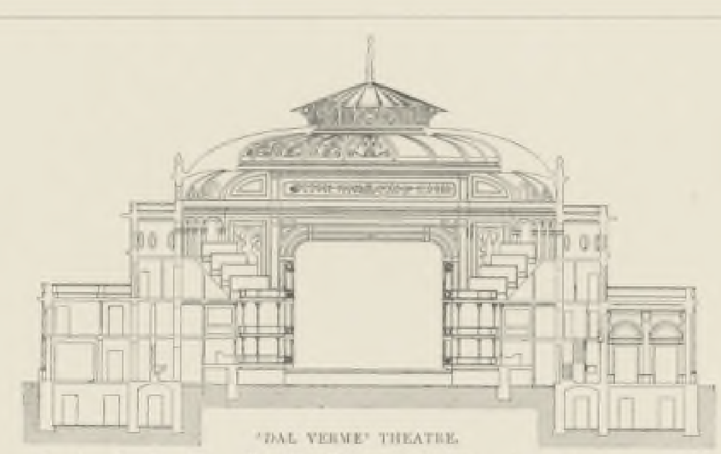
As to the 'Manzoni' Theatre I do not think that either plan or architectural rendering call for further comment, when it has been pointed out that in every respect—in the application of the 'pigeon-hole' system of the boxes, in the arrangement of standing room at the back of the stalls, in the spacious vestibule, in the open foyer, and even in the dearth of sufficient staircase accommodation—its design accords with what is customary in Italy. Its date of erection was 1872, and it was constructed in connection with the scheme of the great Arcade at Milan, known as the Victor Emmanuel Gallery. It has accommodation for an audience of 1050. The initial outlay was about 45,000*l.*

At the 'Dal Verme' Theatre, on the other hand, I wish to point out that the conception is that of a large auditorium with the whole of the seats under the same ceiling; there is no recessing of the back of the upper tiers into well-holes. The ample dimensions, the breadth in conception, the general symmetry and good proportions of the scheme give the structure a unique position, and, in many respects, as above indicated, the principles of its design betray other influences than those prevailing in Italy. It might even be said that the influences were partly derived from the lines of the Roman amphitheatre, combined with some of the principal features of the theatre in Teutonic countries. As is obvious from the drawings, this playhouse is situated on open ground; in fact, it stands in a prominent square.

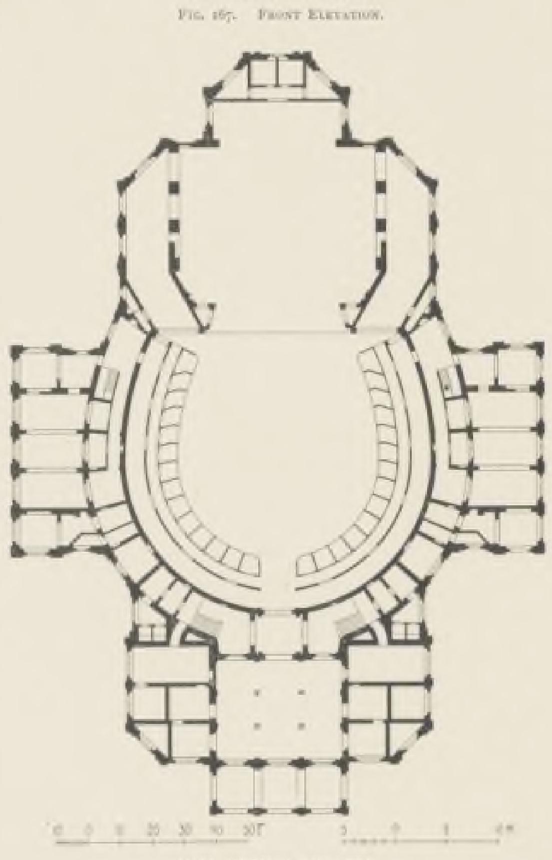
'DAL VERME' THEATRE.
FIG. 167. FRONT ELEVATION.



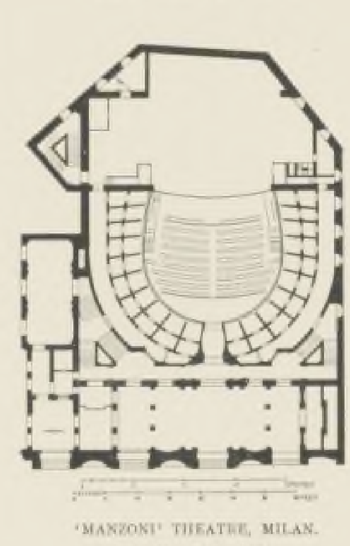
'MANZONI' THEATRE, MILAN.
FIG. 171. PLAN, FIRST TIER.



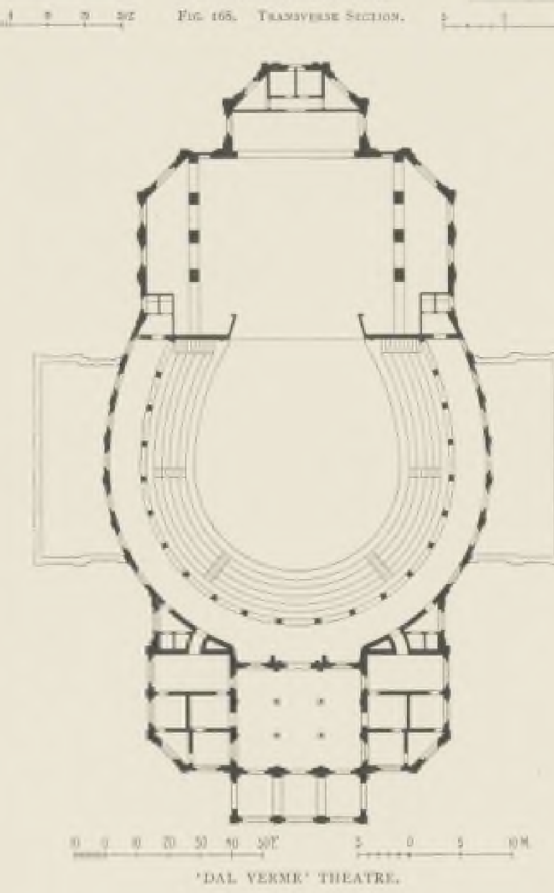
'DAL VERME' THEATRE.
FIG. 168. TRANSVERSE SECTION.



'DAL VERME' THEATRE.
FIG. 169. PLAN, FIRST TIER.

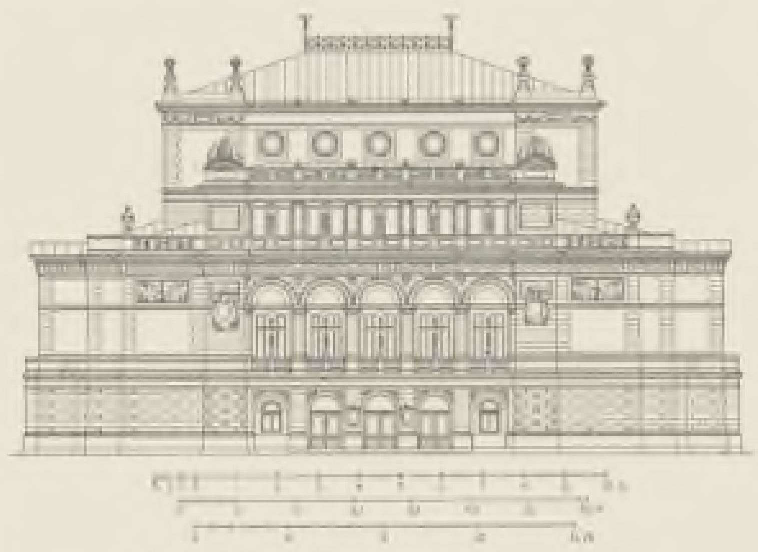


'MANZONI' THEATRE, MILAN.
FIG. 172. PLAN, AREA.



'DAL VERME' THEATRE.
FIG. 170. PLAN, SECOND TIER.

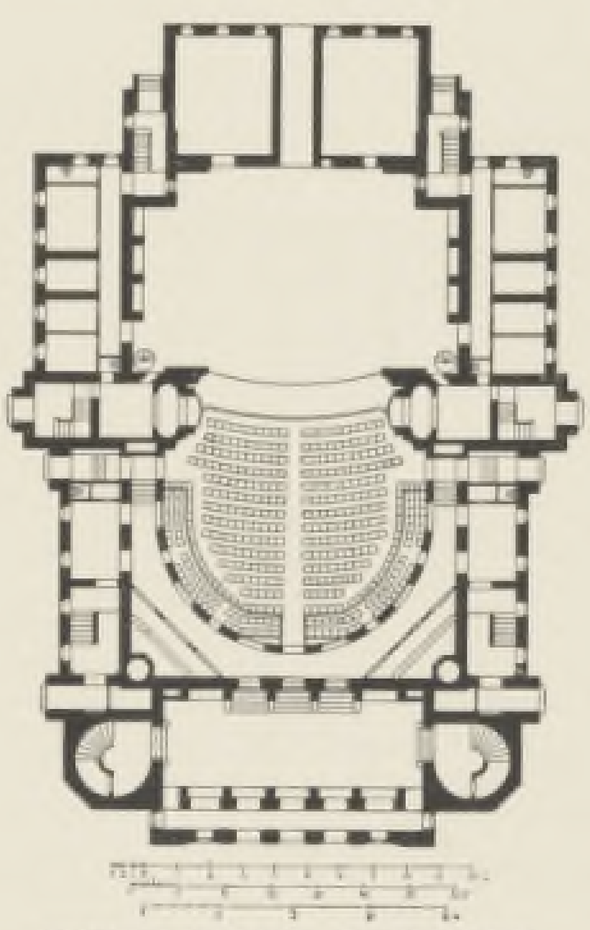
There are, further, two points which cannot pass without comment—the lightness of construction, and the lack of sufficient staircase facilities—both of which defects involve a considerable risk in case of fire, more especially as, including standing room, accommodation is provided for an audience of no less than three thousand. Lastly, I would remark that the 'Dal Verme' Theatre possesses a feature that is not shared with other playhouses on the Continent: the area can be easily transformed into the arena of a circus. I am not sure if the proprietors have often availed themselves of this facility, but perhaps it may account, to a considerable extent, for some of the lines in the building, which are otherwise not quite comprehensible. Its date of erection was 1872.



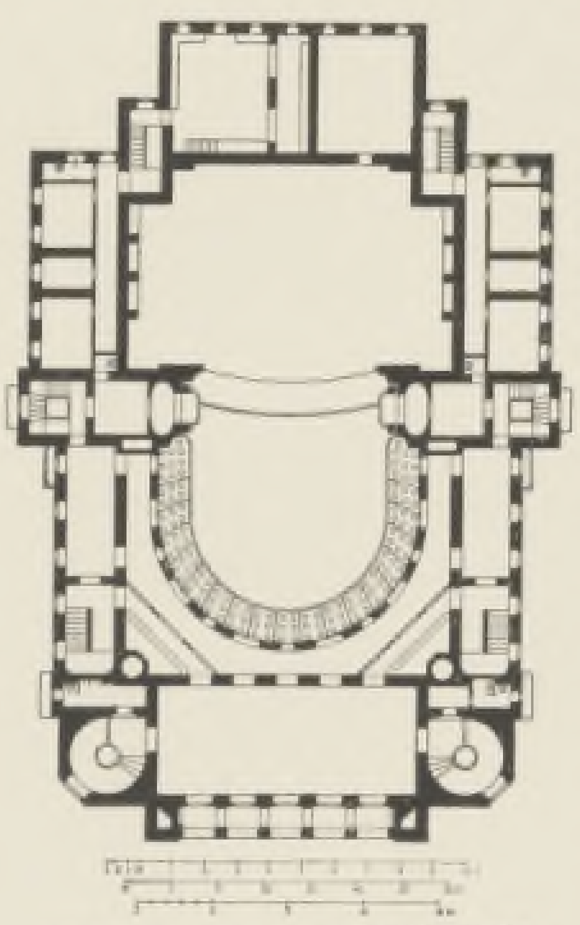
MUNICIPAL THEATRE, NIJNI-NOVGOROD.
FIG. 173. FRONT ELEVATION.

Turning from countries which have but an unsatisfactory record as far as modern theatre design is concerned, I would now call attention to some of the work done in Russia, the theatres of which country I have always taken in conjunction with those of nations subject to Teutonic influence. The effect which the German stage has obviously had on the general tendencies of theatrical building in that empire, is, to my mind, very considerable; and to this it must be added that Russia's leading theatre architect, Victor Schroeter, is of German descent, and somewhat guided by German traditions. I have already shown various examples of recent theatre work in Russia, and amongst other drawings the design for that elaborate Court Opera House at St. Petersburg, which was planned by the above-named architect. Now, Victor Schroeter is associated very largely with the theatre building of the Russian Empire, as besides his post on the Czar's Imperial Theatre Administration, he enjoys a large private practice throughout the country, beyond European Russia, even as far as Siberia. It would hence not be wrong to speak of the existence of a Schroeter type of theatre design, and I propose here to show two examples which, to my mind, typify the class of work which this architect has executed. The two examples in the preceding volumes were not quite so representative, as the great Court Opera House design embodied the fulfilment of quite unusual requirements, and showed a monumental treatment on the radial system; whilst at Tiflis, in the Caucasus, the architect attempted somewhat of an experiment in adopting the Bayreuth lines for a comparatively small auditorium.

One of the examples given on this page is the Municipal Theatre, Nijni-Novgorod, which fulfils the usual purposes of a municipal theatre in a provincial centre of average population. How similar are the Russian requirements for a provincial playhouse will be seen from the second example, the Municipal Theatre at Irkutsk, which, though the Siberian capital, is nevertheless characterised by the ordinary features of Russian provincial life. I may be blamed for having extended my examples in this one instance beyond the bounds of Europe proper; but perhaps I may be excused, firstly, on account of this building being most characteristic of the Schroeter type, and secondly, because, as a curiosity, I wish to show how favourably a playhouse in a Siberian city of 36,000 inhabitants compares with our average playhouses. No doubt it is a subsidised theatre, and none of our playhouses can boast of such assistance; but subsidised or not subsidised, architecturally it may claim the merit of being in every sense a public building and fitting home for the Drama. In other words, I wish it to be seen what a theatre is like in the distant parts of an empire which we are too apt to associate with barbarism.

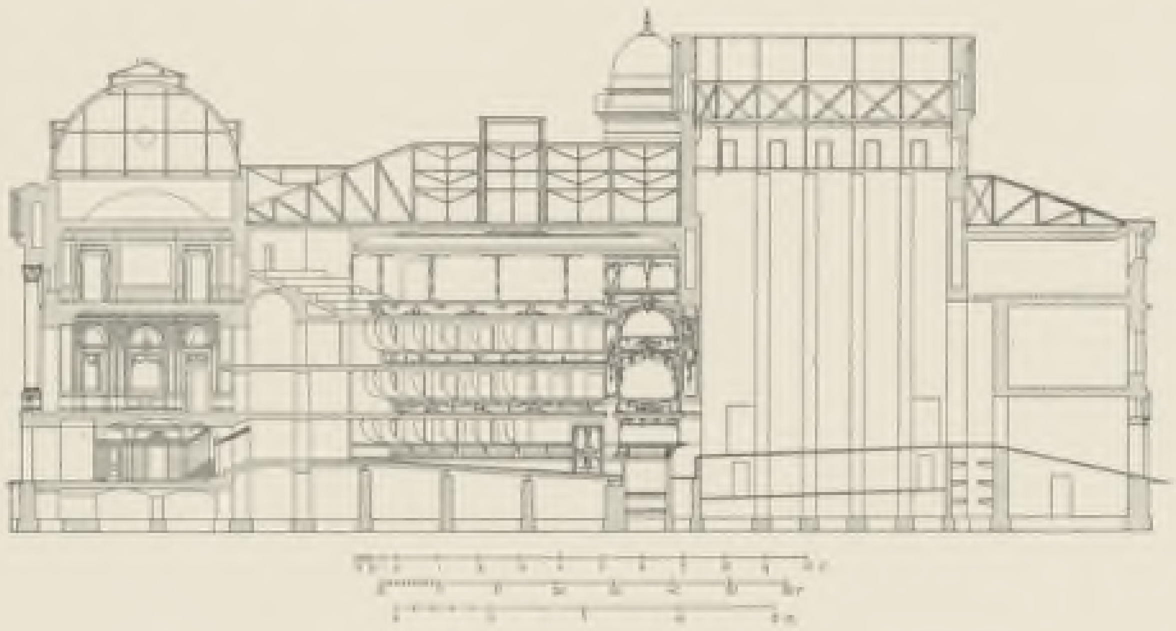


MUNICIPAL THEATRE, NIJNI-NOVGOROD.
FIG. 174. PLAN, AREA.



MUNICIPAL THEATRE, NIJNI-NOVGOROD.
FIG. 175. PLAN, FIRST TIER.

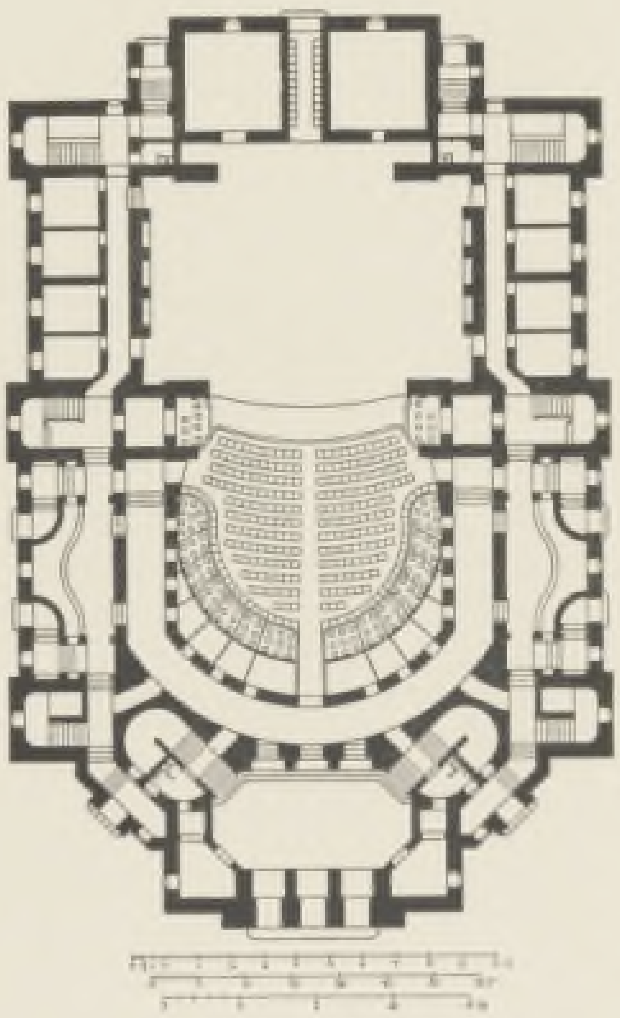
But quite apart from the circumstance of its locality I would call attention to its absolute symmetry, which is one of the principal features of Schroeter's work, and to the satisfactory character of his auditorium. If we turn to the next page it will be observed from Figs. 176 to 180 how, more particularly at Irkutsk, his auditorium is planned with two tiers of half-open boxes and one tier of ordinary seats, the area being steep, and the ceiling supported by a number of minor supports. The line of the auditorium box-fronts should also be observed, and the manner in which little ante-rooms are supplied to most of the boxes. At Irkutsk, too, the staircases are particularly convenient, and the exit facilities are specially well planned in a straightforward manner; but the feature that would immediately attract the attention of an English eye is the arrangement of lobbies and cloak-rooms, and the general method of excluding



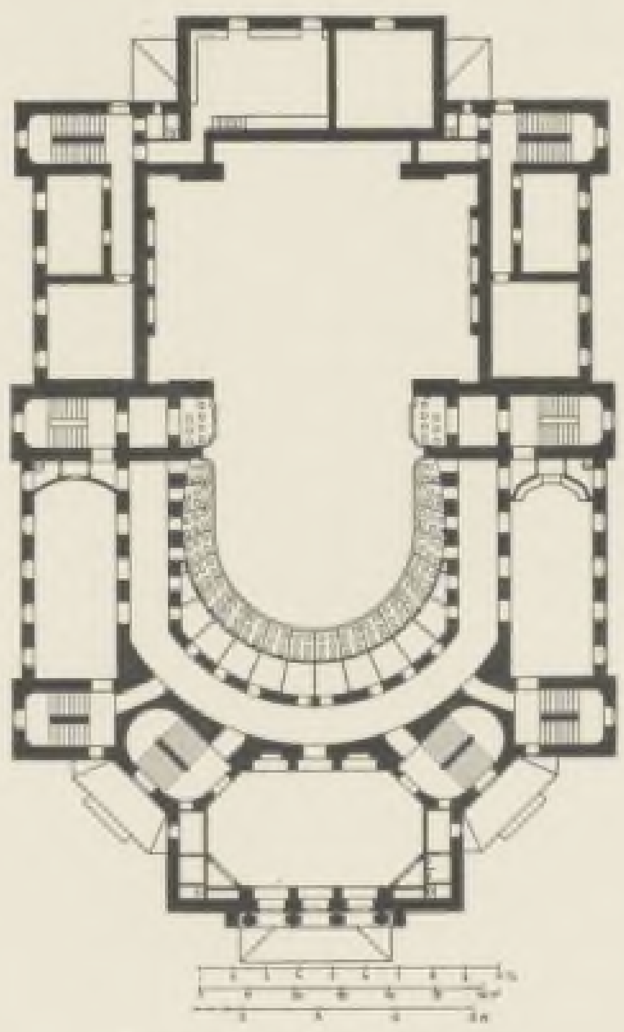
MUNICIPAL THEATRE, IRKUTSK.
FIG. 176. LONGITUDINAL SECTION.

MUNICIPAL THEATRE, IRKUTSK.
FIG. 177. FRONT ELEVATION.

MUNICIPAL THEATRE, IRKUTSK.
FIG. 178. TRANSVERSE SECTION.

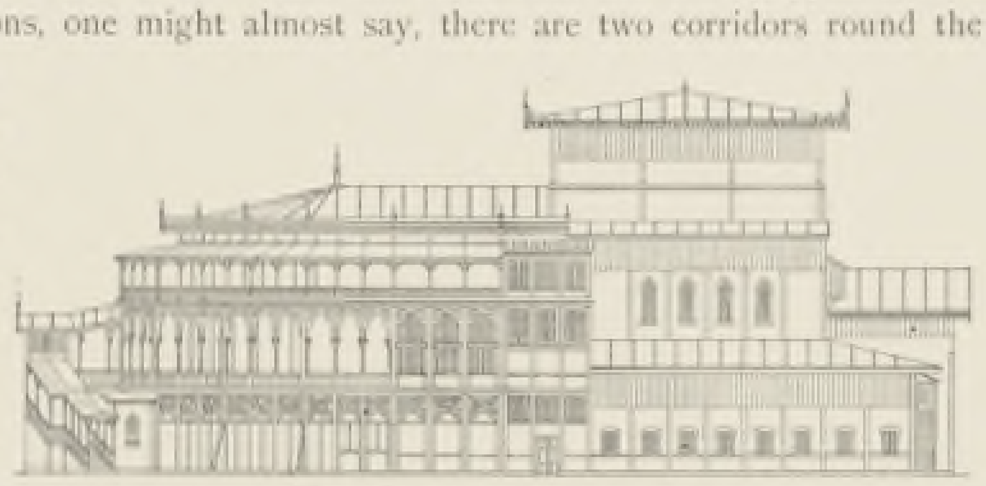


MUNICIPAL THEATRE, IRKUTSK.
FIG. 179. PLAN, AREA.



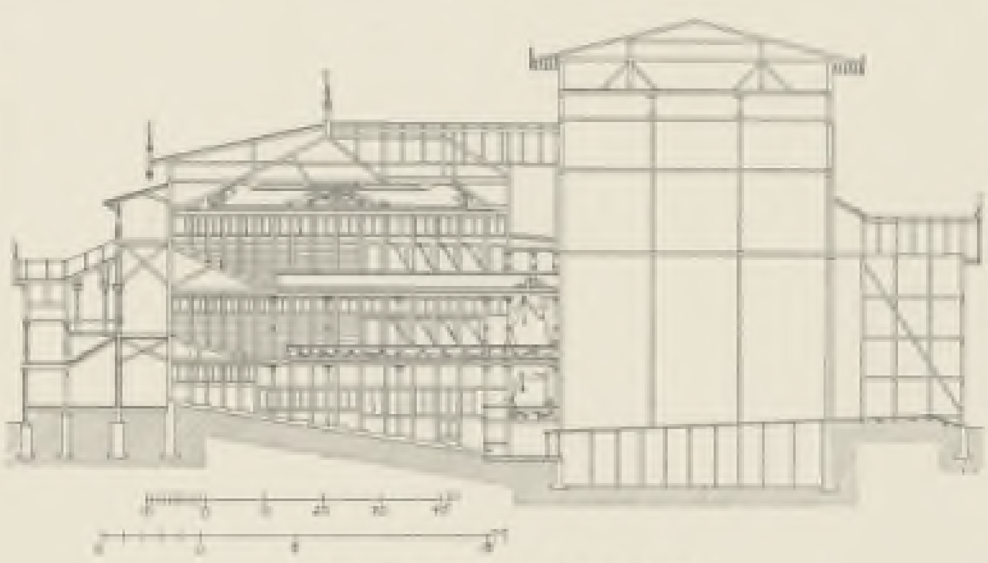
MUNICIPAL THEATRE, IRKUTSK.
FIG. 180. PLAN, FIRST TIER.

draughts. Thus, on either side of the auditorium, which is on street level, we notice a peculiar arrangement for entry to the better seats, and a scheme of a similar kind for the third tier stairs, whilst the main vestibule is equipped with a series of treble draught-screens. To meet the climatic conditions, one might almost say, there are two corridors round the auditorium—the ordinary corridor, and an outer corridor. The same principle has been adopted in regard to the service entrances at the back of the house, for we find two outer lobbies and a staircase in each instance before we reach the dressing-room corridor, from which the dressing-rooms and the stage respectively are approached. These are, of course, unusual features, especially suitable for cold climates, and yet, even in our climate, the many playgoers who complain of draughts would not be averse to Siberian methods being adopted. These special measures call for study, even by those who live in countries not associated with extreme temperatures.



RUSSIAN TEMPORARY THEATRE.
FIG. 181. SIDE ELEVATION.

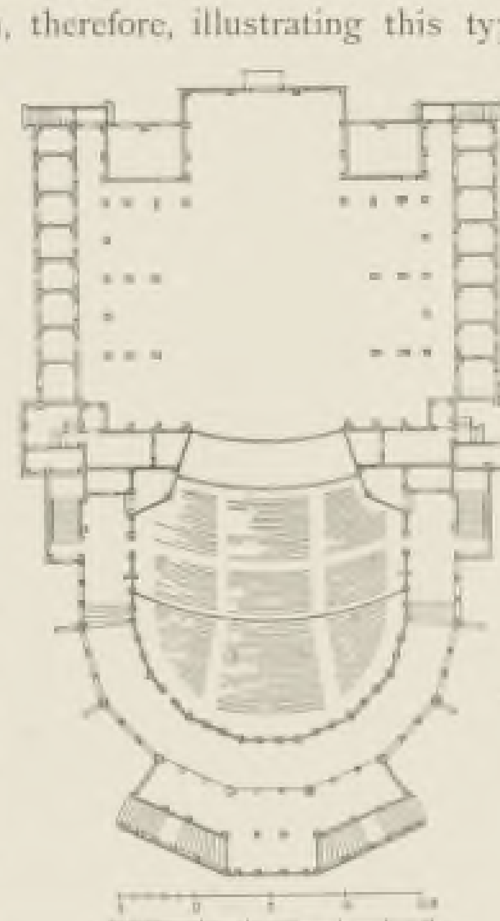
In the matter of the statistics of the two theatres in question, I need only mention that the seating capacity of the area at Irkutsk is about 370, and at Nijni-Novgorod somewhat more; the population of the latter being 70,000. Reliable particulars as to the building funds for these theatres are not available, but the cost was probably about the same in each case. As regards the architectural treatment it will be seen, from the plans and sections on pages 45 and 46, that the Renaissance style has been adopted, and the grouping of the different sections of the building has been successfully carried out. Though perhaps somewhat commonplace in design, the architectural treatment is by no means unattractive, and, chiefly owing to the grouping which stamps on the exterior the character of the different parts of the building, a very good effect is generally obtained in all the Renaissance work of Victor Schroeter. I hold, however, that his polychrome work in the Neo-Russian style, such as he applied at Tiflis, calls for more comment from the designer's point of view. The design of the Municipal Theatre of that town certainly shows a greater individuality than is exhibited in the two examples here presented.



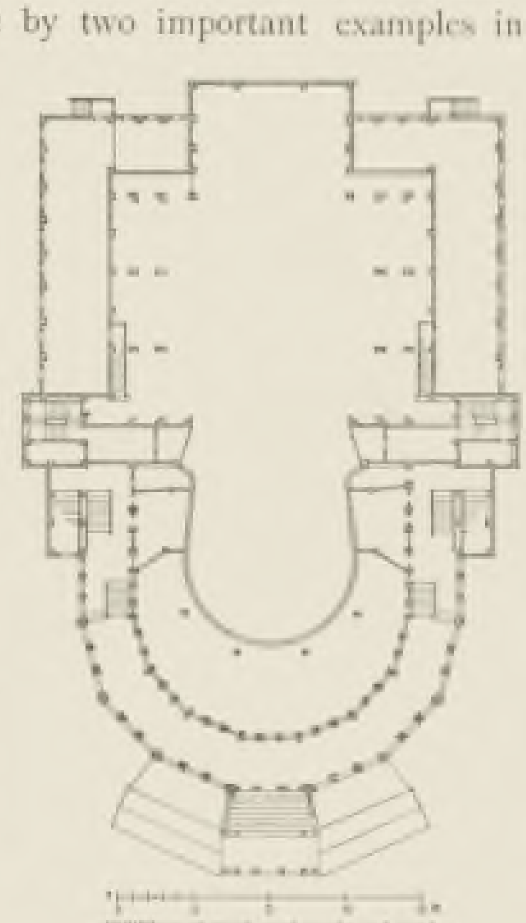
RUSSIAN TEMPORARY THEATRE.
FIG. 182. LONGITUDINAL SECTION.

Before leaving Russia and the Schroeter type of playhouse, I should also call attention to the temporary or 'Summer' theatres which are characteristic of that country, and I am, therefore, illustrating this type by two important examples in Figs. 181 to 189. In showing work of this description, I do not, in principle, advocate any form of temporary playhouse mainly constructed of wood, much less if such a theatre takes the form of a *bonâ fide* establishment in the general arrangement of its plan. Perhaps as an exception, the temporary wooden theatre may be permissible at exhibitions, but even in that case, all wall and ceiling surfaces should be protected by plastering, special opportunities being given for exit, and on no account should there be more than one tier.

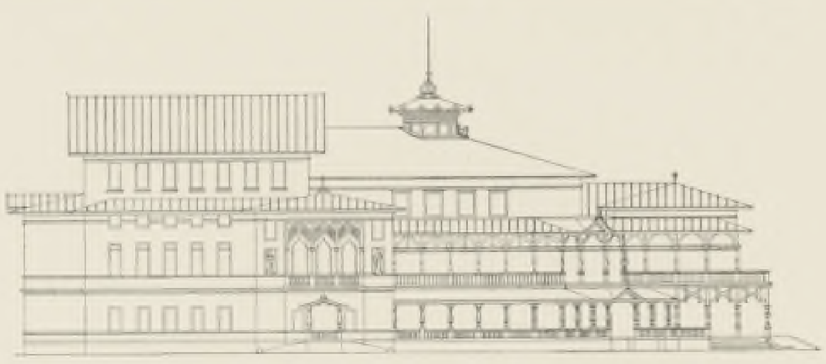
Now in Russia, as will be seen from one of the so-called 'Summer' theatres illustrated on this page, we have a full two-tier house, equipped almost to the same extent as would be necessary were its character more substantial. A building of this description is dangerous to a high degree, and I have often wondered how, for instance, in such an important city as Warsaw, two or more of these theatres can still be found to-day. Of course, the example shown in Figs. 181 to 184 is in no way intended to serve as a model; far from it; for the plan itself is by no means satisfactory, and it will be observed that the opportunities of exit are quite incompatible with safety. Yet, in dealing with the playhouses of Europe, this type of temporary theatre cannot be ignored, and its existence must be recorded, if only as a warning. To what extent this type of temporary theatre has been developed, will be seen from the example given on the following page, where the character of the structure is slightly more substantial



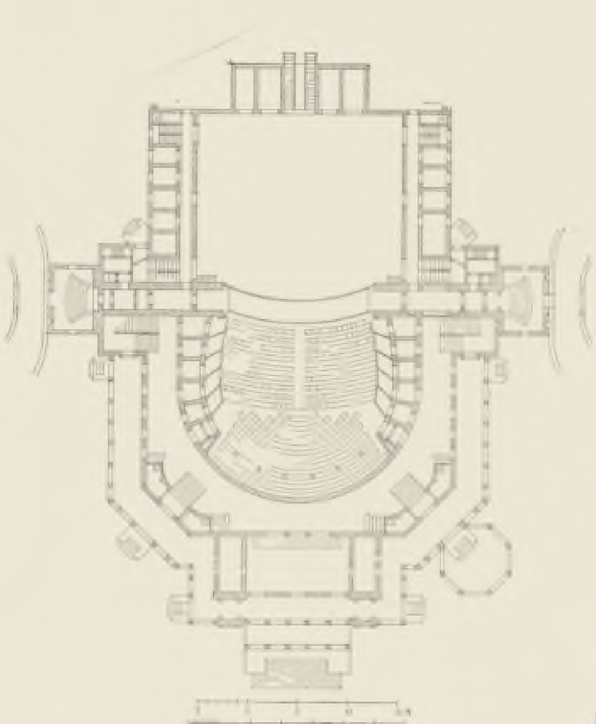
RUSSIAN TEMPORARY THEATRE.
FIG. 183. PLAN, AREA.



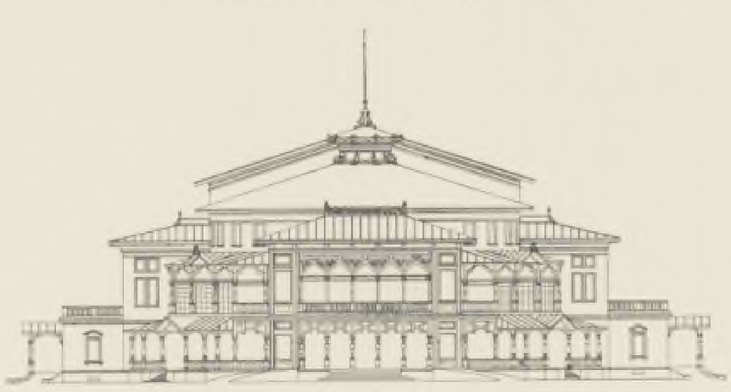
RUSSIAN TEMPORARY THEATRE.
FIG. 184. PLAN, FIRST TIER.



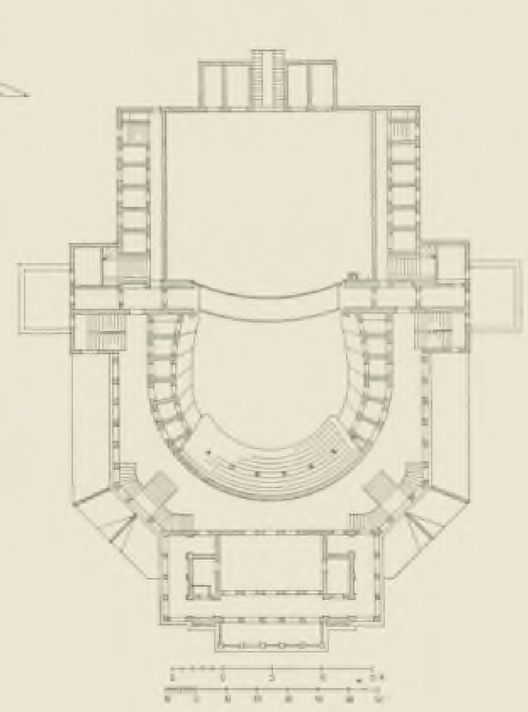
RUSSIAN TEMPORARY THEATRE. FIG. 185. SIDE ELEVATION.



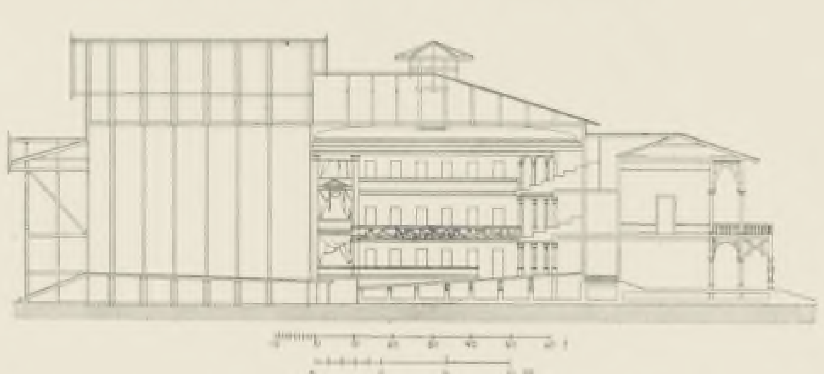
RUSSIAN TEMPORARY THEATRE.
FIG. 188. PLAN, AREA.



RUSSIAN TEMPORARY THEATRE. FIG. 186. FRONT ELEVATION.

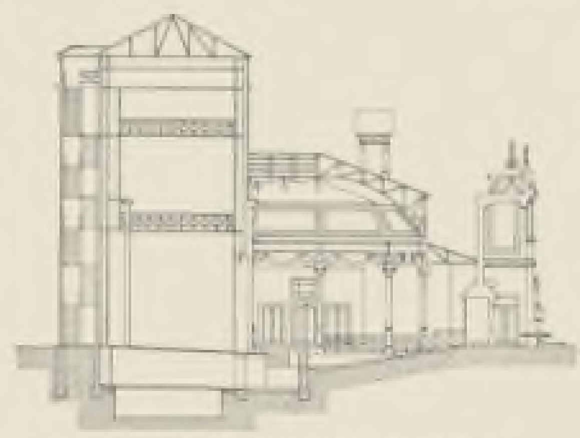


RUSSIAN TEMPORARY THEATRE.
FIG. 189. PLAN, FIRST TIER.



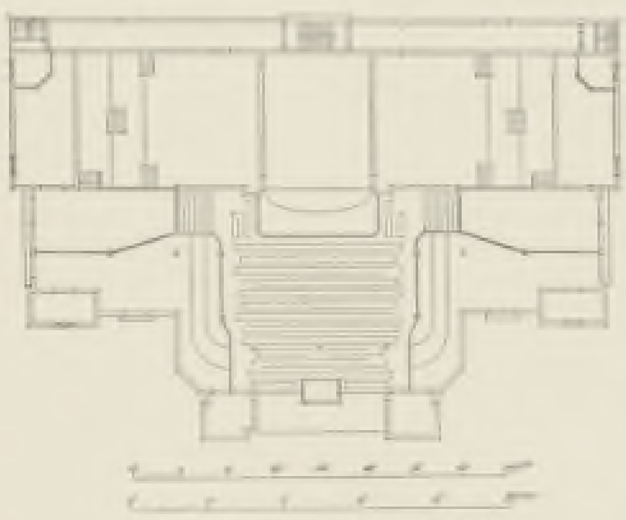
RUSSIAN TEMPORARY THEATRE. FIG. 187. LONGITUDINAL SECTION.

than in the preceding example. To accommodate so large an audience in what is, at the best, a provisional building of the most combustible kind, is a mistake; and if sufficient funds were not forthcoming to provide a better class of building, it would certainly have been wiser to do without the playhouse altogether. There is only one point which can be admired in these temporary Russian theatres, and that is their picturesqueness. Owing to the grouping which gives character to each individual section of the block, the quaint method of dealing with the woodwork, and the assistance afforded by polychrome treatment, the effect, as a rule, is very charming. Nevertheless, it cannot be denied that temporary theatres of this kind are nothing less than anomalies at the end of the nineteenth century.

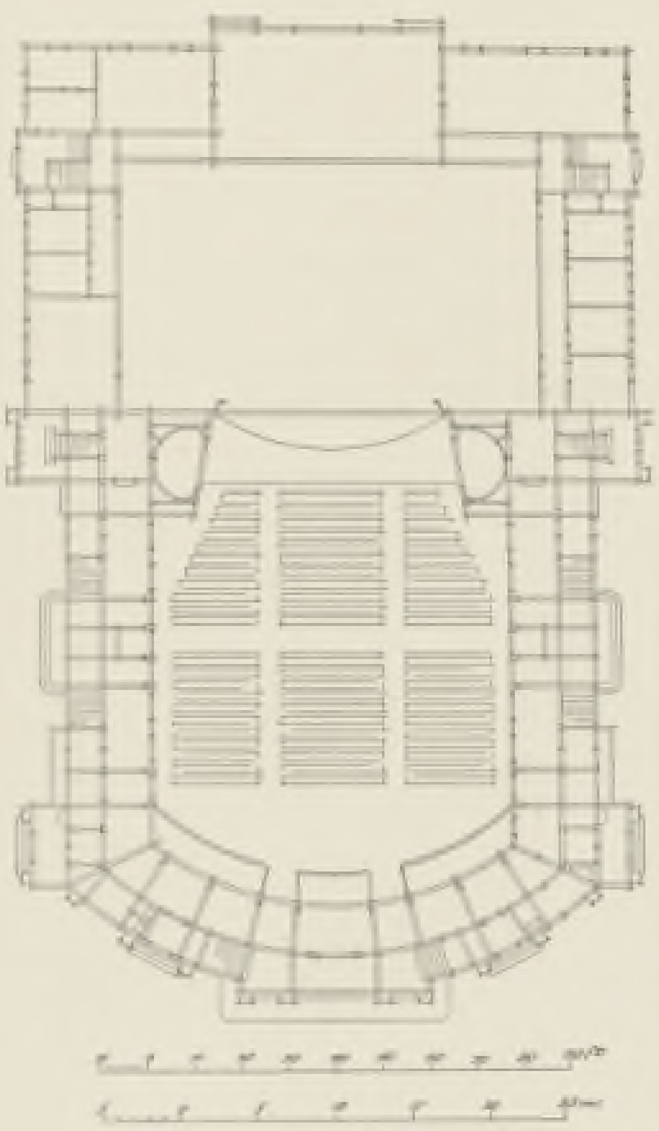


EXHIBITION THEATRE, BERLIN.
FIG. 190. LONGITUDINAL SECTION.

Now, I said that, to my mind, the only permissible form of provisional playhouse is the Exhibition Theatre. There will here be found two examples of this class of structure, one of which, shown in Figs. 190 and 191, was erected in connection with an exhibition held at Berlin, in 1889, and the other (see Figs. 192 and 193) on the occasion of the great Music and Theatre Exhibition of Vienna, in 1892. They fulfilled different purposes. The Berlin Theatre was constructed in such a manner as to give the public an opportunity of seeing the working of the stage, and examining the various stage appliances, whilst the performance itself was only of secondary importance, being merely arranged to give scope for working stage appliances with as much variation as possible. At Vienna, on the other hand, the theatre was erected for the production of different classes of plays, presented by companies from various countries, and the stage appliances, though certainly open for public examination when there was no performance, in this case held much their usual position.



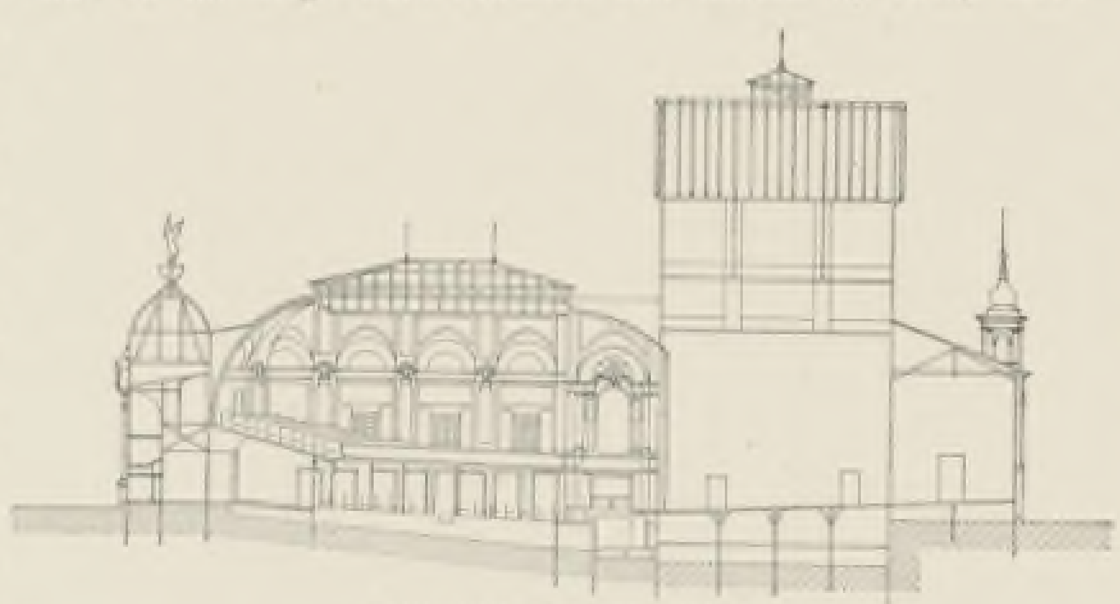
EXHIBITION THEATRE, BERLIN.
FIG. 191. PLAN, AREA.



EXHIBITION THEATRE, VIENNA.
FIG. 192. PLAN, AREA.

The Vienna Exhibition Theatre was erected from the plans of Ferdinand Fellner and Hermann Helmer, and showed, to some extent, an application of their principles of design. But taken as a whole, this temporary structure had not much in common with the lines of their usual type of playhouse. Thus, for instance, the auditorium took the form of a large hall with a single balcony or tier, and the whole of the constructional arrangements, as will be clearly seen from the accompanying section (Fig. 193), varied materially from what we observe elsewhere in the work of the architects. If I may be permitted to enter slightly into detail, I would, however, point out the very clear means of exit, and the striking effect of the circular frontage and the special block which marks the main entrance.

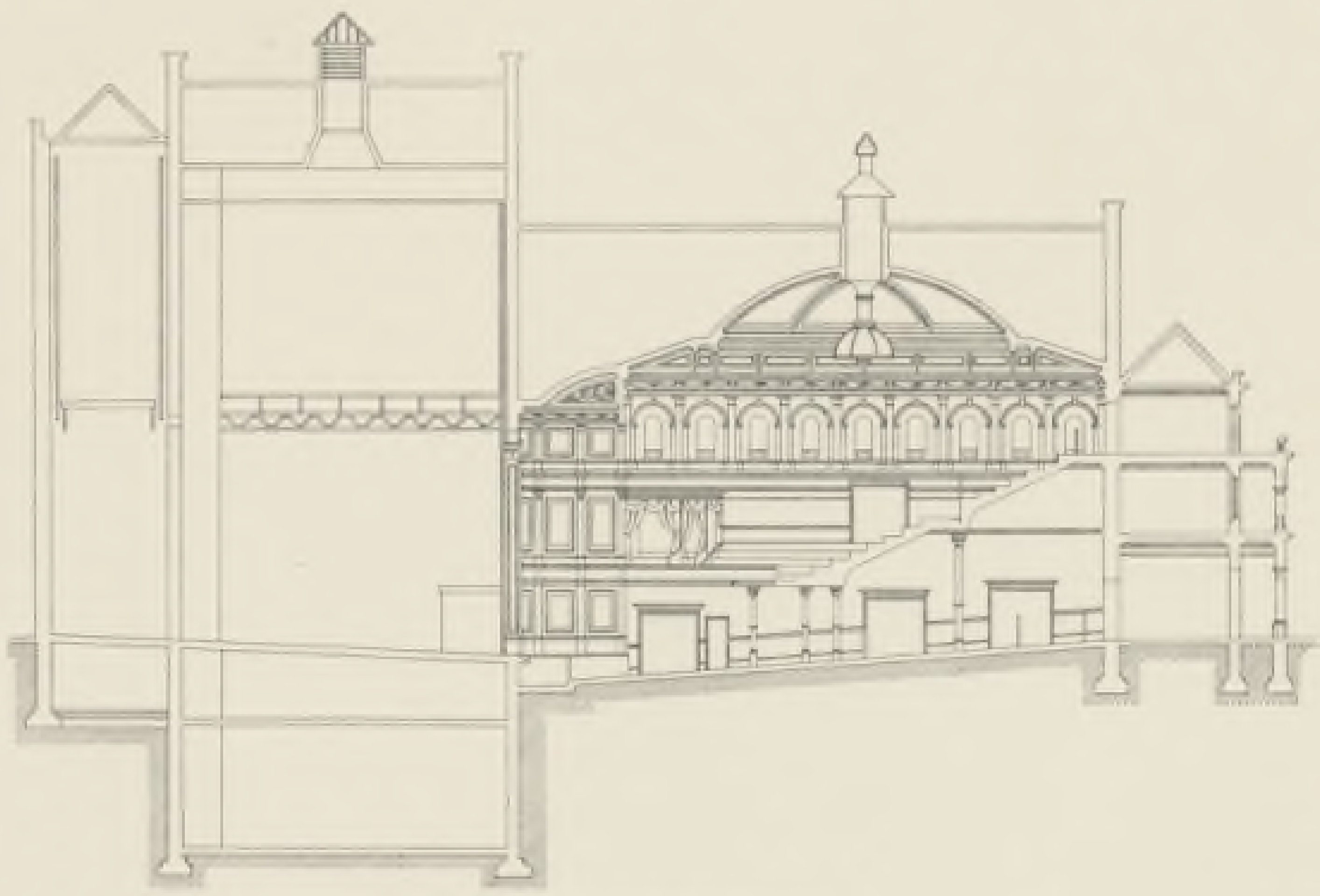
In the Exhibition Theatre at Berlin, everything was subservient to the arrangements which were made to enable the public to see what was passing on the stage. The sides of the stage were extended and flanked by easily accessible tiers or platforms, from which could be observed all the operations performed during a change of scenery. I lay stress on these arrangements as I believe them to have been unique in the annals of theatre construction.



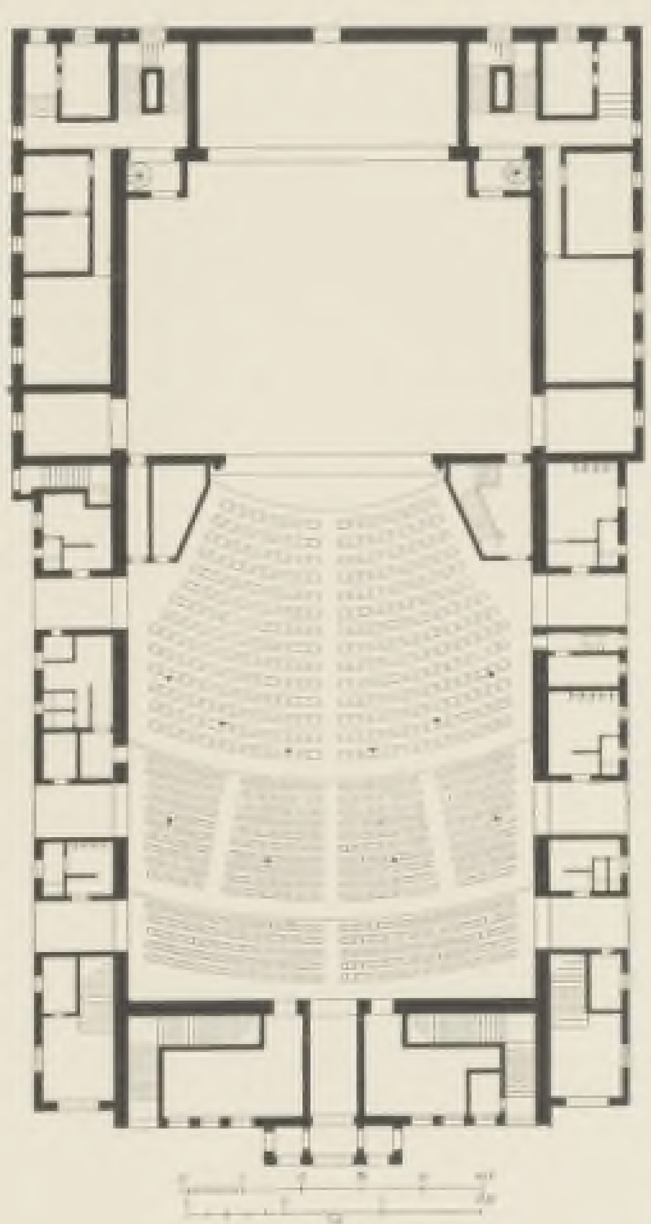
EXHIBITION THEATRE, VIENNA.
FIG. 193. LONGITUDINAL SECTION.

In conclusion, if I were to discriminate between the Exhibition Theatres at Berlin and Vienna, I could not perhaps do better than say that one was itself an exhibit, and the other a theatre in an exhibition. It is characteristic of the difference in purpose that the accommodation provided at Vienna was for an audience of 1650, whilst at Berlin the number of spectators for whom seats were available was limited to 250.

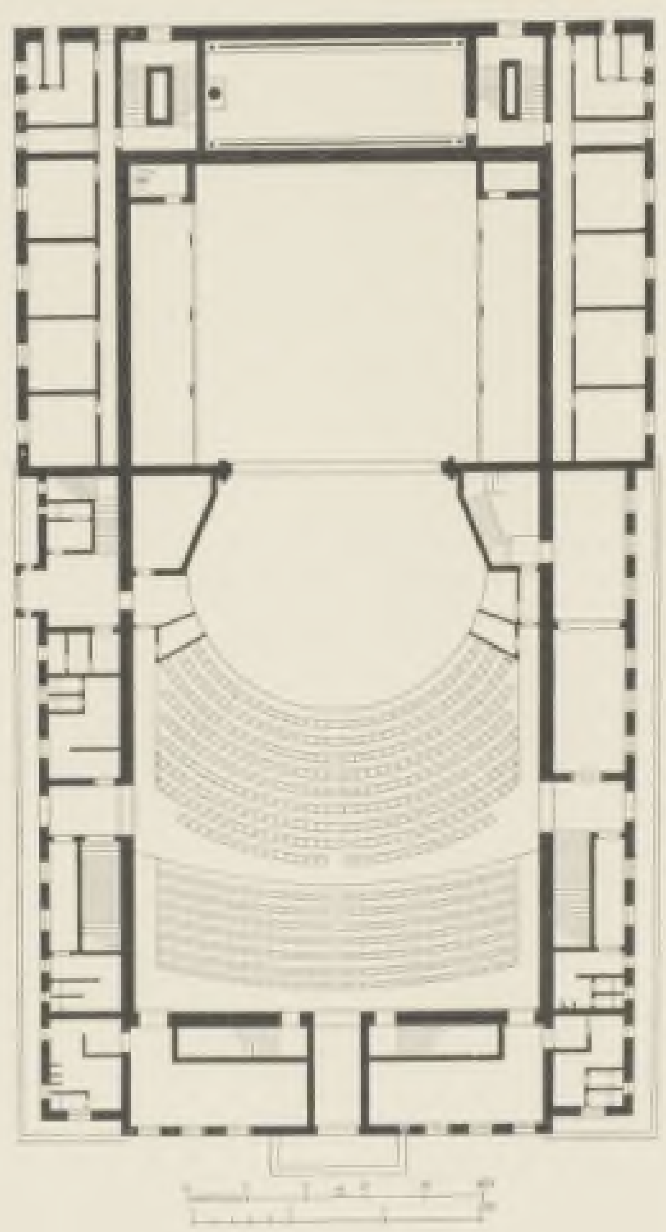
With the Russian work of Victor Schroeter I concluded my instances of types of theatre planning which can be classified by their authorship. We have seen that, quite irrespective of playhouses designed by architects not specially engaged in theatre work, Europe contains numerous groups of buildings displaying certain fixed characteristics. We have,



IRVING 'SAFETY' THEATRE.
FIG. 194. LONGITUDINAL SECTION.

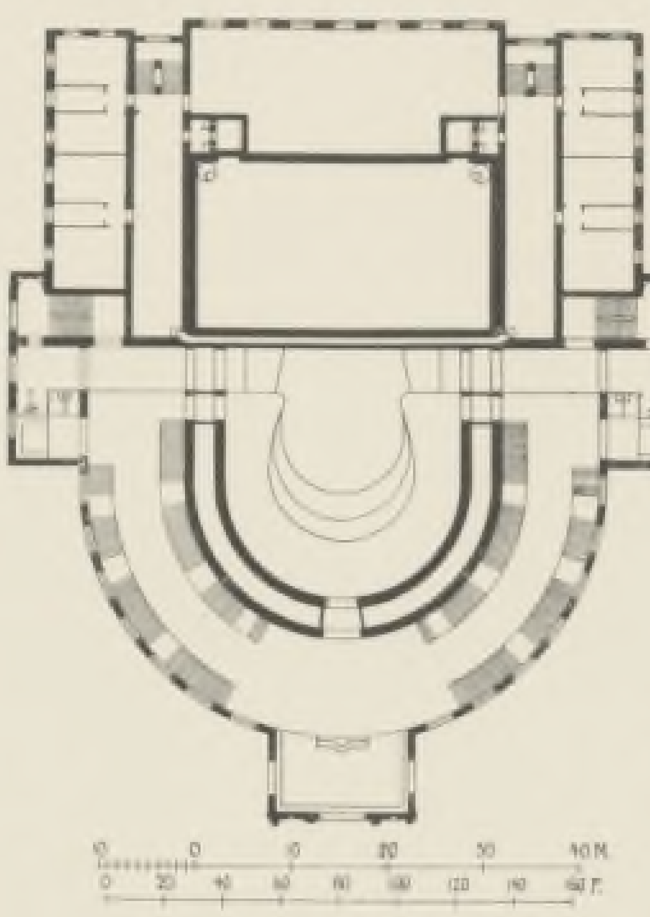


IRVING 'SAFETY' THEATRE.
FIG. 195. PLAN, AREA.



IRVING 'SAFETY' THEATRE.
FIG. 196. PLAN, FIRST TIER.

in this country, the Phipps, Matcham and Runtz types, in Austria, the Fellner and Helmer type, in Germany, the Seeling type, and in Russia, the Schroeter type, and it goes without saying that each of these types has often, in their respective countries, considerably influenced the work of architects with whom a commission to build a theatre is an exception. Of course, there is also the Gottfried Semper system of radial planning, applied by himself to three great playhouses, and elsewhere by others; but, as a matter of fact, Semper's ideals stand so far above those of other creators of types, that I am reluctant to associate his work with buildings of the character chiefly under consideration in this chapter. Semper stands out as the founder of a new school of thought, and his work must not be confused with that of the smaller men who simply apply certain practical expedients, or build a certain type of theatre, as the result of certain experiences. But, as also when speaking of groups of designs in the Fellner and Helmer work, it should be remembered that this classification by authors is to a certain extent discretionary, being merely a matter of opinion or convenience. It is not to be confused with the great natural division of playhouses according to national influences—Teutonic, Latin, or Anglo-Saxon, as the case may be—or according to primary purposes and conditions, or even with such divisions as the 'radial,' the 'centralised' and the 'nondescript' plan.

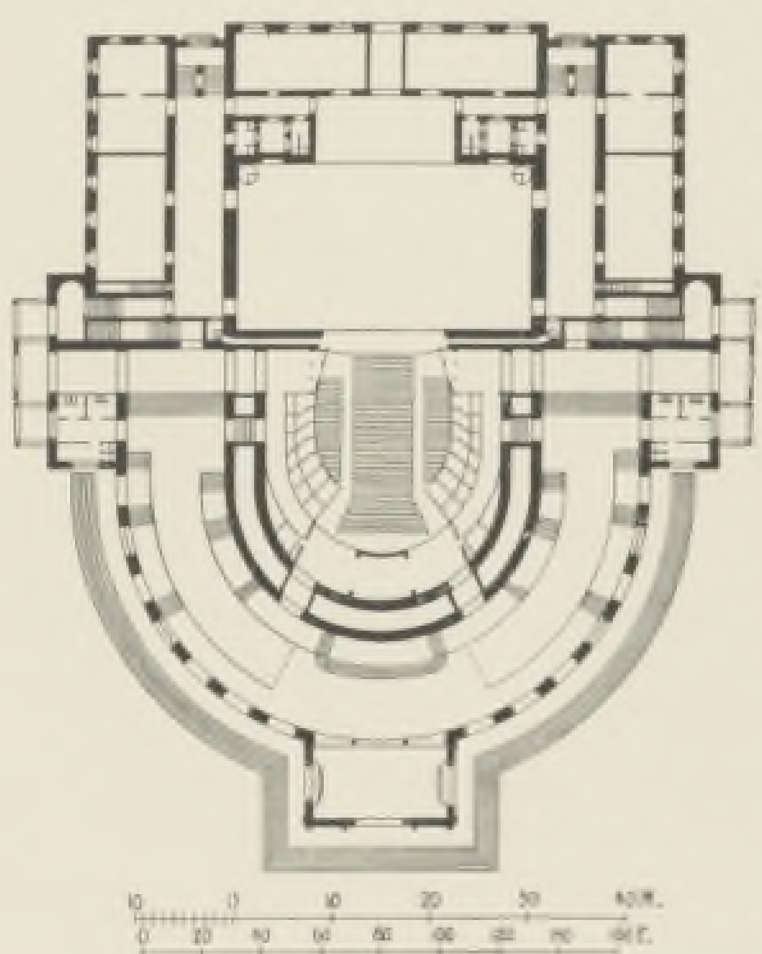


'ASPHALEIA' MODEL THEATRE.
FIG. 197. PLAN, FIRST TIER.

Of all the above types, none will live to be known as such to posterity, not even the ones so often carried out by Fellner and Helmer. The great divisions, however, will continue to exist, while among the modern systems which bear the name of any one architect, I believe that of Semper alone will survive. The greatest of individual examples, Charles Garnier's famous work, does not appear to me to hold the same position as the Dresden or Vienna playhouses, which are characterised by a new system of logic and treatment in architectural work. The foundation of a school of design is something very different from the successful execution of a single structure.

'ASPHALEIA' MODEL THEATRE.
FIG. 198. LONGITUDINAL SECTION.

Now, up to the present, I have only dealt with types and individual examples of theatres which have been actually carried out, but I cannot altogether ignore the existence of the many so-called 'standard specifications' published from time to time. For although it very rarely occurs that the design for a model theatre is actually executed, yet such a model has occasionally been followed in existing playhouses, and the principles advocated in their conception have in some isolated cases had influence on the theatre architecture of recent years.



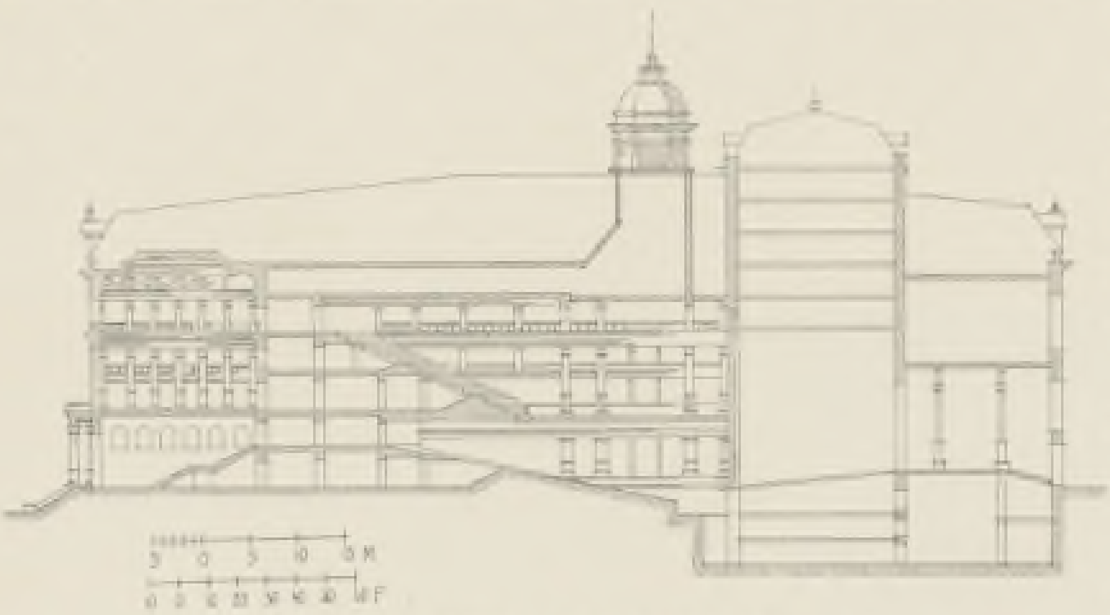
'ASPHALEIA' MODEL THEATRE.
FIG. 199. PLAN, AREA.

Among the many model theatres which have been put forward, it is very difficult to decide which should have a place in this volume. After considerable selection I have limited myself to showing but five.

Two of these, the so-called Irving 'Safety' Theatre of 1887, designed by Alfred Darbyshire in conjunction with Sir Henry Irving, and the 'Asphaleia' Theatre of 1881, put forward by the Vienna 'Asphaleia' Syndicate, have had the advantage of undergoing the test of execution. In each case one or two existing theatres have been planned in accordance with the principles specified, and though, of course, material modifications had to be made, the theatres as carried out can be absolutely identified with the model. I have, for instance, already remarked the influence of the Irving 'Safety' Theatre on the Manchester 'Palace' of Varieties, shown in Volume I., and on the Exeter Theatre, which has taken the place of the building destroyed by the fearful catastrophe of 1887. The Manchester Variety Theatre, in particular, has closely followed the model on which it is based. Again, in accordance with the 'Asphaleia' model, Franz Roth, the architect identified with that scheme, carried out the 'Raimund' Theatre at Vienna, illustrated in the second volume, in which he adopted as far as was practicable, all the more important principles advocated by the Syndicate.

Another instance of a model theatre, known as the 'Sturmhoefel' model, and dating from 1889, belongs to the many essentially theoretical schemes which are advocated in the interests of some particular idea, and are only intended as abstract studies. Yet they often contain much that is instructive, and also at times have influenced practical theatre architecture.

My last two examples of model theatres are not quite so theoretical, several of the principles illustrated in their conception being quite capable of adoption. In fact, they stand well within the limits of practical policy. One of these, the Schmidt and Neckelmann model, is the result of a competition for a Safety Theatre opened in 1882, shortly after the 'Ring' Theatre fire at Vienna. The other, emanating from Scotland, is the result of the studies of an amateur, who had a certain amount of assistance from an architect. It is known as the 'Young' model, and is of such recent date as 1896.

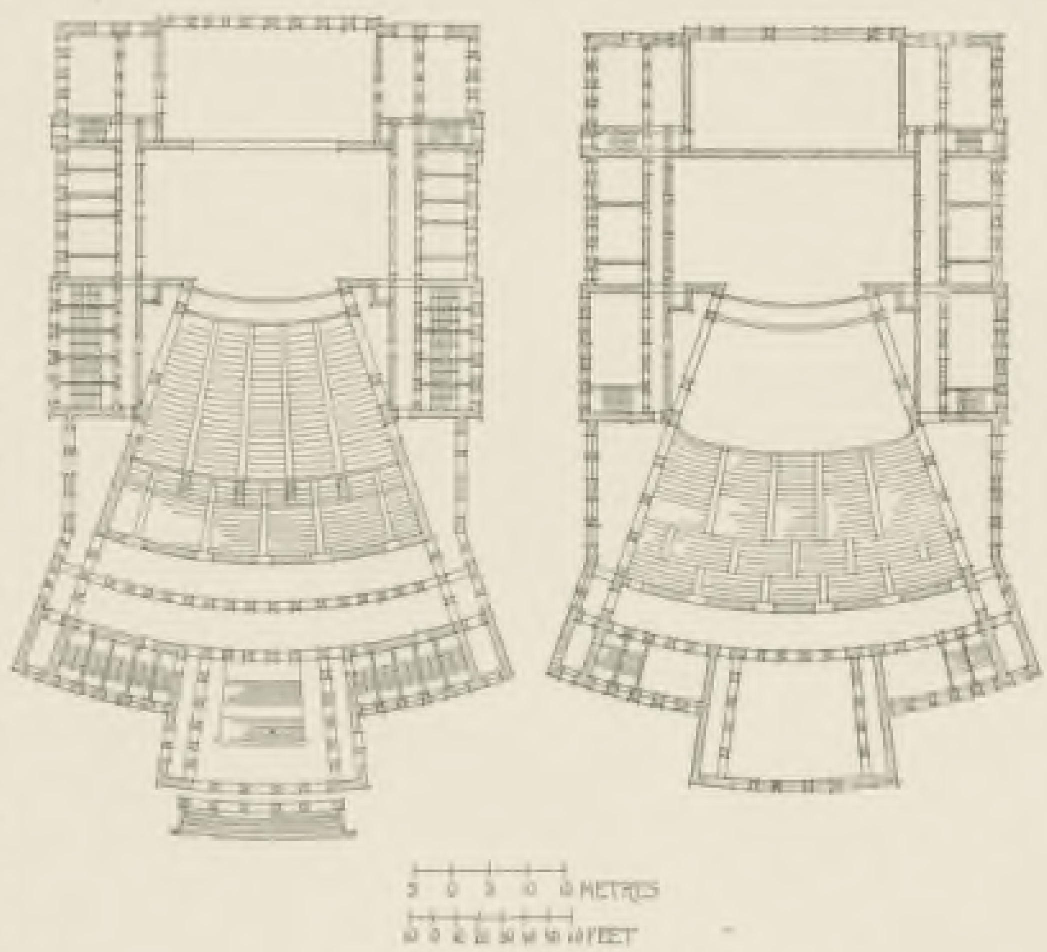


STURMHOEFEL 'MODEL' THEATRE.
FIG. 200. LONGITUDINAL SECTION.

In order to explain the features of importance in these five models, I will refer directly to the principles advocated by their respective authors.

To begin with, I would quote from the writings of Alfred Darbyshire, who, when the Irving 'Safety' Theatre was first made public, put forward the code of conditions on which he had worked, as the minimum of what was necessary to ensure the safety of the audience. The first condition laid down in this code is, that theatres must stand completely isolated from other property; the second is, that the stage can be instantly isolated from the auditorium by the closing of the proscenium opening; whilst the third is, that the highest seat shall be as near the street as possible, no seat being higher than the proscenium opening. The fourth condition specifies that every part of the house shall be provided with two exits, each communicating separately and directly with the street, and having no opening except at the top and bottom. There were also, of course, the usual conditions as to fire-resisting materials, and the requirement that the stage should have a 'fire-proof' roof provided with a large smoke shaft; but such questions of construction do not affect the planning or general arrangement of the playhouse, and thus need not be considered under this head.

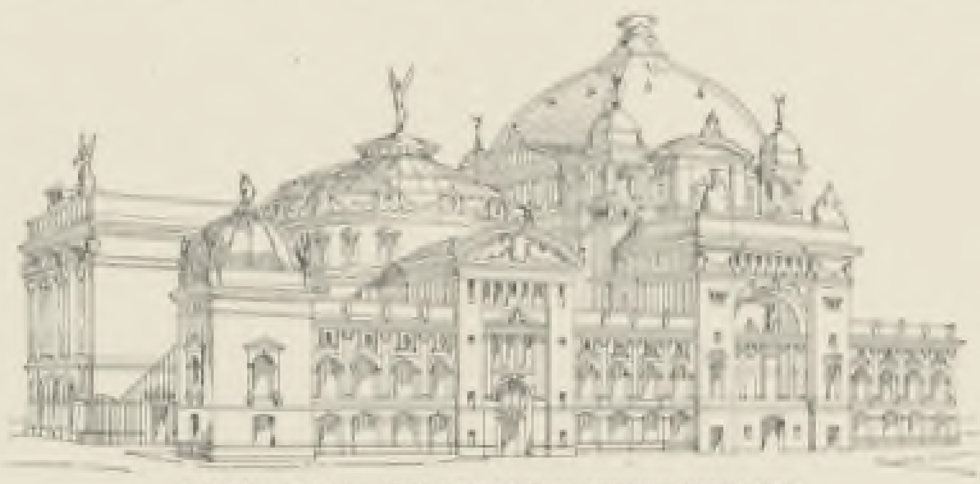
The points embodied in the conditions governing the design can certainly not be termed extreme; for, with the single exception of the question of site, the requirements are almost identical with those put forward in most of the recent regulations given in Supplement III. As to the solution of the problem which is based on these conditions, I must say that of all model theatres the Irving 'Safety' Theatre is the one which, as far as England (the country for which it is intended) is concerned, stands the first chance of realisation and application. It goes without saying, however, that the model is essentially and solely that of a 'Safety' theatre. The scheme embodies no special theories of general design, proportion or acoustics. All these questions are subservient to that of fire-protection.



STURMHOEFEL 'MODEL' THEATRE.
FIG. 201. PLAN, AREA. FIG. 202. PLAN, FIRST TIER.

When speaking of the 'Asphaleia' model it should be borne in mind that the 'Asphaleia' syndicate, though primarily associated with questions of stage equipment, to which I refer in Supplement I., had at the outset of its existence propounded particular theories regarding the general construction of the theatre and its plan. Now the writings of the 'Asphaleia' syndicate were issued shortly after the great catastrophe at the 'Ring' Theatre, Vienna; and hence, as in their efforts with respect to stage mechanism, the question of fire protection figures prominently, not to say pre-eminently, in all the arguments adduced in support of a model theatre plan. Certain general improvements in the sighting, acoustics and seating accommodation, it is true, were brought forward at the same time, and these subjects undoubtedly received some consideration in their scheme. But nevertheless, all efforts in other directions seem quite secondary to the details relating to the precautionary measures. For all practical purposes, in fact, the 'Asphaleia' model theatre may be termed a model 'Safety' theatre.

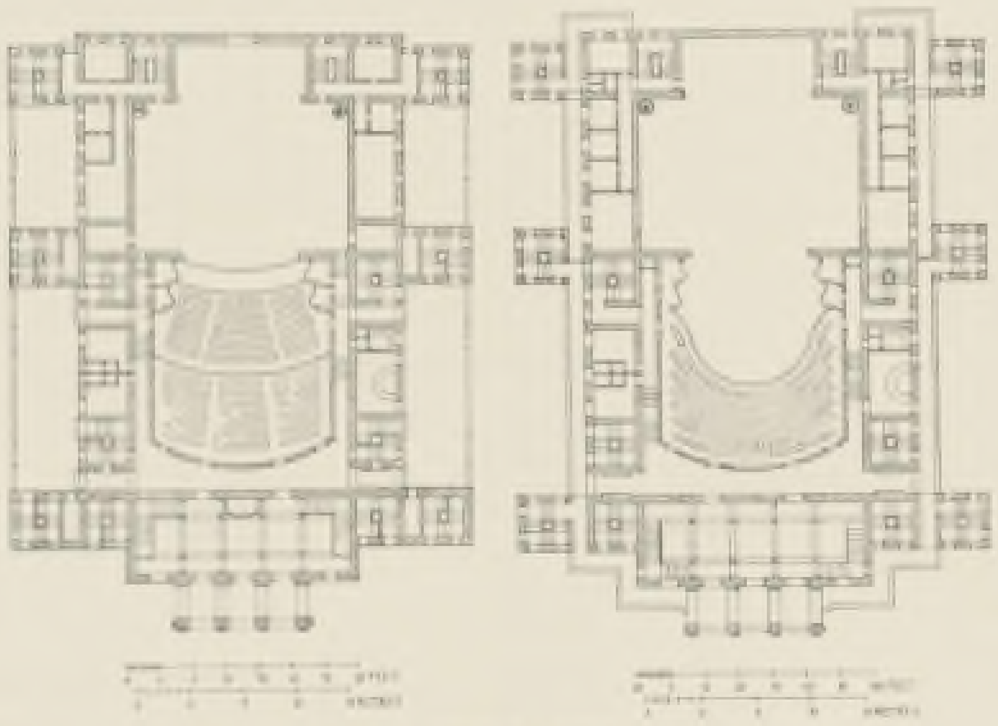
To summarise the arguments propounded by the 'Asphaleia' syndicate, I may say that, apart from their numerous precautionary measures, they advocated the full architectural expression of the auditorium on the exterior, retaining, however, its conventional shape and box-front lines, with the exception that each tier sets back more strongly than is usually the case, and that the whole of the audience is underneath one ceiling, i.e. there is no well-hole at the back of the top tiers. In plan, therefore, the façade takes a semicircular or segmental form. For the sake of safety, the promoters advocated long flights of steps with landings, in lieu of staircases proper, and placed them in the large segmental hall which surrounds the auditorium, and, at different levels, serves either as foyer, corridor or vestibule. They did not recommend the principle of absolute isolation in the means of communication for different sections of the public, but took the whole of the audience into their large vestibule, letting each stairway end in close proximity to an outer door. To speak plainly, this staircase arrangement is the one great blunder of the scheme, inasmuch as a system of long flights is distinctly dangerous. The isolation is restricted to the introduction of distinct division between the 'front of the house' and the 'back of the house,' between the auditorium and its offices, and between the stage and its offices. As to the division between the 'front' and 'back of the house', we find the arrangement of a double proscenium wall, the intervening space between which is used for service and fire brigade purposes only. Between the auditorium and its offices we again have a double wall, where the intervening space is utilised both for ventilation and acoustic purposes. Between the stage and its offices run corridors of ample dimensions. But even in this design of a model theatre, it is easy to see how the syndicate's own principles have been evaded in the disposition of the box staircases and various other makeshifts. Nevertheless this model, which exhibits the embodiment of certain self-set requirements, contains many features, even in minor details, that call for study, and though essentially a 'Safety' theatre, shows lines such as those of the auditorium ceiling and of the proscenium frame, which are remarkable for general proportion and architectural rendering.



SCHMIDT AND NECKELMANN 'SAFETY' THEATRE.
FIG. 203. GENERAL VIEW.

SCHMIDT AND NECKELMANN 'SAFETY' THEATRE.
FIG. 204. PLAN, AREA.

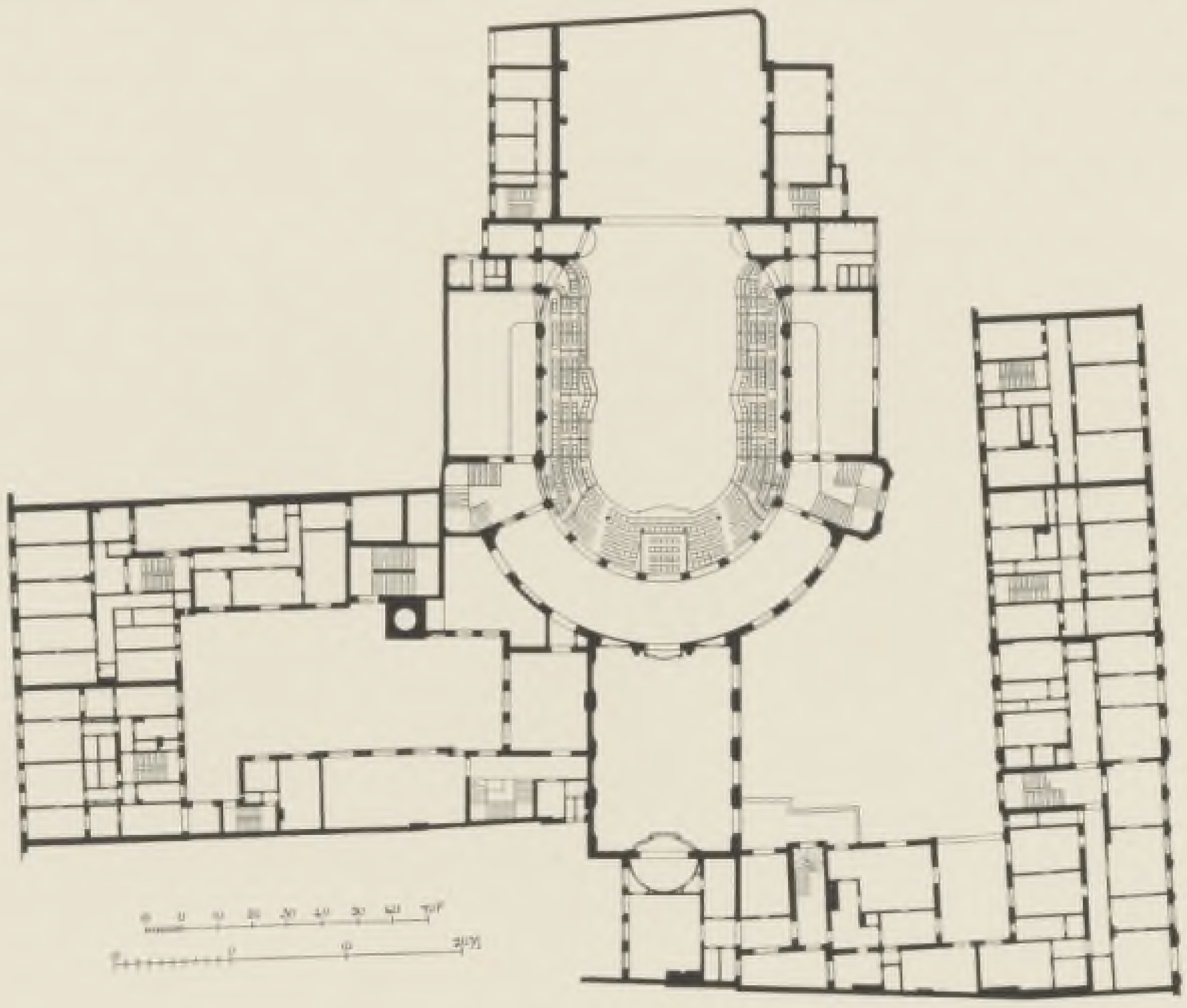
The 'Asphaleia' scheme has been acted upon in the 'Raimund' Theatre at Vienna. But the main precautionary principle of the syndicate, the long flights of stairs all ending in one vestibule, could not be there adopted—and very rightly so—owing to local regulations. These, as will be seen from Supplement III., require staircases to be absolutely separate, and the flights of steps limited. We are no doubt indebted to the syndicate for many valuable ideas, but we must not suppose that everything they advocate meets modern requirements in the best possible way.



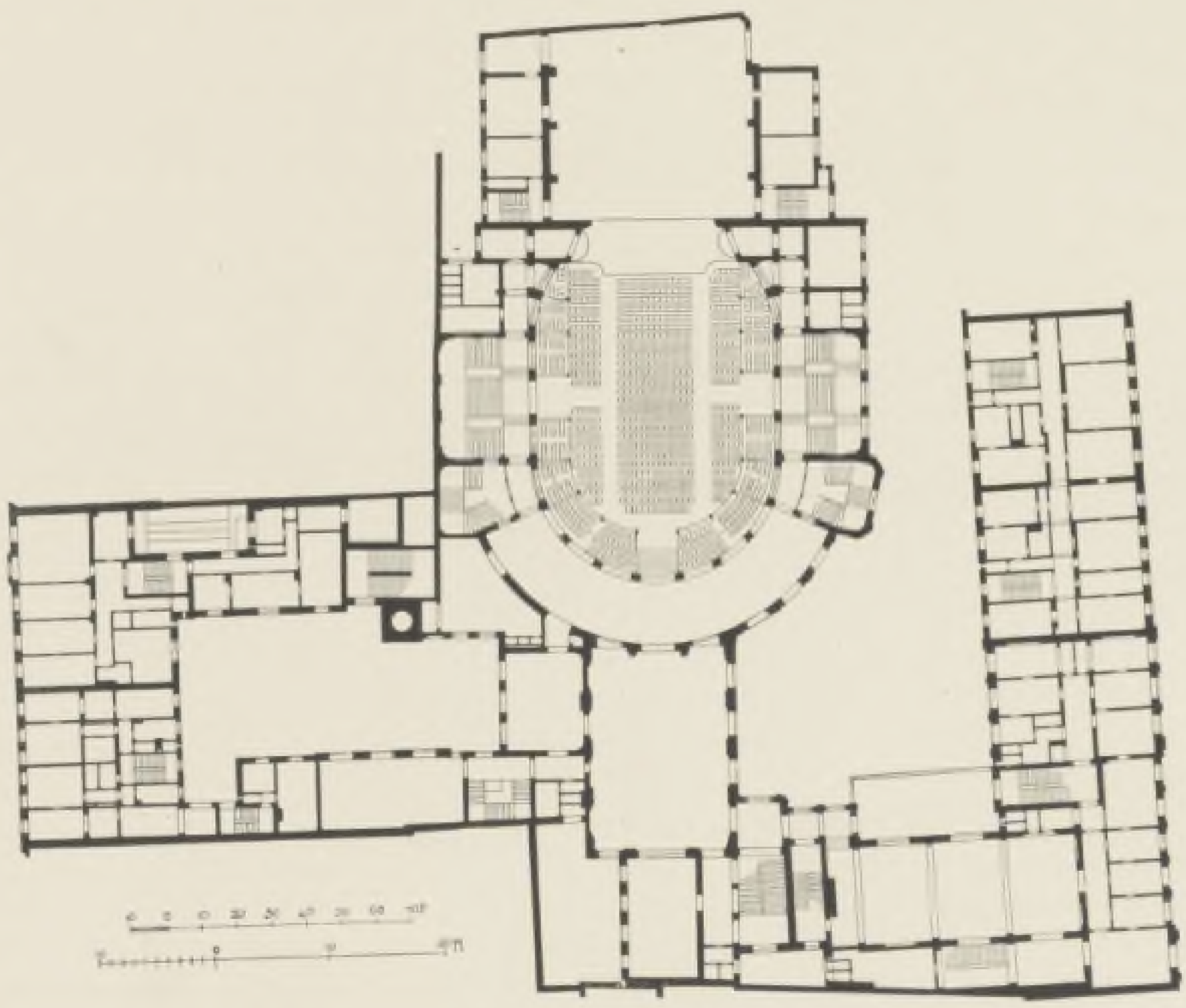
YOUNG 'SAFETY' THEATRE.
FIG. 205. PLAN, AREA. FIG. 206. PLAN, FIRST TIER.

In respect to the illustrations of these 'Model' or 'Safety' plans, I should perhaps say that I have in each case presented reproductions of the original drawings of the promoters, limiting myself, however, to as few as possible.

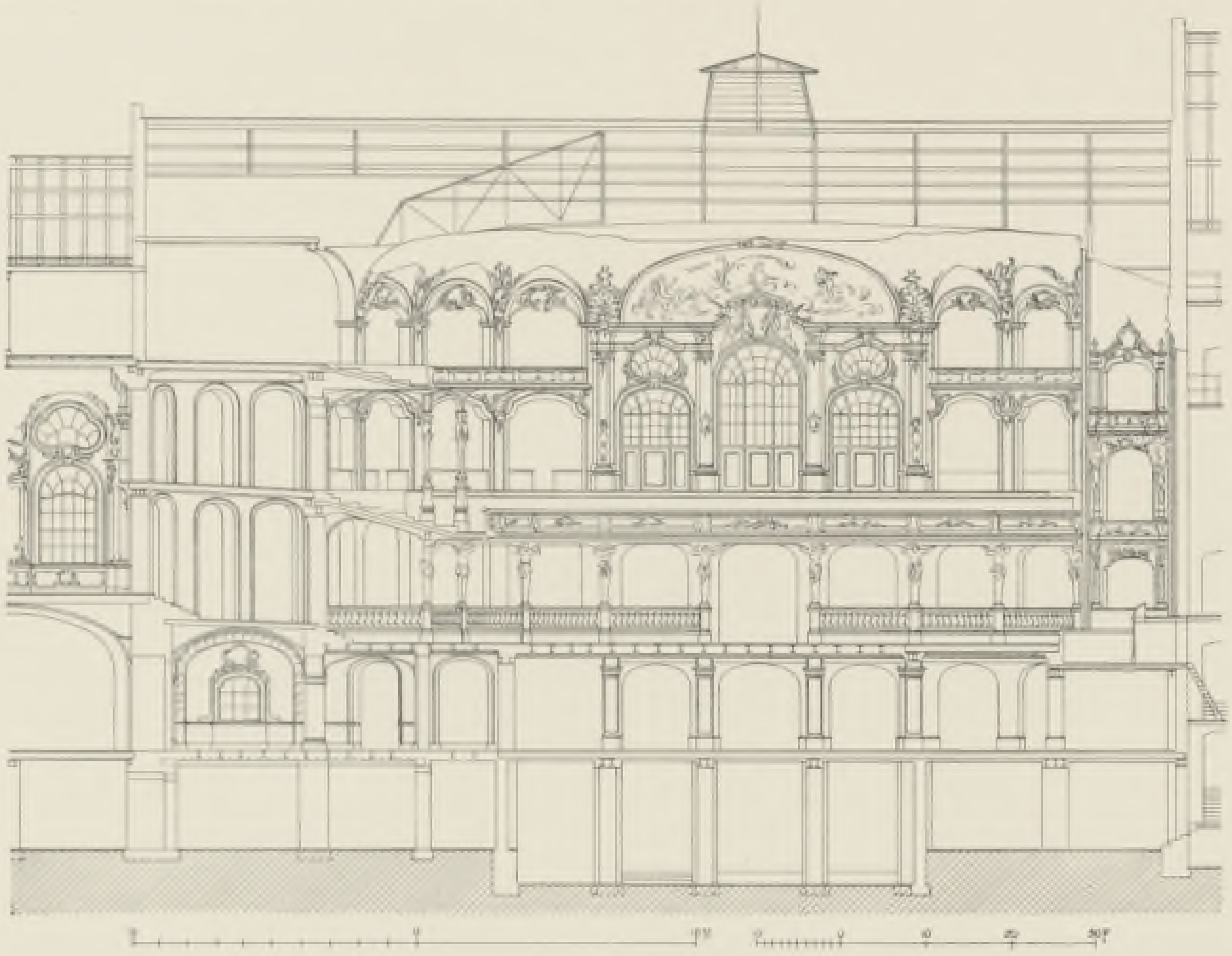
Turning now to the model theatre advocated by A. Sturmhoefel in 1889, we perceive a far more ideal treatment of the question of theatre planning than that embodied in the Irving or 'Asphaleia' plan. In both the latter cases there were claims of greatly increased safety, but the general design and the auditorium as such, received scant attention. In the Sturmhoefel plan it will be seen that the auditorium is of primary importance, and its arrangement governs everything the inventor has in mind. Further, it is a question with him of constructing a model, not to be practically applied, but rather to serve as a study for the conception of playhouses on Wagner principles. As such, and as such alone, this model must be considered, and a comparison of the Bayreuth plans in Volume I. with the diagrams in Figs. 201, 202, on the page opposite, will clearly show why I say this. The seating, for instance, of the auditorium, which is distributed over a steep area and a yet steeper continuous first tier, is a direct development of the Wagner



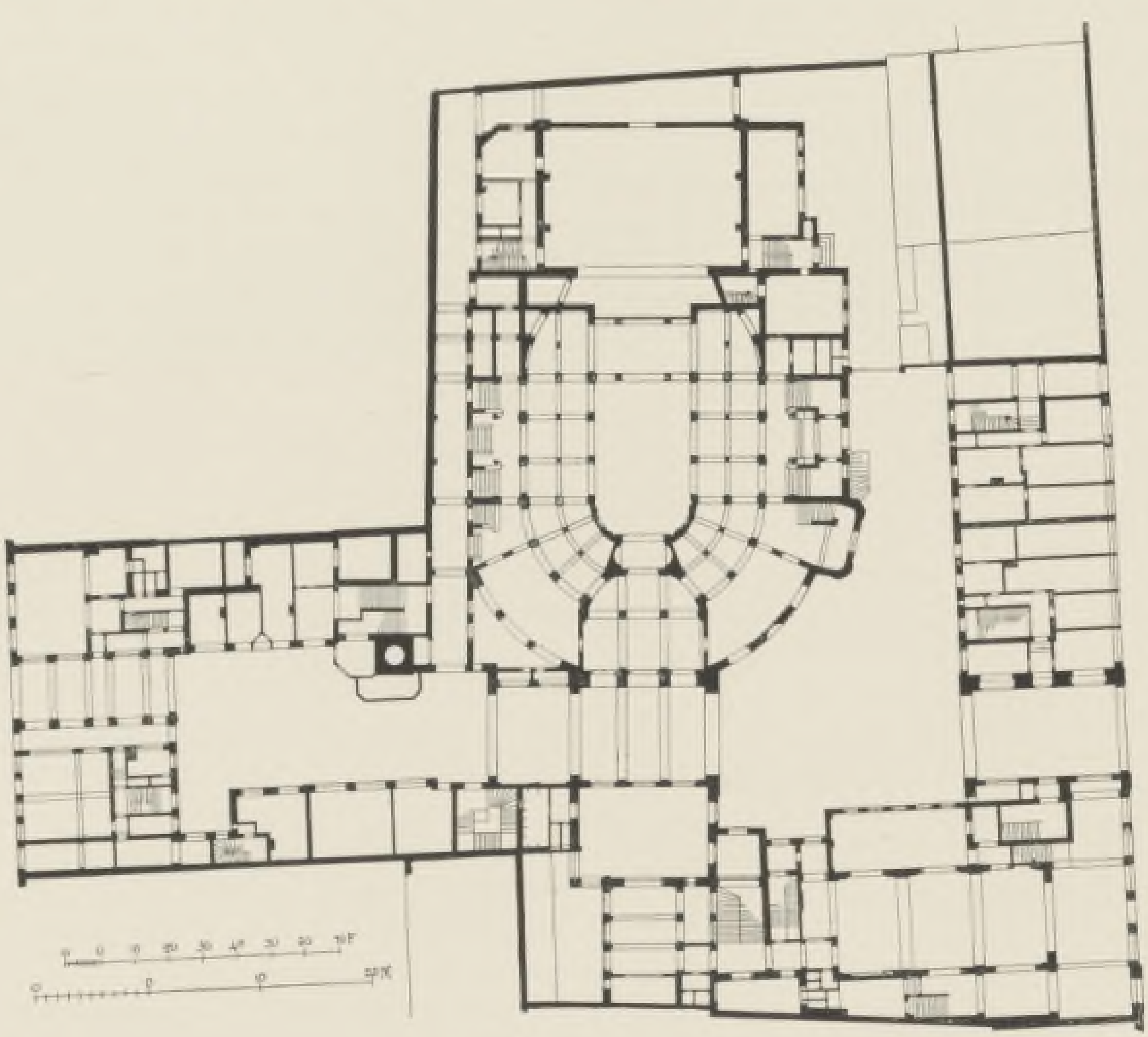
VARIETY THEATRE, MUNICH.
FIG. 207. PLAN, FIRST TIER.



VARIETY THEATRE, MUNICH.
FIG. 208. PLAN, AREA.



VARIETY THEATRE, MUNICH.
Fig. 209. Longitudinal Section.



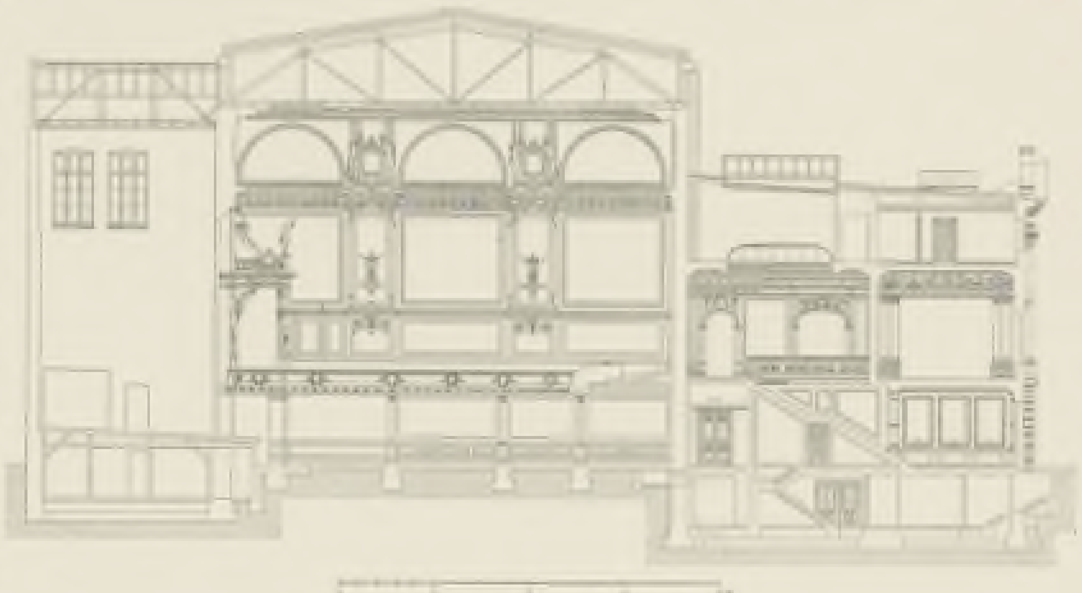
VARIETY THEATRE, MUNICH.
Fig. 210. Plan, Street Level.

plan. Of one thing there is however no doubt, namely, that though this model is conceived almost entirely on theoretical lines, yet it is the result of much close reasoning, and thus merits favourable mention among the essentially theoretical studies which have been put so frequently forward.

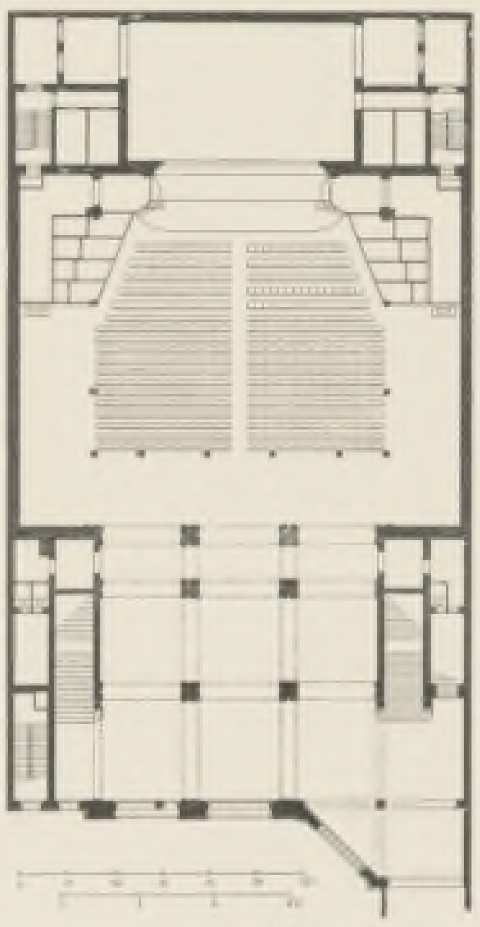
The Sturmhoefel model theatre, contrary to the 'Irving' and 'Asphaleia' models, was never intended for direct execution. But, as I have said, there are two further models which are so intended, although there has, as yet, been no application of the principles they suggest. These are respectively the 'Safety' Theatre of Archibald Young, of Edinburgh, and the 'Safety' Theatre of Schmidt and Neckelmann, formerly resident at Hamburg.

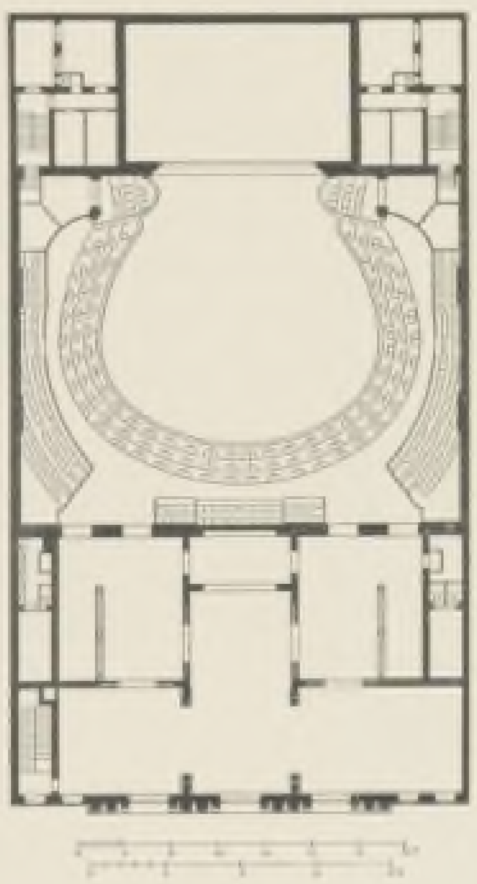
'CONCORDIA' VARIETY THEATRE, BERLIN.
Fig. 211. Transverse Section.

Now, in respect to the former, we find the embodiment of certain principles of safety having much in common with those set out by Alfred Darbyshire. There is, however, one great exception. The author seems to have defined for himself the condition that, besides the ordinary and recognised means of exit, which must conform with the regulations, the building should be surrounded by a series of balconies and terraces, to which 'emergency' exits should lead, and from which there should be special 'emergency' staircases. This theatre was designed with a sole eye to safety, and consequently many of the anomalies of the commonplace auditorium have been repeated, not forgetting the uppermost tier with its seating accommodation almost entirely in a well. As regards its outside galleries and extra exits, it should be emphatically and distinctly stated that anything in the light of an 'extra' exit or 'emergency' staircase or gallery is a mistake. The ordinary staircase accommodation should always be amply planned in a straightforward manner, so that anything of an 'extra' or 'emergency' description should be absolutely unnecessary. No doubt the principles are interesting to study, and there is no reason why they should not have been practically tried, as the similar principles of Jean Baes—though without the extra sets of permanent staircases—have already been applied in the 'Flemish' Theatre, Brussels. But the results would have been the same as in Belgium, calling for the same adverse criticism that I found necessary in Volume I. when treating the work of Jean Baes. On the whole, then, this model must be taken as a negative one, and as such it is here presented.



'CONCORDIA' VARIETY THEATRE, BERLIN. Fig. 212. Longitudinal Section.

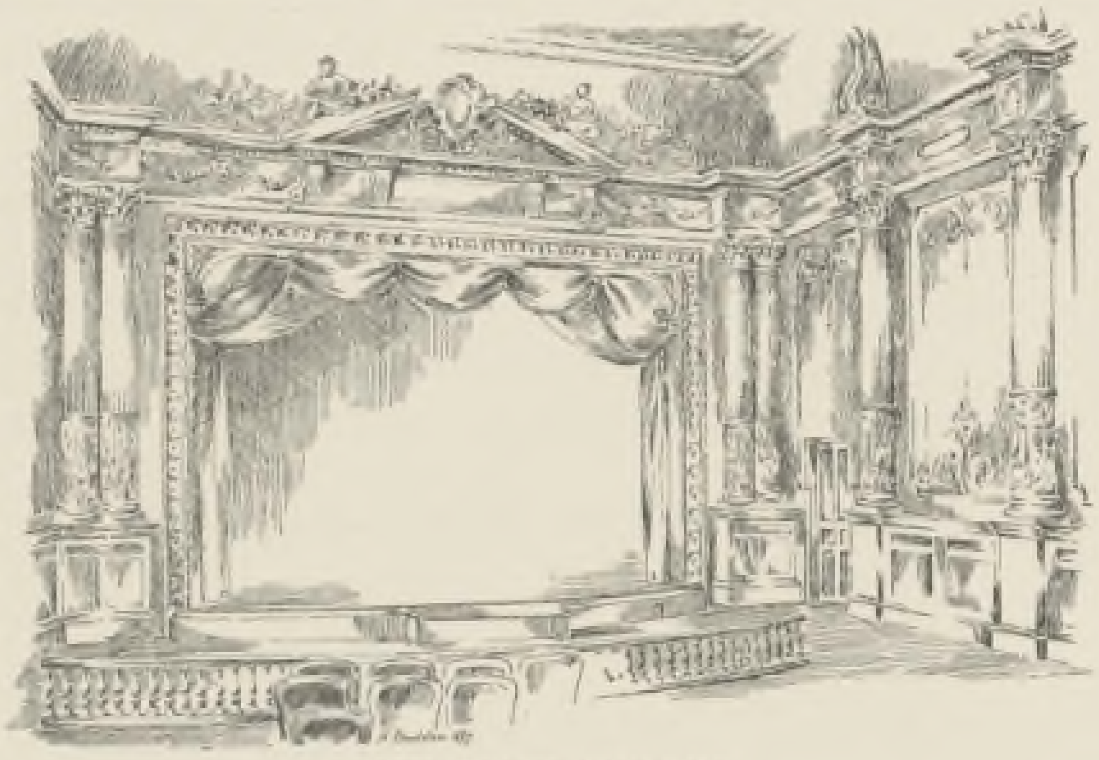




'CONCORDIA' VARIETY THEATRE, BERLIN.
Fig. 213. Plan, Area. Fig. 214. Plan, First Tier.

As regards the 'Schmidt and Neckelmann' model, I need only remark that the principle of isolation as expressed in the plan, Fig. 204, no doubt has many advantages, and there is, in fact, nothing against the practical execution of the scheme as embodied in the illustration. But where so much space is covered, the more usual lines of playhouse construction could well be adopted with better results. The scheme includes the provision of powerful lamps in the courtyards, their installation being based on the assumption that if these are served independently of the general lighting of the theatre, they would, in the event of the latter being extinguished on an outbreak of fire, afford ample illumination to the staircases and passages of the auditorium. This design, which was the outcome of a competition held in connection with the Public Health Exhibition of 1882 at Berlin, was accorded the first premium of two hundred pounds, chiefly on account of this principle of lighting. But I am afraid it has not yet found favour, nor is it likely to do so while safety can be assured in so many simpler ways.

Taken as a whole, these 'Model' theatres cannot be regarded in any other light than as studies or methods of describing certain ideas, excepting perhaps the Irving 'Safety' Theatre, which is of a more practical character. It should be remembered that this selection of five 'Model' theatres is taken from a very large number, most of which have been proposed solely in the interests of fire protection. As a matter of fact, there are scarcely a dozen 'Model' theatres which can be said to show due consideration of the acoustic properties, general proportion and sighting, every effort apparently being directed solely to the question of safety. The very idea, too, that a 'Model' theatre can be designed line by line to meet various conditions has proved wrong. 'Model' plans, in fact, can only serve as illustrations of certain ideas, which could probably be expressed better diagramatically than in a complete design. The ideas in themselves may be quite serviceable, but their application in general plans of the description shown here teaches us comparatively little.


PATTI THEATRE, CRAIG-Y-NOS.
FIG. 215. VIEW OF AUDITORIUM.

It may have been noticed that, in referring to types and examples, I have almost always mentioned buildings intended for the presentation of *boná fide* drama or opera. The chief exceptions are the temporary Exhibition theatres, which are at times utilised for lighter spectacular performances, and secondly, two of the Variety Theatres of Ernest Runtz, which, however, could almost fulfil dramatic purposes. When speaking of playhouses I have in mind, primarily, the homes of opera and drama, though, according to the requirements of to-day, the differences between these and the home of the variety entertainment are no longer so great as they used to be. Excepting the general disposition of the foyer, saloon, promenade and the gangway facilities, they share many features in common.

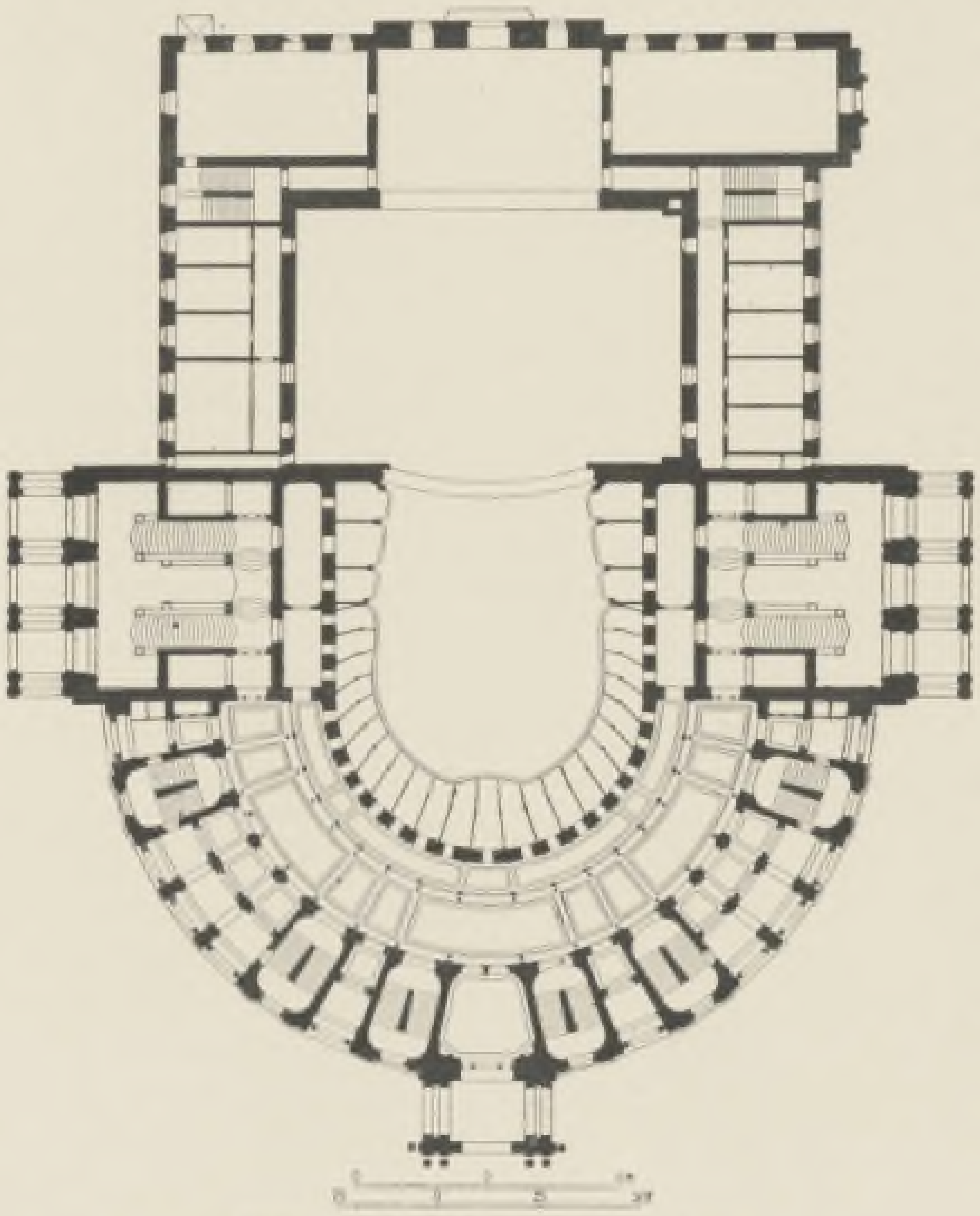
I would, however, before closing this part of my subject, like to refer to two buildings utilised for the lighter form of entertainment, one at Munich and the other at Berlin. I am led to do so by the fact that the circumstances attendant on their erection were peculiar, not to say difficult. In both cases the theatres are situated on back-land, and are designed in connection with other buildings, and yet, architecturally, they attain a high standard, and fulfil their purposes in a particularly satisfactory manner. The first of them displays the characteristics of a small music hall as they were generally understood some years ago in Germany, before the influence of the great Variety establishments of London and Paris made itself so generally felt; the second is designed on the most recent lines.

The 'Concordia' Variety Theatre, on page 56, now commonly known as the 'Apollo' Theatre, at Berlin, was erected from the plans of Gustav Ebe in 1890. We here find an auditorium with a flat floor, which enables it to be also used as an assembly room without any material alteration. It has one gallery, and there is only a small stage. The saloon or foyer at the same time serves for a supper-room, and the vestibule for a saloon bar. The theatre, as already indicated, stands on back-land, and abuts on adjoining property on three sides, having in front only a small court. The main entrance to the hall from this court is through a passage which also runs under a tenement building forming part of the property. The accommodation afforded for the audience is ample and convenient, and the seating leaves no room for complaint, whilst the general aspect of the interior of the building shows that considerable talent has been brought to bear on its execution, for it is architecturally sound, and of pleasing appearance. The structure has, in fact, only one radical mistake, and that is its position on back-land, as, no matter how good the planning or architectural rendering, the difficulty of exit is an ever present source of danger. The whole of the audience and *personnel* have, in this instance, only the passage referred to above by which they can leave the building, and given a fire in the tenement building and a panic resulting therefrom, even this one exit would probably be blocked. The cost of the block, I would add, was 25,000*l*.


CASTLE THEATRE, TOTIS.
FIG. 216. VIEW OF AUDITORIUM.

At Munich we have to deal with a theatre which accords more with the recent ideas of a Variety establishment in this country, but which was again erected in connection with other structures, i.e. as part of an important block of flats and a large restaurant. Here, notwithstanding the position, both the exterior and the interior again most plainly show that the promoters were assisted by an architect of considerable skill, and the exit and cloak-room facilities are particularly well conceived.

Speaking generally, the manner in which Alexander Bluhm, who was entrusted with the commission, arranged his theatre under unusually difficult conditions is worthy of all praise; for although the main block abuts on adjoining property on one side, as well as at the back, the whole is symmetrically disposed, and there are ample facilities for communication within the theatre proper. Reference to Figs. 207 to 210 on pages 54 and 55, show the manner in which the ground was laid out, and the great care which was necessary in the circumstances to give the theatre a suitably dignified approach. Reference to the same illustrations will also show how the main rooms of the restaurant can be used in conjunction with the auditorium, and how the latter has been so arranged, that in combination with the stage on the one hand, and the reception rooms on the other, an extensive superficial area is placed at the disposal of the public. Full advantage of the block can thus be taken during such fêtes as the Carnival at Munich, when theatrical representations make way for entertainments of a different kind, and the premises serve as a gigantic suite of assembly rooms. As a matter of fact, both the 'Concordia' Theatre, of which I have been speaking, and this establishment were purposely designed to perform, when necessary, functions of this description. It is worth while also to note the planning of the spacious promenade and the main staircases, no less than the pleasing vista obtained in looking down on the stage from the large foyer. As with the 'Concordia' Theatre, in fact, there is little to complain of in this playhouse except its location.



MUNICIPAL THEATRE, ODESSA, ORIGINAL SCHEME.
FIG. 217. PLAN, FIRST TIER.

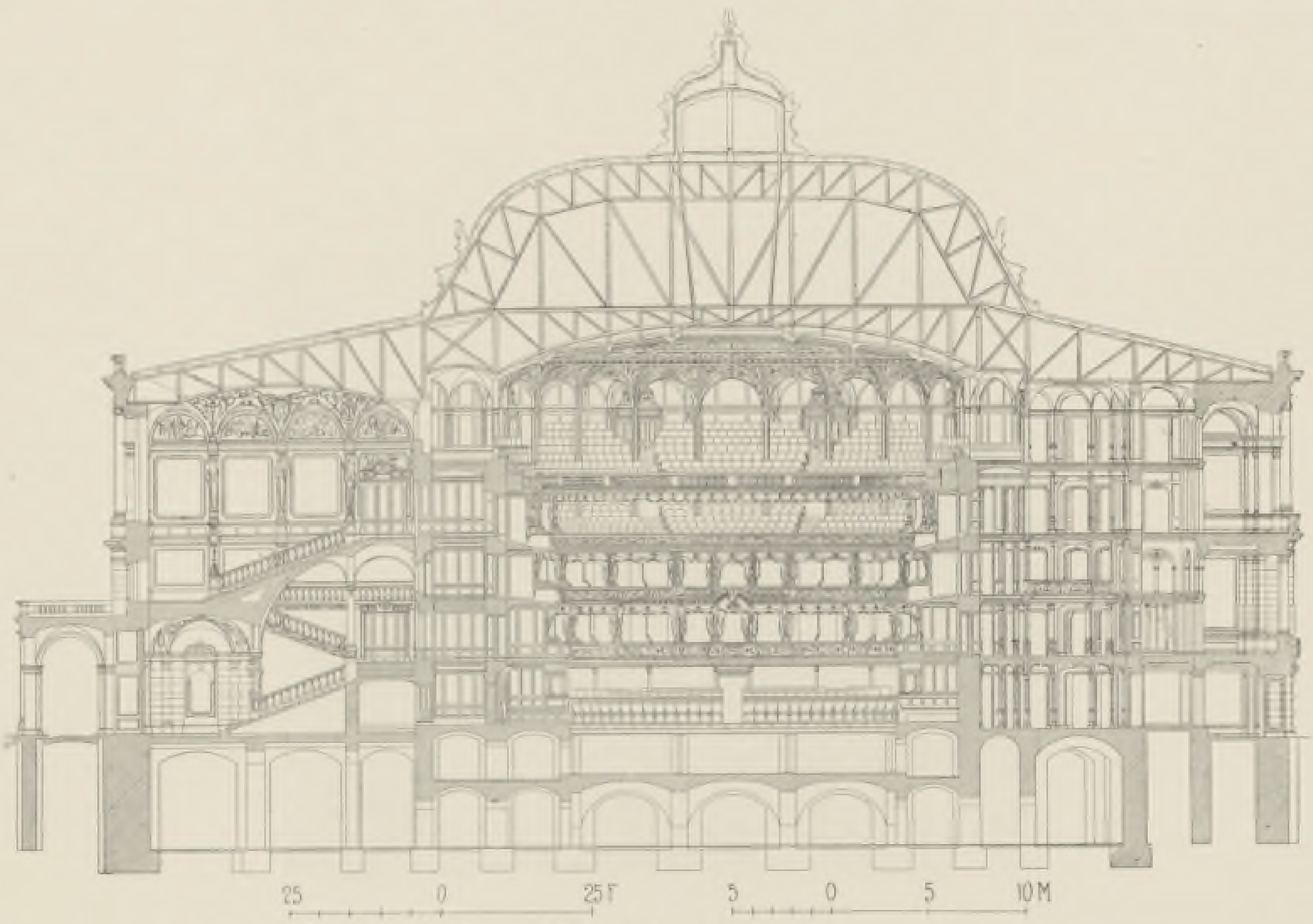
In referring to examples of variety theatres built under peculiar circumstances, i.e. in connection with other buildings and on back-land, I think it would not be out of place to mention that there are of course a number of small theatres attached to palaces, private residences and public buildings, which, although not open to the general public, well fulfil the purposes of a small playhouse, and afford every facility for the presentation of plays. In reality, as I believe I have already mentioned in Volume II., it is doubtful whether a playhouse like the Casino Theatre at Monte Carlo should not be rightly included under the miniature private theatres in this sense. But there is certainly no doubt that such establishments as those of Totis and Craig-y-nos are essentially private miniature theatres, even if the public are occasionally admitted.

Private theatres of this description, though among the smallest of their class of building, are often of considerable architectural pretension, and the views of the two named, at Totis and Craig-y-nos, on page 57, show what good work can be achieved in this direction. At Craig-y-nos the theatre forms a wing of the residence of Adelina Patti. It was erected from the designs of A. Bucknall and E. W. Jennings. The Castle Theatre, Totis, is from the design of Ferdinand Fellner and Hermann Helmer of Vienna, and was carried out on a somewhat more elaborate scale. The illustrations, however, describe the rooms sufficiently to show that theatres of this kind offer particularly pleasant opportunities to an architect of refined taste. The views also demonstrate that miniature theatres attached to private residences possess sufficient individuality to claim classification among the playhouses of Europe. They are not mere music rooms or assembly halls.

In connection with the above remark regarding the opportunities afforded the architect and the presentation of two such praiseworthy examples of variety theatres executed on back-land, I would now close this chapter on general arrangement by referring to the absolute necessity of considering the question of plan conjointly with that of the architectural treatment. In the common London theatre attention may have been given to the plan and section, yet rarely, if ever, have they been seriously considered in conjunction with the elevation, or with any scheme of decoration. Given a certain plan and section the general procedure has merely been to put some 'dressings' on the façade, without any thought for the general grouping, or the main lines of the structure. Even in one of our most successful playhouses, D'Oyly Carte's English Opera House, T. E. Collcutt was called in to treat a block, of which the carcass, and therefore the main lines and all openings were already set out, regardless of the architectural requirements. As to the interiors, the less said the better, since we know that in the majority of our playhouses the plastic decorator is entirely responsible for what we see, and even he too frequently discovers that the architect has left the subject of decoration so entirely out of account as to make it difficult for him to apply the spurious stock 'ornaments' which his standard of 'taste' would allow.

Of course this is all most ludicrous, were it not unfortunately so serious a matter, resulting in a most discreditable collection of ugly theatres. What we want, and should have, in the playhouse is a regard for architecture, both in plan and in treatment, with full consideration of every practical object, and with due economy. At present we may have theatre construction, but true theatre architecture is almost unknown.

I would again point to the perspectives of work by Ernest Runtz; comparison with their respective plans will explain my meaning thoroughly. I do not advise the imitation of some of the Continental architects who have spent years in the elaboration of their plans and elevations prior to signifying their readiness for execution. Such procedure is impossible in this practical country. But I would certainly go as far as the eminent architects, Fellner and Helmer, in preparing numerous careful studies before the actual working drawings are taken in hand. To give an example, I here show a study



MUNICIPAL THEATRE ODESSA, Original Scheme.
Fig. 218. Transverse Section.

for the plan and section of the Odessa Municipal Theatre, illustrated in Volume I., which, in its architectural differences from the drawings actually executed, plainly shows what trouble even such specialists have to take in order to develop a scheme which gives satisfaction. I would refer to this study those who believe that a design, and a theatre design in particular, can be evolved without great difficulty, that they may see what pains these architects—whose experience includes the planning of some fifty first-class theatres—take to obtain a successful *ensemble*.

In closing these remarks on the general arrangement of the modern playhouse, and referring to the examples here presented, as well as to those more fully illustrated in the preceding volumes, I cannot but again emphasise the importance of considering questions of general proportion. The architectural rendering of a theatre may be insignificant; there may be much in the detail that is unpractical; but such matters can generally be remedied at some small sacrifice. If, however, the general proportions and the main dispositions of the plan are unsatisfactory there is but seldom a remedy, and the makeshift character of the improvements that are in such cases attempted generally leads to complications, if not to fresh causes of complaint. On the general conception, the main outline of the plan, and above all the general proportions of the block and of every section of it, depends the success or failure of a modern playhouse, and no meritorious decoration or satisfactory equipment can ever modify defects under these major heads.

The general arrangement is the more difficult as interests of an essentially conflicting character have to be considered, and much skill, tact and common sense, are required to weigh the different claims put before the architect. Not only has the comfort and convenience of the audience in its entirety to be considered, but the comfort and convenience of every section of it individually. Social prejudices and local customs require quite as much thought as any question of sighting, hearing or seating. The facilities for the performance have to be considered as a whole quite as much as those of every single department connected with the presentation of the play, and yet neither in the 'front of the house' nor behind the curtain is it permissible to grant facilities or conveniences that do not accord with the principles of economy practised by the management.

As I have said before, but would emphasise again, the interests of Art call for an equal amount of thought with those of technical science applied to the theatre, no matter if the institution be one of secondary importance or of high standard. It would, however, lead too far to enumerate the conflicting interests of art and science in detail.

But whatever points may clash, it is in the general conception and in the definition of the general proportions that a compromise can alone be made. It is, to repeat, by this general arrangement and definition of the general proportions that the character and the success, or non-success, of a playhouse are determined.

MUNICIPAL THEATRE, BROMBERG.
FIG. 219. GENERAL VIEW.

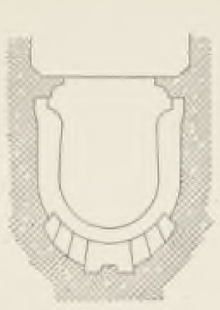


Fig. 220.
'Flemish' Theatre, Brussels.

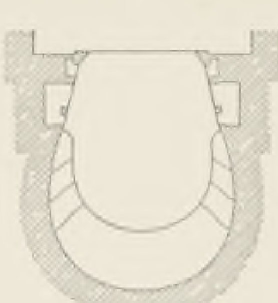


Fig. 221.
National Theatre, Christiania.

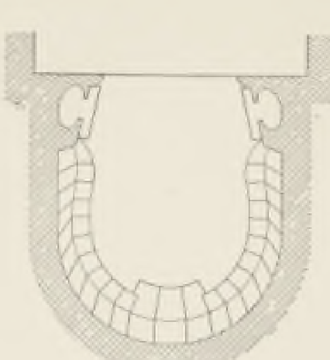


Fig. 222.
National Opera House, Buda-Pesth.

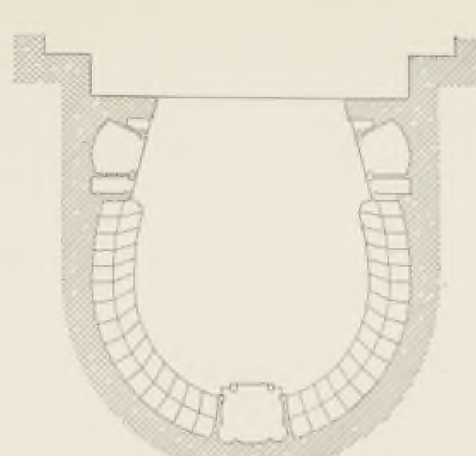


Fig. 223.
Proposed Court Opera House, St. Petersburg.

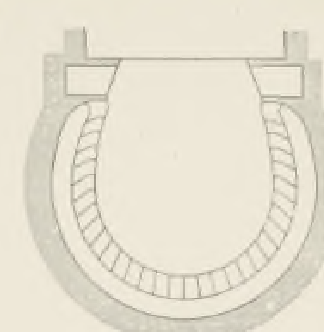


Fig. 224.
'Linden' Variety Theatre, Berlin.

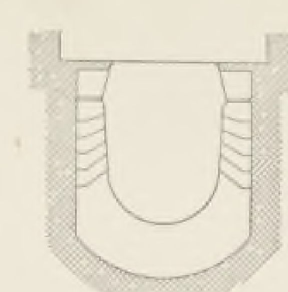


Fig. 225.
Municipal Theatre, Halle.

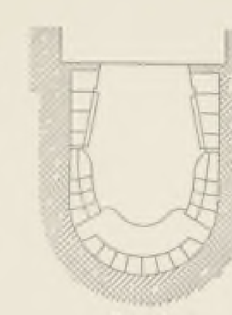


Fig. 226.
'New' Theatre, Berlin.

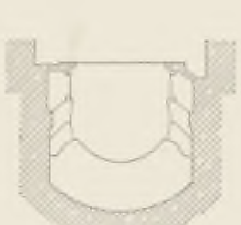


Fig. 227.
Daly's Theatre, London.

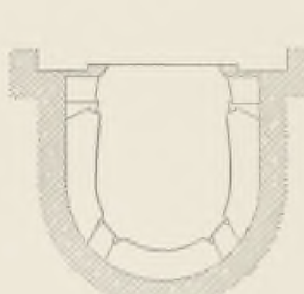


Fig. 228.
Municipal Theatre, Amsterdam.

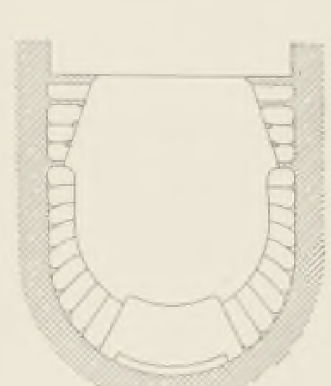


Fig. 229.
'German' Theatre, Prague.


Fig. 230.
'Wagner' Opera House, Bayreuth.

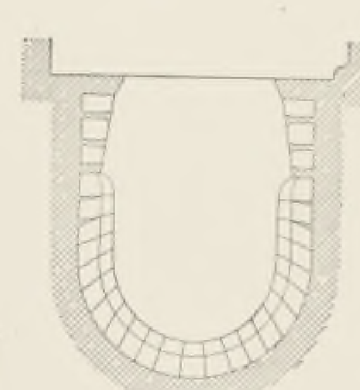


Fig. 231.
Municipal Theatre, Odessa.

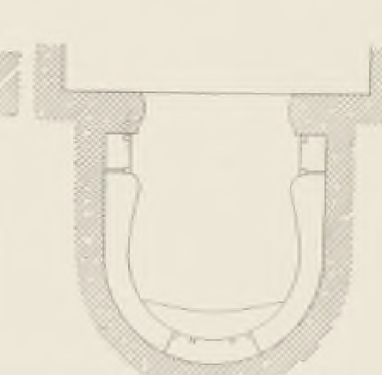


Fig. 232.
Court Opera House, Dresden.

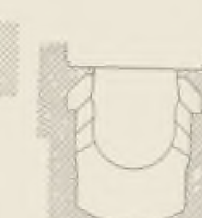


Fig. 233.
'Trafalgar' Theatre, London.


Fig. 234.
D'Oyly Carte's Opera House, London.


Fig. 235.
'Palace' Variety Theatre, Manchester.

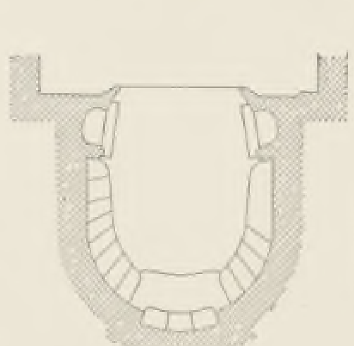


Fig. 236.
Court Opera House, Stockholm.

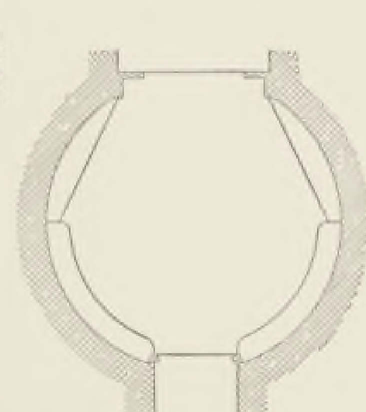


Fig. 237.
People's Theatre, Worms.

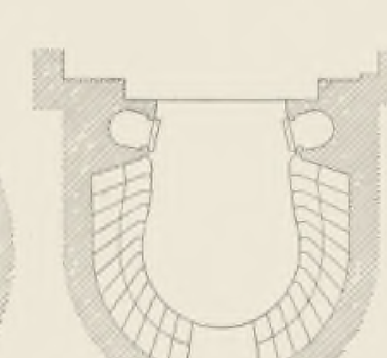


Fig. 238.
Court Theatre, Vienna.

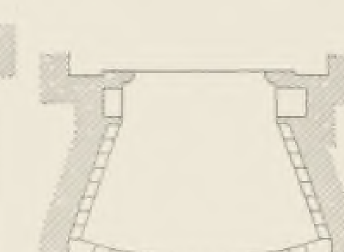


Fig. 239.
Municipal Theatre, Tiflis.


Fig. 240.
'Grand' Theatre, Wolverhampton.

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AUDITORIUM: SKELETON PLANS FROM EXAMPLES IN VOLUME I.

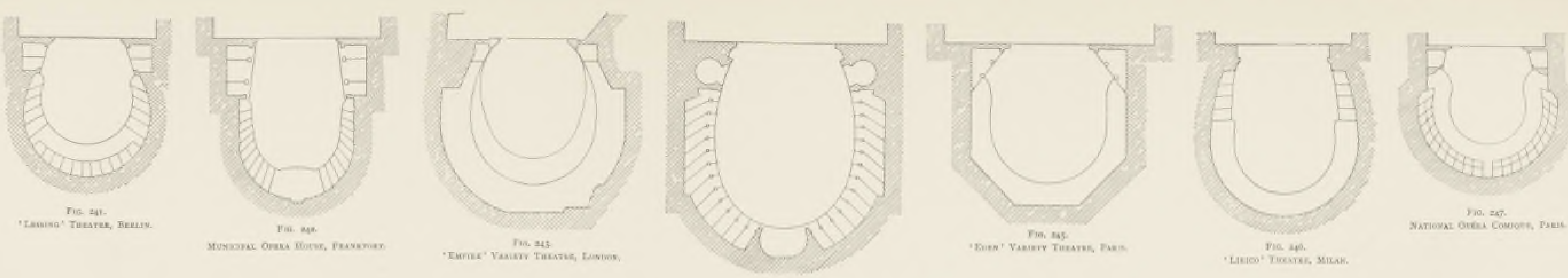

Fig. 241. 'Lessing' Theatre, Berlin.

Fig. 242. Municipal Opera House, Frankfort.

Fig. 243. 'Empire' Variety Theatre, London.

Fig. 244. Court Opera House, Vienna.

Fig. 245. 'Eden' Variety Theatre, Paris.

Fig. 246. 'Lirico' Theatre, Milan.

Fig. 247. National Opéra Comique, Paris.

Fig. 248. Municipal Theatre, Rostock.

Fig. 249. Czech National Theatre, Prague.

Fig. 250. Municipal Theatre, Bilbao.

Fig. 251. National Opera House, Paris.

Fig. 252. 'Raimund' Theatre, Vienna.

Fig. 253. National Theatre, Athens.

Fig. 254. Municipal Theatre, Laibach.

Fig. 255. Municipal Theatre, Salzburg.

Fig. 256. Municipal Theatre, Rotterdam.

Fig. 257. 'Grand' Theatre, Leeds.

Fig. 258. Municipal Theatre, Palermo.

Fig. 259. Municipal Theatre, Zürich.

Fig. 260. People's Theatre, Turin.

Fig. 261. Municipal Theatre, Geneva.

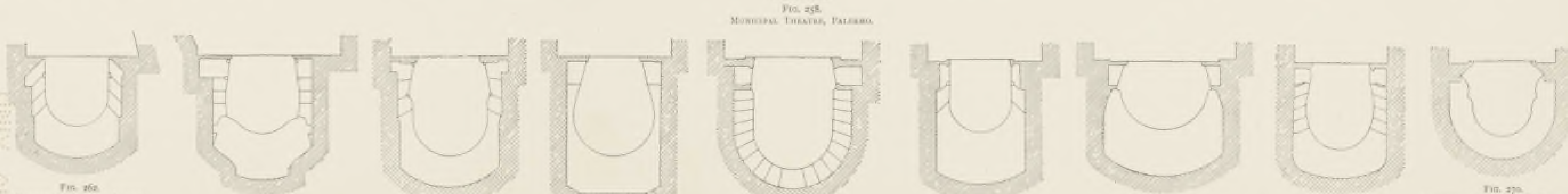

Fig. 262. 'Garrick' Theatre, London.

Fig. 263. 'Lyric' Theatre, London.

Fig. 264. 'Oxford' Variety Theatre, London.

Fig. 265. Municipal Theatre, Essen.

Fig. 266. National Theatre, Bucharest.

Fig. 267. 'New' Theatre, Cambridge.

Fig. 268. 'Her Majesty's' Theatre, London.

Fig. 269. Municipal Theatre, Bromberg.

Fig. 270. Shakespeare Memorial Theatre, Stratford-on-Avon.

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AUDITORIUM: SKELETON PLANS FROM EXAMPLES IN VOLUME II.

Fig. 271. Theatre, St. Helens.

Fig. 272. Theatre, Montpellier.

Fig. 273. Municipal Theatre, Augsburg.

Fig. 274. Filodrammatico Theatre, Milan.

Fig. 275. Court Theatre, Wiesbaden.

Fig. 276. Municipal Theatre, Angers.

Fig. 277. 'Shaftesbury' Theatre, London.

Fig. 278. Theatre, St. Lo.

Fig. 279. Theatre, Paisley.

Fig. 280. Municipal Theatre, Nijni-Novgorod.

Fig. 281. Municipal Theatre, Brünn.

Fig. 282. 'Manzoni' Theatre, Turin.

Fig. 283. 'Haymarket' Theatre, London.

Fig. 284. 'Renaissance' Theatre, Paris.

Fig. 285. Court Theatre, Schwerin.

Fig. 286. Municipal Theatre, Irkutsk.

Fig. 287. 'Empire' Variety Theatre, Edinburgh.

Fig. 288. 'Dal Verme' Theatre, Milan.

Fig. 289. People's Theatre, Buda-Pesth.

Fig. 290. Municipal Theatre, Fiume.

Fig. 291. Temporary Theatre, Russia.

Fig. 292. 'Criterion' Theatre, London.

Fig. 293. 'New' Theatre, Cheltenham.

Fig. 294. Municipal Theatre, Pressburg.

Fig. 295. Temporary Theatre, Russia.

Fig. 296. Municipal Theatre, Carlsbad.

Fig. 297. 'Prince of Wales's' Theatre, London.

Fig. 298. Theatre, Lincoln.

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AUDITORIUM: SKELETON PLANS.


Fig. 301.
'Trafalgar' Theatre, London.

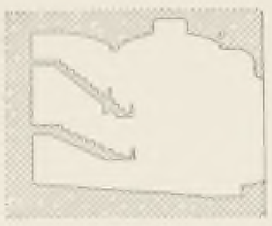
Fig. 302.
'Grand' Theatre, Islington.


Fig. 303.
'German' Theatre, Prague.

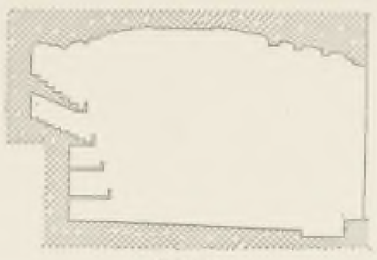
Fig. 304.
Municipal Theatre, Odessa.


Fig. 305.
Court Opera House, Stockholm.

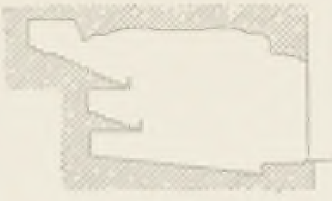
Fig. 306.
Municipal Theatre, Halle.

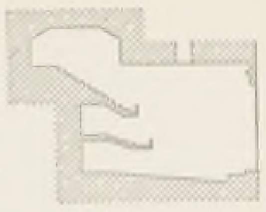
Fig. 307.
'Grand' Theatre, Wolverhampton.

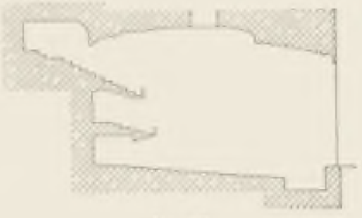
Fig. 308.
National Theatre, Christiania.

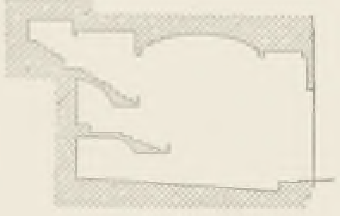
Fig. 309.
'Empire' Variety Theatre, Bristol.

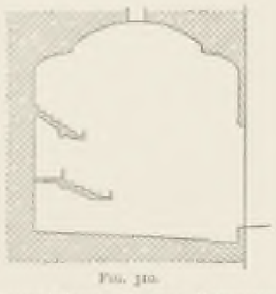
Fig. 310.
'Palace' Variety Theatre, Manchester.


Fig. 311.
National Opera House, Buda-Pesth.

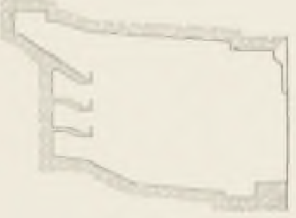
Fig. 312.
Municipal Theatre, Tiflis.


Fig. 313.
'Flemish' Theatre, Brussels.

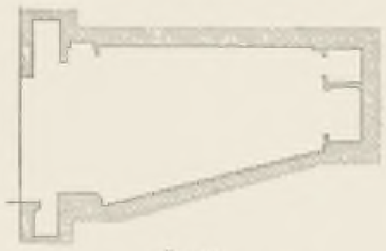
Fig. 314.
'Wagner' Opera House, Bayreuth.

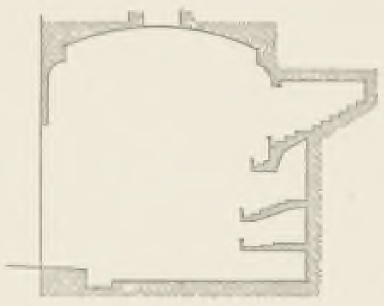
Fig. 315.
'Alhambra' Variety Theatre, London.


Fig. 316.
Proposed Court Opera House, St. Petersburg.

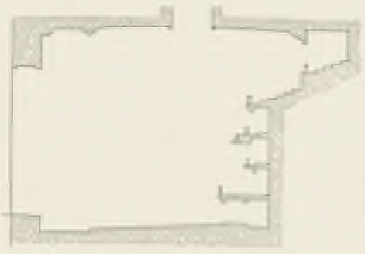
Fig. 317.
Court Opera House, Dresden.


Fig. 318.
People's Theatre, Worms.

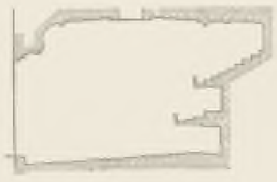
Fig. 319.
'New' Theatre, Berlin.

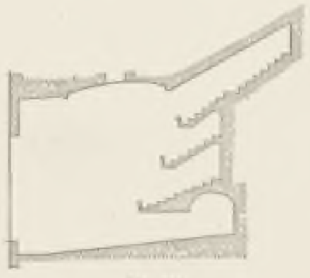
Fig. 320.
D'Oyly Carte's Opera House, London.


Fig. 321.
Court Theatre, Vienna.

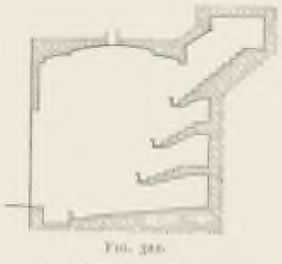
Fig. 322.
Daly's Theatre, London.

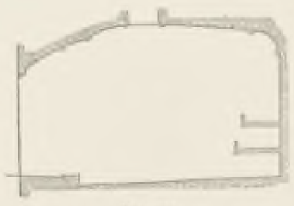
Fig. 323.
'Linden' Variety Theatre, Berlin.

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AUDITORIUM: SKELETON SECTIONS FROM EXAMPLES IN VOLUME I.

Fig. 324. 'Lessing' Theatre, Berlin.

Fig. 325. 'Grand' Theatre, Leeds.

Fig. 326. Municipal Theatre, Bromberg.

Fig. 327. 'Empire' Variety Theatre, London.

Fig. 328. 'New' Theatre, Cambridge.

Fig. 329. Shakespeare Memorial Theatre, Stratford-on-Avon.

Fig. 330. Municipal Theatre, Zürich.

Fig. 331. Municipal Theatre, Frankfort.

Fig. 332. National Opera House, Paris.

Fig. 333. National Theatre, Athens.

Fig. 334. 'Garrick' Theatre, London.

Fig. 335. 'Lyric' Theatre, London.

Fig. 336. Municipal Theatre, Rotterdam.

Fig. 337. Court Opera House, Vienna.

Fig. 338. National Theatre, Bucharest.

Fig. 339. Municipal Theatre, Laibach.

Fig. 340. Municipal Theatre, Salzburg.

Fig. 341. 'Oxford' Variety Theatre, London.

Fig. 342. 'Eden' Variety Theatre, Paris.

Fig. 343. Municipal Theatre, Palermo.

Fig. 344. 'Raimund' Theatre, Vienna.

Fig. 345. Municipal Theatre, Bilbao.

Fig. 346. 'Her Majesty's' Theatre, London.

Fig. 347. Czech National Theatre, Prague.

Fig. 348. National Opéra Comique, Paris.

Fig. 349. 'Lirico' Theatre, Milan.

Fig. 350. Municipal Theatre, Rostock.

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AUDITORIUM: SKELETON SECTIONS FROM EXAMPLES IN VOLUME II.

CHAPTER II.

AUDITORIUM ARRANGEMENT.

Having dealt with the arrangement of the theatre from a general point of view, and presented a considerable number of examples of recent plans, I would now turn to what should be the main feature of every playhouse, i.e. the auditorium.

In the preceding chapter I emphasised the great importance of well considering all questions of proportion in designing a playhouse, and I went so far as to point out that I primarily attributed the success of the great Vienna specialists, Fellner and Helmer, to their conspicuous ability in this matter. Just as the question of proportion is of the utmost importance in the general design of a theatre, so does it take a most prominent position as far as the auditorium is concerned. In fact, for no part of the theatre, after the general proportions in the design have been determined, is it more essential that there should be the right feeling in this respect than in the auditorium. It is also no mere question of proportion as far as appearance is concerned; but proportion in respect to acoustics, proportion in respect to sighting, and even proportion in respect to the essentially technical matters of ventilation, heating and lighting.

It has been attributed to Charles Garnier, that as he was not in sympathy with any of the prevailing theories of acoustics, so also he had no liking for the application of the theories by which the general proportions of the auditorium are frequently determined. Garnier certainly explained to me that he was in no wise guided by scientific data on acoustics when he determined the principal lines of his auditorium in the National Opera House at Paris, and the same can be truthfully said as to his disregard of the more abstract methods of laying down the proportions of the auditorium. The very existence of a science of proportion as understood in classical times was scarcely known to him. He had in fact not given questions of theatre design much thought prior to the preparation of his successful competition drawings for the Paris Opera House. Nor did he give much attention to the scientific side of the subject when he made a tour of inspection on the acceptance of the commission. The success he achieved at the Paris Opera House in respect to proportion was due solely to intuition. As for calculation, I have been assured by himself that except for such specific purposes as his writings or reports, he had never compared the dimensions of other theatres with those of his Opera House. To speak plainly, he set out his auditorium entirely regardless of any scientific system.

'CRITERION' THEATRE, LONDON.
Fig. 254. View of Auditorium.

Now Charles Garnier succeeded in designing an auditorium in which one can hear well, and in which the general proportions are highly satisfactory, and so his intuition may be taken as having been correct. But it is very rare that successful results are obtained by mere intuition, unless by such specialists as have, in addition, had a very considerable experience in the matter, and even some of these are known to have made the worst of mistakes.

Taken altogether it is no doubt safer, before designing a theatre, to study the question of proportion in the same way as it is advisable to study the question of acoustics. And, in order to facilitate this study, I have grouped on a series of five plates a considerable number of diagrams showing both in plan and section the auditorium lines of important examples of playhouses illustrated in these volumes. I do not believe that any such comparative diagrams have been published as yet elsewhere, although dimensions have been taken from time to time and tabulated for reference purposes. But with the aid of these diagrammatic illustrations I hope that the architect entrusted with a theatre commission will be able to gauge to a nicety some of the reasons which govern certain effects. Or, in other words, if he visits any of the playhouses here depicted, and compares the results of his observations of their acoustic qualities and the effect of their general proportions with these drawings, he should be able to arrive at results by the application of which his task of design can be materially facilitated.

Now it might be argued, that having gone to the labour of preparing these diagrams, and having also visited the theatres themselves, I should give my personal opinions in each case, or, perhaps, even tabulate my conclusions in connection therewith. But I am afraid this would be just as useless as if I were to set up a standard or model of the requirements of a playhouse, since the results in every one of these theatres differ, not only according to the proportions and lines, but also on account of the method of decoration, upholstery and furnishing adopted, the purpose to which they are put, and many other matters, including even the character of the audience, whether a quiet one or a noisy one. It would be as futile, too, to compare these theatres one with the other and try to arrive at some general result. Assuming that an architect is entrusted with a commission to erect a comedy house for a highly refined audience of

DIAGRAMS OF BOX FRONT LINES.
Figs. 351-370.

one thousand, lavishly decorated and upholstered, heated by hot water and ventilated artificially, he will visit theatres fulfilling similar conditions, and, having judged by actual results, will then be able to refer to these diagrams, which will assist him very considerably in understanding to what the results are due. Similarly, if he be commissioned to erect a People's Opera House to hold a middle-class audience of two thousand five hundred, in which Grand Opera alone is to be given during the winter season with an orchestra of, say, ninety, the building to be equipped on modern lines but with natural ventilation, decorations of a very plain type, and American wood seats, etc., he will be enabled to judge in which of the existing theatres carried on under similar conditions the effects he desires are obtained, and by reference to these diagrams to see what are the governing features. Now, it may be said that, inasmuch as many of these examples have been reproduced to the uniform scale of one to two hundred and fifty in the preceding volumes, facilities for comparison have already been given. But I would venture to suggest that comparison is far easier on sheets where such lines alone have been presented as influence the points here under consideration, and where the examples are grouped side by side.

In respect to the plates on which these diagrams are presented (Figs. 220 to 350), I would call attention to the fact that as with the plate of block plans in the preceding chapter (Figs. 39 to 92), where I grouped separately the examples from Volumes I. and II., division by volumes has been here observed. Auditorium plans from examples in Volume I. are shown in Figs. 220 to 240, those in Volume II. in Figs. 241 to 270, and the arrangement of the sections appears respectively in Figs. 301 to 323 and 324 to 350. I might, however, add that in arranging the plans in line I have taken as a datum the line of the proscenium curtain. Of course the front of the stage may coincide with this line, but it generally reaches well into the auditorium, and its exact position in relation to the auditorium can be seen from the sections. With the aid of this information it can also be easily ascertained whether or not a singer, for instance, standing close to the footlights on a stage which reaches well into the auditorium, is better heard than on the proscenium curtain line, or some feet back. These sections also show the relative location of the orchestra; but, of course, here as in the plans, my diagrams are essentially approximate. For approximate presentation in diagram form is sufficient for the purposes intended; exact and detailed illustration would have led too far. As a rule, too, in these plans, the diagrams are taken from the first tier level, with one or two incidental exceptions. The line of the box fronts on the first tier is almost uniformly shown, whilst the part marked 'solid' is intended to represent what, for the purpose of acoustics, etc., forms the solid backing. This may be the containing wall of an open auditorium, or only the back of an ante-room to a box—I have used my discretion on this point. Further explanations, I hold, are unnecessary, and I only trust that these figures may be successfully put to the use for which they are intended.

I assume that it is scarcely necessary to point out in detail how the line of the box front influences the conception of the auditorium. In fact, in many respects, this line governs not only the general appearance of the auditorium, but also the acoustics, and almost entirely the sighting. Without entering into the many arguments in favour of one line or another, I may say that the advantages and disadvantages of the horseshoe are obvious; the line of the lyre has also been the subject of innumerable more or less successful experiments, and also the double curve and the segment. The point that I would emphasise, however, is that any complication in the line is generally detrimental to the theatre, and that though some of the erratic forms shown may give certain distinct advantages, particularly in respect to the seating, the acoustic qualities only too easily suffer, and the ensemble of the auditorium is generally spoilt. I am showing in Figs. 355 to 374 a selection of box front lines from various theatres, the names of which I have affixed in each case for purposes of reference. The whole of these lines are taken at first tier level, and it will be observed that, even in the few chosen, there is very considerable variety. I would remark, however, that they are not reproduced to scale.

'Lindens' Variety Theatre, Berlin.

Municipal Theatre, Rotterdam.

Municipal Theatre, Amsterdam.

Municipal Opera House, Frankfort.

D'Oyly Carte's Opera House, London.

'Oxford' Variety Theatre, London.

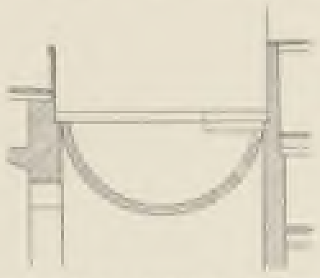
DIAGRAMS OF BOX FRONT LINES.
Figs. 375 to 380.

Here let me mention that the matter of box fronts standing above one another, setting back and the like, should receive the earnest attention of the architect. There is no doubt that a certain setting back of the box front in each tier is of very considerable advantage, both in respect to the acoustics and sighting, and some material assistance is often thus obtained for producing a good general effect. But if this setting back takes the form of a variation in the line of the box front, and a complication arises, as is the case in some of the London theatres, not only do the advantages claimed disappear, but they result in a positive disadvantage.

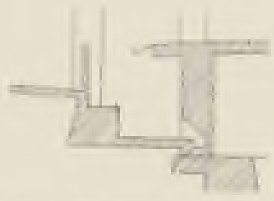
COURT THEATRE, VIENNA: Auditorium.
Figs. 381, 382. Alteration of Box Front Lines.

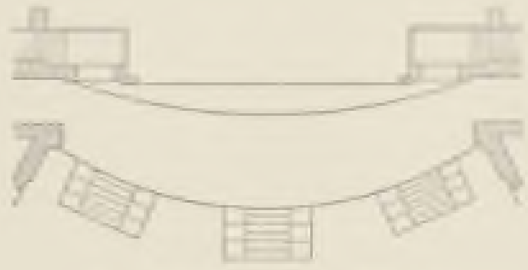
In illustration of my remarks I am submitting in Figs. 375 to 380 some examples of box front lines where the different tiers are set back. It is curious to observe how, in one instance, the setting back is exactly parallel right around the line, whilst in another case it is concentric to a slight extent, and in a third, concentric to a very considerable degree. Where the lines are parallel they are frequently determined by fixed columns which support the ceiling, as in some of the French theatres; although, as a matter of fact, in a typical French auditorium there is no setting back whatsoever, the fixed columns being on the box front lines, which is also the case where the 'pigeon-hole' principle is observed as in Italy and Spain.

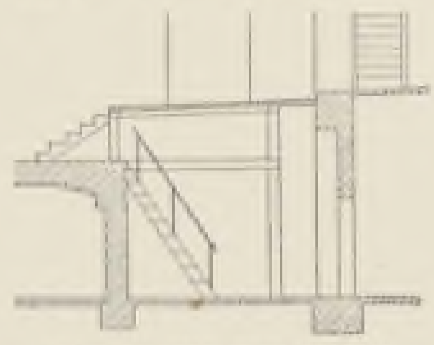

COURT OPERA HOUSE, DRESDEN.
Fig. 383. Plan of Orchestra.

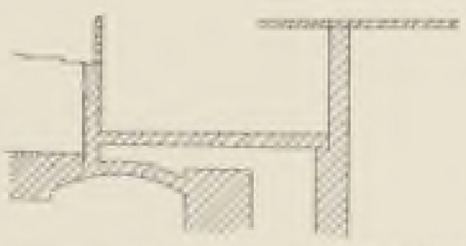

COURT OPERA HOUSE, DRESDEN.
Fig. 384. Section of Orchestra.


'TRAFALGAR' THEATRE, LONDON.
Fig. 385. Plan of Orchestra.


'TRAFALGAR' THEATRE, LONDON.
Fig. 386. Section of Orchestra.

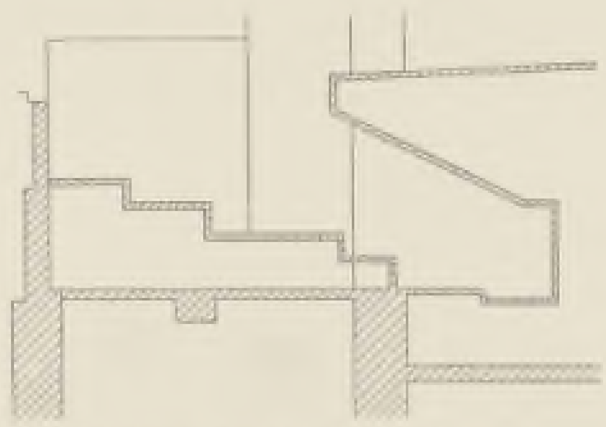

PEOPLE'S THEATRE, WORMS.
Fig. 387. Plan of Orchestra.

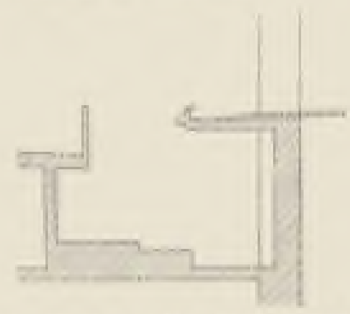

PEOPLE'S THEATRE, WORMS.
Fig. 388. Section of Orchestra.


CZECH NATIONAL THEATRE, PRAGUE.
Fig. 389. Section of Orchestra.


CZECH NATIONAL THEATRE, PRAGUE.
Fig. 390. Plan of Orchestra.

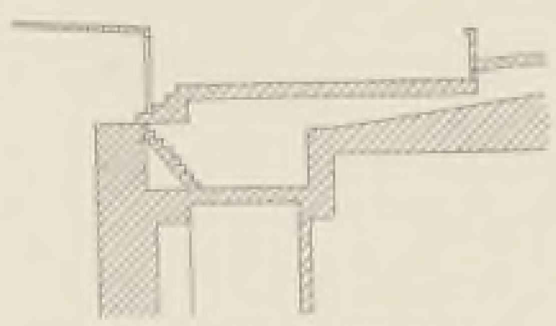

'WAGNER' OPERA HOUSE, BAYREUTH.
Fig. 391. Plan of Orchestra.

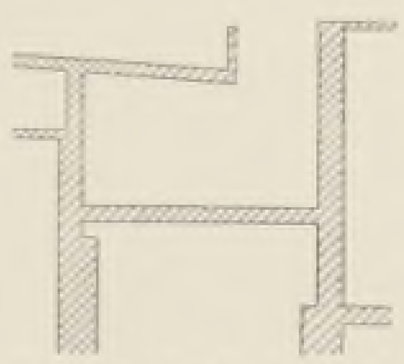

'WAGNER' OPERA HOUSE, BAYREUTH.
Fig. 392. Section of Orchestra.


MUNICIPAL THEATRE, ESSEN.
Fig. 393. Section of Orchestra.

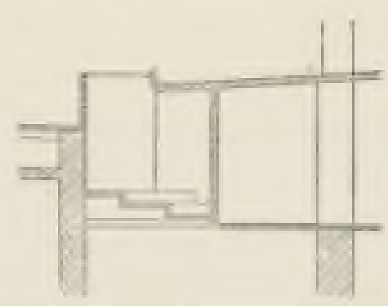

MUNICIPAL THEATRE, ESSEN.
Fig. 394. Plan of Orchestra.


NATIONAL OPERA HOUSE, PARIS.
Fig. 395. Plan of Orchestra.


NATIONAL OPERA HOUSE, PARIS.
Fig. 396. Section of Orchestra.


'RAIMUND' THEATRE, VIENNA.
Fig. 397. Section of Orchestra.


'RAIMUND' THEATRE, VIENNA.
Fig. 398. Plan of Orchestra.


'LINDEN' VARIETY THEATRE, BERLIN.
Fig. 399. Section of Orchestra.

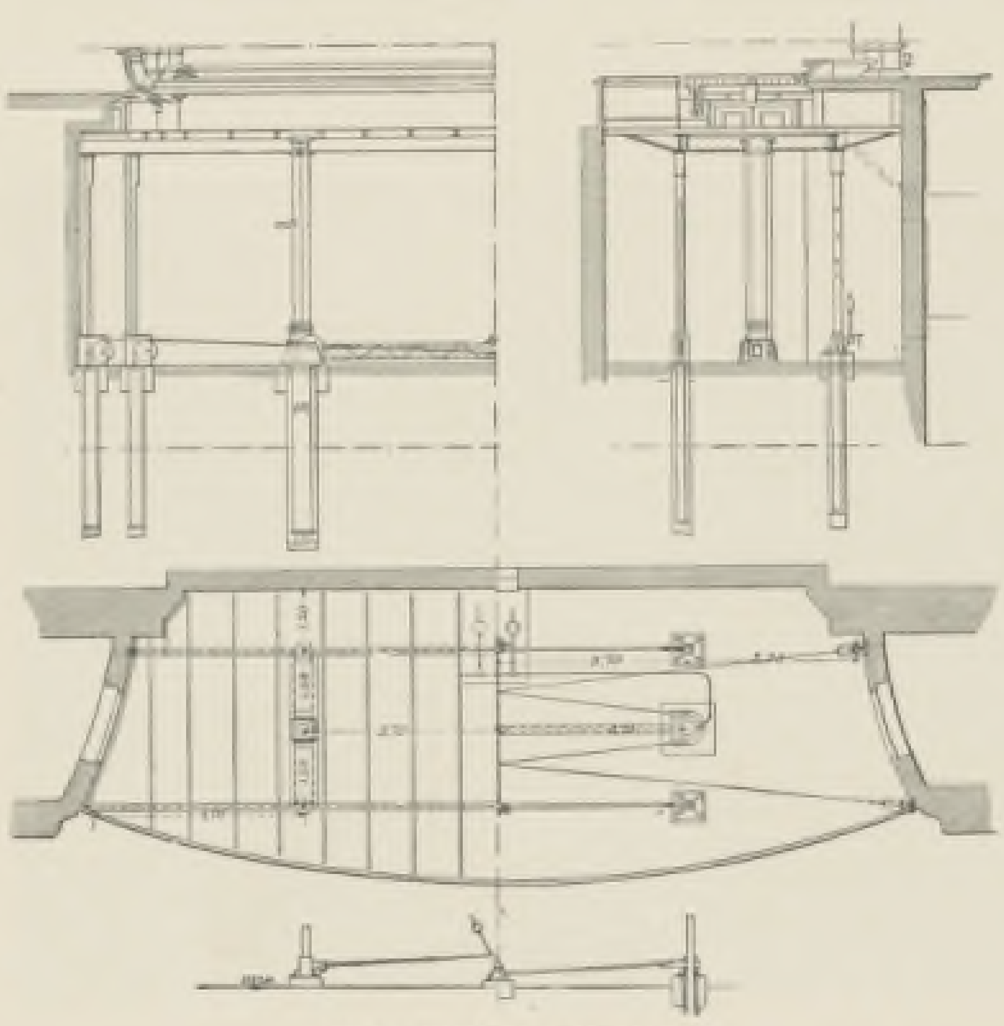

'LINDEN' VARIETY THEATRE, BERLIN.
Fig. 400. Plan of Orchestra.

In closing this section I would only refer to the two box front lines of the Court Theatre at Vienna, which present an instructive lesson. The line with the accentuated double curve presented in Fig. 381, was that originally designed and executed by Gottfried Semper and Baron Hasenauer after a very considerable study of the subject. But unfortunately the results of their investigations were not successful, as it was only too soon discovered that the acoustics were materially affected by the sharp projection of the lyre line, which occurs just before the proscenium box. That the double curve had in this instance been so injurious to the hearing qualities of the house was the more obvious when, after the alterations of 1897, the line had been flattened as shown in Fig. 382. Not only were the acoustics very noticeably improved, but also the sighting from the boxes, which had been somewhat unsatisfactory owing to the projection; and last, though not least, a few additional seats could be added to the stalls on both sides, which of course meant an increase in the receipts during the season. No better object lesson is necessary to give support to my arguments in favour of according every attention to questions of box front lines.

DIAGRAMS OF ORCHESTRA LINES.
Figs. 401 to 405.

Of course, what I have said above on the subject of proportion in the auditorium and of the box front lines may be assumed to apply to all playhouses alike, whether used for the presentation of opera, drama, or the lighter forms of entertainment. But as far as opera houses are specially concerned, or even theatres in which the production of music in front of the stage has a prominent part accorded it in the performance—say, for instance, in the presentation of ballets or spectacular pieces—there is another feature on which much depends. I allude to the orchestra.

Now, though the effect of the orchestra on the architectural rendering of the auditorium may not be very important, since efforts are generally made to hide the orchestral well entirely, or make it as inconspicuous as possible, yet, as far as the acoustics are concerned, and, to a certain extent, in regard to the sighting, its position and outline call for the closest attention. Perhaps, however, I might modify my statement as to its effect with regard to the architectural rendering of the auditorium, by saying that there are exceptions where the arrangement of the orchestra also takes a prominent part in the general scheme. Where, for instance, the Wagner principles of Bayreuth find favour, the exact location of the orchestra in the "mystische Abgrund"—which separates the auditorium from the stage—is a leading characteristic of the general conception. And, similarly, there are cases where the location of the orchestral well has been the subject of much consideration, and even a guiding feature in the determination of the lines of the proscenium frame and boxes. But nevertheless, I must emphasise the fact that, as a rule, the orchestra is treated as something quite outside of the general architectural scheme of the auditorium. This, of course, is, not as it should be; for its influence on the acoustics in particular, should not be neglected.



COURT THEATRE, WIESBADEN.
Figs. 406 to 408. Movable Orchestra Floor; Plan, Sections.

The question of the location of the orchestra depends not only on the nature of the performance but also on the principle or system on which the play is produced. I mean that, though of course the requirements of different orchestras have to be met, whether for grand opera on the one hand or burlesque on the other, the lines on which the plays are produced must also be considered. Thus the orchestra at the Paris Opera House must be located in an entirely different manner from the orchestra at some of the German institutions where the Wagner ideas are strictly observed. The same band, as far as size is concerned, may, for instance, in Paris, have to take up a large area in front of the stage, whilst at a German theatre it may have to be placed in a deep well or almost entirely underneath the stage, thus covering a very small surface from the spectator's point of view. I might enter into the discussion of a number of side issues, such as the effect of sound under different circumstances, or the number of instruments, but I am only anxious at present to emphasise the point that the arrangements of the orchestra well cannot be safely neglected. It is of quite as much importance to fix the exact position in which music can be heard to the greatest advantage by the audience, as it is to determine the lines of the auditorium, so that the actor may reap the full benefit of good acoustics.

In Figs. 401 to 405, on page 65, I show some of the more common positions of orchestra-wells in an ordinary London theatre. I would remark that the actual line of the well—which is generally determined without any regard to the scientific aspects of the question—also deserves more attention than it at present receives. As a matter of fact, its outline on the auditorium side is generally solely governed by the seating arrangement, which should certainly not be the case.

COURT THEATRE, VIENNA.
FIG. 409. VIEW OF PROSCENIUM.

On page 64, Figs. 383 to 400, I am reproducing a series of orchestras taken from buildings illustrated in these volumes, and in each case a plan and a section are given with a view to explaining the various methods adopted in setting out the well. Without entering into the question of the advantages or disadvantages of different plans or sections, I should mention that it is now a recognised fact in the presentation of Wagner's music, that his principle of the hidden orchestra should be adopted as far as practicable; and further, that whatever may be the character of the orchestra-well, it is an enormous advantage to have suitable sound-space underneath its floor, and, if possible, around its sides. The construction of an orchestra-well in such a manner that its stage side is, perhaps, the face of the brickwork of the proscenium wall is a common mistake. I have only too often found a proscenium wall on the stage side, a cellar wall on the auditorium side, and the floor of the orchestra placed either directly on the ground or on the top of some vault or cellar. At the Court Opera House at Dresden, Figs. 383, 384, page 64, it will be seen that although the orchestra is not sunk and backs on to the brick proscenium wall, a special sound-well, semicircular in section, has been constructed underneath the floor, the effect of which is particularly satisfactory. An arrangement such as is shown in Figs. 389 and 390 on the same page, from the Czech National Theatre at Prague, does not suffice for acoustic purposes, although it is better than nothing. There has been a tendency of late, for reasons of safety from fire, to concrete and cement the whole of the orchestra-well, much to the disadvantage of the music. Care should be taken to avoid this too frequent error. However important questions of safety may be, there is but rarely any reason why the precautions should affect the performance. If the orchestra-well has a carefully laid floor in hard wood, and if the vault below is accessible and is kept clean, it will suffice.

COURT THEATRE, VIENNA.
FIG. 410. VIEW OF AUDITORIUM.

As regards sunk or hidden orchestras, I cannot do better than include a diagram explaining the arrangement of the one at Bayreuth, of which an illustration will be found in Figs. 391 and 392 on page 64. This plan and section should be contrasted with that of the National Opera House, Paris, in Figs. 395 and 396 of the same page, where an entirely open orchestra is installed. A compromise may be observed in the construction of the orchestra-wells of the Municipal Theatre at Essen, of the 'Raimund' Theatre at Vienna, of the 'Linden' Variety Theatre at Berlin, and also, to a slight extent, of the Czech National Theatre at Prague, all presented on the same sheet. For purposes of economy in space—not by any means for musical or scientific reasons—this principle of the hidden orchestra has also been recently adopted to a very considerable extent in our London playhouses, where a small band of some ten or twenty musicians is generally employed. To give an instance of a small orchestra of this description I have shown in Figs. 385 and 386 a plan and section of the 'Trafalgar' Theatre. At the 'Haymarket' Theatre the orchestra was placed entirely under the stage, with no well proper in the auditorium. This is an extreme case, and I cannot say it is altogether satisfactory.

In conclusion, while dealing with this question of orchestra, I would add that there has been a very practical attempt at the Court Theatre, Wiesbaden, to make a compromise between the conflicting requirements of the large orchestras for Wagnerian opera, and the smaller ones which may be used in the same auditorium. This compromise is arrived at by placing the musicians on a hydraulic lift, or in other words, making the floor of the orchestra movable by the aid of water power. The orchestra can thus be entirely hidden from view, and arranged to hold a large number of musicians, say one hundred, or it can also be arranged for a smaller number, say forty, sitting at a higher level between the front of the stage and the first row of the stalls. Or again, if a chamber play be presented the orchestra may be entirely dispensed with and the floor can be raised to the level of the stalls, so that by merely removing the barrier between the orchestra-well and the stalls a few extra rows of seats can be placed on what thus becomes part of the area floor. This contrivance, of which I am showing the figured working drawings in Figs. 406 to 408 on page 65, is certainly ingenious, and has been found quite practicable both acoustically and otherwise. And though on its introduction the wits of the locality hinted that the appliance was used to raise the orchestra bodily when playing crescendo, and to lower it when the music is soft and distant, this ridicule was by no means deserved. In fact, those who were responsible for the idea should be congratulated, not only on its conception, but also on its simple and successful execution.

MUNICIPAL THEATRE, SALZBURG.
FIG. 411. VIEW OF AUDITORIUM.

I have spoken of the necessity of proportion in connection with theatre planning generally and in determining the lines of the auditorium. But no matter what the proportions or dimensions of an auditorium may be, the one dimension and the one proportion which always govern a theatre design, and more particularly the design of the auditorium, are the width of the proscenium opening and its ratio to the height. It has been often said with some truth that the proscenium strikes the keynote in every theatre; but I would not go quite as far as this, for the importance of the site question is quite equal to that of this opening as far as the conception of the theatre generally is concerned. The opening, however, is certainly the chief factor in determining the lines of the auditorium, and it would not be irrelevant here to add that it is also the basis on which the stage and its equipment should be, and is elaborated, as explained in Supplement III. Moreover, as a rule, the manner in which the proscenium opening is framed characterises the whole structure.

Now, it will have been obvious from the illustrations in the preceding volumes that there is a vast difference in the various conceptions of a proscenium opening and its frame. Quite irrespective of the variations in size, the difference in proportion, outline and architectural treatment is most conspicuous. And hence, following my principle of illustrating individual features in theatre planning diagrammatically where I hold that comparisons call for study, I here present some examples of proscenium openings and frames drawn in the same manner to identical scales, and placed side by side on two plates, see Figs. 415 to 431.

'GERMAN' THEATRE, VIENNA.
FIG. 412. VIEW OF AUDITORIUM.

As before, I have taken my examples from the playhouses illustrated in the first two volumes of this work, and I have also been careful that every class of institution should be represented, from the National Opera House at Paris (Fig. 427), or the Court Opera House, Vienna (Fig. 425), to the Municipal Theatre, Zürich (Fig. 418), or the small 'Oxford' Variety Theatre in London (Fig. 424). I am under the impression that these comparative diagrams will be of considerable value in determining what I have called the 'keynote' for the auditorium. In any case they will serve as a study of the various methods, not only of framing the proscenium, but also of insuring that the auditorium generally is brought in touch and harmony with the frame of the stage picture. In respect to this last named point, the manner in which different architects have overcome the difficulties of terminating the tiers against the proscenium opening, almost calls for special attention.

With regard to the individual merits of the various examples here presented it will be sufficient to say that although a proscenium opening which has a greater height than width generally gives the best architectural effect, the reverse proportion is the more practical. A high proscenium opening generally means that the upper part has to be covered by a semi-fixture, generally a metal partition coloured to represent drapery, and known abroad as the *manteau*, and there are few things so incongruous in an auditorium as this device. In my Supplement on 'Stage Construction' I have referred at length to the question of framing a stage picture, calling attention to some arguments of Hubert Herkomer, the painter, who has occupied himself much with Scenic Art. Hence I would not enter here on the subject of the anomalies of the proscenium frame, or any question of movable framings, but assume, as is essential for all practical purposes, that the principal frame of the stage picture is a thoroughly substantial fixture, and that in dimensions and proportions it meets the requirements of the institution it has to serve. I do not, however, hold that the semi-fixture of a metallic screen, in order to reduce the height of the proscenium, is at all advisable, nor is it necessary if care is taken to obtain an effective and practical proportion for the stage picture, and to make the other features of the auditorium harmonise. As to the extension or reduction of a stage picture, with the aid of adjustable inner frames, that is to my mind a question by itself, which should in no way influence the principal dimension, i.e. the width of the main frame,—known generally as the proscenium frame.

'HER MAJESTY'S' THEATRE, LONDON.
FIG. 413. VIEW OF PROSCENIUM OPENING.

I have selected my examples of proscenium openings from every class of playhouse, and I have made some attempt to ensure that the various styles of architectural treatment common to such buildings should be represented in order that it may be seen to what extent different architectural styles meet the demands of the governing feature of the auditorium. I believe all the styles generally used in the auditorium of a theatre are represented, from the severer forms of Italian Renaissance (Fig. 416), to the Neo-Russian (Fig. 423), and the nondescript variations of Saracenic (Fig. 430). I have further supplemented the proscenium views presented in the preceding volumes by several other reproductions from photographs or sketches which will be found either in this chapter or in illustration of other sections of my treatise. Perhaps I should point out that in individual instances these views also show the all-important proscenium curtain. The various diagrams and views should tend to explain the various methods adopted in overcoming that difficult corner to which I have referred, i.e. the point where the tiers join the proscenium, either directly, as, for instance, in the case of the 'Alhambra' Variety Theatre in London, or where this direct conjunction of tiers and frame is broken—as is almost invariably the case—by the establishment of a second and broader frame, which contains the proscenium boxes. It is, in fact, quite the exception that the tier should run directly into the frame, as at the 'Alhambra' Variety Theatre (Fig. 430). Some break, no matter how narrow, is nearly always to be found, and reference to the plates with diagrams of auditorium plans will clearly show how very rare the direct junction is.

In connection with determining the actual proscenium frame, there almost invariably arises the question, not whether there should be a second frame containing proscenium boxes, but simply what lines this second frame should take. For there is an enormous difference between the deep frames with three or four sets of boxes which have been recently adopted by such architects as Fellner and Helmer, and the more common form of frame containing one set of proscenium boxes only. There is also the question of compromise between the direct junction and a second proscenium frame, to which I have referred when dealing with Heinrich Seeling's theatres in the preceding volumes. I allude to the manner of flanking the proscenium frame by two structures containing boxes, which, however, can in no way be considered a part nor an extension of the frame proper. Such flanking arrangements may be seen in the Municipal Theatre at Bromberg, presented in Volume II., and are again shown at the 'Concordia' Variety Theatre, Berlin, illustrated on page 56, in my chapter on the general arrangement of playhouses.

'FLEMISH' THEATRE, BRUSSELS.
FIG. 414. VIEW OF PROSCENIUM OPENING.

FIG. 415.
'RAIMUND' THEATRE, VIENNA.

FIG. 416.
CZECH NATIONAL THEATRE, PRAGUE.

FIG. 417.
COURT OPERA HOUSE, STOCKHOLM.

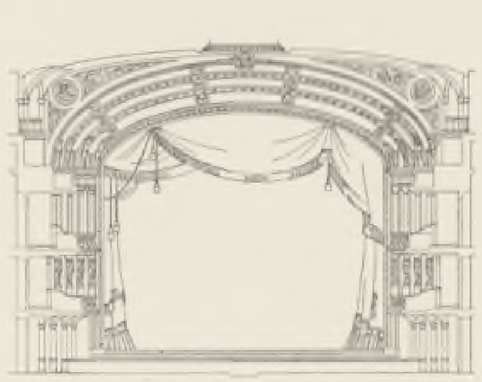


FIG. 418.
MUNICIPAL THEATRE, ZÜRICH.

FIG. 419.
PEOPLE'S THEATRE, TURIN.

FIG. 420.
MUNICIPAL THEATRE, HALLE.

FIG. 421.
'LINDEN' VARIETY THEATRE, BERLIN.

FIG. 422.
COURT THEATRE, VIENNA.

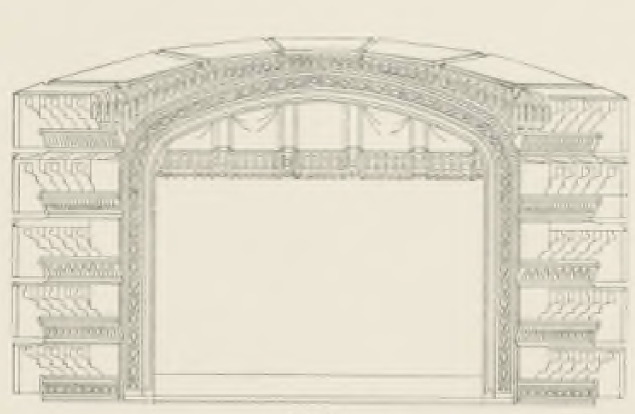


FIG. 423.
MUNICIPAL THEATRE, TIFLIS.

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AUDITORIUM: ELEVATIONS OF PROSCENIUM FRAMES.

Fig. 424.
'Oxford' Variety Theatre, London.

Fig. 425.
Court Opera House, Vienna.

Fig. 426.
Municipal Theatre, Laibach.

Fig. 427.
National Opera House, Paris.

Fig. 428.
Municipal Opera House, Frankfort.

Fig. 429.
Daly's Theatre, London.

Fig. 430.
'Alhambra' Variety Theatre, London.

Fig. 431.
Municipal Theatre, Amsterdam.

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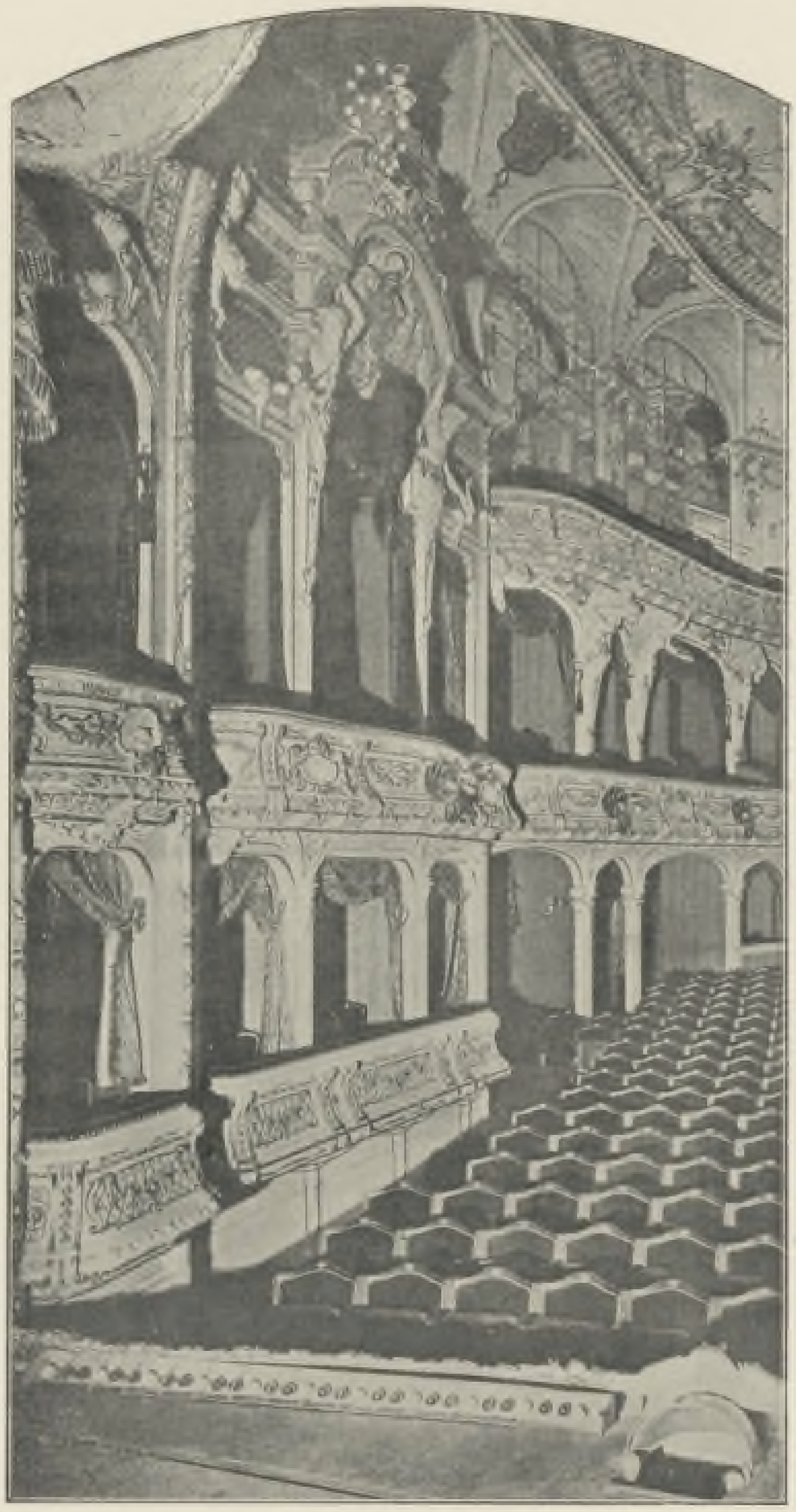
AUDITORIUM: ELEVATIONS OF PROSCENIUM FRAMES.

These compromises go even further, for we find at the 'New' Theatre at Berlin a frame containing one set of proscenium boxes, which is no doubt intended as a *bonâ fide* proscenium frame, and then on either side of this a pair of structures, each holding three further important sets of boxes, which, however, need not necessarily be termed proscenium boxes. In mentioning this example of the 'New' Theatre I am referring in particular to the large photograph presented on this page, and to the plates and a sketch which are given in Volume I.

For an instance of more simple arrangement of two such additions on each side of the proscenium frame, I should, perhaps, also refer to the photograph of the Bromberg Municipal Theatre, reproduced in the concluding chapter of this treatise, as well as to the drawings shown in Volume II. I think that these examples suffice to describe what I mean by speaking of flanking structures on each side of the proscenium frame proper, though there are several other illustrations which might be given. It is argued in favour of such flanking structures as compared with the more ordinary form of proscenium frame with its boxes that they are economic, and allow of greater openness and freedom in treating the auditorium and its ceiling. I do not quite appreciate the argument of economy nor the one relating to the openness of treatment. I would prefer to say that an excellent effect can be obtained without involving any extra expenditure, and that they offer certain facilities in design.



'NEW' THEATRE, BERLIN.
FIG. 432. VIEW OF PROSCENIUM CORNER.

But to turn to instances where the tiers run directly into the proscenium frame proper, besides calling attention to the proscenium lines of the 'Alhambra' Variety Theatre, shown in the form of a diagram in Fig. 430, which will perhaps be better appreciated by reference to a photograph in Volume I. on page 43, I would here only point to two further examples, one being the proscenium of the small auditorium at the 'Criterion' Theatre in this Metropolis, Fig. 354, page 61, and the other the proscenium of the 'Flemish' Theatre at Brussels, of which a drawing is shown on the preceding page. At the 'Alhambra' Variety Theatre and the 'Criterion' Theatre we have instances of the tiers running directly into the proscenium proper, practically regardless of architectural feeling. At Brussels, on the other hand, it is more a question of the tiers running into the proscenium wall, which is treated as a blank surface, having a quite independently framed recess for the proscenium opening. Reference to the plates in Volume I. will very clearly show the difference of treatment in the two London examples compared with that at Brussels. Blank walls with independent frames, such as we see at Brussels, will also be found in other examples. At the Czech National Theatre, Prague (Fig. 416), for instance, the tiers run directly into the proscenium wall, but in this case they receive an architectural treatment which accentuates the juncture. Several photographs in Volume II. may be referred to for illustration of this kind of arrangement. Then again there is the direct juncture commonly found in the ordinary Italian auditorium, where the 'pigeon-hole' box principle is adopted. Yet, even there, if we turn to the 'Filodrammatico' Theatre, Milan, Fig. 437, page 73, we notice that some attempt at a 'dummy' second proscenium has been made; so that we may take it the advantages of the break are also recognised in Italy.

But speaking generally, the direct union in any form whatsoever, as well as the compromise in the work of Heinrich Seeling and Gustav Ebe, is exceptional. Usually there is a second proscenium frame, and the only question is to decide what character the frame shall take. As a rule, too, the outer proscenium frame is so arranged as to include boxes, but there are, nevertheless, instances where it takes the form of a mere 'dummy.' In the 'Filodrammatico' Theatre at Milan we had such a 'dummy' in the most elementary form of a specially broad reveal to the actual proscenium opening. Similarly, if we turn to the plates and photographs illustrating D'Oyly Carte's English Opera House in Volume I, we find a 'dummy' in the form of a marble framework, though, in this instance, it is designed in conjunction with a large proscenium cove, which stands on one of the two sets of proscenium boxes in a somewhat nondescript manner. But it is when designing the usual second proscenium frame with boxes that there arise the questions of how deep the proscenium shall be, how many sets of boxes it shall hold, and if the boxes shall have any particular character. And when I speak of character, it should be remembered that the different purposes of a playhouse at once make themselves felt in this part of the house. For instance, in Court and National Theatres, the character of a State Box is generally given to those situated on the first tier level in the proscenium frame, and there is an incognito box below it; whilst in private theatres, where the seating capacity has to be considered to a nicety, a large number of boxes have to be placed in a given depth of frame, and, of course, full advantage must be taken of each tier. Then there also arises a question as to whether the boxes of the proscenium should have their floor level identical with that of the first row of seats on their respective tiers, or if the proscenium and its boxes should be treated quite independently, in which case the tiers would indiscriminately cut into the proscenium. Then follows the question whether the proscenium frame should have State Boxes split up into two levels to afford extra accommodation. We may even have a case in which three adjoining boxes situated on the same tier can be converted into one large one.

COURT THEATRE, VIENNA.
FIG. 433. VIEW OF PROSCENIUM CORNER.

Among the examples of a proscenium frame having a State Box on the first tier and an incognito box below it, none more successful can be shown than that of the Court Theatre at Vienna. Unfortunately, however, the State Boxes in this case are somewhat out of scale with the detail of the box fronts and box divisions, and the general rendering of the tiers is thus dwarfed. But regarded solely by itself, this proscenium is most successful, and one need only turn to the plates of Volume I. in order to see how cleverly the difficulties of the situation were overcome. On the opposite page Fig. 434 shows the line elevation of the proscenium boxes, and I have supplemented the drawing by a photograph of the upper part, given in Fig. 433 on this page. In the drawing, I have made a point of indicating the exact relation between the tiers and the proscenium frame, and it will thus be perceived to what I refer when I speak of the unfortunate difference in scale. This will be seen even better still from the two views of the auditorium of this playhouse in Figs. 409 and 410, page 66.

Leaving the Court Theatre, Vienna, I wish next to notice several other proscenium frames containing State Boxes, of which we have already had illustrations in the preceding volumes; for instance, in the National Opera House of Buda-Pesth, and the Court Opera House of Vienna. I would also particularly call attention to the deep prosceniums containing a number of important boxes, of which those on the first tier may be used as official boxes, state boxes, etc., as the case may be. Striking examples are afforded in those of the Municipal Opera House, Frankfort, and above all, in the more recent institutions erected from the designs of Fellner and Helmer. Among the latter, I would particularly call attention to the Municipal Theatre at Odessa in Volume I., the plates of which are supplemented by a view on page 57; to the 'German' Theatre at Prague, in the same volume; and to the Municipal Theatre at Zürich, in the second volume. In connection with this point, I am adding on page 67 a photograph and on page 73 a sketch of the auditorium of the 'German' Theatre at Vienna.

I do not wish to treat the subject in greater detail, as numerous illustrations of proscenium frames and corners have already appeared in this work. In fact, a special effort has been made to illustrate the manner in which the more difficult problems have been solved. I will, therefore, proceed to point out some of the more commonplace methods of arranging boxes and proscenium frames in this country. Thus, on page 72 will be noticed the proscenium of the 'Empire' Variety Theatre at Bristol, of which drawings are also shown in Volume I., and there is the proscenium opening proper of 'Her Majesty's' Theatre, London, in Fig. 413, page 68, a general view having been given on page 53 in Volume II.

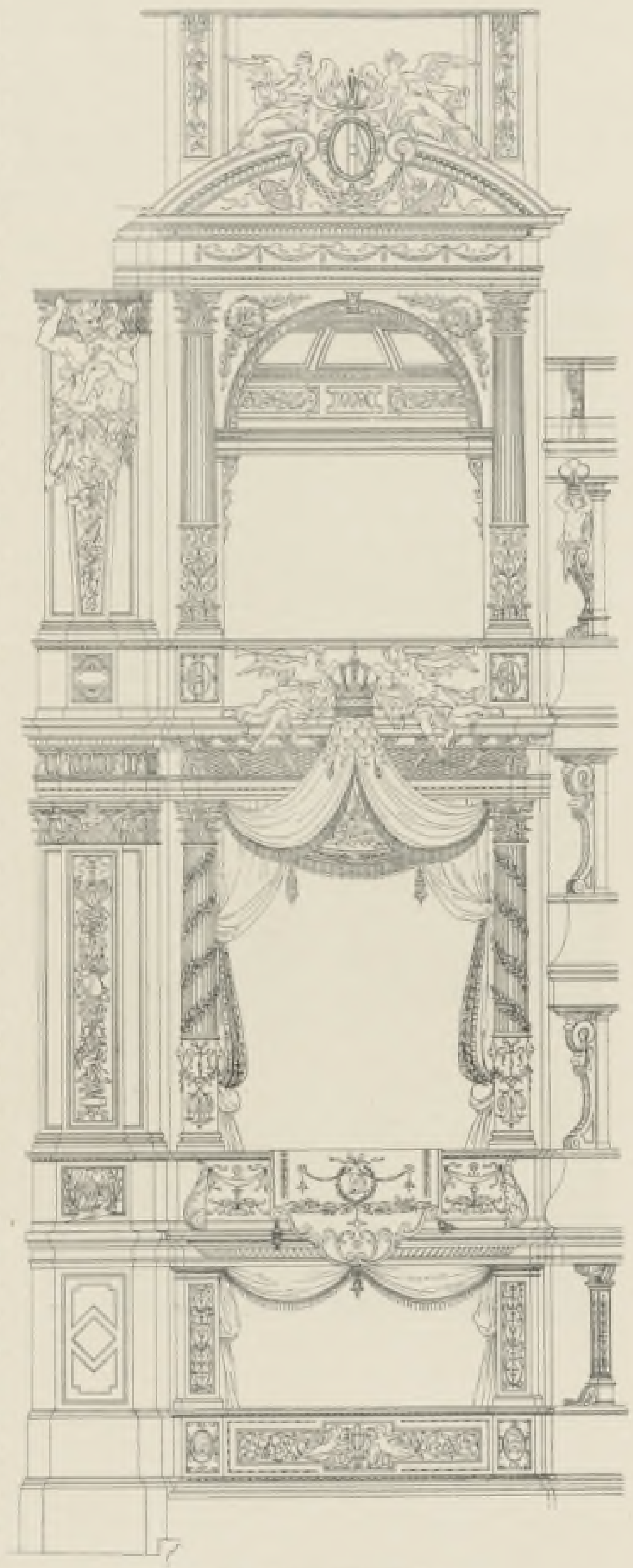
These may be taken as samples of the stock patterns adopted by English architects in the few cases where there has been some attempt to be logical. As a rule, I am afraid, there is not even a semblance of system in their conceptions, the nondescript lines of the proscenium generally leaving little room for comment. Even the proscenium at D'Oyly Carte's Opera House, to which I alluded above, is most unsatisfactory in this respect, and the same may be said of Daly's Theatre. In many other examples the architectural rendering can simply be described as that species of decoration which is calculated by the 'foot super,' with a time limit as the 'essence of the contract.'

Finally, however, I should say that, on the whole, the second proscenium frame with its boxes affords one of the most complicated problems in theatre design, and that often, no matter how successful the frame proper may be by itself, the combination of the two is disastrous. Even in the work of Charles Garnier, who was at infinite pains to obtain a good result, and fully recognised the difficulties, there is no doubt much room for improvement. The conception of the large State Boxes of the Paris Opera House, cut up into two tiers, is, to say the least of it, unworthy of the author. The frame itself leaves nothing to be desired, but when the proscenium is considered as a whole it is a different matter. The same remark applies to 'Her Majesty's' Theatre, London. Nothing better could be desired than the simple frame shown in Fig. 413, page 68. But if we refer to the photograph on page 35 in Volume II., it will be observed that the effect of the proscenium as a whole is unsatisfactory.

Speaking quite generally, there are as yet few successful prosceniums, but I am under the impression that the curvilinear solution, i.e. that of a large cove around a semi-circular or elliptical proscenium opening, as frequently adopted by Ferdinand Fellner and Hermann Helmer, is one of the most satisfactory, and should serve as a basis for future work. Setting aside the question of refinement in detail, there are few more successful proscenium effects than are to be found in the theatres of the Vienna specialists, and I would again draw special attention to the Municipal Theatre at Zürich. But—and this must never be forgotten—the architectural rendering of the auditorium, and above all of the ceiling, must harmonise with the proscenium. The ceiling must be thought out hand in hand with the proscenium, and on no account independently, as though it had no relation to it. It is by the combination of proscenium and ceiling that the Vienna specialists have been able to accomplish such effective work.

Prior to touching on the question of ceiling design, I cannot do better than speak of the need for carefully considering the character of the box fronts and box divisions, as distinct from their outline, for although their function is principally decorative, yet the manner in which they are formed influences, to a certain extent, the acoustics of the auditorium.

Having spoken of the box front line, and of the fact that box fronts of different tiers are set back behind one another, I should perhaps at once say that in modern buildings of inferior architectural pretensions—and in this country with the primary object of economy—it is becoming customary to let the tier fronts 'rake' from front to back, an arrangement which is particularly helpful to the sighting. I have said that this principle is chiefly adopted in buildings of secondary architectural pretensions, and I think I am justified in stating that it is only in such buildings that such makeshifts are permitted. I do not expect, however, from a technical standpoint, and considering the general feeling to-day on the application of modern engineering methods to all forms of buildings, that the 'raking' tier front is likely to meet with disfavour or much opposition. But it is distinctly ugly, and architecturally I hold this 'raking'



COURT THEATRE, VIENNA.
Fig. 434. View of Proscenium Boxes.

incorrect, even if it be ingenious. In reality it is the outcome of a desire for economy which should not, and need not, be associated with a playhouse. That this is the case is only too obvious from the fact that this arrangement is almost entirely restricted to the private theatre of the British Isles, where of course the question of design is quite a minor consideration. Even the Vienna specialists, Fellner and Helmer, whose reputation for economy is well known, do not introduce such makeshifts. Where, as in the case of the 'Linden' Variety Theatre at Berlin, i.e. in a house devoted to the lighter forms of entertainment, a slight 'rake' was applied by them, it is so slight as to be scarcely perceptible to the eye. When, however, we turn to such examples as D'Oyly Carte's Opera House, Daly's Theatre, and some other examples of our leading playhouses, we find how unsatisfactory is the general effect of the steep 'rakes' and double curves. It was pleasant to see that when the late C. J. Phipps was engaged on his *chef-d'œuvre*, 'Her Majesty's' Theatre, he most carefully avoided going to extremes on this point. The application of a 'rake' is, no doubt, most valuable, both as regards the sighting, and from an economic point of view. But where a 'rake' involves the eye-sores to which we have been treated in this country, there is reason to regret that this modern method of construction should ever have been employed in the playhouse. Why not, if it be absolutely essential to secure the advantages of a 'rake,' reduce the 'rake' to a minimum, and then judiciously decorate the box-fronts in such a manner as to produce the optical illusion that they are quite horizontal?

'EMPIRE' VARIETY THEATRE, BRISTOL.
FIG. 435. VIEW OF PROSCENIUM.

In speaking of the box division I must not forget to mention the essential difference between the box of an Italian auditorium arranged on the 'pigeon-hole' principle, and the open box, which is not a box in our sense of the word, but simply a small section of the tier, divided off and holding a limited number of seats. There are innumerable variations between these extremes, from the various kinds of partly open boxes, which are almost entirely closed, as in some of the French theatres, to the partly open box so common in Germany, which might almost be taken as entirely open.

For the Italian or 'pigeon-hole' system, there is no doubt that the light columnar marking of each box division is the most effective, as may be observed from the various examples already presented where this principle is applied. The box division of many French theatres, which takes the form of a double curve without any ornamentation whatever, is, to my mind, unpleasing, inasmuch as such an important feature of the auditorium calls for most careful architectural rendering. Where half-open boxes have to be installed, I would prefer to see those we find in many of the German and Austrian theatres. The pleasing result obtained by the manner in which the division is marked at the Court Theatre, Vienna, for instance, will be seen on page 11, Volume I. What I understand by a box being almost entirely open will be seen from a sketch at the Dresden Opera House on page 20, Volume I., whilst the box where the difference can scarcely be noticed will be observed at the 'German' Theatre, Prague, for were it not for the marking of the corbels which support the tiers above, we should there have a *bonâ fide* open box. This instance will be found on page 18 of the same volume. I would similarly call attention to a box division at the Czech National Theatre at Prague, shown on page 23, Volume II., and to the plainer rendering at the 'Raimund' Theatre, Vienna, which may be found on page 28 of that volume.

The 'pigeon-hole,' or closed boxes, are, as I have said, characteristic of Italy, though in the boxes used in the Metropolis privacy on similar lines is demanded. The half-open boxes, which are often very nearly closed, are most common in France, where the privacy desired is, as a rule, afforded by a small ante-room. With a yet lesser degree of privacy the half-open box, with and without an ante-room, may also be found in other Continental countries. But the open box, or almost open box, is essentially Teutonic, and the demand for ante-rooms is also but seldom put forward in Germany and Austria. When provided, in fact, they are of a quite secondary character, merely fulfilling the purposes of draught-excluders and cloak accommodation. There being no demand for privacy among the playgoers in German-speaking countries, the principle of division by boxes is not considered important, and the seats in a box are generally sold separately. I have often known a family prefer to take the two front seats of three adjoining boxes rather than take one box for six. This is certainly more practical from their point of view, as, if privacy is not demanded—and privacy can scarcely be said to be possible in a half-open box—it is natural to seek the best seats available; for the back seats of a box, or, in fact, the seats in any row at the side of an auditorium other than the first, cannot be said to be absolutely the best. This is one of the points, trivial as it may be, which brings out plainly the enormous variations existing in the conditions which architects have to fulfil in designing playhouses in different localities. Such a detail as whether a box shall be open, half-open, or closed, is also most important as far as the appearance of an auditorium is concerned, and I may even say, characterises the interior almost as much as the lines of the proscenium opening. In concluding my remarks on the various examples of box divisions presented in these volumes, I must emphasise the necessity of giving every attention to the best method of meeting local requirements in respect to the provision of boxes, since, quite irrespective of the fact that such a matter considerably affects the popularity of an establishment, the general appearance of the auditorium greatly depends on the rendering here adopted.

'GERMAN' THEATRE, VIENNA.
FIG. 436. VIEW OF PROSCENIUM CORNER.

Prior to the foregoing remarks on box fronts and divisions, I pointed out how essential it is that the design of the ceiling of an auditorium should thoroughly harmonise with the lines of the proscenium opening and its frame, as the ceiling is a feature second only in importance to the proscenium itself. Therefore I would here supplement the examples of ceilings given in the preceding volumes by a few further instances; but it would be well to observe that, before determining the lines of the ceiling, it is essential to know the nature of its supports, or at least, the character of such architectural features in the auditorium, if any, that give a semblance of supporting it.

'FILODRAMMATICO' THEATRE, MILAN.
FIG. 437. VIEW OF PROSCENIUM.

It will have been observed that the variety in supports is again most marked. We have the usual differences in the countries showing Teutonic and Latin influence, with all manner of modifications. Speaking generally, however, we may say that in France, Italy and Spain the ceiling is supported by uprights placed on a line with the box fronts. These usually consist of four pairs of strong columns, over which arches are thrown, as I have already noticed in speaking of the general lines of the French auditorium. As an alternative, there may be a sequence of columns holding an architrave which carries the ceiling, or there may be various modifications or combinations of this principle. In an essentially Teutonic country, on the other hand, the ceiling is scarcely ever supported by uprights placed on the box front line. If these exist, they almost invariably stand back behind the box front line of the topmost tier, and are sometimes connected by arches forming the arcade which we see depicted in the Fellner and Helmer examples, or in designs of greater severity, such as the Court Opera House at Dresden. But in other cases, the ceiling seems to spring from the back wall of the auditorium, and the fact of its being supported by this wall is sometimes marked by an architrave or series of pilasters, or, perhaps, by some freer rendering of a caryatid such as we find for instance illustrated in Fig. 439, page 74. On pages 74 and 75 of this chapter there will be found several studies of the manner in which ceilings are supported. In closing, I need merely say that in Latin countries the auditorium ceiling covers only the well of the auditorium, whilst in countries showing Teutonic influence, the whole of the audience is supposed to be under one ceiling, though those seated at the back of a topmost tier are frequently placed in some kind of well.

It would be a hard task to attempt an explanation of the principles adopted in the conception of auditorium ceilings in English theatres, as it is questionable even whether any principles actually exist. Reference to the illustrations of these theatres will perhaps show this better than any words can, and if I might add anything it would be that we frequently find dome-shaped ceilings which are either supported by the main containing walls of the auditorium, or on columns or light steel uprights, so-called 'pins,' lodged in convenient positions. As a rule, however, the only attempt at a principle observed is that the form of the ceiling shall be in relationship with the roof construction. A flat ceiling placed under the main trusses of a wooden roof is very common, and we also find the trusses of a roof taken up on a 'rake' and a ceiling following this line. Reference to the examples I have so frequently noted as the best work to be found in this country, i.e. D'Oyly Carte's Opera House, 'Her Majesty's' Theatre and Daly's Theatre, will perhaps give the clearest idea of the prevailing practice in London.

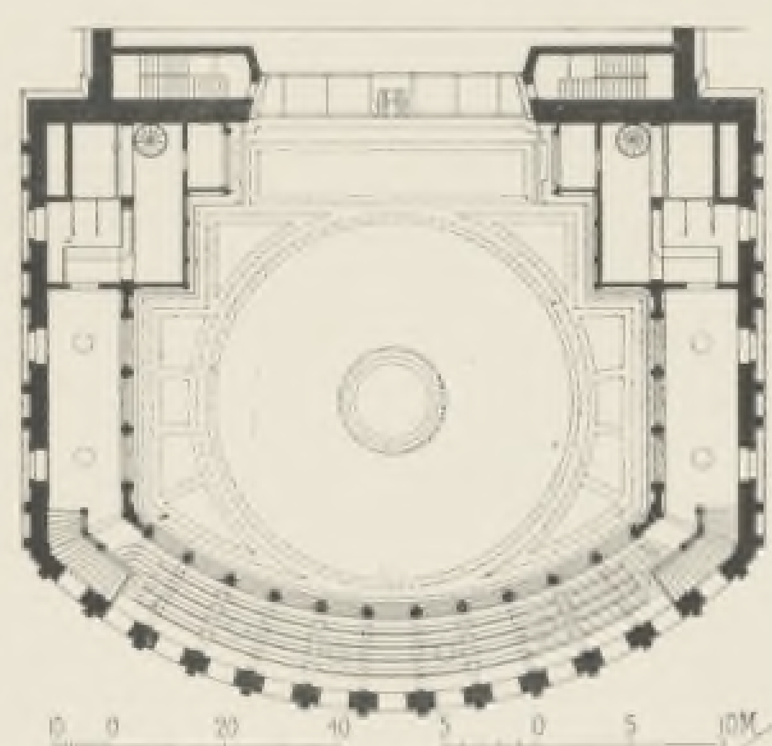
FLEMISH THEATRE, BRUSSELS.
FIG. 438. PLAN OF CEILING.

It had been originally my intention to follow the method adopted elsewhere in this work by showing the different characteristics of the ceiling diagrammatically, but I am afraid that the great variety in the delineation of this feature is such as to exclude any attempt at illustrative classification, or, in fact, any hard and fast division beyond the grouping according to the method of support.

Nevertheless, by studying the supplementary instances here presented, and carefully comparing them with the plans and sections of the playhouses from which they are taken, the student may obtain a considerable insight into the prevailing practice. To make such a selection is in itself difficult, and I have limited myself to presenting a few instances typical of different countries and different classes of buildings, which, if examined together with the views already produced, may be said to cover some of the principal methods of designing this all-important feature of the auditorium.

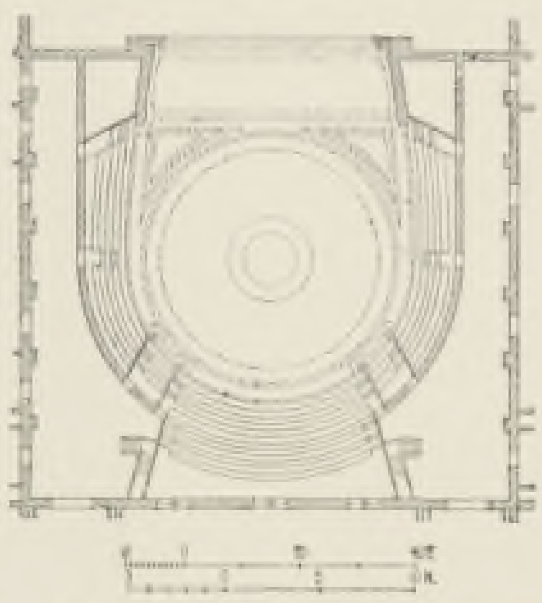
'LESSING' THEATRE, BERLIN.
FIG. 439. CEILING SUPPORT.

As regards the examples already illustrated to a large scale, I need only refer to the double plates on which are respectively illustrated the ceilings of the Court Theatre at Vienna and the National Opera House at Paris. The former will be found in the first volume, and the latter in the second. I may also call attention to the plate in the first volume on which is presented the ceiling of the Dresden Court Opera House, by Gottfried Semper, as it will be seen that, to a certain extent, its outline served as a basis for his later conception of the ceiling of the Court Theatre at Vienna, which was materially elaborated in detail by Baron Hasenauer. There is, of course, a very important difference in the manner in which these two ceilings are supported; for the example at Dresden rests on an open arcade, whilst the Vienna ceiling is supported by the main containing wall of the auditorium; but for all that, both show as the dominant feature, the circle, and, what is more, the circle which in plan cuts beyond the line of the main proscenium boxes. Speaking of the circular line, it will be seen that the Paris National Opera House has a similar circle as the controlling feature of the ceiling, but I would emphasise the fact that it here stands absolutely independent of the proscenium frame. This circular line enjoys particular favour on the Continent, and reference to the following pages of this chapter will show how it has been applied under the most varied circumstances, as, for instance, in the case of the Czech National Theatre at Prague, of which the ceiling is shown in Fig. 444, page 76, in the ceiling of the Municipal Theatre at Geneva, see Fig. 442, page 75. Even a flat ceiling, such as that of the 'Concordia' Variety Theatre at Berlin, illustrated in the preceding chapter, has the circle. And where the circle has been difficult to arrange for, we still find the application of the same principle in the form of the elongated circle or ellipse. A modification of this description will be found at the Court Opera House, Vienna, the ceiling of which is shown in Fig. 445, page 76. In the examples just mentioned, I assume that it is scarcely necessary to point out the differences of support, for comparison with the general plans and sections of the playhouses in question will easily show how, for instance, in the last-named example, and in the Czech National Theatre at Prague, the ceilings are supported by arcades, and how the arcade in the Prague example stands very differently from that of some of the other instances mentioned.



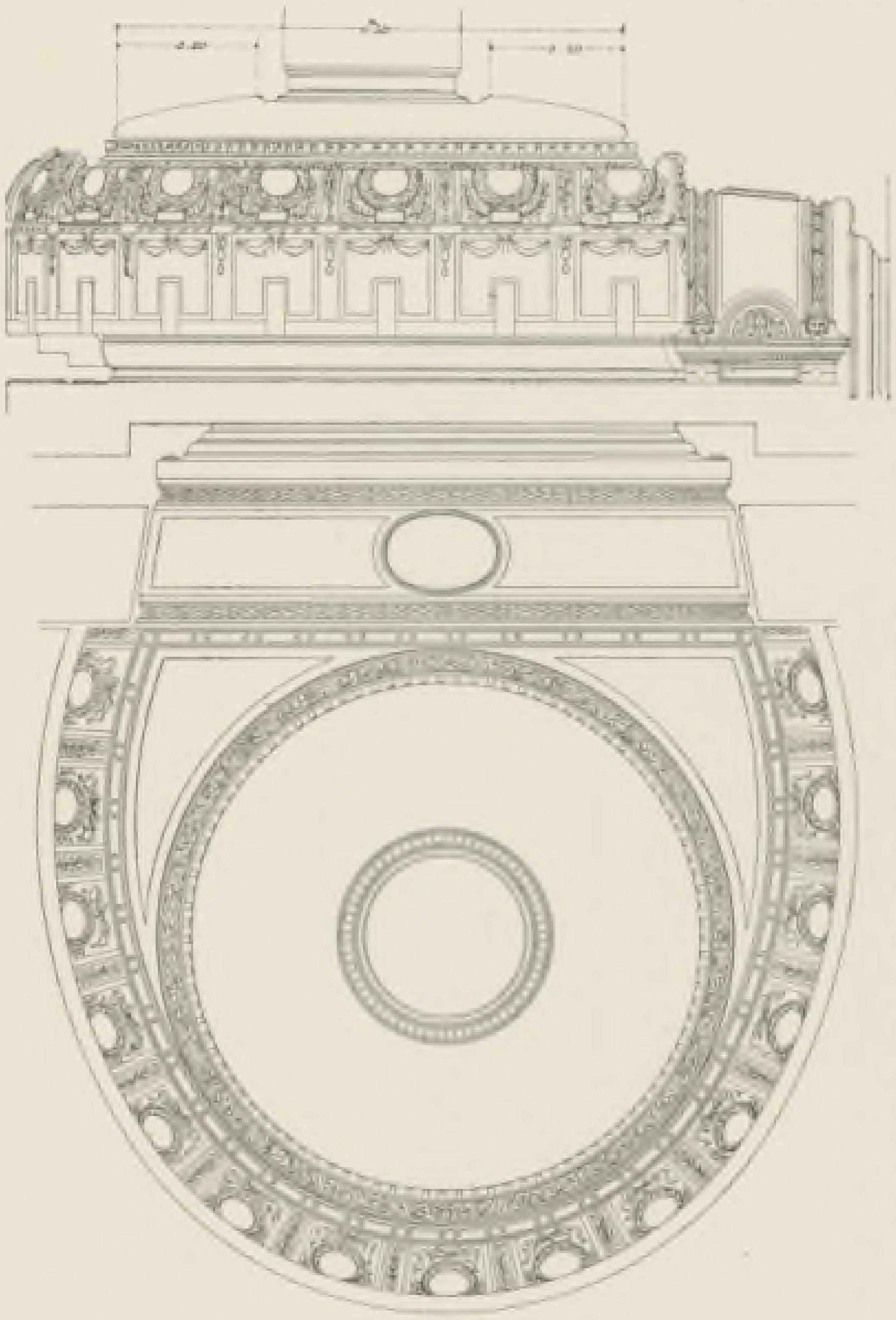
COURT OPERA HOUSE, BERLIN.
FIG. 440. PLAN OF CEILING SUPPORTS.

Nor need I point to the technical features which govern their outline, for in many of the ceilings it will be at once observed how the design has to meet the specific requirements of large or small ventilating ducts, of sunlight burners, chandeliers, or even a glazed cupola, such as we find in the ceiling of the 'Flemish' Theatre, Brussels. All this would lead too far. But one point I should note, and that is the great difference between the ceiling which is regularly divided up in the form of the geometrical pattern, and the ceiling which practically appears as one large surface on which, I might almost say, the decorations are placed indiscriminately. The latter method of treating the ceiling is particularly characteristic of the work of the Vienna architects Ferdinand Fellner and Hermann Helmer. For this reason I would refer to the general views of the auditorium in examples for which they are responsible, and particularly to some of the special ceiling views from Salzburg, Zürich and elsewhere reproduced in this volume, in which an attempt has been made to show by photography the effect of some of their ceiling designs seen, say, from the first row of the stalls looking towards the 'front of the house.' The auditorium of the 'German' Theatre at Vienna is shown in Fig. 412, page 67, and of the Salzburg Theatre in Fig. 411, on the same sheet. Both the first and second volumes contain similar illustrations. It is in this rendering of the ceiling that the Vienna architects have been particularly successful, and taken generally, I am under the impression that the absence of absolute regularity or geometrical patterns is advantageous to the general effect of the auditorium except in those cases where the severest styles of architectural rendering predominate. It is only in the auditorium which is treated on the lines of the Italian 'Renaissance' style, or on classical lines, that methods of geometrical rendering almost become compulsory.



MUNICIPAL THEATRE, AMSTERDAM.
FIG. 441. PLAN OF CEILING SUPPORTS.

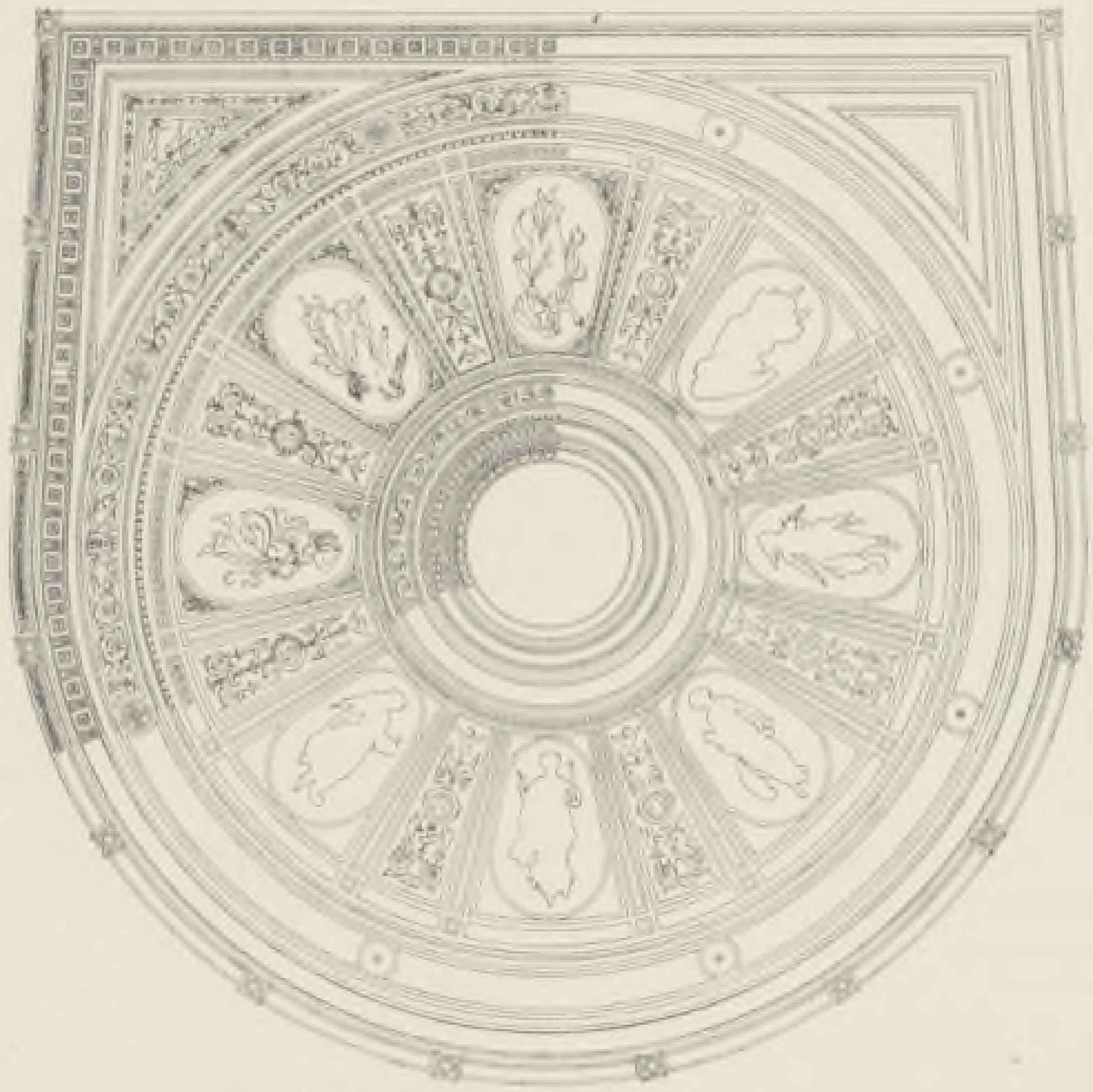
I do not wish to enter further into the subject, but I cannot help pointing to the example of the ceiling at the 'Oxford' Variety Theatre, London (see plates in Volume I.), as an instance of the English dome-shaped ceiling supported at the four corners, which has of late gained considerable favour, and is certainly an improvement on the more indiscriminate forms of ceiling construction common to the Metropolis. I would repeat that the endless variations in the arrangement of ceilings, frequently no doubt created on identical principles, make it impossible to speak of types of ceilings, much less to assert that any two or more playhouses are similarly equipped in this respect.



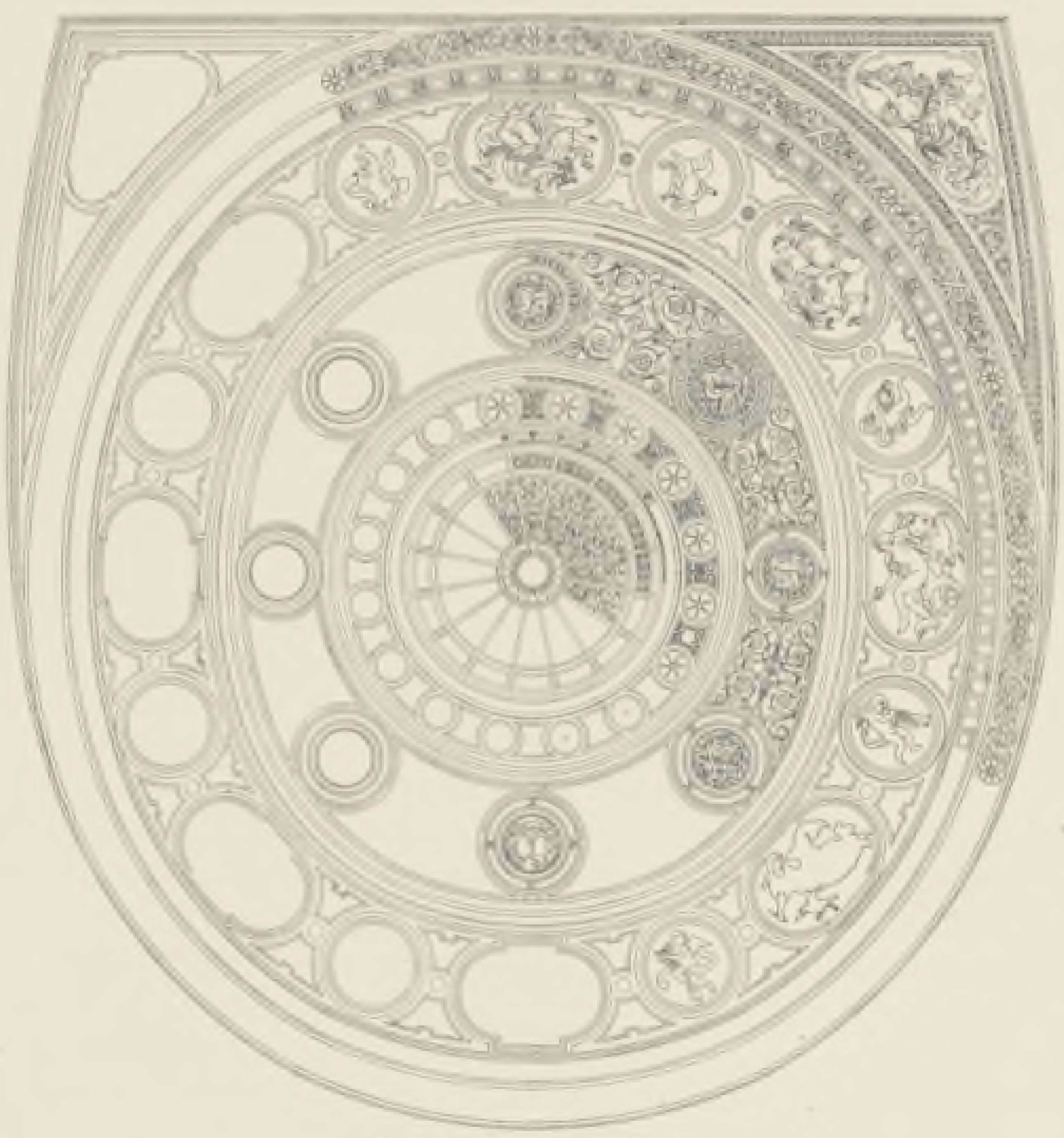
MUNICIPAL THEATRE, GENEVA.
FIGS. 442, 443. PLAN AND SECTION OF CEILING.

Before actually leaving this question of ceilings, I should point out that, quite irrespective of the main lines, there can also be enormous variety in the decorative treatment, either by the employment of painting alone, of semi-relief and fresco work, of semi-relief and colouring, or of semi-relief in one colour only. Naturally the principles of the decorative schemes found in theatres vary greatly, but, as a rule, personifications of Drama, or Opera, as the case may be, have been the leading motive of the decoration whether in sculpture, semi-relief ornament or fresco. In institutions having traditions, we find portraits of notable musicians, dramatists or actors who have been associated with the house. In those playhouses, too, especially connected with certain composers or authors, we often find that portraiture takes a prominent place. But, generally, the decorative scheme is symbolical or allegorical, and questions arise as to how much elaboration in the painting of certain allegories or symbols the funds will allow, and what amount of framing the painting demands, according to whether it takes a primary or secondary position in the treatment of the ceiling.

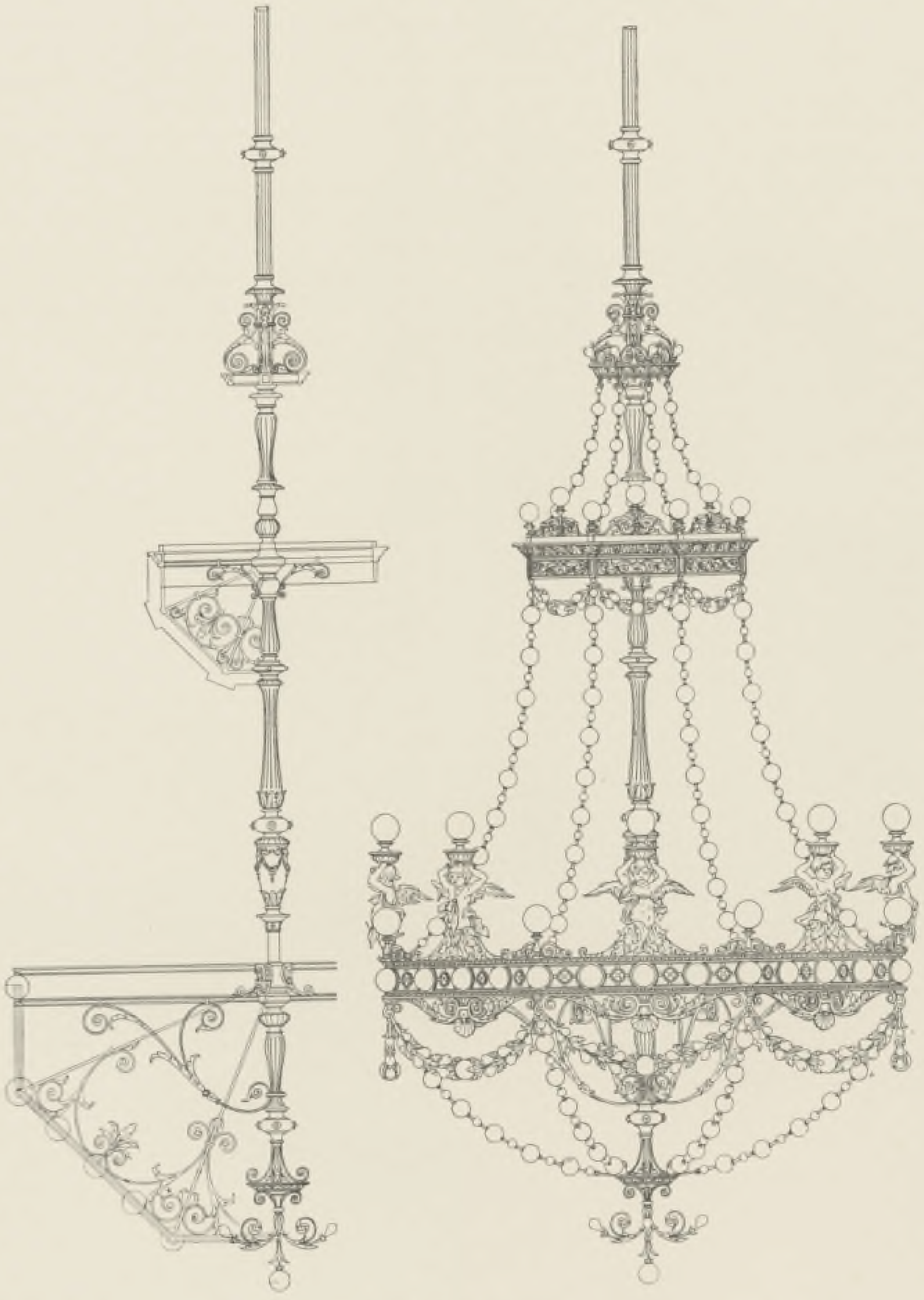
As far as the Metropolis is concerned, it is true, we find little painting of artistic worth on the ceilings of our theatres, and inferior plastic work of stock pattern takes its place. Of course, there are one or two auditorium ceilings which have not been left to unskilled hands; but, broadly speaking, we have no more to learn from our ceilings than from any other part of the architectural rendering of our theatres, and it is necessary to turn to the Continent to find the principles of true architecture embodied in a ceiling. It is only in a few practical details, chiefly matters of economy, and,



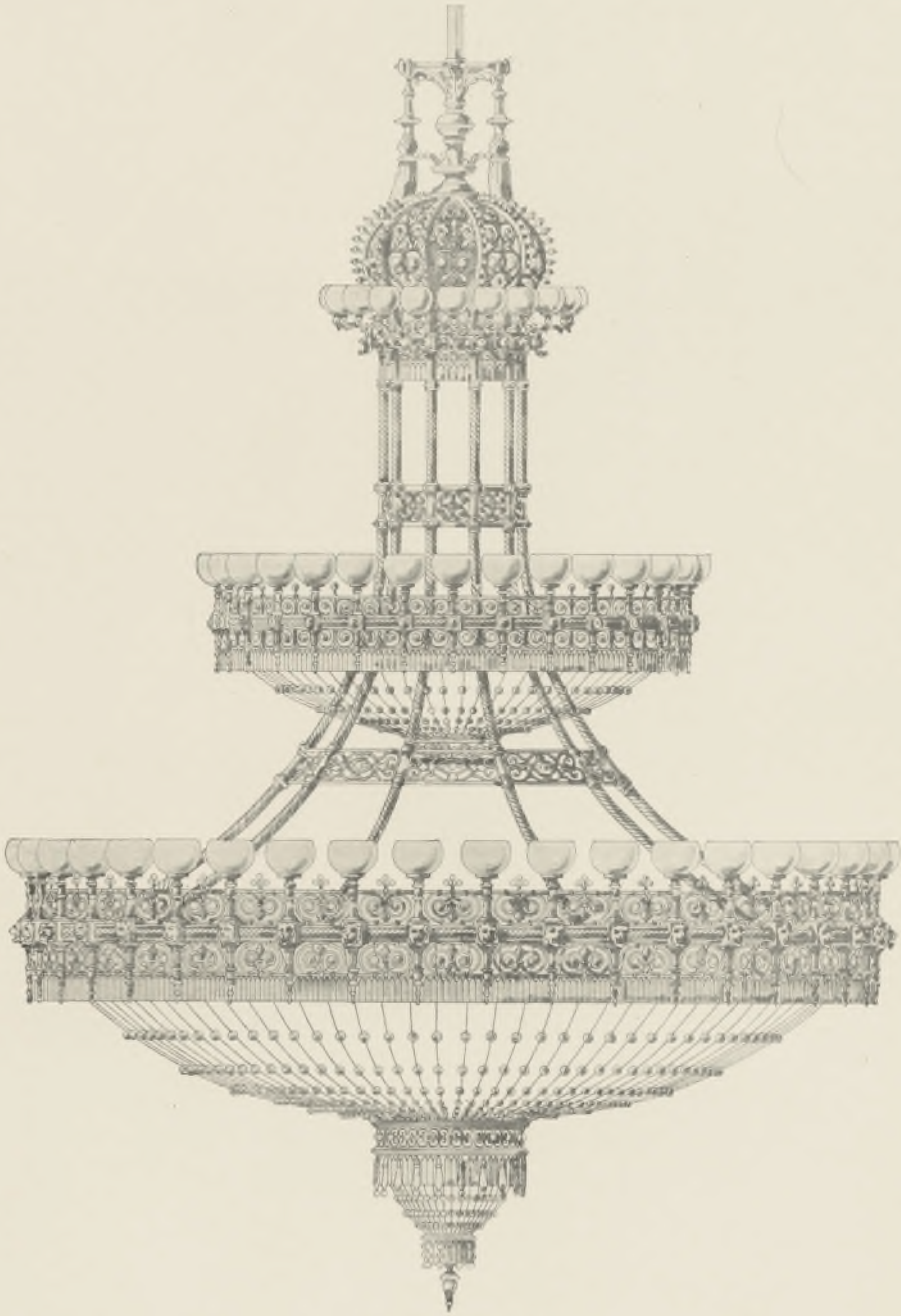
CZECH NATIONAL THEATRE, PRAGUE.
FIG. 444. PLAN OF CEILING.



COURT OPERA HOUSE, VIENNA.
FIG. 445. PLAN OF CEILING.



COURT THEATRE, VIENNA.
FIG. 246. AUDITORIUM, CHANDELIER.



COURT OPERA HOUSE, VIENNA.
FIG. 447. AUDITORIUM: CHANDELIER.

as I have mentioned, in sanitation, that our Continental neighbours fall behind us. It is needless to add that the method of decorating the ceiling, plastically or otherwise, materially affects the acoustics of a house.

One feature still remains which I should consider in connection with the ceiling, namely, the facilities for the lighting and ventilating installations. It has been generally recognised that openings in the ceiling should be provided for the ordinary ventilation, and when gas was the universal illuminant, it was of the highest importance that a large well-hole should be contrived in the centre of the ceiling, above the customary gas chandelier. Even since electricity took the place of gas, the central chandelier has remained a characteristic feature in the auditorium. But with the electric light, the necessity for a strong draught directly over the 'sunlight' is not so important, and ventilation openings can be equally well placed elsewhere, while the central opening may be greatly reduced. The necessity of having an open burner, and hence a burner attached to a chandelier, also no longer exists; therefore, certain countries adopt what I might term a 'hidden sunlight,' for an explanation of which I would refer to Figs. 449 and 450 on page 80, examples introduced by Seeling at the theatres of Halle and Bromberg. These fittings must, of course, not be confounded with the common gas 'sunlight' still used in many of our older establishments. There is no doubt that with improved electric lighting facilities, we may find Seeling's method becoming common, as it is certainly more practical than the chandelier to which we have hitherto been used. The chandelier, which must generally hang low to look in any way effective, often considerably obstructs the view of that part of the audience which is placed on the uppermost tiers; dust accumulates on it which, when heated, gives off a noxious smell; and the many small globes are dangerous to the audience below. Hence, if a different arrangement can be popularised it will be an advantage to the modern playhouse.

CZECH NATIONAL THEATRE, PRAGUE.
FIG. 448. AUDITORIUM; CHANDELIER.

As regards the rendering of the chandelier, I would call attention to the illustrations in Figs. 446-448 on these pages, describing the chandeliers at the Court Theatre, Vienna, the Court Opera House of the same capital, and the Czech National Theatre, Prague, which may well be studied in connection with the ceiling designs shown here and in Volume I. It should be remembered that the ceiling cannot be designed entirely irrespective of the lighting effects of the auditorium, or, to be accurate, the location and arrangement of the lighting appliances; and just as the large chandelier must harmonise in design with the ceiling, and *vice versâ*, so must the design of the ceiling, and more particularly its plastic decoration and its colouring, be adapted to the quantity and character of the light and its exact position. For instance, to imagine that a ceiling which is effective with its chandelier comparatively low would be equally effective with a 'hidden sunlight' burner close up to the ceiling level, or a 'sunlight' opening such as we find at the 'Flemish' Theatre, Brussels, is of course a great mistake. Unfortunately, we have a most striking case of want of consideration in this respect in 'Her Majesty's' Theatre, London, where we find that the chandelier is not only entirely out of proportion to the auditorium in bulk, and in detail, but that it prevents the ceiling from being as effective as it should be. It must not be forgotten that such a 'sunlight' opening as that at Brussels sheds no light whatever on the ceiling proper, which is entirely in the shade, whilst with the 'hidden sunlight' of Seeling there is also a considerable tendency towards leaving the ceiling insufficiently lighted.

It would not be in accordance with the programme of this treatise to dwell on the many minor details which have to be considered in the arrangement of an auditorium, though it should not be forgotten that the due consideration of what may seem trivialities will often materially tend to the comfort and safety of the audience. Such matters as the distribution of the seats, their dimensions, and the disposition of the gangways call for the architect's most careful attention, quite irrespective of the questions of upholstery and make of the seats or carpets, which come more appropriately under the heading of furnishing. Reference to the regulations presented in Supplement III. will show what importance even the public authorities attach to seating arrangements from the protective point of view alone. But as with the boxes referred to above, these questions have also to be regarded from the aspect of local requirements, customs or prejudices. And these customs and prejudices must be considered not only with an eye to the locality but also to the characteristics of the different classes of establishments. Just as the requirements of the 'pit' in a London West End theatre differ from those of the 'parterre' of Paris and Berlin and the 'platea' of an Italian playhouse, so also a very great difference exists between the 'stalls' of a West End theatre, as compared with those of an East End or suburban institution. But though peculiarities of this description afford an interesting study, their enumeration lies beyond the scope of this chapter.

MUNICIPAL THEATRE, HALLE. AUDITORIUM.
FIG. 449. VIEW OF 'HIDDEN SUNLIGHT.'

As with such a detail as the arrangement of the seating, so it is with many other points which I will not even touch on in this place; but I should perhaps mention that it is also of importance that the architect should consider the possible purposes to which the auditorium may be put, other than its functions of housing the audience that attends the presentation of a play. In many theatres, for instance, the auditorium is at times used as a ball-room in conjunction with the stage, and facilities are provided for raising or lowering the floor of the area or for boarding it over. In the case of the more important playhouses, the possibility of the use of the entire building for state functions, has to be considered. It will be remembered, for instance, that numerous alterations had to be made at the Covent Garden Theatre, London, for the State Performance during the Jubilee Celebrations of 1897, and there should therefore be allowance for a certain elasticity in the boxes, ante-rooms and offices.

I am not dealing with the question of upholstering in this chapter, nor, as a matter of fact, elsewhere, yet I must remind the architect that great care must be taken, both in the colouring and draping of the hangings. But of all hangings, of course, those of the proscenium opening contribute most in helping or spoiling a decorative scheme. The proscenium curtain, no matter if it be a mere monochrome cloth, a pair of embroidered curtains, or a pictorially decorated drop cloth, must be chosen with regard to the general lines and colouring of the auditorium. One of the most common mistakes made by managers is to order this curtain independently, as if it were a piece of scenery for the stage.

As to the general decorative rendering of the auditorium, I would, in conclusion, repeat what I have often said elsewhere, namely, that it must be in keeping with the character of the institution and its audience.

MUNICIPAL THEATRE, BROMBERG. AUDITORIUM.
FIG. 450. VIEW OF 'HIDDEN SUNLIGHT.'

CHAPTER III.

COMMUNICATION.

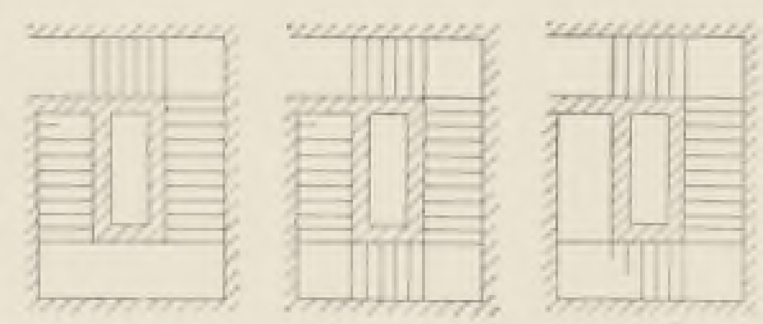
TAKEN in order of importance, no doubt, the stage ranks next to the auditorium, and if a chapter were set aside for dealing with the stage alone, it would certainly follow at this place. But except in so far as it determines the main containing walls as shown in plan, and in some degree their height and the roofing, there is little to say about the stage as such, unless we consider it in connection with its equipment for the presentation of plays. Everything, however, relating to the necessary installation for such a purpose is dealt with at considerable length in Supplement I., entitled 'Stage Construction.' Hence, to devote a chapter solely to describing the arrangement of the carcass of the stage would seem somewhat unpractical, the more so as I could only here give examples of its various plans, dimensions and proportions. As a matter of fact, the plate showing instances of the block plans of theatres, at Figs. 39 to 92, in my chapter on their general arrangement, illustrates the shape, size and relative proportion of each stage, not only as compared with the entire block, but also with the auditorium and with other stages. And, indeed, it has never been my intention to deal with each individual section of the playhouse separately. The little I would say regarding the stage proper that is not contained in the Supplement, will be found in my chapter on Service arrangements generally, which deals primarily with the 'back of the house.'

I will therefore turn my attention to that part of the house on the treatment of which the comfort and safety of an audience materially depend, and from which the character of a playhouse is often judged. I refer to the means of communication, and inter-communication for the audience, such as passages and staircases; next, the vestibules and lobbies; then the rooms devoted to refreshment or promenade; and lastly, the offices required for controlling entry and exit, i.e. the management of the house as distinct from the stage. But as it is not my object to treat minutely each section of this subject, I would only touch on those which form important features in the plan. I could, of course, easily devote a whole chapter to the minor offices alone, but, as I have said, such particulars properly belong to text-books. For general reference in theatre planning, it is immaterial to know the exact extent of the accommodation required for administrative purposes, whether for the treasury, the check-taker or the programme room, under the various conditions that occur. As a matter of fact, the extensive collection of plans which is to be found in these volumes is, without much explanation, sufficiently descriptive of the various requirements put forward from time to time, and the manner in which they may be met. I will, therefore, limit myself to dealing with the staircases, vestibules and lounges of existing theatres; for if the plans really be examined it will be found that it is only these parts which are of any account in the conception of a theatre design. The minor offices referred to can safely be subordinated to the main lines of the front of the house.

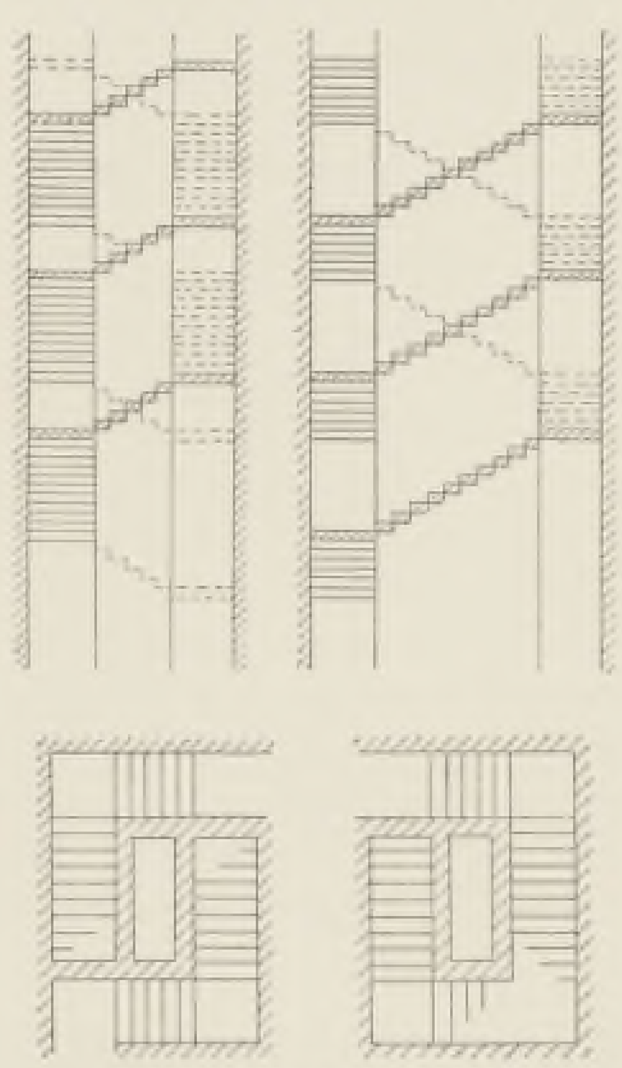
MUNICIPAL THEATRE, ZÜRICH.
FIG. 431. VIEW OF VESTIBULE.

Where there is a lack of space it will be noticed that the administrative offices are sometimes even removed from the 'front of the house' and placed behind the proscenium wall; whilst, say, the programme room is relegated to the cellar.

It is only in some of the less important theatres of Europe, such as those in these Isles, that so much stress seems to be attached to the minor offices. In order to accommodate them, the question of the clear planning of the staircases, lounges and vestibules is often disregarded, and we find that veritable maze of passages, those circuitous stairs, and other defects against which I have had such frequent occasion to protest. In these cases, no doubt, such practical points as the exact positions of the programme room and the sweeper's cupboard have been very carefully determined. But the architects of these playhouses may be assured that even the most prosaic and prejudiced of their clients would be better satisfied if they obtained a clearer and roomier plan, even if they had to reject certain traditions in the process. Though I elsewhere protest against architects blindly following a client's instructions on a question of safety, I would remind them that by making a maze of their plans on account of some quite subordinate point in the employer's programme, they also often incur the moral responsibility for loss of life. It is the duty of the architect to oppose requirements that tend to confuse his plan. I am quite aware that a London manager prefers, as a rule, to adhere to those customs and practices to which he has all his life been used, but when it comes to be a question of the offices destroying a clear plan simply on account of some unimportant advantage, he will generally appreciate the gain in roominess, and readily permit the unaccustomed arrangement. He is, for instance, fully alive to the fact that no matter how little sympathy a playgoer may have for the architectural treatment of a theatre, a clear plan and means of quick exit will always do much to popularise an establishment. Unfortunately, in the circumstances which habitually attend theatre enterprise in this country, the manager seldom has the opportunity of having a clear plan laid before him.



TYPE OF STAIRCASE.
FIGS. 452 TO 454. PLANS, AREA, FIRST TIER, SECOND TIER.

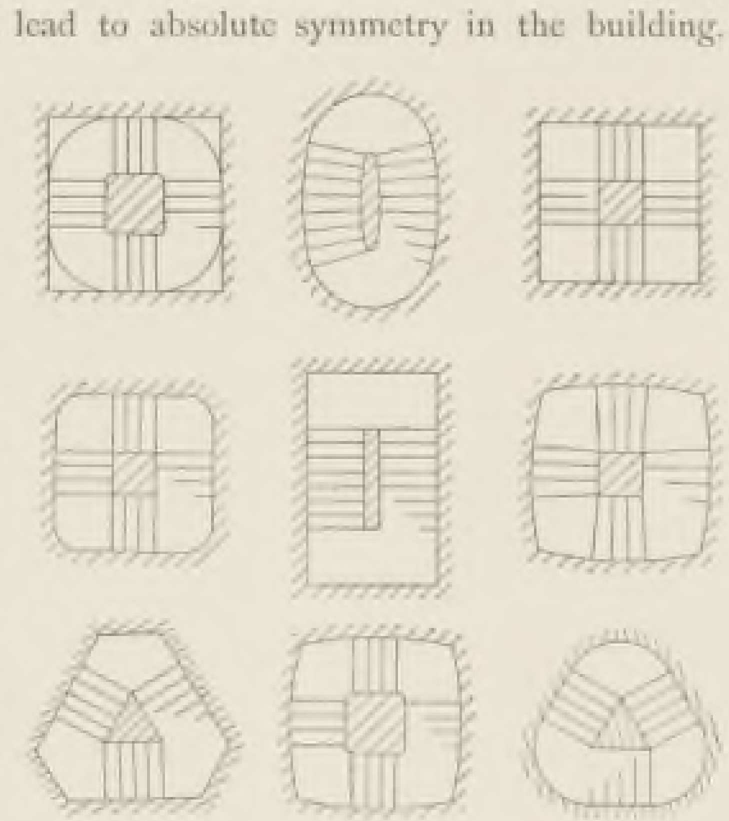


TYPE OF OVERLAPPING STAIRCASE.
FIGS. 455 TO 458. PLANS AND SECTIONS.

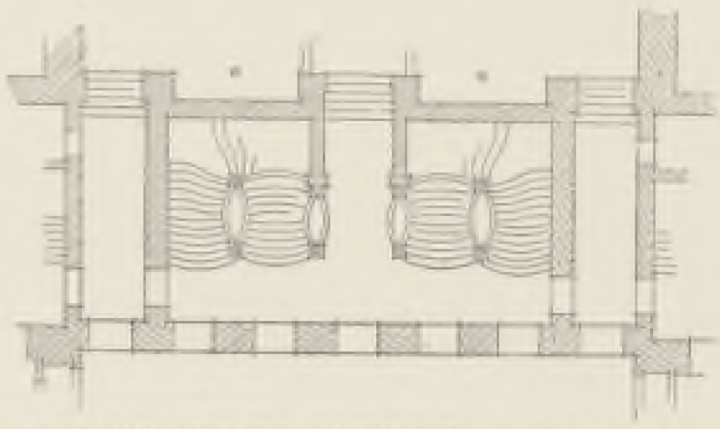
Turning to the staircases, vestibules and lounges, I hold it of the utmost importance that, in planning, these should go hand in hand with the corridors.

I am not going to argue here the pros and cons of symmetry, of straightforward planning, of the regard due to certain dimensions, etc., for, on the one hand, I have already indicated how much importance I attach to these matters, and, on the other, I need only refer to the various codes of requirements presented in Supplement III. to show what different countries look upon as necessary in this respect.

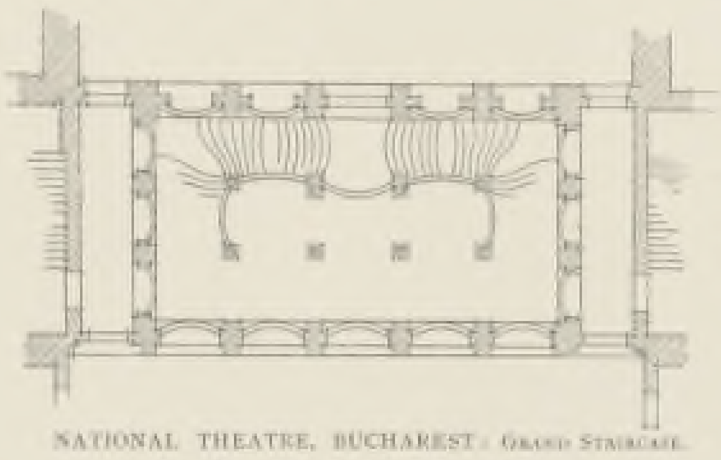
There is one point, however, that I cannot again too strongly emphasise in connection with this part of the subject, namely, that I do not consider the regulations of the London County Council as regards site sufficiently stringent, inasmuch as their requirements do not lead to absolute symmetry in the building. It is also exceedingly detrimental to the interests of safety to foster the assumption by the audience, that though there are two doors for entrance and exit to a certain part of the auditorium, one only of these is the usual entrance and exit, while the other is an 'extra' exit. In laying down the lines of the vestibules, staircases and passages, they should be so arranged that all means of communication are constantly in use. The only difference in the entrance to any part of the house, as compared with the exit, should be that, in the latter case, having reached the bottom of the staircase, it is possible to pass directly into the open instead of traversing the vestibule through which the entry was made. I know that this would more frequently, than is at present the case, lead to the occupants of the stalls and several of the upper tiers meeting in the same vestibule, and that where the planning is not very clever it may even necessitate the employment of extra pay-boxes and check-takers. But the policy is of far too great importance to be obstructed by a question of social distinctions or minor economy. With good planning there is no reason why there should be any extra expenditure in maintenance. In an ordinary London playhouse, we often find the occupants of the stalls and those of the first and second tiers using the main vestibule in common, whilst the pit and the gallery have separate entrances. The wants of the first-named parts are met by one booking office in the vestibule, whilst pit and gallery have each their own pay-box. By a trifling re-arrangement of plan, the staff need not be increased, or at any rate not by more than an extra check-taker or two.



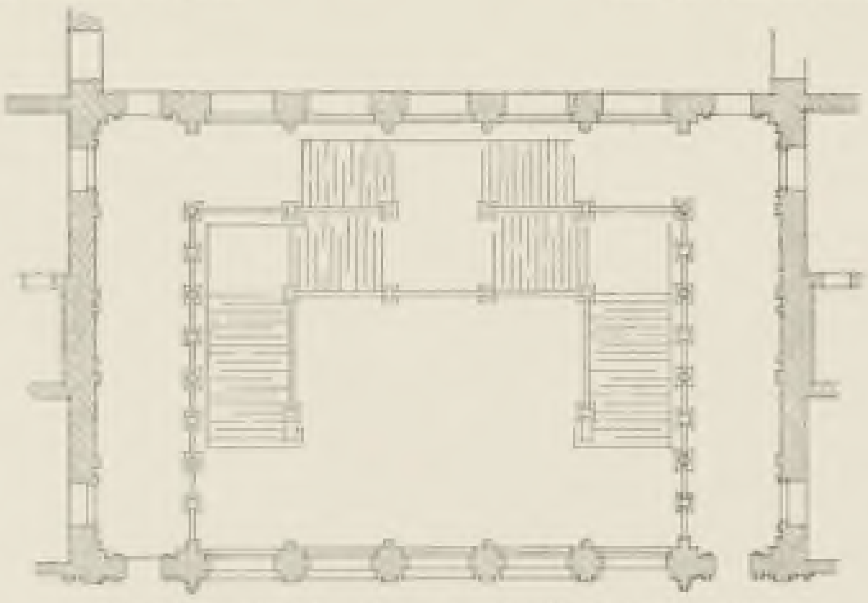
TYPES OF STAIRCASES.
FIGS. 459 TO 467.



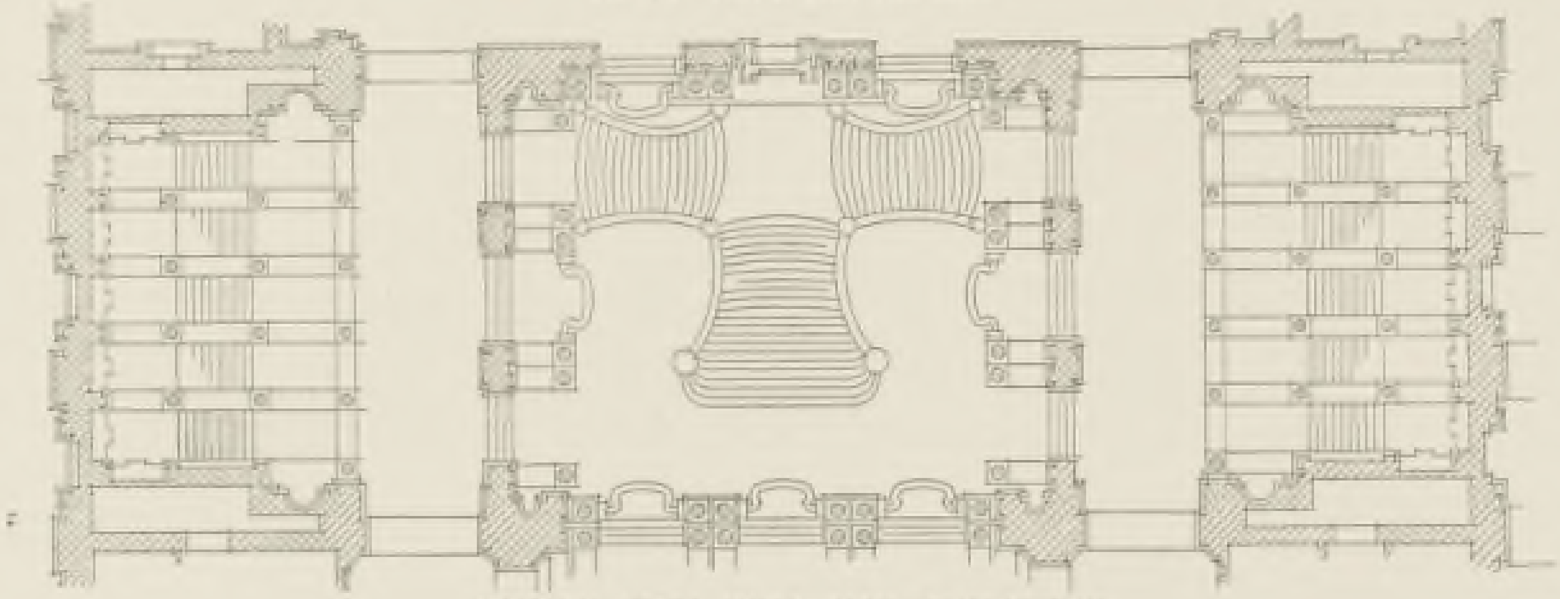
NATIONAL THEATRE, BUCHAREST: Grand Staircase.
Fig. 468. Plan at Entrance Level.



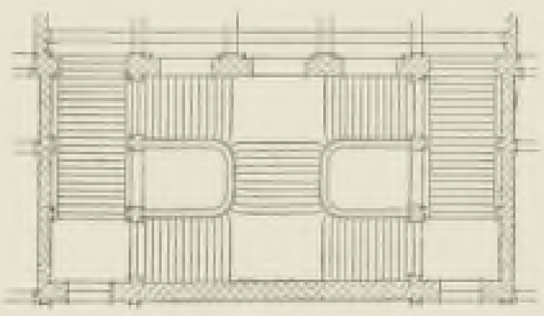
NATIONAL THEATRE, BUCHAREST: Grand Staircase.
Fig. 469. Plan at First Tier Level.



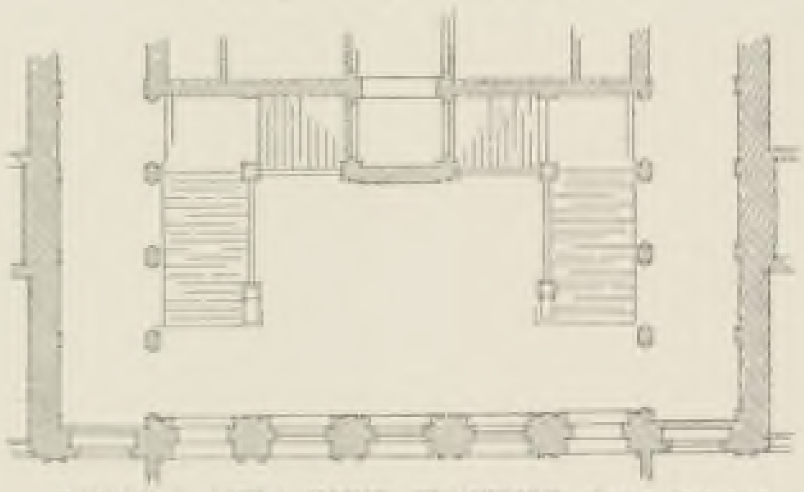
MUNICIPAL OPERA HOUSE, FRANKFORT: Grand Staircase.
Fig. 470. Plan at First Tier Level.



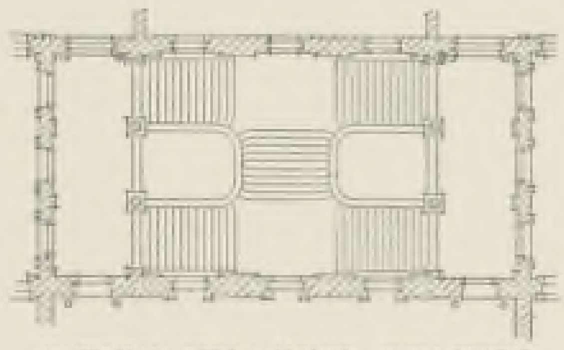
NATIONAL OPERA HOUSE, PARIS: Grand Staircase.
Fig. 471. Plan at First Tier Level.



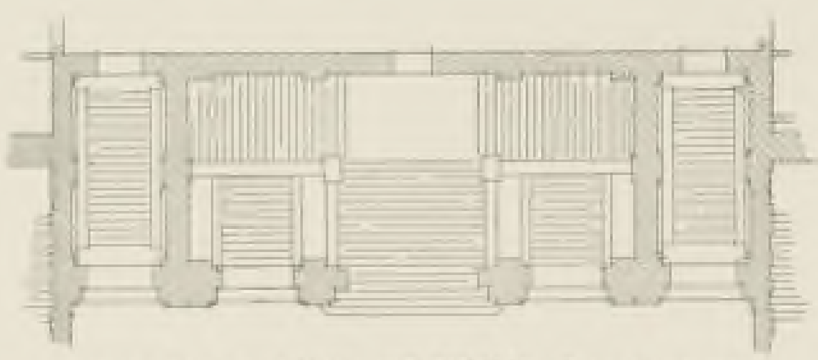
NATIONAL OPERA HOUSE, BUDA-PESTH: Grand Staircase.
Fig. 473. Plan at Entrance Level.



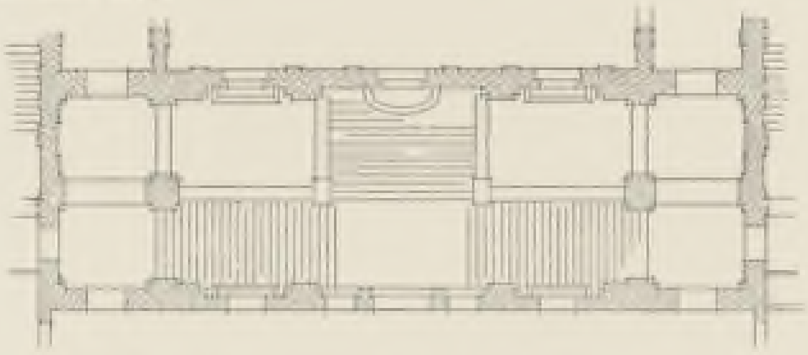
MUNICIPAL OPERA HOUSE, FRANKFORT: Grand Staircase.
Fig. 472. Plan at Entrance Level.



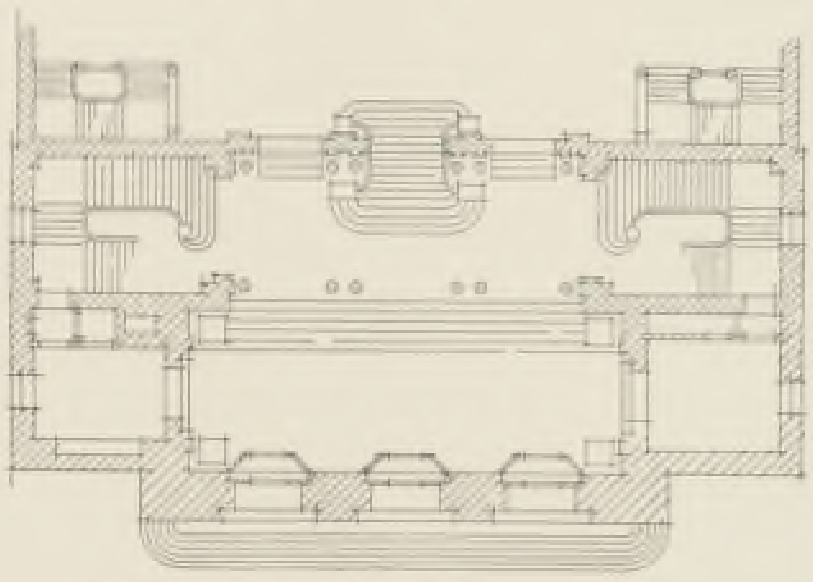
NATIONAL OPERA HOUSE, BUDA-PESTH: Grand Staircase.
Fig. 474. Plan at First Tier Level.



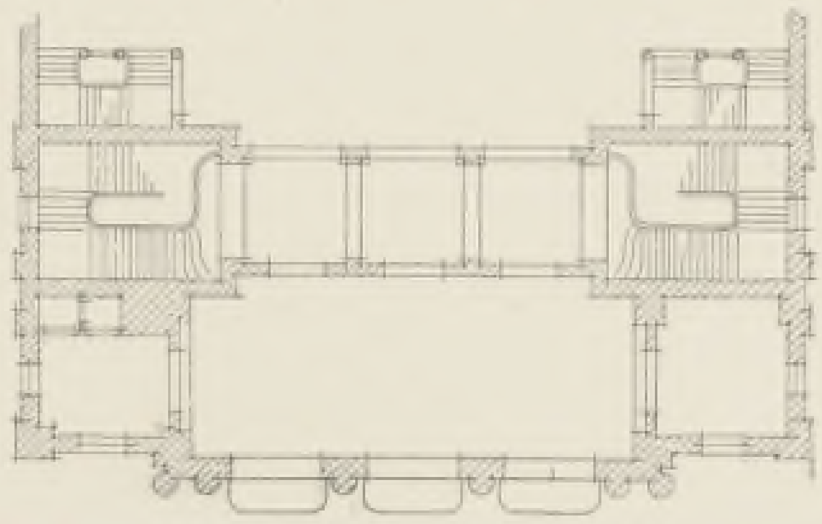
COURT OPERA HOUSE, STOCKHOLM: Grand Staircase.
Fig. 475. Plan at Entrance Level.



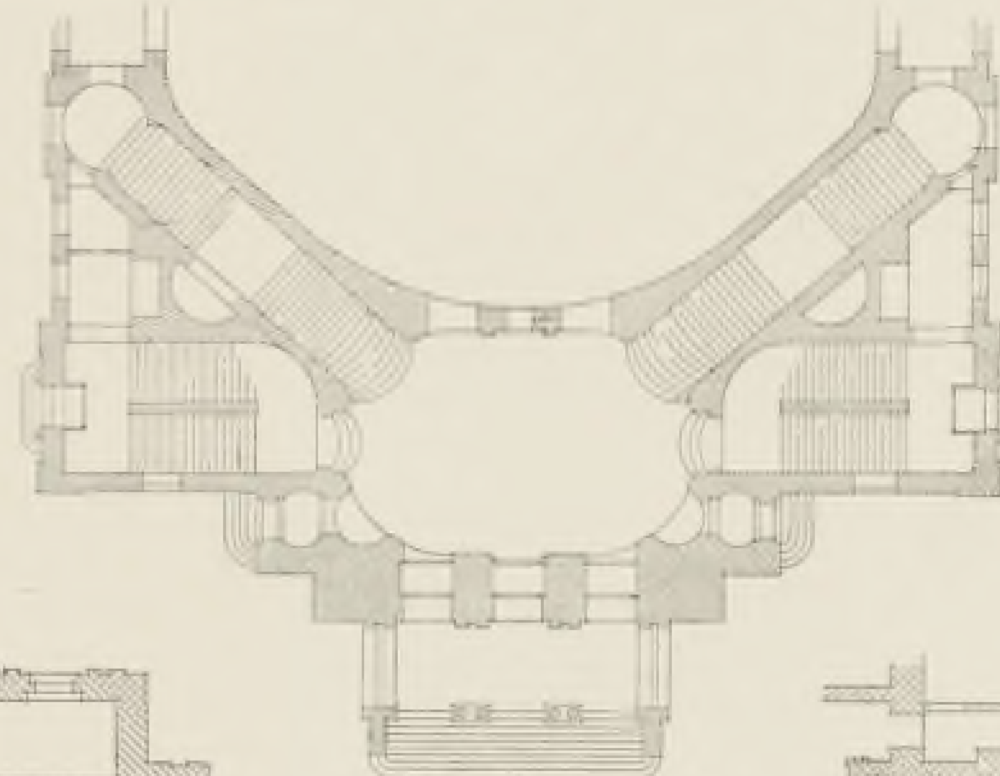
COURT OPERA HOUSE, STOCKHOLM: Grand Staircase.
Fig. 476. Plan at First Tier Level.



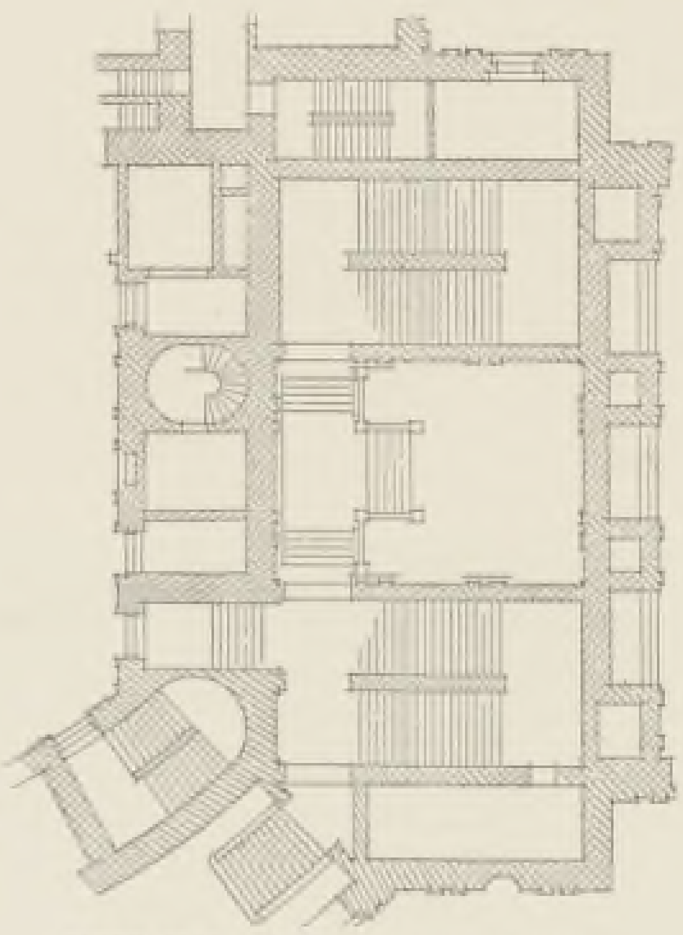
NATIONAL OPÉRA COMIQUE, PARIS: STAIRCASES.
FIG. 477. PLAN AT ENTRANCE LEVEL.



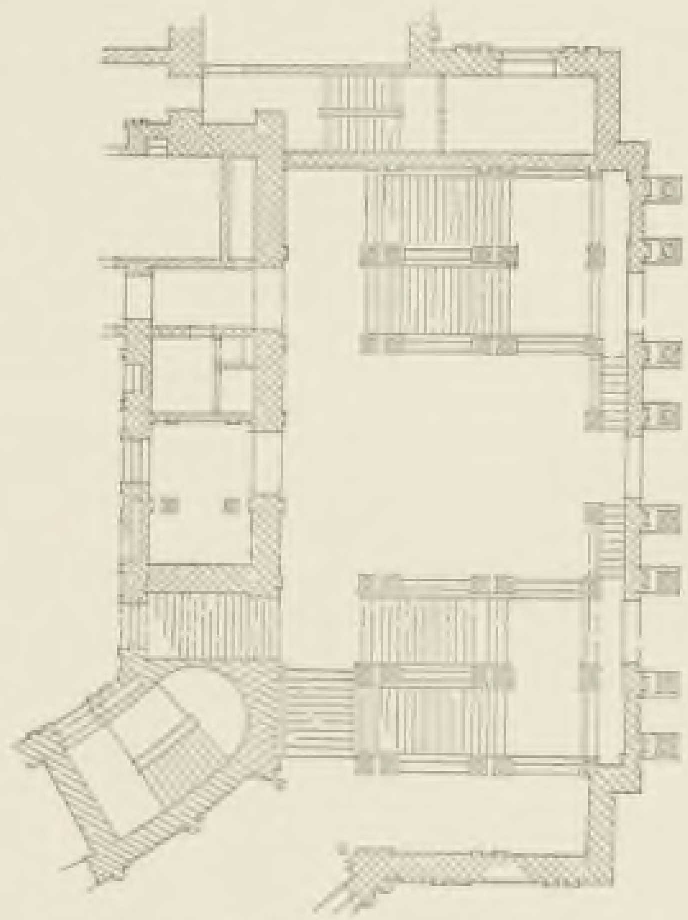
NATIONAL OPÉRA COMIQUE, PARIS: STAIRCASES.
FIG. 478. PLAN AT FIRST TIER LEVEL.



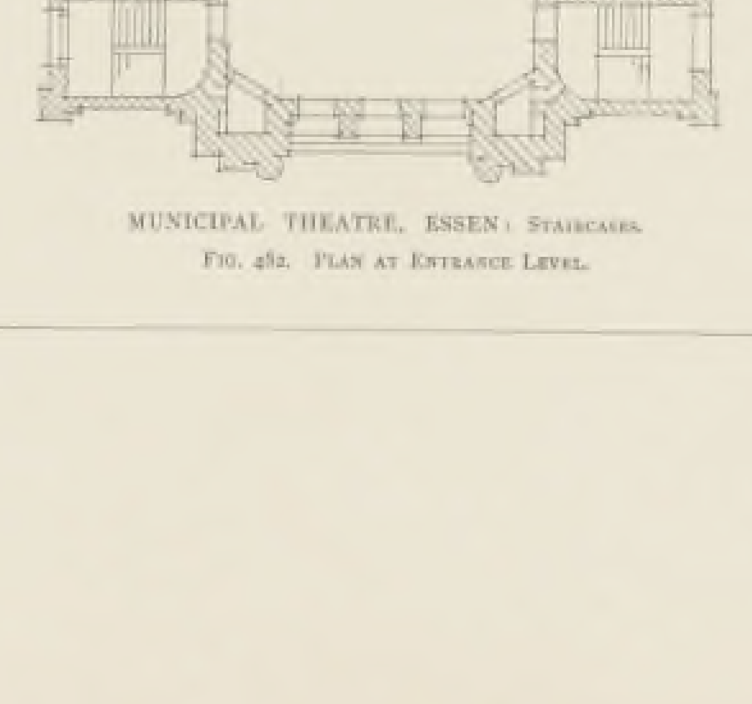
'GERMAN' THEATRE, PRAGUE: STAIRCASES.
FIG. 479. PLAN AT ENTRANCE LEVEL.



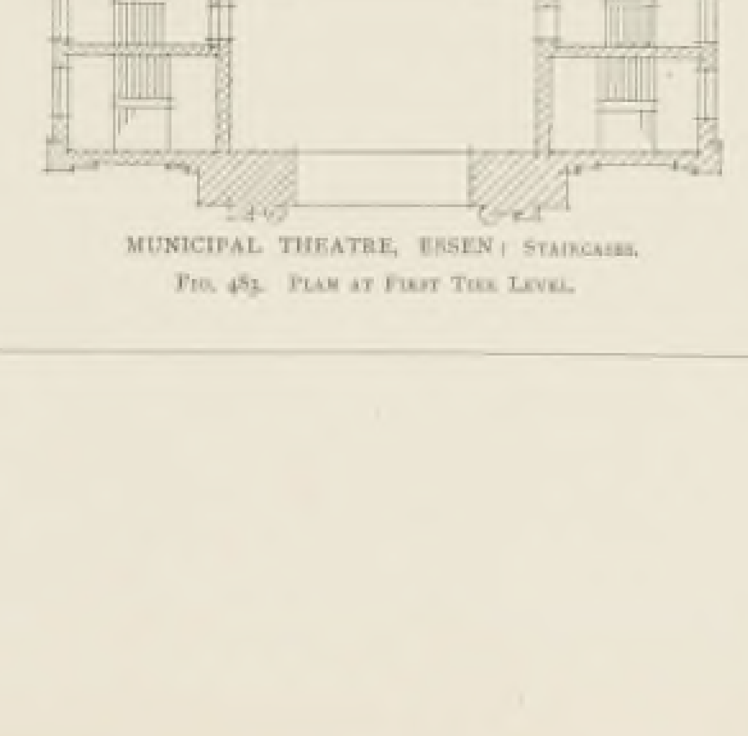
COURT OPERA HOUSE, DRESDEN: STAIRCASES.
FIG. 480. PLAN AT ENTRANCE LEVEL.



COURT OPERA HOUSE, DRESDEN: STAIRCASES.
FIG. 481. PLAN AT FIRST TIER LEVEL.



MUNICIPAL THEATRE, ESSEN: STAIRCASES.
FIG. 482. PLAN AT ENTRANCE LEVEL.



MUNICIPAL THEATRE, ESSEN: STAIRCASES.
FIG. 483. PLAN AT FIRST TIER LEVEL.

As compared with the gain in safety, the usually small salary of a check-taker is of no account whatever, and would scarcely be discernible in the balance sheet of even the most business-like and economical establishment.

The employment of the expression 'emergency' and 'extra' exit involves the serious risk of some of the communications not being used at all in time of danger, although the known means of reaching the open may be inaccessible or may have become over-crowded. It may be a question of instinct or usage, but, as a rule, the playgoer prefers to leave the theatre by the way he entered it, and by splitting up an audience immediately on entry half to the right and half to the left, they not only are afforded a knowledge as to the means of communication intended for their use, but a feeling of confidence will also be inspired by the fact that all exits are open, which is one of the surest safeguards against panic. In fact, every attention must be paid to the principle of centralisation and decentralisation in bringing a playgoer to his seat and giving him opportunities of leaving it. I am writing with considerable detail on this point as this matter is one that is but too frequently neglected even in the best modern playhouses of the Continent, and, as far as London is concerned, such neglect is unfortunately—though, of course, unintentionally—encouraged by the regulations of the London County Council.

COURT THEATRE, VIENNA.
FIG. 484. VIEW OF BOX OFFICE.

If we now assume that symmetry is a *sine quâ non* in every modern theatre, then, in reality, only varieties of symmetrical staircases call for our attention, although we cannot omit consideration of what I would term the 'typical' plan of the ordinary staircase, whether it exists independently or as part of a pair. It is also impossible to ignore all examples of those 'tricky' arrangements of stairs so common in this country, where two stairways are planned with one carcass. But in considering even such examples as, for instance, combine in one staircase the stairs both of the second and third tiers, it will generally be found that the one staircase in question is simply part of a pair of staircases which serve as an approach to the second and third tiers respectively. A staircase, however 'tricky,' which carries two sets of stairs to one identical tier, and allows only for some slight difference of entry, is altogether too reprehensible for inclusion in this chapter.

Now, as regards the planning of ordinary staircases, I will assume that, no matter how circuitous we find the stairs of many London theatres, it is a recognised principle throughout Europe that a theatre staircase should have straight, short flights, of not less than four steps, and not more than twelve at a time, the run of which must turn in one direction only; and also that the 'winder' is recognised as a dangerous expedient in theatre planning which must be entirely avoided. In Figs. 459 to 467 on page 82, I am showing the lines of some of the more usual staircase plans that are met with, including those where the whole of the steps on each flight have a very slight 'wind.' But lest I should be misunderstood, I would state clearly that even a sequence of steps but slightly curvilinear in plan should not be permitted for an ordinary approach or exit, and that, at the most, such an arrangement could only be allowed in secondary stairs such as box or pass staircases. On the same page, in Figs. 452 to 454, will be found a modification of one of the more elementary forms of staircase plan, full or quarter landings being provided at different levels and in different positions to meet such exigencies as commonly arise in a playhouse. Lastly, in Figs. 455 to 458 will be seen instances of two stairs planned within the same carcass on the lines already indicated.

CZECH NATIONAL THEATRE, PRAGUE.
FIG. 485. VIEW OF VESTIBULE.

Of course, every conceivable variation in the individual staircase is possible. But one thing must be borne in mind, and that is that the individual staircase should only form part of some centralised or symmetrical system of communication. When I speak of a centralised or symmetrical system of staircases, I have in mind not only the theatre plan in which a grand central staircase forms a prominent feature in the architectural treatment, while around it are grouped the stairs to various tiers, but also the plans in which staircases are arranged in pairs on either side of the house or on either side of the main vestibule or hall, quite irrespective of whether such pairs of staircases are so planned as to afford facilities for an architectural rendering of importance. Taken as a whole the ordinary symmetrical grouping of the stairs on either side of the house fails to provide an opportunity for accomplishing as fine an architectural rendering as might be desired. There are, of course, exceptions; for if we look at the instances of symmetrical staircase arrangements on page 84, we observe that the two pairs on either side of the auditorium at the Court Opera House at Dresden, Figs. 480, 481, have been treated in a manner which is not only pleasing, but exceedingly dignified. Again, in the National Opéra Comique, Paris, Figs. 477, 478, there is some attempt to make a feature of the two symmetrically placed stairs. But the common practice is that to be observed in Fig. 482, 483, showing the stairs of the Municipal Theatre at Essen, where the doors to the stairs are merely emphasised in the design, whilst the staircase itself generally stands, so to speak, comparatively isolated. A compromise of this treatment of stairs at Essen with the more elaborate renderings at Dresden, Odessa, Amsterdam, the Vienna Court Theatre, and elsewhere, is a conception which at least gives a pleasing view of the staircase from the vestibule, as in Fig. 479, which shows the method adopted at the 'German' Theatre, Prague. Besides the accompanying diagrams of the arrangements at Dresden, Prague, Essen and Paris, I would call attention to the views or sketches of staircases in the preceding volumes. They give some idea of the architectural treatment of such pairs of symmetrical staircases, commencing with the most noticeable example of the class in question, namely those at the Court Theatre, Vienna.

Grand or centralised staircases, as a rule, only extend to the first tier level—or that level on which have been placed, on the one hand, the principal or State boxes, or on the other hand, the principal lounge or saloon, which is such an important feature in Continental theatre design. The grand central staircase will thus almost invariably be found in combination with stairs serving other tiers, and as these latter, where a central system has been introduced, are generally symmetrical, I can limit myself to speaking of the grand staircase only, at the same time mentioning that where it exists, I have seldom known much architectural importance to be accorded to any of the other stairs. In fact, of the examples shown in these volumes, the proposed Court Opera House at St. Petersburg alone serves as an instance of a grand central stair with two symmetrically placed stairs of considerable architectural pretensions.

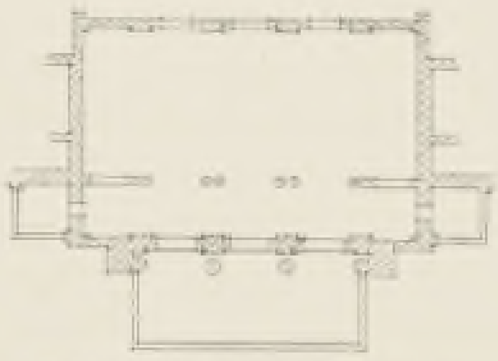
COURT THEATRE, VIENNA.
FIG. 486. VIEW OF VESTIBULE.

Following the lines previously adopted, I have again selected for diagrammatic illustration some typical instances of the grand staircase forming the central feature of the system. These diagrams indicate the various ways in which the lines can be laid down, and it will be at once observed on reference to page 83 that there is a material difference between arranging stairs independently and openly in a large hall, and a *bonâ fide* staircase with its own containing walls standing in a central position.

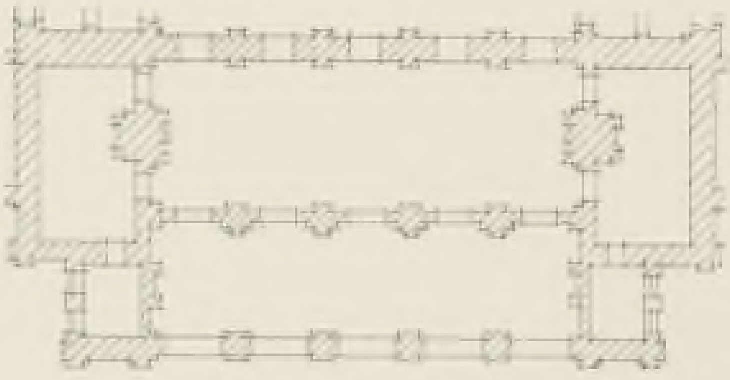
Of stairs which I consider to have been simply placed in a large hall, no more striking example is known than that of the National Opera House at Paris, shown in Fig. 471, which was especially planned to afford opportunity for display; whilst among the more picturesque examples is that of the Municipal Opera House at Frankfort, depicted in Fig. 470. Of staircases proper, I would only mention those of the National Opera House at Buda-Pesth, and the Court Opera House at Stockholm, shown in Figs. 473, 474 and 475, 476 respectively.

In summarising, I would say that the chief variations in a centralised staircase arrangement, are, firstly, stairs which are located in halls as compared with staircases proper within containing walls; secondly, stairs starting with one central flight, or with two symmetrically placed flights; and lastly, stairs with rectangular or curved lines. However important the grand staircase may be, and however much it may be used for ingress and egress, I would, nevertheless, point out that it is by no means the safest method of communication, especially where the flights are broad, and there is no outlook from the landings on to the open. Therefore supplementary staircases must exist for the tier, or tiers, which the central staircase is intended to serve, and their use must be encouraged. A not uncommon way of promoting the use of such auxiliary staircases is to utilise them as regular exits to certain vestibules or porches, affording special facilities for carriages to take up departing playgoers.

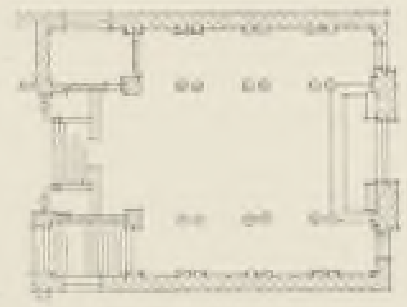
In conclusion, though the central system with its grand staircase lends itself to an imposing architectural treatment in a manner that cannot be rivalled by the roomiest of stairs arranged on the symmetrical system of the Court Theatre at Vienna, I hold that it should only be introduced in playhouses which demand the most dignified



NATIONAL THEATRE, CHRISTIANIA.
FIG. 487. LOUNGE.



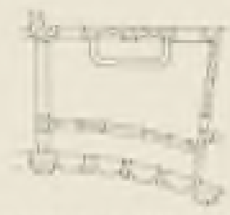
COURT OPERA HOUSE, VIENNA.
FIG. 488. LOUNGE.



'EMPIRE' VARIETY THEATRE, LONDON.
FIG. 489. LOUNGE.

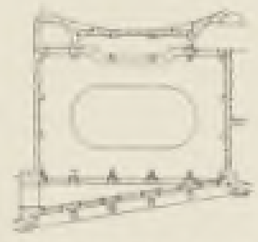
COURT OPERA HOUSE, DRESDEN.
FIG. 490. LOUNGE.

'RAIMUND' THEATRE, VIENNA.
FIG. 491. LOUNGE.



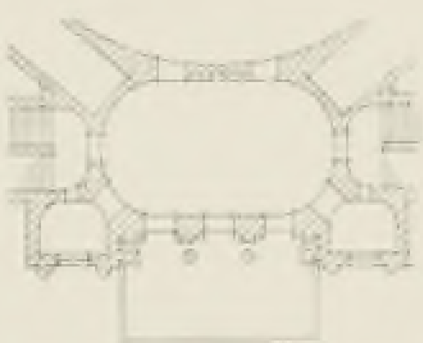
D'OYLY CARTE'S OPERA HOUSE, LONDON.
FIG. 492. LOUNGE.

NATIONAL OPERA HOUSE, PARIS.
FIG. 493. LOUNGE.



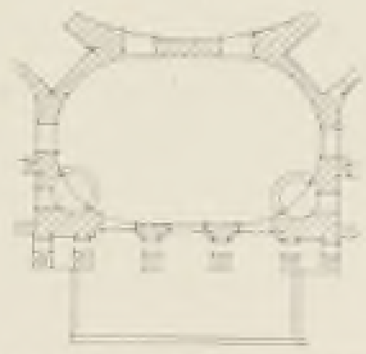
DALY'S THEATRE, LONDON.
FIG. 494. LOUNGE.

MUNICIPAL THEATRE, PALERMO.
FIG. 495. LOUNGE.

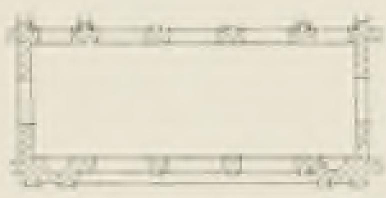


MUNICIPAL THEATRE, ZÜRICH.
FIG. 496. LOUNGE.

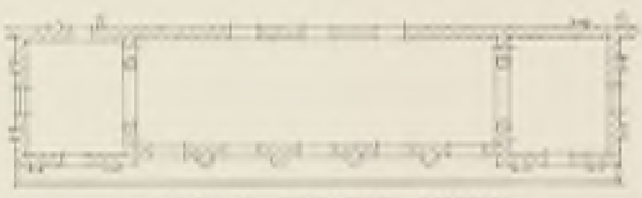
MUNICIPAL THEATRE, ODESSA.
FIG. 497. LOUNGE.



'GERMAN' THEATRE, PRAGUE.
FIG. 498. LOUNGE.



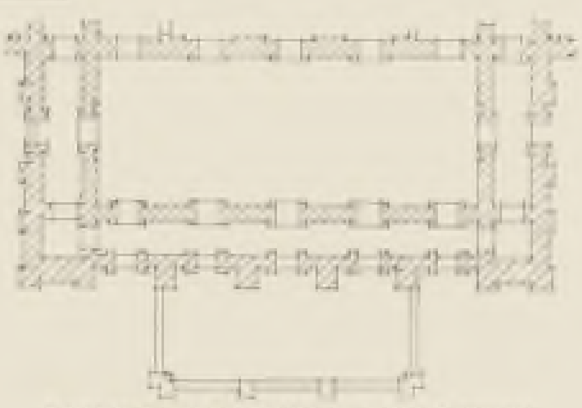
'NEW' THEATRE, BERLIN.
FIG. 499. LOUNGE.



MUNICIPAL THEATRE, RHEIMS.
FIG. 500. LOUNGE.

NATIONAL THEATRE, BUCHAREST.
FIG. 501. LOUNGE.

'EDEN' VARIETY THEATRE, PARIS.
FIG. 502. LOUNGE.



NATIONAL OPERA HOUSE, BUDA-PESTH.
FIG. 503. LOUNGE.

of designs, such as National and Court institutions. The symmetrical system, on the other hand, accords more with the ordinary practical requirements of a playhouse.

In respect to the vestibule or the main vestibule, we must bear in mind its chief purpose, and the many secondary uses to which it is put, such as booking seats, check-taking, draught exclusion, and the like. Generally speaking, the vestibule should offer every facility for centralising the arrangements for the entrance of the audience, as distinct from their exit. The vestibule should, to a certain extent, be an administrative centre, and at the same time a covered approach to the theatre. Whether the vestibule exist as a whole, feeding the entire auditorium, from the best seats to those on the uppermost tiers; or whether it be split up into a number of sections leading to different parts of the building separately; or, again, whether it consist of a number of distinct lobbies for the different sections of the house, the same principle should hold good. In every case, however, it should be considered chiefly as a connecting link between the house and the open, and this should be borne in mind in determining its architectural pretensions. A vestibule should not be treated with the warmth or elaboration commonly associated with the more prominent parts of the house. No better rendering can be found of a vestibule fully answering its purpose than at the Court Theatre, Vienna, of which I am showing a photograph in Fig. 486, on page 86. There the vestibule is exactly what I hold it should be, namely the covered approach to the theatre, and the administrative centre for every section of the audience.

'HER MAJESTY'S' THEATRE, LONDON.
FIG. 504. VIEW OF BOX OFFICE.

In the illustration of the Municipal Theatre, Zürich, Fig. 451, the place for taking tickets will be seen to consist in a small box, or counter, built into the vestibule, and a somewhat similar arrangement will be found in the 'Hofburg' Theatre, depicted separately in Fig. 484 on page 85. This kind of pay-box arrangement, however, in no way accords with the importance of the office in question. To treat the latter simply as a box shows a wanton neglect of one of the main requirements of a playhouse, whether it be a private establishment or a public institution. The box office must be a room of ample dimensions, offering the easiest possible access to the public. As already mentioned in Volume II., few box offices are so practically placed as that of 'Her Majesty's' Theatre, London, of which a view is presented on this page. But I hold that though practically arranged, inasmuch as at the same time it serves as treasury and pay-office for every department of the playhouse, it might well be roomier, and have the dignity of a window to the open. The box office is one of the most important offices in a theatre, and must be treated as such. There are innumerable practical methods of dealing with crowds approaching a pay-box, either in form of the arrangements for a 'queue' or single file of applicants, or for groups of them, under cover or not, but no such arrangements must be allowed to interfere with or block the exit passages. A barrier arrangement is shown at Fig. 486 in the view of the 'Hofburg' Theatre vestibule.

As to the corridors and passages, I need only say that their dimensions should be ample, and the routes they afford direct. The passage or corridor, it is true, may be regarded merely as the connecting link between different sections of a playhouse, yet its importance cannot be overrated, either in respect to the question of safety, the facilities for administration, or the manner in which its treatment characterises the playhouse. I have already mentioned that the staircase should preferably be placed on an outside wall, and have ample window accommodation, and the same, where possible, holds good for the corridor. For, quite apart from any question of safety, light and cleanliness are its first essentials.

Turning now to the lounges, of which I am showing numerous instances on page 87, drawn to approximately identical scales, I would remark on the distinction between, firstly, the promenades planned for theatres constructed on the radial system; secondly, the halls which have been subject to French influence, and more particularly the influence of the National Opera House at Paris; thirdly, the rooms which take more the form of a saloon; and lastly, the many nondescript forms of lounges, which are common in our own theatres. These latter may serve any purpose, from that of a bar to that of a mere gallery overlooking a vestibule, or, as is common in Variety Theatres, of a raised bar overlooking the auditorium and stage.

CZECH NATIONAL THEATRE, PRAGUE.
FIG. 505. VIEW OF ANTE-ROOM TO ROYAL BOX.

Where the lounge serves mainly as a promenade between the acts, no more suitable arrangement can be found than that of the segmental plan, though the elongated rectangular hall common in France has also certain advantages. Where the lounge serves the purpose of a saloon, in which only a small section of the audience meets, and generally seats itself for conversation, the small centralised lounge meets with most favour. As regards the more nondescript form, little can be said, except that such solutions as we find at the 'Empire' Variety Theatre, London, where the stage can be overlooked, or formerly at the 'Eden' Variety Theatre, Paris, where the principal stairs could be overlooked, have certain charms, and that even the arrangement at Daly's Theatre, London, where the lounge is a kind of small circular gallery over the main vestibule, is by no means displeasing. The purpose, however, must always be borne in mind; and it would be just as useless to provide a grand promenade segmental in plan, for an audience, of which, perhaps, only the male portion leave their seats during the brief intervals, as it would be to provide a small saloon, of the character of the gallery we find at Daly's Theatre, in a playhouse where the foyer serves as a great social rendezvous, and for the exhibition of feminine toilette. It is just this question of rendezvous, too, which should characterise the architectural treatment of the foyer. The extensive promenade open to the majority of the audience, requires a very different treatment from the small foyer open only to the occupants of the boxes and stalls. Again, we must distinguish the small foyers and saloons, reserved absolutely for Court purposes and accessible only to a favoured few, from the large foyers which are open to spectators in every section of the house, and the saloons, common in this country, which are little other than refreshment bars.

COURT OPERA HOUSE, VIENNA.
FIG. 506. VIEW OF SALOON TO UPPER TIERS.

Throughout these volumes, I have been careful to show illustrations of lounges and saloons of sufficient interest to call for comment, and I have here supplemented my collection with an instance of a saloon attached to the third and fourth tiers of the Court Opera House at Vienna, which is characteristic of the treatment accorded to these sections of the audience in certain Continental cities. On the other hand, I am showing a saloon in connection with the State Box in the same building, and also a Royal saloon at the Czech National Theatre at Prague, all of which tend to show how distinctly such rooms are treated from the large and hall-like foyers we often find in those Court theatres, where the playhouse is also used, to a considerable extent, as a suite of reception rooms for the monarch.

I would again take the opportunity of pointing to a few typical instances of lounge plans in the diagrams on page 87, for purposes of reference, but the lounge may perhaps be most profitably studied from the individual examples shown in the plates of the preceding volumes. It may also be interesting to turn to some of the views, such as those of the foyers at the Court Theatre, Vienna, on page 12, Volume I., and the Municipal Theatre, Odessa, on page 54, and the lounge of the private establishment known as the 'New' Theatre, at Berlin, depicted on page 24 of the same volume. From such illustrations we can at once see what importance is attached to this part of the building outside our own country, quite irrespective of whether the establishment be a Government institution or the result of private enterprise.

COURT OPERA HOUSE, VIENNA.
FIG. 507. VIEW OF ANTE-ROOM TO STATE BOX.

Yet we must also remember that in London we have a kind of lounge, better known as the promenade, which is essentially English, limited, however, to our Variety theatres. It takes the shape of a very broad gangway at the back of the seating of different tiers. If we turn to the views of such promenades as those of the 'Alhambra' Theatre and the 'Empire' Theatre, London, depicted in Volume I., page 43, and Volume II., page 40, we meet with typical examples of this feature, though various modifications of the principle are met with in some of the Continental Variety establishments, the first instance having been at the 'Eden' Theatre, Paris. The promenade or lounge of the Variety theatre, as found in London, however, has always been used during a performance, whilst this is only now becoming the case abroad.

As with the minor administrative offices which come under this heading, I do not wish to enter into detail regarding the supplementary accommodation that has to be provided in connection with the vestibules, staircases, lounges and passages. And yet taking one detail, I do not wish it to be forgotten that such facilities as the easy storage of hats and coats and the cloak-room facilities for ladies deserve serious attention. Where, as in Teutonic countries, it is customary for every member of the audience to deposit his out-door garments prior to entering the auditorium, the facilities for unrobing, rapid delivery and distribution may materially influence a plan. Reference to many of the examples of modern playhouses presented in this work will show the elaborate arrangement of cloak-rooms, cloak counters, and retiring rooms, which have been considered necessary, and we note that architects, even on a point of this kind, have had to decide between the large centralised cloak-rooms, and such systems of complete decentralisation as give each individual group of seats its own facilities, and again the various compromises between these two extremes. Whatever system, however, be adopted one point must be emphasised, and that is the inadvisability of allowing such accommodation in any way to interfere with direct routes of ingress and egress, and the danger of placing cloak-rooms in positions which prevent easy exit in case of an emergency. To allow hat and coat pegs in passages is a source of danger; even to provide cloak counters in the passages with due allowance for the extra width thus necessitated, involves considerable risk. Such facilities must be kept separate from the means of communication. But, on the other hand, so to arrange them that they take the form of isolated rooms approached, perhaps, only by one door, is to prepare a trap for those unwary individuals whose first thought in the event of panic, unfortunately, is to save their garments, and who, as past experience shows, prefer to seek these rather than take the direct route of exit. In cases of theatre fires such cloak-rooms have invariably been the scene of terrible struggles, and this fact must be taken into account. In the minds of many of the audience, it may also be assumed, there exists an association of the cloak-room with the exit, as was again seen with such sad results at the recent fire in Paris. The best cloak-room accommodation, therefore, should allow for direct exit into the open, or to the staircases, as the case may be.

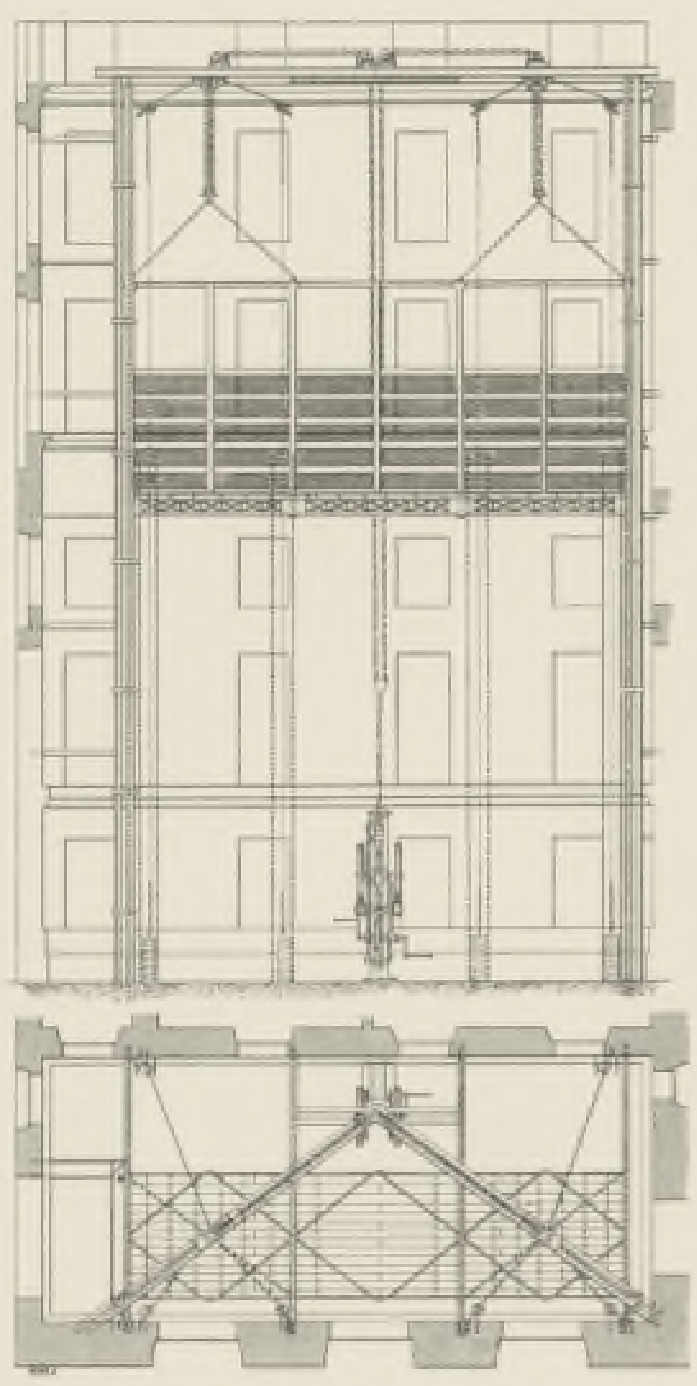
In conclusion, having referred to the staircases, the vestibule and the lounge at some length, I would only remark that the general architectural treatment of these parts of a playhouse should accord as closely as possible with the specific character of the audience for which they are intended. As I already had occasion to say in Volume II., regarding the Municipal Theatre, Zürich, it is anomalous, for instance, to use a sumptuous Rococo style, with masses of gilding and colour, for playgoers of essentially democratic feeling and garb; nor is it less out of keeping to provide the Court theatre of a highly luxurious sovereign with a foyer on the cold and classic lines of the architectural style known as Neo-Greek.

SHAKESPEARE MEMORIAL THEATRE, STRATFORD-ON-AVON.
FIG. 308. VIEW OF VESTIBULE AND STAIRCASE.

CHAPTER IV.

SERVICE.

It has been my custom in this book to call everything relating to the presentation of the play, and to the working of the 'back of the house,' the 'service' of a theatre, inasmuch as everything done in this respect, whether it be the actual performance of a play or its preparation, is that service for which the audience pays, or for which, at least, it visits the playhouse. Speaking generally, it is quite immaterial to the service arrangements at the 'back of the house' whether a performance is being actually given at the time or whether it is merely in preparation. This is most conspicuous in those Continental theatres where a large and varying programme is provided, and for which there is always far more preparatory work in progress than is occasioned by the actual presentation of the play or opera. In fact, the actual performance frequently forms but a very small part of the work that is going on. Take, for instance, any theatre that produces, say, from fifty to eighty different plays on some two hundred and fifty to three hundred successive evenings. It follows, as I have explained in the Introduction, that whilst one part of the company is presenting one play, another part of the company must occupy the rehearsing rooms in preparing for the second; and whilst the scene-shifters may be attending to the performance, the stage carpenters must, for the time being, be making preparations for the following production. Such simple offices as those of the librarian to the orchestra or the stage door-keeper, very secondary posts in themselves, become magnified by the continuity of the work, even to the extent of becoming small departments, and we have the one stage door-keeper customary in England represented by two or three officials, one attending to the performance, another attending to rehearsals, and a third occupied by mere official routine, whilst the librarian of the orchestra has his music-copiers and clerks. The 'service' of the theatre, as it is also frequently called in France, in such a case takes an importance little known in this country, and it will be remembered that such a service, for instance, in the case of the Vienna Opera House includes a staff of no less than three hundred and ninety non-performers, and the perpetual change compels the managers even to have their own staff of dressmakers on the premises.



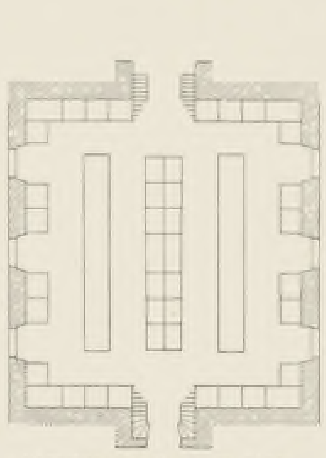
NATIONAL OPERA HOUSE, PARIS.
FIGS. 509, 510. OUTSIDE SERVICE LIFT, PLAN AND ELEVATION.

Now, as is only to be expected, the 'service' of the 'back of the house' requires the utmost attention on the part of the designer, inasmuch as on the degree of excellence obtained in the plan depends, to a great extent, the economy in working the institution. Even in a small establishment designed for long 'runs' as in London, the importance of the economic arrangements cannot be underrated. How much greater, then, must be the importance of these dispositions where a large staff has to be dealt with, working an ever-changing play-bill? The closest study of the requirements must appear still more essential when we remember how constantly they vary in different playhouses, not only according to the purpose in view or the auspices under which they are conducted, but also according to the ideas of different managements or the customs and theories of individual officials. No greater difference can be imagined than that existing between the ultra-methodical methods of a German Court Theatre and those of an average London playhouse. In the former are found readiness for all emergencies and absolute military discipline for all workers, whilst in the latter

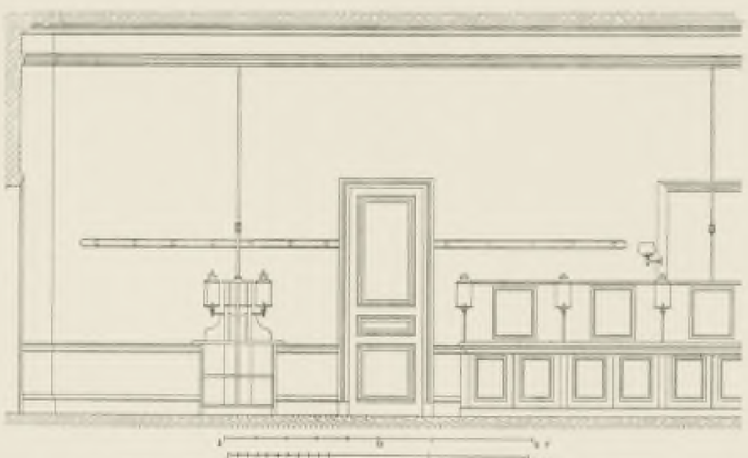
NATIONAL OPERA HOUSE, PARIS.
FIG. 514. DRESSING-ROOM, SECTION.

NATIONAL OPERA HOUSE, PARIS. FIG. 511. WARDROBE-ROOM, SECTION.

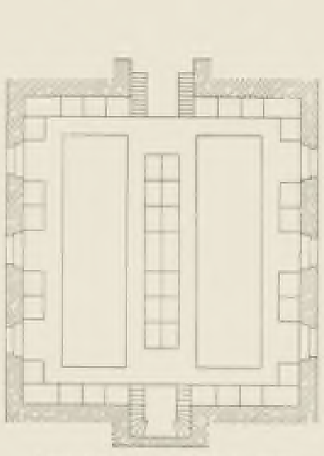
NATIONAL OPERA HOUSE, PARIS.
FIG. 515. DRESSING-ROOM, SECTION.



NATIONAL OPERA HOUSE, PARIS.
FIG. 512. WARDROBE-ROOM, PLAN (FLOOR LEVEL).

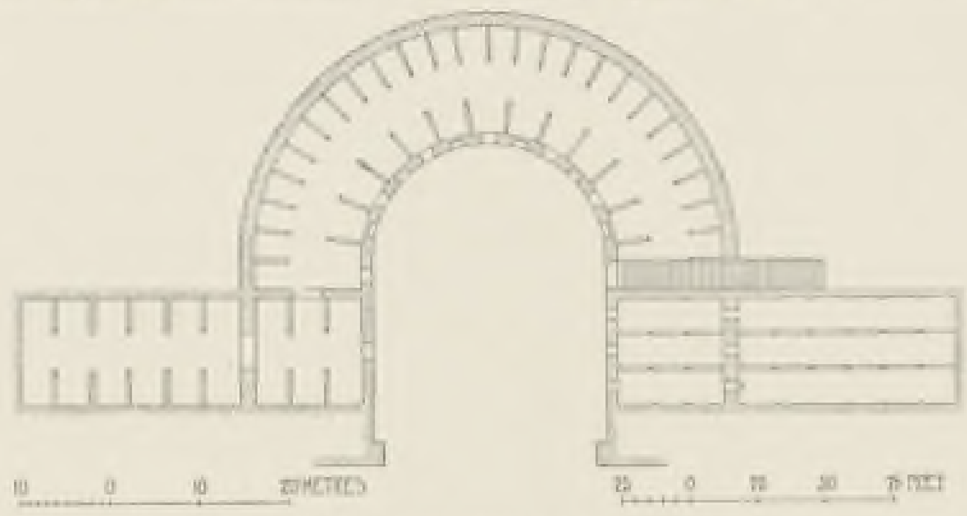


NATIONAL OPERA HOUSE, PARIS. FIG. 516. CHORUS DRESSING-ROOM, SECTION.

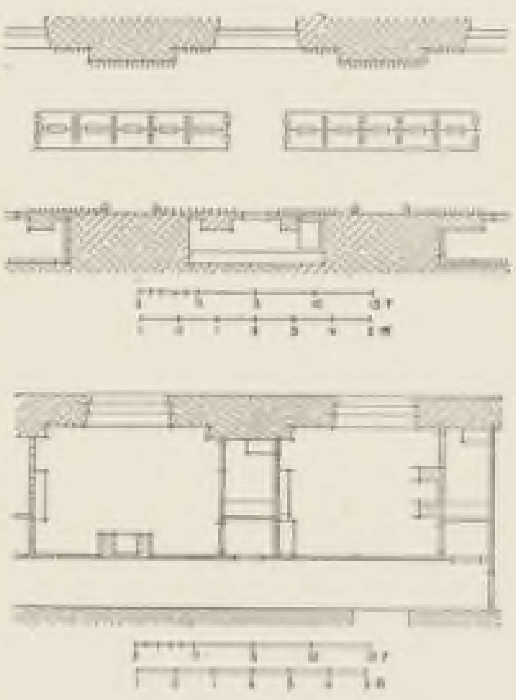


NATIONAL OPERA HOUSE, PARIS.
FIG. 513. WARDROBE-ROOM, PLAN (GALLERY LEVEL).

the very opposite principles are too often the rule. No better description of Teutonic methods can be found than the following from the pen of Albert Carré, Director of the Opéra Comique at Paris, who says: "The first thing that strikes one on going behind the scenes of a German theatre is the prevailing spirit of order and tranquillity. Everyone is in his place and restricted in his actions to the narrow sphere of his appropriate function, which is adapted to that of his neighbour as one piece of machinery fits in with another. In this triumph of organisation nothing is left to chance; all is foreseen, regulated, measured and arranged beforehand." Another Frenchman, holding an equally responsible position with the last-named authority, has expressed himself regarding our London arrangements as follows: "We Frenchmen are well aware how far behind German theatres we are in methods of organisation, but surely we may pride ourselves on being far ahead of 'practical' England. Though it may only be necessary to produce one or two plays a year, and there is generally no excuse for the requirements not being foreseen months in advance, I have never yet known a London stage on which anything was thought of before the very latest moment, and where, whatever good effects may have been obtained, were not due to makeshifts of the most hurried character." No doubt both criticisms are extreme, and may have been taken from examples of theatre management, on the one hand extremely good, and on the other extremely bad; and yet there is no disputing the fact that the contrast is very conspicuous, and the architect must keep that difference and its many gradations in mind.



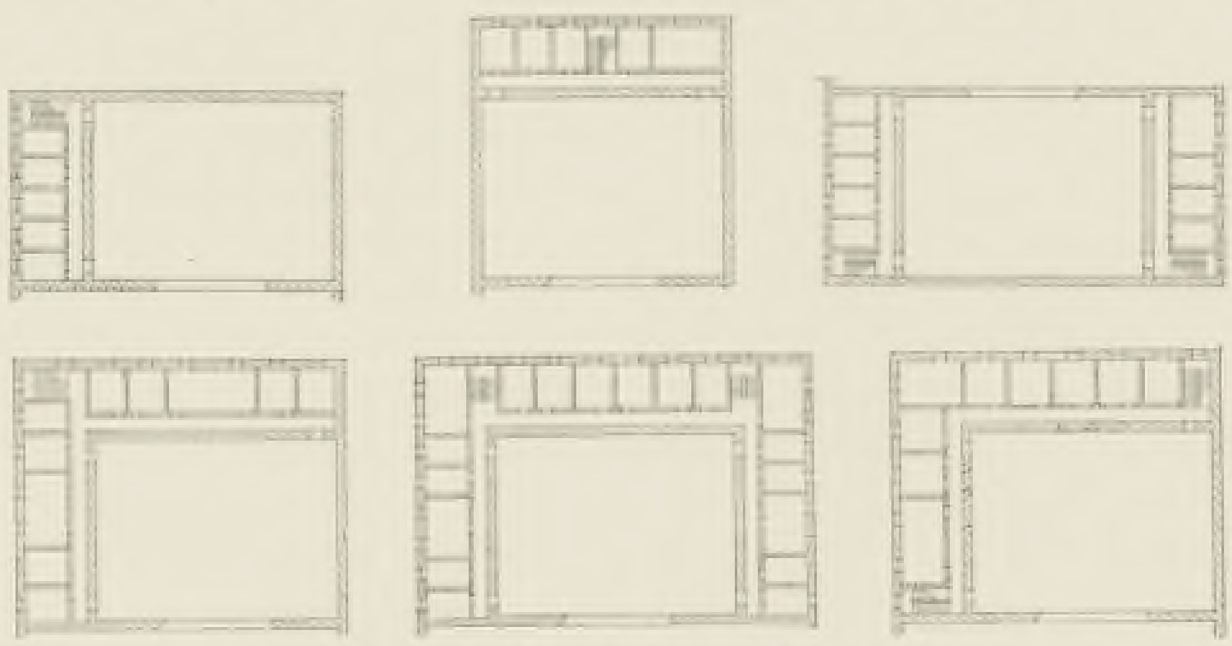
PROPOSED COURT OPERA HOUSE, ST. PETERSBURG.
FIG. 517. SCENE-STORE, PLAN.



NATIONAL OPERA HOUSE, PARIS.
FIGS. 518, 519.
LARGE AND SMALL DRESSING-ROOMS, PLANS.

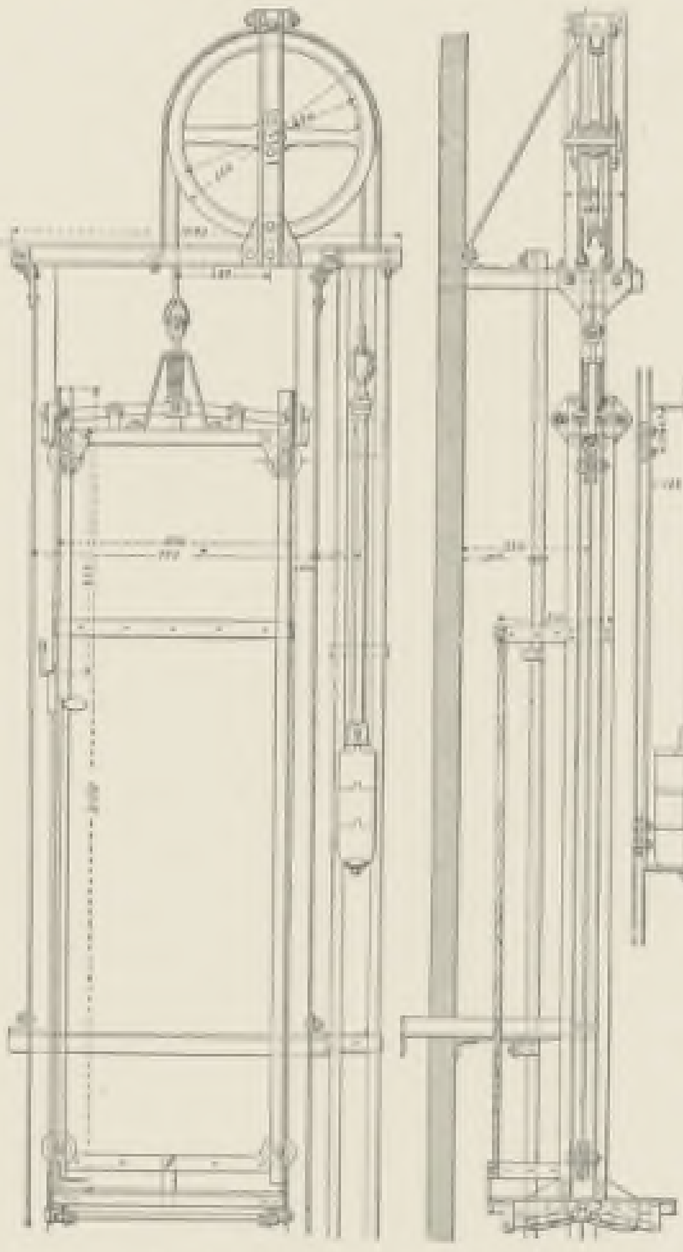
To enter into the requirements of the service in anything like a comprehensive form would be quite out of place in these volumes, the more so as there is no section of the theatre which requires greater specification of detail than the 'back of the house.' I will thus limit myself to pointing out that there is always considerable variation in locating the service, with the one exception of the position of the stage, which must, of course, lie centrally in relation to the auditorium. It is the stage, or rather the carcass of the stage, which must be considered the one important factor in the general plan of the back of the house, and I may add that its dimensions and proportions materially influence the grouping of the block, and govern, to a very considerable extent, the architectural rendering of the exterior. The containing walls of the stage generally have, in fact, to be the most prominent feature in the theatre as seen from the outside. It should hence be remembered that, when determining its lines with regard to the auditorium and its own equipment, the question of exterior appearance must on no account be neglected; and it remains a fact that on the lines of the containing walls very often depends the whole effect of a theatre design. Nothing can more easily spoil the most handsome façade, or the most clever arrangement of the cupola over an auditorium, than the fact that the part of the block containing the stage is out of proportion or awkwardly placed in relation to the parts surrounding it.

As regards the offices connected with the stage, I need only mention that it is now a recognised principle to separate them from the stage proper, if possible, by a continuous corridor, and to place the service staircases, etc., symmetrically with it. I am showing in the diagrams at Fig. 520 to Fig. 525 some of the ways in which the plan of the offices is laid out in the simplest and smallest playhouses; but I would emphasise the fact that even in a small theatre the one-sided arrangement is only permissible when circumstances do not allow of another position. Another point I must not omit to specially note in these diagrams is the position of the staircases. Not only for safety, but also for the general convenience of the staff, there should, if possible, always be two sets of stairs, even in the smallest of establishments. To have but one staircase to a dressing-room block must always be considered dangerous and unpractical.



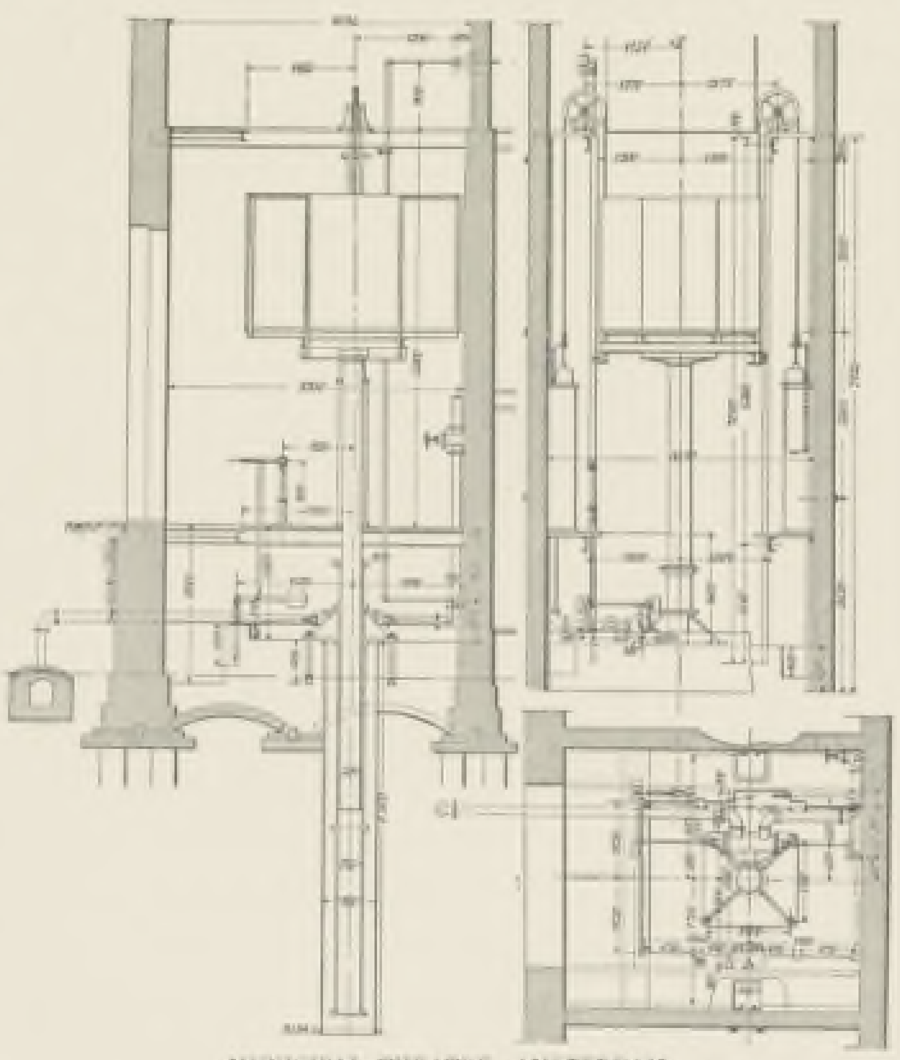
'BACK OF HOUSE.' FIGS. 520 TO 525. TYPICAL PLANS.

As to the multiplicity of the demands upon the architect in respect to the service, I can indicate no better instances in modern theatre design than the plans of some of the large theatres depicted in the preceding volumes. We are there reminded that these requirements may include the most extensive scene-stores, workshops, painting-rooms, and even libraries and music collections. In particular the National Opera House, Paris, and the Court Opera House, Vienna, show instances where the offices are on a most extensive scale.



MUNICIPAL THEATRE, AMSTERDAM.
FIGS. 526, 527. PASSENGER SERVICE LIFT, SECTIONS.

In respect to the superficial area covered by such offices, it should be noticed that the question of scene-storage plays a most important part. I am strongly averse, however, to the accumulation of workshops, painting-rooms, and, above all, scene-stores, under the same roof with the audience. Though I allow that it is a matter of considerable convenience to have everything in the same block, the risk of fire is very great, and the dignity of the house is by no means enhanced by the multiplicity of service departments. To show what I prefer in offices of this description I would call attention to the site plan of the Frankfort Opera House on page 14 in this volume. An independent scene-store close at hand, if possible not at a greater distance than can be easily connected by a subway, is one of the most convenient and safest methods I can imagine. Such a building should be so close that it can not only contain all the necessary stores and workshops, but also the engines, boilers and chimneys which form an essential part of the equipment of a modern institution. It will be remembered that in the second volume, at the Czech National Theatre, Prague, we had an instance where many of these offices were housed in a second or supplementary block at the back of the theatre, and almost independent of it. This is no doubt also an advantage, though I think the Frankfort principle is better. And one word of warning here in respect to placing scene-stores and workshops outside the theatre proper. It is preferable to have a site, even if an expensive one, close by, and to so treat the façade of the store-house architecturally as its position in the neighbourhood seems to demand, than to incur the inconvenience and great expenditure involved by the cartage of goods and scenery to and from a distant depôt, especially in such establishments as are liable to a constant change of repertory. In concluding my remarks in respect to these particular offices, but without entering into details, I would point to some illustrations presented on page 95, in Figs. 532 to 534, of the scene-store of the Vienna Court Opera House, and also to Fig. 517, on page 93, showing a diagram of the radial system of scene-storage proposed by Victor Schroeter for the Court Opera House at St. Petersburg, to which I referred when speaking of this design in Volume I.



MUNICIPAL THEATRE, AMSTERDAM.
FIGS. 528 TO 530. 'PROPERTY' SERVICE LIFT, PLAN AND SECTIONS.

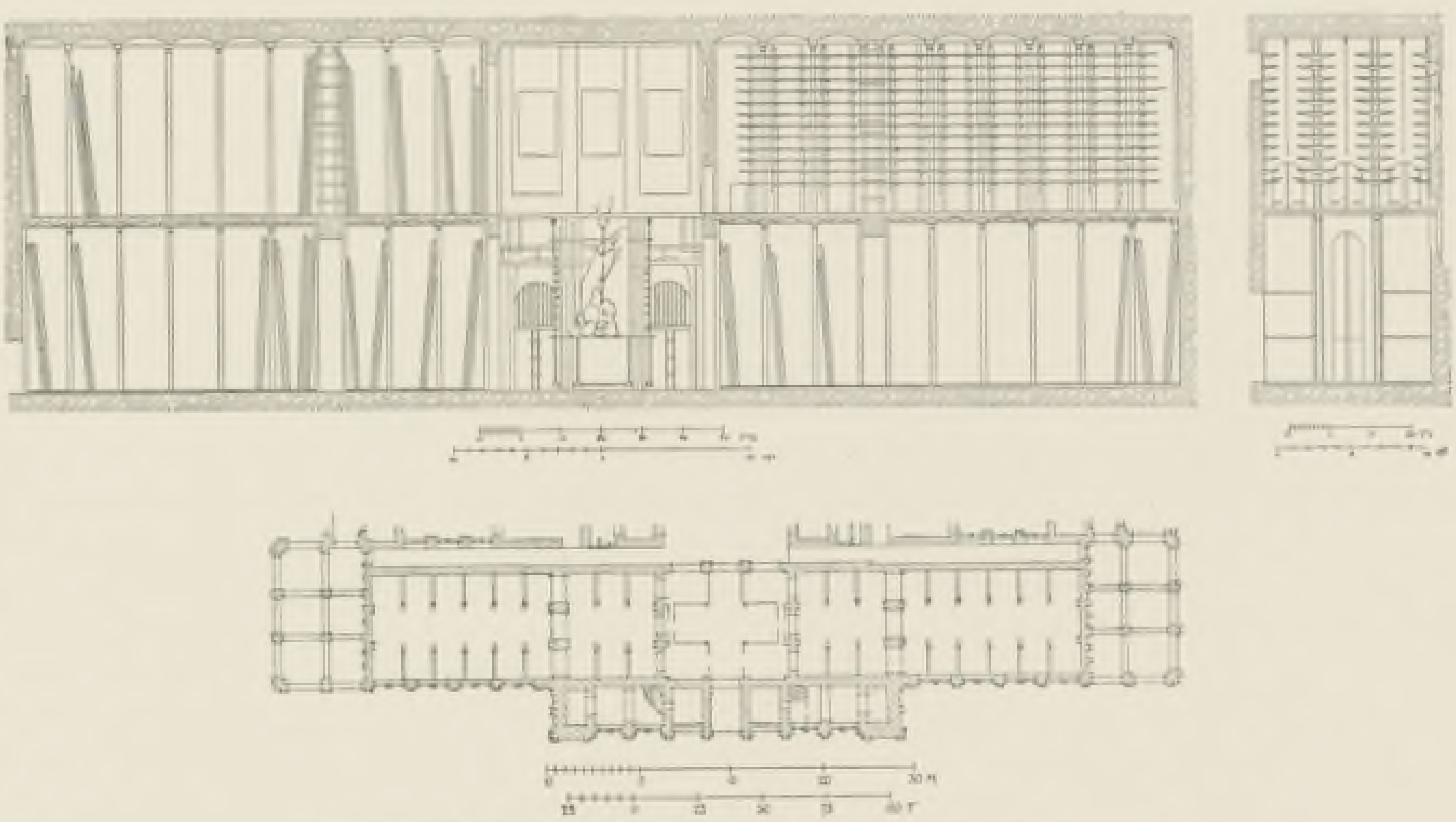
Speaking generally of the offices at the 'back of the house,' I would take the opportunity of commending the central arrangement of the stage door, by which all the members of the establishment entering or leaving the premises can be seen, while it is at the same time in easy touch with the chief corridors and service stairs of this part of the block.

As regards the important subject of dressing-rooms and wardrobe stores, I must call attention to the excellent plan adopted at the Paris Opera House which I have illustrated in Figs. 511 to 516, and Figs. 518 to 519. Though completed in the 'seventies' and at a time when gas was the illuminant, the dressing-rooms in particular still remain model examples. Then I would add that in all countries every set of, say, six dressing-rooms should have its bath-room, and the lavatory accommodation should not only be of the best, but very ample and convenient.

As to the means of communication in the 'back of the house,' the staircase facilities must be very easy, and the passages as direct as possible. But at the same time every effort must be made to still further simplify the stairway communication by means of lifts. On this page, Figs. 526, 527, I am showing one of the passenger lifts at the Amsterdam Municipal Theatre, which can be worked by the passenger himself, and which is of the greatest convenience for rapid transit between different levels. I am also here presenting, Figs. 528 to 530, another lift worked by hydraulic power in the same establishment for moving heavy 'properties,' and yet another, an outside lift for the same purpose, worked by hand power, at the National Opera House, Paris. The lift should be one of the most important features in the working of the 'back of the house' in an economically managed establishment, and where scenery has to be constantly moved in and out of a building the hoisting arrangements in connection with the stage should have every consideration. The difficulties in moving large scenes may be gauged from a sketch that I am showing, illustrating the sliding way of the Paris Opera House, which displays one of the older and clumsier ways of moving scenes. For a modern arrangement in this respect I would turn to the sloping 'bridges' and 'cuts' of the Court Theatre, Vienna, and other more recent examples depicted in Supplement I., where I speak of stage equipment. I am also here giving an example of a scene truck (Fig. 531) used for moving scenery at the theatre last named, as it is not only necessary to have conveyances specially designed to meet the requirements of individual playhouses, but to consider the vehicle in conjunction with the facilities for bringing goods in and out of the 'back of the house.'

COURT THEATRE, VIENNA. Fig. 531. View of Scene Truck.

In conclusion, whilst regretting my inability to enter into detail respecting this section of the institution, I would again emphasise the importance of practical service arrangements for the economic well-being of the modern playhouse.



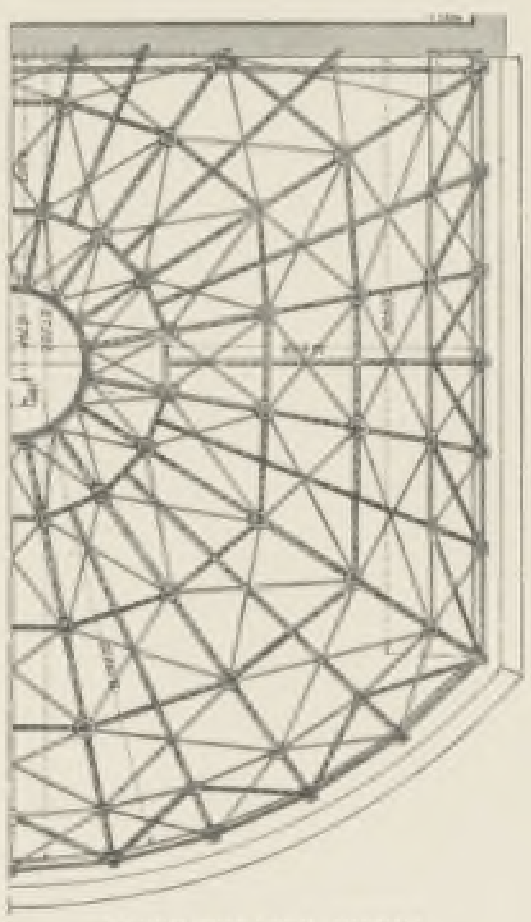
COURT OPERA HOUSE, VIENNA. Figs. 532 to 534. Scene-store, Plan and Sections.

CHAPTER V.

CONSTRUCTION.

Speaking of Europe generally, it may be said that the respective methods which prevail in the ordinary building practice in each country are employed in the construction of a theatre. And indeed, there are very few sections of a playhouse that require the application of methods or systems differing from those practised in any public structure. In other words, a theatre is erected in much the same manner as any other large building, and the characteristic features of its construction are limited to certain parts of the work only. Of these parts the auditorium, with its tiers and ceiling, is certainly the most important, and in fact the only one which to my mind calls for special comment in this place. Next, perhaps, comes the roofing of the auditorium and of the stage, in which certain peculiarities and the large spans that have to be dealt with frequently call for much thought. And yet even in the case of roofs, it may be said that the construction does not differ materially from that found in blocks containing large assembly rooms or concert halls; though there would, for instance, be considerable dissimilarity between the forms employed in erecting the tiers of an auditorium as compared with the lines of a concert-room gallery.

Now in the construction of the auditorium we may take it for granted that in modern work some, if not all, the main features should show the employment of iron and steel, and the more open the auditorium the more extensive should be the application of metal. The use of constructional ironwork, in fact, depends to a very considerable extent on the character of the auditorium, although, of course, there is no reason why, as far as the main structural features, metal should not always take the place of other materials, even if its adoption is not absolutely necessary, as for instance in the simpler forms of auditorium where no attempt is made to reduce the number of uprights which so frequently block the view of the spectator. To-day, however, from the designer's point of view, the primary difference in an auditorium lies in the character of the tiers, and he only discriminates between those supported in the ordinary way by the uprights just mentioned, and the overhanging tiers designed on the cantilever principle which have no vertical support whatsoever to intercept the sighting.

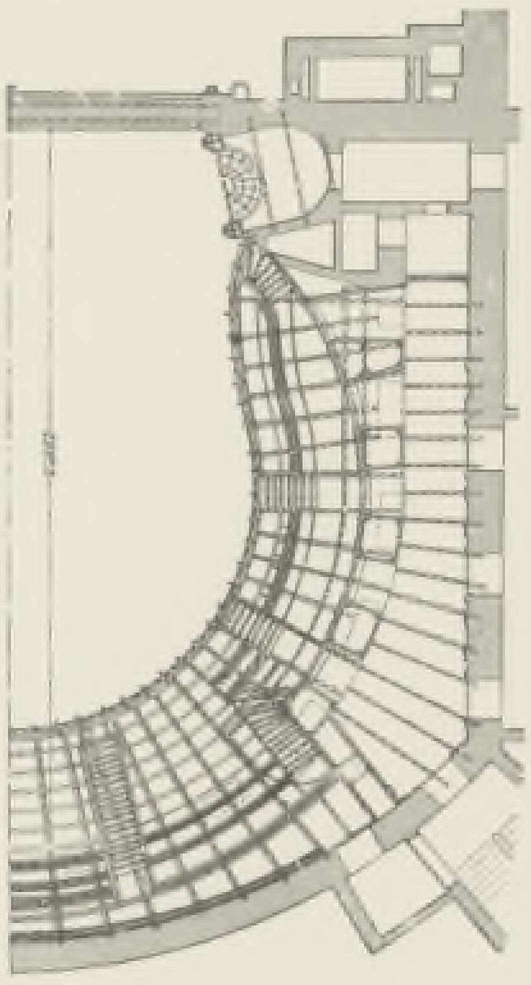


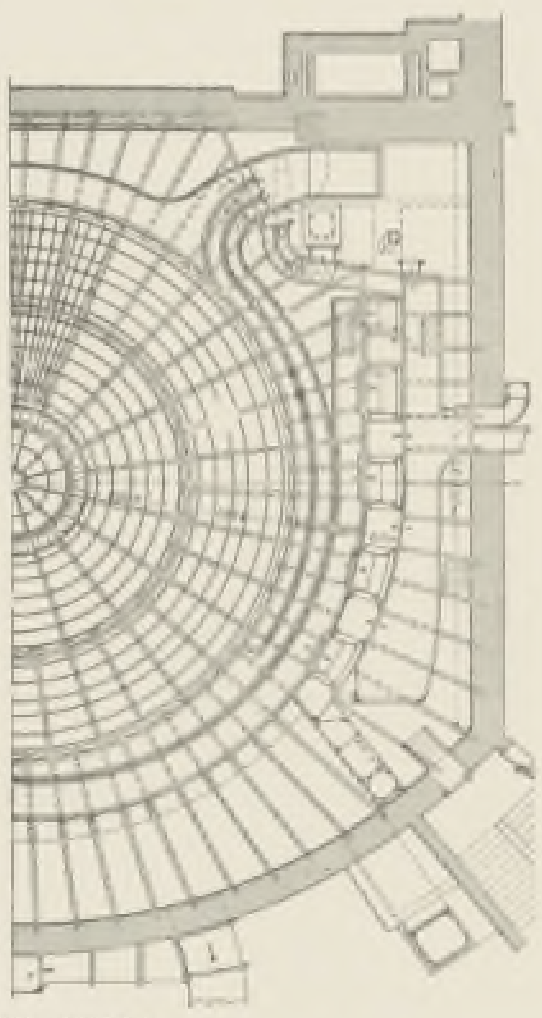
COURT THEATRE, VIENNA.
Fig. 535. Auditorium; Plan of Roof.

As far as the method of supporting a tier in the ordinary manner is concerned, reference to illustrations of the ironwork would be of little value, for the most elementary principles of design are simply brought to bear, and there is seldom anything of interest in such instances. Whether the tiers which hold a number of pigeon-hole boxes be supported by thick cast-iron columns dividing certain sequences or sets of boxes, or by thin steel pins placed at each box division, is a matter of indifference. It is only when such elementary work is elaborated and we find the whole of the auditorium practically taking the form of a large iron framework, that the simpler methods of construction may be said to call for comment. With tiers requiring construction on the cantilever principle the matter, however, stands very differently, for the simplest of cantilevers may almost be said to merit attention. Where the cantilever principle is applied to the large auditorium with raking tiers and perhaps double curved box-fronts, the complications frequently call for the greatest ingenuity, and many difficult feats of construction have already been executed to meet the varying needs which such applications demand.

As regards the employment of an elaborate system of iron framing for a commonplace auditorium, in which, however, the adoption of this modern form of construction has gone so far as to necessitate the main containing wall to be of metalwork, I think no better example will be found than that of the Court Theatre, Vienna; and as it is impossible for me here to enter into the descriptions of the various systems employed for similar purposes, or their many modifications, I cannot perhaps do better than refer at some length to what may almost be taken as a model of this specific type of design and the most comprehensive instance of its kind. At the 'Hofburg' Theatre there is, in fact, not only an interesting application of metalwork in the tiers, the containing walls, the ceiling and the area floor, but also its use in the roof in conjunction with the scheme of the ceiling calls for consideration.

For the purpose of this chapter it will suffice if I call attention to the drawings here reproduced, in preference to attempting any detailed description of the lines laid down or the circumstances which have influenced them; but I should, perhaps, emphasise the fact that the requirements of the heating and ventilation systems of the house must have materially affected the conception of the work. In order to deal with the construction of this auditorium to the full extent of its merits, I am giving illustrations which are perhaps more comprehensive than is to be expected in a general treatise of this kind. I am showing many details, and I have not omitted to give such dimensions as would be of value to those preparing working drawings based on this example. It will be seen that, besides the several plans in Figs. 535 to 539 on these pages, two full transversal and longitudinal sections are depicted on a special plate, whilst the diagrams embrace even the minor connections of the ironwork which I consider of value.

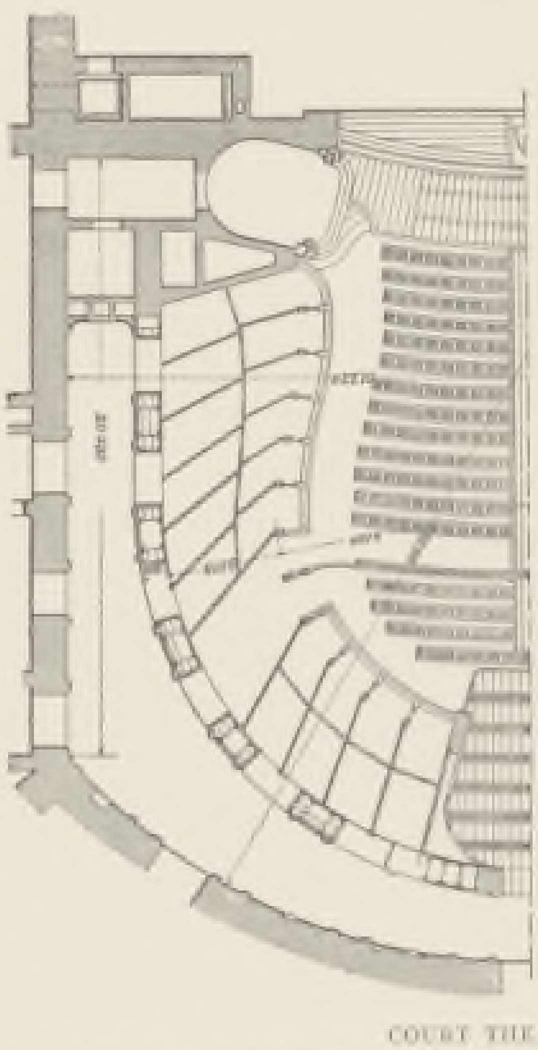


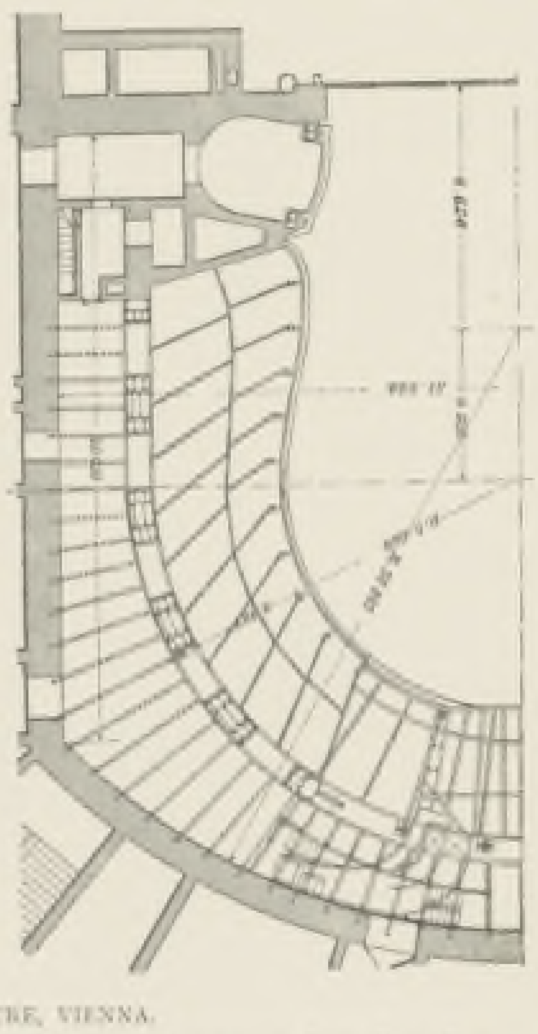


COURT THEATRE, VIENNA.

FIG. 536. AUDITORIUM, PLAN, SECOND TIER. FIG. 537. AUDITORIUM, PLAN, CEILING.

I have indicated elsewhere that the Court Theatre, Vienna, embodies to a large extent the most comprehensive application of technical knowledge applied to the theatre, and the drawings here produced cannot fail to bear out this opinion. Without giving particulars I would, however, point out the lightness and economy of the metalwork for the main skeleton of the auditorium, and the manner in which the rigidity of the whole has been secured. The execution of the ceiling also deserves commendation, whilst the finish of the entire constructional work certainly calls for praise. The manner in which many of the complications caused by the heating and ventilation ducts have been overcome speaks of great ingenuity on the part of the designer, and seeing the importance of the structural work in this playhouse, it would not be out of place to mention that the firm of engineers employed by the joint architects was that of Ign. Gridl.



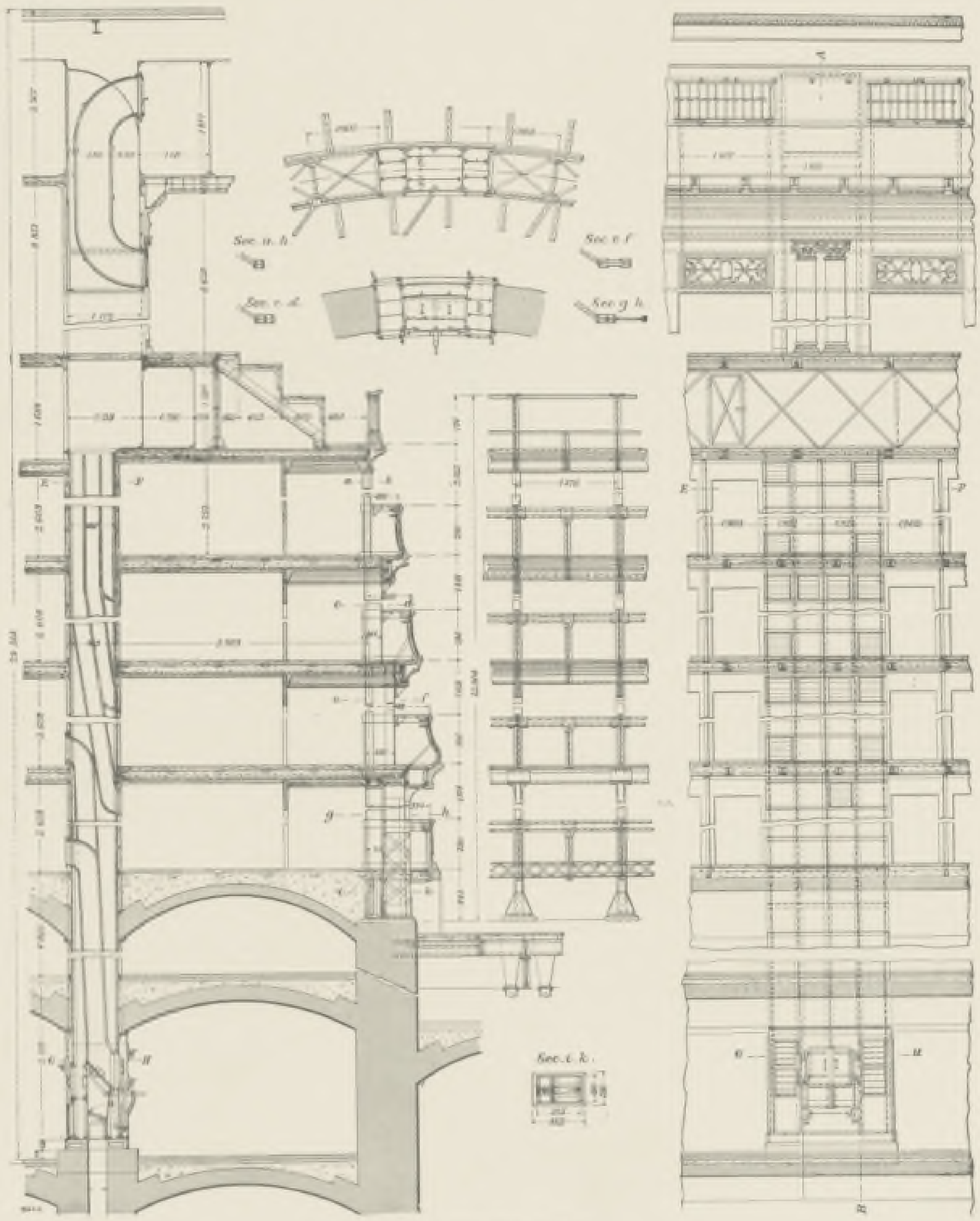


COURT THEATRE, VIENNA.

FIG. 538. AUDITORIUM, PLAN, AREA. FIG. 539. AUDITORIUM, PLAN, FIRST TIER.

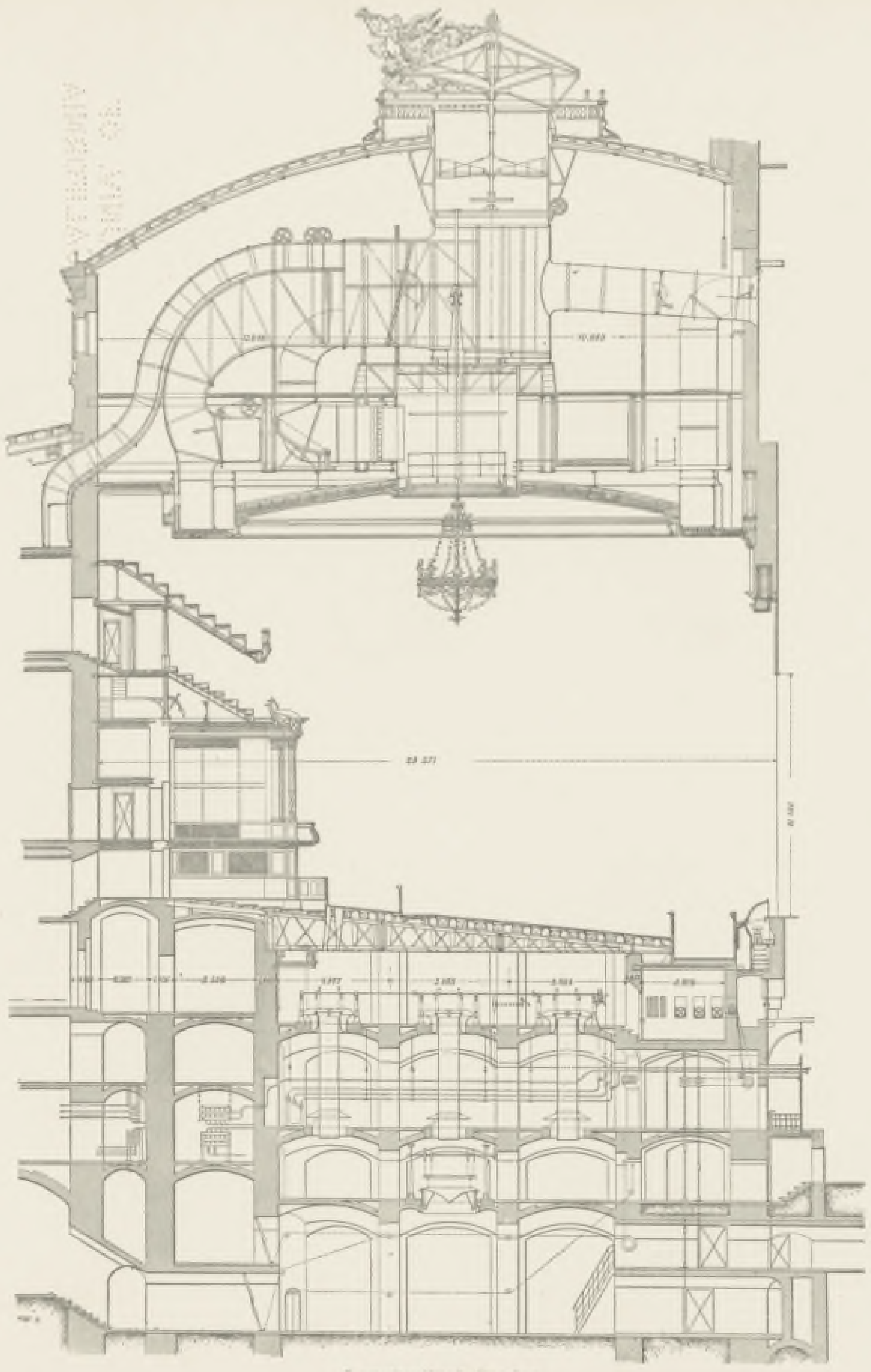
It is not my purpose to criticise the design, and I would hence limit myself to pointing out in a general way that the introduction of metalwork and the adoption of modern methods of construction necessarily led to the introduction of fire-resisting materials for the floors, whilst non-combustible materials were also used for the surfaces, all the lighter divisions and box-fronts being attached to the framing with the aid of metal lathing and similar expedients. For acoustic purposes, however, as well as for the comfort of the audience, all fire-resisting floors were covered with wood blocks or, preferably, parquetry, whilst in the area floor a somewhat greater use of woodwork was made than elsewhere, seeing that this part of the auditorium necessitated a particularly light form of construction, with due consideration for the requirements of the many air inlets to which I shall refer in the next chapter when speaking of the ventilation of this building. It is, however, remarkable, even considering the dates of conception and execution of the ironwork, that greater care was not taken to ensure all metal surfaces whatsoever being duly protected by some casing of fire-resisting material, so that in the event of an outbreak there should be no risk of expansion or collapse in any part of the framing. As a matter of fact, some very important girders and stanchions are left entirely unprotected.

To pick out a detail of this description for adverse comment may seem out of place where the general lines of construction so nearly approach perfection as in the case of the 'Hofburg' Theatre, but what in this individual instance may not be quite of such importance as would appear at the first glance, owing to the general uninflammability of the

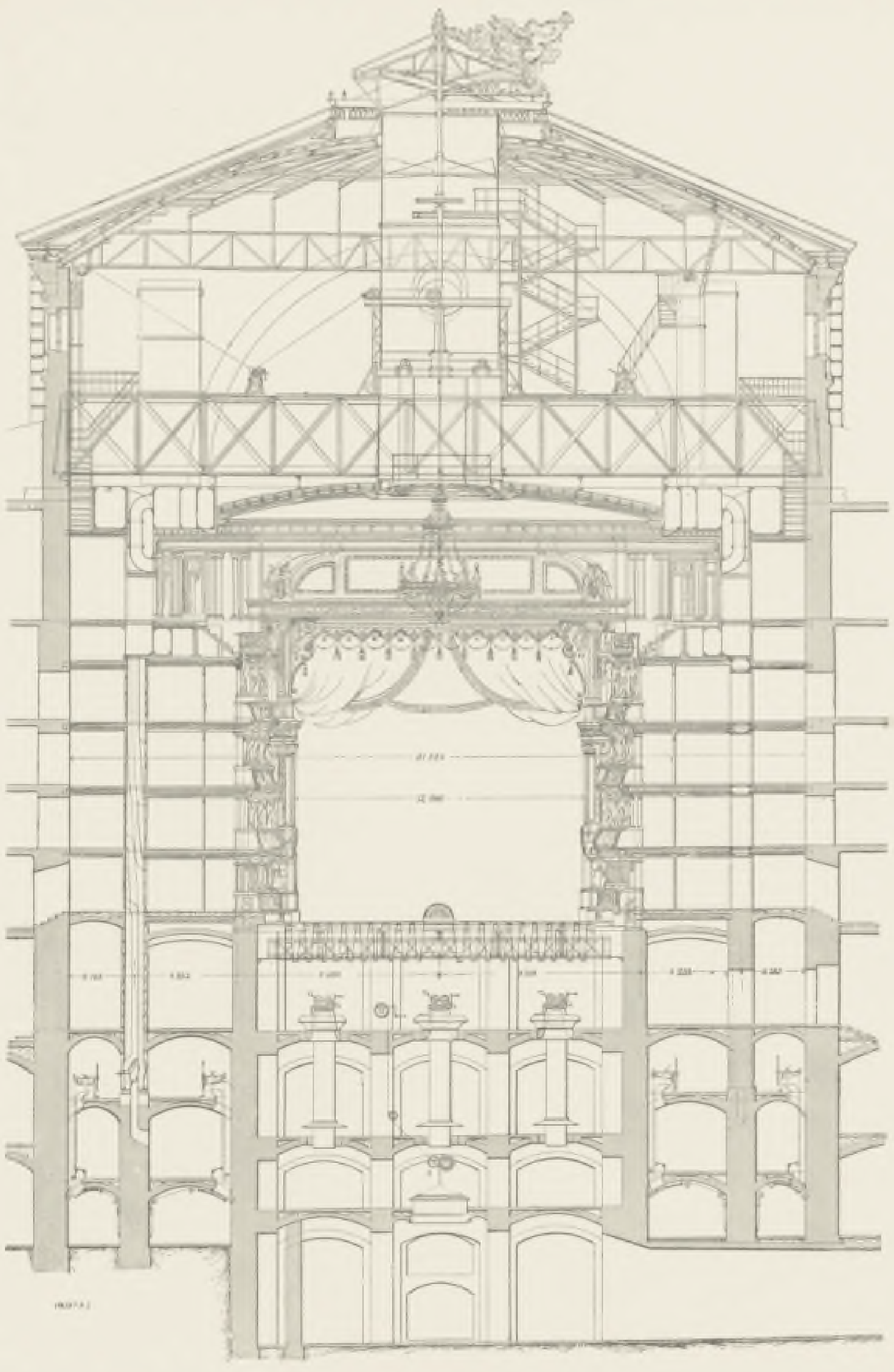


COURT THEATRE, VIENNA.
FIGS. 540 TO 545. AUDITORIUM, DETAILS.

building, must yet be considered in a general sense as a very serious matter, exercising a great influence on the general introduction of metalwork in theatre construction. An auditorium constructed primarily in metal framing is quite in accordance with the requirements of the day, both in the structural and the economic aspects. Yet such methods are only permissible when there is the absolute assurance from the fireman's point of view that the least possible risk is incurred. Where high temperatures are so rapidly reached as in the case of a theatre fire, it is of great importance that the collapse of any small section, which may lead to a general downfall of the constructional work, shall be most carefully avoided; for, although no individual member of the audience is likely to be on a tier at the time when its iron support is being attacked by the fire, it is by no means improbable that members of the audience may still be in the passages or staircases,



Laengsschnitt. Longitudinal Section. (Fig. 558.) Coupe Longitudinale.



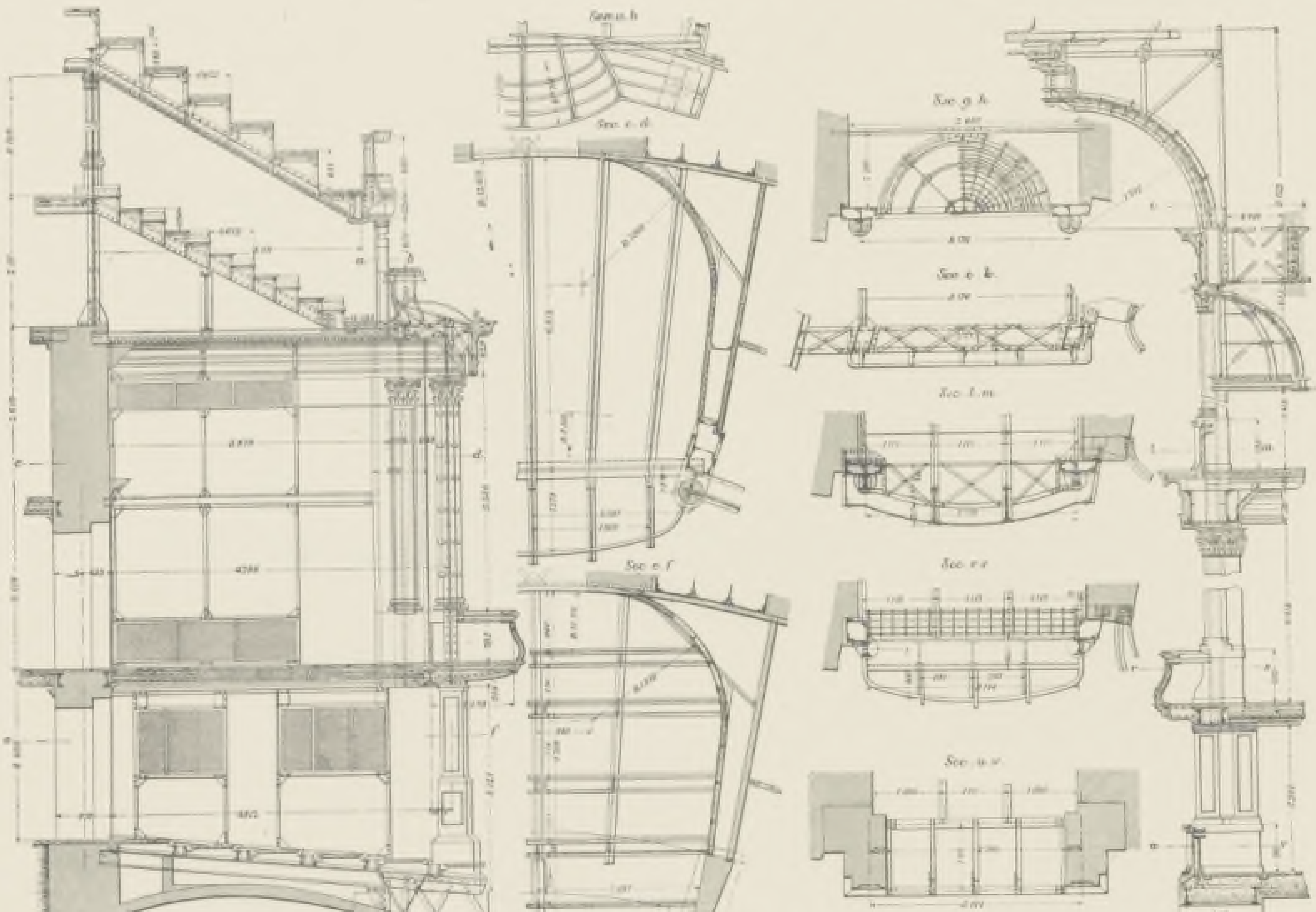
Querschnitt. Transverse Section. (Fig. 559.) Coupe Transversale.

Edwin O. Sachs ed.

CONSTRUCTION: IRON WORK AT THE COURT THEATRE, VIENNA.

and a general failing of the ironwork would even then be a most serious matter to them. And quite irrespective of the audience or the theatre staff, the safety of the members of the local fire brigade or others entrusted with combating the fire, must be thought of. A general collapse of ironwork in an auditorium where tiers, supports, containing wall, etc., form together a gigantic iron frame, would be simply disastrous to the forces employed in attempting the extinction of the outbreak. As regards the property itself, it should, of course, be borne in mind that, though a secondary consideration as compared with the safety of life, the loss through the 'gutting' of a metalwork auditorium must be a very complete one, even compared with the auditorium where the wood tiers are burnt out and the main containing walls left intact. Where metalwork is used in conjunction with wood the thorough protection of all surfaces is of still greater importance than, say, at the 'Hofburg' Theatre, where, as indicated, the amount of inflammable material contained in the structure is so small.

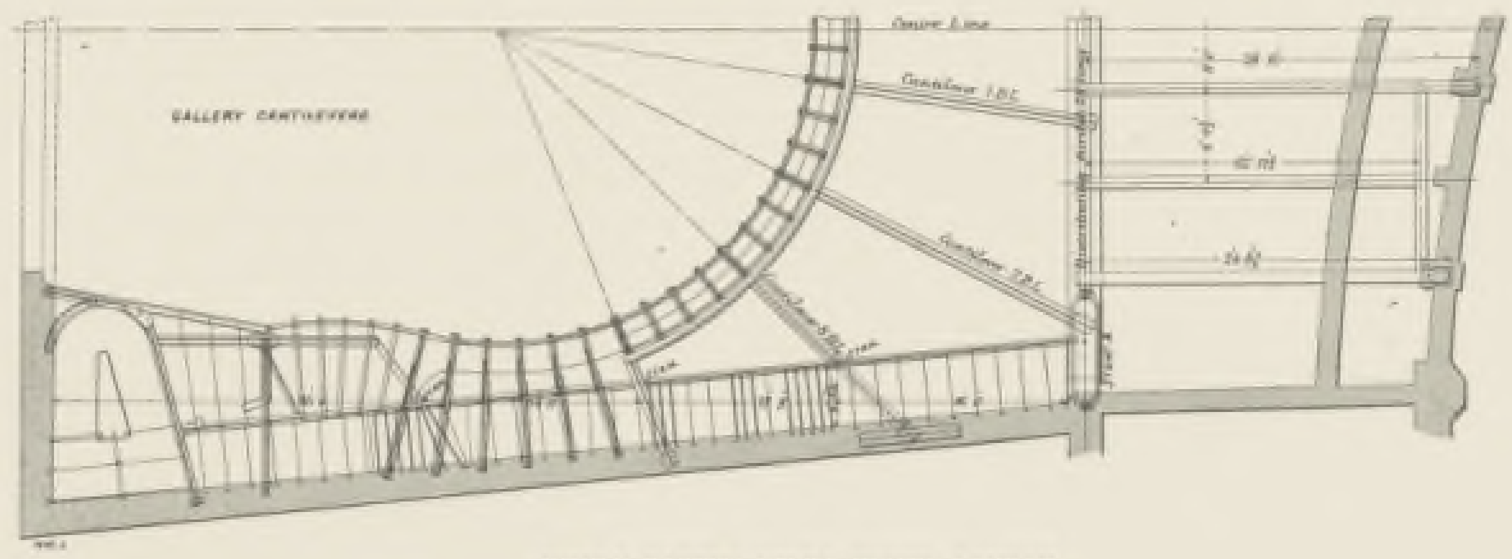
Speaking of the application of iron to the auditorium, and more particularly where it is used so largely as at the 'Hofburg' Theatre, it should be remembered that there are, of course, a number of sentimental reasons on account of which the adoption of the newer forms of construction does not find favour. There are many who prefer the older and more ordinary



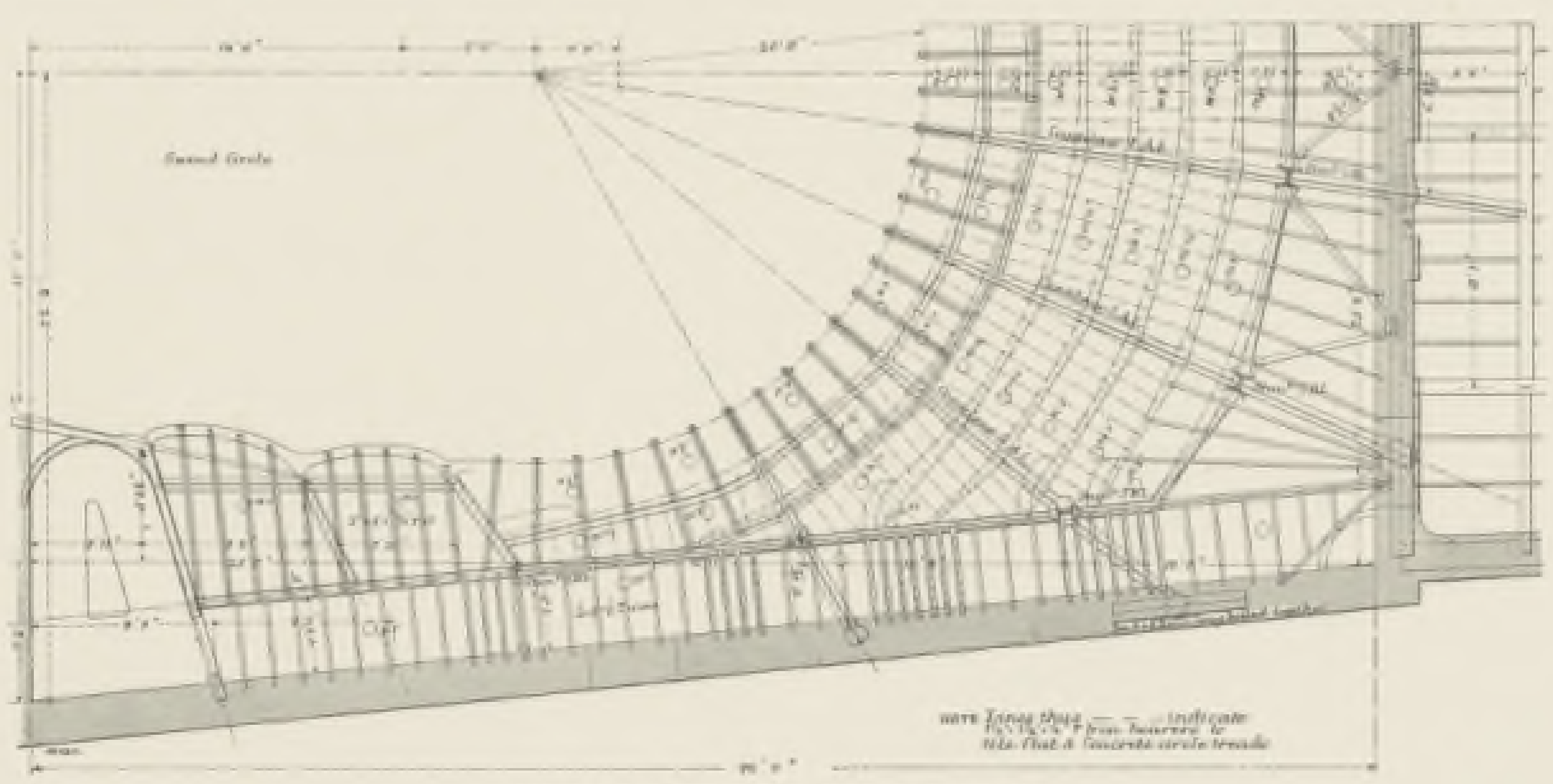
COURT THEATRE, VIENNA.
FIGS. 548 TO 557. AUDITORIUM, DETAILS.

means of construction, because they consider the application of ironwork to the theatre as much out of place as its conspicuous use in a place of worship. To a certain extent this feeling may be due, particularly in this country, to the unfortunate association of metalwork with the steep 'rakes' given to the tiers of some of our recent playhouses, an expedient which, to my mind, as I have explained elsewhere, by no means adds to the beauty of design or decoration.

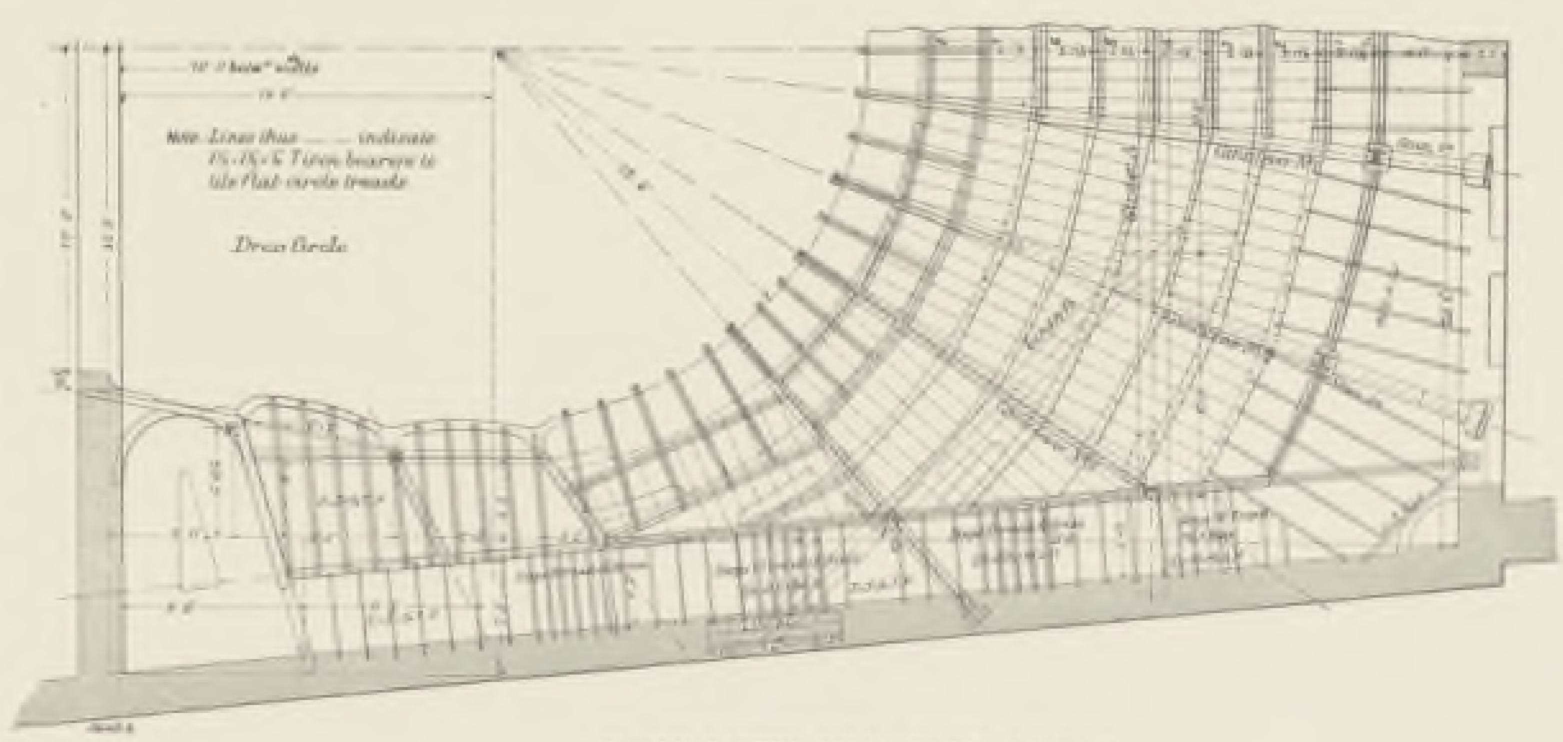
There is also the argument that the amount of metalwork which has sometimes been used of late, is prejudicial to the acoustic properties of the auditorium, and that even where its introduction does not affect the carrying power of the voice it certainly influences the tone, which becomes harsh and metallic, whilst there is a tendency to resonance. There is no doubt that the excessive use of complicated metalwork, or any other application of hard materials, affects the hearing qualities of an auditorium. But metal construction is so useful and economical, and the means of lessening its bad effects in this direction are so numerous, that to debar its employment in the theatre for this reason would be distinctly unwise. A series of box-fronts, covered with iron plate, or some metallic material, such as pressed zinc, would no doubt prove unsatisfactory; but there is no reason why a box-front should not be simply made in a light iron framing, with a filling of any of those many plastic materials which lend themselves so well to theatre decoration, and have no acoustic disadvantages. There is



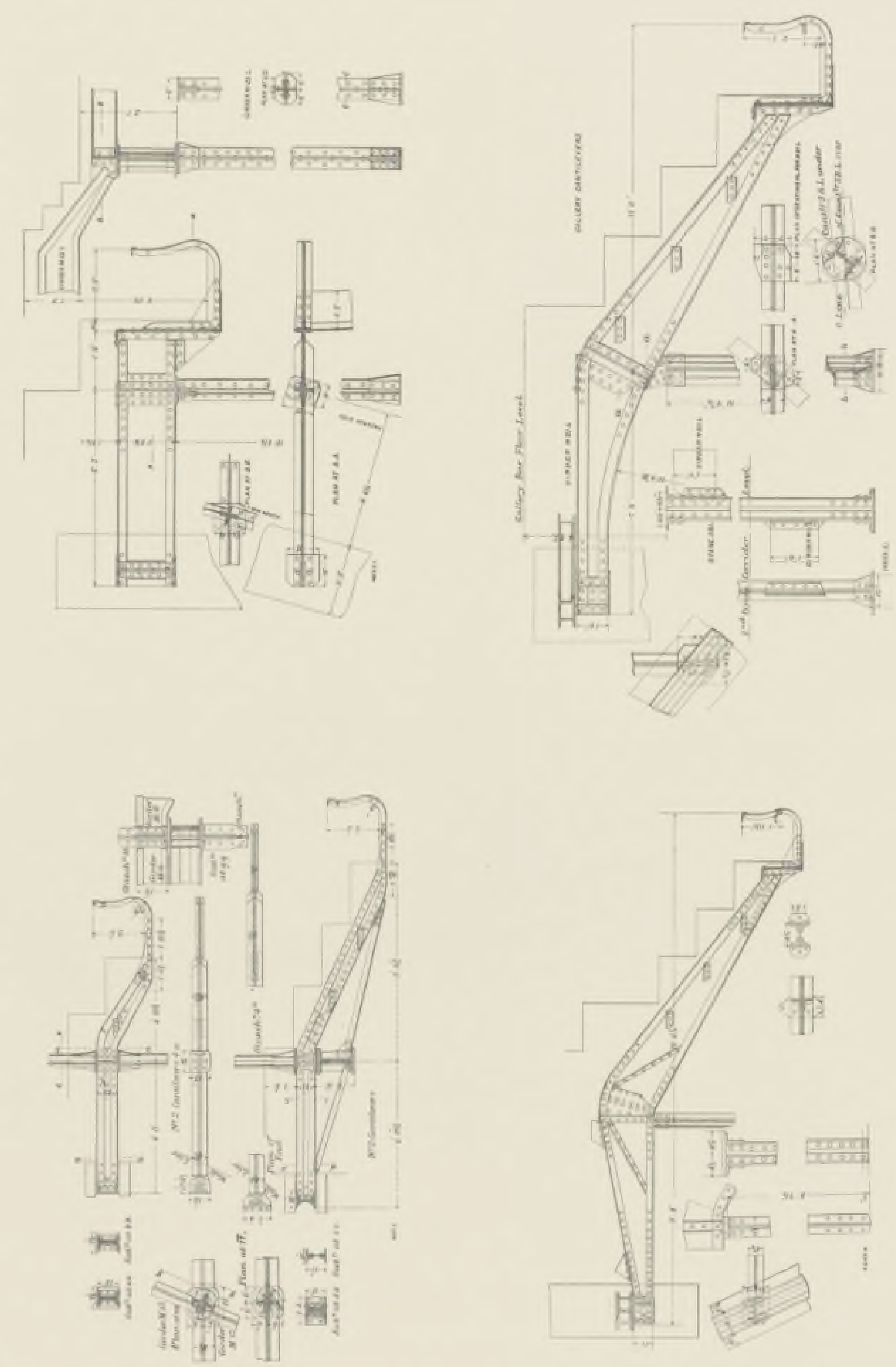
D'OYLY CARTE'S OPERA HOUSE, LONDON.
Fig. 558. Auditorium, Plan, Third Tier.



D'OYLY CARTE'S OPERA HOUSE, LONDON.
Fig. 559. Auditorium, Plan, Second Tier.

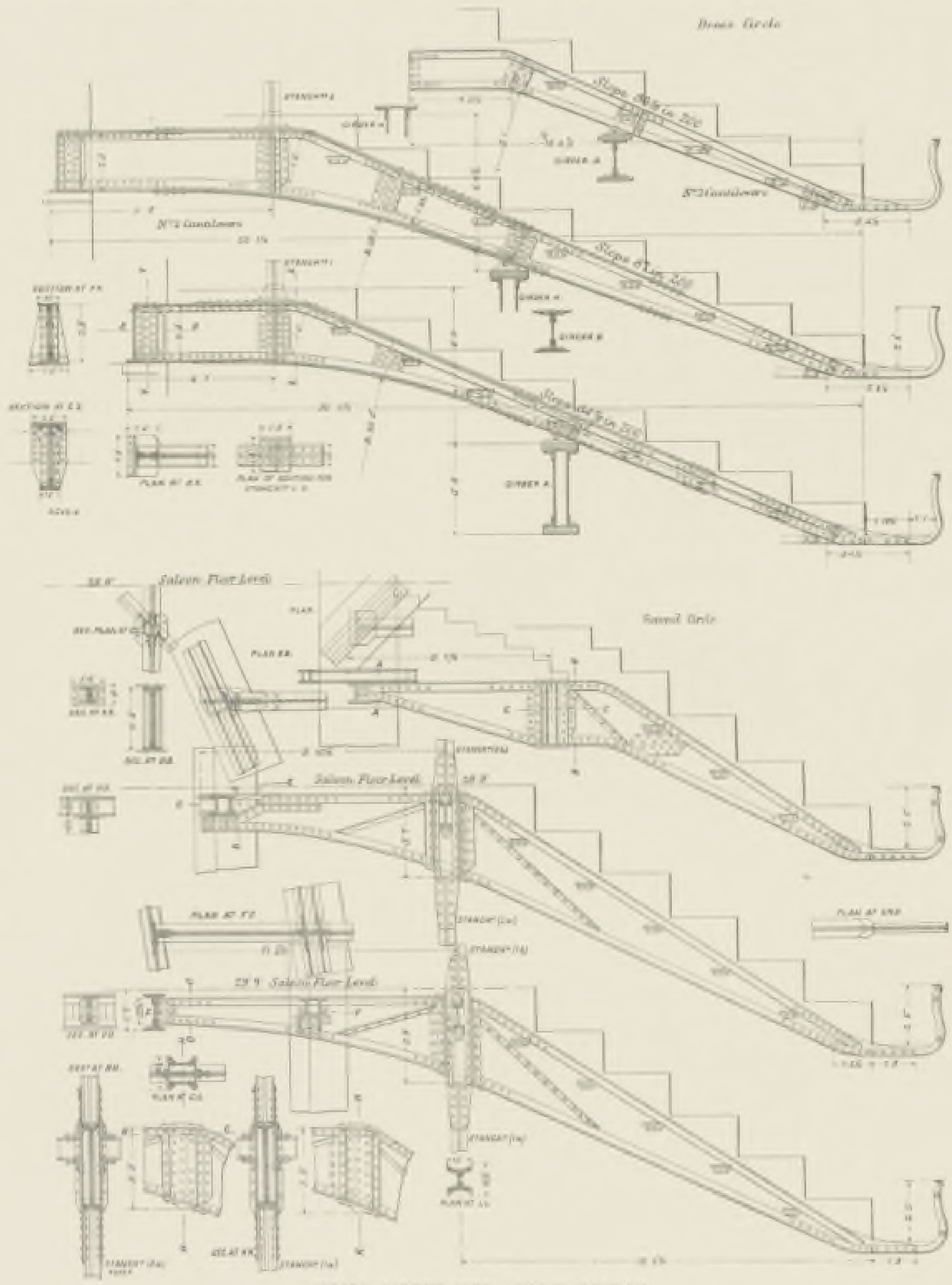


D'OYLY CARTE'S OPERA HOUSE, LONDON.
Fig. 560. Auditorium, Plan, First Tier.



D'OYLY CARTE'S OPERA HOUSE, LONDON.
FIGS. 561 TO 576. AUDITORIUM; DETAILS.

no reason why the backs of boxes, or their divisions should be in metalwork, seeing that a combination of the framing with the lighter and more suitable forms of vertical fire-resisting construction is quite feasible. As with all newer methods of building, mistakes have been made, more particularly by extremist reformers, but now, with the experience gained and a due consideration for the acoustic qualities of the auditorium, there is no doubt that the best results can be obtained. Moreover, the auditorium of which the skeleton is of iron or steel, is generally superior to that in which older forms of construction are employed, from other points of view, such as those of hygiene. Yet it is a curious fact, that for reasons of stability and fire resistance, several codes of building regulations still prohibit the utilisation of ironwork in the theatre to its full extent. I say curious, as there is no legitimate reason for this, since, if the bearing and straining capabilities are



D'OYLY CARTE'S OPERA HOUSE, LONDON.

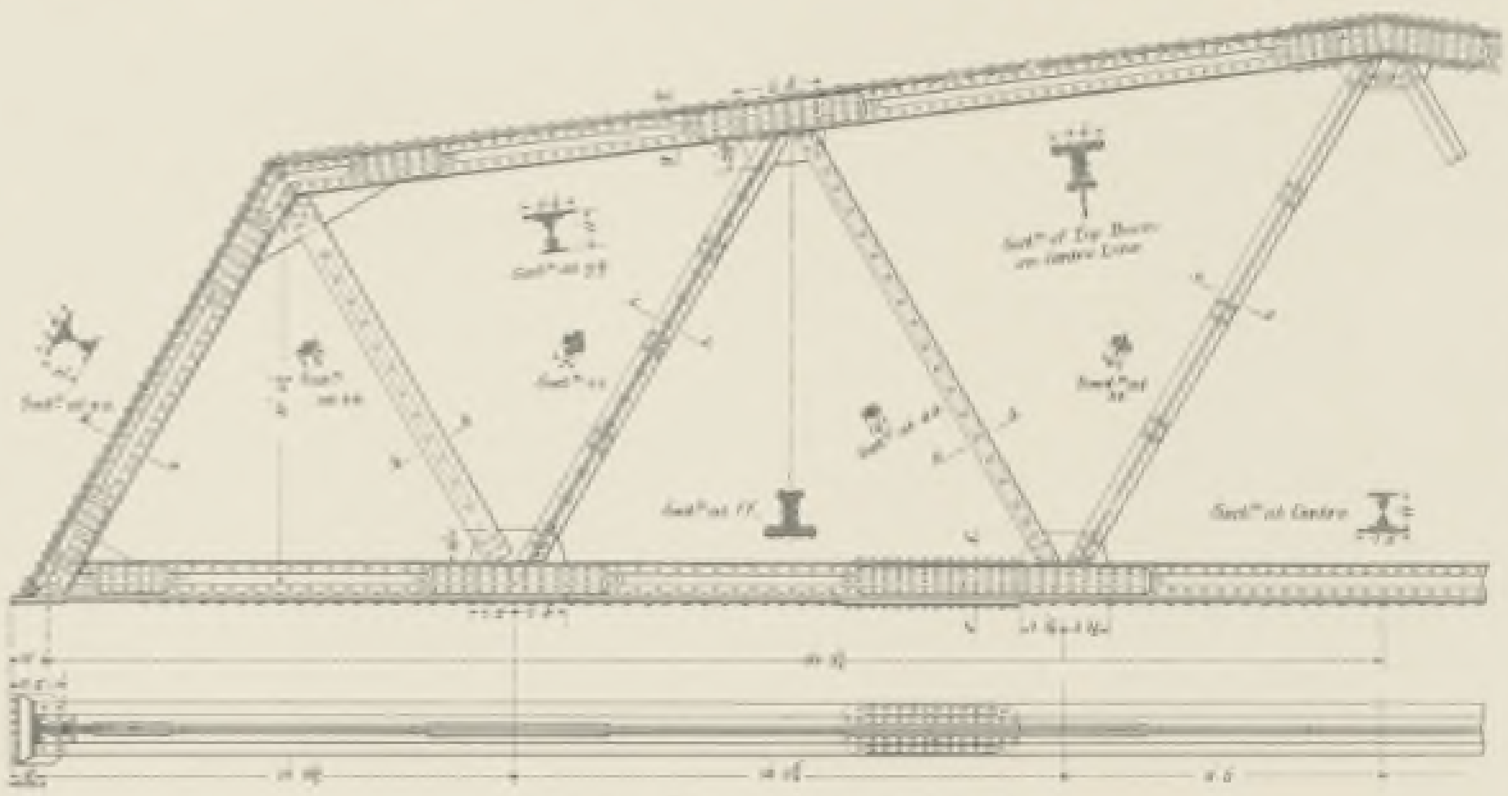
Figs. 577 to 589. Auditorium; Details.

properly determined and the metalwork duly protected from fire by non-conducting materials, judiciously applied, there is not the slightest risk in employing this more modern form of construction; but, of course, the engineering problem must be solved and the fireman's interests considered. Above all, let me emphasise the necessity of a due regard for acoustics.

Speaking of the engineering problem, it would not be out of place here to point out the necessity, especially with respect to large theatres, for the architect to work in consultation with a competent civil engineer. The many and varying interests that have to be considered by the architect in the design of a playhouse, if given due attention, will tax the highest professional ability which need not, however, include an intimate knowledge of metal construction, a subject in which, speaking generally, even the cleverest architects may be, at best, amateurs. It is, perhaps, hard to define the distinct point in the designing and supervision of a building of this class where the architect's duty ends and that of the civil engineer commences, but there is not the slightest doubt that some line can be drawn, and that whilst the general conception and direction remain in the hands of the architect, the detail and execution can become specialised in certain directions. As with metal construction, so with questions of ventilation and warming, fire equipment, or telegraphy, referred to elsewhere, the architect's duties should be carried out in conjunction, not only with a member of the engineering profession, but preferably with an engineer conversant with the requirements of a playhouse. It is not sufficient for the architect to be advised by his contractors and their experts, as is so frequently the case at present, and the owner should be clearly given to understand that some additional professional advice, beyond that of the architect, is essential. Personally, I hold that for the conception of really first-class theatre work, this principle should even go further than the employment of a civil engineer. Each of the special subjects, whether they be electric-lighting, stage mechanism, sanitation or survey, really require particular advisers.

D'OYLY CARTE'S OPERA HOUSE, LONDON.
FIGS. 590, 591. STAGE; PLANS, 'GRIDIRON' AND ROOF.

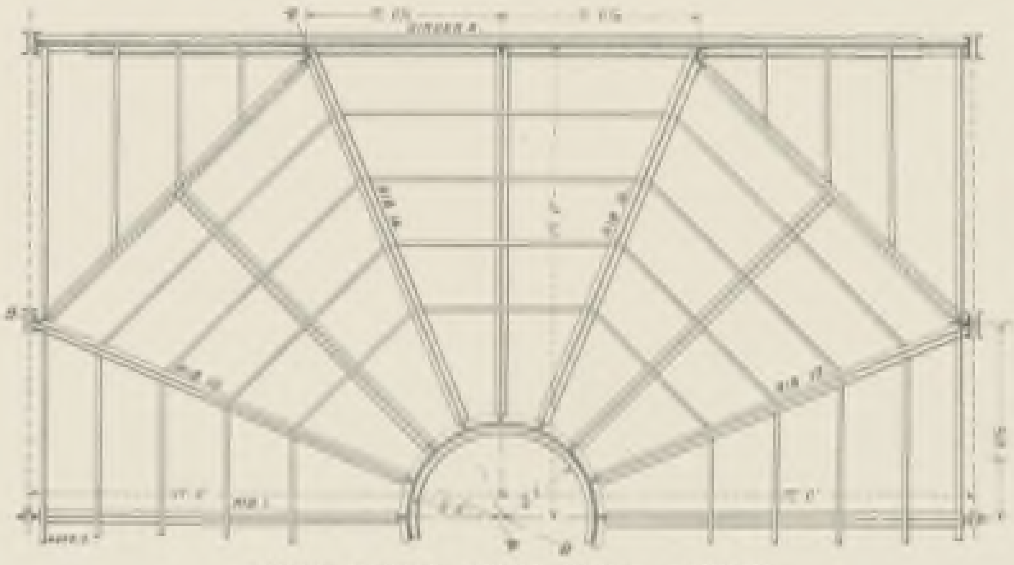
But to return to the example under consideration, i.e. the form of construction employed at the Court Theatre, Vienna, I would conclude by saying that the methods of constructional framing there adopted are essentially Continental, and perhaps I should even go further and say that they are peculiar to German-speaking countries. With us extensive framing of this description is non-existent, and even on a small scale such attempts are few indeed. In Great Britain the ironwork is limited almost entirely to the principal constructional features of the tiers and their supports, whilst its application is particularly associated with the cantilever work in which we excel. In most of our modern playhouses there is a demand for an uninterrupted view of the stage from every seat in the auditorium, and the manager considers it essential for the prosperity of his house to be able to boldly advertise this fact. Hence, even in second-rate establishments, the cantilever is now frequently found, though it may be only in conjunction with the more elementary forms of wood bearers and flooring. But we may certainly pride ourselves on holding the first place in respect to the application of metalwork on the cantilever system, and as Vienna possesses the leading example of elaborate iron framing in the Court Theatre, so can London boast of the best example of cantilever work in D'Oyly Carte's Opera House.



D'OYLY CARTE'S OPERA HOUSE, LONDON.
FIGS. 592 TO 595. STAGE; ROOF, DETAILS.

As with iron framing, it would lead too far to give many examples of the application of cantilever work, and I will therefore limit myself to illustrating fully the most notable example just referred to. In regard to the illustrations of the auditorium cantilevers, it will be seen that I am showing the principal plans of their position, together with some examples of the more important sections, which I think call for comment. And as in the case of the Court Theatre, Vienna, I have been careful to reproduce my diagrams from actual working drawings, and to supplement them with a number of practical details, so that a basis is given to those who wish to study some minor points. I would mention, however, that the engineers were Neade and Riley, and the contractors were the Horseley Ironwork Company.

It would lead too far for me to attempt any description of the construction at D'Oyly Carte's Theatre, and as a matter of fact the illustrations should explain themselves, more particularly if reference is made to the plates illustrating the theatre in question, which have been presented in Volume I. Yet, here again, I cannot but point out the ingenuity shown in overcoming some of the more difficult problems, particularly the great leverage of some of the main cantilevers and the fact that the tier-fronts 'rake' on a double curve. The lightness of the work is very pleasing, whilst the finish throughout is excellent. As in a former example, the metalwork is applied in conjunction with concrete, but, as in the case in question, the protection of the ironwork by fire-resisting materials might well have been extended. An important feature in the conception is the position and arrangement of the main girder on which the cantilevers of the first tier balance, and I should, perhaps, also call attention to the manner in which the various loads are distributed.

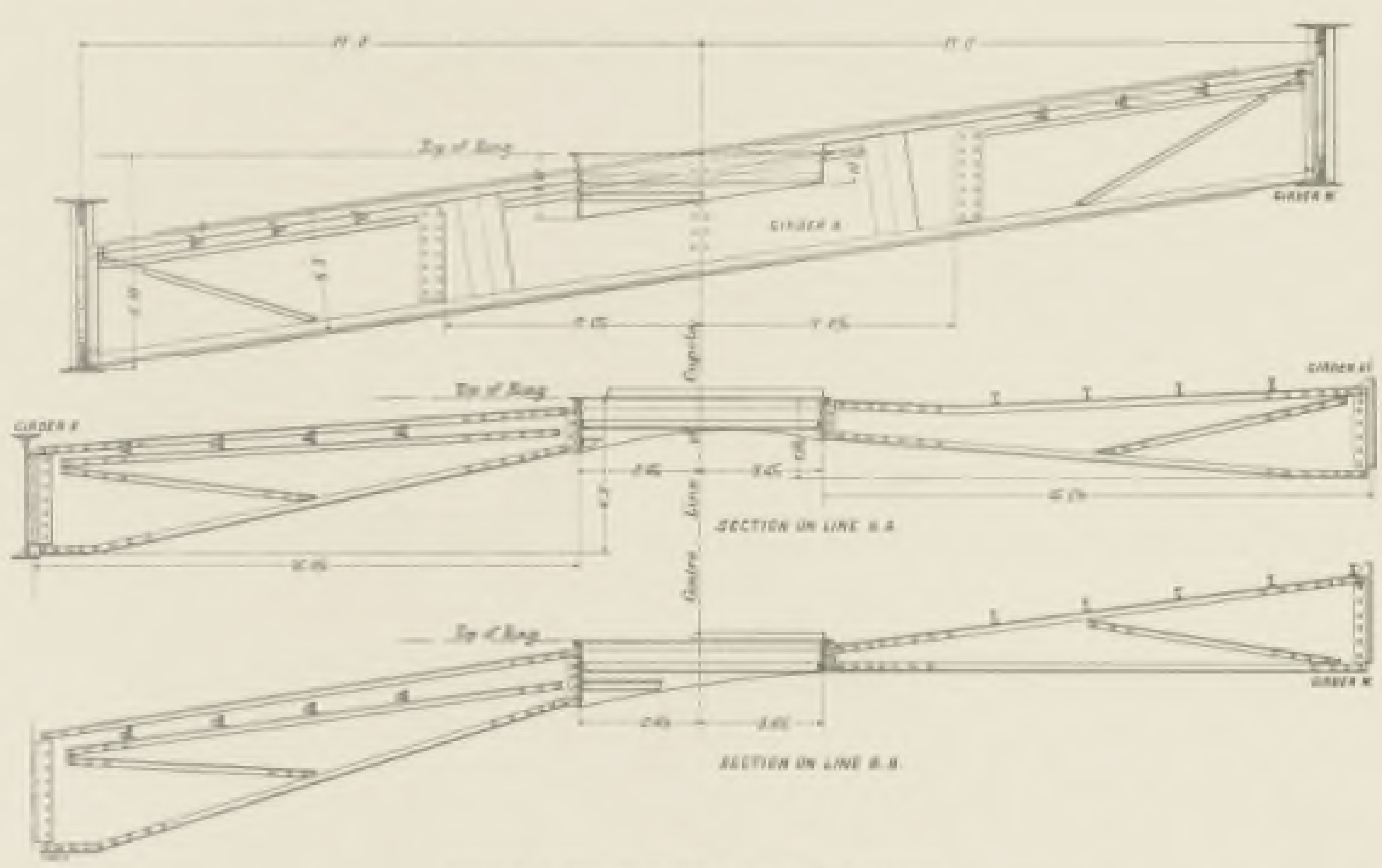


D'OYLY CARTE'S OPERA HOUSE, LONDON.
Fig. 596. Auditorium; Plan of Roof.

As my diagrams in this instance do not include any general section showing the ceiling and roof construction in conjunction with the general arrangement of the tiers, I am adding to the illustrations of cantilever work a plan of the combined ceiling and roof which is to be found at the D'Oyly Carte Opera House. I am further presenting some details of its framing with its principal girders. The plan will be found in Fig. 596, and the girders in Figs. 597 and 599. As will be observed, the combined ceiling and roof has certain peculiarities which, though not of a character that calls for imitation, yet offer points of interest from the engineer's aspect.

Having on an earlier page mentioned that the roof over the stage also at times requires specific forms of construction, not common to other buildings, I have here taken the opportunity of showing two plans in Figs. 590 and 591, in which the combined 'gridiron' and roof plans of the theatre under consideration are depicted, and I have again amplified these with the detail of one of the principal girders. The characteristic of roof construction over a stage, I would add, is the combination of the 'gridiron' with the roof proper; and reference to my Supplement on Stage Construction will show numerous instances where this combination has been effected.

In conclusion, I need scarcely again mention that this chapter might well be extended by the illustration of further examples in modern construction, but as I have explained on an earlier page, it is not my purpose to go into detail, but only to show some typical instances. I would hence close this section of the Treatise by pointing to the great importance of judiciously applying the results of modern scientific investigation and the most recent methods of construction to the playhouse of the future.



D'OYLY CARTE'S OPERA HOUSE, LONDON.
Figs. 597 to 599. Auditorium; Details of Roof.

CHAPTER VI.

EQUIPMENT.

In the more recent examples of playhouses, it is frequently difficult to fix the exact point where the construction of the building ends, and where its equipment commences. Not only does much in the equipment require special consideration during the construction, but it even forms part and parcel of that operation. As recently as in the preceding chapter, we have seen that the metallic containing wall of the auditorium at the Vienna Court Theatre comprises a series of large ducts for the heating and ventilation of the building. No better instance could surely be mentioned to show not only how much the carcass of a theatre is influenced by the equipment, but also how, of late, construction and equipment are becoming merged into one another.

Under the term 'equipment,' it is now usual to include every installation necessary to the service of the theatre, from the means of ventilation, heating and lighting, the water supply and sanitary arrangements, down to minor accessories, such as telephones, bells and fire alarms. Furniture, however, whether fixed or movable, and every form of upholstery are excluded from this category, being generally considered to belong to the 'furnishing' of the house, which it is frequently the duty of the tenant, not the owner of the theatre, to carry out. It is true that stage appliances also fall naturally under the heading of equipment, but in consideration of their great importance, unique characteristics and also for other reasons explained, they have received a more comprehensive treatment in a special Supplement than has been accorded to any special section of theatre construction in this volume. It will be seen, therefore, that in the theatre of the present day, the equipment should comprise the installation of all modern appliances, and the application of modern scientific methods which are capable of furthering the interests of art, from electric lighting or hydraulic power to the chemistry which teaches the impregnation of materials for the better resistance of fire, or the physical laws that govern heat.

COURT THEATRE, VIENNA.

Fig. 600. View of Main Switch Room.

As far as importance in the popular mind is concerned, it may be safely assumed that the lighting of the theatre stands first in this country, little interest being displayed in the questions of ventilation and warming, or mechanical service appliances. For an English audience is apparently easily satisfied in these matters, and is well content if there be some sort of natural ventilation, with a few radiators placed about the building during the winter months; whilst, for instance, the hydraulic passenger lift, already common in all other forms of building, is looked upon as a great luxury for the playhouse.

Why we have not employed more freely the new methods and appliances at our disposal, it would be difficult to explain on other grounds than the economical conditions of private theatre enterprise among us, and that curious conservatism so common in matters theatrical. Only the barest necessaries are provided, and apparently neither improved warming and ventilation, nor the convenience of lifts, come within such classification. It is rarely, and even then grudgingly, unless for the sake of advertisement, that playgoers have been conceded more comforts than the small amount with which they have learnt to be content. No London playhouse can claim to stand on a level with a modern hotel in respect to equipment for the public well-being. Of course I do not wish to imply that there has been no progress in this direction, for both in furnishing and equipment an audience was satisfied with a much lower standard of comfort even ten years ago. Nevertheless, we are too far behind the Continent. It is actually impossible to hold up as an example for study any English theatre equipment in these volumes, although individual details of interest may at times be found. All my praise, in fact, has been reserved for Austria and Germany, except in the one department of sanitation. In drainage and lavatory accommodation, at least, our playhouses are, I am glad to say, much better equipped than the Continental theatre.

Commencing with the lighting of the theatre, I would say that, whether the illuminant be gas or electricity, some system of centralisation is advisable. However advantageous it may be for service reasons to concentrate the working of the lighting at one point, it is usual—not to say compulsory—in some countries, for protective reasons, to keep the lighting installation in the 'front of the house' entirely separate from that behind the curtain, and to make further divisions of the lighting between the stage and its offices, the auditorium and the foyers, vestibules and staircases. But except in regard to the stage, and the centralisation above mentioned, there is, as a rule, no marked difference in the use of either gas or

STAGE LIGHTING.
FIG. 601. APPEARANCE OF THE FACE; A STUDY BY HUBERT HERKOMER.

electric light between the playhouse and any other large public building. On the stage, however, the illumination is certainly arranged in a unique manner and with the aid of appliances not to be found in any other class of structure. To show the relative requirements for lighting power, I am giving some illustrative diagrams of the different quantities of light necessary at the 'front' and 'back of the house' respectively, in the Court Theatre, Schwerin, a Continental establishment of average dimensions. The diagrams illustrate in a most interesting manner the great variations of light which a series of representations demand, and above all, the relation of stage lighting to the lighting of the rest of the house. A full treatment of the subject would in itself require almost as voluminous a description as the Supplement on 'Stage Construction,' and I can only regret that I have been unable to devote a separate section of this work to so interesting a question. Yet, in these general remarks I must not omit to mention that the lighting of the stage as commonly practised, though doubtless, in some countries, with greatly improved appliances, is carried out on a wrong principle, the effects generally obtained being anything but natural, and, in particular, in the case of the human figure, quite eccentric. The four accompanying illustrations should serve to endorse this last remark, especially the two sketches of Hubert Herkomer's on these two pages, which strikingly show the effect of ordinary stage lighting on facial expression. This eminent painter has been a constant advocate of improved stage lighting, and though I fully agree with some of his critics that the experiments made at his private theatre at Bushey are often beyond the bounds of practical application, there is not the slightest doubt that the results he has obtained, if carefully studied, could be easily adapted to actual stage work. I hope on some future occasion to deal with this important subject independently and at length.

For the time being, however, it must be admitted that the presentation of a play remains, as far as lighting is concerned, crudely unreal, and generally coarse, while it is only rarely that we perceive any attempt at more natural effects. Yet, with the application of the modern scientific methods at our disposal, it is as possible to remedy the present bad system as my Supplement shows it to have been possible to reform the mechanical equipment of the stage. Irrespective of illumination on art lines, I hold that in the use of adequate appliances for lighting theatres, both on the stage and elsewhere, the leading specialists in Germany have been doing work of a far superior character to those of all other European countries, and that the results obtained by them are frequently both satisfactory and economical. I would even go further and say that these specialists have already taken some steps in the right direction, as far as art is concerned, but they, no more than the specialists of other countries, have as yet discovered any workable solution of this difficult problem.

STAGE LIGHTING.

Fig. 609. Appearance of the Face; a Study by Hubert Herkomer.

In other words, these contrivances for stage lighting, while worthy of serious study, have not overcome the principal anomalies of our present scenic effects.

There is one point—essentially a technical one—to which I should like to refer in regard to the illumination of the house. It is most advisable that the wiring should be by alternate lamps or fittings throughout the building, so that for every section, however small, there are two independent circuits working from two independent mains. If possible, these mains should be fed by two separate supply companies, or where the generating plant is on the premises, from two separate sets of engines, for a duplicate system on such lines should allow the owner to dispense entirely with so-called 'emergency' lights, whether gas, oil or candle. The break-down of one main or one circuit only involves a partial darkening, and the safety of the audience as well as the general service both gain substantially in consequence. For the ordinary service lighting when the house is closed it is not unusual, for the sake of economy, to have a quite independent installation, with only a few lamps of small candle power, but there are also many occasions when a partial use of the existing lighting, if cleverly arranged, is amply sufficient.

When speaking of the lighting of the theatre, I naturally have in mind electricity as the illuminant. There is no reason why, even in small provincial establishments, gas should be any longer tolerated in a class of building so prone to fires. Hence, I need merely record the fact that the running of piping to alternate fittings is equally advantageous in the case of gas, and similarly the centralisation of gas-cocks by sections. If, however, it be thought too drastic a measure to banish existing gas from playhouses, as has been done by law in many countries, at least I would urge that it be not allowed in new buildings.

In conclusion, I would say of the lighting of the theatre that, where 'emergency' lights are necessary their location is as important as their character—a point that is too often neglected; and where they are introduced it is an advantage to provide special ventilation ducts for each light, as, indeed, has been laid down in several of the codes of protective regulations presented in Supplement III.

Turning now to the questions of heating and ventilation, it is obvious that it would be unwise for me to enter here into the controversies as to the best methods applicable to a playhouse, seeing that the whole question as applied to buildings generally is under discussion, and that there are but very few points, except as regards the auditorium, that require a different treatment from that applied to public buildings generally. To attempt a description of the principal systems of equipment for the auditorium alone would lead too far, yet I cannot help referring to the most elaborate example of heating and ventilation, namely, that of the Court Theatre, Vienna. As the leading instance of a modern system applied to the purposes of the theatre, this equipment holds a unique position both in respect to conception, elaboration and even mere constructional finish; for in this matter, as in many others, the Court Theatre, Vienna, very closely approaches perfection.

COURT THEATRE, SCHWERIN.
FIGS. 605 TO 612. DIAGRAMS SHOWING AMOUNT OF LIGHT USED.

Without entering into detail, the principle adopted at the 'Hofburg' Theatre may be said to provide fresh air at various temperatures by means of a combination of collecting, heating and mixing chambers, the chief mixing chamber being placed immediately under the area of the auditorium, and having a number of small openings directly below the seats. Through these the inflowing air is most carefully distributed, and at the same time is also carried by special ducts to other parts of the house, so as to meet the requirements of the different sections of the audience. Perhaps I should add that the openings under the seats of the area number nearly three hundred and fifty, and that all possibility of draughts is avoided by letting the air enter at an inappreciable velocity.

The temperature of the incoming air can be regulated to a nicety whilst passing through the mixing chamber, the air of the outdoor temperature being there mixed with specially heated air in the desired proportion, thus rendering a direct system of heating in the auditorium unnecessary. The method adopted is practically a development of a scheme which some years earlier was carried out with considerable success at the Court Opera House; but in finish and detail the more recent installation is far superior. Seeing the important position taken in the annals of heating and ventilation by the work done in these two playhouses, I think it would be only just to mention that the engineer primarily responsible for both arrangements was Karl von Boehm. Two of the photographs I am reproducing show the mixing chamber, i.e. Fig. 615 on page 100, and Fig. 617 on page 111. In the former of these the arrangements made for the entrance of the hot and cold air respectively into the mixing chamber, and the system of levers employed for regulating the proportion of hot and cold air, can be clearly discerned. In the latter, the openings with their flaps will be easily seen through which the air passes into the auditorium.

As regards the manner of drawing off the air, I cannot do better than refer to the plate opposite page 99, showing, in Figs. 546 and 547, the two sections of the constructional ironwork of the auditorium. If these sections be studied with some of the plans, such as Figs. 536 to 539 on page 97, and the two photographs, Figs. 613 and 614 on page 109, a very clear insight into the system may be gained. What may be termed 'natural' ventilation is allowed for in all parts of the house so long as the outer temperature does not exceed in height eleven degrees Centigrade; but whenever the weather is warmer, artificial ventilation has to be resorted to, and large exhaust fans are brought into action.

It will have been noticed that I have spoken of the heating only, and I should add that the system at the Vienna Court Theatre also allows for cooling the air. The heating chamber is not used in that case, but the whole of the incoming air is passed over a water surface with a superficial area of twelve hundred square metres, the water being

ACTOR SEEN FROM AREA.
(FIG. 603.)
Schauspieler vom Parkett gesehen. Acteur vu de la Salle.

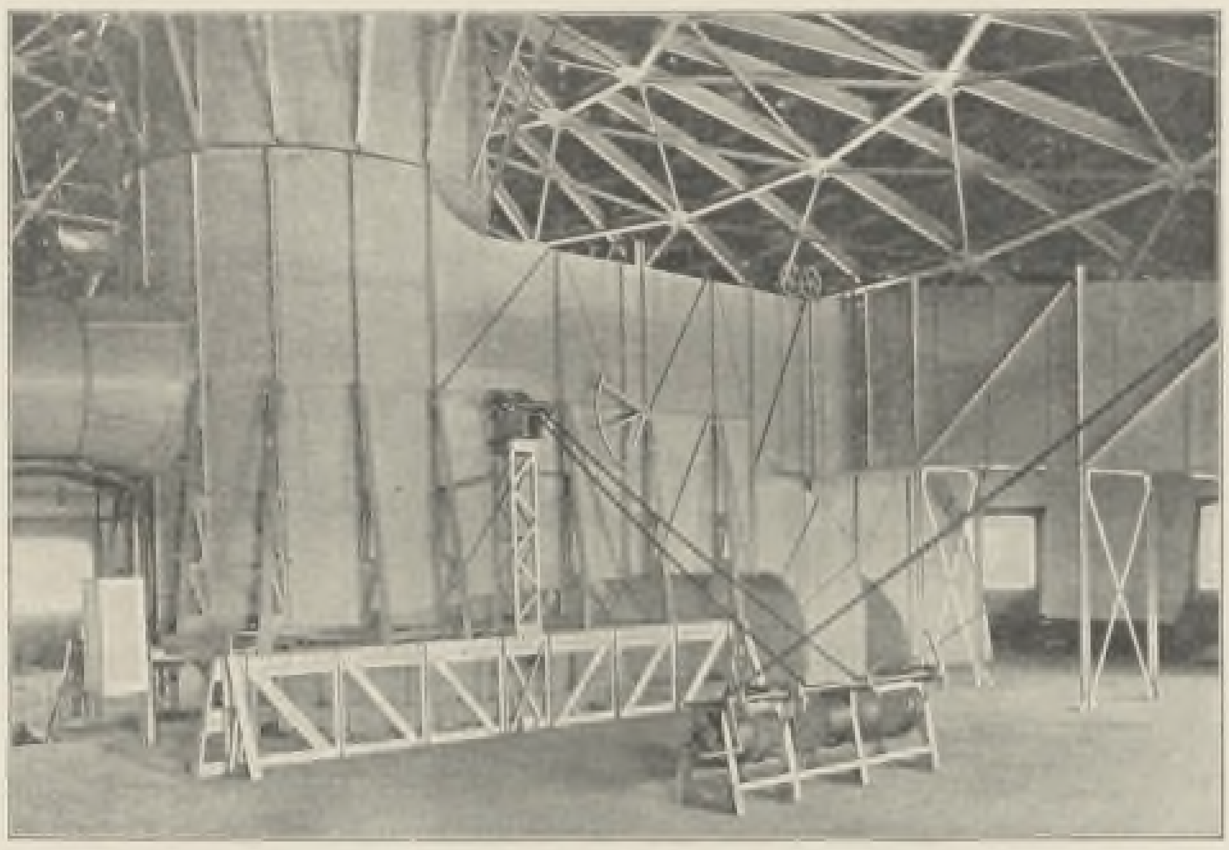
ACTOR SEEN FROM THIRD TIER.
(FIG. 604.)
Schauspieler vom III. Rang gesehen. Acteur vu du Troisième.

Edwin O. Sachs ed:

LIGHTING: APPEARANCE OF FIGURES ON THE STAGE.

drawn from a deep well. The result is that the temperature of the outer air on a warm summer's day can easily, and without any great expense, be reduced by some three or five degrees Centigrade, which is a great advantage for an establishment situated in a locality subject to considerable heat for several months in the year.

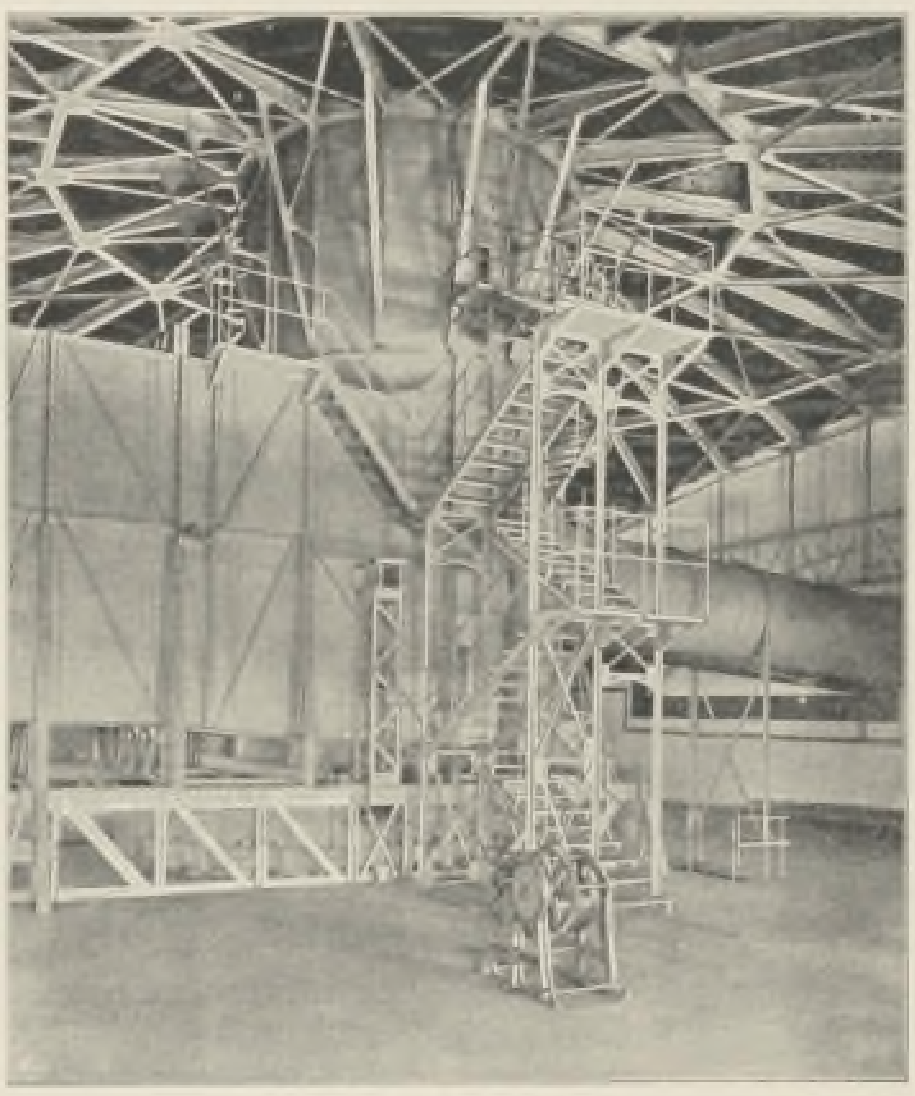
In illustration of the control of both the heating and ventilating arrangements, I show a photograph of the engineer's room in which the levers are grouped, and where, with the aid of an elaborate system of electric thermo-indicators, the temperature can be regulated to a nicety. This inspection room adjoins the main mixing chamber underneath the auditorium, being in a central and easily accessible position. A special advantage of the whole system, and one not always easy to obtain in large towns, is that the main fresh-air inlet starts from a large garden adjoining the theatre, so that the quality of the air used by the audience is of a comparatively satisfactory character.



COURT THEATRE, VIENNA.
FIG. 613. AUDITORIUM, VIEW OF VENTILATION EXHAUST DUCTS.

From the fact that I have given so many particulars in this individual instance, I do not wish it to be inferred that I consider the method adopted at the Court Theatre, Vienna, to be the only system suitable to a modern playhouse, although there is not the slightest doubt that this combination of heating, ventilation and cooling apparatus has proved eminently successful. There are, of course, many other ways of obtaining good results, yet in the same manner as this equipment may be taken as a model of what has proved serviceable where there is no lack of funds for the initial expenditure and subsequent maintenance, so can the principles here embodied be adopted, with certain modifications, even in the smallest of establishments where economic considerations are all-important.

If, without going too much into detail, I might suggest the requirements in heating and ventilation, I should say that the most rapid removal of vitiated air compatible with the exclusion of draught is the first object to be sought, whilst the second should be the entry of air at a suitable temperature with inappreciable velocity. Direct heating is inadvisable for an auditorium, and I know few cases where any system except an indirect one has been applied to theatres without creating draughts. In other words, to heat an auditorium in a practical manner, the necessary temperature must be given to the air before it enters.



COURT THEATRE, VIENNA.
FIG. 614. AUDITORIUM, VIEW OF VENTILATION EXHAUST DUCTS.

Of course, in a theatre, as I have said, the question of special ventilation and heating need only be considered in connection with the auditorium, for the other parts of the house, with, perhaps, the exception of the stage, can be dealt with on ordinary lines. The ventilation and heating of the stage, however, though generally neglected, require almost equal attention with the installation of the auditorium, since by the opening or closing of the proscenium curtain the audience is immediately affected, and an excessively warm stage, or a cold stage, is at times a matter of material inconvenience to many of the spectators. Speaking generally, the temperature of the stage should be identical with that of the auditorium, and particular care should be taken to see that the vitiated air above the top of the proscenium opening be frequently changed, even when the stage is not in use.

Incredible as it may seem, we have not a single instance of a playhouse in this country ventilated in full accordance with any one of the scientific methods at our disposal, good, bad or indifferent. As a matter of fact, those places are exceptional where there is any attempt at ventilation beyond a direct draught through the 'sunlight' or opening over the chandelier of the auditorium. In respect to heating we are almost in the same position, except that several of our more recent playhouses are equipped with radiators. Here and there in London, spectators may complain of draughts or particularly bad air, but there has never been any serious outcry at the way in which our managers choose to treat the public in this respect. The noxious character of the air in the auditorium in most of our theatres, more particularly in the upper parts of the house, is quite indescribable, and it is to be regretted that local authorities do not regulate this matter as a question of hygiene. There is not the slightest doubt that, on the one hand, a large section of the audience risks indisposition, not to say illness, from bad ventilation, whilst, on the other, the actors suffer from the notorious neglect of the hygiene of the stage. Why an English audience, the individual members of which generally attach importance to questions of health and comfort, should permit this insanitary and at the same time uncomfortable state of affairs, has always been a riddle to me. I am convinced that if any manager were to introduce improvements in this direction his efforts would meet with hearty appreciation.

COURT THEATRE, VIENNA.
FIG. 615. AUDITORIUM, VIEW OF MIXING CHAMBER.

Having touched on the hygienic aspect of ventilation, I would allude in a few words to the drainage of the theatre. As I have indicated in the introductory words to this chapter, London has the credit of surpassing the capitals of other countries in this section of theatre equipment. Nevertheless, the importance of the subject allows of further elaboration, and a yet more careful execution in many details, particularly as regards the 'back of the house.' In Continental theatres, however, it is not elaboration or improvement in details, but an absolute reform that is urgently required. In theatres, as in other classes of buildings, Continental ideas on questions of sanitation are still crude, and quite irrespective of the drainage system or the equipment of the lavatory, even the location of the various necessary offices in relation to other parts of the building requires more attention. Common decency, too, should prevent some of the dispositions met with in France and Belgium. The sanitary arrangements in the theatres of these two countries are a discredit to the respective nations, and quite anomalous in a playhouse if we consider the veneration there accorded to dramatic art.

Closely associated with the question of sanitation is that of the water supply, and it will not be inopportune to mention that all the necessary water for the lavatory and other service arrangements of a playhouse should be obtained quite independently of the water supply for fire protective purposes. As far as the ordinary supply is concerned, there is little more to say than that it should be very ample, both at the 'front' and 'back of the house,' and that no modern dressing-room block is complete unless hot water is laid on, with fixed washstands and draw-offs in every room, and unless it has at least one sink to every floor.

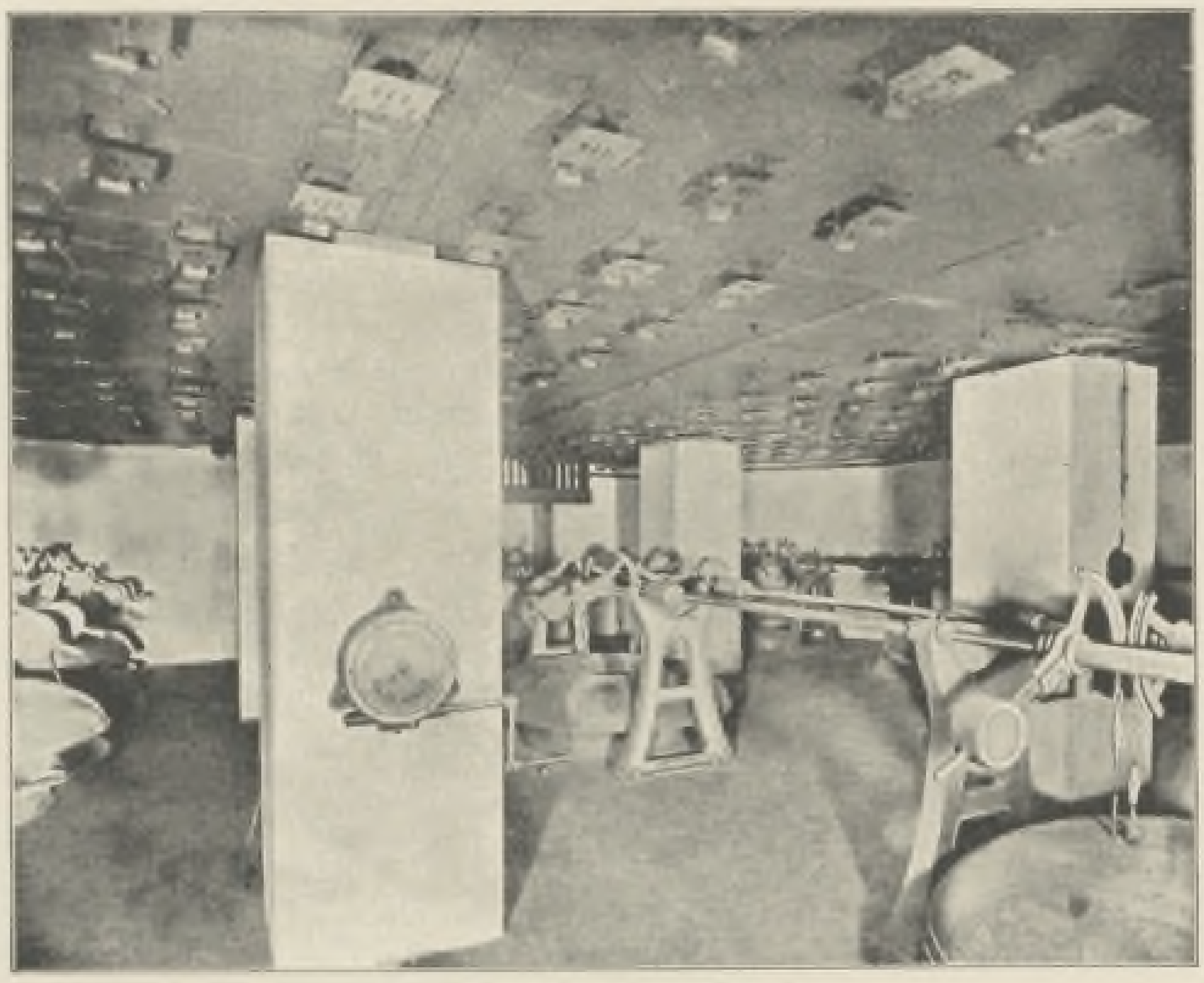
On the other hand, the water supply for fire protective purposes requires particular attention and forethought, for next to the preventive measures for avoiding an outbreak and limiting its spread, it should always be remembered that the rapid application of water is the principal means not only of checking a fire in its initial stage, but also of stopping it when it has obtained a hold on any section of the building. Absolute reliability in the water supply, both in respect to quantity and pressure, is all-important, and to obtain good results local peculiarities must be carefully considered. Storage facilities have to be afforded and reservoirs installed, no matter how excellent may be the constant supply. Where water is obtained from public mains the possibility of a breakdown has to be considered, and the supply must enter the house from not less than two distinct points. Where the pressure is low the possibility of augmenting it should be taken into account; and where there is no public service, or where it is not available, there should be a special well with the necessary pumping plant, and the latter must be so planned that it is not only trustworthy, but also allows for the various contingencies that may have to be met.

COURT THEATRE, VIENNA.
FIG. 616. VIEW OF HEATING AND VENTILATION CONTROL ROOM.

Of course, it is not in accordance with the character of these chapters to enter into detail, but as I have called attention to other instances where a particularly elaborate equipment is to be found, I cannot forego mentioning that the Municipal Opera House at Frankfort has a water service which may serve as a model in many respects. We there find the combination of a supply drawn from the public mains, augmented by a system of reservoirs fed from a well by a strong pumping plant placed in the adjoining scene-store, to which I referred when speaking of the site of this building. Considerable care has also been taken at Frankfort to divide the water mains into different sections, so that a hitch at any one point shall not affect the whole installation. There is a further division according to the position of the various hydrants above street level, in order to obtain the best possible pressure in the upper part of the structure.

In connection with the question of water supply for protective purposes, it would not be out of place to mention that the character of the fire-extinguishing apparatus employed merits consideration, as, unfortunately, we only too often find theatres which, though well equipped as far as water is concerned, have not been given sufficient facilities for bringing the service into operation in the case of an outbreak. In respect to the hydrants in particular, they should not only be carefully located in such a manner as to be easily handled without interfering with the arrangements for exit, and so placed that those who work them will not be cut off from all means of escape in the event of the fire making headway, but the hose and branches attached to the hydrants should be so fitted as to allow of their being brought into action with the greatest possible celerity. Though it is no doubt advisable that the couplings and other gear should match the apparatus used by the local fire brigade, it would generally be of considerable advantage if the more rapid means of forming connections, such as the so-called instantaneous and bayonet couplings, were used. But, as with all arrangements relating to fire extinction, the possibility of complication must be avoided, and only appliances of a simple make introduced.

Referring to the application of water in the event of an outbreak of fire, it would, perhaps, be well to remember that many modern theatres are equipped with some system of 'sprinklers,' and I certainly hold that if suitably applied this method of 'swamping' a fire is particularly appropriate for the special risks associated with the stage. I would go further, and say that a suitable installation of 'sprinklers' is quite essential in any playhouse where a serious attempt is made to minimise the risk of fire; but I must point out that when speaking of 'sprinklers'—a form of appliance primarily introduced for buildings of the warehouse or manufactory class—that some modification from the more usual pattern is necessary to meet the requirements of the stage. In warehouses the height of a floor seldom exceeds fifteen feet, whilst in a theatre 'sprinklers' would have to be fixed below the 'gridiron,' in fact, rarely at a height less than fifty feet from the stage floor. If the stage has many 'cloths' hanging parallel and almost touching one another, it is unlikely that the ordinary form of 'sprinkler' would have the fully desired effect. In other words, it is essential to have 'sprinklers' laid on with due regard to the exigencies of the case, and I would prefer the so-called indirect 'sprinkler' which throws a powerful jet of water against the ceiling—or in this instance the 'gridiron'—the water then spreading out and descending upon the fire. I would further advocate that the lines of 'sprinklers' should be placed diagonally, and not parallel to the proscenium opening. It is also advisable that any installation of this description should be divided into a number of sections, so that in the case of lesser emergency it is not necessary to put the whole area of the stage under water, but only that part of it directly affected by the outbreak. Besides having a special lever to enable the whole of the 'sprinklers' to be put into action together, there should, in fact, be some gear for switching on the individual sections separately. If reliance is to be placed on these appliances, it is a matter of importance that their maintenance should be most carefully attended to, and they ought certainly to be tested at regular intervals. Seeing that I was formerly by no means an advocate of 'sprinklers' as applied to the stage, owing to the special character of the risk, I think it well to add that in now advising their application, I am guided by some experience I have gained of some of the Continental installations, where full working tests were made in my presence. I was particularly impressed by the rapidity with which the Buda-Pesth Opera House can be flooded. I hold that a system of 'sprinklers' could also well be applied to some of the more dangerous offices in the theatre, such as the workshops and stores.



COURT THEATRE, VIENNA.
FIG. 617. AUDITORIUM, VIEW OF MIXING CHAMBER.

In the same way that so much depends on the application of a reliable water supply in the case of an actual outbreak, so it is also necessary for those entrusted with fire extinction to have rapid notification of any source of danger. For this purpose it is customary to provide some telegraphic equipment by which a dangerous occurrence may be duly reported, and steps immediately taken to effect the remedy. Such a system may be supplemented by the automatic notification of high temperatures, which are either a possible source of danger or result from an actual outbreak of fire. The installation may also be developed into one of intercommunication between different parts of the house, or, where watchmen are employed, the instruments may be adapted to recording their 'rounds' or taking their reports. In some of the more recent playhouses elaborate installations have been applied, and those at the Court establishments at Vienna call for particular remark. The first system on a really extensive scale, I should add, was that of the Frankfort Opera House, which even automatically indicates whether the various doors of the building are open or closed.

There is considerable advantage to be gained both for protective and general service purposes by applying telegraphy to the theatre, and for managerial purposes in particular a good system of telephones is also a great convenience. It is not for me to enter here into such details as the laying on of the services in question, but I hold that, as a rule, the stage door-keeper's room should be the centre for the recording instruments, telephone exchange and the like, and any alarm of fire should be notified there as well as at the watchroom of the firemen. I assume that it is needless to add that a comprehensive equipment of bells, speaking tubes and flash-light signals will be found useful, the latter form of signalling having special advantages for the stage owing to it being noiseless.

I could easily enter into many other matters of interest directly and indirectly connected with the general working of a modern playhouse, but space will not permit this, and I will hence close this chapter on Equipment by only again emphasising the importance of giving every attention to the above installations for the economic management of a theatre, and by reminding the owner or lessee that not only do these installations increase the comfort and safety of the audience while facilitating the service, but also by their time-saving mechanism prevent waste in labour, and hence also much unnecessary expenditure for general maintenance.

COURT THEATRE, VIENNA.
FIG. 618. AUDITORIUM, VIEW OF CEILING.

CHAPTER VII.

SAFETY OF LIFE.

Throughout this work, and particularly in this volume, I have continually been compelled to refer at some length to questions relating to the ever-present risk of fire, so unfortunately associated with the playhouse. Two of the Supplements—on Theatre Fires and Protective Legislation—are entirely devoted to precautionary measures, and in Supplement I., also, which deals with Stage Construction, I have frequently had to allude to this matter. Nevertheless, I must devote a special section of this treatise to one or two features connected with the subject of fire protection on which I have been unable to lay emphasis elsewhere. In doing so, I would once more impress on all concerned, whether theatre owners, lessees or actor-managers, whether architects, builders or controlling authorities, that every question in theatre design, both as regards the practical arrangement and the ideal side of the architectural treatment, must go hand in hand with careful thought for the safety of the building, since the question of the security of human life perpetually recurs in every detail of a playhouse and even in its surroundings.

Throughout this treatise I have again and again had to criticise different sections of the building from the fireman's point of view. The selection of the site, the laying-out of the general plan, the arrangement of the auditorium, the disposition of the staircases and passages, and the construction and equipment of the building—all are directly influenced by questions of safety from fire. Nor could it escape notice that in the preceding volumes nearly every description of a theatre contained an allusion to that aspect of the plan which regarded public safety. The Supplement on Protective Legislation is intended to cover this subject as influenced by official enactments, whilst the Supplement on Theatre Fires affords terrible object lessons, which may perhaps lead more effectually to a serious appreciation of the question than any codification of the main principles of theatre planning and construction. It should also not be forgotten that some instances of specification or codification have been given in this volume quite irrespective of the Supplement dealing with actual legislation. I would especially mention my references to the illustrations of the Model 'Safety' Theatre plans, in which some important guiding principles are laid down. Yet I have only dealt with the questions before me as generally as possible, for if I

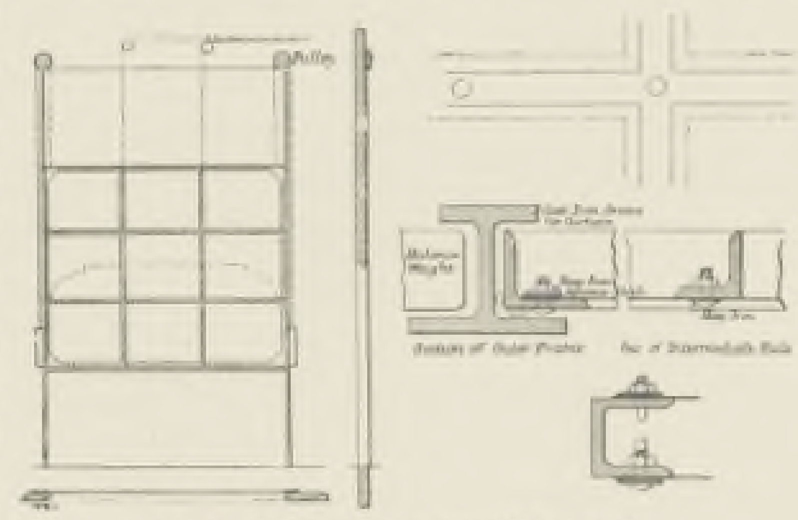


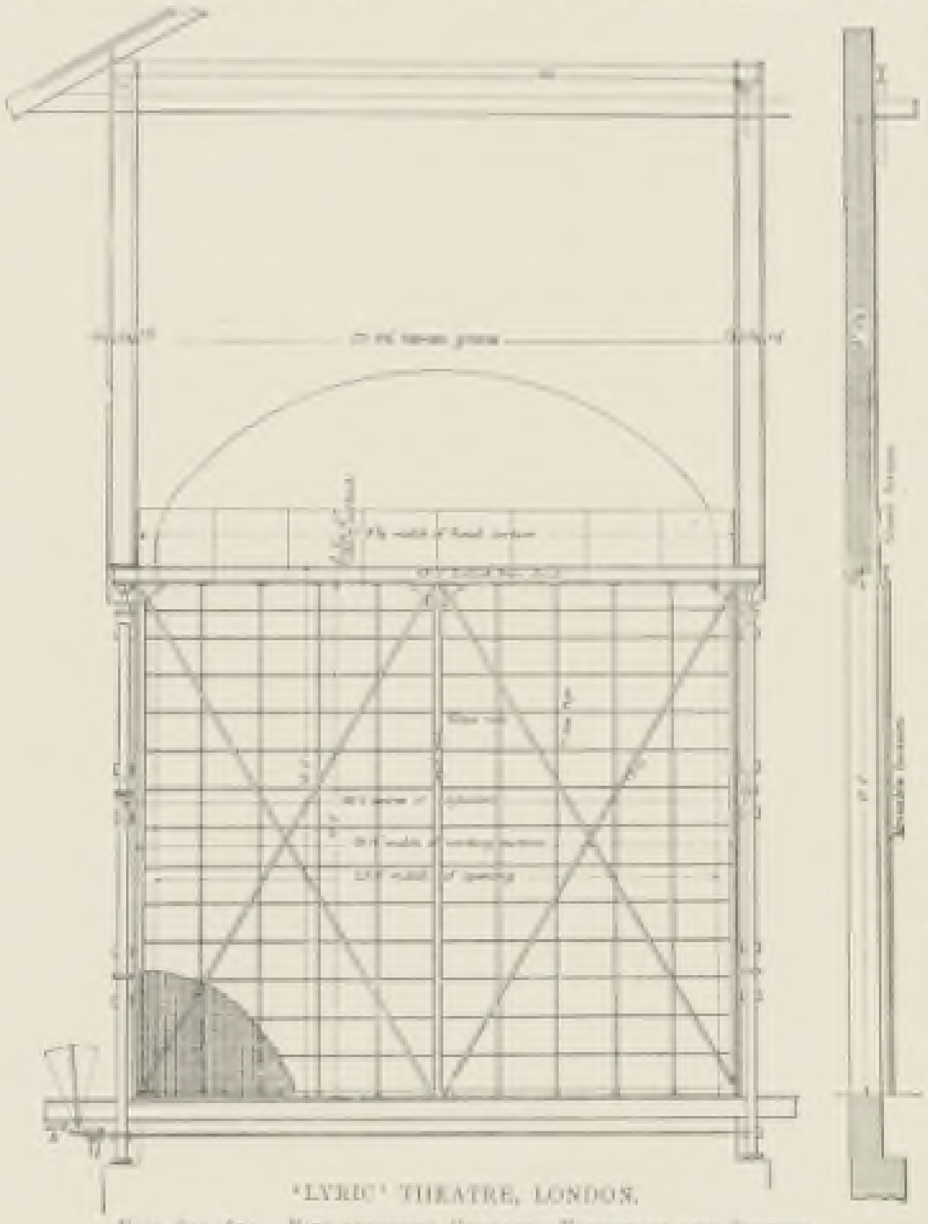
DIAGRAM OF FIRE-RESISTING CURTAIN.

Figs. 619 to 622. Plan, Elevation, Sections and Details.

were to enter into the pros and cons of the details in safety requirements, I could not avoid treating many minor points, reference to which would be quite out of keeping with the character of this volume. I should, for instance, not only have to deal with the many theories or rules propounded for the guidance of architects, but also to give due consideration to the many differing codes drawn up by the public authorities of each nation, which, as explained in the Supplement, are of great length and endless variety. All this would lead too far.

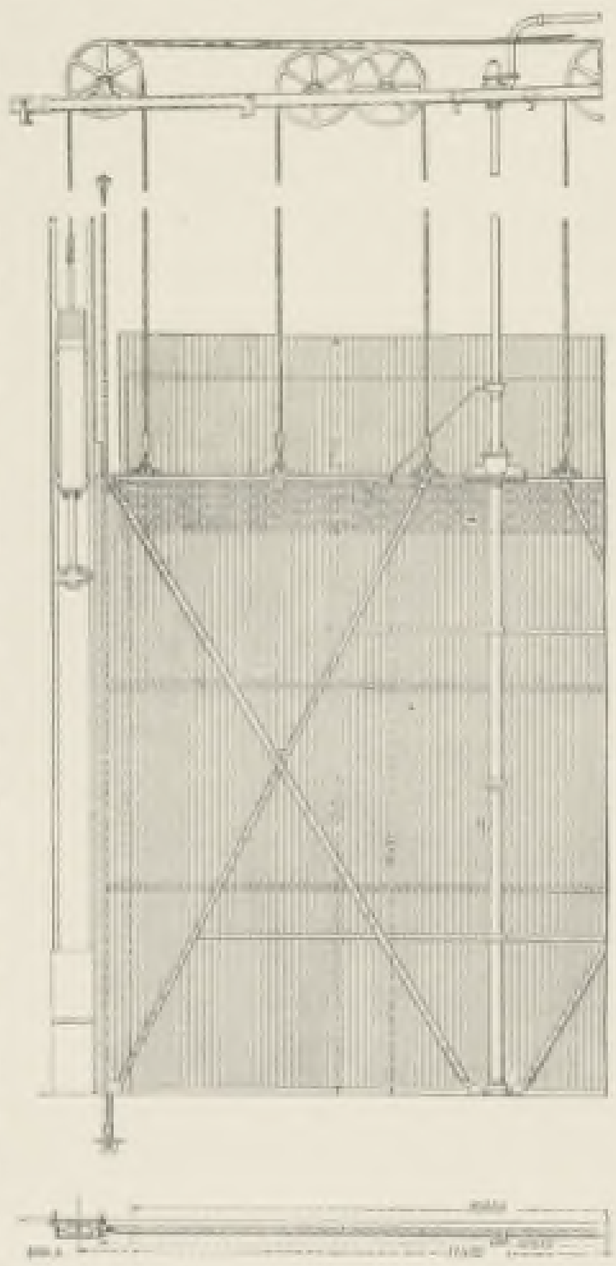
I may, however, briefly recapitulate by stating that we must always bear in mind two distinct groups of precautionary measures: the one dealing with the prevention of an outbreak, and the other with the limitation of its effect by all that is comprised in the term 'fire combating.' It is well known that these two groups sometimes overlap, and this is fully proved by the regulations quoted in the third Supplement. The two different policies with regard to the respective values of construction and exit facilities are also there commented on, for we find in some cases the decrees so worded that facility of exit takes precedence over fire-resisting construction, while other enactments enjoin the reverse.

But among the questions which have led to my giving this subject a separate chapter, there is one which, though considered by many a mere detail, is perhaps next in importance to such leading questions as exit facilities and isolation. This is the construction of the fire-resisting curtain, which, in the event of an outbreak of fire in that place where it is generally to be expected—namely, the stage—can cut off the audience for a time from immediate danger. Then again, there is the question of providing special means for rapidly effecting the escape of the smoke from the stage, or from the auditorium, if it has already passed the curtain. Both these points, the fire-resisting curtain, and the escape of smoke by ventilation, may be classed among details calling for more particular notice than a general treatment in the section to which they belong, i.e. in the chapters on Construction and Equipment respectively.



'LYRIC' THEATRE, LONDON.
FIGS. 623, 624. FIRE-RESISTING CURTAIN; ELEVATION AND SECTION.

Now, if we consider the fire-resisting curtain in conjunction with particular facilities for drawing off the smoke and obnoxious gases generated in an outbreak of fire, I would first remark that after the great 'Ring' Theatre fire at Vienna it was most distinctly shown, during an elaborate series of experiments with a large model of this building, how rapidly any fire that has got a hold on the stage must be carried towards the auditorium, the draught through the proscenium opening to the ventilator in the auditorium ceiling being one of the most dangerous matters to contend with. I would hence say, from the very first, that I do not hold a theatre to be properly equipped from a fireman's point of view if the question of ventilation is not considered at the same time as the installation of a fire-resisting curtain between the auditorium and the stage. In the construction of any divisional curtain, not only protection against the conflagration proper has to be thought of, but also protection against the dangerous gases that are generated by the conflagration of such highly inflammable materials as are used in stageland. The theatre model under investigation was exactly one-tenth full-size, and the desire was to illustrate the three so-called periods of a theatre fire. The first period may be said to comprise the time when the stage has caught alight but the fire has not yet spread to the auditorium. The second period is when the fire has reached the auditorium and the auditorium is in flames; whilst the third period covers the time occupied in the final destruction of both stage and auditorium. The most important results obtained by the experiments were those in connection with the first period, where the progress of the fumes from the stage to the auditorium was clearly shown.



MUNICIPAL THEATRE, HALLE.
FIGS. 625, 626. FIRE-RESISTING CURTAIN; PLAN AND ELEVATION.

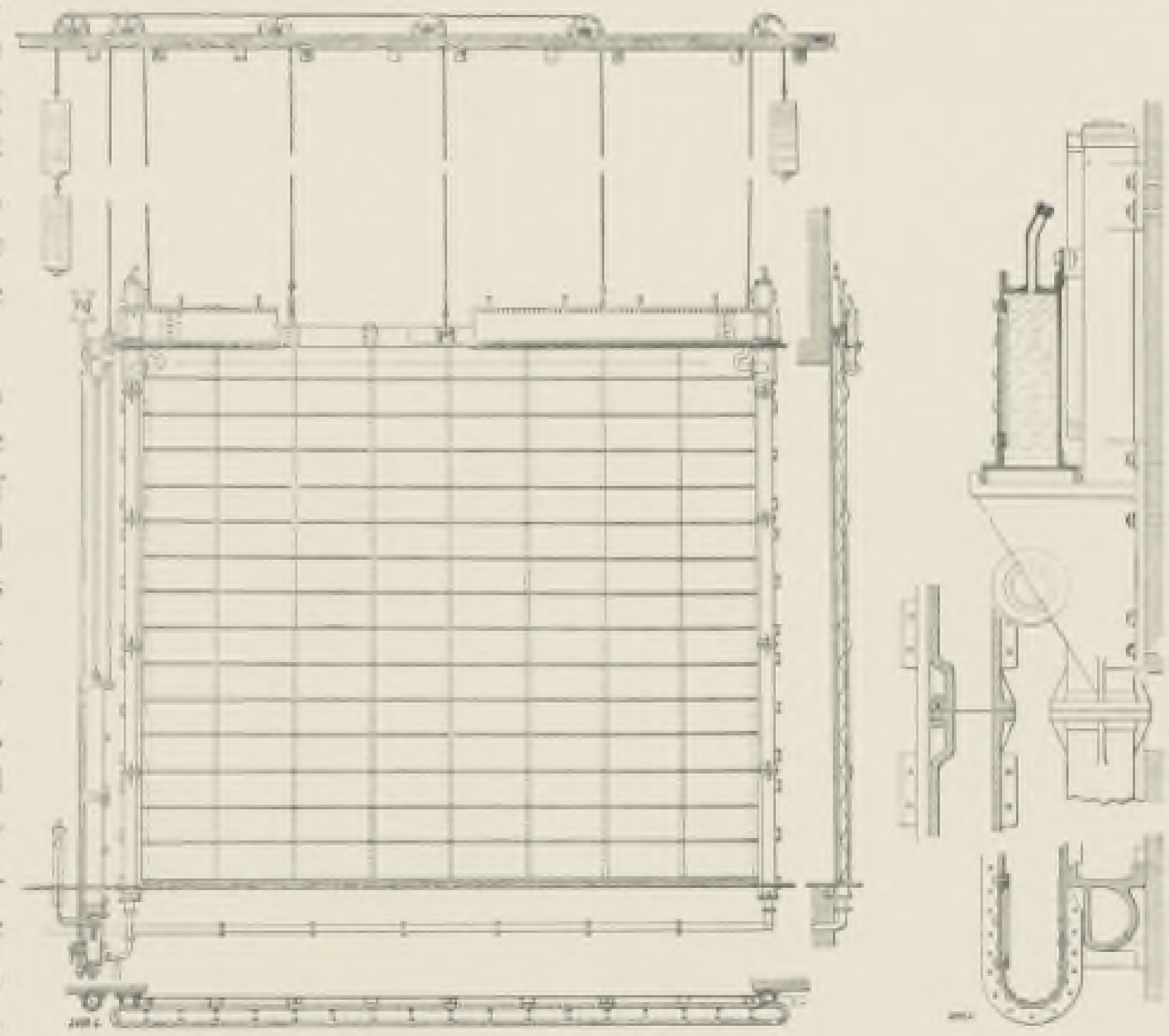
The first series of experiments disclosed how the gases on the stage expanded, blowing the proscenium curtain into the auditorium within seventeen seconds. It was next shown that, even before the auditorium was filled with smoke, the gas-lights were extinguished by pressure of air from the stage; and further, that the highest pressure occurred within twenty seconds of the stage being well alight. The petroleum 'emergency' lights were extinguished within twenty-nine seconds, whilst some 'emergency' lights in which oil and candles were used were extinguished in thirty-one seconds. The air from the stage entered the gas-pipes, driving the gas back to such an extent that lights outside the auditorium were extinguished. It is not necessary to enter here into details of the component parts of the gases generated, but I would point out that from gas of such a nature suffocation must, of course, ensue. In another series of experiments where two stage ventilators were provided the results were very different, for, whilst the first ventilator was opened twelve seconds and the second ventilator twenty seconds after the outbreak, the reverse draught created caused the iron curtain to be drawn back on the stage, where it collapsed. None of the gas-lights were extinguished, though the draught from the auditorium to the stage was very great. On the other hand, the petroleum lamps and the 'emergency' oil lamps were blown out in about forty-two seconds, and the candle, in one case, only after forty-four seconds. Every experiment was repeated three times, and the figures I give are average figures. In this case no dangerous gases entered the auditorium, though the fire was raging furiously on the stage.

I have referred to this series at some length, as the facts are essential for the appreciation of the value of fire-resisting curtains, and still more so in considering the lines on which the curtains should be constructed, and the extent of the ventilation to be adopted on the stage. With all due regard to the advantages of systematic 'emergency' ventilation, I would however remark, that the extremist measures advocated by many authorities are certainly not advisable where any stress is laid on protection by iron curtains; for, as has been seen, the curtain may then be drawn inwards instead of being blown outwards, but the collapse in either direction would have much the same effect.

Mentioning the requirements of local authorities, I point out in Supplement III., on 'Legislation,' what considerable variation there is in the codes of different countries, but there are few points on which the requirements differ more than those relating to the protection of proscenium openings. As far as London is concerned, I should add that the general absence of curtains must be attributed to the fact that it is only since 1892 that the London County Council has been able to order curtains in new buildings, and that they have no powers in respect to existing structures. In 1892, I believe, only five theatres in the Metropolis were equipped with a curtain. Several have been added since then, but such improvements are rather due to the good sense of the various managements than to the powers of the local authority.

But turning now to actual examples of fire-resisting curtains we find much that is anomalous. There are but few firms of engineers who have constructed more than one curtain of any particular description, and these few appear to be very frequently changing their designs. I cannot in fact, at the moment, think of two stages where I have seen the same form of curtain, or the same system and gearing repeated by the same firm. It appears that nowhere has a speciality been made of curtain construction, and the contract for this appliance seems either to go to the general contractor for ironwork employed during the erection of a theatre or to some specialist in fire-resisting materials. In isolated instances, where there are modern stage appliances, the same engineering firm that constructs the stage sometimes supplies the curtain.

Hence, in arranging my examples, I am at a loss to define any particular maker as the author of a typical curtain. The selection of my diagrams has had to be primarily governed by the desire to show the various requirements which have to be fulfilled in different localities. I shall, moreover, only be able to give a few particulars of the various examples presented, without referring to *bonâ fide* tests. It would have been invaluable if I could have definitely shown how different forms of curtain construction withstand fire, but the necessary data are not forthcoming either by experiment or from actual outbreaks. In fact, I am only able to present one solitary photograph (taken after the fire at the 'Queen's' Theatre, Manchester, on August 17th, 1890), illustrating the effects of a conflagration on the curtain, and even here it was a case of the auditorium catching alight, and the effects of the stage being saved; and as, of course, an outbreak in the auditorium is not so fierce as one on the stage, it is not a particularly good instance for reference.



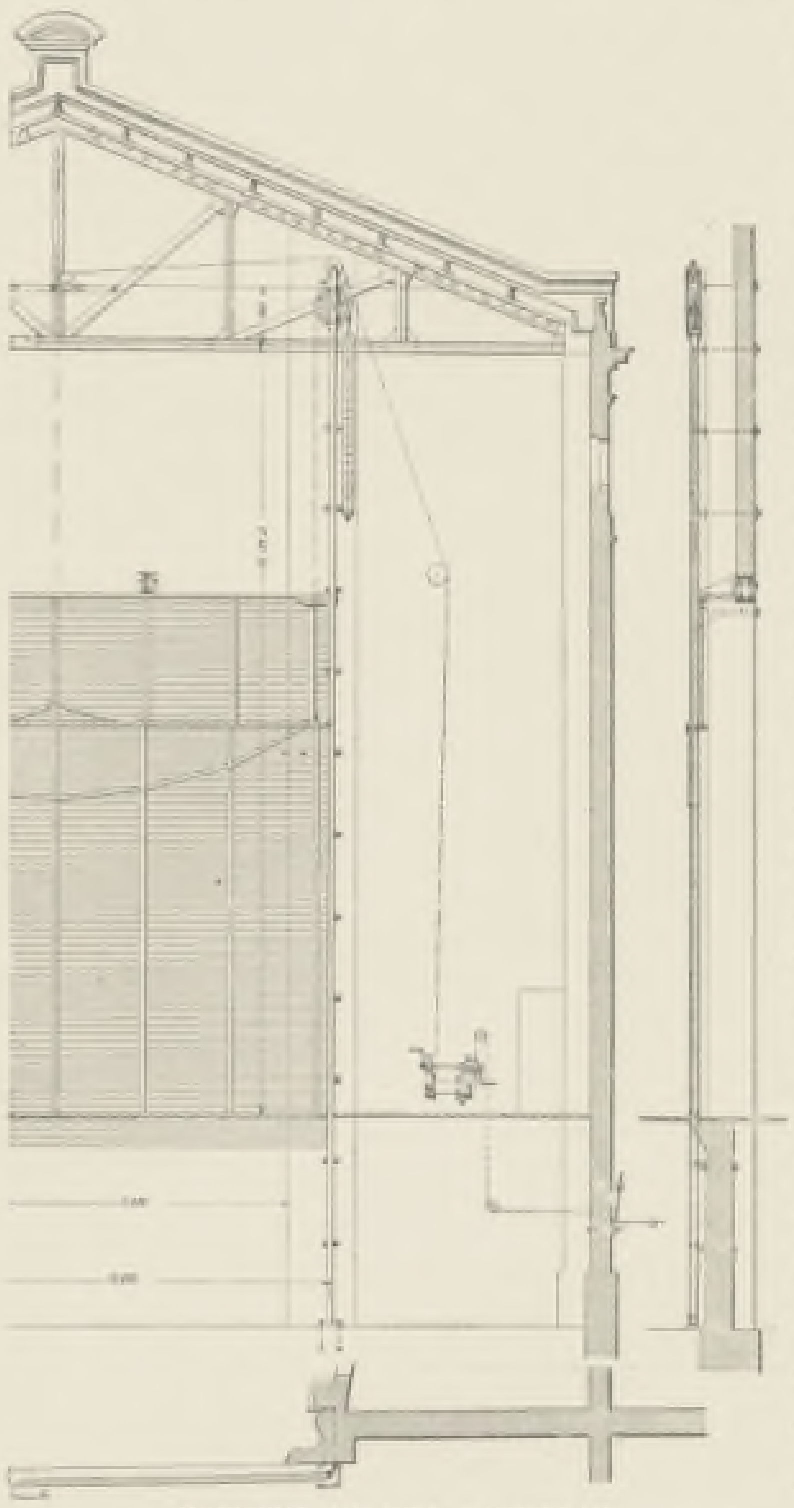
CARL PFAFF'S SYSTEM.

FIGS. 627 TO 631. FIRE-RESISTING CURTAIN; PLAN, ELEVATION, SECTION AND DETAILS.

Proscenium curtains are often divided into three classes: (1) the curtain of wire gauze, (2) the curtain of corrugated iron, and (3) the asbestos woven curtain. This grouping, it will be seen, is according to the material used. Another way of grouping curtains would be to make two distinct sections, comprising 'drop curtains' and 'shutters,' the former being raised from below or lowered from above, and the latter sliding bodily in front of the opening, in one piece, or in two pieces, one from either side. There are also combinations formed by two shutters coming from the sides and a curtain from the top, the three pieces meeting or 'locking' together. Yet another way of dividing the classes of curtains would be in accordance with the gearing that is used for moving them, for we have 'manual curtains,' 'hydraulic curtains,' 'electric curtains,' etc. As a matter of fact classification is exceedingly difficult, on account of the great variety of design and the great difference in requirements. I prefer not to attempt any classification of this description, but simply to name some examples.

Speaking, in the first instance, of the asbestos curtain, I would refer to the diagram shown in Figs. 619 to 622, page 113, which describes one of the more typical designs. We find the curtain to be a simple 'drop curtain,' i.e. a slab supported by counterweights, hung over pulleys and raised by a small winch. The slab hangs from the two principal pulleys by iron chains, and is carefully balanced, whilst it is raised and lowered by two cords running over minor pulleys. The diagrams show the curtain raised half-way, and the details show the construction of the so-called 'single-thickness' asbestos curtains (Fig. 621) and 'double-thickness' curtains (Fig. 622). The slabs are framed by light girders, and tied together with hoop iron. A pair of ordinary I-girders serve on the one side as 'grooves' for the curtain, and on the other as guides for the balance weights. I believe that this kind of curtain is finding considerable favour with managers, principally on account of economy and lightness, but it cannot be termed a reliable one.

A variety of this asbestos curtain frequently found in London theatres, practically of identical construction, generally shows the slab cut up to a greater extent with the view of stiffening it, and in addition we often here find a so-called 'sprinkler' attachment. This, as a rule, is merely a wrought-iron pipe, carried from the nearest main across the proscenium opening, and fitted with separate jets, which play automatically as soon as the curtain is lowered, thus keeping a constant supply of water on the slabs in case of fire, and tending to prevent the asbestos from getting overheated. Of course a similar attachment can be employed for the first examples, and here I would add that asbestos cushions are generally provided for the bottom of all these curtains, to facilitate the exact closing of the opening at the stage floor, and to prevent too severe a concussion if the fall of the curtain be rapid. Another curtain of the same material is the 'roll-up' asbestos curtain, which is used where there is not sufficient height to allow for a slab rising. When on the Continent, I have frequently met with regulations by which the ordinary 'drop scene,' or curtain to the proscenium opening, must be of asbestos cloth, and I am very much in favour of this material being provided for this purpose, as there is no doubt that a fire-resisting curtain would much more easily withstand the strain of a conflagration if first protected by ordinary 'slow combustion' curtains. The same material is used for the so-called 'harlequin,' and often also for the first set of 'wings.'



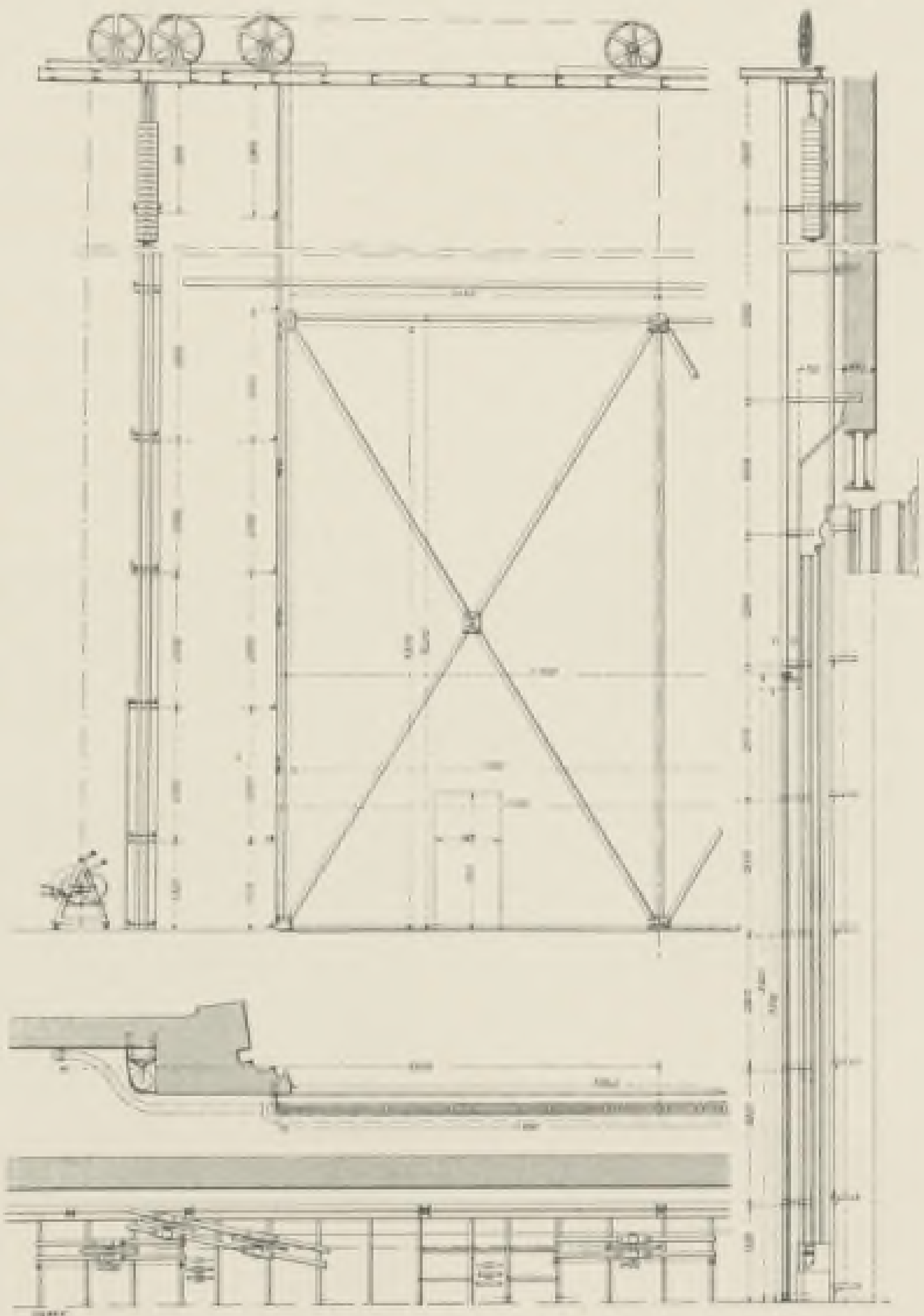
MUNICIPAL THEATRE, ROTTERDAM.
FIGS. 632 TO 634. FIRE-RESISTING CURTAIN: PLAN, SECTION AND ELEVATION.

Turning to the iron curtains, it should be noted that these appliances generally consist of a light framework well braced in numerous sections, and covered in with sheet-iron plates fixed on either side. They are generally worked by winches and well counterbalanced, but of late the application of hydraulic or electric power for lifting purposes is finding considerable favour. Of such iron curtains used in this country, I wish particularly to call attention to a well-constructed one which is utilised at the 'Lyric' Theatre, London (Figs. 623, 624). The curtain for this stage measures thirty-one feet eleven inches in width, to cover an opening of twenty-nine feet eleven inches, and has a height of twenty-eight feet. The arch of the proscenium opening is shown in the diagram, but the upper part is closed by brickwork, and the lower part of the arch has a fixed curtain four feet in height. The actual proscenium opening has a height of twenty-seven feet, so that the movable curtain overlaps the opening by a foot all round. This curtain (as will be seen from the diagram) is worked by hydraulic power, and the rams do not appear to be in any way assisted by counterweights. The rams take a rolled iron joist, from which practically hangs the curtain, a wrought-iron framework, braced in two principal sections and cut up into a number of minor sections, with light iron sheets used to form the covering. The mechanism is worked by one lever, which controls both the rams. I certainly consider the appliance to be a most suitable one for this country, wherever hydraulic power is available, and I ascribe its success mainly to the fact that its designer, Max Clarke, an architect with considerable experience of theatre requirements, has not treated the matter simply as an engineer's theme without knowing the necessities of the case in every detail.

On page 115, Figs. 627 to 631 illustrate a very efficient example from the design of the Austrian engineer, Carl Pfaff. He has designed and constructed several curtains of a more elementary pattern, but the instance presented is considered to be his latest type. We find that hydraulic power is used for raising and lowering it, and that the system of 'sprinklers' is also introduced. Nevertheless, counterweights assist the raising of the curtain. It is scarcely necessary to explain its construction, except perhaps by pointing out that the designer uses curved sheet iron in long horizontal strips, the curves bulging towards the stage. Whilst admiring the ingenuity shown, I personally prefer the simpler forms of curtains as more practical. Complicated, and hence often unreliable, mechanism or construction should be avoided where human life is at stake. Yet, this type of curtain particularly commends itself to the study of those who are seriously interested in the subject, for it is the outcome of the theories which were framed after the various experiments made at Vienna, to some of which I have already alluded.

At the Municipal Theatre, Halle, we also find that a corrugated iron curtain, illustrated in Figs. 625, 626, on page 114, has been introduced. Here, again, the diagram practically explains itself, and shows how the curtain is framed and braced, and slung from six points, the cables running over the pulleys and on to counterweights, whilst the hydraulic ram and guide which works from 'gridiron' level regulates the ascent and descent by a lever on the stage floor. The principal dimensions of the curtain will be seen in the illustration, but I would point out that, as in most theatres, a fixed iron curtain covers the upper section of the opening. Referring to similar designs, I would call attention to the iron curtains which are shown in connection with examples of stage mechanism in Supplement I. We have the example at the National Opera House, Buda-Pesth, depicted on a plate facing page 52, and another in connection with the Court Theatre, Vienna, in the cross section given in Fig. 96 on the plate facing page 61. In the 'Hofburg' Theatre and the Buda-Pesth Opera House, we also find two rare instances in which second curtains are provided for the division of the principal stage from the back stage, with the view of diminishing the risk of a spread of fire and confining the conflagration to the 'back of the house.'

It would be useless to present many further examples of fire-resisting curtains, for those already illustrated amply describe the main lines which have, up to the present, been considered in the construction of these appliances. I will, therefore, conclude with two other instances, one at the Municipal Theatre, Amsterdam, shown in Figs. 635 to 638, on this page, and the other at the Municipal Theatre, Rotterdam, in Figs. 632 to 634, page 116. It is interesting to observe that, in both cases, iron curtains with plain corrugated surfaces have been employed, but whilst in the one the material has been fixed vertically, in the other the slabs run horizontally. In both instances counterweights and manual labour are employed for working the curtains, and in the Amsterdam example it will be seen that 'sprinklers' are provided at the top of the slab. In this case the 'sprinklers' are in the form of a pair of pipes placed just in front of and behind the curtain proper. Particular care has been taken to make both curtains 'smoke-proof.'



MUNICIPAL THEATRE, AMSTERDAM.

FIGS. 635-638. FIRE-RESISTING CURTAIN; PLAN, ELEVATION AND SECTIONS.

I have purposely refrained from presenting any of the shutter curtains which slide bodily from one side or from both sides in sections. I consider them to be unsatisfactory in the highest degree. Neither have I presented any examples of wire gauze curtains, as I regard them as most unsuitable for the purposes they are supposed to fulfil. The examples presented, on the other hand, show work executed in a practical manner, though there is ample room for modifications and improvements. No theatre, to my mind, has yet shown us a model iron curtain. To summarise, as far as simplicity in working is concerned, I certainly prefer the drop curtain from the design of Max Clarke, as adopted in the 'Lyric' Theatre, London, and next the design which is carried out at the Municipal Theatre at Amsterdam. Curtain construction is, however, yet in its infancy, and there is much to be done before perfection can be reached.

I may add that, no matter what may be the tenor of official enactments, a small opening or door in the slab is very essential, for whenever a fire or panic occurs and the curtain is dropped, it is invaluable that some responsible person on the stage should quickly get into touch with the audience. Of course this opening must be of the smallest possible dimensions and well framed, and the door must be thoroughly well constructed and braced, and hung so as to be self-closing, with smoke-proof joints. I am fully aware of the risk of having this door in the iron curtain, where it is a possible source of danger; yet, on the other hand, after duly weighing the matter and reviewing the experience already gained, I must advocate its introduction. I have found that wherever the presence of mind of an actor or employee on the stage allows him to put himself in communication with the audience, he generally obtains a hearing and tends to allay the panic.

Perhaps I should also mention that it has been said that the effect of closing the proscenium opening tends to create a panic. There is no doubt that an ungainly iron or asbestos slab suddenly lowered in the middle of the performance would create uneasiness, and hence it is essential that every effort should be made to prevent this. There is no reason, however, why the iron curtain should not be an ordinary act-drop, and be painted and treated pictorially in the usual manner. A well made fire-resisting curtain should be just as easily controlled by the employees as any ordinary drop-scene. There are, in fact, several instances where the ordinary act-drop is a fire-resisting curtain, whilst in the Court Theatre, Vienna, the surface facing the audience has been charmingly treated in such a way as to represent ornamental ironwork. A view of this curtain, given as the last illustration in this volume, should show that iron curtains need not be ungainly appliances tending to create panic merely by their appearance.

To refer to my remarks on the importance of emergency ventilation, I may state that every stage should be provided with one or more large metal flues or ventilators in its roof, or with ventilating sliding skylights, operated by means of ropes and counterweights, controlled at the level of the stage, or arranged to work automatically by the burning of a hemp cord in case of a stage fire. The object of this ventilator is to provide an outlet and ready means of escape for the thick smoke and fire gases, and if possible any tendency for a draught towards the auditorium must be avoided by applying some apparatus for closing the 'sunlight' well over the latter. The opening over the stage would no doubt act as a means of increasing the draught and spread of the fire in the 'gridiron,' and on this account it has been objected to by many who were evidently more concerned with the saving of the building from destruction than with the saving of life. But, human life being of greater value than property, and the ventilator acting as a powerful means of removing the smoke, the objection raised is evidently of little importance. The exact area of the opening should be carefully calculated in relation to the superficial area of the stage floor.

In conclusion, I would only add that the maintenance and working of these appliances demand the closest attention, for the most practical of curtains or ventilators may otherwise not be properly available on an emergency.

As I have indicated, it may appear strange to have gone to such considerable length in speaking of what is generally considered a matter of detail in the equipment of a modern playhouse, yet the importance of these details is so great to the security of the audience that I have made an exception which I trust may tend to emphasise the value I attach to the safe-guards here discussed.

'QUEEN'S' THEATRE, MANCHESTER. (*Destroyed August 17, 1892.*)
FIG. 639. VIEW OF FIRE-RESISTING CURTAIN AFTER OUTBREAK.

CONCLUSION.

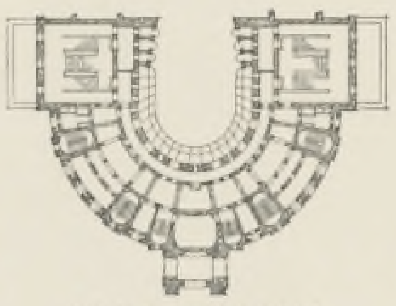
In a volume of this description it must always be difficult to write the concluding words. The subject of this Treatise is so extensive, and, as originally intended, I have only touched in a most general way on the characteristics of its more important sections. Yet although I have purposely avoided the detailed enumeration of facts more suited to a text-book, I feel as if there remained ample scope for further examples and further comments, and that even the additional Supplements devoted to certain matters which I hold call for a more technical treatment than is given elsewhere in these volumes, by no means exhaust special departments which present such an infinite number of points of interest. I might proceed to treat of colour in decoration, having special regard to the methods of illumination common to the playhouse, I might discuss the application of sculpture and painting to the auditorium, or I might enter into questions of furniture, hangings and upholstery, but I fear that such a course would lead too far, and tend to the multiplication of details which I am anxious to avoid. And yet, I cannot forego remarking even at this place, how important for the general effect of the architect's work become, in the playhouse, such details as the upholstery, the fittings—even, say, the door and window furniture—and above all, that where the funds permit of the combination of the two arts kindred to architecture, the application of sculpture and painting may either make or mar a design.

MUNICIPAL THEATRE, SALZBURG.
Fig. 644. Auditorium, View of Ceiling.

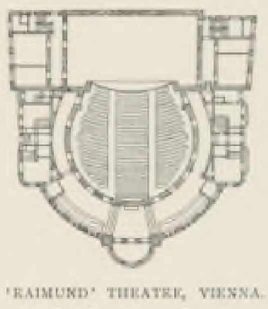
GERMAN THEATRE, VIENNA.
Fig. 645. Auditorium, View of Ceiling.

But to discuss the merest detail of door furniture—say, the panic bolt, which has been the object of so much thought and invention, so much experiment and so much regulation—would occupy considerable space, whilst the many theories and principles of design enunciated by eminent architects, painters and sculptors regarding the allegorical treatment of the decoration in the great monuments of theatre architecture would by themselves form a volume of some bulk. In the case of such structures as the great Paris National Opera House and the 'Hofburg' Theatre at Vienna, exhaustive monographs have, in fact, already been published on the plastic and fresco work, clearly demonstrating the great importance which such features may assume in a building designed by architects worthy of their calling. Even in houses of less importance, for instance any three theatres by Ferdinand Fellner and Hermann Helmer—say, at Vienna, Salzburg and Zürich, respectively—the painting on the ceiling may rightly be considered to belong to the higher forms of art.

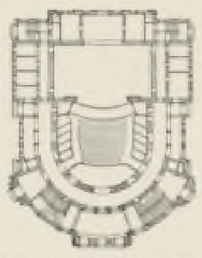
To take another instance, the metal-worker's craft in its best form must be applied to the decorative fittings, such as chandeliers, brackets and the like, with due regard to the requirements of the playhouse. In the chapter dealing with



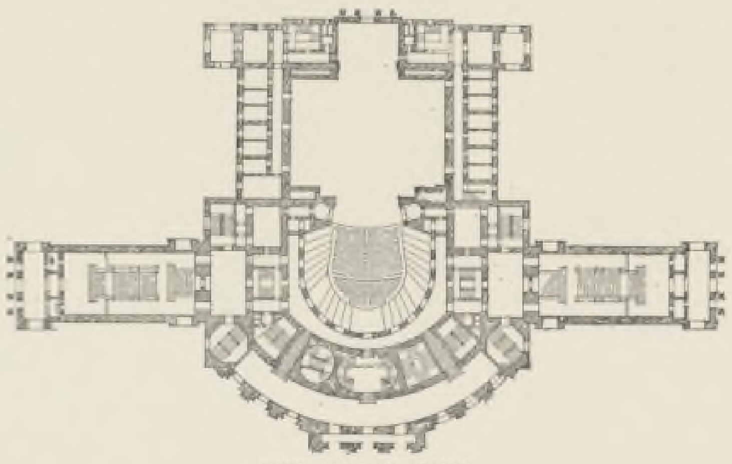
MUNICIPAL THEATRE, ODESSA.
FIG. 646. SKETCH PLAN.



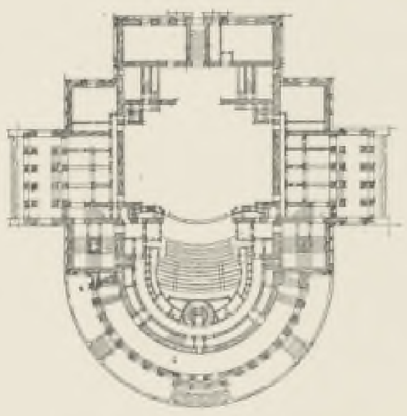
'RAIMUND' THEATRE, VIENNA.
FIG. 647. SKETCH PLAN.



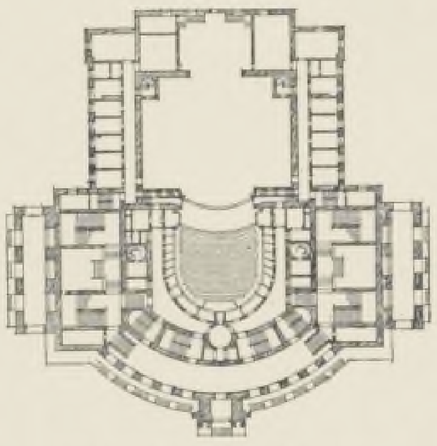
MUSICIPAL THEATRE, LAIBACH.
FIG. 648. SKETCH PLAN.



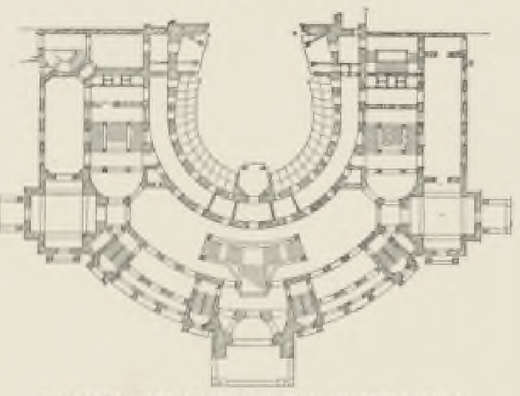
COURT THEATRE, VIENNA.
FIG. 649. SKETCH PLAN.



OLD COURT OPERA HOUSE, DRESDEN.
FIG. 650. SKETCH PLAN.



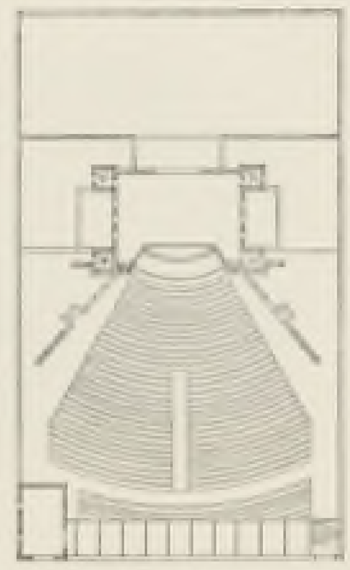
NEW COURT OPERA HOUSE, DRESDEN.
FIG. 651. SKETCH PLAN.



PROPOSED COURT OPERA HOUSE, ST. PETERSBURG.
FIG. 652. SKETCH PLAN.

the auditorium, the illustrations of some of the great chandeliers or lustres which figure so prominently in a modern playhouse, well explain the great variety in principle and purpose which may be found in the larger fittings, and the same holds good for the smaller ones.

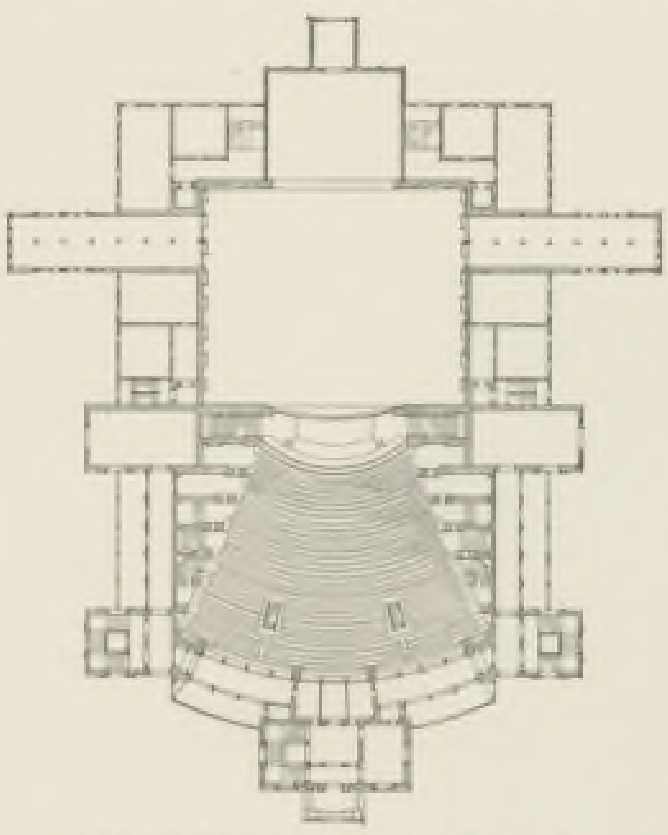
Take again the seating, with all its many variations of 'tip-up,' convertible or movable seats, the benches and the divided benches or chairs. A record of such furniture could not fail to show what a number of apparently unimportant details really call for consideration where an attempt is made to approach perfection in the *ensemble* of a theatre.



SUMMER THEATRE, PIRAEUS.
FIG. 653. SKETCH PLAN.

But it is impossible in the scope of these volumes to treat of everything that relates to the playhouse, even on the most general lines. I have had to limit myself to those matters which, to my mind, characterise the playhouse as distinct from other buildings, and to those questions only regarding which, from the practical standpoint of modern theatre requirements, reference to this Treatise may be considered desirable.

The descriptive character which I have attempted to give these volumes, and, in fact, the absolute dependence of my words upon the many illustrations presented, preclude the possibility of any summary of the contents of the Treatise to which these pages form the conclusion. But, in the absence of any summary of the main features of theatre design to which I have called attention, and of any specification or model code of what should be done in the modern playhouse, I cannot refrain from at least repeating briefly, and almost in the same words as those used in the Introduction to the First Volume, what I hold to be the ideal for which the architect of a theatre should strive.

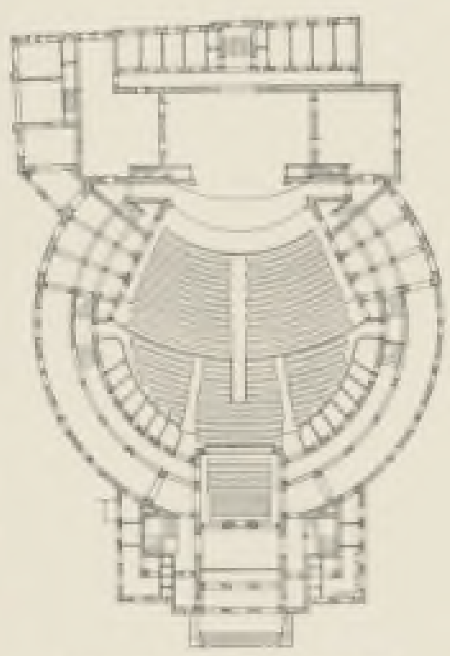


'WAGNER' OPERA HOUSE, BAYREUTH.
FIG. 654. SKETCH PLAN.

Let me hence state that to my mind any architect approaching the subject should first fully recognise that his work demands both the largest share of real beauty and the most careful blending of architecture, painting and sculpture with, at the same time, the satisfaction of innumerable practical requirements, hostile to his best efforts at perfection in design. He must not blind himself to the fact that no class of building puts forward more numerous, complex and essentially technical demands, whilst requiring that the architectural rendering shall not fall below the highest standard of taste. It should be his aim to house the drama in a manner befitting the position of that august art, yet not to forget those other practical requirements among which sighting, hearing and opportunities for escape in case of danger, must ever hold foremost positions.

Circumstances may prevent the architect from even attempting to approach his ideal. Economic conditions in this country particularly are against any one who sets himself the task of fulfilling such a programme. Yet, when he is given a commission, even under the most adverse circumstances, this ideal should be always present in the architect's mind; and if it is, there is not the slightest doubt that even under the most difficult conditions a satisfactory playhouse may be designed.

But to attain this end it will at least be necessary that the financial basis of the theatre should be in every way sound, and that the commission be placed in the hands of an architect who deserves that appellation in its best sense. No matter what size the theatre, and no matter what its purpose; no matter whether the institution has official aid, or if the establishment be a commercial enterprise and nothing more; there is no reason why the drama should not be suitably housed, and it is an absolute mistake to believe that on the one hand a large building fund alone ensures good work, and, on the other, that a small outlay must result in the production of an eye-sore.



PEOPLE'S THEATRE, WORMS.
FIG. 655. SKETCH PLAN.

As regards the future development of the existing principles of theatre design practised at home and abroad, the page of illustrations opposite (Figs. 647 to 652), illustrating plans based on the radial system of Gottfried Semper, may be taken as the direction in which designers will probably work, whilst the three illustrations on this page (Figs. 653 to 655) describe the amphitheatrical lines of old as adapted to recent buildings, which in their application are likely to materially influence the future arrangement of the auditorium. In other words, the radial plan of Semper, with its clear expression of purpose, combined with the more open and amphitheatrical seating arrangements of the 'Wagner' Theatre, may be looked upon as the precursor of the impending era in theatre design; and with the growing tendency—both from the sentimental and the protective aspect—to place theatres on isolated sites, I hold that every facility is given towards development on these lines.

I am here, of course, speaking of Europe generally; and in speaking thus, I may say, that in my opinion, Teutonic influences are in the ascendant, whilst the principles of theatre design as practised in Latin countries no longer accord with modern requirements. The application of the latter will hence probably only be exceptional.

As far as England is concerned, or particularly the Metropolis, this Teutonic influence is already making itself felt, just as that of the Latin countries was evident during the earlier part of this century. And it only remains for these Teutonic lines to be suitably applied to our peculiar purposes and conditions to open a fresh era in theatre design which may give a new character and, perhaps, some individuality to the housing of the drama in the British Isles. Up to the present, with the exceptions indicated, theatre architecture in the sense of a liberal art has been non-existent, and we simply have a form of theatre construction of essentially economic tendency that is lacking in refinement. Theatre construction has, in fact, fallen to a very low position in London, and this is especially regrettable at a time when architecture generally has been making such rapid strides throughout the United Kingdom.

MUNICIPAL THEATRE, ZÜRICH.
FIG. 656. VIEW OF CEILING.

As a concluding word, let me express the hope that these volumes may in some slight measure tend to raise the standard of the housing of the drama in our Metropolis, and that the examples presented in this work may assist all those who are interested in theatres—whether resident on this side of the Channel or abroad—in determining the character of the future playhouses of Europe.

MUNICIPAL THEATRE BROMBERG.
FIG. 657. AUDITORIUM; VIEW OF PROSCENIUM.

END OF VOLUME III.

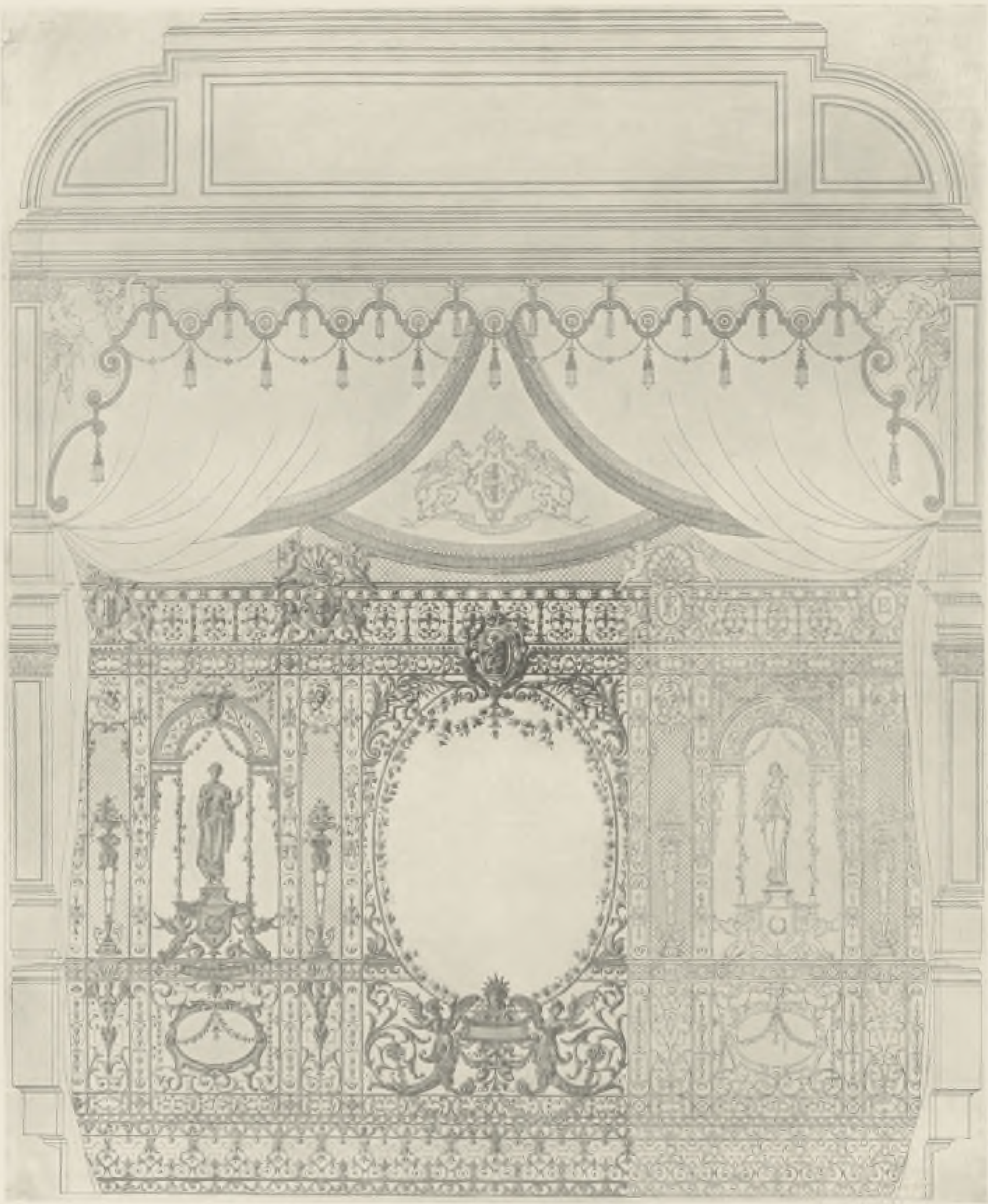
SUPPLEMENTS

ON

STAGE CONSTRUCTION, THEATRE FIRES

AND

PROTECTIVE LEGISLATION.



COURT THEATRE, VIENNA.

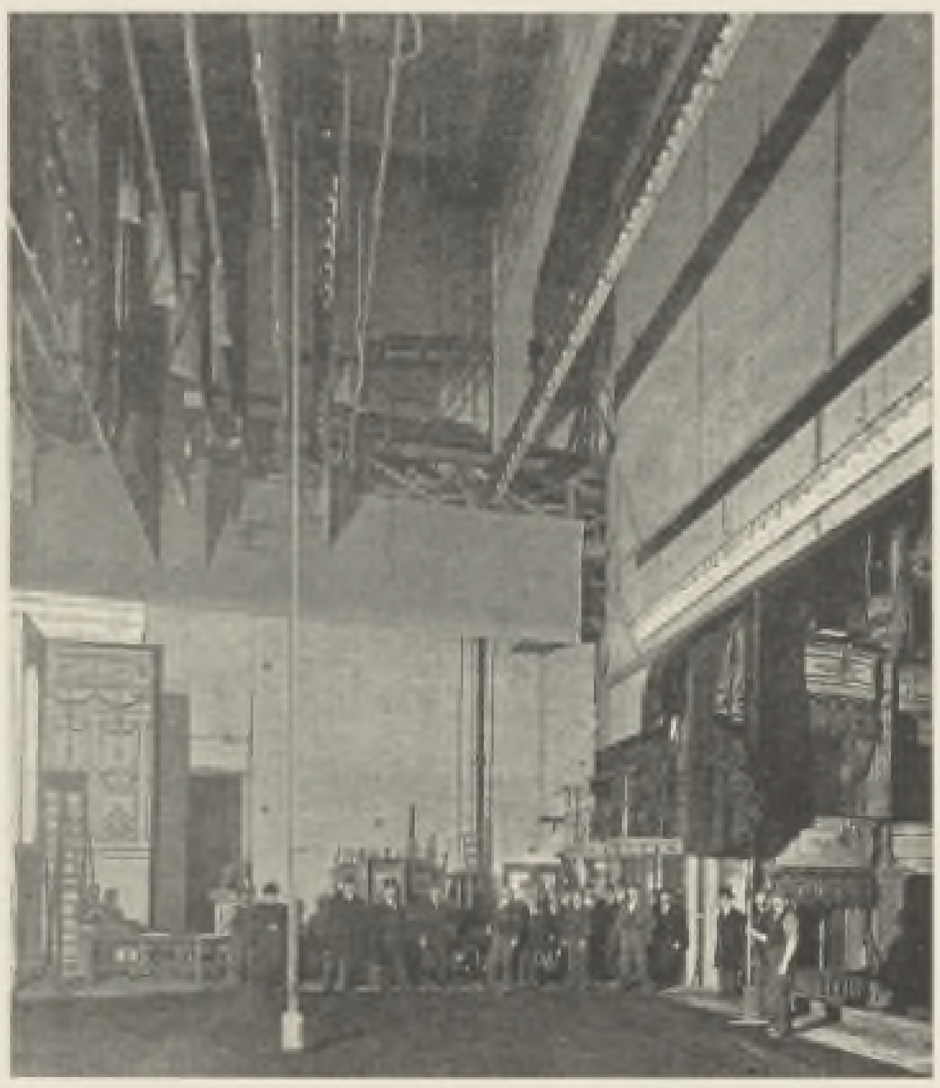
Fire-resisting Curtain, Decoration.

CONTENTS OF SUPPLEMENTS.

Supplement I.—Stage Construction

Supplement II.—Theatre Fires.

Supplement III.—Protective Legislation.



'HER MAJESTY'S' THEATRE, LONDON. STAGE.
GENERAL VIEW.

LIST OF ILLUSTRATIONS.

SUPPLEMENT I.—STAGE CONSTRUCTION.

INTRODUCTION.

WOOD STAGES.

WOOD-AND-IRON STAGES.

IRON STAGES.

MUNICIPAL THEATRE, AMSTERDAM.
- PLAN OF STAGE FLOOR.
- LONGITUDINAL SECTION.
- TRANSVERSE SECTION.

NATIONAL THEATRE, CHRISTIANIA.
- PLAN OF STAGE FLOOR.
- LONGITUDINAL SECTION.
- TRANSVERSE SECTION.
- DETAILS OF 'UNDER MACHINERY.'
- DETAILS.

'ASPHALEIA' SYSTEM.
- ORIGINAL DESIGN: LONGITUDINAL SECTION.
- ORIGINAL DESIGN: TRANSVERSE SECTION.
- DIAGRAM SHOWING 'UNDER MACHINERY' AND 'HORIZON.'
- DIAGRAM SHOWING 'BRIDGES.'

MUNICIPAL THEATRE, HALLE.
- PLAN OF STAGE FLOOR.
- PLAN OF FIRST 'MEZZANINE.'
- PLAN OF 'CELLAR.'
- PLAN OF 'GRIDIRON' FLOOR.
- PLAN OF FIRST 'FLY GALLERY.'
- PLAN OF SECOND 'FLY GALLERY.'
- LONGITUDINAL SECTION.
- TRANSVERSE SECTION.

NATIONAL OPERA HOUSE, BUDA-PESTH.
- PLAN OF STAGE FLOOR.
- PLAN OF 'UNDER MACHINERY.'
- TRANSVERSE SECTION. (*FRONTISPIECE.*)

AUDITORIUM, CHICAGO.
- SECTIONS OF 'UNDER MACHINERY.'

COURT THEATRE, VIENNA.
- PLANS OF STAGE FLOOR.
- PLANS OF 'UNDER MACHINERY.'
- PLAN OF SECOND 'MEZZANINE.'
- PLANS OF 'GRIDIRON' AND 'FLY GALLERY.'
- LONGITUDINAL SECTIONS. (*PLATE.*)
- TRANSVERSE SECTIONS. (*PLATE.*)
- DETAIL OF 'GRIDIRON.'
- DETAILS OF HYDRAULIC RAMS.
- VIEW OF 'UNDER MACHINERY.'
- VIEW OF 'GRIDIRON.'
- VIEW OF 'UPPER MACHINERY.'

COURT THEATRE, BERLIN.
- PLAN OF STAGE FLOOR.
- PLANS OF STAGE FLOOR AND JOISTS.
- PLAN OF 'UNDER MACHINERY.'
- PLAN OF 'CELLAR.'
- PLAN OF 'GRIDIRON.'
- LONGITUDINAL SECTION.
- TRANSVERSE SECTION.

COURT THEATRE, WIESBADEN.
- PLAN OF STAGE FLOOR.
- LONGITUDINAL SECTION.
- TRANSVERSE SECTION.

FRITZ BRANDT'S SYSTEM.
- PLAN OF 'BRIDGE.'
- DETAILS OF 'BRIDGE.'

ELECTRIC 'TURNTABLE' STAGE.
- PLAN OF STAGE FLOOR.
- LONGITUDINAL SECTION. (*PLATE.*)
- TRANSVERSE SECTION. (*PLATE.*)
- VIEW OF STAGE.
- PLANS OF SCENES FROM 'DON JUAN.'
- VIEWS OF SCENES FROM 'DON JUAN.'

CONCLUSION.

ANDREW BROWN'S SYSTEM.
- PLAN OF STAGE FLOOR.
- TRANSVERSE SECTION.
- DETAILS.

'LYRIC' THEATRE, LONDON.
- PLAN OF 'BRIDGES.'
- SECTION OF 'BRIDGES.'

ROBERT AFFLECK'S SYSTEM.
- DETAILS OF 'GRIDIRON' PULLEYS.

CASINO THEATRE, MONTE CARLO.
- PLAN OF STAGE FLOOR.
- TRANSVERSE SECTION.

MUNICIPAL THEATRE, SALZBURG.
- PLAN OF STAGE FLOOR.
- LONGITUDINAL SECTION.

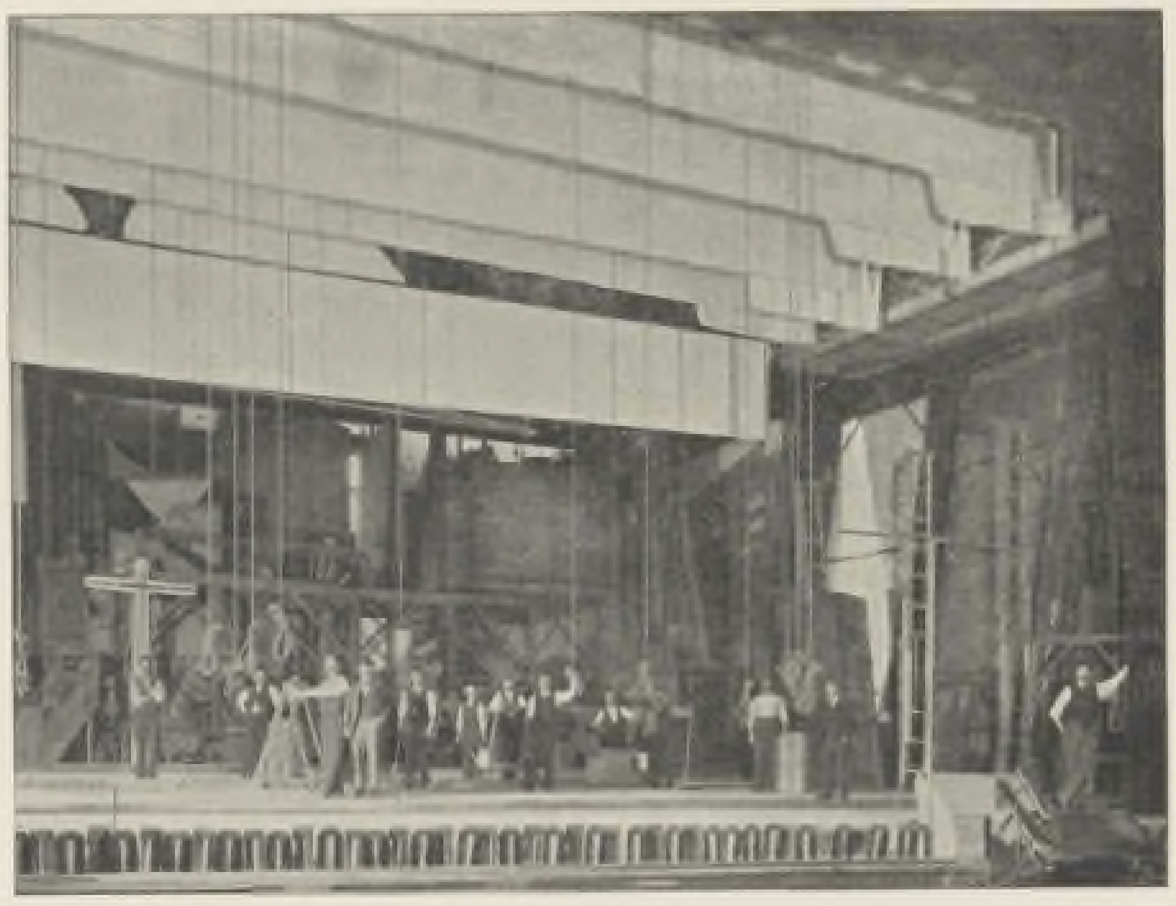
'NEW' THEATRE, BERLIN.
- PLAN OF STAGE FLOOR.
- LONGITUDINAL SECTION.

MUNICIPAL THEATRE, ESSEN.
- PLAN OF STAGE FLOOR.
- LONGITUDINAL SECTION.

'EMPIRE' VARIETY THEATRE.
- PLAN OF ROSTRUMS FOR 'FAUST' BALLET.
- DETAILS OF ROSTRUMS FOR 'FAUST' BALLET.
- VIEW OF SCENE FROM 'FAUST' BALLET.

Supplement II.—Theatre Fires.

Supplement III.—Protective Legislation.



COVENT GARDEN OPERA HOUSE, LONDON. STAGE. FIG. 1.—VIEW OF STAGE FROM AUDITORIUM.

ILLUSTRATIONS DERIVED FROM OTHER PUBLICATIONS.

THE PHOTOGRAPHS OF COVENT GARDEN OPERA HOUSE, DRURY LANE THEATRE, AND 'HER MAJESTY'S' THEATRE, LONDON, ARE BY ALFRED ELLIS;
THE PHOTOGRAPHS OF THE COURT THEATRE, VIENNA, ARE BY C. GRAIL;
IN OTHER INSTANCES THE NAMES OF THE PHOTOGRAPHERS HAVE NOT BEEN OBTAINABLE.

DRURY LANE THEATRE, LONDON. STAGE.
FIG. 2. VIEW OF HYDRAULIC 'BRIDGES' IN SLOPING POSITION.

SUPPLEMENT I.

STAGE CONSTRUCTION.

INTRODUCTION.

A MOVEMENT known by the name of 'Stage reform' has of late years received some attention in this country. It originated some twenty years back in Austria, with the primary object of encouraging the greatest possible imitation of nature in the *mise-en-scène* of opera and drama. The rudiments of art, as understood by painters, sculptors, architects and the cultured public of the day, were to be applied to the stage, and a true Scenic Art was to take the place of the nondescript, irrational and frequently coarse mounting previously given to plays. To facilitate the efforts of the scenic artist, the fullest application of our modern sciences (notably of mechanics and hydraulics) in the interest of 'Stage reform' was considered essential, and the introduction of recent methods of lighting was also deemed necessary. The numerous fatal conflagrations which had originated on the stage, caused the question of protection from fire to be closely associated with the movement, while the frequency of dangerous diseases among the members of the dramatic profession preserved the claims of hygiene from neglect.

The movement, as I have said, originated in Austria, soon after the terrible 'Ring' Theatre fire at Vienna; and, on account of the prominence accorded to protective measures against fire, much headway was at that time made in German-speaking countries. Able exponents were found among leading artists; and stage-managers, architects, engineers, firemen, and last, though not least, the Government and municipal authorities interested themselves in the matter. Since then the movement has not only surely and gradually developed throughout Austria and Germany, but has also spread beyond the frontiers of those countries. Concurrently, some quite independent movements also originated amongst several other nations, and, though the purposes of these were not identical, they were very similar. Throughout Europe, a transitional period may be said to have begun for the stage. Up to the present time, however, this period has nowhere attained its desired termination in any generally recognised reform. No definite new era has yet opened, even in the countries where the movement first obtained a footing. Experiments have been numerous and various, and the failures have almost outnumbered the acknowledged successes. The boldest experiments, with their valuable achievements and costly failures, have, however, now been made, so that little remains to be done except the practical and systematic application of the experience gained. I may here at once say that I see no reason why the experimental or transitional period of the movement should not now be superseded by a new and definite epoch, more especially if the matter is taken up by men who are free from fads of their own.

The primary object of the originators of the movement—i.e. the closest possible imitation of nature—has in several instances already been attained, but the Art-world, and the cultured also, have found that this generally means crude realism. The mystery of the *mise-en-scène*, so necessary to a good scenic picture, is lost, and much also of the so-called 'feeling' of the spectacle is lacking. Modern science and the most recent methods have already been employed to some purpose in the interests of the mounting, but stage-managers and experts have found that an extreme modernisation of the scenic artist's auxiliaries often means more complication and uncertainty than was formerly the case. The expenditure incurred by extreme reform on the stage has also been found to be disproportionate to the advantages gained therefrom.

Both in the effects to be obtained, and in the methods to be adopted, *practical* reform is now gradually taking the place of *radical* reform. There can be no doubt that the exponents of the extremist movement have given the necessary impetus towards the improvement of the scenery, and future generations will be greatly indebted to them. As is usually the case, however, with any radical reform, the originators of the movement are scarcely likely to see their proposals adopted in their entirety. Nevertheless, they may be well satisfied that a moderate and practical outcome of their efforts is assured. And this is a great deal when we consider to what an extent the stage clings to tradition and convention, and repudiates any interference from outsiders, and how sweeping the proposed reforms appeared twenty years back.

In England, the primary object of 'Stage reform,' the imitation of nature in the *mise-en-scène* of both opera and drama, has certainly found a fair amount of favour. This, however, is virtually due to the manner in which the public have associated the movement with that crude realism which has of late met with so widespread an appreciation in all branches of art and letters. There has been no outcry against the indifferent mounting of a play, and the realism of a spectacle has generally been more appreciated by an audience than its merits as a work of art. 'Stage reform' in this country is still associated with the sensational shipwreck, the race, or some other exciting item of the programme, and any popularity of the movement is practically due to the rendering of such realistic scenes. There have not yet been many instances where art alone has helped the movement, but for that matter, perhaps, we have not seen many examples of a *mise-en-scène* on truly art lines.

With very few exceptions, on a small scale, no extreme reform has been attempted in this country as it has in Austria and Germany. This is largely due to the fact that our actor-managers have to rely on their own purses or on those of some speculative financier, instead of having a certain proportion of public funds placed at their disposal. Our managers cannot afford expensive experiments. Too much risk is involved in the sudden departure from traditions and conventional usages, and the most that can be undertaken is a gradual improvement of the scenery on the old lines. Such improvements, as distinct from extreme reforms, there certainly have been. Sir Henry Irving, of the Lyceum Theatre, is a notable exponent of moderate reform. The late Sir Augustus Harris, our leading *impresario*, has also done much in the gradual beautifying of his scenes on recognised lines, though he was frequently hampered by the fact that his productions required a too realistic mounting of the ultra-sensational kind.

If we wish to see a *mise-en-scène* on artistic lines, the outcome of extremist experiments, we have only the private stage at Bushey, where Hubert Herkomer, who at one time took a leading part in the movement in England, has at his own expense achieved numerous successes as a stage-manager and scene-painter. His miniature stage has been a working model from which our actor-managers have learnt much. Those who have had the good fortune to see one of the Bushey performances will have realised the difference between nondescript mounting and really artistic scenery. The general public little knows to what an extent the efforts of Hubert Herkomer have affected stage management. Without his private experiments, it is hardly probable that even Sir Henry Irving's stage would have shown such improvements as are now accepted as a matter of course.

The curious feature, however, of the movement in England, is not so much the absence of extreme changes in the scenery of our stages, as the almost entire absence of the application of modern science and modern methods in the interests of stage management. Even the few exceptions which do exist generally concern only the substitution of electricity for gas in stage lighting, or some minor or mechanical appliances to facilitate what is termed a 'quick change.' We are for once untrue to our national reputation for practical adaptations; and this, moreover, in a case where there is unlimited scope for energetic young engineers. In this country, again, the question of fire protection has not been associated with the movement, and the advancement of stage hygiene seems scarcely to have been considered by our exponents of 'Stage reform.' The former omission is, of course, quite in keeping with our traditions. We insure our property, and never consider the tremendous national loss by fire, nor do we take measures for the protection of life until some great catastrophe has fallen upon us. But in the matter of hygiene, such neglect is unusual in a country which prides itself on its leadership in matters connected with sanitation.

In this Supplement, I now propose to show how far modern sciences and methods have already been brought into the service of stage management, and how the protection of audiences and of employés has been attended to, as far as the arrangement of stages is concerned. I do not intend to formulate any model code of requirements, or to describe any model stage of my own. The following pages will be confined to explanations of typical examples of stages erected during the last twenty-five years, nearly all of which are in full working order at the present day. The series will be illustrated by reproductions of the original working drawings specially prepared for me, or, where these are not forthcoming, from measured drawings specially plotted on the spot. I have added also a few descriptive sketches and photographs, together with some diagrams. I am showing examples from different Continental countries—thus, for instance, the stages of the Amsterdam Municipal Theatre, the National Theatre, Christiania, the Berlin Court Theatre, the Halle and

Wiesbaden Theatres, and a new stage for Munich. These are all stages in which modern methods have been employed. The stage at D'Oyly Carte's English Opera House, now better known as the Palace Theatre of Varieties, is also included in this Supplement as one of the few examples of modern stage mechanism to be found in our island. Then, again, the Paris Opera House stage is represented, as one of the first in which iron was used to any appreciable extent in the construction. Modern wooden stages are illustrated by some drawings of the Vienna Court Opera House, and the 'Flemish' Theatre at Brussels, the Court Theatre at Dresden, and the 'Eden' Variety Theatre at Paris, which has only lately been pulled down. Earlier examples of stage machinery are not dealt with, as these can easily be explained from what I shall term a typical example of the English stage of to-day. There is little difference between the ordinary London stage of 1897 and the stages of 1750. The electric light may have incidentally taken the place of the limelight and gas of recent years, or the candles and lamps of an earlier period, and, as I have observed, there may be some 'tricky' mechanical detail or slight improvement in the minor gear; but such unimportant contrivances, I am afraid, complete the list of changes made. Even where the *mise-en-scène* is improved so much as at the Lyceum Theatre, the antediluvian wood stage still remains. London, however, is not the only city, nor England the only country, where such lack of progress is observable. Modern stages are as yet rare abroad, except in the countries where 'Stage reform' originated. The only difference is that, while some of the oldest and worst stages in London have been known to show excellent mounting, good scenery abroad will, as a rule, only be found on a modern stage; and I will here take the opportunity to express my admiration at the perfect scenic arrangement of some of our plays, for the production of which our managers are so greatly hampered by their pitiable stage equipment, which compels them to have recourse to innumerable makeshifts. It would, however, be impossible for the London manager to do such excellent work if he had to change his play-bill daily, as is frequently the case on the Continent. The so-called 'set pieces,' for instance, could not then be so extensively used as they are now. It is probable that plays with long runs, in which the stage-carpenter's work becomes mere routine, have partly been the cause of our tardy progress in 'Stage reform,' while the more complicated requirements of a continually changing play-bill must have assisted the movement abroad.

Before commencing the compilation of this Supplement, I visited most of the playhouses on the Continent noted for their modern stage equipment, solely with the view of studying this particular branch of theatre construction, and the practical merits of each stage have been carefully considered—quite apart from the importance of the institution to which it belonged—before the examples here presented were determined on. Manifold opportunities were afforded me for testing everything of importance under varied circumstances, and I was specially allowed to see the necessary account books, in order to study such financial details as the cost of wear and tear, the maintenance of the requisite staff, etc. As new subjects, however, only too easily lend themselves to prejudice, I have sometimes made it a special point to quote the opinions of those in charge of modern stages, and, where possible, I have tried to indicate the ideas and views of those responsible for the design. I have also been at pains to visit all parties concerned, and, besides having had the advantages of personal interviews, have generally also had reports or descriptions prepared for me, embodying various views on specific features.

It is, perhaps, not out of place to mention that, with, I believe, two or three exceptions where small monographs have appeared on individual theatres, none of the examples have been presented before, except incidentally in the form of miniature woodcuts appearing in some of the foreign technical journals or handbooks on theatre construction and stage decoration. Even Moynet, whose able volume, 'Trucs et Décors,' was published in Paris during 1893, treats almost only of the old wooden stage, and his illustrations are of an essentially popular character. Contant's work on theatres, which was issued in 1842, has a supplement to his second edition, dated 1860, which, to my knowledge, is the only instance in which the stage has been illustrated from working drawings. In describing the old wooden stages of his time, Contant devoted no less than forty large plates to their illustration, explaining English, German and French systems of stage carpentry, with most exhaustive details; but this is now thirty-seven years ago, and his examples belong to the beginning of the century. I must not omit here to point out that Clement Contant was an architect, and that the stage appliances of his day would perhaps have been more appropriately dealt with by an engineer. To-day, when iron replaces wood, and hydraulics and electricity supersede manual labour, the description of the stage certainly appears to be rather an engineer's subject than an architect's. Hence, like Contant, and with still more reason, I must crave indulgence from engineers if my explanations and diagrams show a want of that knowledge of mechanical engineering which they expect from members of their profession. As an architect, I am at a disadvantage.

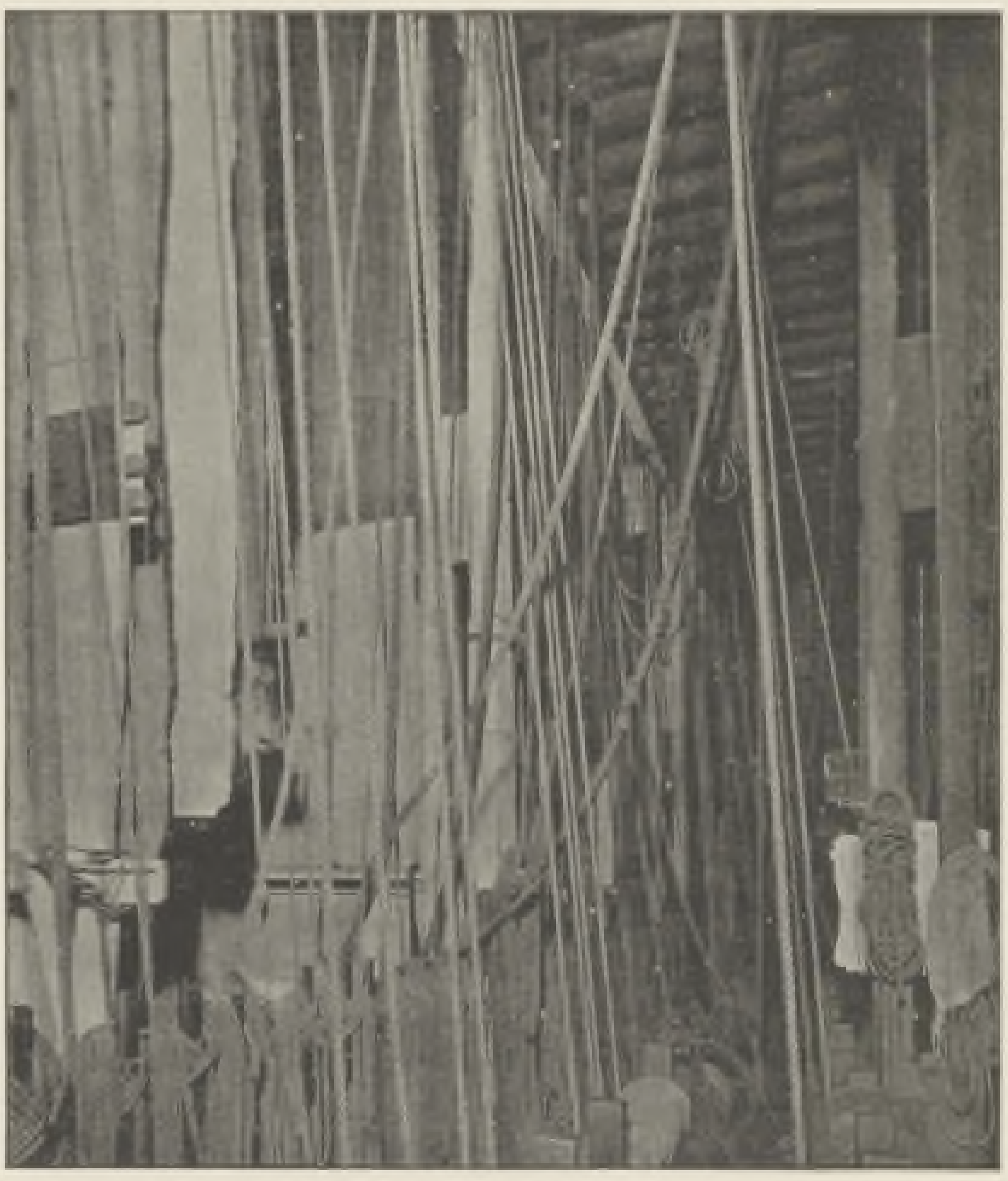
It would certainly be premature to attempt any rigid form of classification in so new a subject. The exact definition of the headings seems to me practically impossible. It would, however, be well to note that, during the preparation of this Supplement, I have grouped the stages according to the materials of which they are constructed. I have used the headings: Wood Stages, Wood and Iron Stages, and Iron Stages; and I have also found it necessary to arrange for subdivisions according to the power chiefly employed in working the appliances. These subsections are: Manual Labour, Hydraulics, Electricity. Owing to the almost entire absence of steam for motive power in connection with stage machinery, a separate division for appliances where steam is employed was not required. I have first taken the wood stage, then the wood and iron stage, and, lastly, the iron stage. Manual labour is employed in all three, but electricity and hydraulics are only to be found in connection with the latter. Hence the division of the subject is practically as follows:—

Wood Stage: Manual Labour.

Wood and Iron Stage: Manual Labour.

Iron Stage: Manual Labour; Hydraulic Power; Electrical Power.

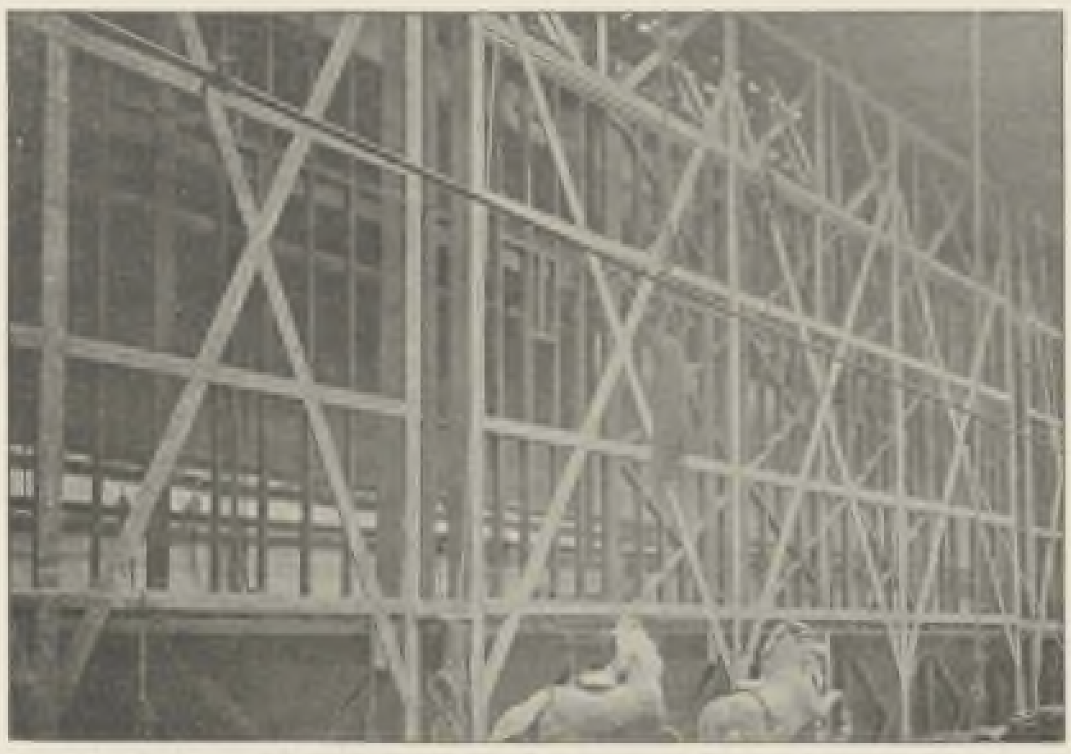
Before, however, speaking of the stage, I must particularly call attention to my remarks in the Introduction to Volume I., on the purposes of the various classes of playhouses for which scenic paraphernalia have to be provided. This may at first sight appear out of place, but I hold that if the purposes of the different institutions are borne in mind, it will greatly facilitate the appreciation of the circumstances which govern the construction and working of stages, and the structural, as well as the economic difficulties which have to be overcome. I must also refer to my remarks in an earlier part of this volume, on the planning of a modern playhouse, more especially in regard to the stage and auditorium; for it should be clearly remembered that the sighting and acoustic properties have to be considered. The block plans of the various examples illustrated should be carefully studied in connection with the subject, for the relative sizes and outlines of the stages may be judged from them, and it will be observed that the differences in many instances are somewhat remarkable. The outlines and dimensions naturally depend, in the first place, on the respective requirements of the stage management or owner; but in the same way as the lines of the auditorium are essentially governed by the proscenium opening, the setting out of the stage is regulated by the height and width of this all-important feature. From these plans it will also be seen that many of the stages have so-called rear or back stages, the dimensions of which are, however, dictated mainly by the facilities to be afforded for obtaining certain effects. Altogether, I would emphasise that not only the architect, but also the engineer who wishes to give attention to the subject of stage construction, must fully comprehend the requirements and possibilities, and it is absolutely essential that he should not only know the wishes of an individual client, but also the varied policies or makeshifts necessary under different circumstances, and, above all, in different countries.



COVENT GARDEN OPERA HOUSE, LONDON: STAGE.
FIG. 3. VIEW OF 'CLOTHS.'

Again referring to the Introduction to Volume I., it will perhaps be remembered that I spoke at some considerable length on the very different manner in which theatre construction was treated by the architects of the Continent as compared with the way in which it is dealt with in this country. I laid some stress on what I might almost term the difference of feeling which pervaded theatre architecture, and it would not be out of place to repeat that there exists a considerable distinction between the artist and leader of his profession who is responsible for the Continental building and his more practical *confrère* of our own metropolis, to whom it is all-important that he should possess the abilities of a financial agent before almost any other consideration.

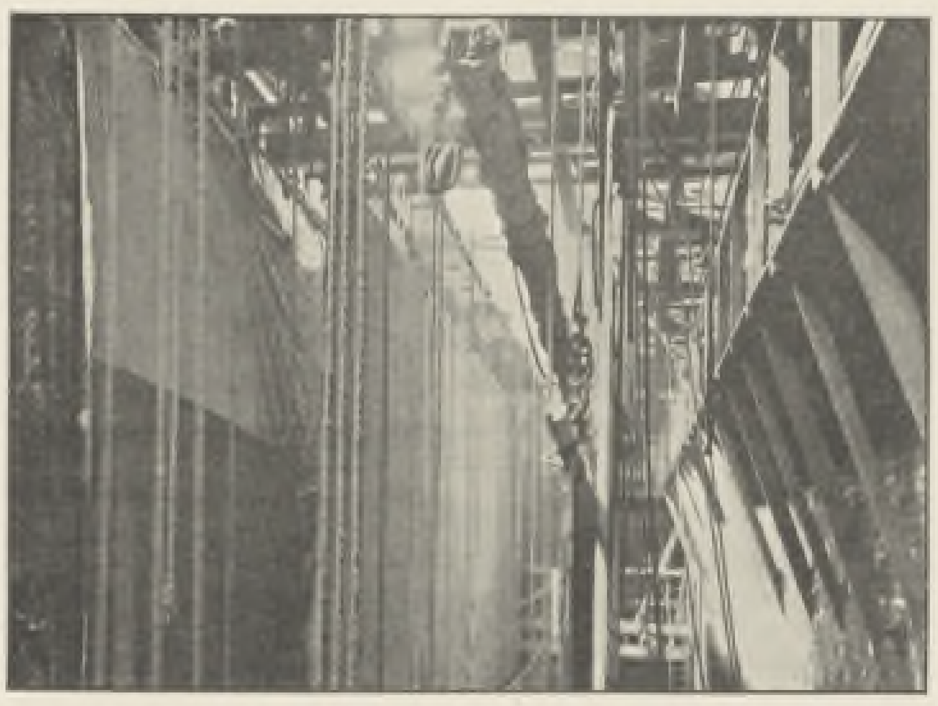
In the same way as there is a decided contrast in the character of those responsible for the erection of theatres in this country as compared with those on the Continent, so there is a wonderful difference in the *personnel* responsible for the construction and working of the stage. With few exceptions the construction of our stages is in the hands of mere stage-carpenters, who possess but little more technical knowledge and experience than the ordinary foremen-carpenters of the building trade, and whose position in the theatre is similarly no better than that of any average foreman of artisans. Abroad, even for the construction of wood stages, the commissions are given to fully qualified engineers who hold influential positions in their profession. More particularly in German-speaking countries there is a distinct calling of 'stage-engineering,' and though some few of the present leaders may have risen from the ordinary stage-carpenter, this profession is practically now only composed of men whose preliminary training alone often approaches that of our Royal Engineers. The body of stage-engineers includes men with exceptional powers of initiative, as may be judged from the chapters dealing with modern hydraulic and electric stages; and the way in which the work is usually executed also displays, I am glad to say, such full consideration for the requirements of the scenic artist as is but seldom found where the interests of art and science clash. In several instances even the stage-engineer also takes the position of 'director of scenery' (Artistischer Leiter), and he is held responsible for all stage effects, including the design of the scenery, which is prepared under his supervision. This last-named combination of offices in one man I certainly do not hold with, and I would add that the arrangement is but rarely successful. I prefer to see the mounting of a play in the hands of a scenic artist of recognised standing, to whom the engineer and the principal of the painting room should be able lieutenants, and not collaborators on an equal footing. One mind alone should govern the mounting of a play. All the larger theatres of the Continent, it is noticeable, employ permanent engineers, whose appointment is mostly in the gift of the owner and is held continuously, irrespective of any change in management, lesseeship, or varying appointments of scenic artists.



COVENT GARDEN OPERA HOUSE, LONDON: Stage.
Fig. 4. View of 'Gridiron.'

It is not my intention to indicate how much the scope of the engineer depends on the individual in charge of the stage—in other words, the stage-manager, lessee, or actor-manager, as the case may be—nor do I wish to speak of the various circumstances on which depends the amount of attention the mounting of a play receives, what effects are attempted, and what methods are employed. All this would lead too far, though, to repeat, it is essential for the theatre engineer to be versed in the varied requirements that he may be called upon to consider. I cannot, however, when speaking of the modern stage, omit some mention of expert opinion on scenic art and its auxiliaries, for nothing has so materially influenced the recent development of stage mechanism as the candid criticism of recognised authorities.

I have before stated that it is my purpose to quote the opinions of others in treating a subject which lends itself so easily to prejudice, and I could not, perhaps, find a better opportunity than the present to reproduce some views on the anomalies which exist in the mounting of our plays, so ably expressed by Hubert Herkomer when the question of 'Stage reform' was first mooted in this country. This distinguished artist has generally put forward the argument that the real secret of perfect scenic art lies in illusion, i.e. in visual deception, or in not allowing the eye of the spectator to discern the means whereby the semblance of reality is obtained. Mere actuality will not accomplish this any more than will good painting *per se*. It is in the attempt to get absolutely every requisite effect by painting that so much mystery is lost on the stage, for the scenic artist's art should be as much concealed as that of the actor. It should not be too manifest whether a background is painted or modelled any more than whether an actor is 'made up' or appears in his natural form. All we ask is that he shall look the character he is portraying. In the same way we desire that his background shall be artistically correct. Herkomer pleads that the 'make-up,' as it were, of the background should be regarded as of equal importance with the actor's personal 'make-up.' To dispense with the one is to throw the actor and his surroundings out of harmony. Indeed, if we accept a rose-bush cut out of thin boards, the edges of which we can hold between our thumb and first finger, or a street scene painted on canvas and hung across the stage—a sheet that is moved like a sail by every draught—and upon which the shadows of the passing actors thrown from the footlights fall, we ought, in all truth, to be satisfied with an actor whose wig has been so badly fitted that his own hair is visible beneath the artificial covering. The latter would never be tolerated by the audience, yet the former are seldom objected to. The authority I am quoting considers that it is amazing how an audience, which is only too ready to ridicule the slightest inconsistency in the characters of a play, will meekly accept the grossest incongruities in the scenic effects. The utter absence of mystery, the barefaced, childish neglect of any effort to be true to the appearance of nature, never disturbs. Herkomer holds that the stage is a medium through which the greatest truths in nature can be brought home most effectively to the minds and hearts of the people, and that all the arts should, to their



COVENT GARDEN OPERA HOUSE, LONDON: Stage.
Fig. 5. View of 'Upper Machinery.'

fullest capacity, be united to obtain the most perfect expression of life and its surroundings. But we should not be satisfied until the various arts employed on the stage are brought to an equal degree of perfection.

Although scenic art has improved in this country, it has been a slow process, and has not been inspired by any solicitations from without. When our audiences begin to howl down a ridiculous stage moon, we shall probably find a way to mend that luminary. At present it is quite safe to let our moon rise perpendicularly *up* the sky very quickly until the mechanism is exhausted, and then to allow it to remain stationary. Further, it is quite an accepted arrangement that the moment this red rising moon appears above the horizon it shall emit rays of blue light from the opposite direction from which it comes. It is safe to let down a 'wobbly' sheet of canvas close to the footlights, with a scene painted thereon representing breakers dashing over the rocks, and perhaps a sinking ship in the distance, to which the actor may have to refer in his speech. It is safe to have layers of canvas hanging from the 'sky' like so much washing hung on a line; and certainly but few have ever questioned the prerogative of the 'firmament' to come together at right angles in the corner. It would take almost a volume to describe the many anomalies of scenery constantly observed on the London stage.

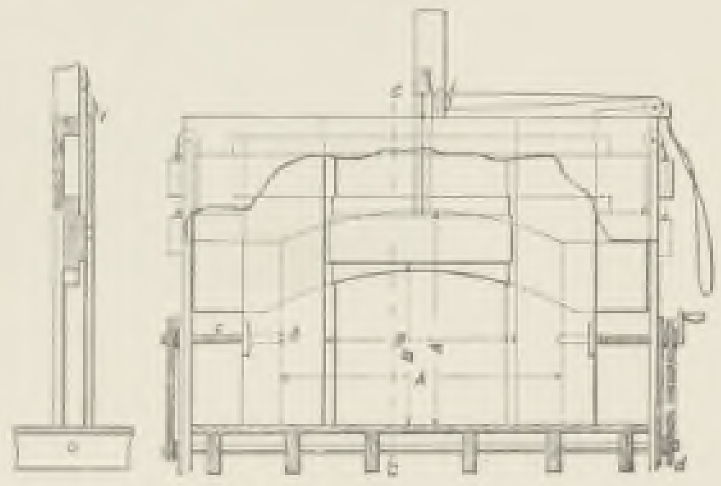
In regard to the anomalies existing in stage-land, opinions, not so very unlike Herkomer's, were first publicly expressed at Vienna in 1881, when the so-called 'Asphaleia' Syndicate, to which I refer later at some considerable length, was promoted to construct hydraulic stages. The originators of that enterprise assume that the desire for realism which pervades the nineteenth century has completely changed the end and aims of modern scenic art. The scenic, like the dramatic artist, endeavours to play the part of interpreter between author and public. Now-a-days, both must thoroughly study the author whose work they present; they must understand his motives and designs if they would give a proper setting to his teaching and his ideas. The decorative artist must, like the actor, know how to be in earnest. Actor and scene-painter alike must, above all, so labour that the audience shall forget that they are within the four walls of a theatre. But our old stage methods prevent the realising of such an aim, and the impression of the audience that they are only witnessing a play is often far too palpable.

A pamphlet issued by this Vienna Syndicate in 1882, also contains some interesting remarks on the subject of *personnel*. I will here quote verbatim: "The theatre had to develop behind the back of society, and the memory of this former condition still clings to things theatrical. Truly the actor of to-day is treated well enough by society; he is no longer a vagabond and a stroller. Nevertheless, the stage still occupies an exceptional position; it is still, to a large extent, ignored by the State and by science. Science has turned industrial. She makes railroads, steam engines, factories and mills; she tins meat and condenses milk; but she has not troubled herself about the stage, and is only now waking up to its necessities. Hence it is that so many persons connected with the *technique* of the theatre are destitute of the smallest amount of scientific knowledge. They have all been through the mill; they know the whole routine of the theatre —as it was, is, and, as they think, evermore shall be—and they hand on their limited knowledge to their descendants and successors. As a result, there has been no essential change in the planning and arranging of the stage for 200 years past; indeed, fundamental improvements were as little likely to be made under such circumstances as it was possible for the average farm labourer to invent the steam plough."

The state of affairs in our own country has been indicated, and Herkomer's words on the subject have been referred to. I have just quoted the opinions of some Continental experts; I will conclude with some remarks by another authority, who must, however, here be nameless. This expert argues that as an actor should seek to obtain the closest resemblance to nature, so the theatrical manager should cause the play and its scenic surroundings to appear as the spontaneous growth of the time in which the drama or opera is set. We credit the actor with the genius of simulating nature. As a matter of fact, the principle on which he proceeds should also dominate every detail of the theatrical production. What the actor strives for, the manager, stage-manager, scenic artist, engineer, musical conductor and chorus should be striving for too. Each, in his respective department, should endeavour to *simulate* nature. I emphasise the word 'simulate' because the simulation, as distinguished from the actual reproduction of nature, is the peculiar province of stage art. It is a fact that the real tree upon the stage looks less like a real tree from the auditorium than a tree painted upon a piece of canvas, and that with a little canvas and a little paint the scene-painter can, at the expense of a few shillings, produce a Persian rug looking costlier and more like the real article than would an actual Persian rug costing a couple of hundred pounds. What in real life would appear grotesque, becomes on the stage a perfect simulation of nature. The actor's natural bloom would be a ghastly pallor in the glare of the footlights, so he is obliged to rouge his cheeks in order that their colour may look natural; and as, in this case, the appearance of nature is produced by exaggeration, so it is with everything pertaining to stage art—voice, gesture, costume, scenery, properties, light effects, &c. They must all, so to speak, be 'rouged' and 'roughened.' A stage production, to be successful, must be prepared with this principle always in view.

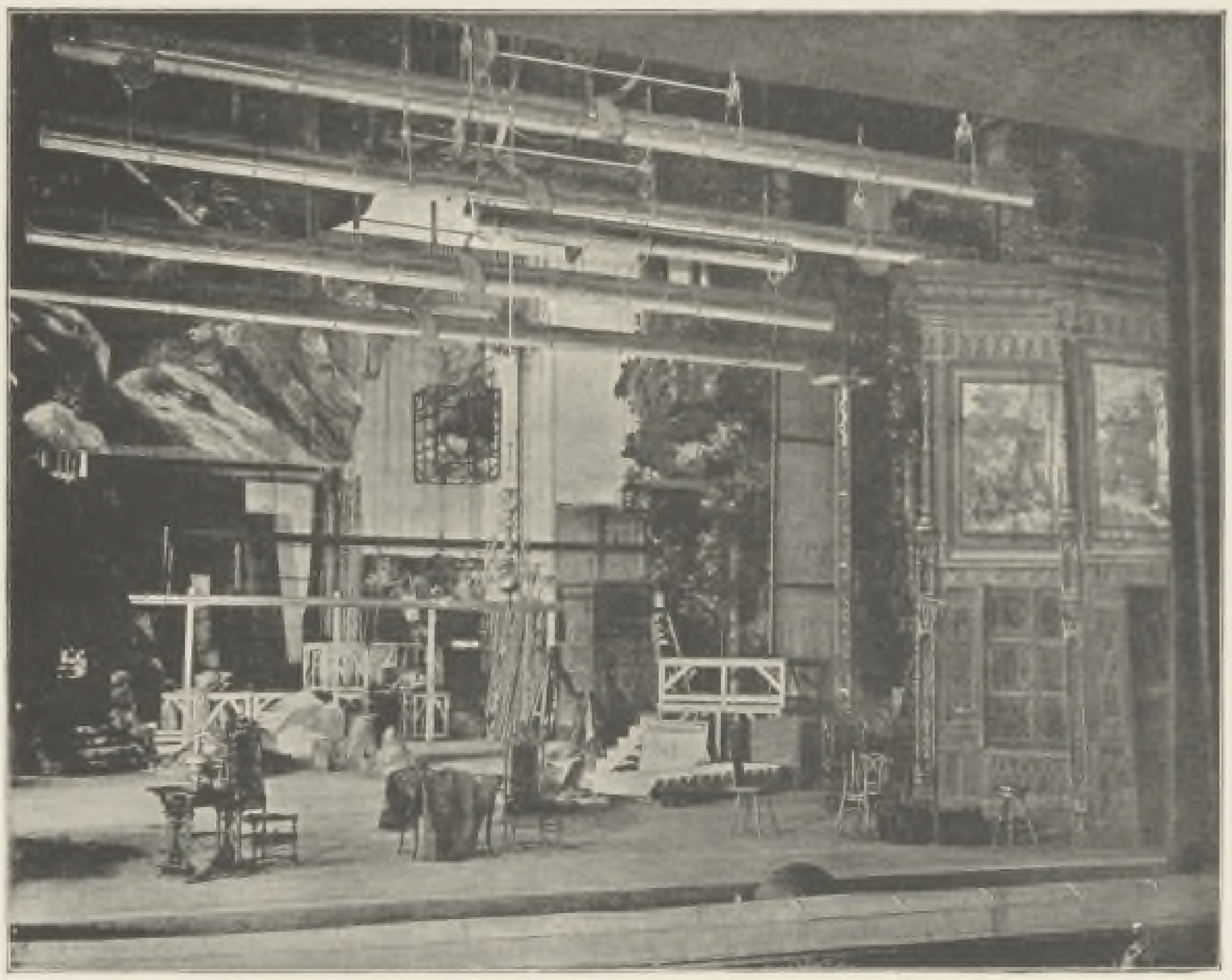
Speaking of the typical stage carpenter, this authority always refers to him as 'going with the lease.' He describes him as a man who has not learned, or, what is worse, has not unlearned a single thing in all these years. The architect, he contends, may give to his part of the work the result of his best knowledge, he may apply to it every modern improvement, and do all he possibly can to make his theatre stand for all that is best in construction, so that his house may splendidly typify the progress of his time, and then, ignoring entirely the man to whose poetical brain and practical brush the public must look for the pictorial part of the productions of his stage, he places the execution of the necessary appliances in the hands of a man whose only ambition is to make them 'as they made them when he was a boy.' Sentiments of this description are not expressed without full conviction. Unfortunately, only few appreciate a well-mounted piece or notice the anomalies in an inferior production, and a yet smaller number recognise the absurdity of a mismanaged stage, with its dangers from fire, its bad sanitation and its false economy.

As I am not here dealing with the question of safety from fire, nor the question of sanitation in regard to stage construction, and as it will be seen that I have avoided any reference to the illumination of the stage in this Supplement, there is, perhaps, only one point I should touch on in concluding these preliminary lines. I must allude to the proscenium opening as the 'frame' of the stage picture. From the architect's point of view there is no doubt that the frame proper will have to remain stationary, no matter whether the picture to be presented is large or small, and the scope of the architect's work will be limited to the proportions, form and colouring of his fixed proscenium. Any variations in the 'framing' of a stage picture will have to be accomplished on the inner 'frame' or 'mount' of the picture, not on the proscenium opening proper; and I am now referring to the various kinds of mount better known by the French term of *manteau d'arlequin*, and very generally used both in England and on the Continent. Herkomer, whose views I have previously quoted, has also taken up this question of 'framing,' and has expressed himself to the effect that "the proscenium should be to the stage picture what the frame is to the easel picture, or better, to the oil-painting." It should separate the picture from its surroundings. In that case, however, the stage picture should, like most oil-paintings, fill the frame. Now in most instances the proscenium is built so high that a considerable space has to be covered with curtains to make the opening in any way manageable, and the architect generally tries to explain the extra height by saying that it adds dignity to the proportions of the house, or perhaps that it is customary to build a proscenium in this manner, though as a matter of fact the dimensions, to a certain extent, go hand in hand with his programme so far as the number of tiers and the general outline of the auditorium is concerned. There is no inquiring what may be the real function of the proscenium. The extra height is nearly always meaningless in relation to the stage picture, and it is with reason pointed out by way of comparison how curious it would be to send a picture to the Academy in a frame that was a foot too high, having the vacant space modestly covered with drapery. It is on account of the anomaly in the custom of 'framing' the stage picture that Herkomer then goes on to suggest that the proscenium should be made to contract and expand. Every artist, says this authority, knows that the size of the canvas upon which he represents his subject has as much to do with the success of the work as the proper placing of the subject within that space. On the stage, however, with a fixed proscenium, the poor man's cottage or the garret has to be represented in a space of the same size as that occupied by a palace; a secret corridor in a castle must be of the same size as a banqueting-hall. Frequently we have first the representation of a house, and then a room in that house, which is proportionately much larger than the building shown immediately before. Thus the eye of the spectator is never properly prepared for any great climax in the scenery, because the trivial incidents leading up to it have been presented on such a disproportionate scale. According to Herkomer, a contracting proscenium should in no way be difficult to apply to the average theatre, and ought to be capable of being easily worked. Herkomer holds that there are many incidents in plays in which only two or three actors appear on the scene, and where the minimum dimensions requisite would make such a contrivance an inestimable boon to the scenic artist. He looks to the very foundation of composition in art, which, for the balance of the whole requires not only the careful consideration of parts, but demands that the human figure shall be made duly prominent. The scenic artist, by the aid of this contracting proscenium, could, with the collaboration of other authorities in 'stage-land,' fulfil all the laws governing pictorial composition in art. Herkomer has gone so far as to introduce a movable proscenium at Bushey, which is worked by a very simple arrangement of right-handed and left-handed screws for the sides, and some counterweights with ropes for the top. A diagram prepared from the model of this stage is presented (Fig. 6). The plan is no doubt ingenious, but in reality, for all practical purposes, the same effect has already often been obtained in a modified form by 'mounts' worked with the aid of two 'chariots' and a 'border,' examples of which will be shown in connection with the descriptions of modern Continental stages. Herkomer's method does not give the spectator the idea of an outer 'framing,' but simply that of a 'mount.' Hence I must repeat the opinion already expressed, that variation in the size of a stage picture can only be practically carried out with the 'mount' and not with the outer 'frame,' and further, that the variation in the 'mount' must be limited to the top and two sides of the picture, as the variation at the bottom would create numerous complications. The shape of the fixed outer 'frame' of the picture (the proscenium) could, however, easily be altered to accord more with the requirements of the average stage picture, and its present quite irrational shape might without difficulty be done away with.



HERKOMER'S CONTRACTING PROSCENIUM.
FIG. 6. ELEVATION AND SECTION.

In concluding this introduction, I only wish to emphasise that in my Supplement on stage construction I merely undertake to indicate how far modern science and methods have been brought into the service of stage management, and that I have no intention to formulate any model code of requirements or to indicate any model stage of my own. I speak of the different types of stages and I present examples. If the great difference between the stage of old and the modern installations is to be pictorially indicated, as distinct from technically, by description or diagram, I need only call attention to the great contrast between the stage of Covent Garden Theatre, London, depicted on pages 4 and 5, and the 'Hofburg' Theatre stage shown on pages 56 and 57. On the other hand, the similarity between the London stage of old and the latest example of a metropolitan installation, will at once be observed by comparing the general view of Covent Garden Theatre and that of 'Her Majesty's' Theatre. There is, however, no reason why this similarity of construction should not henceforward be relinquished in favour of appliances more suited to the modern requirements of the drama. As I have before contended, now that experiments, with their valuable achievements and costly failures, have been made, the application of the experience gained should be the means of opening up a new and definite epoch in theatre construction.



COURT THEATRE, VIENNA: STAGE. FIG. 7. VIEW OF STAGE FROM AUDITORIUM.

WOOD STAGES.

THE ENGLISH WOOD STAGE.

IN the preceding pages I have already indicated that the first section of this Supplement would be devoted to wood stages, but in order more easily to appreciate the complicated examples of machinery, it is essential first to describe exhaustively the typical English stage of to-day, which, as explained, is practically the old wood stage of the last century. This description will, at the same time, afford an opportunity for defining some of the many special terms used in 'Stage-land,' and which, though scarcely yet classified in technical dictionaries, must be regarded as *bonâ fide* technical expressions common to the stage of our country.

The example I have selected is the stage of an ordinary modern provincial or suburban theatre, which, as explained, is essentially a commercial concern, and generally used by touring companies, changing with their scenery, etc., weekly or fortnightly, as the case may be. A 'run' of any considerable length is only accorded to the Christmas pantomime, or on some exceptional occasion, when 'scratch' stock-companies are generally formed. The example chosen has the average dimensions of the stage of the provincial or suburban theatre, these dimensions being very similar throughout the country, and are adopted to suit the visitors' scenery, which is generally made for a proscenium opening of from 28 to 30 feet width. A proscenium 30 feet wide requires a measurement of 65 feet between the main walls of the stage, as the width of the stage must be at least somewhat more than double the width of the opening, in order to allow the floor to be 'worked off' to the right and left as will be explained. The example illustrated has a width of 65 feet.

Now the width of the proscenium opening governs its height, though the proportions of the measurements in the framing of a stage-picture vary. Very frequently the height of the opening coincides with its width, the actual 'sight' of the frame being square, but the architectural treatment over the opening, whether by arch, pediment or frieze, is generally increased in height, giving the more usually desired effect of greater height than width. The height of the actual opening being fixed so as to harmonise with the width, it follows that this dimension decides the full height of the stage from the 'floor' to the 'gridiron'; for there should be the possibility of lifting the scenery bodily out of sight above the proscenium arch. There are many reasons why the scenes should be lifted without rolling or folding, and among others I would mention one which appeals most directly to the managerial mind, i.e. the fact that a 'scene' (or what is more technically known as a 'cloth') which is not rolled or folded has a longer life. The paint is not worn off, and there is not the cost of constant retouching or repairs. Moreover, the movement of the 'scene' is more even and the risk of fire is also greatly reduced, for a 'cloth' that 'drops' is not so likely to come in such close proximity to the gas-burners, and will remain longer in good condition. Further, there is the advantage that 'cloths' which are not folded take up less room when suspended from the 'gridiron,' and a greater number of 'scenes' can, therefore, be hung if they have a simple 'drop.'

Just as the 'scenes' raised upwards have to be taken out of sight, so the 'scenes' lowered under the stage-floor have likewise to disappear from the vision of the audience; hence the height from the bottom of the 'cellar' or 'well' under the stage should, if possible, also be equal to the height of the proscenium opening, or rather to the height of the 'cloths.' This depth, however, is not always obtainable, as there are many difficulties to be faced. One of the greatest is the drainage of the 'well.' A prime factor governing the whole of the details of theatre designing, it will be remembered, is the safety of the public frequenting the building, and it has been found that English architects in particular, who make a speciality of theatre planning, frequently sink part of their building below the ground in order to make the street level equidistant from those occupying the topmost seats of the gallery and those seated in the area, or floor of the house. This sinking of the pit floor below the street naturally places the stage and the stage 'cellar' also below the ground, and where the 'cellar' is as much as 30 feet below the stage-floor, it is more often than not below the level of the main drainage, and in some houses in London, even below the level of the Thames bed. In such cases the difficulty of keeping the water out of the 'cellar' or 'well' is considerable, and pumps have to be employed daily to clear out the water. The presence of water is also a source of great annoyance and expense to the stage manager, as it ruins the stage machinery and damages the scenery. The deep 'cellar' under such circumstances, to say the least, must be very unpleasant and unhealthy, and may create a constant expenditure of time and labour, and hence 'cellars' of a smaller depth are being more generally adopted in the Metropolis.

The distance from the curtain line to the back of the stage entirely depends on the amount of ground that can be spared for the purpose; but 30 feet may be taken as a minimum, while in larger houses 80 feet would not be too much.

I have already shown what are the rules governing the outer shell of the English wood stage. It is now necessary to understand its divisions, taking first those shown in the sections and which occur in the height from 'cellar' to 'gridiron' (Figs. 11 and 12).

The top floor of the stage is known as the 'rigging loft' or 'gridiron,' and is practically a wooden staging or an open wood floor laid upon the tie-beams of the roof trusses. Wooden joists are laid on the beams from the back wall to the proscenium wall, and upon these joists an open floor of narrow fillets is laid with about an inch spacing down which the ropes supporting the depending scenery can pass. The term 'gridiron' is derived from the resemblance which this open flooring is supposed to have to the domestic article of the same name. A considerable weight has to be supported by the 'gridiron,' for from it depend all the 'cloths,' 'borders,' 'battens' and everything that is raised upwards from the stage. The strength of the roof and 'gridiron' over the stage, therefore, should be calculated with this usage in view. Accidents, attended with great danger to life and risk from fire, have been known to occur through the partial or total collapse of the 'gridiron.' The various parts of scenery suspended from 'battens' include all the so-called 'sky borders,' 'ceiling pieces,' 'drapery borders,' and 'profile borders,' which latter may represent trees, foliage, etc. The 'gridiron' is also called the 'rigging loft' from the fact that the 'scenes' are 'rigged-up' on ropes from it. The 'scenes' are raised and lowered from this level by means of such ropes passing through the spaces in the floor over blocks with wheels in them on to the 'drum,' and thence down to the 'fly-floors' below.

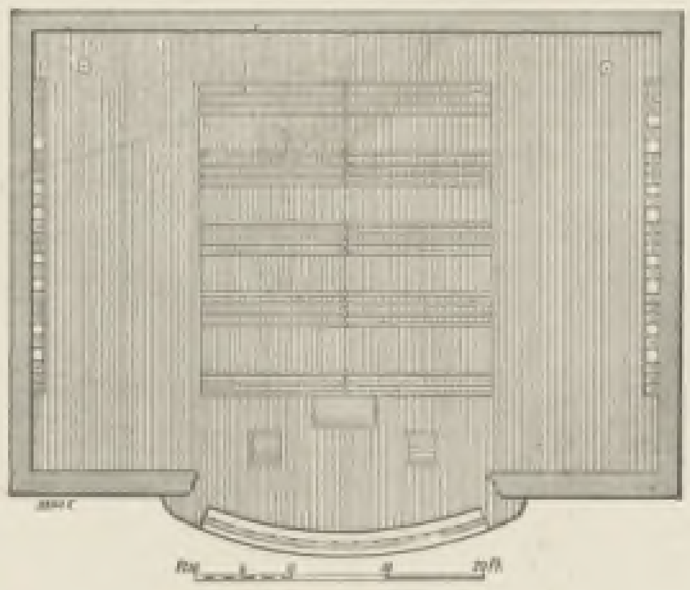
This leads me to the consideration of the next division known as the 'flies,' which come between the 'gridiron' and the level of the stage. The 'flies' comprise galleries on both sides of the stage, running from the proscenium wall to the back wall. In the wood stage the 'fly-rail' consists of a framed girder made specially strong to take the weight and pull of the ropes from the 'scenes' which are brought down from the 'gridiron.' Each 'cloth' hung from the 'gridiron' has four ropes, and these are all brought over blocks in the 'gridiron' floor down to the 'flies,' where they are made fast on 'cleats' fixed to the 'fly-rail.' The 'fly-floor' is supported by joists running from the 'fly-rail' girder into the side wall of the stage. On the 'fly-floor' are placed the 'windlasses,' used to raise the heavy weights suspended from the 'gridiron.' Where the load is very great it is relieved by counterweights placed against the wall. These are encased, so as to prevent their breaking loose and falling on to the stage below. In the ordinary theatre the 'fly galleries' are, as a rule, only two in number, one on each side; but in larger theatres, where the work cannot all be done in one level of 'fly galleries,' there are two, and sometimes even three or more tiers of 'fly galleries,' one above the other. Nearly all the work of the 'flies' is generally done on one side of the stage, that is to say, the ropes from the 'gridiron' are all brought on to the 'fly-rail' at the 'prompt side.' Therefore, the 'fly galleries' on the side where the ropes are made fast are known as the 'working flies.'

The 'flies' are connected by a 'bridge' against the back wall of the stage, and sometimes there are intermediate narrow 'bridges' in among the scenery, suspended from the 'gridiron.' These are better known as the 'flying bridges,' more especially used when the 'fly galleries' on both sides are employed as 'working flies,' so as to enable the flyman to cross the stage quickly without having to descend to the stage level, and also to enable him to get at the top of the scenery. In provincial theatres, the 'bridge' against the back wall of the stage, which connects the 'flies,' is often used as a 'painting bridge,' from which the scene-painter works; but it is not a desirable adjunct to the stage, in consequence of a heating stove having to be employed for melting the size. There is also the usual danger arising from the scenic artists or their assistants smoking, which, however, should not exist in a well-managed theatre. It would here, perhaps, be well not to forget that the English painter does his work on 'cloths' which hang vertically, and which can be moved easily by means of ropes and pulleys when any particular part is to be brought within reach of the brush. Abroad, all scene-painting is done on a horizontal surface—preferably, the floor of an extensive paint-room—the scene-painter walking over his 'cloth' to any particular section he may wish to deal with.

In the type of wood stage that I am describing, everything connected with the 'fly galleries' is constructed of wood, although the form naturally suggests iron construction for the more important parts as better for the work required. The same remarks apply to the 'gridiron.' Even the 'cleats,' on which are made fast the ropes bolted to the 'fly-rail,' are of hard wood, although iron 'cleats' would undoubtedly be far better, less clumsy and stronger. The two divisions, i.e. the 'gridiron' and the 'flies' together, are known as the 'top' or 'upper machinery.'

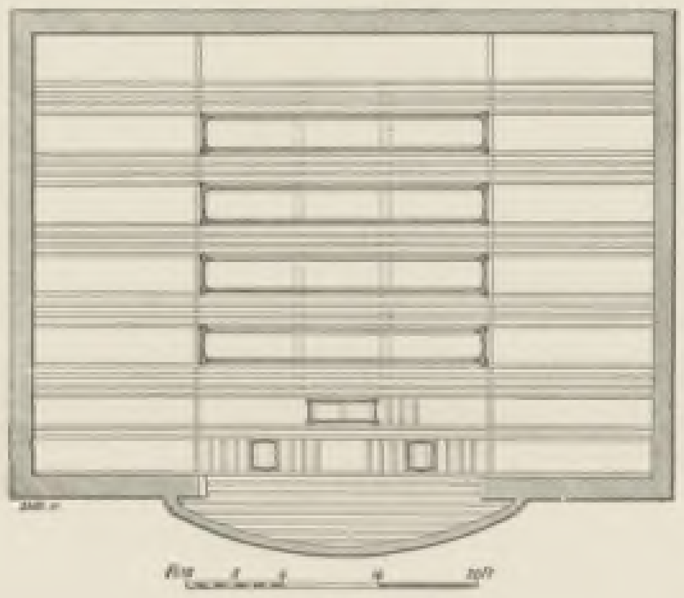
In some of our wood stages, so-called 'grooves' are suspended from the under side of the 'fly gallery' floors. These 'grooves' are intended to serve as supports for the tops of the 'scenes' and 'wings,' and consist of wooden frames, grooved and hinged, so as to take up and down, along which the top of the 'scene' can slide, and be held as if in a fork. These 'grooves' are, however, I am glad to say, now considered out of date, as the 'wings' are generally arranged in a different way. They are, however, shown in my illustrations, because they are not yet quite obsolete. When 'grooves' are used, it would be well to note that the 'scenes' have to be set at right angles with the side walls, or parallel with the curtain line, enforcing a very stiff and unnatural effect in many of the stage pictures, and greatly hampering the scene-painter.

The next division is that of the stage floor itself, the most important of all the levels. All our stage floors, with one exception, are laid to the same 'rake,' namely, with a fall of ½ inch to every foot from back to front, and it is strange how accustomed actors and dancers become to this sloping floor, and how 'all at sea' they are if, by any chance, they have to perform upon a level platform. The slope of the stage is, I should add, by no means a necessity, for horizontal stages have been introduced in other countries, and recently by Herbert Beerbohm Tree in 'Her Majesty's' Theatre, London. It is only a question of arranging the 'sighting lines' of the auditorium to enable the occupants of the area to see the actor as he retires 'up' the stage. As regards the planning of the divisions in a stage floor, it should be remembered that there are so-called 'imaginary' divisions used in stage directions, and 'actual' divisions for working the scenes.



ENGLISH WOOD STAGE.
FIG. 8. PLAN OF STAGE FLOOR.

In respect to the 'imaginary' divisions, the two extreme sides of the stage are known as the 'prompt side' (P.) and the 'opposite prompt side' (O.P.). The 'prompt side,' usually the left-hand side facing the audience, is 'the working side,' but this is not a fixed rule, and is governed by the relative position of the dressing-rooms and offices. Here, the stage manager and the call-boy stand. The speaking tubes, light-plates, etc., are also placed on this side. Next come the 'prompt centre' and 'O.P. centre,' while the middle of the stage is technically known as the 'centre.' The spaces at the side of the stage under the 'fly galleries' are called the 'wings,' which term, however, is more particularly associated with the 'side scenes' proper. Any one retiring from the audience is said to go 'up' the stage, while those advancing towards the proscenium come 'down' the stage. The imaginary divisions, which are parallel with the curtain line, are known as 'entrances,' and are numbered 'first entrance,' 'second entrance,' and so on. There are 'P.' and 'O.P.' first, second and third 'entrances' respectively.



ENGLISH WOOD STAGE.
FIG. 9. PLAN OF 'MEZZANINE.'

The actual and structural divisions can be better understood by reference to the plans (Figs. 8 and 9), and it must be remembered that these particulars refer to the English wood stage in its simplest form, where the number of 'traps,' etc., are only those found in any ordinary provincial theatre.

In the front and 'centre' of the stage is a 'trap,' known as the 'grave trap,' on account of its use in the grave scene in *Hamlet*. It will be noticed from the details of this 'trap' that the floor of the stage is made to open in two parts, and to slide in grooves in the joists under the stage floor. The 'trap' itself is a small wooden platform framed together, and made to rise up and down in grooves between four corner posts. The 'trap' and any 'load' put upon it is made to rise and fall with ease by means of the counterweights which are attached to ropes running over pulleys, and connected with it, as indicated in the illustrations.

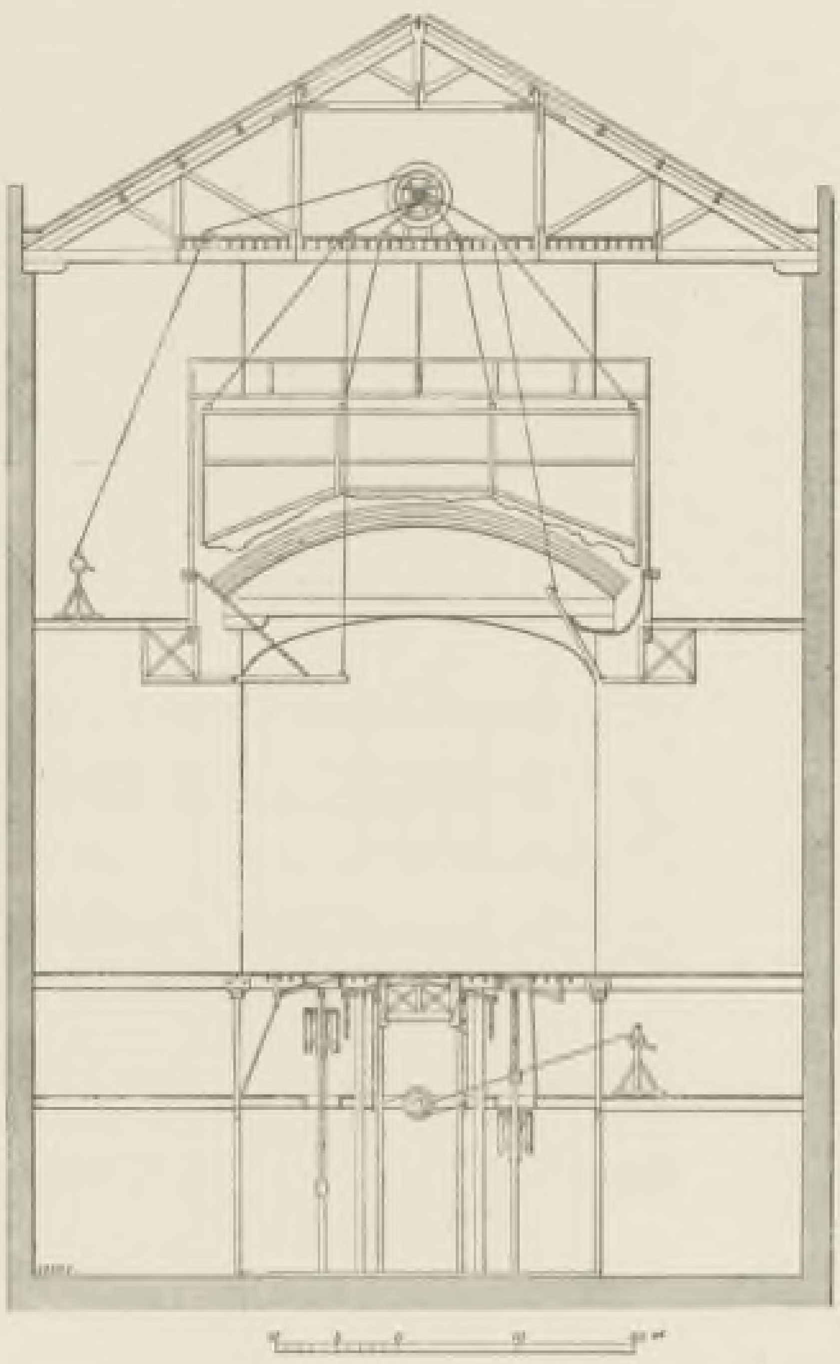
The two 'traps' at the side of the 'grave trap,' which are shown upon the plans in the front part of the stage, are known as the 'corner traps,' on account of their position (Fig. 9). They are the most used of any 'traps' in pantomime, and in stage gymnastics and acrobatic performances. These are the 'traps' through which the demon is shot high into the air on one side, and through which he disappears on the other. They are square on plan and, like the 'grave traps,' worked by counterweights, but they travel between two uprights instead of four. As in the case of the 'grave traps,' the floor of the stage has to be removed for the 'corner traps,' and this is done by releasing a lever and letting the floor drop into a groove and slide under the immovable parts of the side of the stage. In this manner an opening is left in the stage which is filled by the ascending 'trap' proper. The 'corner traps' are floored in on the stage level in various ways, differing from the solid floor of the stage. In many instances the frame is made octagonal, and the floor framed in eight triangles hinged at the base of the frame (Fig. 10). This form is used where the actor ascends and requires the stage floor to close of itself immediately. The effect is obtained by attaching strong india-rubber bands to the under side of each triangular section of the 'trap,' which, when used in this form, is often called a 'star trap.' Where it is desirable for a figure to rise through the stage without the hole or opening being seen, bristles are sometimes put over the floor;

FIG. 10.
PLAN OF 'STAR TRAP.'

these cling to the body and return to the level when the actor is clear of the 'trap.' A tight skin of india-rubber with a slit in it is also employed for the same purpose, but all these makeshifts are rather of the character of so-called 'stage tricks,' and should not, perhaps, be taken notice of in this work. Another form which these 'traps' take is that which is known as the 'vampire trap,' where the floor is in two parts and hinged to fall downward, so that the acrobat, taking a dive below the stage, opens the floor by the weight of his body, and the floor returns into position by means of strong springs. Other additional 'traps,' constructed on the same principles, are sometimes introduced where much 'trapwork' enters into the entertainment.

To return to the arrangement of the floor, the plan shows that behind the 'grave trap' there are three narrow slits or openings, technically known as 'sliders,' followed by a wider opening, termed the 'bridge.' As will be seen, these 'sliders' and 'bridges' are repeated until the whole floor space is used up.

The 'sliders' consist of narrow strips of flooring which are made to slide in two parts, to the right and left, under the side of the stage. They run in grooves cut in the joists, and are moved backwards and forwards by means of a rope which winds round a windlass. The length of each half of the 'slider' is half the width of the proscenium opening, and as each half has to pass under the stage to the 'prompt' or 'opposite prompt' side, it follows that the total width of the stage must be at least twice the width of the proscenium opening. This requirement was indicated when I spoke of the principal dimensions of the stage at the beginning of the chapter. When the 'slider' is *taken off*, the open space in the floor and the space underneath is known as the 'cut,' and it is in these 'cuts' that the scenery is placed when it is raised from below (Fig. 13). When the 'slider' is *on* (that is, when the stage floor is intact) it is held in position by a wooden lever. The construction of the 'slider' comprises a slab of narrow grooved and tongued boarding fixed to a backing or fillet of hard wood. By this means a certain flexibility is obtained. Where, in exceptional cases, the width of the stage is not twice the width of the 'slider,' the latter has to be specially made so as to roll up under the side stage when *taken off*. 'Scenes' are raised through the 'slider cuts' by means of 'sloats,' which consist of lengths of wood travelling up and down a groove, the 'scene' being attached. A more detailed description of the 'sloat' will be found elsewhere.



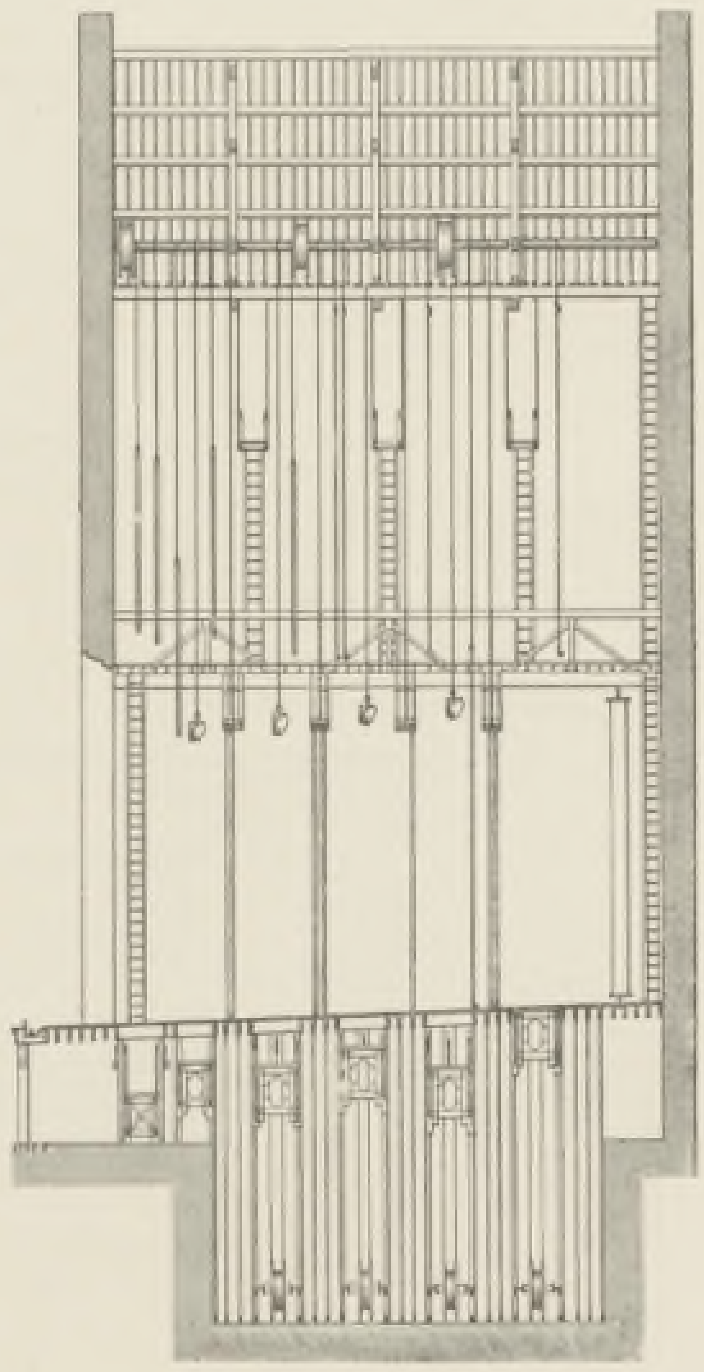
ENGLISH WOOD STAGE. FIG. 11. TRANSVERSE SECTION.

The floor of a 'bridge' is like the 'slider' floor in construction. The only difference is in the width of the opening left in the stage when it has been removed. To fill this broader space, a platform of the same dimensions as the opening is raised on similar lines to those adopted for the 'grave trap.' This platform, which is framed together of wood, slides up and down between four corner posts, and is raised and lowered by ropes on 'drums,' windlasses and pulleys, the weight being relieved by means of counterweights. The details in Fig. 14 show how the 'bridge' is constructed and worked. The use of the 'bridge' is to raise bodily any heavy 'scene,' furniture, or group of figures, but it only raises its load level with the stage, whilst some of the modern 'bridges,' which will be seen in subsequent illustrations of foreign stages, rise above the floor.

The whole construction of 'traps,' 'sliders' and 'bridges' in wood stages is of the most clumsy and primitive description, which is, perhaps, not so much the fault of the stage carpenter as the result of the materials employed. That is to say, the carpenter makes the best of his 'traps,' considering he is so bound by conventional usage and lack of enterprise in adopting other materials more suitable to the forms and requirements of stage machinery. It is, indeed, exceedingly strange, as I have already observed in my Introduction, how persistent the English stage carpenter is in adhering to these old forms, whilst rapid strides have been made in the construction of other parts of our playhouses during the past few decades.

The last division of the wood stage is known as the 'under machinery,' and I would first point out that the level immediately beneath the stage floor is known as the 'mezzanine.' This is the working level for all the 'traps,' 'sliders' and 'bridges,' and it is here that all the windlasses are placed for working the ropes to open and close the sliding portions of the stage, and which raise and lower the scenery and set the 'bridges' and 'traps' in motion. The 'mezzanine' takes exactly the same place in the manipulation of the stage machinery *below* the stage floor as the 'fly gallery' does *above*. Again, like the 'flies,' if the machinery is very heavy or complicated, the number of 'mezzanine' floors is increased, until we find in large opera houses three or four levels of 'mezzanine.' This is, of course, necessary where the number of ropes and windlasses is so great as to lumber up the floor space and make the working difficult. The lowest level of the stage, as already mentioned, is known as the 'cellar' or 'well.' The excavation for this need only be made immediately under that portion of the stage floor which is movable, for it is not necessary to open up the 'cellar' under the 'sides,' or under the front or back stage. The 'cellar' is used solely for lowering the 'scenes' into, and its depth, though preferably in accord with the height of the scenery used, varies owing to the structural difficulties already referred to.

From the 'cellar' spring the wooden uprights which support the joists of the stage floor. The spaces between these uprights, as before described, are called the 'cuts,' and it is in these spaces that the 'scenes' are placed. The uprights, and the joists which they support, can be made to lift bodily away, so as to give a larger opening in the stage floor for special spectacular purposes. When this is done the joists across the middle of the stage are laid into iron 'shoes,' as shown in Fig. 13. The want of some bracing together or connection between the uprights from back to front of the stage gives the latter a tendency to move forward. If, however, such a movement were allowed, there would be great danger of the 'cuts' becoming wider than the movable portions of the floor which are made to cover these openings, and there would be the risk of the floor falling in between the joists. To avoid movement in the old wood stage the uprights are fastened together from back to front on the hook-and-eye principle, with old-fashioned iron shutter-bars. I would here remark that since the authorities have insisted upon the stage being divided from the auditorium and orchestra by a solid brick wall, much greater rigidity has been given to the stage floor than under the old form of construction, when the proscenium wall was only a wooden partition.



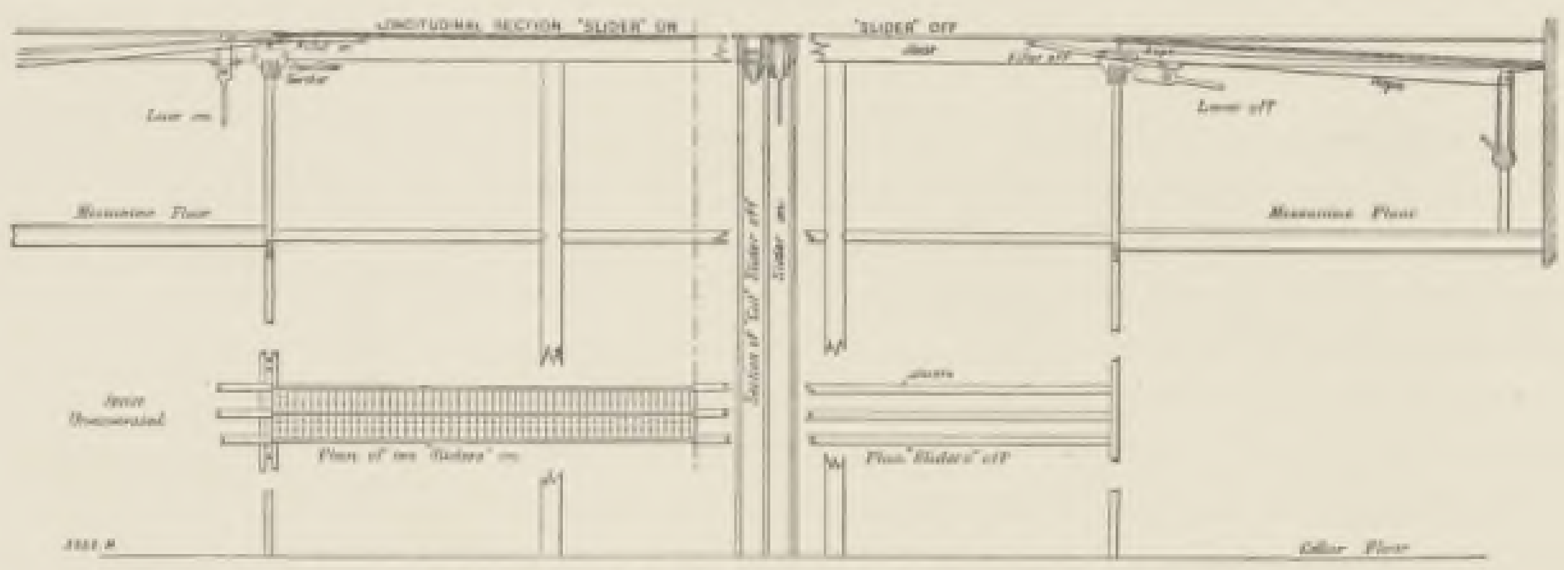
ENGLISH WOOD STAGE.
Fig. 12. Longitudinal Section.

At the bottom of the 'cellar' floor are placed the 'drums and shafts' used for lifting the 'bridges.' The rope passes from the 'bridge' on to the 'shaft,' which is made to revolve by another rope being taken off the 'drum' on to the windlass in the 'mezzanine,' in the same way as the 'drums and shafts' are employed on the 'gridiron' level for raising and lowering the 'cloths,' whilst they are actually worked from the 'flies.' All this work with 'drum and shaft' is most cumbersome, and the room taken up very considerable.

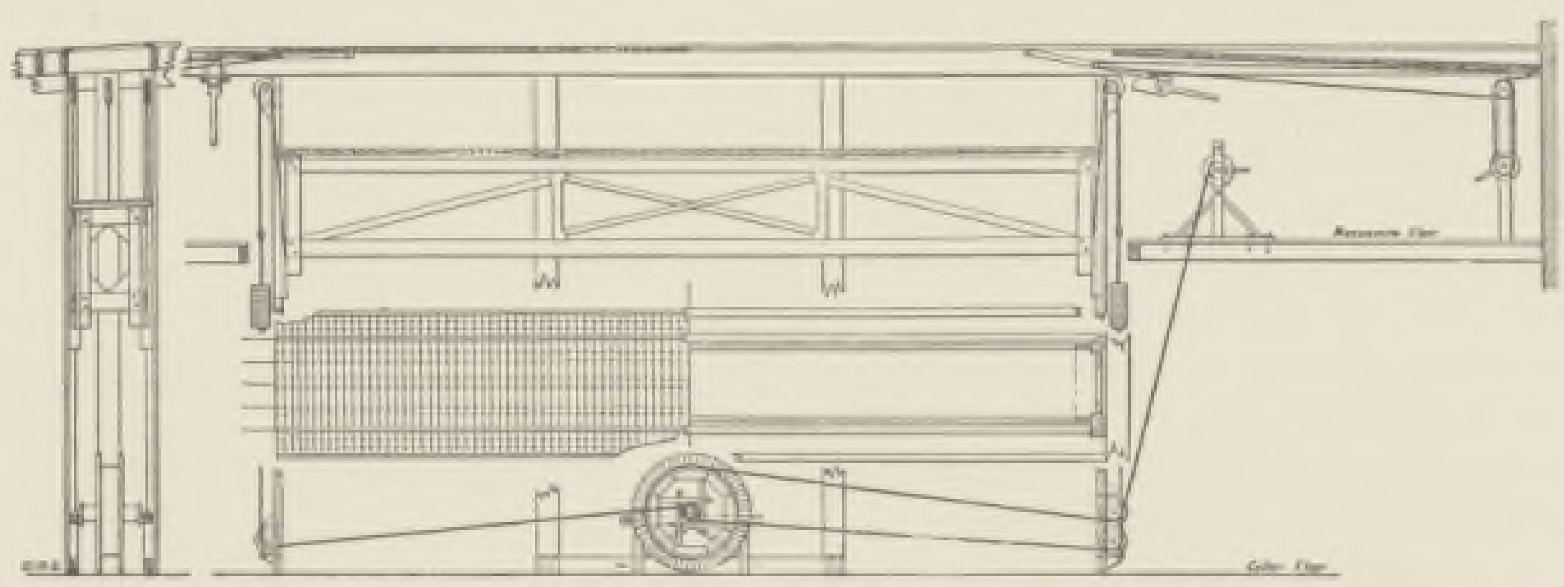
I have now described the principal divisions of the English wood stage, taking its different sections in turn from the 'gridiron' at the top to the 'cellar' at the bottom, and I have indicated the various pieces of scenery which are either 'hung' from the 'gridiron' or 'raised' from the 'cellar.'

There are many portions of scenery in addition to these which are fixed on to the stage floor itself, and are removed bodily to the sides or back, into 'wings,' 'scene drops,' or 'back stage,' without leaving the stage level. Firstly, there are the parts of the 'built-up scenes,' known as the 'flats.' These 'framed' or 'built-up scenes' are often most solidly put together, and are very heavy to move, comprising as they frequently do, mantels, fireplaces, doors, windows and even solidly built staircases. Besides the large slabs or 'flats' proper, 'box scenes' and 'heavy sets' are also used for the more cumbersome 'settings.' Further, there are the 'ground pieces,' small 'profile strips,' which are only 2 or 3 feet above the stage level, and represent rocks on a seashore, etc. Then there are the so-called 'rostrums,' which are built-up platforms, strong enough to carry the weight of a number of people. It would be easy to prolong this list, but it is not necessary here to dwell further upon the component parts of a 'built-up' scene. I would only remark that the way these 'built-up scenes' are put together is really too surprisingly primitive. The 'scenes,' 'profile pieces,' etc., are fixed to the stage by means of a wooden brace with a screw inserted at one end in the wooden framework of the 'flat,' and at the other end in the stage floor. By this means the 'scenes' are held upright, but the stage floor is being constantly pierced and worn with small holes, and looking as though it were worm-eaten. This is the method which has superseded the 'grooves' referred to as being more common to the older stage. Then, again, the heavy 'rostrums,' which are employed to obtain platforms at higher levels than the stage floor (because no part of the stage floor can be raised above its own level), are very cumbersome to move, and occupy a great deal of room. Lately, however, some of these appliances have been most cleverly put together, constructed in parts with folding trestles, and run on wheels; but then again the fitting together and taking apart wastes time and creates long 'waits' for the audience.

Prior to closing my remarks on the English wood stage, I should add that in order to obtain as much room as possible, and to increase the depth of space of the stage floor available for setting scenery, many theatres now have what is termed a 'back stage.' This space is usually of the width of the proscenium opening, and has no movable portions in its floor, no 'gridiron,' no 'flies' *above*, and no 'cellar' or 'mezzanine' *below*. It is practically only a piece taken out of the back portion of the building, and may have dressing-rooms on either side, and some other adjunct of the theatre above it. This floor space is most useful for distant 'scenes,' and when not actually used for 'setting' upon, affords space for manipulating portions of scenery as they are 'struck.' I should also not omit some reference to the method by which the wood stage is hidden from the view of the audience when *en déshabille*. The 'act-drop' is worked from the 'flies,' in the same way as the 'back-cloth' is worked over a windlass and round a 'drum' in the 'gridiron.' The so-called 'tumbler,' on which the canvas or baize is mounted to prevent draughts blowing it through the proscenium opening, adds to its weight. The curtain, which is drawn right and left and gathered in folds, is also worked from 'flies' over a 'drum' in the 'gridiron,' the arrangement of the ropes only being different, and their number sometimes greater to allow of the gathering being done neatly. The 'act-drop' is generally made a subject for decoration, green baize having almost become a thing of the past.



ENGLISH WOOD STAGE. FIG. 13. DETAILS OF 'SLIDERS.'



ENGLISH WOOD STAGE. FIG. 14. DETAILS OF 'BRIDGE.'

CONTINENTAL WOOD STAGES.

In this chapter I shall describe some examples of wood stages constructed on the Continent, although these must by no means be looked upon as types of Continental stage mechanism of to-day. They are examples of stages constructed some twenty or thirty years back, and hence still numerously represented, for there are as yet but few cases where such stages of that period have been entirely reconstructed in order to bring them up to date. They may have undergone various alterations, but they have not been wholly removed from the theatre to make room for others. This kind of bodily reconstruction has only been effected with stages of an earlier date, notably with those at the Berlin Opera House, the Berlin Court Playhouse, and the Hanover Opera House, where in each case, Fritz Brandt, of Berlin, who was entrusted with the improvements, completely demolished the wooden construction to make room for one of ironwork. The French and German examples illustrated here are shown exactly as they were carried out, all improvements or alterations of a date later than the opening of the theatre being carefully omitted. They will serve as a basis for the explanation of special foreign technical terms, as well as for comparison when the more advanced types are described; just as the English example dealt with will constantly serve for reference as to general technical terms and for purposes of comparison when I have to allude to the more elementary systems of stage construction.

It will be seen at a glance that the lines of a Continental stage vary materially from the lines of our English example, and further, that the theatre stage of the Latin countries differs from that of the Teutonic countries. To simplify matters I shall speak of French and German stages, though from the very outset I am showing a stage of Brussels as an example of French construction, and a stage built at Vienna as an example of German work. To avoid complication I must limit myself to dividing my stages into English, French and German examples, remarking that, in the same way as there are slight variations between stages built in Germany and Austria, known simply as German examples, so there are differences of but little importance in the stages built in Italy, France and Belgium, which will be known merely as French examples. As regards other countries, I find that Scandinavia adopts the German stage, and Russia and Spain, with few exceptions, the French stage. Switzerland has German or French stages, according to the language spoken in the locality, Zürich having a German stage, and Geneva a French stage.

The French type of the wood stage is here illustrated by a longitudinal section of the 'Eden' Variety Theatre at Paris (Fig. 22), together with the plans and a transverse and a longitudinal section of the 'Flemish' Theatre at Brussels (Figs. 18 to 21); but to simplify my explanations I shall refer only to the latter.

In the Brussels example it will be at once noticed, from Fig. 21, that the openings which extend across the stage are of three different widths, and that, unlike the method adopted in the English example, the coverings to broader openings are not divided into two lengths only, but into several parts or sections. There are also no small fixed 'traps' in the front of the stage, like the English 'star trap' and 'grave trap,' as any single section of the larger coverings is made available for the purpose. The narrowest openings, which are continuous slits in the stage floor about 1 inch wide, are for what is technically known as 'chariots and poles,' a special feature in all foreign stage machinery.

Explained in brief, the 'chariot and pole' comprise a framework under the stage floor, with an upright or 'pole' passing through and above the floor. The 'chariot' travels upon wheels running on a line of rails, and by this means the 'pole' can be moved along the 'slit' from one side of the stage to the other. The adoption of this appliance has several advantages over the English 'brace,' which has been referred to in connection with the 'flats,' and which is fastened by a screw in the stage floor. A 'scene' can be fixed to the 'pole,' and can be easily moved, either on the stage, or on the 'mezzanine' level, by pushing the frame along the rails referred to. There are various kinds of 'chariots,' two of which are shown on the section of the Brussels stage (Fig. 18). Further reference is subsequently made to this very practical appliance.

The planning of the floor of the stage at the 'Flemish' Theatre will be seen to allow—if I may for the moment use the English terms—a 'chariot slit,' a 'bridge,' then a 'chariot slit' and a 'slider,' followed by another sequence of 'chariot slit,' 'bridge,' 'chariot slit,' 'slider,' and so on. A 'chariot slit' is placed on both sides of each 'slider' or 'bridge,' and the 'sliders' and 'bridges' alternate. On the English stage, it will be remembered, there are three 'sliders' to every 'bridge.'

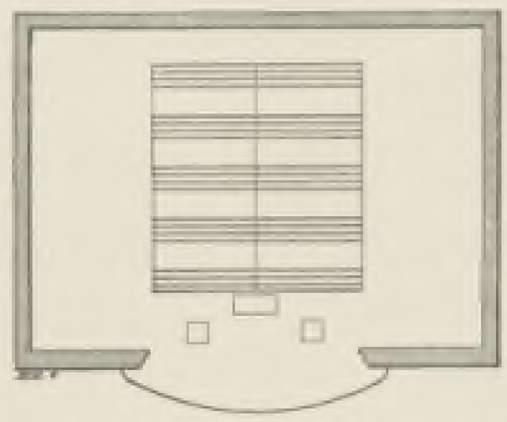


Fig. 15.
Sketch Plan of English Wood Stage.

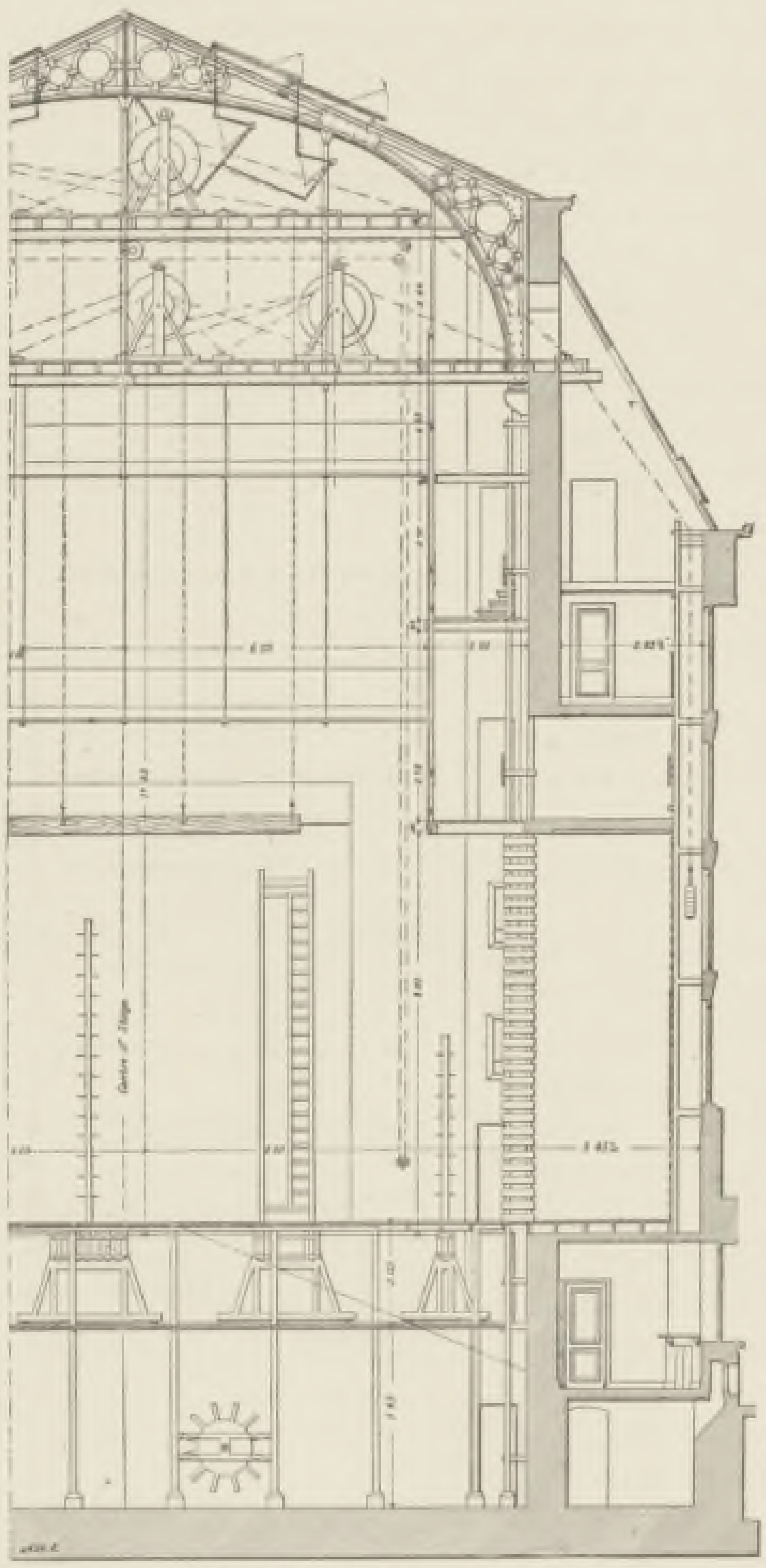
Fig. 16.
Sketch Plan of German Wood Stage.

Fig. 17.
Sketch Plan of French Wood Stage.

TYPES OF STAGE FLOORS.

The type of the German wood stage is here illustrated by the drawings of the stage machinery at the Vienna Opera House and the Dresden Court Opera House. If a comparison be made between these and the English type (Fig. 15) essential differences in the stage floor will be noticed. In the German type (Fig. 16) it will be seen that the number of 'cuts' for 'chariots' is greatly augmented, and that their location upon the plan is totally different from their position in the French type (Fig. 17), there being three 'chariot slits,' followed by a 'bridge,' and a 'slider,' then again a sequence of three 'chariot slits,' a 'bridge' and a 'slider,' this arrangement of 'bridges' and 'sliders,' with some slight variations in the number of 'chariot slits,' continuing *up* the 'back' of the stage.

Before entering into a more detailed description of the French and German wood stages, it may be as well to point out that there are other differences in general design besides those in the planning of the stage level. For instance, it will be seen in the sections of the Brussels stage (Figs. 18 and 19) that there are two 'gridiron' floors, three sets of 'fly galleries,' and one 'mezzanine' level, while in the Dresden theatre there is but one 'gridiron' floor, with five 'fly galleries' and two 'mezzanine' floors; in the Vienna Opera House there is one 'gridiron' floor, with four 'fly galleries' and three 'mezzanine' levels. It will be remembered that the English type has only one 'gridiron,' one 'fly gallery' and one 'mezzanine,' unless under exceptional circumstances. It is also a characteristic of the French stage that ample room is left at the sides, so that the 'scenes' can be quickly run off into the side docks. In Germany, Austria and England a 'back stage' is more frequently used for this purpose. In comparing the examples I would observe that the Vienna Opera House, as well as the Dresden theatre, represents the larger German stages. The one was completed in 1868 and the other is quite twenty years old. The Brussels 'Théâtre Flamand,' on the other hand, is a small theatre compared with either of the German examples, and was completed about ten years back. The Eden Theatre, which may be considered to be above the average size, was installed about fourteen years ago. I should, perhaps, add that in each instance iron has already been used to some extent in the construction of the roof, and also slightly in the 'gridiron' and the 'fly gallery' supports; otherwise (as in the English example) wood only has been employed.



'FLEMISH' THEATRE, BRUSSELS: STAGE

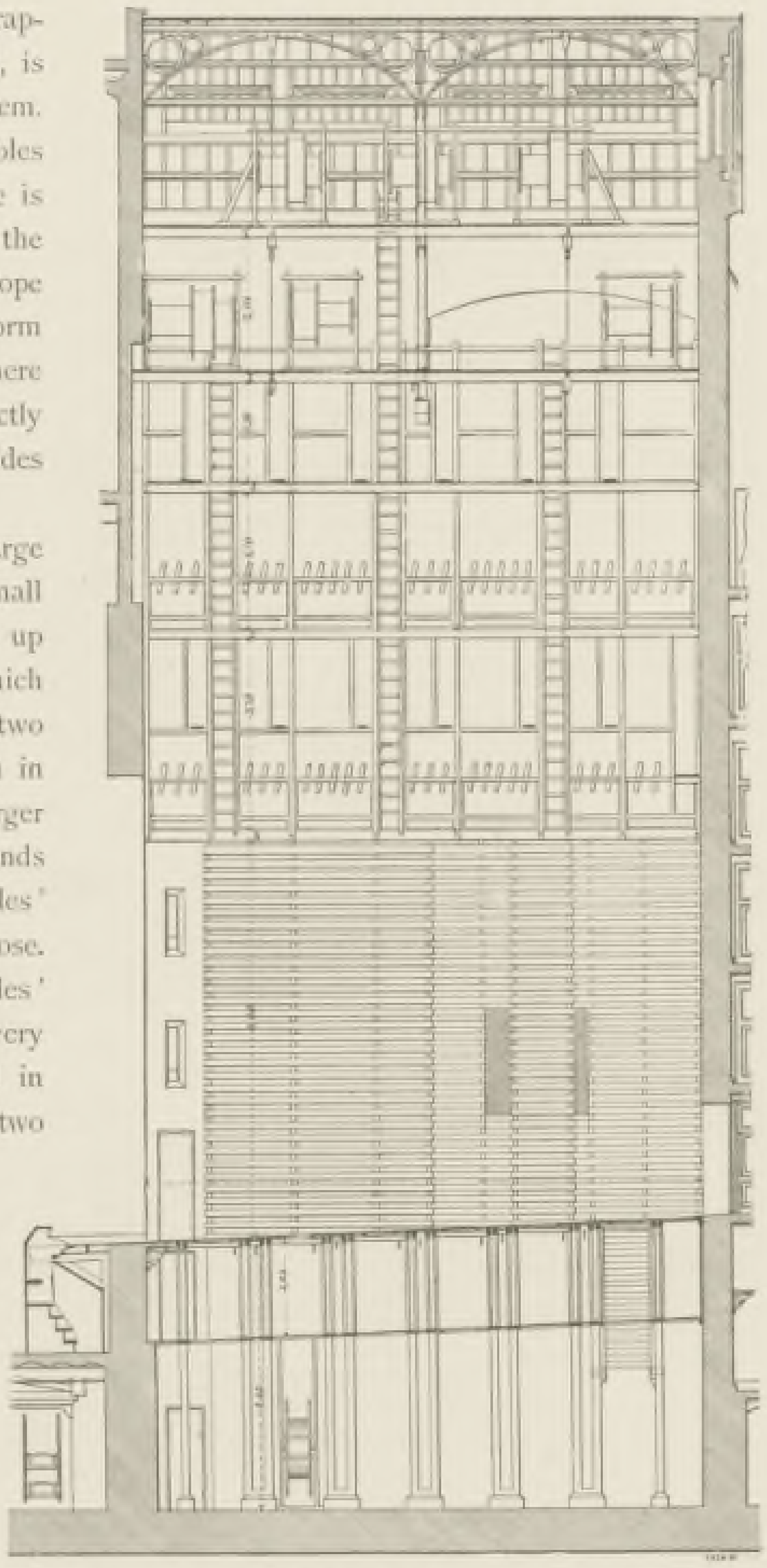
FIG. 18. TRANSVERSE SECTION.

The stage floor is undoubtedly the most important part of the structure, and its divisions govern the position of the machinery above and below, and upon the number of 'cuts' in the stage depends the space which is available for the scenery to be raised and lowered, and the space left for the actors. In all countries the first principle for setting scenery on the old wood stage is a series of side 'scenes' or 'wings' with a 'back-cloth,' and, however complicated a scene may become, it is always built up upon this initial idea. Whatever differences may exist in the floor plan, the first principle of scenery setting is based upon this one idea, which is obviously the simplest, though also the least effective way of filling the proscenium opening. The model on which the scenic artist works is set up on these lines, and the stage manager's plan of changes in the scenery all show the same method.

In the French example, the stage floor will be seen to be easily movable. I have already explained the system of the French floor plan, but will now add that the technical expressions for the three different kinds of opening are the 'rue,' the 'trappillon,' and the 'costière.' The 'rue,' which is equivalent to the English 'bridge cut,' is used for large pieces of scenery; the 'trappillon' is the same as our 'slider cut.' The 'costière' is for the 'chariot and pole.' I have said that the typical French floor generally shows two 'costières' separating a 'trappillon,' after which there comes the 'rue'; but I also know of several instances where the sequence is 'costière,' 'trappillon,' 'costière,' 'trappillon,' 'rue,' i.e. an extra 'slider cut' and 'chariot slit' have been added. The width of the 'costière' in the Brussels example is about 1½ inches (0.04 metre), of the 'trappillon,' 18 inches (0·45 metre), and of the 'rue,' 51 inches (1·30 metre). These dimensions vary but slightly in the French theatres, excepting only in the Paris Opera House, where the widths have been considerably diminished. The French plan of the stage floor is said to have been adopted with a view to multiply the 'cuts,' thus giving the scenic artist greater liberty in designing.

The floor of the 'rue' is constructed in such a manner that it separates in the middle, going to the right and left under the side floor of the stage, and these movable floors are called 'tiroirs,' or 'sliders'; but the French appliance, as I have already pointed out, is made in sections, which can be attached or detached, whereas the English 'slider' is in one length. The 'trappillon' opens in a similar manner. The floor of the stage at the sides, though intended to be immovable, as in the English example, is so constructed that it can be lifted up in sections, or in 'slabs,' the 'slabs' being placed in line with the 'sliders,' but having some little extra width so as to rest *on* the joists.

Like the English stage, the French example, with its many openings, is difficult to construct with sufficient rigidity to withstand either the weight brought to bear upon it, unequal loading, or the rhythmical movement of a *corps de ballet*. The supports are placed under the joists on each side of the 'costière,' as shown in the sections of the Brussels theatre. The 'chariots' run between these supports upon rails fixed to the flooring, which is laid across the stage on the 'mezzanine' level, the rails being exactly under the 'costière.' The uprights supporting the stage floor are placed in the basement upon a concrete floor, and are braced together at the 'mezzanine' level, and they are also connected at the stage floor level by the floor joists I have just mentioned. These extend across the stage from side to side, and are built into the walls. The posts or uprights in the 'cellar' are tenoned at the top into the joists. The posts of the 'mezzanine' are fixed in the same way, the tenons of the posts below and the mortise passing right through the joists. The floor under the 'rue' and 'trappillon,' which is practically an open floor on the 'mezzanine' level, is supported by the small cross-joists, with iron hooks underneath them. These are let into an eye and strap fixed to the uprights. This enables the whole of the floor to be raised when the full depth of the stage is required to the 'cellar' level. The cross-joists and hooks keep the whole of the stage from a tendency to move forward, which the slope of the floor towards the footlights naturally increases, and they form what I will term a chain from back to front of the stage. Where there is a second or third 'mezzanine' these are constructed on exactly the same principle, except that the rail on which the 'chariot' glides on the first level is not required.



'FLEMISH' THEATRE, BRUSSELS: STAGE.
FIG. 19. LONGITUDINAL SECTION.

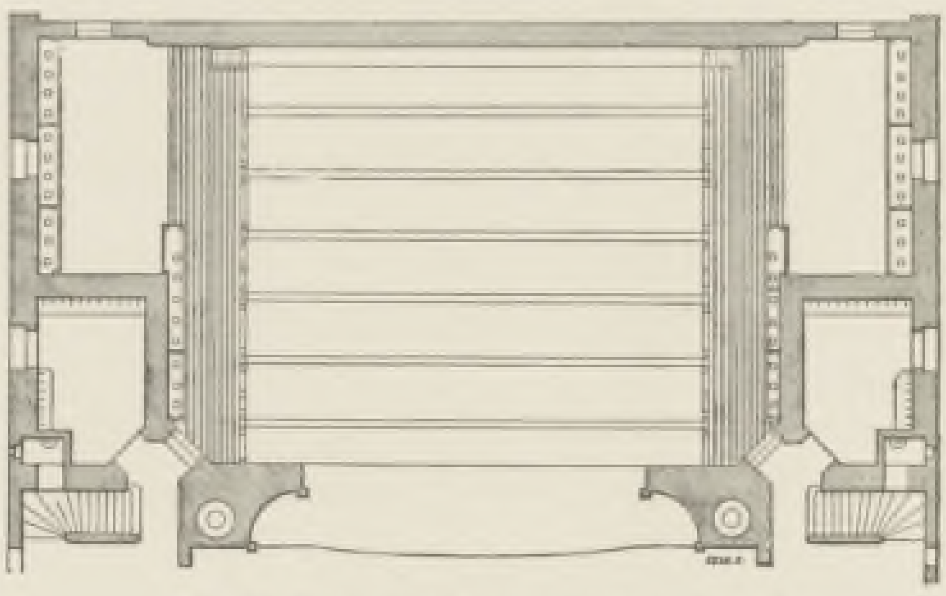
Referring to the 'chariot' of the French stage, we find large and small 'chariots.' The latter are used when a tree or some small portion of scenery has to be supported, whilst the large ones hold up the 'wings.' The 'pole' which the 'chariot' supports, and upon which the 'scene' is fixed, varies in height. The larger 'chariot' supports two 'poles,' the smaller, only one. Both kinds of 'chariots' are shown in the section of the Brussels theatre, and it will be seen that the larger one is here made in the form of a ladder, to enable the stage hands to manipulate the canvasses with greater facility. The small 'poles' generally have stepping-pieces let into the sides for the same purpose. A heavy load of scenery or the weight of a man may give the 'poles' a tendency to go out of the 'plumb.' They have, therefore, to be very firmly fixed in iron shoes at their base, and they are also held in the 'chariot' by iron straps. The 'chariot' itself is composed of two vertical pieces of wood framed on to a wooden base which holds the wheels, iron tie-rods being carried from the uprights to the base to stiffen the construction. The 'pole' drops into the space between the two uprights, which are held together by the iron straps, the 'pole' resting upon an iron shoe. In the large 'chariot' the two sets of uprights are held together by an iron rod. When several 'chariots' have to be used to support one 'scene,' they can be coupled together by connecting irons fitted into eyes on the sides of the 'chariots.' The rapidity and frequency of the movements of the 'scenes' require absolute solidity.

There are two large and one small 'chariot' to each 'costière,' a large one to the 'cour,' and one to the 'jardin' side of the stage. Here I must point out that the terms 'cour' and 'jardin' are used to designate the sides of the stage in the same way as we speak of the 'prompt' and 'opposite prompt' side. The 'cour' is to the right of the spectator, and the 'jardin' to the left. The stage hands are called 'couriers' and 'jardiniers,' according to the side on which they work. This practice originated from the theatre at the Tuileries erected in the seventeenth century. This theatre, which was a large one and had very elaborate stage machinery, was situated between the court and the garden of the palace in the vicinity of the Rue de Rivoli. Thus these appellations of 'cour' and 'jardin' came into use. At one time the sides of the stage were known as King's side and Queen's side, but, for obvious reasons, these terms ceased to be used during the Reign of Terror. The terms 'court' and 'garden' side, however, survived, and are still applied.

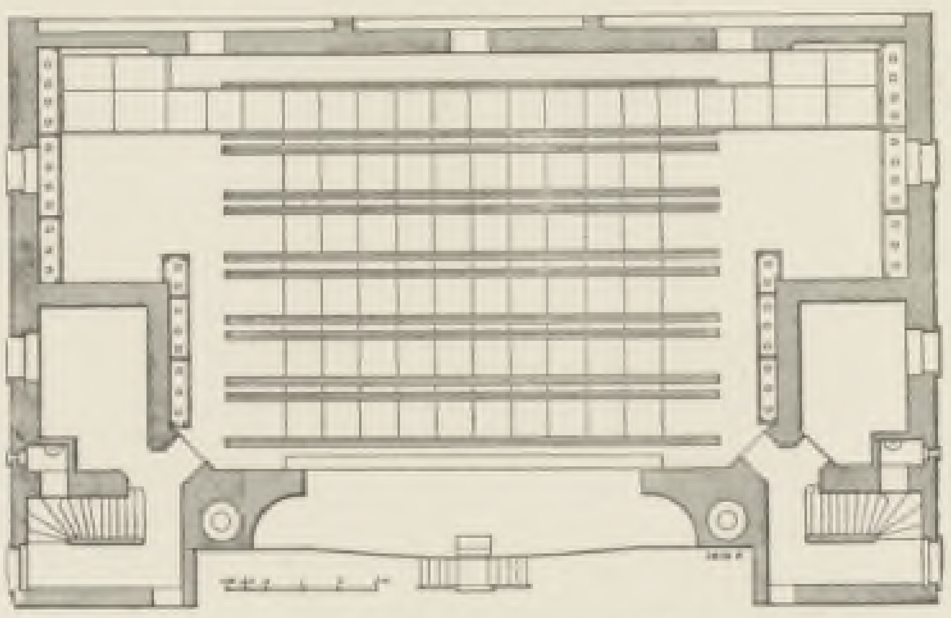
The necessity for a distinctive nomenclature of the two sides of a stage is as great as in the case of a ship, where the terms 'starboard' and 'port' are used.

The floor or cover of the 'rue' is formed, as I have said, of many sections, which are called 'trappes.' These can be connected at will, and made to slide under the stage along the joists in the same manner as the English 'bridge slider'; they thus make a void large or small in accordance with the size of the 'scene' to be raised from below. The 'trappillon' opens in like manner, but it extends further across the stage than the 'rue,' that is to say, is of greater length, the 'rue' being about 23 feet long, whereas the 'trappillon' is 33 feet. The parts of the floor which slide are worked in much the same way as the English 'slider,' being supported at one end by a lever worked off in a groove under the stage, the principal difference being that sections of the floor can be connected, as a train, by hooks, and it is not necessary to remove the whole 'slider' as in the English type. To open the void, the end of the 'slider' is connected to a continuous rope which is wound round a wooden roller with a loose end. It takes two men to work the ropes. The sections or 'trappes' of the French 'rue' are generally strengthened underneath by iron bands.

On referring again to the sections of the Brussels theatre, it will be seen that the whole of the 'scenes' which are suspended from above are worked from the 'flies' and the 'gridiron.' In this example there are three tiers of 'fly galleries' on each side, and two 'gridiron' floors extending over the area of the stage floor. Two tiers of 'bridges' run across the stage at intervals, partly hung from the 'gridiron' and partly resting upon the rails of the 'fly galleries' at their ends. These 'hanging bridges' are, as explained when describing the English type, for quick access from the 'flies' on one side to those on the other; but in the French example, perhaps, their object is more to allow the scene-shifter to reach the tops of the 'scenes,' to disentangle any ropes or undo any knots in the many cords which hang from the 'gridiron.' The lower tier of these 'hanging bridges' has to be placed at such a height that it cannot be seen by the spectators; the upper tier is generally six feet below the 'gridiron' floor to enable the scene-shifters to reach the 'gridiron' from below. The number of 'hanging bridges' is the same as the number of 'rues' on the stage floor, and their position is exactly over them.



'FLEMISH' THEATRE, BRUSSELS: STAGE.
FIG. 20. PLAN OF 'FLY GALLERIES.'

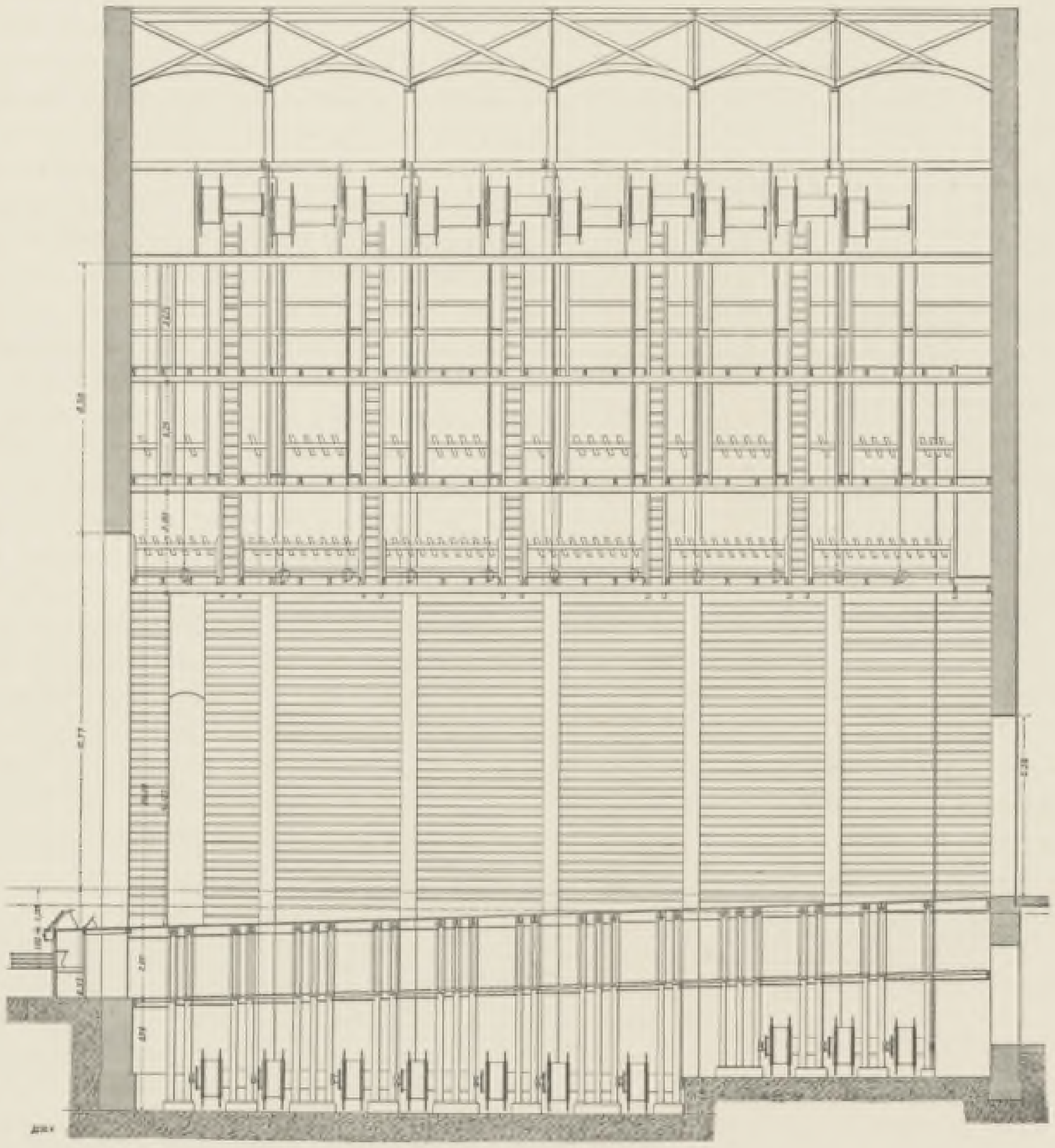


'FLEMISH' THEATRE, BRUSSELS: STAGE.
FIG. 21. PLAN OF STAGE FLOOR.

The whole of the top part of the stage, as in the English example, is suspended from the roof, the main girders of the 'fly galleries,' however, having some support on the front and back walls. The various tiers of the 'flies' are connected by a series of ladders which are carried up to the two 'gridiron' levels. These ladders not only serve as a means of access to the various levels above the stage, but become a part of the actual construction of the 'flies' themselves, being framed into the 'fly girders.' The whole of the 'flies,' 'gridiron,' 'hanging bridges,' etc., which are placed above the stage level, are known on the French stage as *les services du centre.* With regard to the particular uses of the various levels of the 'fly galleries,' it will be seen that on the first and second tier the rail is furnished with wooden 'cleats' for fastening the cords by which the scenery is suspended from the 'gridiron.' These 'flies' are used for pulling up and lowering the 'cloths,' or, in technical terms, serve as the 'working flies.' The greatest amount of labour connected with the 'upper machinery' takes place in the lowest 'fly gallery.'

The force employed to move the scenery in the French wood stage, as in the English example, is manual, assisted by counterweights. These counterweights vary but little. They are circular iron discs threaded upon an iron bar, with an eye at the end to which is fastened the rope attached to the scenery. The iron bar has a base in the form of a bulb, and upon this the number of weights are placed in accordance with the requirements of each case; each weight is made to drop into a socket in the other so as not to slide off. The counterweights, as seen in the drawings of the Brussels theatre, pass down the sides of the stage, and are encased in a framework to prevent them from falling and causing accidents.

The 'drum and shaft' enters largely into the working of the machinery in the French wood stage; in fact, the two tiers of 'gridirons' are almost entirely occupied by a series of 'drums and shafts,' which are worked on similar lines to those described in the English stage. The 'working' line is again wound up or down from the windlass in the 'flies,' and when the windlass is released, the counterweight descends, causing the shaft to revolve and the scenery to ascend, whilst, when the scenery has to be lowered, the windlass is worked, and the counterweights wound up. Sometimes a stage machinist prefers to arrange his counterweights to practically balance with his scenery, in which case the working of the windlass up and down requires but slight manual effort. Sometimes the counterweights are, however, arranged so as to be heavier than the object to be raised, and the rope is mounted upon the 'drum,' the working line being on the shaft as the only 'break.' When this working line is loosened, the counterweight descends and the 'scene' ascends. There is one row of three 'drums and shafts' in the top 'gridiron' of the Brussels Theatre, whilst the lower 'gridiron' has three rows of three 'drums and shafts' each. Of course in larger theatres these numbers are very much augmented. The number of ropes by which the 'scene' is hung depends principally upon its size, but however many ropes are employed, they are

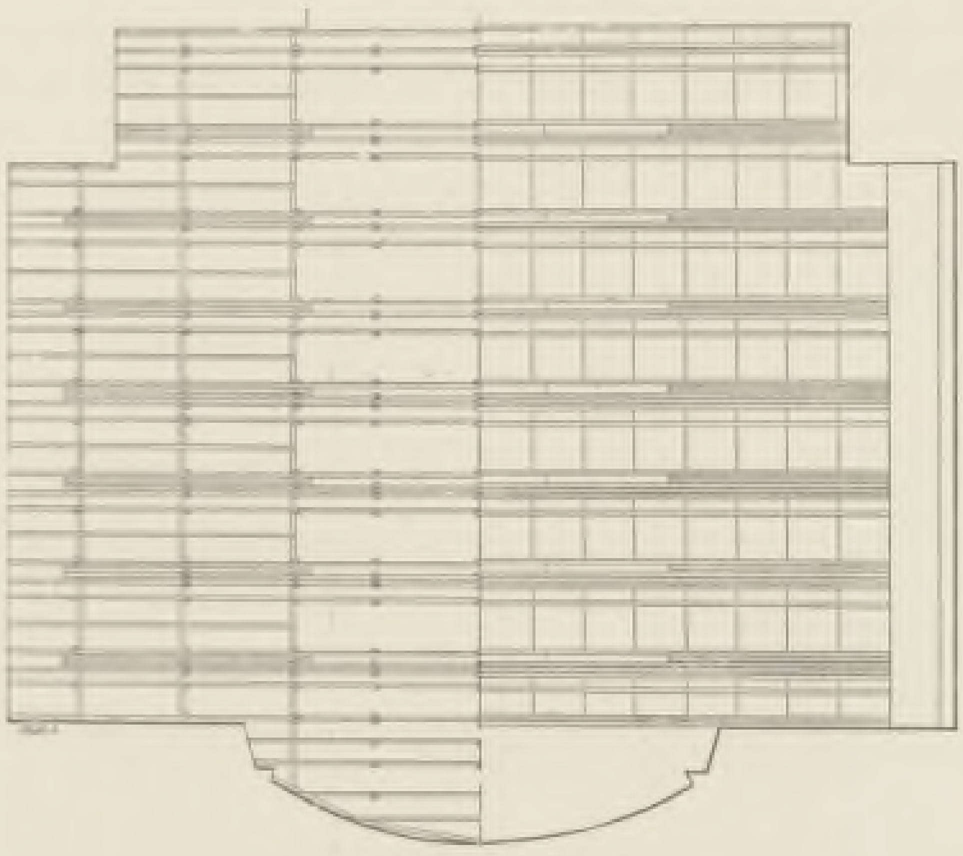


'EDEN' VARIETY THEATRE, PARIS: STAGE.
FIG. 28. LONGITUDINAL SECTION.

all brought on to the 'shaft,' and one 'working' line only is used and taken off the 'drum' to the windlass in the 'flies.' The 'sky border,' 'battens,' 'ceiling pieces,' etc., are all raised in the same manner.

To raise a 'scene' from the 'cellar' below an appliance is employed similar to that of the 'sloat' of the English wood stage. This appliance, termed the 'cassette,' is composed of two distinct parts, the 'cassette' proper and the 'âme.' The 'cassette' is hollow, and the void is fitted by the 'âme,' which can be worked up and down in the former. On to the 'âme' the scenery is fixed; a rope is then fastened to the bottom of the 'âme,' and passed over a wheel at the top of the 'cassette'; the rope is then taken down to a 'drum' placed in the 'cellar,' and has the 'working' line attached to a windlass in the 'flies.' When this rope is wound up the 'âme' is raised, sliding up the 'cassette,' and appearing through the stage with the scenery attached to the front. The opening through which the 'cassette' and 'âme' work is the 'trappillon.' Several of these appliances can be worked together over one 'drum.'

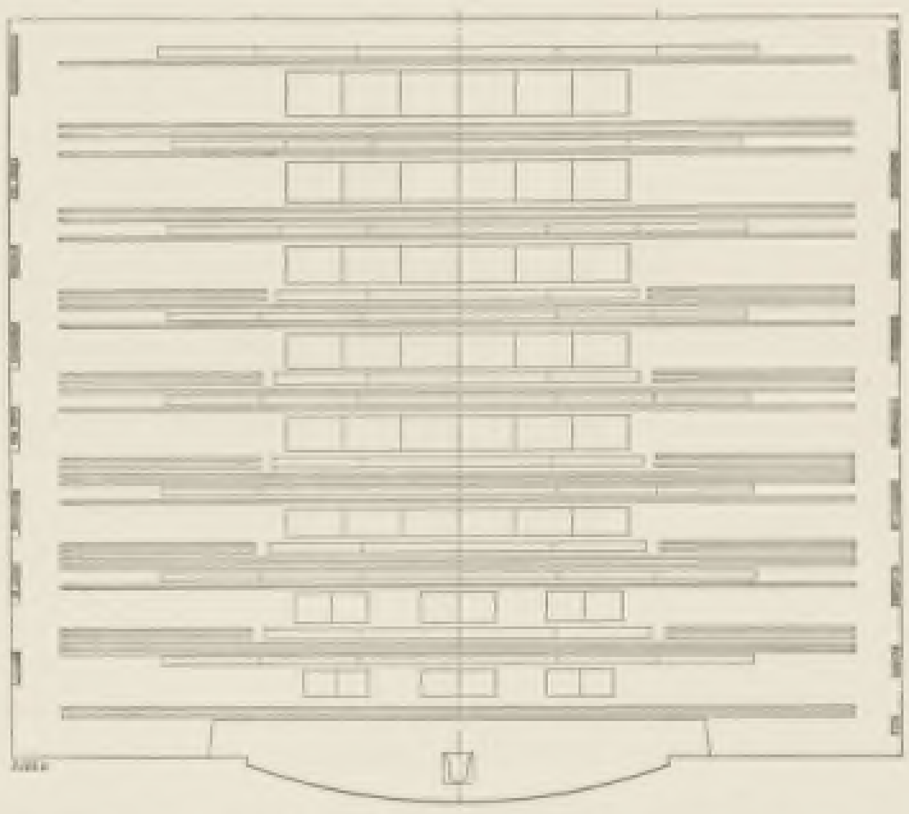
I have now to pass to the consideration of the details of the German type of wood stage, as illustrated by the drawings of the Court Opera Houses at Vienna (Figs. 24, 27 and 28) and the Court Opera House at Dresden (Figs. 23, 25 and 26). The German wood stage has its three distinct divisions, i.e. stage floor, 'upper machinery' and 'under machinery,' as in the case of the French and English examples, and the general arrangement of the scenery with 'wings,' 'back-cloth' and 'sky borders' is likewise similar. I have already pointed out that there are certain differences in the arrangement of the German wood stage floor plan, and that such differences primarily exist in the grouping of the 'traps.' The stage floor itself is called the 'Podium.' The widest of the three kinds of opening, called in English the 'bridge cut,' is known in the German examples as the 'Versenkung.' It is covered in by a series of 'slabs' made to slide under the side floor of the stage to right or left, and, like the French 'rue,' any number of these sections can be moved from any part of the length of the 'Versenkung,' and they can be shifted singly or in groups, sliding one beneath the other. There are no single 'traps' in the flooring of the typical German wood stage, like the 'grave trap,' the 'star' and the 'vampire' traps in the English type, as any one of the sections of the 'Versenkung' can be easily made to answer these purposes. There are, however, certain variations from this rule, as, for example, the Vienna stage, illustrated in Fig. 24, and where two rows of 'grave traps' take the place of 'bridge cuts,' making together six 'grave traps.' These six 'traps' in the Vienna Opera House have simple 'slabs' raised by windlasses, which are on the 'cellar' level, and are shown in detail on the transverse section (Fig. 27).



COURT OPERA HOUSE, DRESDEN: STAGE.
FIG. 23. PLAN OF STAGE FLOOR AND JOISTS.

The openings which take the place of the English 'sliders' are called the 'Kasettenklappen' on the German stage, and these, unlike those of the English and French examples, are not provided with a sliding floor, but with hinged flaps opening from the stage downwards, the hinge being towards the audience. The width of this 'cut' is generally from 1 foot to 1 foot 3 inches (30 to 40 centimetres). The 'Kasettenklappen' are not only used for raising framed 'flats' from below, as in the case of the 'slider' openings in England, but are also often required for 'back-cloths,' which are taken off their rollers and placed in the 'mezzanine.' It would be well specially to point out that the 'Versenkung' and 'Kasettenklappen' of each sequence are not divided by a 'chariot slit,' the two larger openings together forming what is known as a 'Kulissengasse,' and being so placed as to occupy the space between every two groups of wings.

Below the 'Versenkung,' as in the English stage, there is the usual framed 'bridge,' with a table top, 'Versenkungstisch,' and, as will be seen from both the examples of the German wood stage given in this chapter, this appliance is again worked by means of a windlass in the 'mezzanine,' the ropes passing over a 'drum and shaft' in the 'cellar.' The windlass is again worked by manual power, the weight of the load to be raised, however, generally being equalised by counterweights. The width of the 'Versenkungstisch' or 'bridge' is usually about 3 feet, but in the Vienna example it will be seen that those at the back of the stage are wider than those in front.

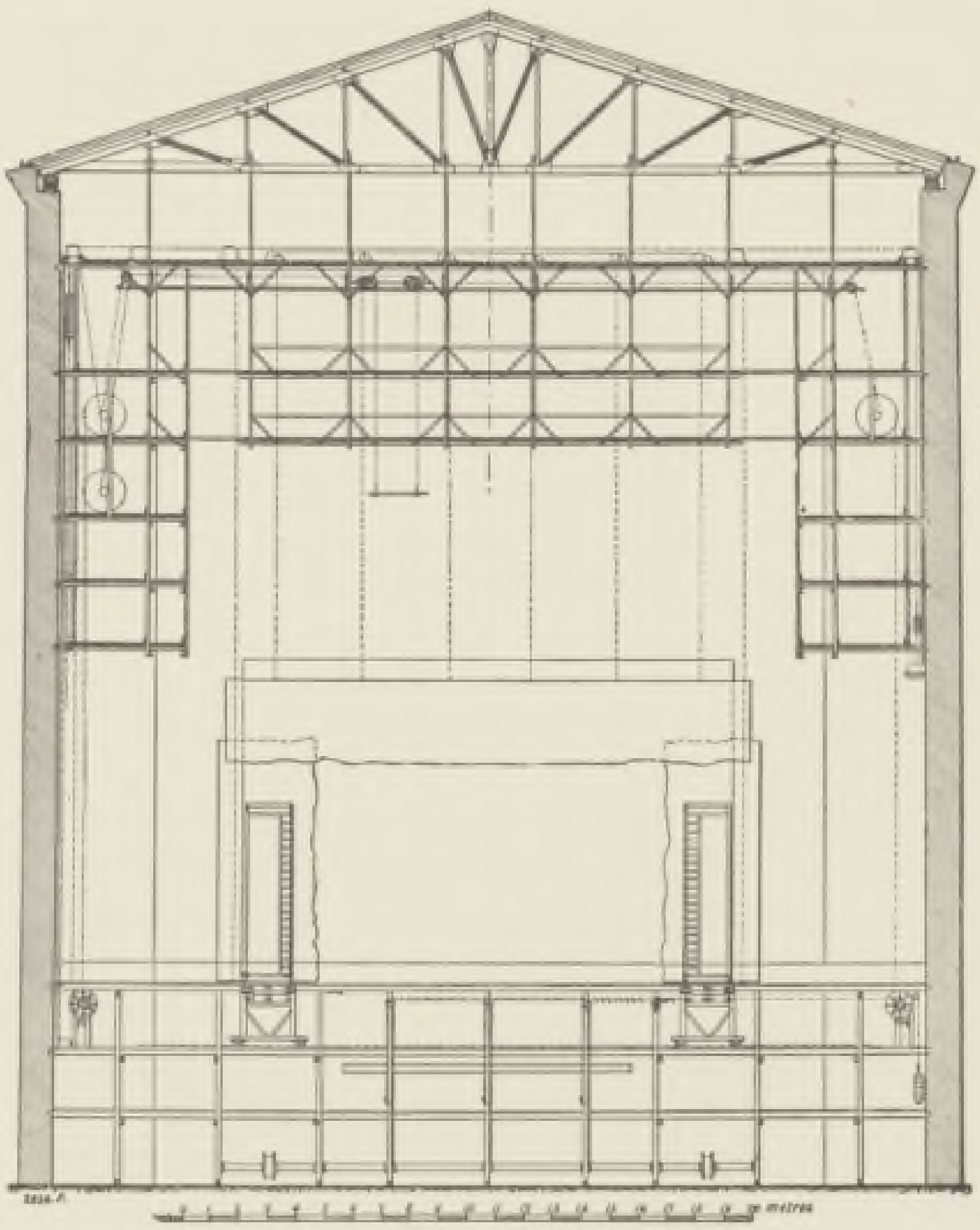


COURT OPERA HOUSE, VIENNA: STAGE.
FIG. 24. PLAN OF STAGE FLOOR.

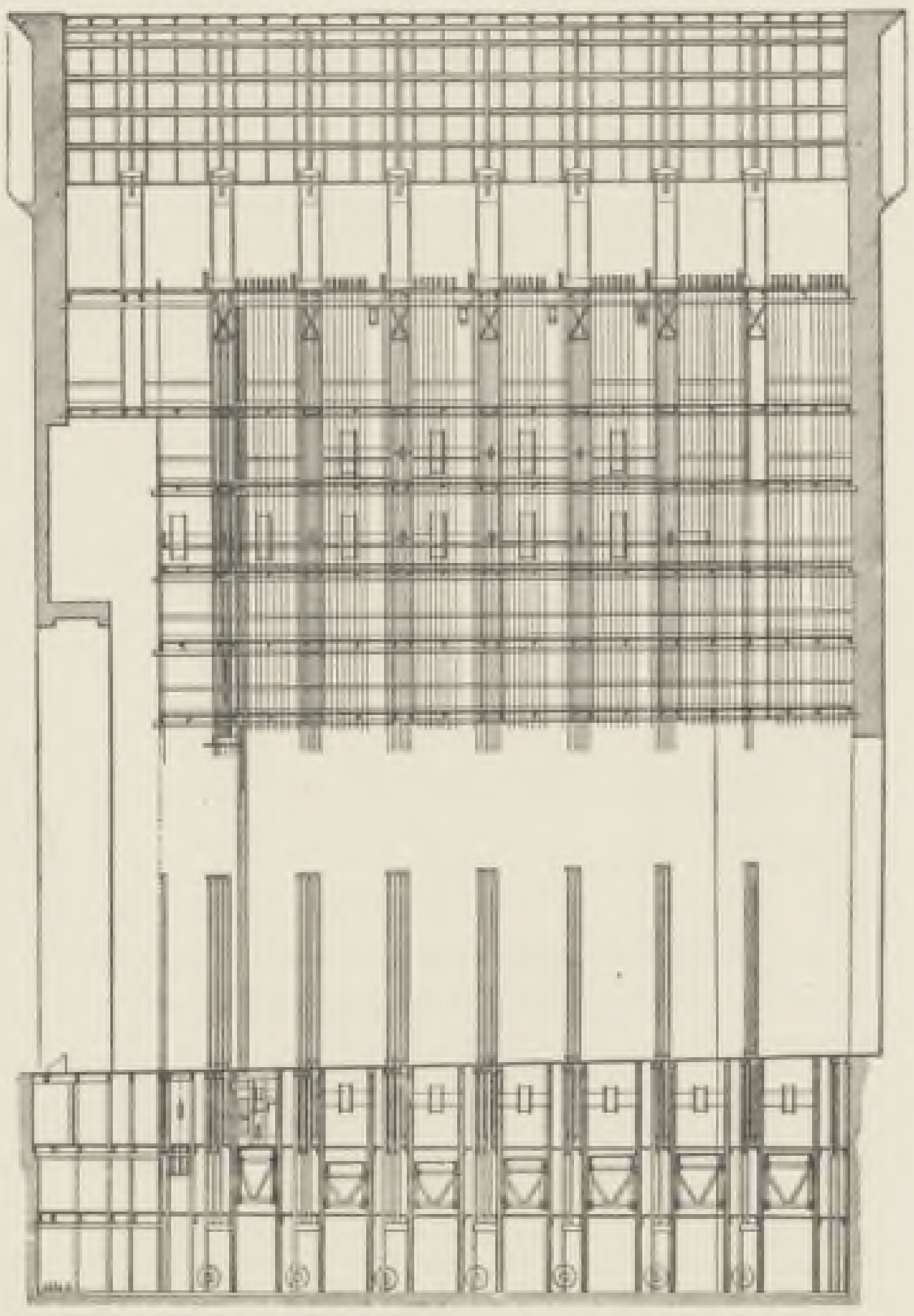
On each side of a 'Kulissengasse' or entrance, we find in the plans of the Vienna and Dresden examples that there are groups of 'side scenes' or 'wings' on a line with the 'slits,' which run either partly or entirely across the stage. These 'slits' fulfil the same purposes as the French 'costière,' and are merely narrow 'cuts' for the passage of the 'chariot and pole.' These 'cuts' in the older examples of German wood stages are only taken partly across the stage, the 'chariots' merely being used for the support of the 'wings' on either side; subsequently, however, the 'cut' was extended to allow the 'chariot and pole' to support independent pieces of scenery, such as a tree, placed in the centre or in any other position on the stage, and the 'cut' then took the name of 'Freifahrt,' literally, free passage. A combination of the two kinds of 'cuts' is frequently to be found. When the opening required for the 'Freifahrt' is not in use, it is closed by a wooden lath, making the stage floor continuous. In Germany this piece of wood is called a 'Holzfeder.'

The 'wings' or 'side scenes,' as in the English and French wood stages, are of framework and canvas, painted and cut out so to mask-in the ends of the 'back-cloth' as well as the various 'entrances.' These 'wings' are run on the lines of the 'Freifahrten,' being attached to the 'pole and chariot' as in the French examples. The 'wings' are arranged in groups or sets of two, three, or more, to facilitate a rapid change, one set being pushed forward whilst the other is pulled out of sight, or *vice versâ*, as the case may be. Each group of 'wings' is known as a 'Kulissensatz.' The distance between the edges of opposite 'wings' has also very wisely been given a technical name—i. e. 'Kulissenstand.' This distance varies in accordance with the size of the stage, and in all cases decreases between each group of 'wings' as they recede 'up' the stage—that is to say, the distance between the front pair of 'wings' is considerably more than between those which are next to the 'back-cloth.'

The 'chariot and pole' of the German wood stage differs only slightly, if at all, from the French example. The 'chariot' is called the 'Kulissenwagen,' or 'wing-carriage,' and the 'pole' the 'Kulissenleiter,' or 'wing-ladder.' Where a ladder is not required to support a 'wing,' it can be removed, and a 'pole' can take its place to hold up any single piece of scenery which stands alone. This 'pole' goes by the name 'Kulissenbaum.' The 'chariots' run on rails, and are



COURT OPERA HOUSE, DRESDEN: STAGE.
FIG. 25. TRANSVERSE SECTION.

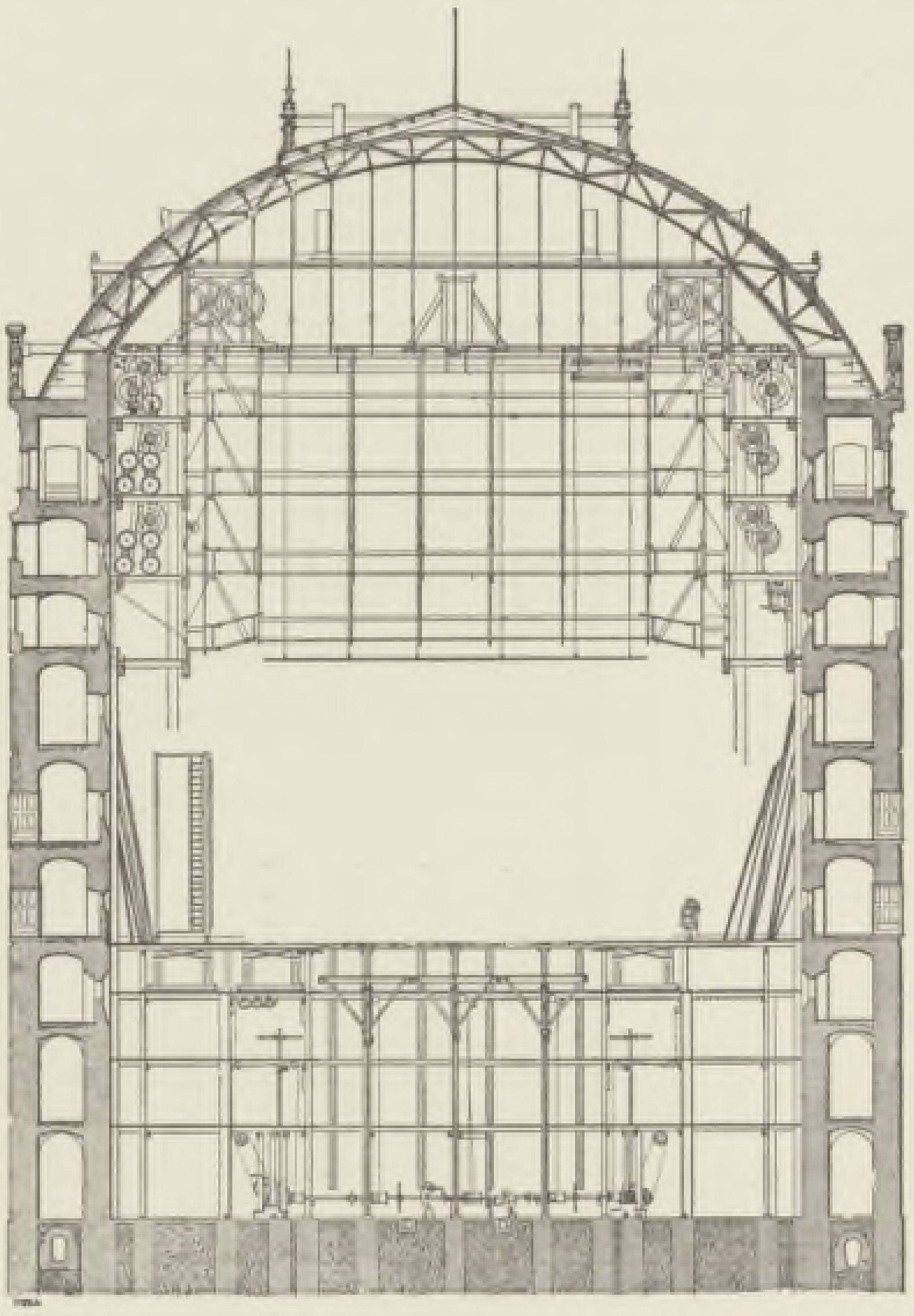


COURT OPERA HOUSE, DRESDEN: STAGE.
FIG. 26. LONGITUDINAL SECTION.

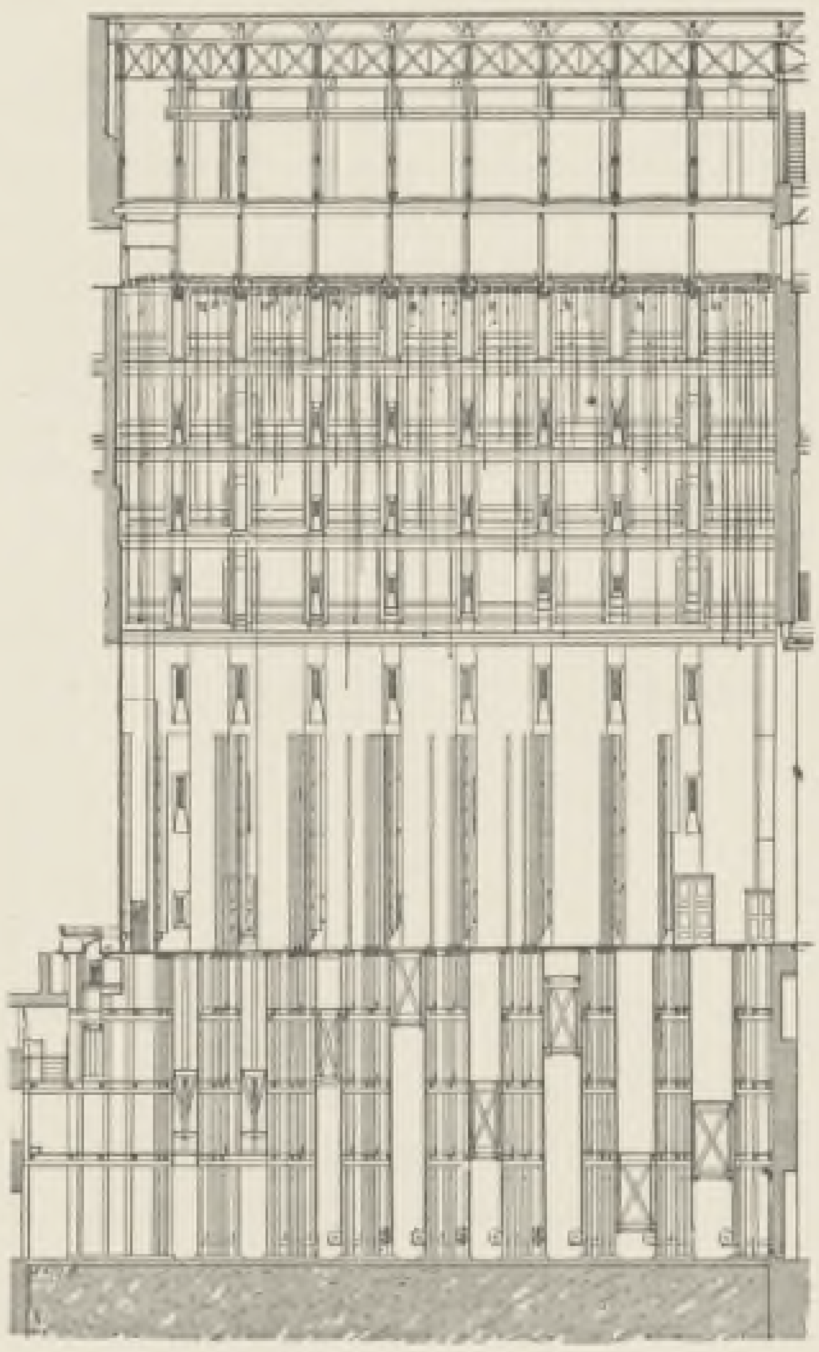
adjusted with the greatest nicety, so that the slightest push will move them backwards or forwards. One 'chariot' may be worked by itself, or any number can be coupled and worked together. To go further, I must here point out that the 'chariots' can be worked together with the 'borders' and the 'back-cloth,' for all the ropes can be brought on to one shaft, and taken by a single working line on to a windlass, so that one movement will simultaneously shift a whole scene with its component parts of several 'wings' (on each side), 'borders' and 'back-cloth.' The adjustment of the ropes to carry out this single movement is, however, no easy matter on a wood stage of this description.

As in England, every pair of 'wings' has its 'sky border,' but the unsightliness of the joint between the 'sky border' and the 'wings' has frequently caused the German stage mechanic to use a continuous piece of canvas, consisting of 'wings' and 'border' in one—in fact, a 'back-cloth' with its centre cut out in profile. This piece of scenery is technically known as the 'Bogen,' or curved piece, and it is raised and lowered from the 'gridiron' floor in the same manner as all other 'cloths' and 'borders.' When the 'Bogen' is introduced the 'chariot' can, of course, be dispensed with, as there are no wings to move; but I have also known the 'pole' to be used for stiffening the long ends of the 'Bogen,' which has a tendency to be affected by draughts.

The 'upper machinery,' 'Obermaschinerie,' of the German wood stage, as elsewhere, includes the 'fly galleries' and 'gridiron' floors. In the Dresden Court Opera House there are five tiers of 'fly galleries'; in the Vienna Opera House there are four tiers; each example, however, only having one 'gridiron' floor, as in the case of the English stage. Unlike the English 'fly' floors, the German type has the flooring laid with narrow boards and open spaces, so that ropes can be dropped through, which is the case in the 'gridiron' of all countries. Each tier of the 'fly gallery' is connected across the stage by 'hanging bridges' suspended from the 'gridiron' and roof by iron rods. In the French stage, as illustrated by the Brussels Theatre, it will be remembered that these 'hanging bridges' were continuous from 'fly gallery' to 'fly gallery,' obtaining partial support at their ends by resting upon the gallery rails. On examining the cross-section of the Vienna Opera House, it will, however, be seen that the arrangement is different, as a portion of the 'flying bridges' is made to lift at each end in the manner of a drawbridge. This provision is necessitated by the employment of a class of scenery essentially German in its origin, and known in England as the 'continuous panorama,' as distinct from the ordinary 'panorama cloth.' The cloth in this case goes 'up' one side, is curved across the back, and passes 'down' the other side,



COURT OPERA HOUSE, VIENNA: STAGE.
FIG. 27. TRANSVERSE SECTION.



COURT OPERA HOUSE, VIENNA: STAGE.
FIG. 28. LONGITUDINAL SECTION.

forming a screen which is practically a stilted semicircle in plan. This 'panorama,' in passing 'up' and 'down,' would be interrupted in its movements by the 'hanging bridges' connecting the 'flies,' if there were no break in them, and for this reason the miniature drawbridge is opened to give free passage for the canvas. Unlike the 'panorama cloth' of the English stage, the German appliance is made to mask-in the whole of the two sides and back. In the English example we have simply a straight 'back-cloth' moving off a roller on one side to a roller on the other. The German 'panorama,' when it is made movable, runs on a lath at the top. The chief difficulty in working this 'panorama' is, of course, at the curved part. In the later development of German scenic machinery we find that this appliance plays a most important part. It is used principally to obviate the difficulty of making a good scenic picture with the parallel lines of 'wings,' 'borders' and 'back-cloths,' and to conceal the unsightly joints which the more primitive forms always exhibit.

Common to all types of wood stages is the 'built-up' or 'box scene' of the English stage, and in Germany the same kind of 'rostrum' (termed the 'Practicabel') is employed, together with the 'ground pieces,' 'profile pieces,' and all the other details. There are also, of course, common to all countries alike, stage tricks for the representation of thunder, lightning and rain. These, however, I do not consider should have a place in this Supplement.

WOOD-AND-IRON STAGES.

The Stage of the National Opera House, Paris.

I have so far described my examples as types, and have selected my illustrations with the object of showing the general lines on which the construction of a stage is based, both at home and abroad. I shall now treat of individual stages, to show what progress has been made in stage construction of late years. Where, however, these structures have been reproduced elsewhere to such an extent as to become examples of distinct types, I shall not fail to mention the fact, but otherwise each design presented may be considered to figure as the single instance in which some specific principle has been introduced. I shall frequently refer back to the preceding illustrations of typical wood stages, for the general and foreign technical expressions used in 'Stageland,' and for comparison, when some allusion to the elementary lines of stage construction is requisite. Where of interest, I give dimensions, to assist in the appreciation of size.

The first stage I shall treat individually is that of the Paris Opera House. This stage has, no doubt, had an enormous influence on the construction of other French work, but it is by no means an example of any specific class or system of stage mechanism. Its unusual dimensions would alone prevent it from being a suitable model for copyists. A model must generally have average dimensions, and not extraordinary ones.

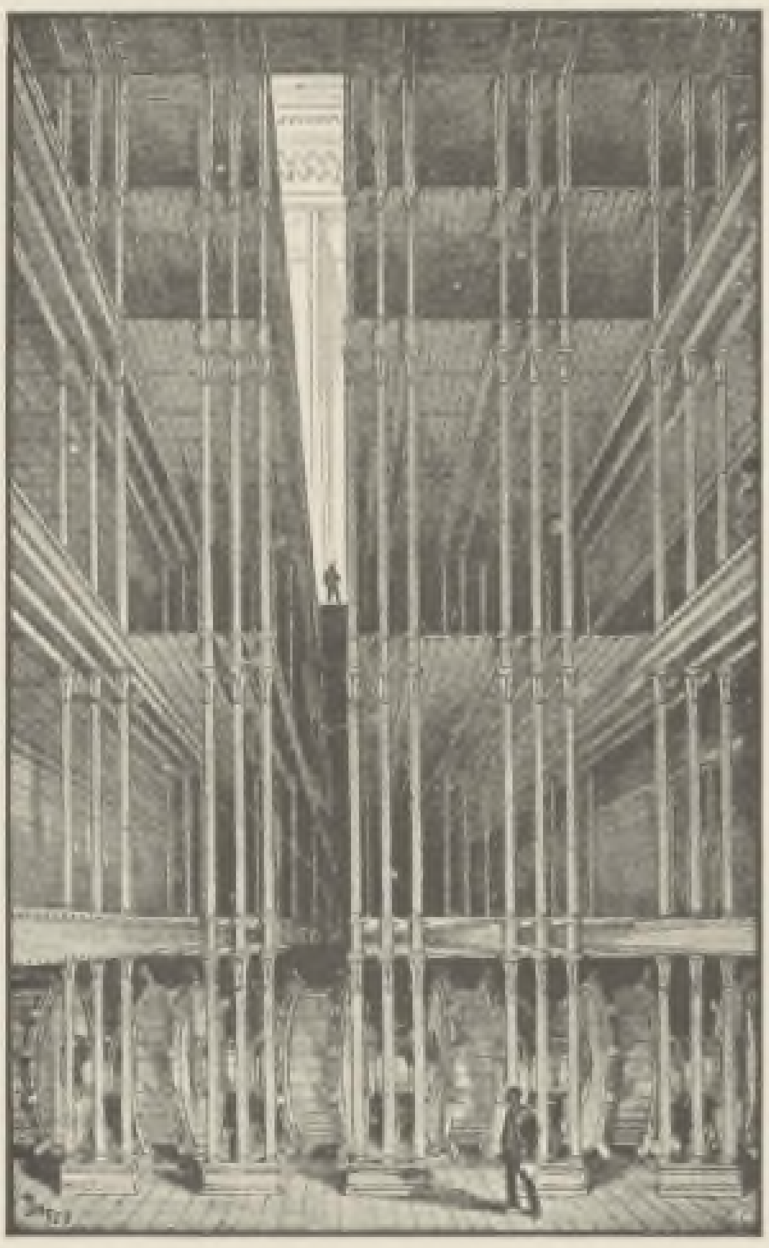
The erection of the National Opera House, Paris, afforded an excellent opportunity for all inventors of theatre appliances to attempt the introduction of their novelties with the certainty of courteous consideration, and the improbability of a refusal on account of a lack of funds. It was common knowledge that the architect, Charles Garnier, was ever ready to examine anything new that was put before him. In the same way as the auditorium and its foyers received attention, the stage and its offices were the subject of most exhaustive deliberation; and finally, at Garnier's request, the authorities went to the length of electing a special commission to consider the arrangements of the stage proper. This commission was composed of quite a number of leading authorities, with Regnault, a member of the Institute of France, as its President. Besides Charles Garnier, the architect, and Louvet, his clerk-of-works, the board included the Director of the Opera; the Assistant-Manager of the Science and Art Department; the head of the Public Works Department; with several engineers and scenic artists. The deliberations of the commission were spread over six years, sub-committees first examining the numerous schemes and models submitted for consideration and then taking the evidence of experts who were retained to frame reports on individual points. The results of this onerous work can, however, scarcely be considered satisfactory, as none of the proposals were accepted, and not even a compromise made. As will be seen from the illustrations, the principles of the old French wood stage were retained with but little modification, iron only being introduced to replace wood where the latter material was found to be unsuitable for the greater loads and longer bearings which had to be dealt with. A great opportunity was thus lost, and the German-speaking countries were left to do what France so curiously failed in. Charles Garnier, I know, still mourns this lost opportunity.

The main dimensions of the Opera House stage are:—nearly 174 feet (53 metres) between the side walls of the stage; about 85 feet (26 metres) in depth; 52 feet 6 inches (16 metres) at the proscenium opening; and nearly 103 feet (31 metres) working room between the columns which support the 'flies' on either side of the stage. These dimensions are, of course, unusual ones, but I must remark that this depth of the stage had already been exceeded at the time of the erection in various Continental opera houses, and that Covent Garden Theatre, London, has almost the same dimension from the proscenium to the back wall. Since the erection of the Paris Opera House, several stages with greater depth have also been built.

In the Paris Opera House the width of a 'rue' is 3 feet 6 inches (1·09 metre), and the width of a 'trappillon' is about 1 foot 6 inches (0·49 metre), the 'costière' having its usual 1½ inches (0·04 metre). The sequence is different to the Brussels example, and there are always two 'trappillons' to every one 'rue,' the order being—'costière,' 'trappillon,' 'costière,' 'trappillon,' 'costière,' 'rue.' There are ten sequences to the depth of the stage, as will be seen from Fig. 31.

These sequences or groups of 'cuts' are technically called 'plans.' The 'rue' opens to the length of 49 feet (15 metres). The 'trappillon' is 55 feet 9 inches (17 metres) long. The slope of the floor is about 5 centimetres per metre. At the back of the stage is a space known as the corridor, and mostly used for setting heavy pieces of 'built-up' scenery. The *foyer de la danse* is beyond this, and the depth from the back wall of the foyer to the front of the stage would allow a vista of over 150 feet (45·70 metres) in extent. At each side of the stage the counterweight boxes practically form enclosing walls with a number of openings leading to a series of 'scene' docks on each side. The arrangement of these side docks, as already remarked, is essentially of French origin, and they afford a very ready means for the disposal of scenery which has to be quickly removed from the stage. I would here observe that the Paris Opera House stage was designed for a nightly change of scenery, the playbill being subject to almost daily alteration. Extra afternoon performances are also sometimes given, but only on rare occasions, and then, generally, there is no evening entertainment.

The machinery below the stage is worked from five different levels, four 'mezzanine' and one 'cellar' floor (see Figs. 30 and 33). The first and second 'mezzanine' floors are not level, but follow the slope of the stage floor. The height between the stage floor and the 'cellar' is nearly 47 feet (14·25 metres) in front, and 51 feet 6 inches (15·70 metres) at the back, the difference of over 4 feet (1·28 metres) arising from the slope of the stage floor towards the front. The five levels below the stage are of unequal height, the first 'mezzanine' averaging 7 feet 10 inches (2·40 metres), the second 7 feet 6 inches (2·29 metres), the third 13 feet (3·95 metres), the fourth 11 feet (3·40 metres), and the 'cellar' 10 feet (3·10 metres).



NATIONAL OPERA HOUSE, PARIS: STAGE.
FIG. 29. VIEW OF 'UNDER MACHINERY.'

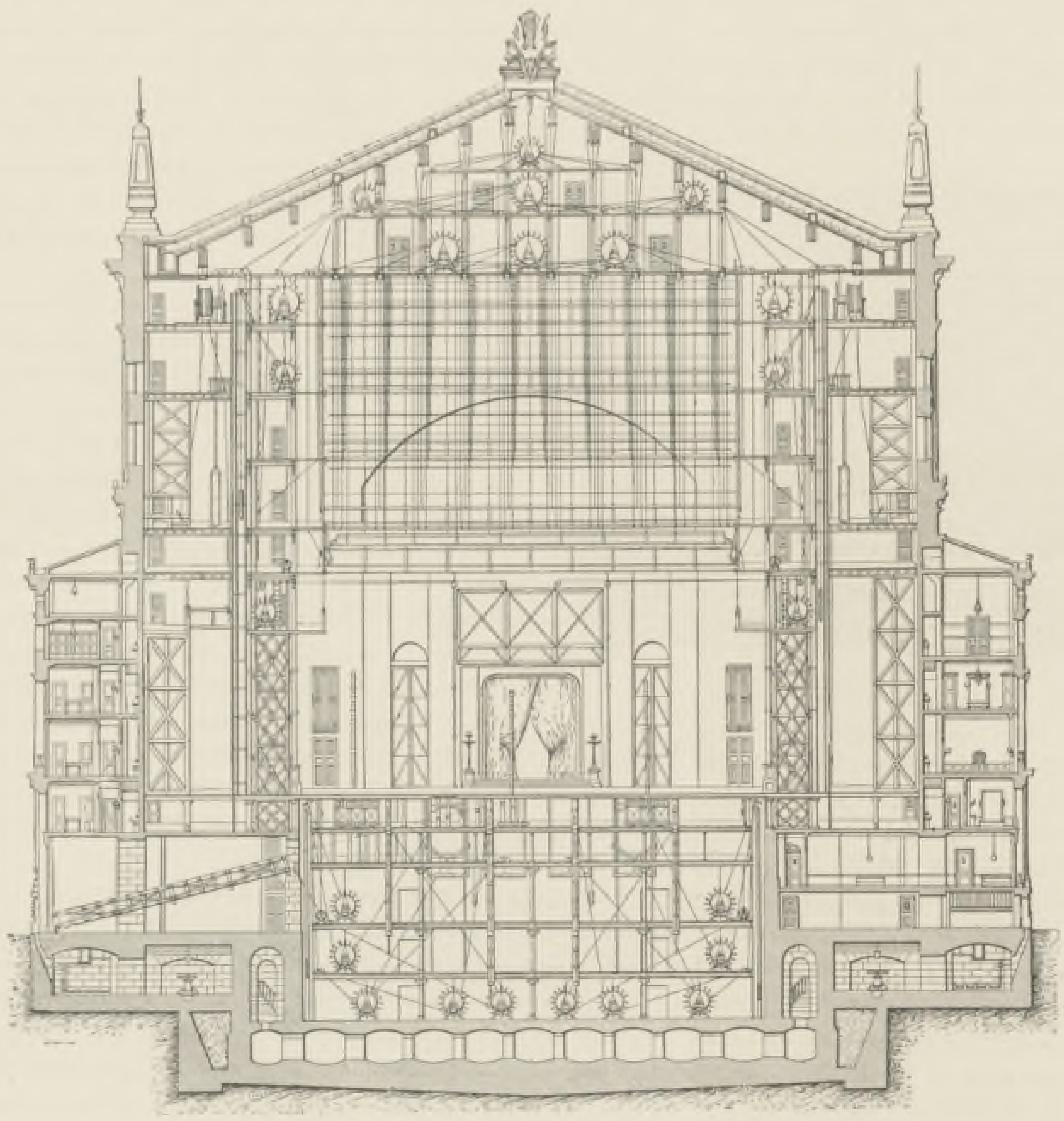
On the 'cellar' level are placed the bases which support the iron uprights of the stage. Each base has a group of three uprights upon it. Between each base and group of columns is the space above for the 'rue,' but between the three columns themselves are the 'trappillon' and the 'costière.' At each level are brackets bolted to the columns to take the iron joists, 1 foot 5 inches (0·45 metre) in depth, which support the stage. The length of the four iron joists together from wall to wall is just over 100 feet (31 metres).

At the level of the second 'mezzanine' the number of columns is increased by the introduction of an intermediate column in the centre of each of these four joists; and it will be seen, therefore, from the section (Fig. 30) that at this level there are seven columns in a row instead of three, each of these seven columns supporting two iron stanchions which are immediately under the stage. It will be seen from the detail (Fig. 33) that on the top of the stanchions are channel irons; to these are fitted the oak fillets which form the sides of the 'costière.'

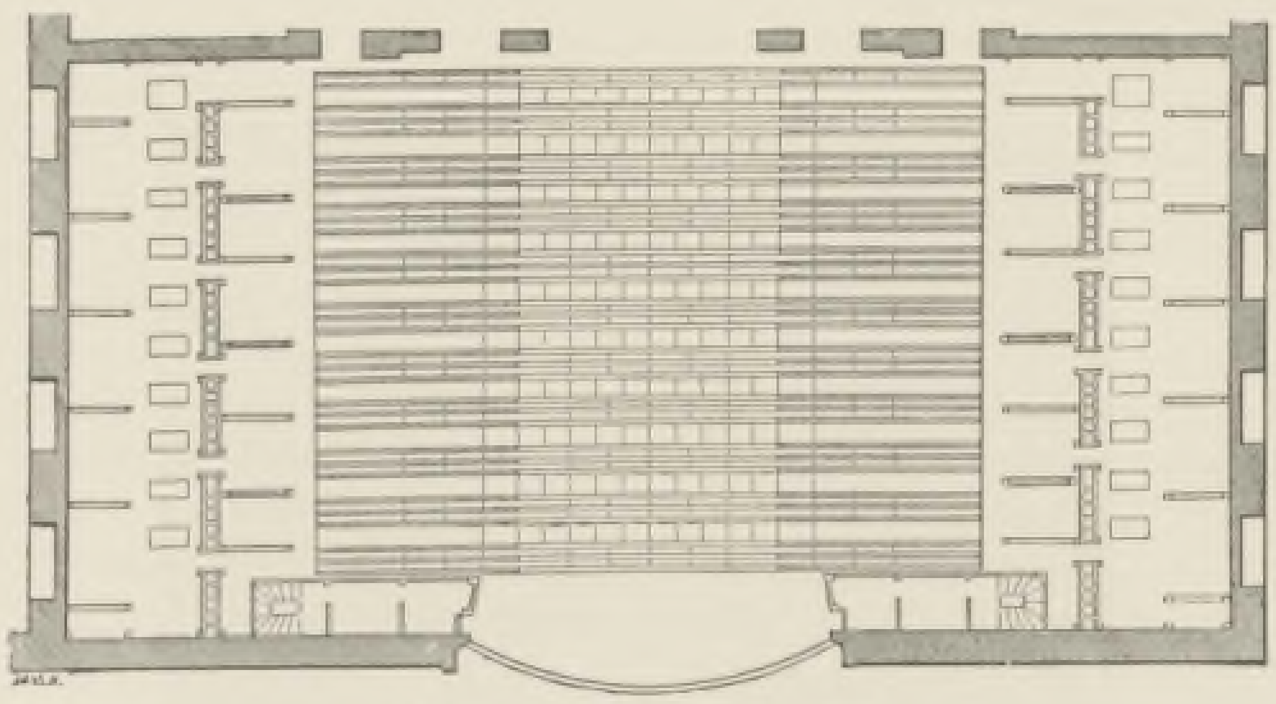
For the ten 'plans,' of which the stage floor of the Paris Opera House consists, there are thirty-three bases for the groups of iron columns, supporting the stage below (ninety-six columns in all), to each of the two lowest 'mezzanines,' double that number to the second 'mezzanine' level, and four times that number of iron posts to the first 'mezzanine.' The rails on which the wheels of the 'chariot' run are fixed to the iron joists of the first 'mezzanine' floor (Figs. 30 and 33). The floors of the different levels below the stage are formed with open planking in the usual way.

The framework of both the small and large 'chariots' is made of iron. The large 'chariot' is 9 feet 10 inches (3 metres) long, and is so constructed with four uprights, cross-braced by iron rods, that there are thirteen iron sockets into which two 'poles' can be dropped. This arrangement has the advantage that the same 'chariot' can carry several 'poles' to support any 'scene' or framework of considerable weight. Each 'costière' is furnished with two large 'chariots,' whilst the number of smaller 'chariots' varies according to the requirements of a scene. The large 'chariots' are never moved from their own 'costière,' but the small ones are lifted out and taken to any part of the stage where they may be required. There are sixty-four large 'chariots' at the Paris Opera House, and twenty-two small ones. The 'poles' are of fir and have an average height of 32 feet 9 inches (10 metres).

The 'trappillon' is used for raising 'flats'; the depth available below being about 49 feet (15 metres). This depth, however, is somewhat curtailed in parts by the presence of the 'drums' in the 'cellar,' which stand 11 feet 6 inches (3·50 metres) above the floor. The actual 'working depth' is hence only about 36 feet (11 metres); that is to say, a 'scene' of this height can be made to disappear bodily beneath the stage, or can be raised up from below. The 'flats' are generally worked by 'sloats' or 'cassettes,' of which appliances six are necessary for the full width of a 'trappillon.' At the Paris



NATIONAL OPERA HOUSE, PARIS: Stage.
Fig. 30. Transverse Section.



NATIONAL OPERA HOUSE, PARIS: Stage.
Fig. 31. Plan of Stage Floor.

Opera House the 'cassette' is made of long iron plates, held together by angle-irons, and formed in the shape of an oblong box, with one of the four sides partly open, whilst the 'âme,' which in this case is made of oak, can be easily worked over some small rollers at the side of the iron box. The ropes of a set of the six 'cassettes' are all taken on to one 'drum.'

In the 'cellar' level there are six rows of 'drums,' four between the bases of the columns, and one on each side near the walls of the 'cour' and 'jardin.' On the third 'mezzanine' are two rows of windlasses which serve to raise the counterweights. The system adopted at the Opera House is to make the counterweights heavier than the object to be raised. In most theatres the counterweight boxes extend from the top of the 'gridiron' to the bottom of the 'cellar' without any interruption, but in the Paris Opera House these boxes are stopped at the stage level.

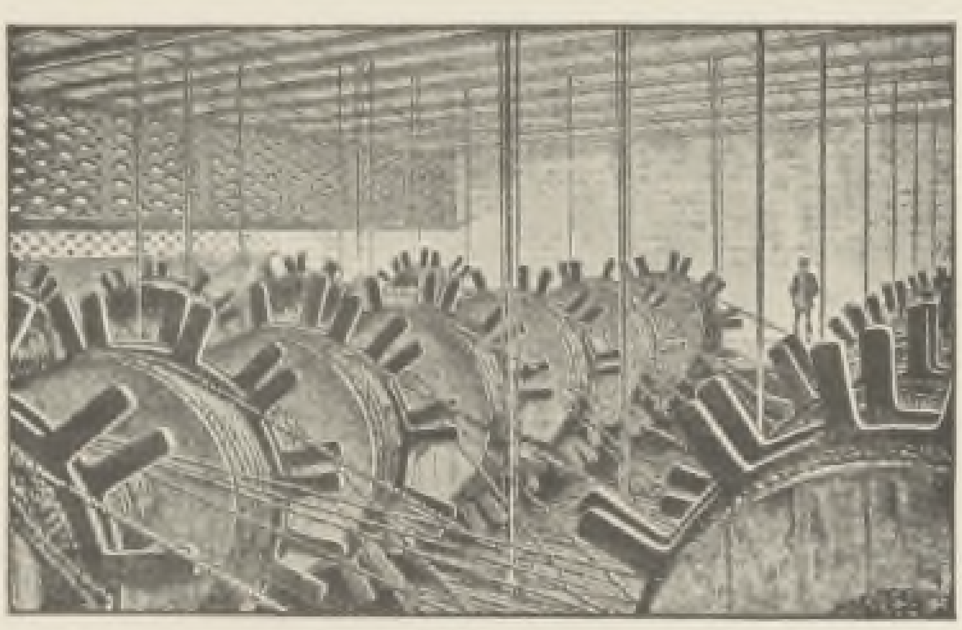
NATIONAL OPERA HOUSE, PARIS: STAGE.
FIG. 32. VIEW OF 'FLY GALLERY.'

Before leaving the stage floor I should remark that means have to be provided for easily moving large quantities of scenery in and out of the building, when large scene-stores have not been constructed in connection with the block and a frequent change of bill has to be considered. In order to take the long rollers on which the 'back-cloths' are wound, in and out of the Opera House, there is a sloping way, called the *chemin des rideaux*, from the street level to the second 'mezzanine' level (Fig. 30). This sloping way is a framed platform of wood braced with iron and provided with rollers. The 'scene' is pulled up the sloping platform by a rope attached to a windlass in the 'mezzanine'; it is then lifted through the opening of a 'rue,' and placed on the stage.

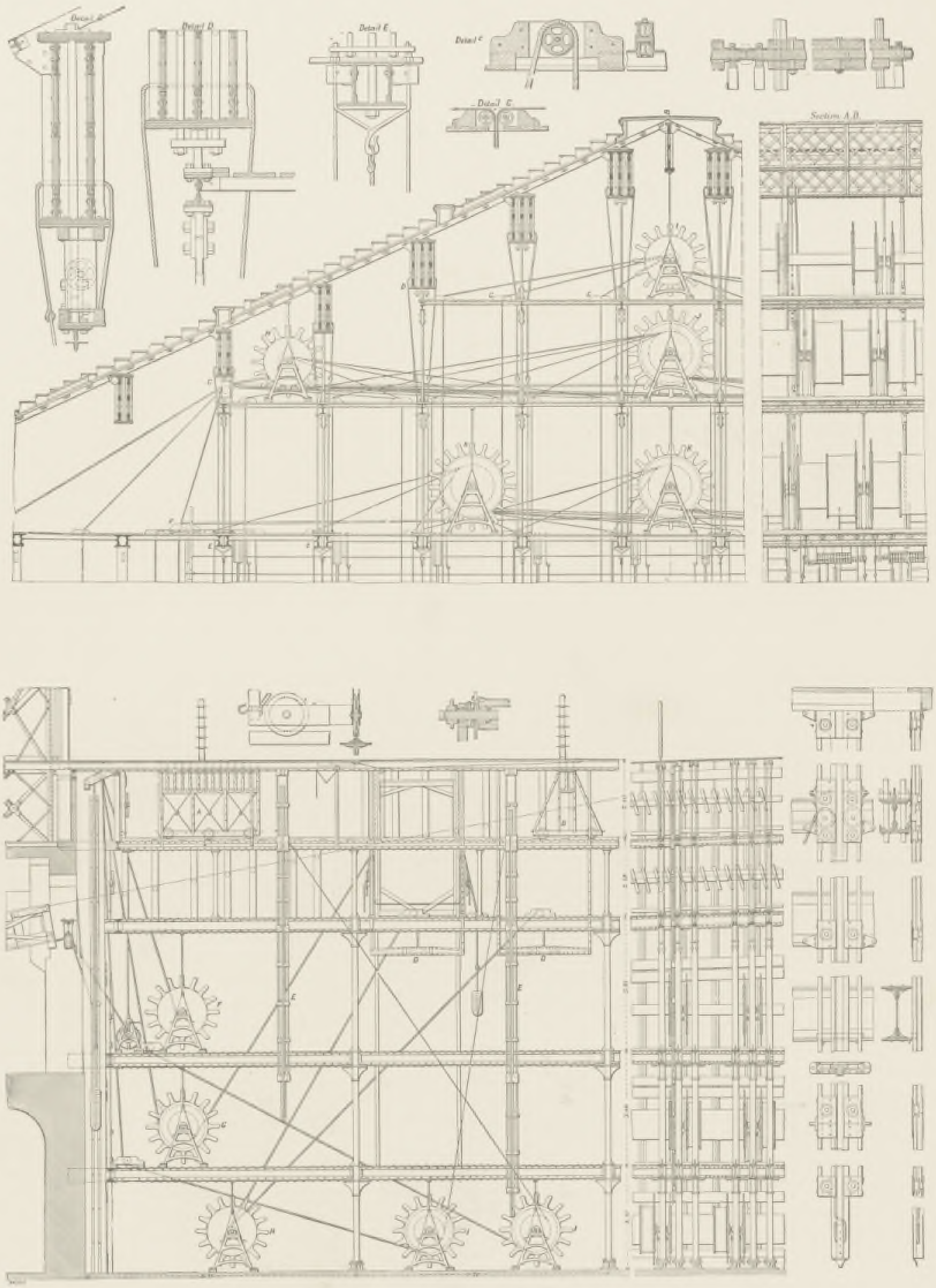
As regards the 'upper machinery' of the Paris Opera House stage, there are two rows of cast-iron columns on either side which are carried up to the height of the 'gridiron' and support the various tiers of the 'fly galleries.' These two rows of columns are braced together by lattice ironwork which, at the same time, form the side walls for the scene-docks. They are also tied together by the iron girders which support the floors of the galleries.

The height from the floor of the stage to the floor of the 'gridiron' is 119 feet (36·25 metres). Five tiers of 'fly galleries' are provided, to which has been added a sixth and supplementary tier. This additional tier was erected for the purpose of working the electric light, and it has received the name of Pont Dubosc, after that of the engineer who directed this installation. The distance from the 'fly-rails' on the one side to the 'fly-rails' on the other is over 90 feet (27·50 metres), which admits of a 'back-cloth' slightly less than 80 feet (24·50 metres) in width. The communication between the two sides is again effected by sets of 'flying bridges' placed immediately over the 'rues' and hung from the 'gridiron.' All the cords are fastened to cleats screwed to a rail at the back of the 'fly galleries.' In the English system these cleats are fixed to the 'fly-rail' itself.

The 'gridiron' is 119 feet (36·25 metres) above the floor of the stage, as I have already stated, and I would add that it has three levels. The first of these 'grils' has three rows of 'drums' running from front to back, one 'drum' being placed over each set of 'traps,' so that there are ten 'drums' in each row. There are similarly three rows of 'drums' on the second level, but only one row on the third.



NATIONAL OPERA HOUSE, PARIS: STAGE.
FIG. 33. VIEW OF 'CELLAR.'



DETAILS.

Einzelheiten. (Fig. 33.) Dètails.

Edwin O. Sachs ed:

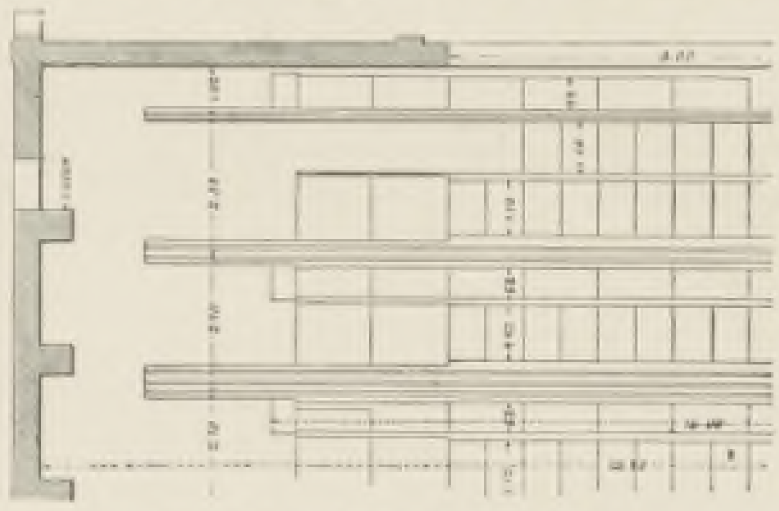
THE STAGE OF THE NATIONAL OPERA HOUSE, PARIS.

0 5 10 20
Feet.

5 0 5
Mètres.

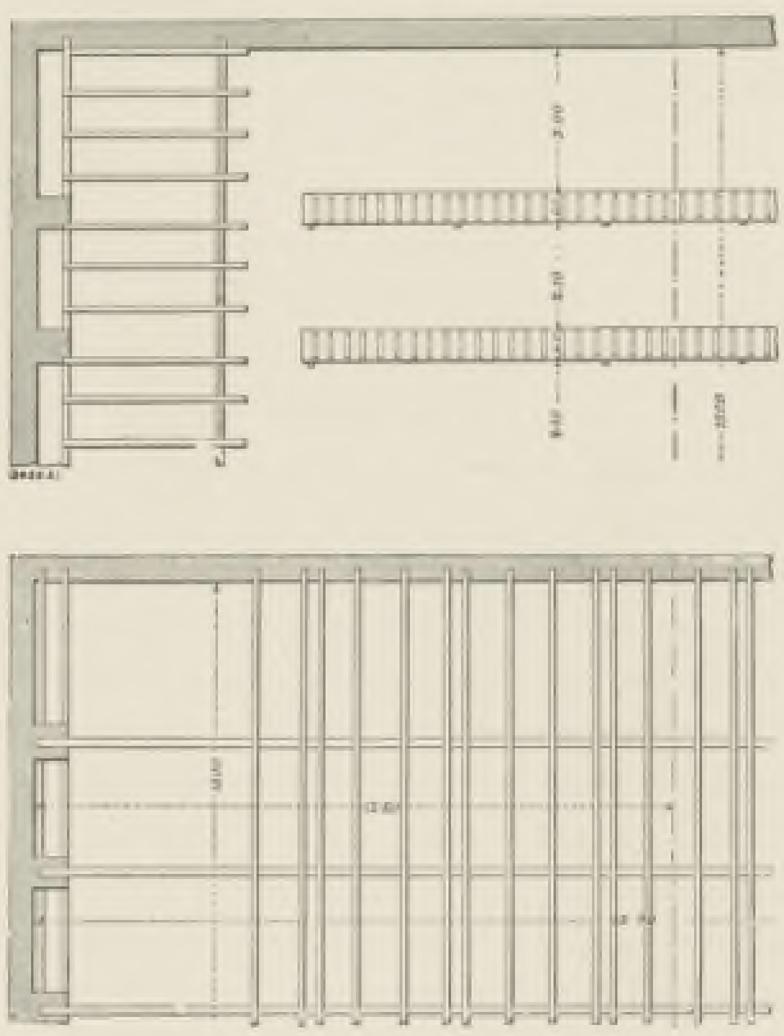
The Stage of the Municipal Theatre, Rotterdam.

In this chapter I shall describe the stage of the Rotterdam Theatre, which was erected from the plans of J. Verheul, and is illustrated in the second volume. The stage engineer was Albert Rosenthal, who acts as engineer-in-chief at the Municipal Theatre, Cologne. This theatre was erected in 1886—i.e. subsequent to the 'Ring' Theatre fire and the erection of several hydraulic stages. As was the case with the Paris Opera House stage, however, this piece of construction does not mark any special type, but can only be studied as an individual example. Its importance among modern stages is due to the fact that it is a wood-and-iron stage of average dimensions, in which the former material predominates, the latter having only been employed for some main structural parts and for minor details. At the same time, there are distinct improvements both in the arrangement of the 'upper machinery' and the 'under machinery,' as compared with that of the old wood stage. The old 'drum and shaft' has been excluded for hoisting purposes, and the pulley takes its place on the 'gridiron' level. The principal parts of the 'under machinery' have also been put together more systematically than before. This stage illustrates, if I may call it so, the transitional period from wood to iron at its earliest, though the date of its erection really demanded something more advanced. In speaking of this stage, it is well to point out that there were considerable difficulties in making the foundations of the theatre, which is built on piles, and that this was an obstacle to sinking the 'cellar' to the desired depth. I would also again remark that the purposes of both an opera house and a comedy house have to be fulfilled by the building. There are, to repeat, two distinct administrations in the block, the one for national drama and the other for opera, whilst the playbill is changed either weekly or nightly, as the case may be. This, of course, materially affects the requirements formulated for the stage appliances.



MUNICIPAL THEATRE, ROTTERDAM: STAGE.
FIG. 37. PLAN OF STAGE FLOOR.

One of the chief features of the Rotterdam stage is, as I have already indicated, the total exclusion of the 'drum and shaft' system in the mechanism used for the 'upper machinery.' We find that the whole of the 'scenes,' 'borders' and 'battens' are raised and lowered over pulleys fixed to the 'gridiron' floor. There are six of these pulleys to every 'cloth'—that is to say, the width of the 'cloth' requires six ropes to hang it from the 'gridiron,' and each of these six ropes passes over a pulley. They are then collected over one central pulley at a higher level, as shown in Fig. 40, from whence the working lines and counterweight ropes are taken. There are a great number of these pulleys in use at the Rotterdam Theatre, for the stage is a large one, consisting of six sequences of 'cuts,' and over each sequence or division of the stage there is provision for hanging eight changes of 'cloths' or 'borders.' On the 'gridiron' floor alone there are thus nearly three hundred pulleys, besides which there are two tiers of central pulleys at a higher level, numbering close on one hundred.

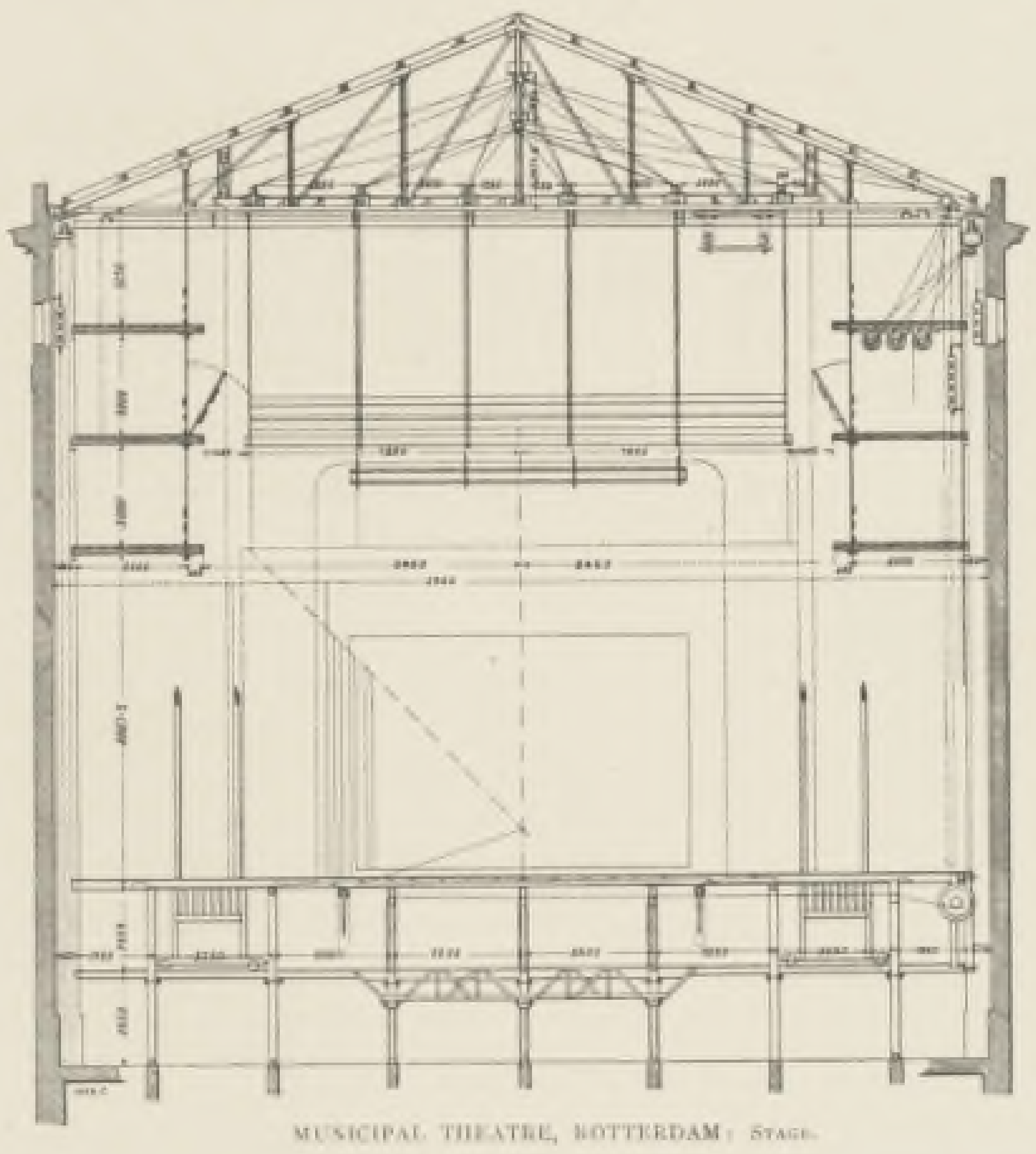


MUNICIPAL THEATRE, ROTTERDAM: STAGE.
FIGS. 38, 39. PLANS OF 'FLY GALLERY' AND 'GRIDIRON.'

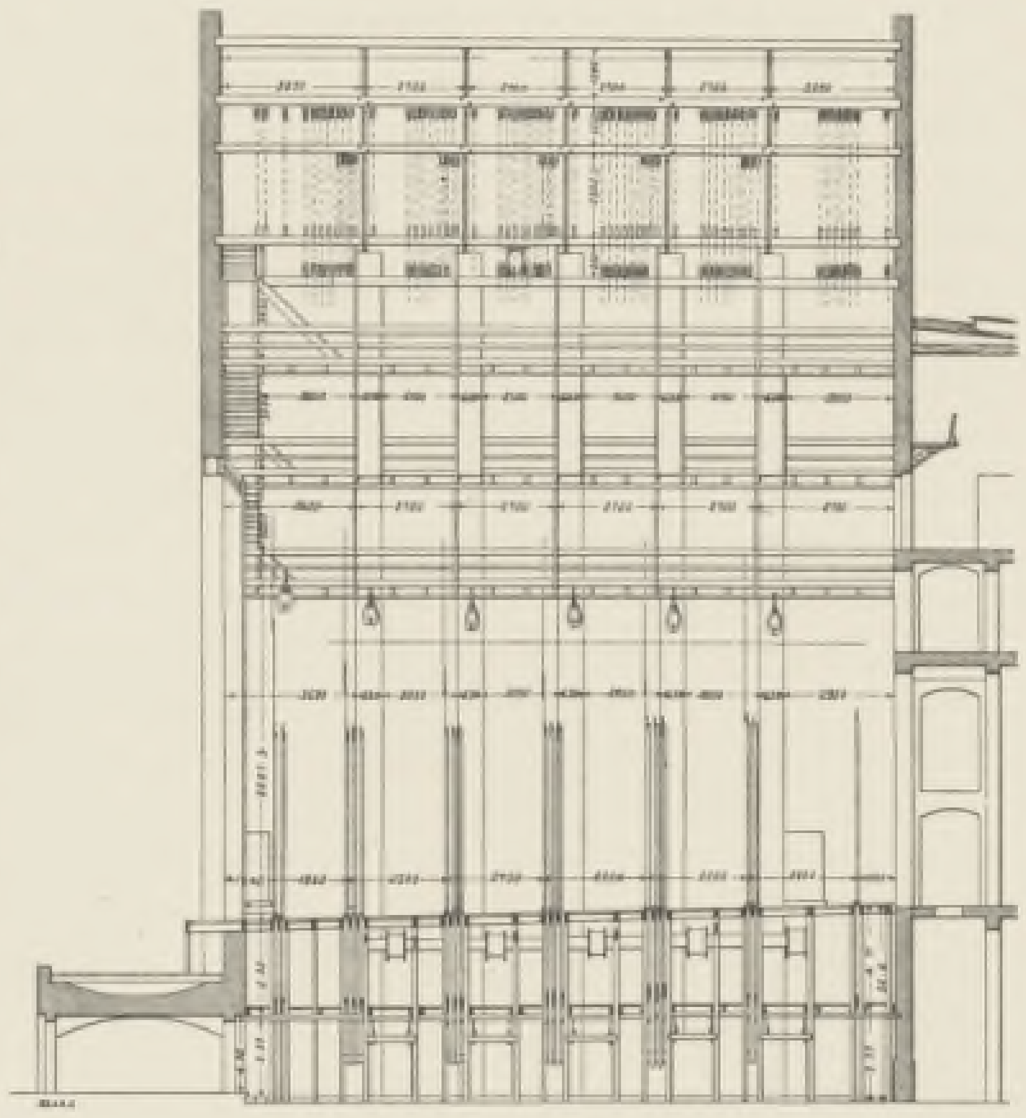
The counterweight system enters very largely into the working of the 'upper machinery' of the Rotterdam Theatre, and it will be seen that the counterweight boxes are ranged against the walls and each side of the stage, and that they can be raised or lowered the entire distance from the 'gridiron' level to the lowest 'cellar' under the stage floor. The transverse section shows that, on the left side of the stage, there are two lines or series of counterweights in use, and that the space in which the counterweights are worked is provided for by building the side walls of the stage with internal piers, between which they are hung.

There are three tiers of 'fly galleries,' the floors of which are of wood, laid upon iron joists. On the middle tier, drawbridges connect the 'flies' on either side to the 'hanging' or 'flying bridge' which runs across the stage over each sequence of 'traps.' These 'flying bridges' are hung from the 'gridiron' floor, but they are constructed entirely of wood. The front of the 'fly galleries' is strung up to the roof by a series of iron rods, and upon these rods are fixed the wooden rails, which form the 'fly gallery' rails of each tier. Under the 'gridiron,' along the full width of the stage, is suspended a beam, and upon this the wheels of a 'traveller' run.

With regard to the construction of the 'gridiron' there is little to say, except that, as will be seen from Fig. 39, on p. 27, a set of main girders resting on the piers of the side walls support the necessary sequence of joists which run from front to back of the stage. At the same time, these girders form part of the construction of the roof, as will be seen from the sections. The flooring of the 'gridiron' is wood boarding and spaced in such a manner as to allow the ropes



MUNICIPAL THEATRE, ROTTERDAM: STAGE.
FIG. 40. TRANSVERSE SECTION.



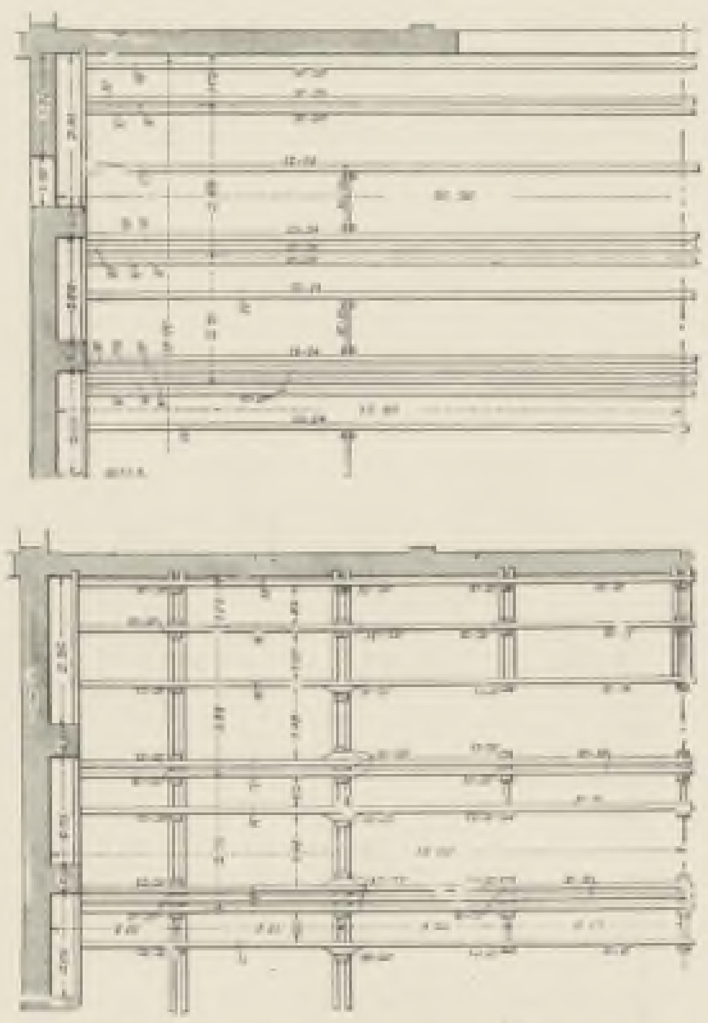
MUNICIPAL THEATRE, ROTTERDAM: STAGE.
FIG. 41. LONGITUDINAL SECTION.

to be dropped through. As shown in the diagrams, the span for the 'gridiron' is over 82 feet (25 metres), and the height from stage floor to 'gridiron,' at curtain line, over 59 feet (18 metres). The main girders are about 8 feet 9 inches (2·70 metres) apart.

Having noticed the chief characteristics of the upper part of the Rotterdam stage, I must now pass on to describe the manner in which the 'cuts' are set out upon the floor. The floor, as I have said, is divided into six sequences of 'cuts.' These commence with a pair of 'chariot grooves,' which run right across the stage, and are used for the 'curtain-wings'; next come two sets of 'slider cuts,' the covers to each of which are divided up into ten sections. Each section can again be removed separately, or the whole ten can be made to slide under the stage floor, five to the right and five to the left. Behind these there are three 'chariot grooves,' followed by a 'bridge' and another set of 'sliders.' This sequence of three 'grooves,' a 'cut' and a 'bridge' is then repeated four times, when a change again appears; for, after two 'chariot grooves,' there are then two 'bridges,' one 'chariot groove' and one 'cut,' the latter completing the divisions of the floor of the main stage. The stage, as will be seen, extends back beyond this, but there are no 'cuts' in the so-called back stage. There is, in fact, only an arrangement in this part of the floor for lowering the scenery into a 'scene' store below.

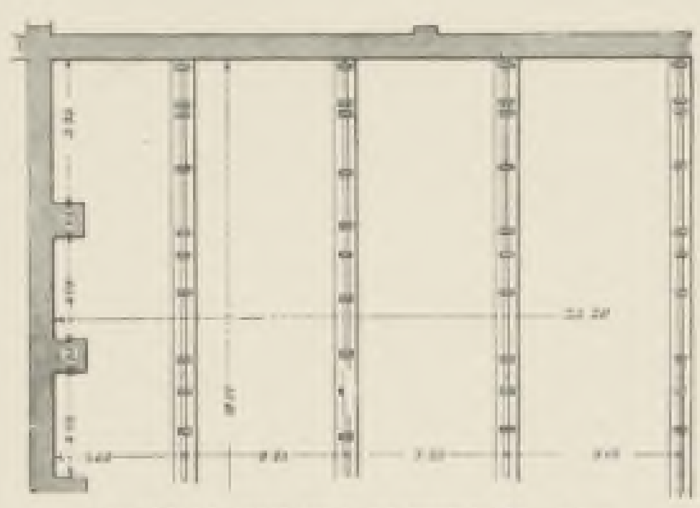
I should mention, before passing to my remarks on the construction of the 'under-stage,' that at Rotterdam every 'chariot groove' extends from one side of the stage to the other, allowing all the 'chariots' to travel the full width of the stage. This, as already explained, is not always the case, as in some theatres 'chariots' are only used to support the 'wings,' and travel only a little beyond the line of the proscenium opening. In some cases, too, only one or two of the 'grooves' run right across the stage, as was the case at Dresden. The 'bridge cuts' are of less length than the measurement of the proscenium opening in the Rotterdam Theatre, whilst all the 'sliders' open considerably wider.

In this chapter I have made a point of showing a full set of plans to illustrate the arrangement of the stage floor, its joists, and the construction of the 'mezzanine' and 'cellar' below. The 'under machinery' in this case has only one 'mezzanine' floor and a 'cellar,' and the whole is constructed and framed together with wooden posts and wooden joists. Immediately under the stage floor are the joists, extending from side wall to side wall of the stage, and spaced from front to back in accordance with the width of the particular description of 'cut' above in the stage floor. Every joist has seven uprights, and in order to stiffen the stage and prevent the uprights from falling forward, the joists on either side of the 'chariot slits' are well bolted together and also to their respective uprights. It should be further noticed that the stage is stiffened laterally, by the posts between the 'trappillons' and 'rues' being tied to the posts of the 'chariot cuts.' Where groups of posts support the joists of the 'chariot cuts,' it is only the front and back posts which are carried down to the 'cellar' level; the centre ones are bolted to a cross-piece some few feet above that level, and hence the actual number of posts which rest upon the sole-plates in the 'cellar' are only 147 out of 217. On reference to the plan showing the joists of the 'mezzanine' level, it will be noticed that the whole of the stage is considerably stiffened on each side by the rows of double bridging joists running from the proscenium wall to the back wall on each side of the post, and supporting the 'mezzanine.'



MUNICIPAL THEATRE, ROTTERDAM: STAGE.
FIGS. 42, 43. PLAN OF 'UNDER MACHINERY.'

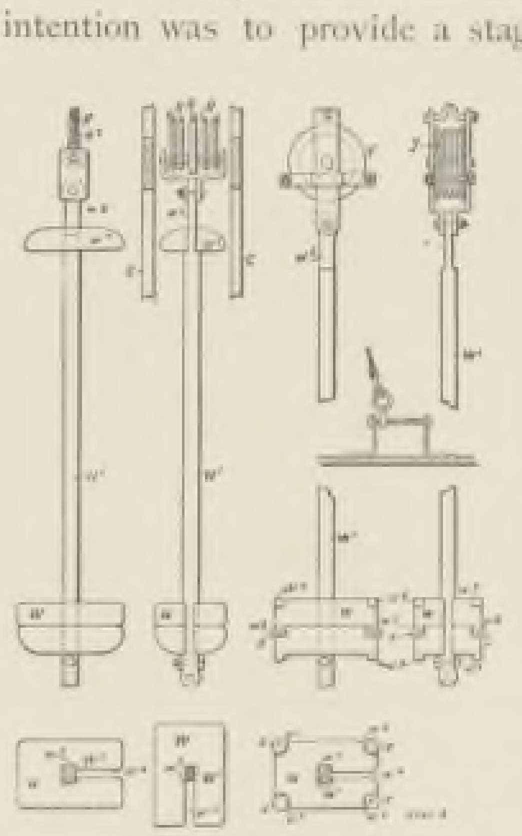
Although there are no 'drums' or 'shafts' employed in the 'upper machinery,' they are used in the 'under machinery,' and a row of them is placed the full depth of the stage on the right-hand side of the 'mezzanine' level. They are used for raising the 'bridges.' The 'bridges' themselves consist of a very simple form of a wooden framed table having the full length of the 'rue,' which, as I have already observed, is rather less in frontage than the proscenium opening. The method by which the stage floor is opened to allow the 'bridge' to rise up to that level is practically similar to that which prevails in the English wood stage, the one difference being that an iron lever is used to keep the slabs or 'trappes' in position. The 'chariots' travel, as in most cases, upon a metal wheel and on a tram-line laid upon the 'mezzanine' joists. The 'chariots' are constructed entirely of wood, framed together, with eight sockets into which the 'poles' can be placed as required. The 'pole' is of wood, with an iron shoe and pin. There are two 'chariots' to every 'cut' or 'groove,' and there are seventeen 'chariot grooves' in the stage.



MUNICIPAL THEATRE, ROTTERDAM: STAGE.
FIG. 44. PLAN OF 'CELLAR.'

THE STAGE OF D'OYLY CARTE'S ENGLISH OPERA HOUSE, LONDON.

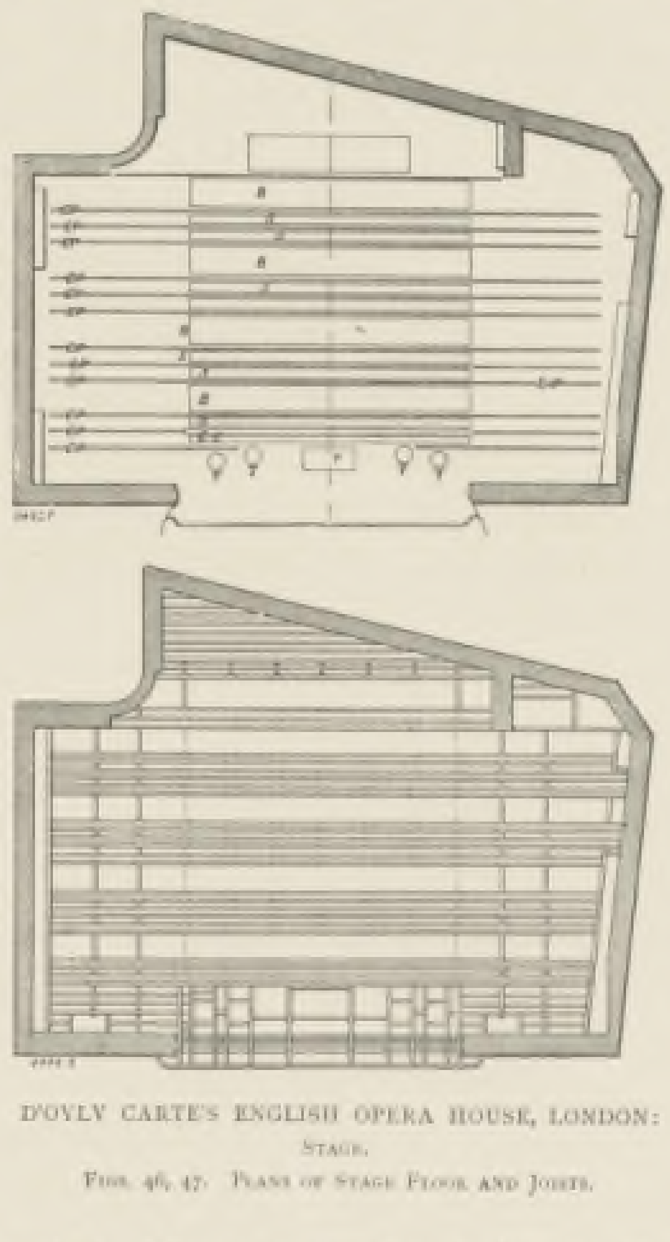
WHEN D'Oyly Carte was about to construct his new English Opera House in Shaftesbury Avenue, his original intention was to provide a stage built entirely of iron, and the drawings which were passed in the first instance by the authorities indicated an iron stage. This scheme, however, was subsequently abandoned, and a wood-and-iron stage was erected. The designer of this stage was Walter Dando, an engineer who had considerable experience with French appliances. The variations and improvements which he introduced into the English Opera House stage have been patented by him as an invention 'in connection with theatrical stages,' and as I consider that the patent specification describes the features of his design better than any explanation of the actual example carried out, I am quoting the former at considerable length. I am also referring to much of the detail in the diagrams by reference letters arranged similarly to those in the patent specification.



D'OYLY CARTE'S ENGLISH OPERA HOUSE, LONDON: STAGE.
FIG. 45. DETAILS OF COUNTERWEIGHTS.

Regarding the two plans and the transverse and longitudinal sections, I would in the first instance note the following lettering:—A A indicates the stage floor level on the sections; the first 'mezzanine' is shown at M, the second at M_1, the third at M_2, and the 'cellar' level at L.

The stage floor is carried by a number of wooden uprights held together by three tiers of joists, J, J, which run across the entire width of the stage, and, at the sides, support the various levels of 'mezzanine' floors. The floor joists on either side of 'chariot slits' are marked *a a*, whilst those between which 'sliders' are worked are shown as a_1, a_1. All this framing of the 'under machinery' can be carried out in iron or in wood and iron. The whole of the mechanism underneath the stage is used for raising and lowering the 'scenes' through the various 'cuts' in the floors. These 'cuts' differ from those of the ordinary English wood type, inasmuch as, in addition to the 'sliders' and 'bridges,' there are the Continental 'slits' for the 'chariots and poles' already referred to. These are here made to travel the full width of the stage. In the plan (Fig. 46), B represents the 'bridge cuts,' S the 'slider cuts,' C P the 'chariot and pole slits,' and C C the 'carpet cut,' of which I shall have more to say hereafter. T T are the 'grave and star traps.'

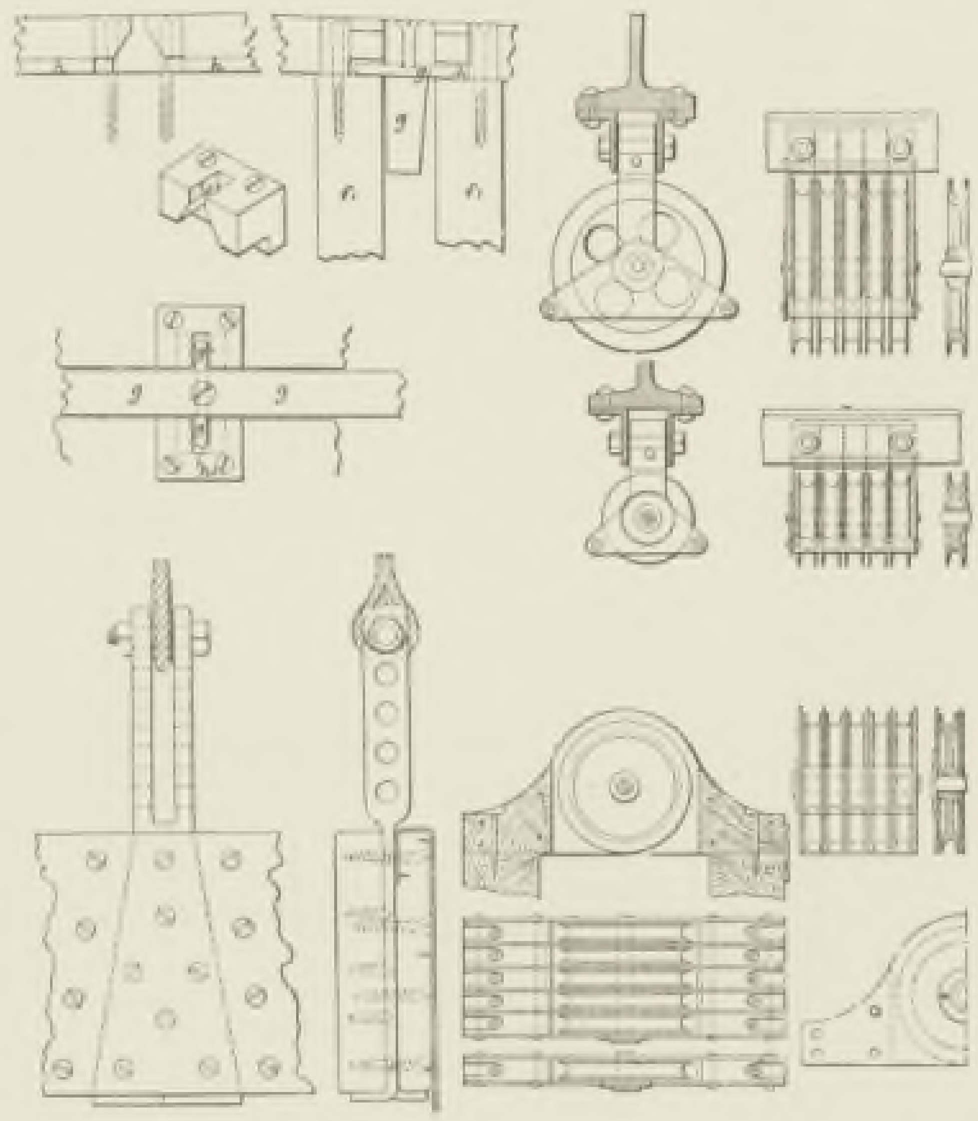


D'OYLY CARTE'S ENGLISH OPERA HOUSE, LONDON: STAGE.
FIGS. 46, 47. PLANS OF STAGE FLOOR AND JOISTS.

The plan (Fig. 46) shows how cramped the stage is, and what a lack of room there appears to be for shifting scenery sideways or to the back. The framing under the stage floor level is indicated in Fig. 47.

The arrangement of 'cuts' upon the floor plan is somewhat different to any of the examples illustrated, for though, as will be seen, the 'grave trap' occupies its usual central position, and is close up to the front of the stage, there are two 'star traps' placed on either side. Immediately behind these smaller 'traps' are placed the first 'cuts' for the 'chariots and poles,' on which the 'curtain-wings' are mounted. These 'cuts' do not run right across the stage, but only extend a short distance beyond the proscenium opening. This pair of 'cuts' is followed by the first 'slider,' which, though like the appliance of the old wood stage, running in 'grooves,' and 'taking-off' right and left in two halves, is here held by iron levers, and worked by steel ropes and iron 'crabs.' The next opening is known here as the 'carpet cut,' and I give large scale details of the contrivance in Figs. 51 and 52. The purpose of this 'cut' is to enable a carpet on the stage floor to be removed without any of the stage hands appearing before the audience and rolling up the carpet in their sight. The details show how the opening is effected by means of a lever L, and the carpet is then dragged through the 'cut' C to the 'mezzanine' below, where it is wound up on a roller. The 'carpet cut' is followed on the plan by another 'slider,' which is the first unit in the regular sequence of 'slider,' 'chariot slit,' 'bridge,' 'chariot slit,' 'slider,' 'chariot slit,' which recurs three times, and again in a fourth instance but without the last three units.

The means for raising and lowering the 'scenes' through the 'slider' openings is fully shown in Figs. 51 and 52, with working details of the 'sloats' upon which the 'scenes' are fastened. The 'rise and sink' scenery—the technical term given to 'scenes' which descend below the stage floor—is fixed to the 'tongues' of the 'sloats' T_1. These 'tongues' are raised or lowered by the flexible wire ropes which are attached at one end to the 'tongue,' and at the other to the 'drum' *d* in the 'cellar' level. The weight of the scenery is balanced by means of the counterweight C running in the 'shaft' as shown, and attached to one end of the wire rope W_1, which passes over ten pulleys P_1, and is attached at the other end to the 'drum' *d*. The 'drum' is worked by the power rope W_2, by means of the 'crab' K, and when in motion, the 'tongues' rise or fall in the 'sloats,' and the scenery is raised or lowered as required. The counterweight C is regulated by the weight of the scenery. In the diagram, the raising of the scenery is being assisted by the counterweights; but by passing the wire W_1 over the 'drum' *d* in the reverse direction, the counterweights can be made to assist in the rapid lowering of the 'scenes.' In the latter case, a brake on the 'crab' K regulates the descent. In Figs. 51 and 52 are given enlarged details of this 'drum' *d*, and it is only necessary to provide a coupling-bar D, which will fit on the square of the spindle of the 'drum' *d*, to raise or sink a number of 'scenes' simultaneously in the various 'slider cuts.' The object of this arrangement is, of course, to allow the spectators to see only one gradual movement of the whole of the scene, no two pieces travelling at a different speed. Enlarged details of the 'sloat' and 'tongue' are shown, with plan, section and elevation of the working parts, lettered in the same way as in the general diagram. Two different kinds of 'drums' are also shown.



D'OYLY CARTE'S ENGLISH OPERA HOUSE, LONDON: STAGE.
FIG. 48. DETAILS OF PULLEYS, 'BATTENS' AND 'TONGUES.'

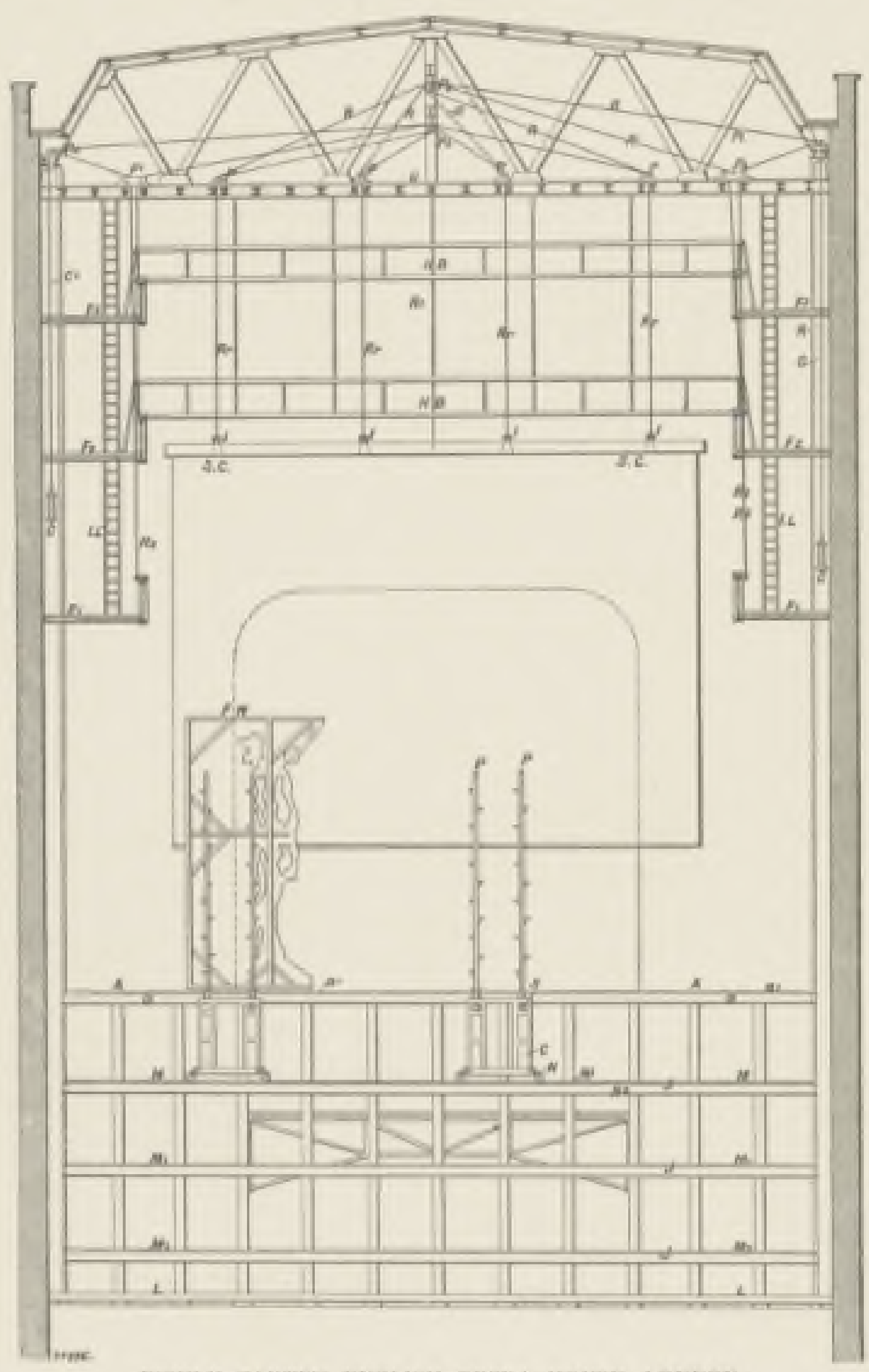
As to the 'chariot and pole' of Walter Dando's stage, it should first be again observed that the 'chariot slits' are taken right across the stage floor. Details of the construction of the 'slit' are given in Fig. 48, and it will be seen how the opening, when not required, is closed by oak 'fillers.' The 'fillers' are indicated by the letter *g*, and in each 'filler' are two steel pins g_1, which run in continuous grooves or slots *h*, formed at the top of the cheeks f_1 by undercutting the stage floor-boards. The oak 'fillers' can be pushed along in front of, and after, the 'chariot' as it travels across the stage, so that no 'cut' or opening is visible to the eye. They can be easily lifted out or put in place, for they are made in several sections to the length of the 'cut,' and the adjacent portions of the stage flooring are provided with small vertical openings, h_1, through which the steel pins of the 'fillers' drop into the horizontal slots. A sketch of an oak block with such openings has been added. The 'filler' when dropped into the slot, is then pushed along, and held in position by the steel pins, and another 'filler' is inserted. The obvious danger to dancers from a 'cut' being left open or not well closed, is avoided, and the clattering common to the ordinary 'filler' is also done away with.

In Fig. 49 is shown a 'chariot' placed near the centre of the stage, with two 'poles' P P mounted thereon. These 'chariots' have grooved wheels N, running on metal rails N_1, fixed to the timbers N_2. The 'chariots' carry the 'poles' P P, which are supported upon hinged shoes S at the bottom, and each 'pole' is mounted with a metal end. These 'poles' are placed with their greater width at right angles to the 'cut,' so that there may be as small a slit in the stage floor as possible. A framed 'wing' F W is shown at the side of the stage ready mounted, to be pushed on by means of the 'chariot.'

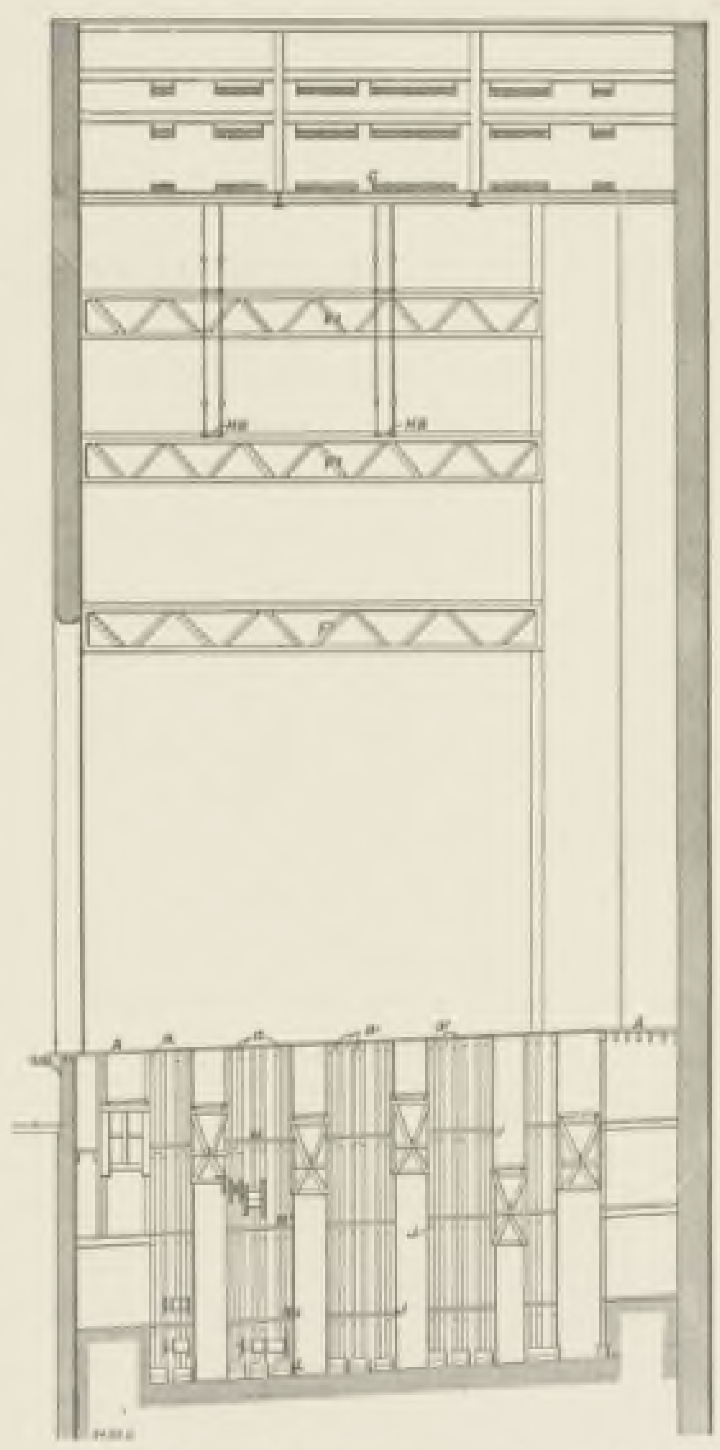
Speaking generally of the 'under machinery' of this stage, I would observe that wood has again been used for the principal part, though iron has been introduced in much of the detail, including such appliances as the 'bridges.' The 'under machinery' is of deal, with oak 'bearings' and linings, iron 'bridges' and 'crabs,' steel ropes and metal fittings throughout. A special feature of the design is the substitution of pulleys and counterweights for the cumbersome system of 'drums.' The advantages of this improvement were explained in connection with the preceding example.

In the 'upper machinery' more metalwork is used than under the stage floor level, for, besides there being a roof supported by ironwork, the 'gridiron' framing and the 'fly galleries' show girder-work. There are three tiers of 'fly galleries,' F_1, F_2, F_3, on each side of the stage, connected with each other by iron ladders I L, which lead also up to the 'gridiron' level G. The two upper tiers of 'fly galleries' are connected by 'hanging bridges' H B. The 'gridiron' floor is carried by the roof principals. Upon this floor are fixed four sets of pulleys, and over these the steel ropes pass from which the scenery is suspended. In Fig. 48 I give details of these pulleys.

The hanging scenery is attached to a specially designed 'batten,' and from the details (Fig. 48) it will be seen how this 'batten' is made so as to lessen the wear and tear of the 'cloth.' Under ordinary circumstances the 'cloth' of the English theatre is nailed to a roller, and the ropes are passed round it and through a hole made in the canvas. Where this method of attachment is in vogue there is considerable risk of damage and much undue wear and tear, while the difficulty of adjusting the 'cloth' and of making it hang straight involves a great loss of time. With Dando's 'batten'—which is always left hanging—the wire rope is attached to an iron clip, which passes down one side of the so-called permanent wood 'batten.' To attach a 'cloth' to it, a second wood 'batten' is screwed into the permanent one,



D'OYLY CARTE'S ENGLISH OPERA HOUSE, LONDON: STAGE. FIG. 49. TRANSVERSE SECTION.

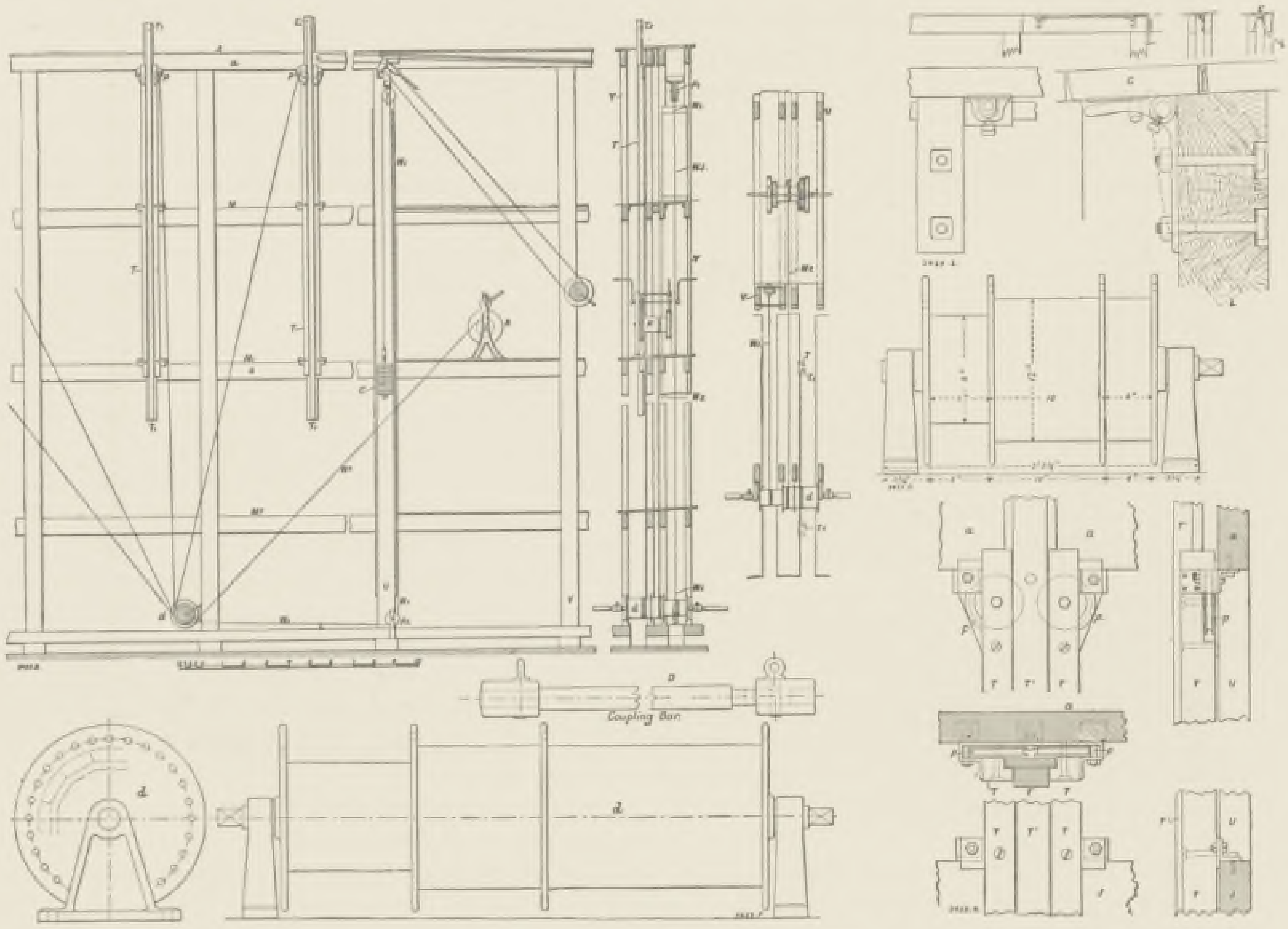


D'OYLY CARTE'S ENGLISH OPERA HOUSE, LONDON: STAGE. FIG. 50. LONGITUDINAL SECTION.

the canvas being fixed in between the two and then screwed up tight. To release the 'cloth,' the screws are loosened and the 'scene' slipped out. There is no nailing whatever.

On the section (Fig. 49) is shown a 'scene' fixed to the 'batten' S C, and hanging by four steel ropes R*r*. These four ropes R*r* are taken up and passed over the pulley P, and then around the 'sheave' pulley P_2, over the 'sheave' pulley P_4, down into the 'shaft,' where they are attached to counterweights. The power rope R_1 is fastened to the centre of the 'batten,' and is led over the 'sheave' of the pulley P_1 down to the 'fly' gallery. By pulling this rope the counterweight C runs down, and the 'scene' is evenly raised. The rope R_2 also leads to the 'flies,' and passes over the pulleys P_1 and P_4, and is then attached to the counterweight, so that by pulling this rope the counterweights are raised, and the ropes R and R_1 are run out, and the scenery lowered. To distinguish the rope by which the raising is effected, from the rope by which the lowering is carried out, coloured strands are woven into the ends. The 'scenes' are operated from either of the various 'fly' levels, according to the convenience of the moment, and are so counterbalanced that one man can, with ease and alacrity, raise or lower any of the 'scenes' by working the ropes R_1 or R_2 by means of a 'crab.' By carrying all the counterweight wires and working lines into the middle of the 'gridiron' over the centre pulleys, P_2 and P_3, the use of the 'long and short line' is obviated.

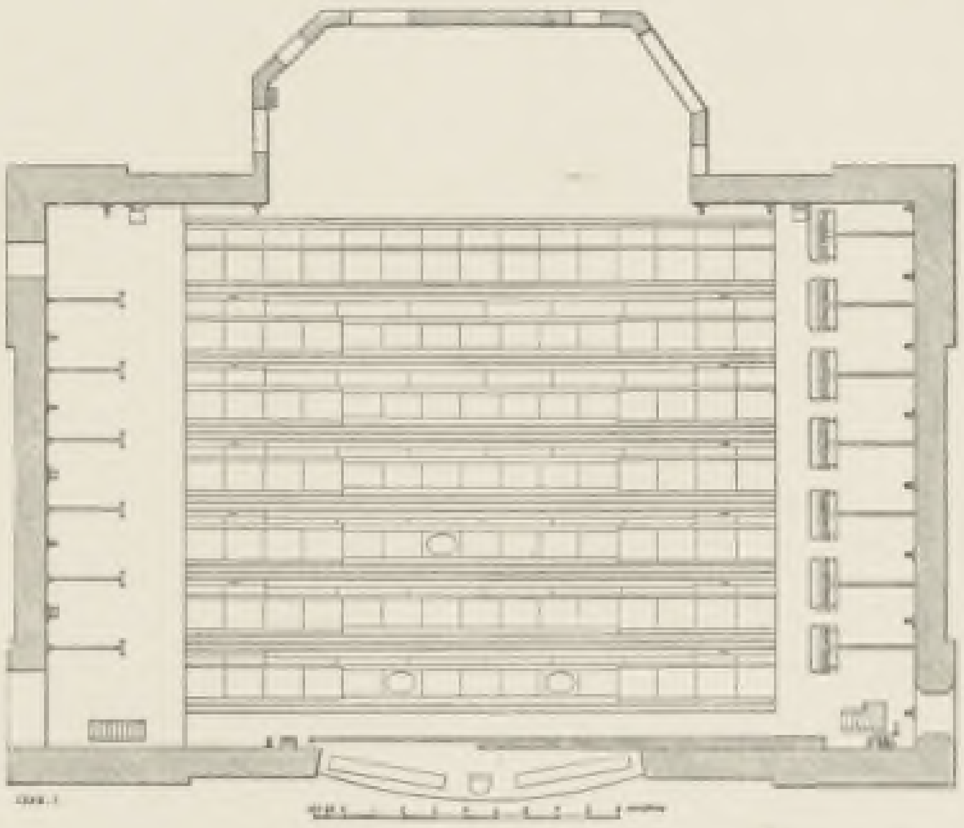
The engineer of the English Opera House has not confined his attention simply to the constructive parts of the stage machinery, but has introduced many contrivances for facilitating the mounting of 'scenes.' Among other minor appliances I would notice his adjustable attachment for suspending a 'batten' to carry a ceiling-piece at any required angle (Fig. 45). A screw is fixed in a frame attached to the ceiling-piece, and upon this screw a 'nut' is mounted, to which the suspending chain is attached. The number of these suspending chains depends, of course, upon the size of the ceiling-piece. By turning the screw the 'nut' is caused to travel and place the ceiling at any required angle. A detail of the counter-weight iron used by Walter Dando is also given. The counterweights have a cut, by means of which they can be slipped sideways upon the narrow part of the iron, and then passed down to where the larger part of the iron falls in line with the hole. Various sizes and shapes of counterweights are shown in the diagram, but special attention should be drawn to the one which has 'leg' pieces, W_8. These obviate any rattling noise, especially when a rubber disc x is inserted between the weights. I would point out, in reference to the counterweights, that if the whole distance from the 'gridiron' to the 'cellar' cannot be used for the drop of the counterweight, then a counterweight-iron with a single-purchase pulley, as at y, can be substituted, by means of which a gain of about half the distance travelled by the counterweight W is obtained on the length of the wire.



D'OYLY CARTE'S ENGLISH OPERA HOUSE, LONDON: STAGE.
FIGS. 51-52. DETAILS OF 'UNDER MACHINERY.'

THE STAGE OF THE COURT THEATRE, SCHWERIN.

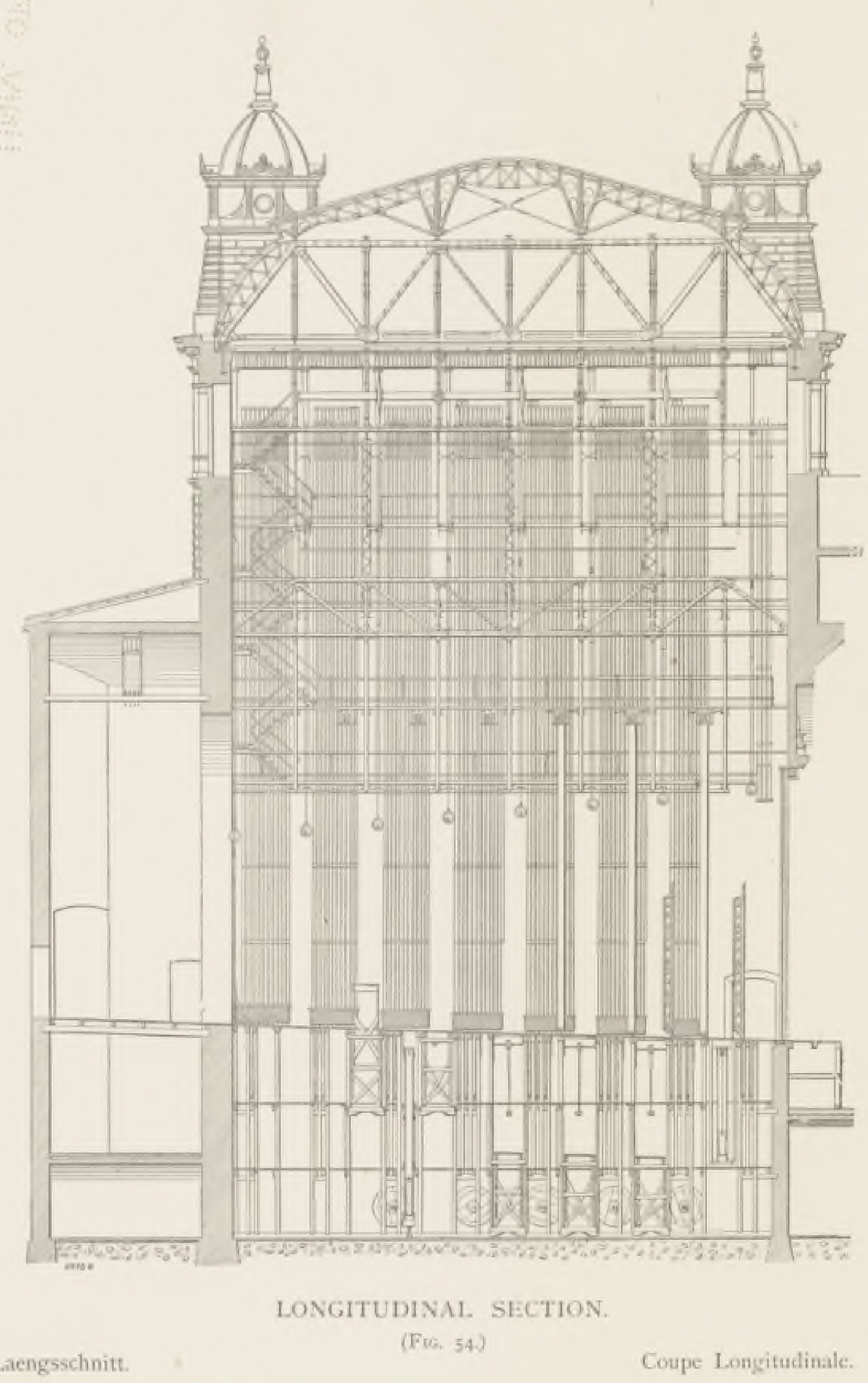
IN the illustrations of the stage machinery of the Schwerin Theatre, I present a type of stage somewhat common in Germany, representing the transition state between those constructed entirely of wood and those built up solely of iron. Wood is still used throughout the 'under machinery' at Schwerin, but everything in the 'fly galleries' and 'gridiron' is of iron, with the exception of the floor boards. Hence the example specially calls for attention on account of its 'upper machinery'; it, perhaps, also deserves more than usual consideration, as one of the first instances in which the stage mechanic, Karl Lautenschlaeger, of Munich, was enabled to use iron for part of his construction. It has also served as a basis for many of the more advanced stages. How it came about that only the 'upper machinery' was constructed of iron, or how it happened that iron was introduced at all in this building, must be explained by the fact that the theatre was burnt down on the night of April 16, 1882, when a conflagration destroyed practically everything in the old block. As usual, directly there has been a destruction of property in this way, some effort is made to prevent a repetition of a similar catastrophe, and as the fire on a stage generally first affects the appliances above stage floor level, special care was taken that here, at least, fire-resisting materials should be principally used. For so late a date as 1882, however, the improvements might well have even been of a more advanced kind than they were.



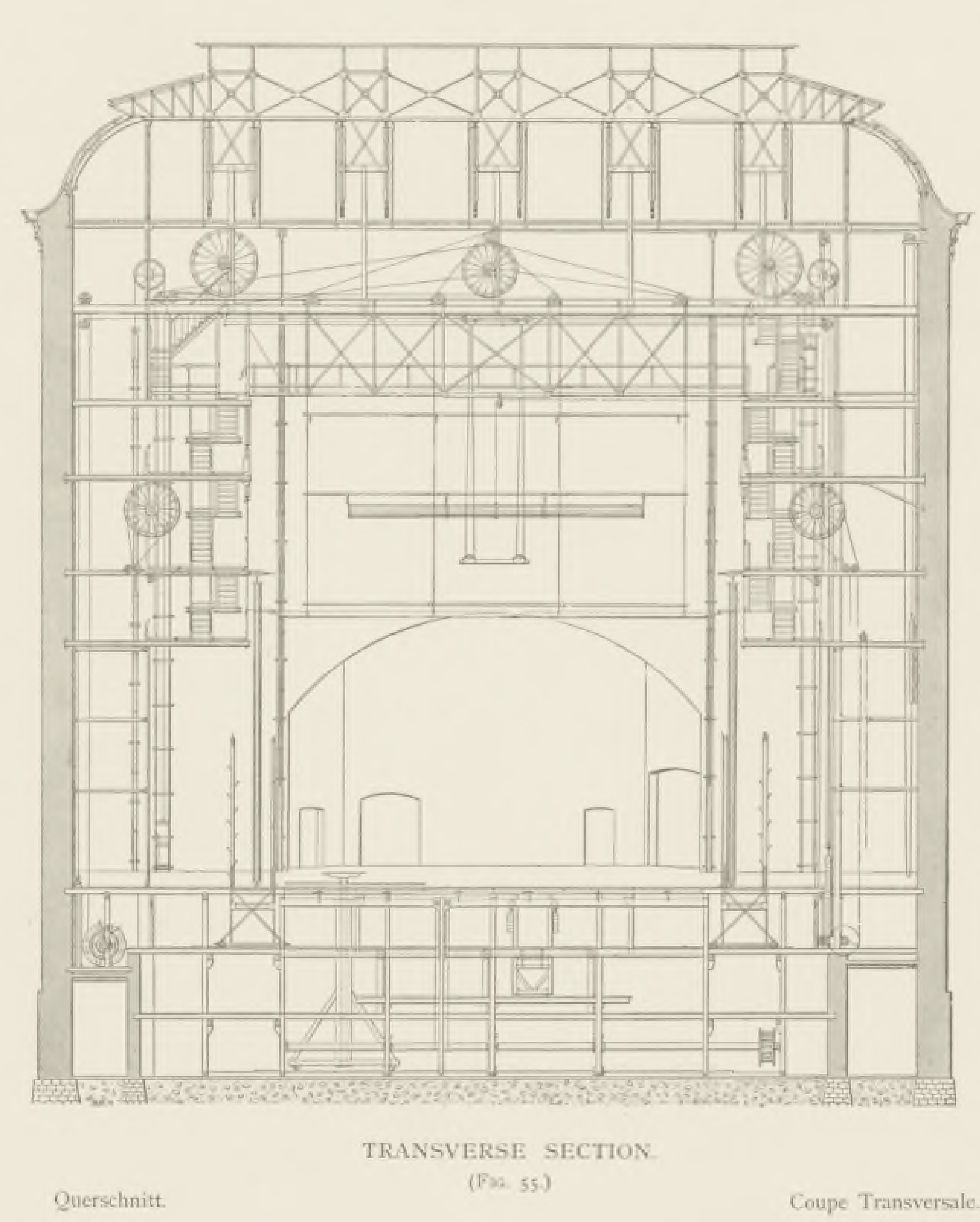
COURT THEATRE, SCHWERIN: STAGE.
FIG. 53. PLAN OF STAGE FLOOR.

I have found it advisable, in dealing with the various types of stage construction, first to call attention to the arrangement of the stage floor, and in this instance I will commence by pointing out that the plan (Fig. 53), though essentially of German design, shows the adoption of the French system of arranging the counterweight boxes some distance from the side walls instead of close up against them. This location of the counterweight boxes allows for the provision of six small 'scene-docks' on each side of the stage, into which the 'wings,' small pieces of scenery, 'rostrums,' etc., can be rapidly moved. There is a dock for each sequence of 'traps,' so that the 'wings' belonging to each 'entrance' can always be kept in the dock opposite it. The sequence of the 'cuts' shown in the stage floor plan, is based upon the system of the old German wood stage. First, there are next to the proscenium opening two 'slits' for the 'chariots' and 'poles' which support the painted 'curtain-wings' used to regulate the width of the proscenium opening in accordance with the requirements of each particular 'scene.' After these two 'chariot slits' comes a 'bridge,' which has a length rather less than the measurement of the proscenium opening, and is divided into seven sections, each of which can be removed separately, so as to make one or more small openings, or moved together to leave one large opening. I should add that any one of these seven sections can be replaced by the covering 'slab' of a movable or framed 'trap' somewhat similar in construction to the English 'star' or 'corner trap,' the appliance itself being movable and placed under the opening. On the German stage this appliance goes by the name of 'Transportable Versenkung,' and it is much used, even for raising single pieces of furniture, etc., and where a quick change of 'scene' obviates much porterage. I have stated that the 'bridge' is divided into seven parts in a distance rather less in length than the measurement of the proscenium opening. These seven sections are made to slide under four others on each side of the stage, which, in their turn, can also be removed when occasion calls for an opening in the stage floor of greater width than that of the proscenium. This would, of course, be only in exceptional cases, the actual working part of the 'bridge' being composed of the seven sections first described. When the stage manager, however, wishes to move bodies of men quickly up on to the stage, representing, for instance, their approach up a ravine, these side 'slabs' can be removed to allow headroom for those who are marching up the gradient.

Following the first 'bridge' on the Schwerin stage, comes a 'slider,' the floor of which is divided into six



LONGITUDINAL SECTION.
(Fig. 54.)
Laengsschnitt. Coupe Longitudinale.



TRANSVERSE SECTION.
(Fig. 55.)
Querschnitt. Coupe Transversale.

Edwin O. Sachs ed:

THE STAGE OF THE COURT THEATRE, SCHWERIN.

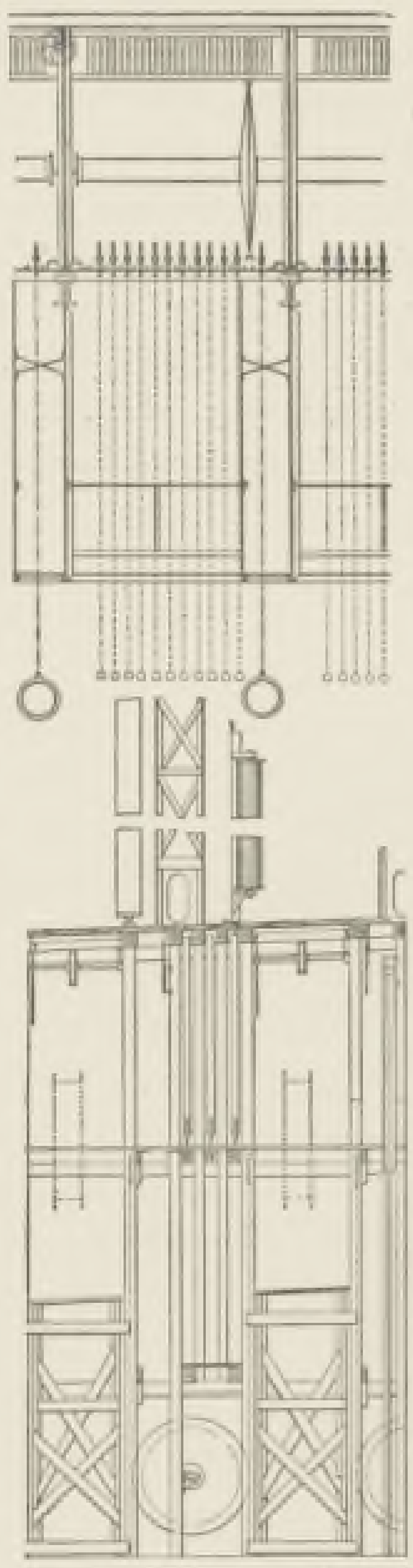
sections, and these, when removed, leave an opening in the stage somewhat greater in length than the width of the proscenium opening. The purposes of the 'slider' are the same here as elsewhere, but, as I have said, the 'slabs' do not slide off sideways on German stages, but work on hinges. The next openings in the floor are a series of three 'slits' for 'chariots and poles,' and then follow again a 'bridge' and a 'slider.' This sequence of three, 'chariot slit,' 'bridge' and 'slider,' is repeated three times, the dimensions being the same. The sequence then recurs twice, but with the variation of only a pair instead of three 'chariot slits,' and a 'slider' of greater width. Behind the whole series is a roomy back-stage. We do not, however, find any sequence of 'traps' continued through this.

In regard to the 'under machinery,' I have already observed that it is constructed entirely of wood, no modification having even been made in respect to the main supports, and the whole of the uprights and framing of the stage floor being of oak. There are heavy joists running between each line of openings in the stage floor, as in the English wood stage. Each joist is supported by seven wood posts which rest upon continuous sole-pieces running from back to front in the basement. The 'mezzanine' floors are supported by joists resting on brackets bolted to these wooden posts. It will be noticed, on reference to the longitudinal section, that where groups of 'chariot slits' occur, only the two outside uprights are carried down to the 'cellar' level, the intermediate posts being supported by cross-pieces which are fixed between the outside posts at the second 'mezzanine' level. The object of this is to allow room for the five rows of big 'drums' which occupy so much space on the 'cellar' floor.

I have already referred to the 'Transportable Versenkung,' used in connection with any section of a 'bridge.' The transverse section (Fig. 55) shows how this 'trap' can be moved on rails along a platform called the 'Versenkungtisch,' whilst the manner in which this 'trap' is worked with the aid of the so-called 'Versenkungswalzen,' can also be clearly seen by the transverse section.

There are two 'mezzanine' levels and a 'cellar' floor to the stage, and in the first 'mezzanine' run the rails for the 'chariots.' The framework of the 'chariots' themselves—'Kulissenwagen,' as they are termed—is here constructed of iron, the 'poles' dropping into iron sockets, and being furnished with iron angle-pieces for clipping on the 'wings,' and with iron stepping-pieces to allow the stage hands to climb up them to fix the scenery. There are two 'Kulissenwagen' to each 'chariot slit,' and each one is provided with two 'poles.' Each 'chariot' at Schwerin can traverse the full width of the stage. We do not find the 'ladders' of the French 'chariots' on the German appliance, nor the third 'chariot' to each 'slit,' which is used for fixing trees and other small 'pieces.'

The first four 'sliders' are used for the passage of framed 'scenes' by means of 'sloats.' On the transverse section a 'sloat' is shown in detail, and it will be seen to comprise simply a wooden box, and a wooden 'tongue,' the latter being raised and lowered by ropes passing over 'pulleys.' The fifth 'slider,' as I have already remarked, is wider than the front four; and this one is furnished with a piece of mechanism, known in Germany as the 'Casettenflugwerk,' which is shown on Fig. 55. The object of the 'Casettenflugwerk' is to raise a person or piece of scenery up from the stage level to any required height. By increasing these appliances any number of figures can be grouped in a 'scene,' and moved up or down as required. Such mechanism as this is of great value in pantomime transformation scenes, or in large spectacular ballets. Here the appliance is built-up entirely of wood, and is raised and lowered by means of the ordinary 'drum and shaft' in the basement. It is interesting to note this primitive form in wood construction used to raise objects above the stage level, as the requirements of the 'Casettenflugwerk' may be looked upon as having influenced the hydraulic stage, where the raising of various parts above the floor level forms one of the characteristics of the conception.



COURT THEATRE, SCHWERIN: STAGE.
FIG. 56. DETAILS.

Five rows of 'bridge cuts'—that is, from the second to the sixth, inclusive, are furnished below with 'bridges' proper, framed up in wood as in the English stage, but differing by the further development of a rising platform or 'table trap' within the 'bridge.' On the longitudinal section and in the details (Figs. 54 and 56) will be seen the component parts of these 'bridges.' They can be lowered to the 'cellar,' and raised to the stage level, and, when in the latter position, the 'table trap' can be raised so as to hold anything up above the stage level. Although this 'under machinery' is constructed in wood, yet I cannot but point out that the developments here again are such as forecast many of the characteristics of iron stages.

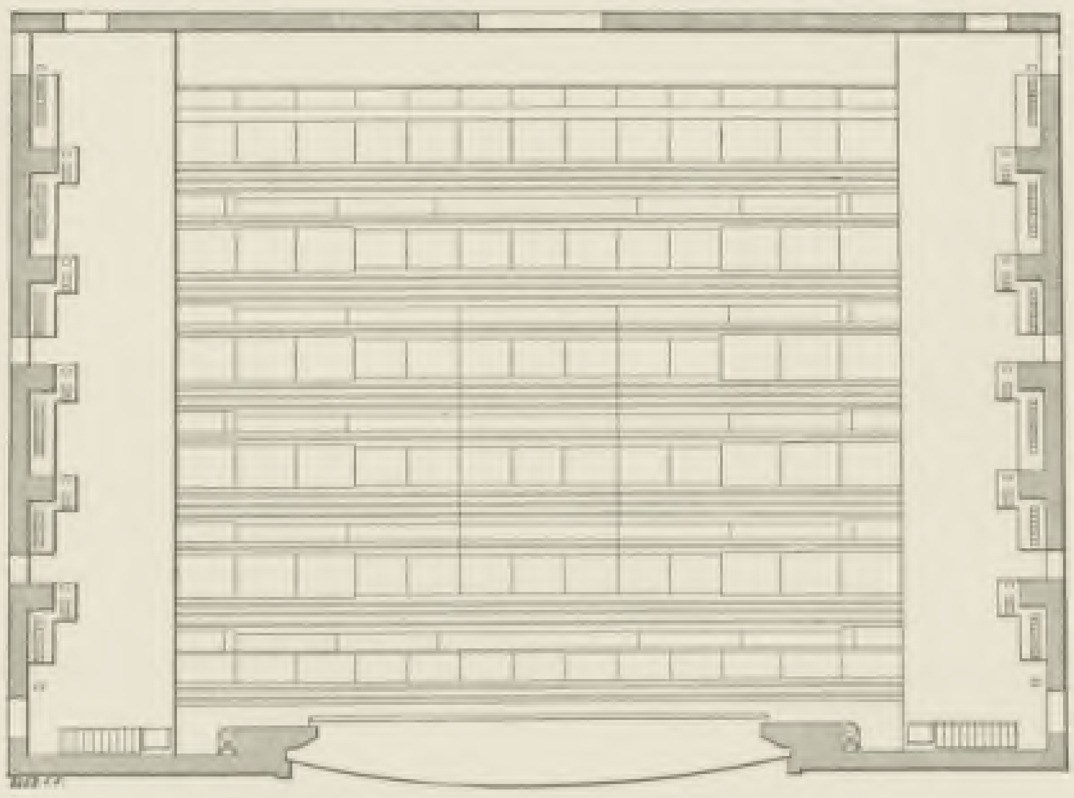
Referring to the 'upper machinery,' I should call attention once more to the use of iron in the construction of everything above stage floor level. In the first place the partitions dividing the six 'scene-docks' already referred to, consist of light skeleton iron frames. There are four tiers of 'fly galleries.' Two deep built-up girders at the level of the third tier pass from the front to the back wall of the stage and form the main support for the three lower galleries. As will be seen from the illustrations, the three 'fly galleries' are practically hung from this girder in the same manner as the fourth 'fly gallery' is hung from the 'gridiron.' Each tier or level of the 'flies' is connected with the others by means of iron staircases, and the upper level is provided with 'flying bridges' extending from side to side of the stage. These 'bridges' are here hung up from the 'gridiron' floor above, and there are the same drawbridges at each end as I have already described. There are seven 'hanging bridges,' one over each 'bridge cut.' On the floor of the second 'fly gallery' are placed adjustments for fixing the top of the 'panorama drums.' The longitudinal section shows three of these 'drums,' but there is provision for six on each side of the stage. Each 'drum' revolves on an iron base-socket. The two large wheels on either side of the 'gridiron' floor are used for working the 'panorama.'

There is only one 'gridiron' with three sets of 'drums and shafts' for raising and lowering the scenery, 'battens,' etc. These 'drums,' I would point out, differ materially from any we have seen in earlier examples of stage machinery, for instead of the heavy and clumsy wooden 'drum' taking up so much valuable space, we have a light wheel of iron construction, with iron spokes, and a 'groove' in the rim over which the ropes run. The central 'drum and shaft' are for working the hanging scenery, the ropes from which are collected over pulleys in the 'gridiron' floor to a central pulley hung from the roof principal; from thence the ropes are passed on to a 'shaft.' The 'shaft' is made to revolve by the rope on the iron 'drums' passing down to the windlass and counterweights in the 'flies.' Immediately under the 'gridiron' floor is hung a rail, upon which run the wheels of the 'traveller' or 'Flugwerktraverse.' This is a suspended framework of iron, which, by means of an arrangement of cords, can be made to travel backwards and forwards across the stage, at any height, and can be raised from the floor at one side to the 'gridiron' at the other, or made to take any straight or curved line of flight desired.

IRON STAGES.

THE STAGE OF THE MUNICIPAL THEATRE, AMSTERDAM.

WITH this chapter I commence the third and most important section of my subject, for under the heading 'Iron Stages' I propose describing such examples of stage construction as might reasonably be expected where the term 'modern' is applied. Generally speaking, this term implies the use of metal in the construction of the appliances, and some motive power other than manual labour in its working. Unfortunately, however, this assumption is by no means correct, as there are many new theatres which (flauntingly) boast of their 'modern' appliances, and yet show nothing better than an antediluvian wood stage, with perhaps, at the most, some improvement of little or no importance. England, as I have already had occasion to state, has been conspicuously backward in adopting the improvements which can be seen in many of the stages of Continental countries; and I have only been able to present one example of a wood-and-iron stage illustrating the most advanced piece of construction to be found in the playhouses of this country. There is, strictly speaking, no iron stage in Great Britain, and, with one or two exceptions where some special effect has been attempted, steam, hydraulics and electricity have not yet been applied to the working of our scenery. I feel compelled to emphasise the fact that there has been an almost entire absence of any application of modern science and methods in the interest of stage management, as far as England and its metropolis are concerned, and that I can, therefore, throughout this section of my subject, deal only with the outcome of foreign ingenuity and enterprise.

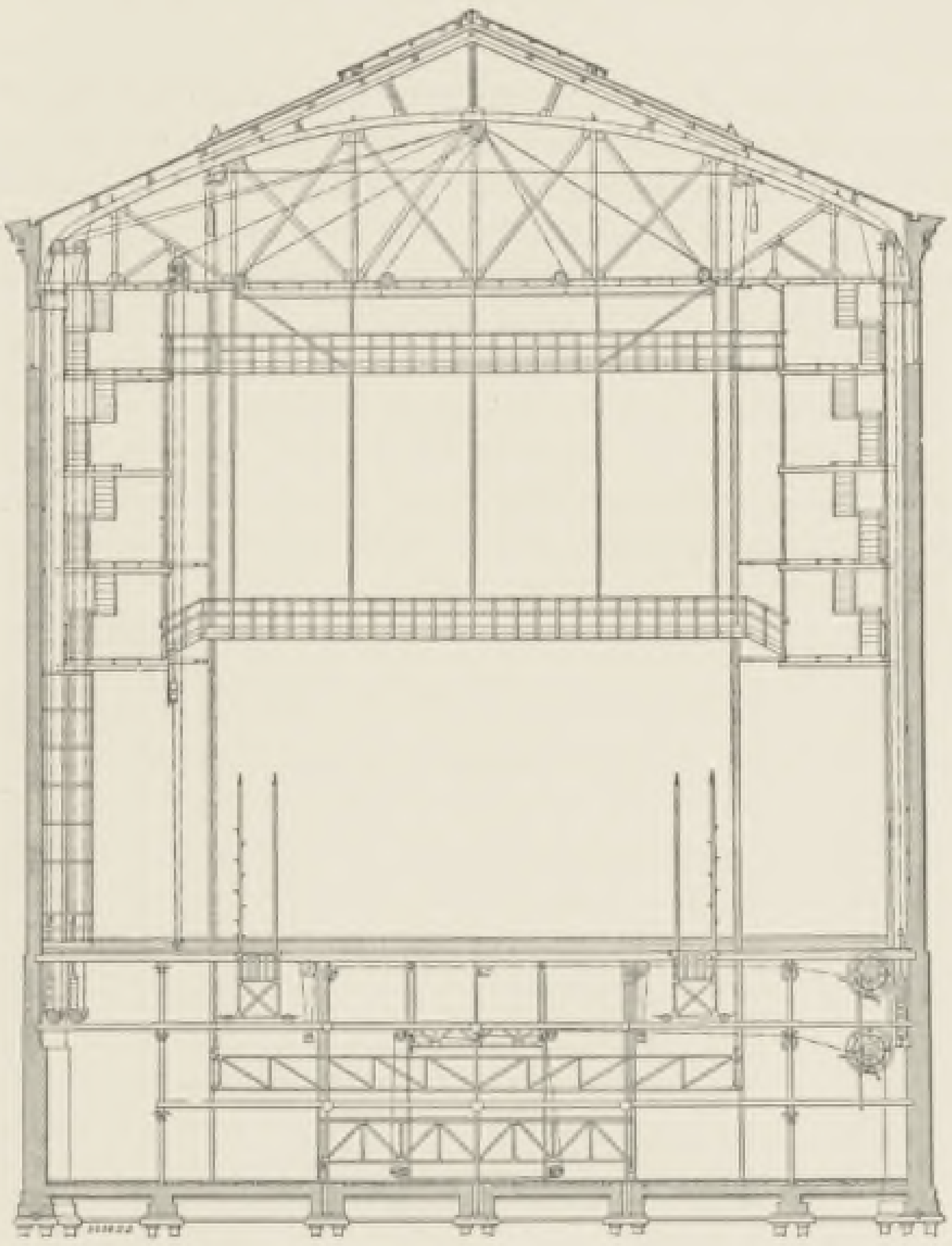


MUNICIPAL THEATRE, AMSTERDAM: STAGE.
FIG. 57. PLAN OF STAGE FLOOR.

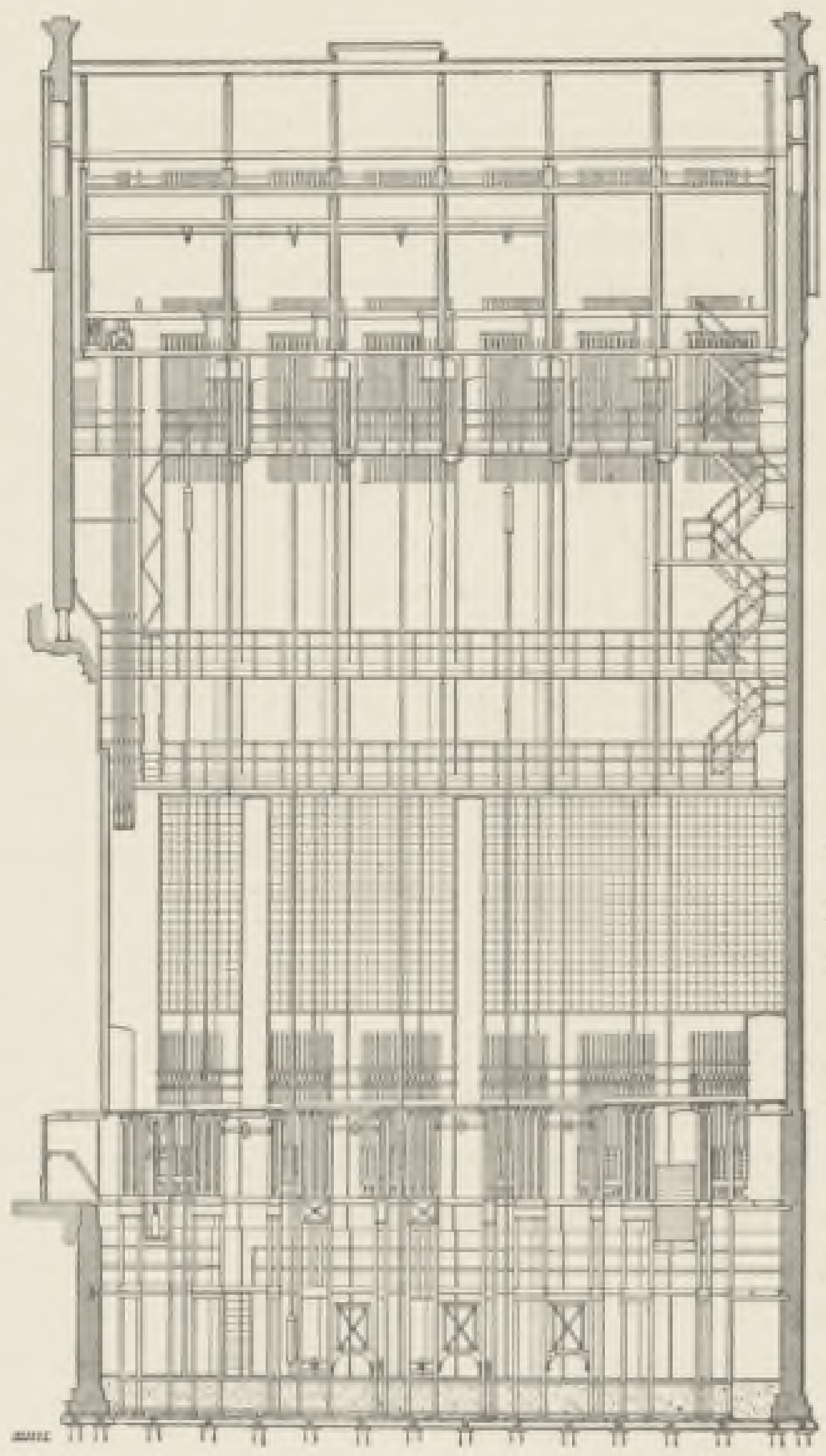
The wood stage has been referred to at some considerable length, primarily with the view of showing the manner in which the elementary requirements of 'Stageland' have been fulfilled. My descriptions of the wood stage have also given me ample opportunity for explaining these requirements, and, further, for recording a large number of technical expressions used in the theatres of various countries. The wood-and-iron stage represented a transitional period in stage mechanism; the actual requirements were elaborated and became more complicated, and there was a slight tendency to adapt the results of modern science to the purposes of the theatre. The examples which illustrate the Continental iron stage will now, on the one hand, show to what extremes this tendency has gone under the guidance of those who advocated *radical* 'Stage reform,' and, on the other, to what practical results this extremist movement has led.

I have explained in my Introduction how the primary object of the originators of the foreign movement was the closest imitation of nature, and how their efforts, carried to extremes, resulted in crude realism. The excessive modernising of the scenic artist's auxiliaries also frequently meant a disproportionate complication, uncertainty, and expense for the management, as compared with the advantages gained therefrom. I am, however, fully illustrating some of these 'extremist' efforts in stage mechanism, in the same manner as I am presenting examples which are the outcome of *practical* reform; for, whatever may be said against any of the costly attempts which have afterwards undergone material modification, it has been due solely to the radical reformer that the actual results of to-day have been obtained, and there is little that is more instructive in the history of modern stage mechanism than the record of the work due to his initiative. A perusal of some of these experiments will perhaps prevent more unprofitable labour and outlay in a wrong direction, and may serve as a basis for further practical developments.

My first example of an iron stage worked by manual power is that at Amsterdam, which shows an exceptionally clear disposal of all the more important appliances of the earlier stage, with material improvements. This Amsterdam example presents a very perfect piece of metal construction, in which the extended requirements of the more elementary stage have been fulfilled without unnecessary complication, and it also forms an excellent connecting link between the last-named instance of wood-and-iron stage at Schwerin, and the more advanced types of stage mechanism. The stage is self-contained, and surrounded by a thick wall, with only such openings in it as are necessary for the due performance of the 'business' of the theatre. It is sufficiently lofty for its purpose, but, unfortunately, difficulties in the foundations did not allow the architect to give the 'under machinery' any considerable depth. Its design is based on the lines of the old German wood stage, and as an adaptation of a different material to the principles involved, the Amsterdam stage is, in many respects, a model example. It should be particularly noted that there has been no attempt at radical 'Stage reform' in this



MUNICIPAL THEATRE, AMSTERDAM: STAGE.
FIG. 58. TRANSVERSE SECTION.



MUNICIPAL THEATRE, AMSTERDAM: STAGE.
FIG. 59. LONGITUDINAL SECTION.

case, but simply an endeavour to modernise and elaborate, under the special difficulty of a want of depth for 'under machinery.' In this instance, manual labour has not been replaced by steam or hydraulics, and yet the design ranks high amongst the most modern examples of stage mechanism. Its designer is Karl Lautenschlaeger, who also arranged the Schwerin stage, and hence many of the same characteristics are observable in both.

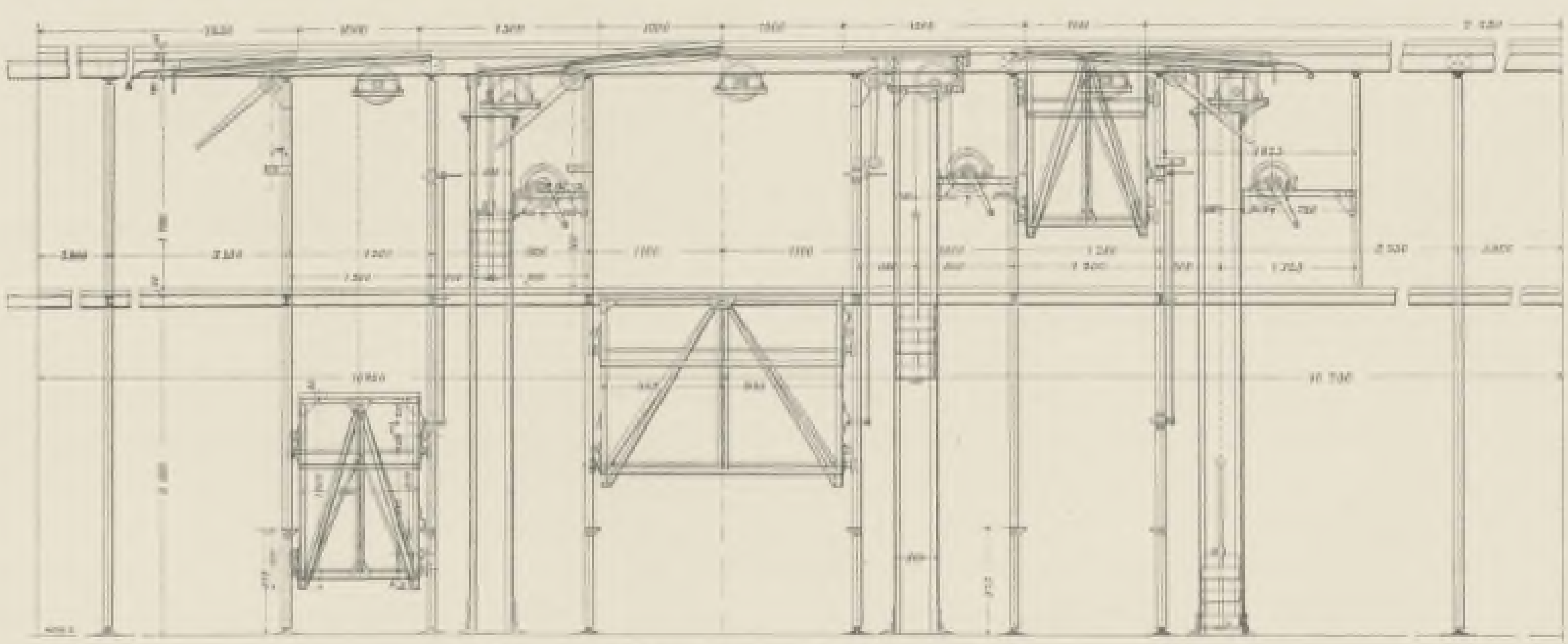
At the Amsterdam Municipal Theatre the stage floor is laid out upon a plan, which at first appears complex, but in reality has the simplicity of regular sequences. Commencing with the front of the stage, we have (Fig. 57) immediately behind the curtain line the first openings in the form of two 'chariot slits' which are used for the 'curtain-wings.' As in many other instances where these 'slits' are used, the openings run right across the stage. After the second 'chariot slit' is placed the first 'slider,' in a somewhat modified form. The purpose of the modification is explained by the term 'Abnehmbarer Deckel,' or movable lid, which allows various 'Personenversenkungen,' or 'traps,' to be placed at discretion, even in rows, forming, if I may call them so, a line of independent 'grave traps.' The first set of 'sliders' proper follow. Then are arranged three 'chariot slits,' followed by the first 'bridge.' From this point the next four groups of openings are arranged in the same sequence of one 'chariot slit,' one 'slider,' three 'chariot slits,' one 'bridge.' A novel feature in this plan, which I have not yet noticed, is the 'Grosse Bodenversenkung,' which allows a large portion of the centre of the stage flooring being removed to form an opening. By an easy combination, this section can be sunk, only one movement on the part of the engineer in charge being necessary to obtain the effect.

The whole of the stage floor is supported upon iron joists running from side wall to side wall. Every joist is held by a number of iron stanchions, and is built into the side walls, whilst, to give extra strength, there are also stout iron columns with box girders running from back wall to front wall at the line between the fixed portion of the floor at the sides, 'Fester Boden,' and the movable portions in the centre of the stage. The only wood used is in the stage floor itself, and in the fillets which are fixed to the joists for working the sliding 'grooves' of the movable parts.

The first 'mezzanine' extends right across the stage from side wall to side wall, but the second 'mezzanine' is only constructed under the centre or working part of the stage, and on one side of it. On the other side, the height is free from the 'cellar' level to the floor of the first 'mezzanine.' On the 'working side' of the stage are placed the 'crabs' which work the whole of the 'under machinery.' As this machinery is entirely of iron, and consequently occupies far less space than if constructed of wood, there is naturally more room below the stage floor than is seen in any other example. On the first 'mezzanine' are the 'chariots,' the framework of which is here braced ironwork with five sockets for the 'poles.' These 'poles' are also iron, and there are two to each 'chariot,' one of every pair being provided with stepping pieces at the sides. The 'chariots' again run on wheels laid on the transverse iron joists of the first 'mezzanine.'

Referring to the 'sliders,' it should be observed that the 'sloats' are here replaced by a long, lightly constructed piece of iron framework extending across the stage to a distance a little beyond the proscenium opening. At either end of this framework, top and bottom, are wheels or runners which glide upon upright rails, and these rails extend from the 'cellar' to the under side of the 'gridiron.' A 'cloth' can, therefore, be fastened to the framework ('Gitter' or 'Casettenzug') in the basement, raised up to show on the stage, and subsequently drawn up out of sight to the 'gridiron.' On the other hand, it can be lowered from the 'gridiron' and disappear under the stage floor through the 'slider' or 'Casettenklappen.' The ropes or wires which work this appliance are attached to each end of the framework; they run upwards by the side of the vertical guide-rails to the 'gridiron,' and pass over pulleys to descend again to the windlasses and counterweights in the 'cellar.' I use the term 'girder-batten' when referring to this appliance.

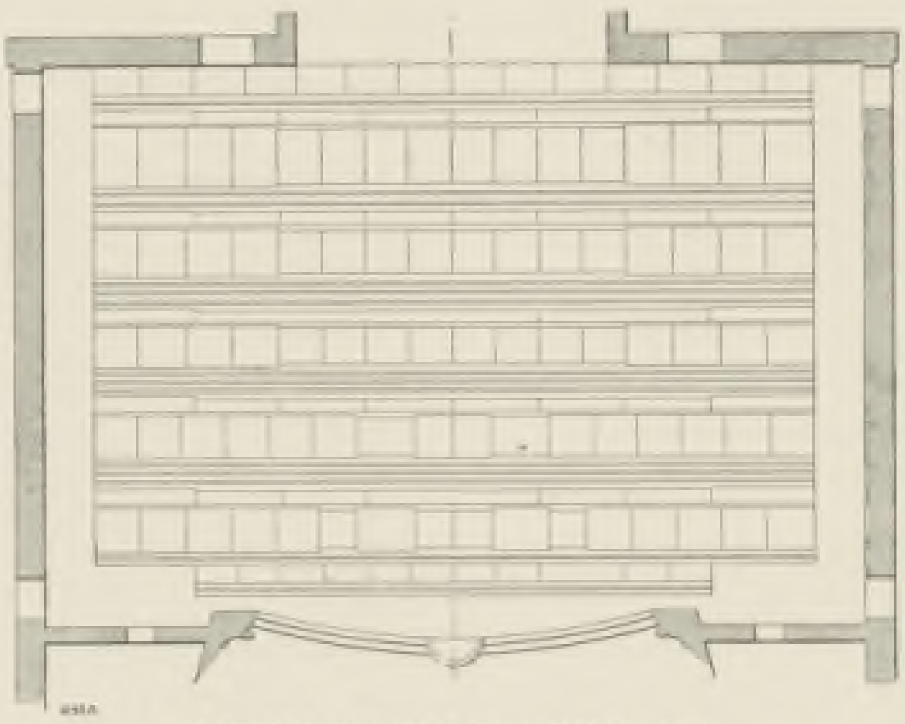
The 'bridges' ('Versenkungen') are also constructed of iron framing, but support a wood-floor or platform. They are raised by means of cables, fixed at the sides, which pass over pulleys immediately under the stage floor, and are finally collected upon the big wheels in the first 'mezzanine.' Upon working the 'crab' the 'bridges' are raised or lowered, counterweights also being employed. The 'Bodenversenkung' is also a framework of iron, running on wheels up the sides of vertical guide-rails which extend from the stage level to the 'cellar.' The manner in which this section of the 'under machinery' is worked is by means of ropes fixed to the sides, which first pass downwards over pulleys in the 'cellar' level and then up again over pulleys leading to the big wheels of the second 'mezzanine.'



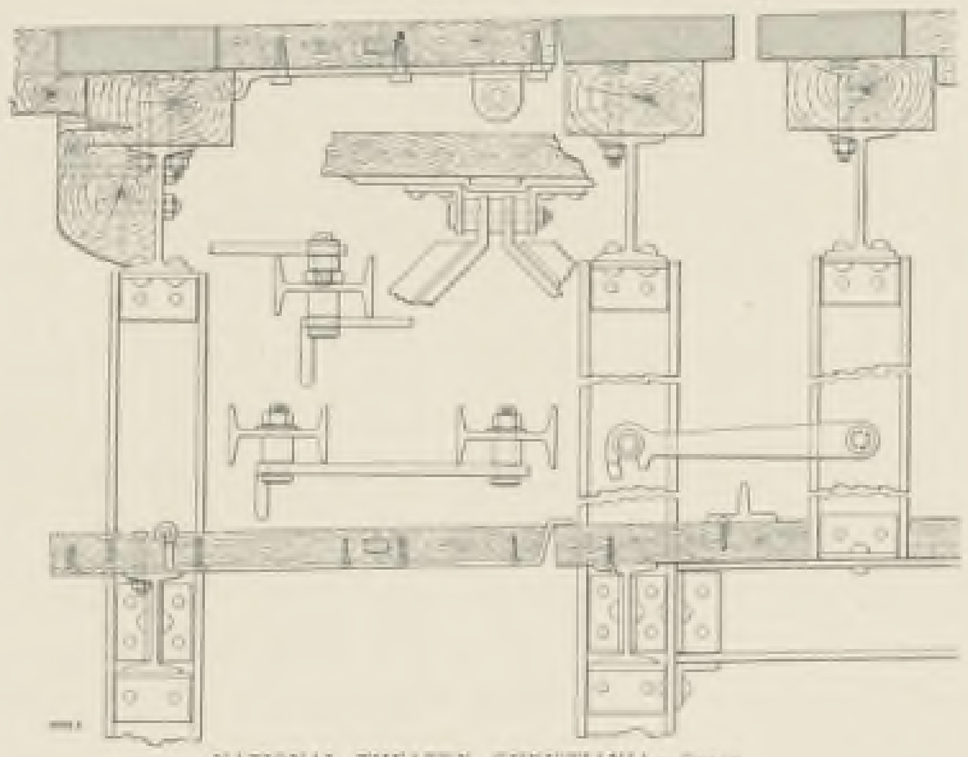
NATIONAL THEATRE, CHRISTIANIA: STAGE.
FIG. 60. DETAILS OF 'UNDER MACHINERY.'

THE STAGE OF THE NATIONAL THEATRE, CHRISTIANIA.

IN the same way that my first example of an iron stage was that of the Amsterdam Municipal Theatre in which Karl Lautenschlaeger showed the application of modern methods without having recourse to the motive powers of hydraulics or electricity, so does my second example show a similar instance where manual labour has to be employed, though in every other way recent requirements are duly met by the use of iron and advanced forms of construction. This second example is the stage of the new National Theatre at Christiania, in course of construction at the present time. Here the designer is Julius Rudolph, whose name is generally associated with the Court Opera House at Vienna, and who is responsible for numerous stages built in Austria and Hungary on almost identical lines with the installation here under consideration. In mentioning the Court Opera House at Vienna it will be remembered that we there found one of the largest wooden stages of the so-called German type, and that this stage stands in a comparatively new building, as the Vienna Opera House was only completed in 1869. It is but natural that the lines of the Vienna stage, more particularly those which have been found advantageous in handling the vast amount of scenery used where there is a constant change of bill, should have been employed by Engineer Rudolph; but at the same time I think that it is only right to mention that the designer, though by no means an advocate of radical reform, is a man who has had the experience of seeing stage mechanism develop through its various phases, from the elementary wood stage to the more complicated forms of to-day, and has always shown considerable interest in scenic effect from the artist's point of view. I will not refer further to this engineer at present, as I shall have occasion to quote his opinions in connection with the more advanced forms of hydraulic stages; but it is always well to bear in mind who the designer of a stage is and what experience he has had, when we are judging an example of his work. As in the case of Amsterdam, as far as the iron stage worked by manual labour is concerned, or Rotterdam, so far as it is an example of the wood-and-iron stage, German influence is naturally again much in evidence in this Norwegian example. This is only natural considering the nationality of the designer, although, of course, local requirements had to be taken into consideration, and, as at Amsterdam, the particular difficulty of insufficient depth under stage floor level had to be contended with.



NATIONAL THEATRE, CHRISTIANIA: STAGE.
FIG. 61. PLAN OF STAGE FLOOR.

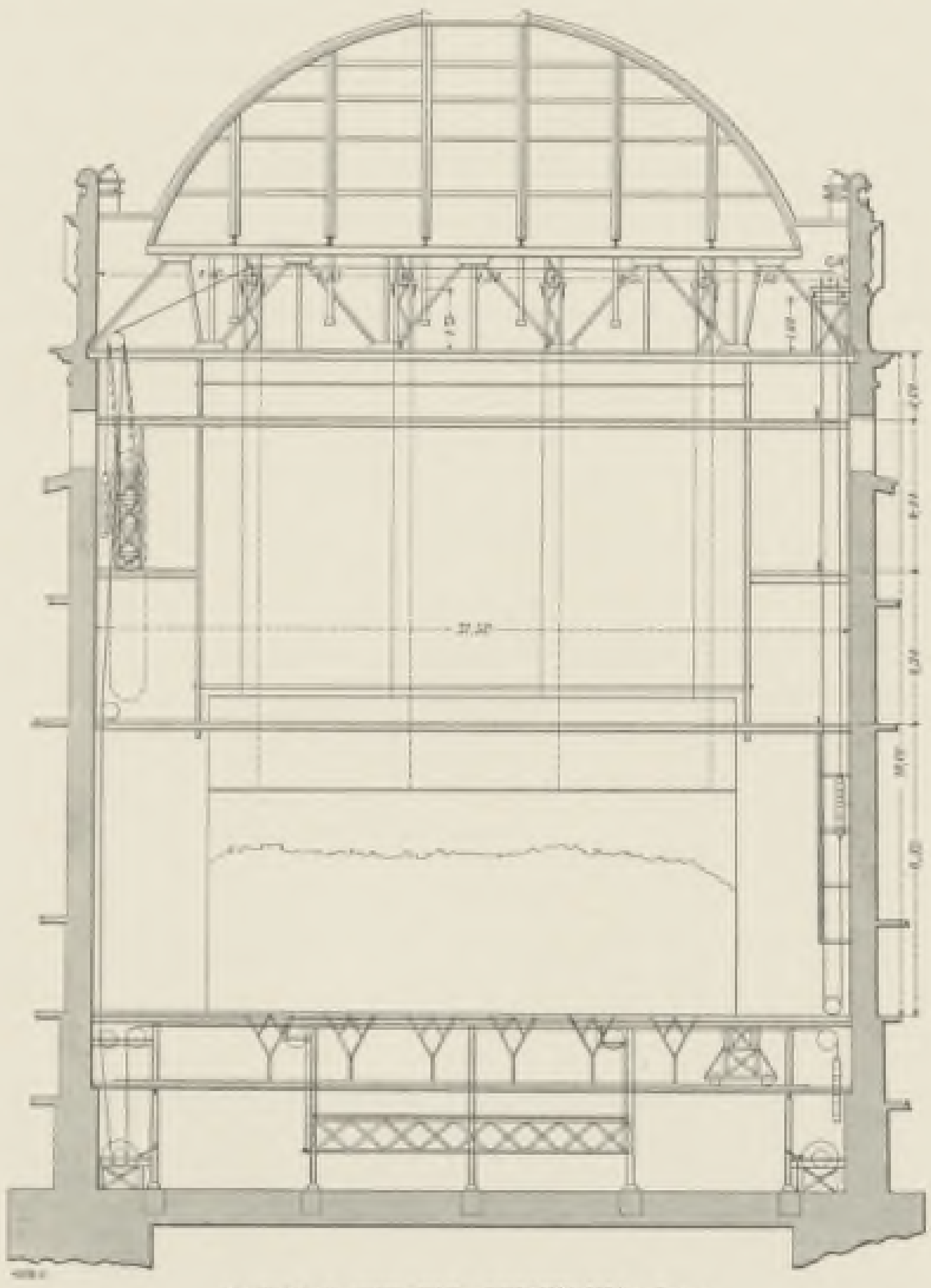


NATIONAL THEATRE, CHRISTIANIA: STAGE.
FIG. 62. DETAILS OF 'UNDER MACHINERY.'

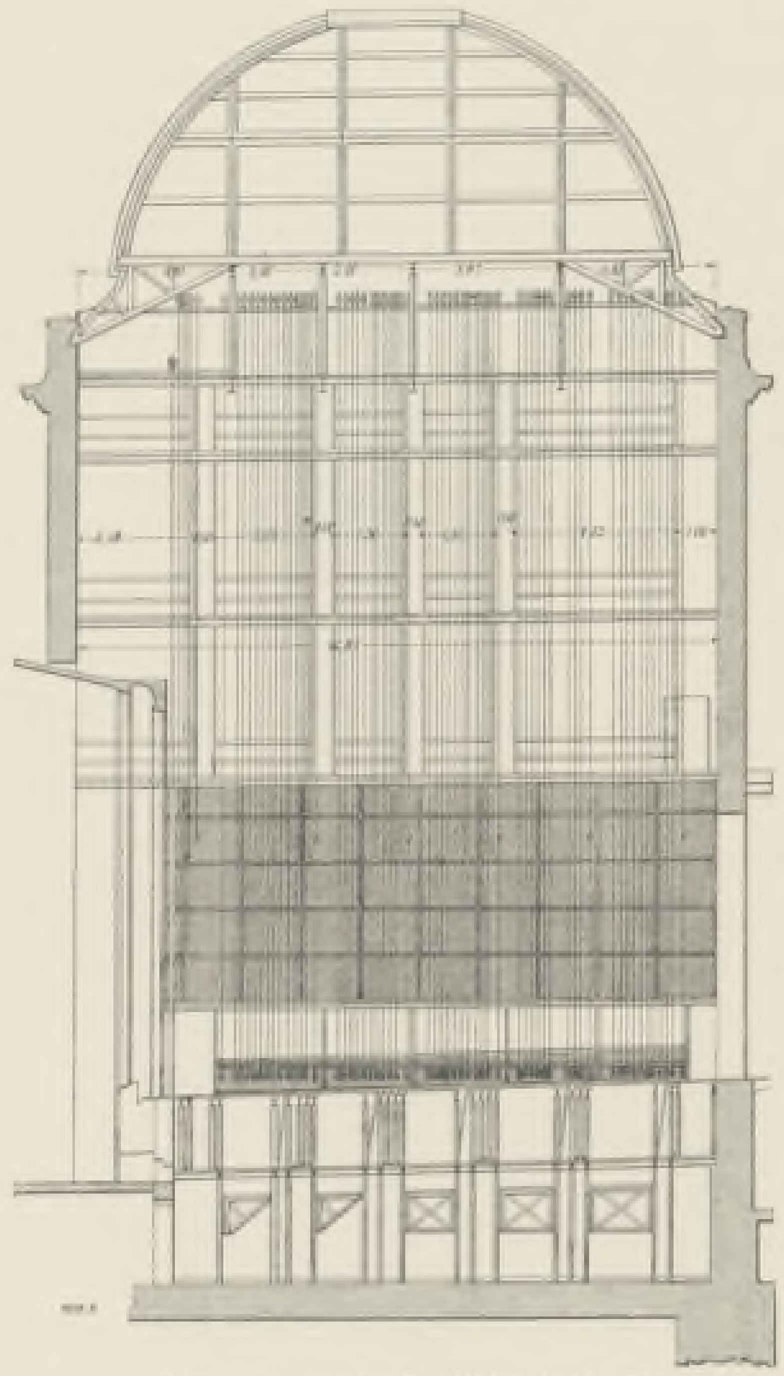
By the bye, it is perhaps needful to remind the English engineer how the German mechanic having systematically set to work to improve the equipment of his own theatre, has practically found an open field throughout Northern Europe. Perhaps, too, from the industrial side I should add that to a very great extent the stages which are put together outside Germany from German designs are actually constructed in Germany, and bodily transferred to the country where they are to be employed. The export of stage appliances has become a recognised section of the German engineering industry.

But let us proceed to examine the lines of the Christiania example before us. As to the division of the floor, the plan explains itself, and I would only observe that the sequences do not show that absolute similarity to one another to which we have been accustomed elsewhere in examples for which German engineers have been responsible. We find, for instance, the first 'chariot slit,' then a set of 'sliders,' another 'chariot slit,' 'bridge cut,' and again a set of 'sliders,' before we arrive at three sequences which comprise each three 'chariots,' one 'bridge cut' and a 'slider.' But even here the two first sequences are narrower than the third. The arrangement which follows is that of two 'chariot cuts,' a 'bridge cut' of extra width, a 'slider cut,' 'chariot slit' and another set of 'sliders,' the latter running close up to the back wall of the stage. It will thus be seen that the width of the 'bridges' increases from front to back of the stage, and if the section be examined it will further be seen that the construction of the 'bridge' varies, for the first two 'cuts' have really only a kind of improved 'trap,' whilst the last three have 'bridges' proper.

Further, examining a section as far as the 'under machinery' is concerned, it will be seen that there is only one 'mezzanine' level above the cellar; but this 'mezzanine' is a complete one and not cut away like the second 'mezzanine' of the preceding example. It will further be seen that the five lines of supports running from back to front are so placed



NATIONAL THEATRE, CHRISTIANIA: STAGE.
FIG. 63. TRANSVERSE SECTION.



NATIONAL THEATRE, CHRISTIANIA: STAGE.
FIG. 64. LONGITUDINAL SECTION.

that the two outside ones are close to the side walls, practically dividing off a space to take the larger pieces of mechanism for working the 'bridges,' as well as the counterweights for the latter.

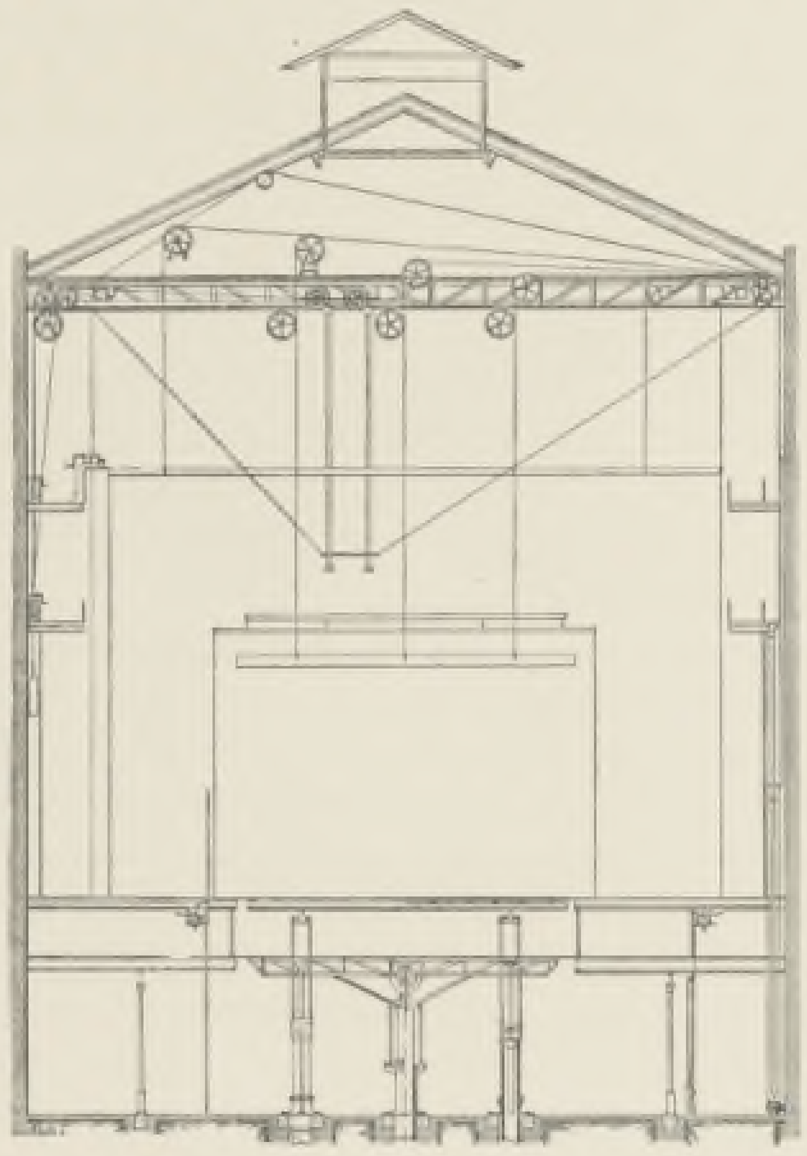
If we lastly turn to the 'upper machinery,' we find three tiers of 'fly galleries' and a 'gridiron' in two levels. The arrangement of the 'upper machinery,' coincides to a great extent with the division of the stage floor plan, for each sequence of 'traps' has its own sequence of 'pulleys' and 'battens.' It will thus be seen that there can be a greater number of 'pulleys' to the broader 'bridges' at the back than there are to the narrower ones at the front. The main dimensions of the stage are 70 feet 6 inches (21·50 metres) in width and 54 feet 9 inches (16·75 metres) in depth, and the height from stage floor at curtain line to 'gridiron' level is 62 feet 3 inches (19 metres), whilst the height of the first 'fly gallery' above stage floor is 27 feet 3 inches (8·25 metres) and that of the second 'fly gallery' 41 feet 3 inches (12·50 metres). The third tier, with its series of hanging 'bridges,' is 6 feet 6 inches (2 metres) below the 'gridiron,' so that the under side of the 'gridiron' floor is easily accessible for passing through the necessary ropes or cables.

As I have indicated above, the Christiania stage is in course of construction, and thus nothing can be said as yet in respect to the working of the actual appliances installed. Other stages constructed from Engineer Rudolph's designs on almost identical lines have proved to be both practical and economical.

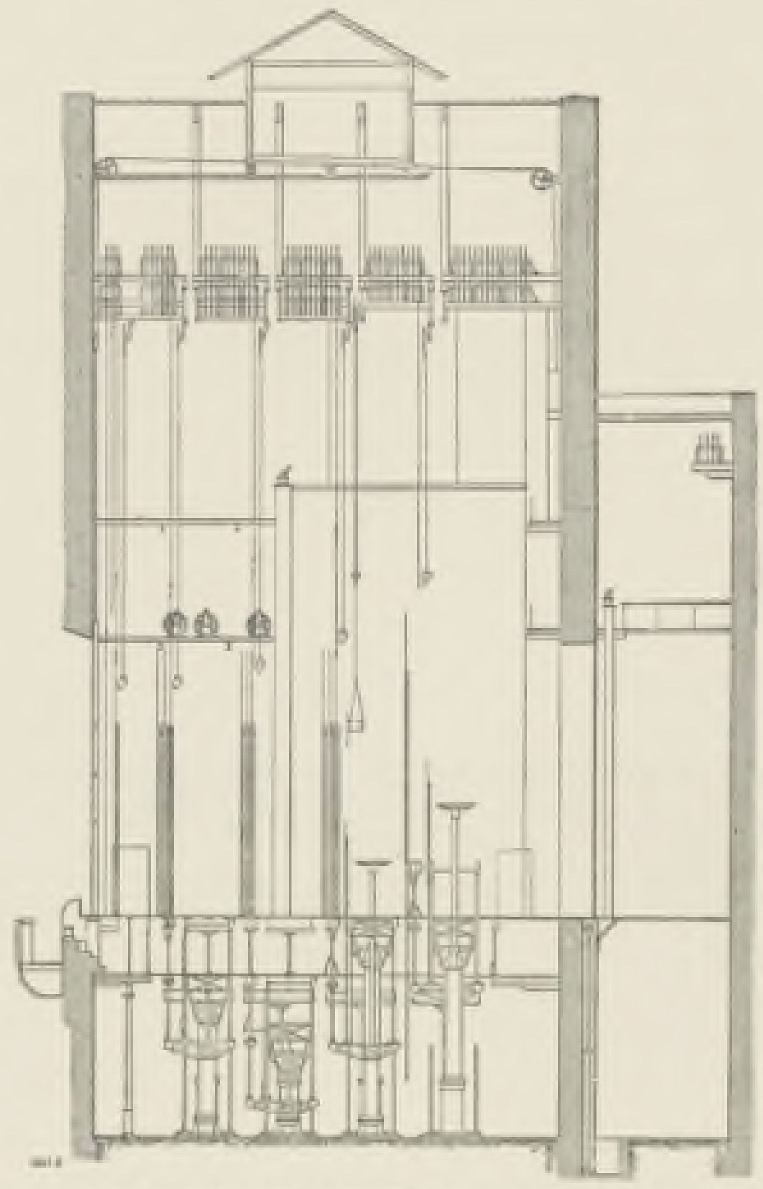
The 'Asphaleia' System.

THE SYSTEM.

As I have already inferred, it is generally considered necessary that an iron stage should be worked by hydraulic power; in reality, however, this idea is quite erroneous. As has already been seen, the two theatres at Amsterdam and Christiania have iron stages, worked entirely by manual labour. There are other examples in which neither hydraulic nor any other more advanced motive power has been introduced, while there are several iron stages generally classified under the heading 'hydraulic,' in which water merely plays a secondary part, and is, perhaps, limited to working some specially cumbersome appliance in the 'under machinery.' The movement known as 'Stage reform' has been far too prominently associated with hydraulics, and I might also say that this is the reason why a stage in which the construction is known to have been influenced by this movement is also, as a rule, regarded as an example of hydraulic mechanism. For 'Stage reform' the actual application of hydraulics in working the appliances was by no means of such importance as is generally assumed. It is true that much stress was laid on the advantages of replacing manual labour by some mechanical



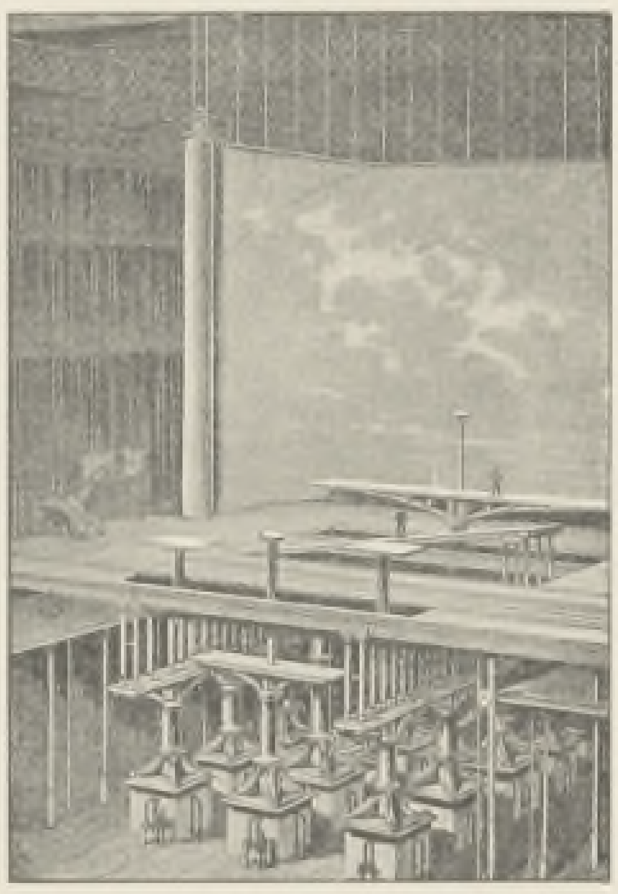
THE 'ASPHALEIA' SYSTEM: STAGE. ORIGINAL DESIGN.
FIG. 65. TRANSVERSE SECTION.



THE 'ASPHALEIA' SYSTEM: STAGE. ORIGINAL DESIGN.
FIG. 66. LONGITUDINAL SECTION.

power, and that the first designs of a remodelled stage showed that hydraulics could be extensively introduced; but, for all that, the general idea of a model stage was by no means deemed to be dependent on any particular motor.

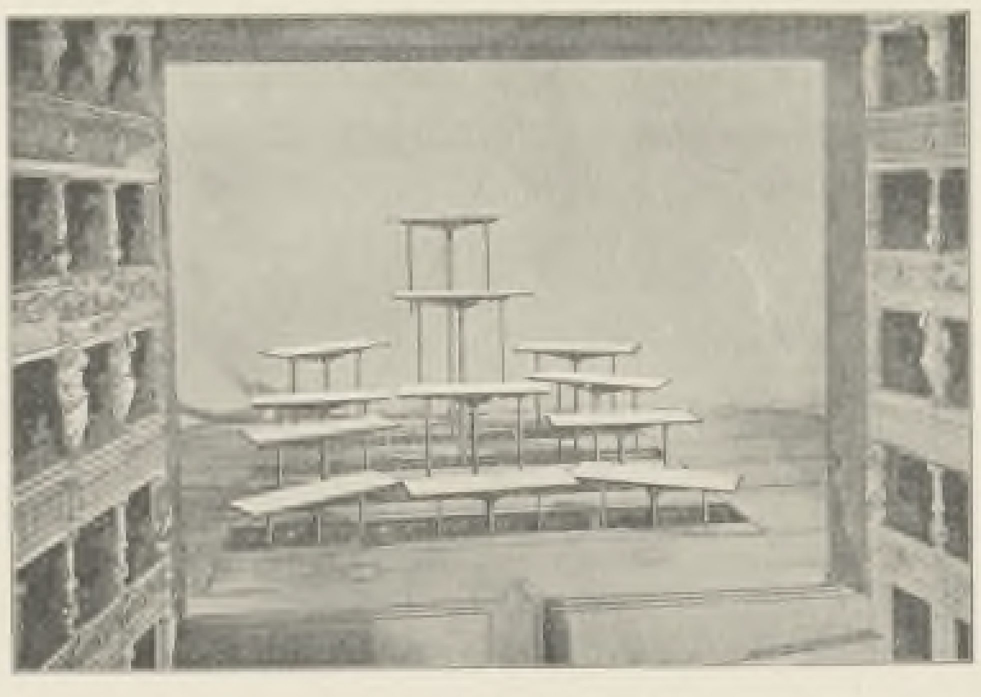
There was a strong commercial element in the body which first drew attention to 'Stage reform,' and I wish to lay special emphasis upon this, as there was too much hypocrisy in the initial period of the movement, and many deserving enthusiasts, whose ideas were pirated by the commercially inclined reformers, may well be said to have had serious grievances against those whose disinterestedness was so lauded at the time. It may, perhaps, be injudicious to attribute the great results of the movement to others than those officially connected with the change, but I cannot omit to mention that I consider such men as Julius Rudolph, of the Court Opera House at Vienna, and Friedrich Brettschneider, of the 'Hofburg' Theatre in that city, directly responsible for a great deal that is popularly ascribed to others. The great modesty of these two talented stage-mechanics is to my mind the sole cause of their names never having been prominently mentioned in connection with the early period of the evolution. The names generally associated with the subject are Dengg, Gwinner, Kautski, Roth and Riedinger, who, if I am rightly informed, were the principal members of the so-called 'Asphaleia' syndicate, whose 'Asphaleia' stage was destined to be of such importance in modern theatre mechanism. Prior to going into detail with regard to this stage and describing examples actually constructed, I propose to reproduce the more important part of the prospectus, dated 1882, and published by the syndicate shortly after the terrible 'Ring' Theatre fire; and though some of the ideas have already been expressed in the Introduction, the manner in which the various contentions are put forward also have some interest. Of course the English version of a foreign prospectus must appear somewhat stilted in phraseology. The eulogistic terms in which many of the advantages of the 'Asphaleia' system are put forward must also be taken for what they are worth, i.e. as commendations of those commercially interested in the invention, for as I have remarked, we are here dealing with the efforts of a very interesting trading concern, and not with the opinions of independent experts. Just in such a case, however, quotation should materially assist in appreciating the purposes of the promoters.



THE 'ASPHALEIA' SYSTEM:
STAGE. FIG. 67.
DIAGRAM SHOWING 'UNDER MACHINERY' AND 'HORIZON.'

In my Introduction I have stated how the Vienna disaster was practically the cause of the 'Stage reform' movement being energetically started, and how one of the principal objects of the reformers was, ostensibly at least, to prevent, as far as possible, any repetition of such a calamity. Hence, it is only natural that considerable stress should be laid on the question of safety of life throughout the prospectus under consideration. It commences, in fact, with a mention of the 'Ring' Theatre fire, and the various attempts that had been previously made to minimise the risks of such conflagrations.

After some comments on the historical development of the theatre, the prospectus goes on to explain how, in the seventeenth and eighteenth centuries, the object of scenic decoration was altogether different from what it is to-day. In the eighteenth century the queer, the grotesque and the non-natural were the ideals of the decorative artists, and transformations, spectral forms, flying dragons, fairies, will-o'-the-wisps and the like, their best stock-in-trade. There was no thought of illusion; no one thought of trying to make the audience imagine that they were not in a theatre. The 'theatrical' was the antithesis of the 'natural.' The syndicate continues, as I have elsewhere remarked, by explaining that the desire for realism which pervades the nineteenth century has completely changed the ends and aims of modern scenic art. The scenic artist seeks to play the part of interpreter between author and audience. He studies the author whose work he assists to present, and whose ideas he must necessarily understand if he would give form to his teaching and his thoughts. 'Like the actor,' proceeds the prospectus, 'the scenic artist must know how to be in earnest.' 'Actor and scene-painter alike must, above all, so labour that the audience shall forget that they are within the four walls of a theatre.' But the stage methods of old prevent the realisation of such an attempt, and, where they have not been superseded, the audience has to be satisfied with the reflection that they *are* in a playhouse.



THE 'ASPHALEIA' SYSTEM:
STAGE. FIG. 68. DIAGRAM SHOWING 'BRIDGES.'

The prospectus then goes on to show how, shut out from society, the theatre had to develop in seclusion and privacy; and how the tendency of the former condition still clings to things theatrical. As I have stated in my prefatory remarks to this Supplement, the promoters bitterly complained that, at the time of their venture—only fifteen years since—the majority of persons connected with the *technique* of the theatre were destitute of the smallest amount of scientific knowledge. To quote the prospectus again, 'They have all been through the mill; they know the whole routine of their stage as it was, is, and, as they think, evermore shall be, and they hand on their special knowledge to their descendants and successors.' And I do not think that their arguments are far wrong when they mainly attribute to this cause the fact that no essential change in the planning and equipment of the stage for two hundred years past. I cannot but emphasise that fundamental improvements could not well be expected under such circumstances.

So far, the prospectus deals with the stage generally. It then goes on to describe the working of the model stage designed by the syndicate, and with the aid of which their system was brought before the public. Here, again, we are asked first to look at it from the point of security against fire. The 'Asphaleia' stage has, according to its designers, little probability of being burnt, for it is composed almost entirely of metal. All the mechanism and fittings are of iron. The floor of the stage only is of wood, for if this were made of any other material it would be useless for stage purposes; but the actual flooring, of course, would be very unlikely and very slow to catch fire. Even the ropes and cords, usually of hemp, are in the 'Asphaleia' stage superseded by wire cables. Besides being uninflammable, these do not become stretched and slack like hemp ropes, while they have a much longer life. The initial cost of these wire ropes is little more than that of the ordinary ones, but the syndicate holds that as in actual work two hemp ropes are replaceable by one cable, wire should in reality be much cheaper. According to the prospectus, another point of importance for security against fire is that the power used throughout the whole machinery is hydraulic, and thus facilities are afforded for obtaining a high pressure in the water supply for use against fire.

Besides advocating the closest attention to security in this direction, the syndicate makes a point of its consideration in regard to the safety of those employed on the stage from accidents caused by defective appliances. The various openings in the stage floor are recognised as a source of danger, but in the 'Asphaleia' theatre the 'traps' are said to be perfectly free from risk. Use of ropes in connection with these appliances is needless, and, therefore, the likelihood of their giving way—a much more frequent occurrence than many people imagine—is obviated. The 'trap' mechanism in the 'Asphaleia' theatre is described as being of great strength, and with reasonable precautions should be quite free from failures.

The chief improvement upon which the 'Asphaleia' Company appears to pride itself is in theatrical mechanism and the centralisation of the control of all appliances. The whole of the skilled labour required to work the machinery is confined to one man with an assistant. From the place where he stands he has a complete view of the stage, and is able to manipulate, at any moment, any given part of the machinery.

According to the syndicate, hydraulic power is the simplest and most reliable in working, as well as the least noisy; and although the first outlay for an installation is great, the system is described as being the cheapest in the end, as it reduces the number of men regularly employed by one-half, or by even more. The hydraulic pressure required for the appliances is only six atmospheres. In towns where the water power is insufficient, the syndicate contends that a motor engine can during the daytime fill the reservoirs with the quantity of water required, and in the evening can be employed for the production of electric light, and for other purposes, such as ventilation, etc.

All these advantages, according to the syndicate's prospectus, are put forward to prove how carefully the promoters have considered their system, and how greatly advanced they believe it to be as compared with the stages existing at the time of the 'Ring' Theatre fire.

In describing the stage floor (as shown in Figs. 67 and 68), the syndicate points out that they have arranged for it to open in every possible direction, without any special preparation being necessary. Every opening extends right across the stage, and its width is divided into three sections. Each one of these rests on the plunger of a hydraulic press, and each section can not only be lowered but also raised, either alone or with the other two. In like manner, the floor of the stage, either in whole or in part, can be raised or lowered. These movements are effected by opening or closing stop-cocks which regulate the flow of water kept under constant pressure. As it is possible to raise or lower, now one side, now the other side of the floor to a given extent, there can be produced a 'see-sawing' of the surface as a whole, or of any one section of it, with a precision and a perfect absence of danger attainable in no other way. There are many other possible combinations too numerous to describe. The 'traps' can be arranged one after the other as a succession of steps, for bridges, balconies, mountains, ships, or for the stories of a house. Most of the clumsy timberwork, 'rostrums,' trestles, etc., previously in use are considered to have become quite unnecessary.

Between the principal openings or 'bridges' of the 'Asphaleia' stage there are two 'sliders' through which a whole 'scene' can be raised to any required height. Besides these a similar 'slider' runs down each side of the stage from back to front, through which 'side-scenes' can be hoisted into position. Thus, it is possible to raise up from below the stage into view of the audience a complete 'scene' representing a room. Particular emphasis is laid on the fact that the whole mechanism can be set in motion simultaneously.

The 'flying' apparatus of the 'Asphaleia' theatre is intended to be in complete harmony with all modern requirements. It can be moved anywhere, and can be worked not only in straight lines, but in curves and in any direction required.

Another important feature already referred to is the 'horizon.' Up to the present time it has been customary, whether an interior or the open country is to be represented, to diminish the breadth as well as the height of the stage as it recedes from the foot-lights. The 'wings,' right and left, are nearer together at the back of the stage than they are at the front; the floor of the stage rises at the back, whilst, in the same proportion, the 'borders' and 'floats' hang relatively lower. As far as built-in rooms are concerned, the syndicate considers this satisfactory, although, by the gradual sloping upward of the stage a false perspective is obtained. In open-air scenes, however, this arrangement is declared to be in the very teeth of reality, for in nature the visual angle finds its fullest expansion at that part of the view most distant from the eye. To produce this effect, the back of a scene on an 'Asphaleia' stage is not made narrower than the proscenium opening, as is the case in older theatres. Its 'working area' is framed in by a 'panorama cloth,' called the 'horizon' (Fig. 67), which runs round the back of the stage and as far forward on both sides as the second set of 'grooves,' and in order to produce the appearance of an unbroken surface the corners are rounded off. With the aid of this 'horizon' the syndicate contends that it is quite possible to represent boundless plains and the illimitable expanse of the sea. This 'horizon' not only aids in the illusion as to the stretch of land or sea to right and left, but it also reaches so high that ugly and dangerous 'sky borders' are no longer needed. Hitherto, nothing has so jarred upon the imagination as these strips of various tints of blue, which never in any way produce the illusion of the immensity of the heavens. This the 'horizon,' if well illuminated, does so far as a picture can.

These, in broad outline, are the chief advantages of the 'Asphaleia' stage as put forward by the promoters. In conclusion, the syndicate again emphasises that, although the 'Asphaleia' system is, in its initial outlay, more expensive than any ordinary type of stage mechanism, they hold it to be much cheaper in its actual working. They contend that the insurance premium alone would be far less, in view of the greater security against fire. The waste of materials in the construction of 'set scenes,' would be reduced to a minimum. The 'horizon' will serve where, nowadays, a number of new 'scenes,' with a whole quantity of 'borders' and 'wings,' would be necessary; and the movable sections of the stage floor does away with most of the cumbersome and wasteful 'sets' which now have to be built up. Lastly, as before mentioned, the saving of labour for the working of the stage is considered to amount to at least fifty per cent.

What I said as to the partiality of the promoters at the commencement of this chapter will, no doubt, have been all too apparent in the actual quotation of the prospectus, and yet, as I have said, there is so much of interest in the description of the 'Asphaleia' system as propounded by the syndicate, that it would have been inadvisable to omit this highly coloured picture. There is so much merit, too, in the conception of the general scheme, and such very considerable daring in stepping before the public with reforms so radical, that even the exaggerated language of those commercially concerned may be excused. Nevertheless, the tone of the prospectus is to be regretted, and, to my mind, the plain record of actual facts in the early years of the movement would have had better results for the company than tactics which tended to make the more conservative members of the technical professions very sceptical, and, at times, perhaps, even hypercritical. There was quite enough in the proposals of the 'Asphaleia' syndicate to stand on its own merits. Why, then, invite disappointment?

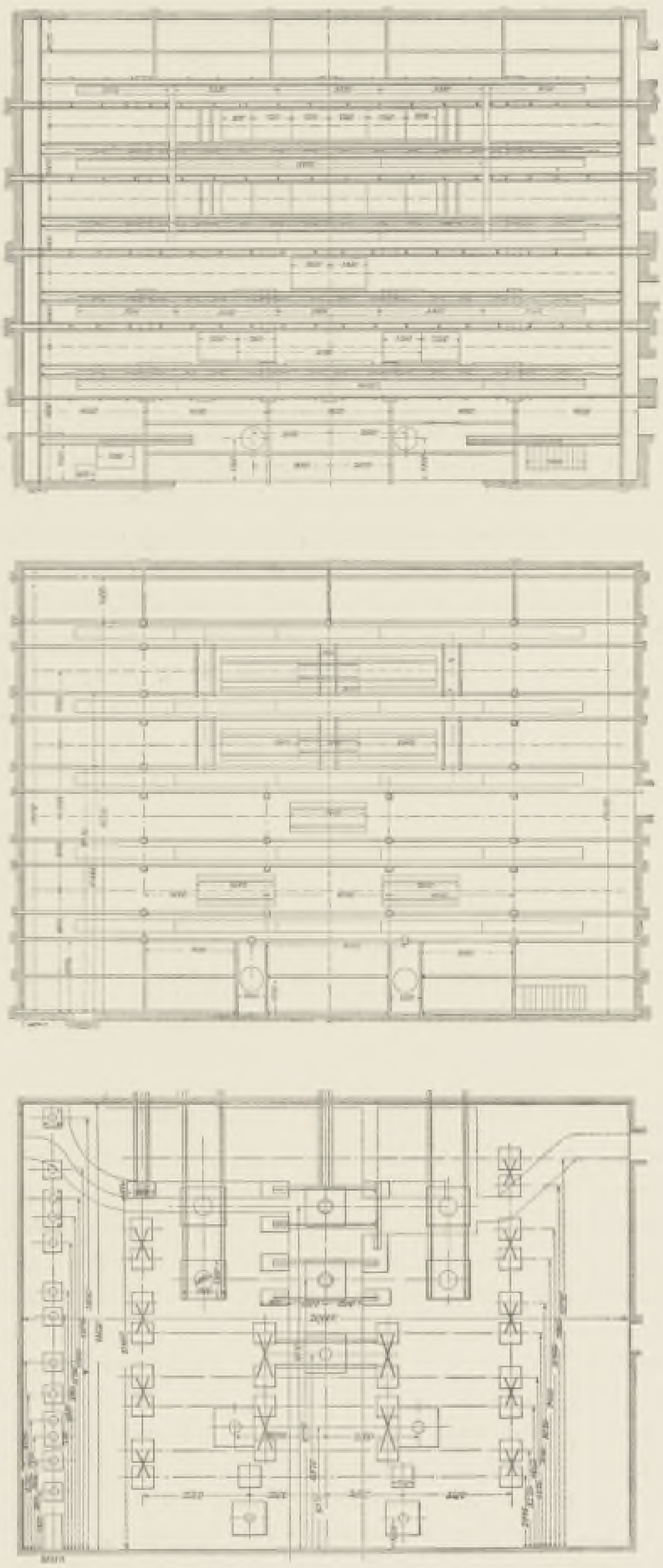
THE 'ASPHALEIA' STAGE AT THE MUNICIPAL THEATRE, HALLE.

I HAVE so far attempted to describe what the 'Asphaleia' syndicate claimed for its iron stage, and I have set forth its programme at some considerable length. As I have before inferred, there are two sides to this, as to every scheme, and I shall now quote the opinions of engineers and others who have had practical experience of the appliances in question. In the previous chapter, moreover, I only illustrated the system by diagrams taken from the original designs or the model of the 'Asphaleia' stage. It is therefore essential to present some drawings of actual stages now in use which have been constructed on the system and by the syndicate, though not necessarily coinciding in all points with the original design. Of 'Asphaleia' stages proper the two most important will be found at Halle, in Germany, and in the Buda-Pesth National Opera House. In the subsequent pages illustrations of both are given.

The Municipal Theatre at Halle, though situated in a comparatively small provincial town, has, as was shown in Volume I., a considerable repute among architects and engineers for its excellence in structural and technical arrangements at a date when improvements of this description were comparatively uncommon. To recapitulate what was there said, the building had the benefit of that period of reformation in matters of theatre construction which followed the fearful catastrophe at the 'Ring' Theatre in Vienna. This calamity, it will be remembered, happened at the end of 1881, and in August 1883 the municipality of Halle arranged an open competition for the design of their new playhouse.

The building was completed in 1886, the architect being Heinrich Seeling. The advance shown in the planning of this theatre has already been referred to, and I would now emphasise that Halle can pride itself on being a pioneer, not only in respect to improved theatre construction in a general sense, but more particularly in respect to 'Stage reform.' In the case of the Halle Theatre, the public authorities not only acquiesced in the improvements of the reformer, but lent all the assistance in furthering its cause which their influence and financial powers permitted. This was, of course, a great step, as far as 'Stage reform' was concerned. To allow a considerable expenditure of public money for the sudden banishment of the principal traditions of stage setting was also a most daring step to take.

If studied in connection with the preceding pages, the illustrations of the Halle Theatre practically explain themselves, but it should, perhaps, be pointed out how far the system has been adopted. In the first place, the dimensions of the stage show a depth of about 49 feet (15 metres) by a width of about 65 feet (19·75 metres). Though the design of the stage is not dependent upon 'wings' or 'chariots,' the main lines of the floor divisions associated with the latter have been adopted, and we find that there are four 'Kulissengassen,' though the first of these is placed rather further back from the proscenium opening than is customary. In the space in front of the first 'Kulissengasse' there are two 'star traps,' while in the first 'Gasse' there are two 'traps' which would practically take the place of our 'grave traps'; in the second 'Gasse' there is one 'trap' of a similar description; and in the third and fourth there are 'bridges' proper. The whole of these movable parts are worked by hydraulic rams. Figs. 71, 75 and 76 show how the principal joists, uprights and rams are distributed, and the foundation plan (Fig. 71) explains, perhaps, most clearly on what a small number of points the stage floor is really supported.



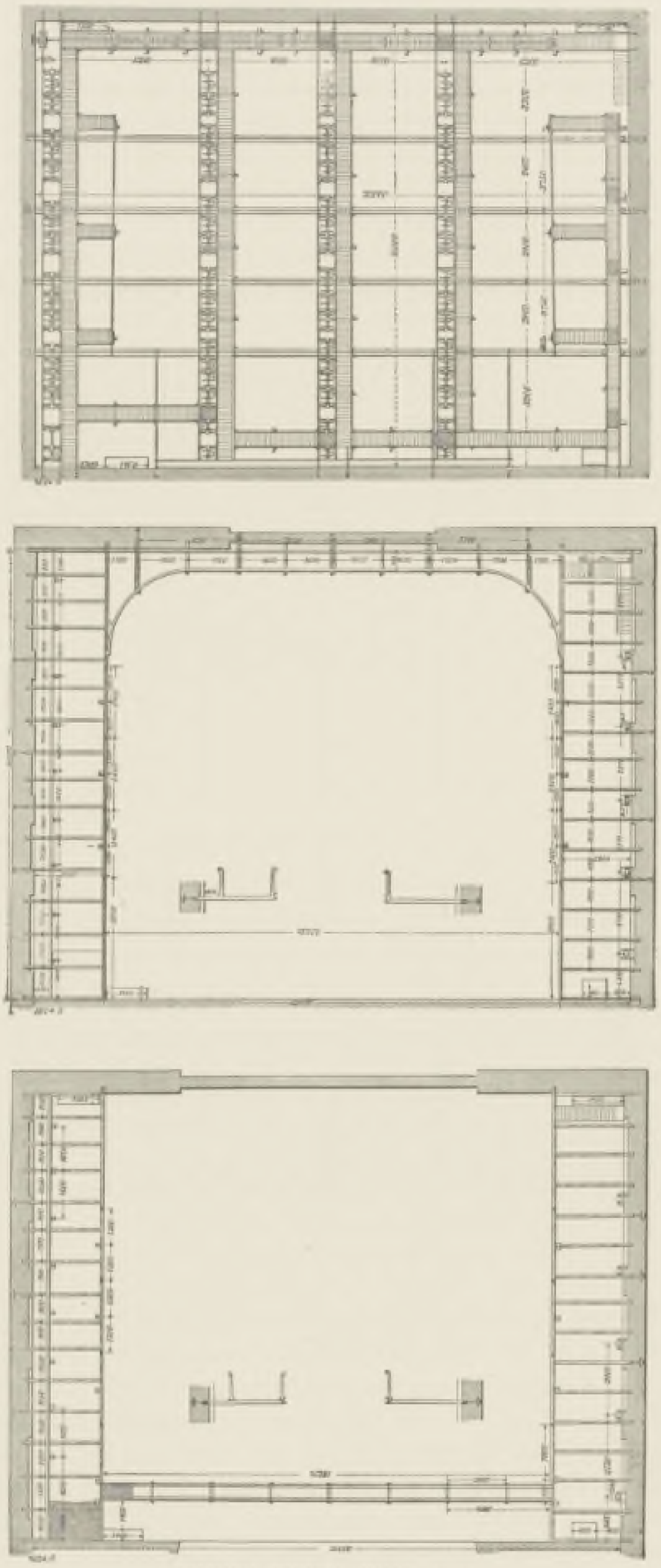
MUNICIPAL THEATRE, HALLE: STAGE.

FIGS. 69, 70 AND 71. PLANS OF STAGE FLOOR, FIRST 'MEZZANINE' AND 'CELLAR.'

It is not my intention to describe here in detail how the stage floor has been laid out, as the Halle Theatre is intended primarily to illustrate the general possibilities of the system rather than the individual arrangement found necessary in this locality. It is immaterial whether there are four or more 'Kulissengassen'; and it is immaterial, too, what part of the floor can sink or rise with the aid of the hydraulic rams; each 'Kulissengasse' may have 'bridges' running the whole width of the proscenium, or it may have only single 'grave traps' or 'star traps.' It is also of little consequence whether there be one 'mezzanine' or more, or by what special installation the hydraulic rams are worked. In the same manner any criticism must be taken as referring to the system more than to the individual example. It should not be overlooked that the 'Asphaleia' system has now been improved upon, and that its principal interest for the practical constructor of to-day is the fact of its having been the basis of modern hydraulic stage construction, and it is as such that he will study it.

The series of illustrations showing the plans above the stage level (Figs. 72, 73 and 74) with the 'fly galleries' and the 'gridiron,' are only of interest on account of the system represented. The sequence of galleries, the position of connecting 'bridges,' and the combinations of 'gridiron' can be varied considerably; but in all cases where the 'Asphaleia' system has been adopted it will be found that everything is run over pulleys as distinct from 'drums and shafts,' and that cables are used instead of cords, while the whole of the 'upper machinery' can be worked from one spot at stage floor level, no matter how large or how small the number of points that has to be governed. But, whatever the sequence, it would be well to note some of the leading dimensions marked on the diagrams, for these give a good idea of the proportions that have to be introduced and the possibilities attainable.

To those who have been used to the wood stage of old, a visit to one worked entirely by hydraulics is, indeed, a revelation, for the principal difficulties, not only from the scenic artist's point of view, but also from the stage carpenter's, are met in an entirely different manner. The effects of 'Stage reform' appear far more evident in actual working than any drawings or descriptions can possibly make them. Scarcely anything is managed on the old lines, and scarcely any duty is the same as before. To take one instance only, there is no staff detailed for the 'flies,' no work having to be done above stage floor level. The 'fly galleries' would be almost unnecessary were it not that they afford the requisite space for the various 'tricks,' such as the production of 'thunder,' 'wind,' etc., and for which room has to be found as before. The whole character of the stage is also changed, and there is little wonder that the conservative scenic artist and the older actor do not take kindly to these innovations. A model stage on the 'Asphaleia' system has to be kept scrupulously clean, and worked by smart mechanics. There is little that aids the picturesque on a stage of this kind—no dust, no dirt, no antiquated workers. I have heard an eminent actor say that the very newness, coldness and hardness of the surroundings appalled him, and were detrimental to his acting. I grant that the 'Asphaleia' stage has certain defects in this direction, but, as in the case of all radical reform, extremes were first attempted, only to be afterwards modified, and naturally there were considerable oversights. As an example of this, one may mention that the resonance of the iron stage, in fact none of the acoustic properties of the new as compared with the old, were taken into account.

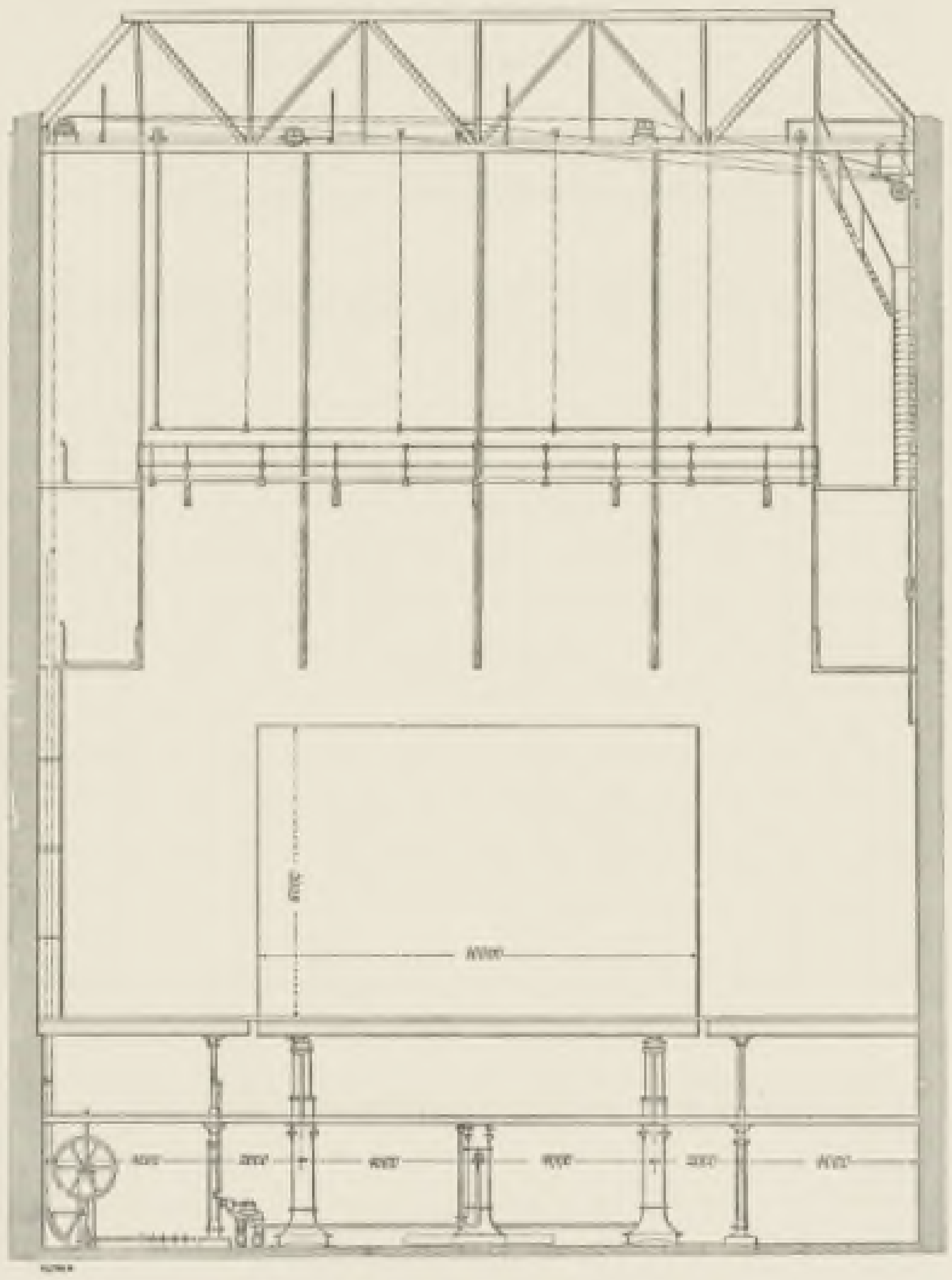


MUNICIPAL THEATRE, HALLE: STAGE.

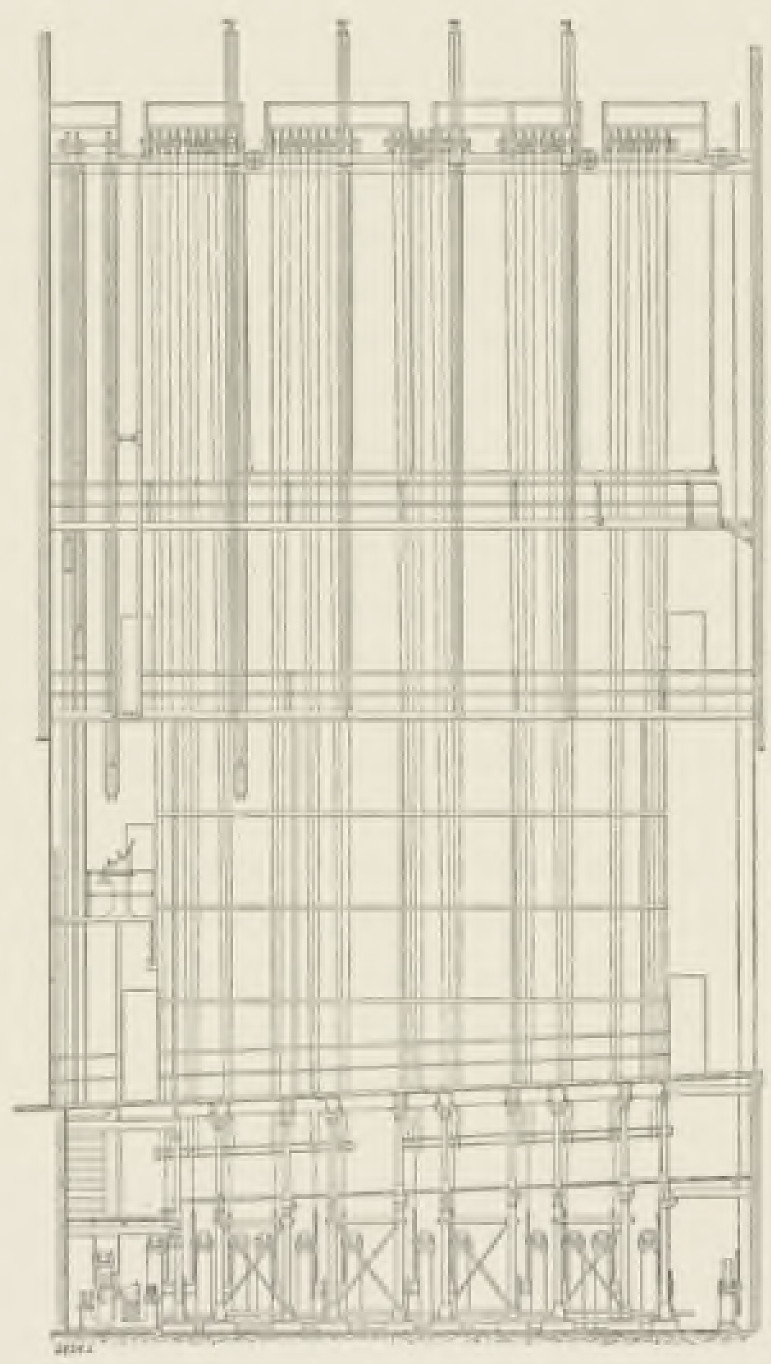
FIGS. 72, 73 AND 74. PLANS OF 'GRIDIRON' FLOOR AND FIRST AND SECOND 'FLY GALLERIES.'

Before referring to the opinions of stage experts, I would point out that there has been much feeling among the older generation of this body, on account of the way in which the members of the 'Asphaleia' syndicate on coming before the public posed as the inventors of something entirely novel, whilst in reality they had, to a great extent, made a clever combination of the most modern improvements of the time, carefully collected from all parts of the Continent, and then adapted to a special purpose. It is true that these modern improvements may have been introduced only periodically, but for all that they were the inventions of others, and it was only admiration at the trouble and expense devoted to the intelligent combination which prevented complications from arising. Perhaps one of the most striking instances of the 'Asphaleia' Company's methods was in connection with the 'horizon' mentioned on page 46, and first used by Engineer Lehmann at the 'Karl' Theatre, Vienna, and afterwards adopted by Engineer Rudolph for mounting the play *Ochnone* at the Old Burg Theatre, in 1873. The first model of the new 'Hofburg' Theatre made by Julius Rudolph was ready in 1876, and showed the 'horizon,' but no reference to any anticipations of this important feature appears in the prospectus of the syndicate. One would have thought that unusual proceedings of this kind might have caused the opinions of the older stage mechanics to remain prejudiced even to-day; yet this is by no means the case. It is, in fact, among these very engineers whom the 'Asphaleia' Company offended that we find the most enthusiastic admirers of the system. The engineers who felt the most slighted were those who had been striving to improve upon the antiquated wood stage, and who hailed the first epoch in the history of modern stage construction with joy, in spite of the extent of their private losses. We can, therefore, accept the opinion of Julius Rudolph, to whose 'horizon' I referred above, as unbiassed, and I shall quote his criticisms as those of a typical representative of the older generation of Continental stage experts holding one of the most important posts open to his profession, namely, that of engineer to the Court Opera House at Vienna.

I must not fail to remind the student that when using the word 'profession' I do so advisedly, as I am not about to quote the opinions of men so untutored and prejudiced as the typical English stage carpenter, but of experienced and scientifically trained engineers who have taken up stage *technique* as a speciality. When one considers the extent of the machinery worked by hydraulic power, it can be fully understood that *bonâ fide* engineers are required to replace the stage carpenter of old, and whilst the stage carpenter still flourishes in our own country, the stage engineer is rapidly coming to the front abroad. In fact, nearly every theatre there of any importance has a first class 'Obermachinenmeister,' even where the wood stage survives. In addition to Rudolph, I must here again specially mention Friedrich Brettschneider of the Court Theatre, Vienna, as a great authority on theatre construction, as well as Christofani, of the Buda-Pesth



MUNICIPAL THEATRE, HALLE: STAGE.
FIG. 75. TRANSVERSE SECTION.



MUNICIPAL THEATRE, HALLE: STAGE.
FIG. 76. LONGITUDINAL SECTION.

National Opera House; Fritz Brandt, of the Berlin Court Theatre; Karl Lautenschlaeger, of Munich fame; Heinrich Richter, a pupil of the latter, who had charge of the 'Asphaleia' stage at Halle.

Commencing with the criticisms on this subject of Heinrich Richter, who represents the more modern school of theatre engineering in the same way as Julius Rudolph represents the senior experts, I understand that he is a great admirer of the 'Asphaleia' system as a whole, and that his experience has taught him that, except for some minor details, the actual working of the machinery under his charge is satisfactory. Going into detail, however, Richter has several faults to find and some suggestions to make. He does not consider the Asphaleia 'horizon,' which, though a semi-fixture is intended almost for constant use, practicable, and has improved upon the one employed at the Halle Theatre by falling back on some of the makeshifts of the old wood stage. I hold Richter to be right on this point, for there is no doubt that the 'horizon' of the 'Asphaleia' stage is far too cumbersome. He also condemns the vertical hydraulic shafts to the 'traps,' for when the shafts are immediately under the working part of the stage floor they so obstruct the 'cellar' as to render it nearly useless for the sinking of the scenery. For this reason he proposes to place the entire hydraulic machinery at the sides, where, in fact, the 'drums' and windlasses are located in the wood stages. This defect in the 'Asphaleia' system is, to my mind, a most formidable one, and one which has done much to cripple the syndicate's enterprise. Roominess is the essence of stage design, and this important factor was apparently overlooked in planning the 'under machinery.' Heinrich Richter, in this and in other important details, favours a compromise between the old system and the new. He is of opinion that the hydraulic system for everything below the stage level is excellent; but, as I have said, power must not be applied direct, but from the sides, on account of the loss of valuable space. He also advocates manual labour for the change of scenes in all 'top' work, it being necessary to watch each 'cloth' as it is lowered, in order to prevent it catching in any hanging 'batten' or on any piece of scenery. To lower several 'cloths' and 'borders' by pressing one lever, and to set all the machinery in motion from a point where it is impossible to watch the 'cloths' in their descent, he considers a mistake, for they may fall out of place, and not only be unsightly and make the scene imperfect, but also cause danger and confusion. Having, however, a centralised system to work with at Halle, he used it, and has gone so far at times as to couple four levers together in cases where celerity is needed. By a simple mechanism he has also arranged that with the movement of one lever he can lower the scenery *en masse*, in order that should any portion be on fire, the whole of the hanging canvas will come down instantaneously in a heap on the stage floor, allowing the fire to be trampled out or extinguished by the firemen. The heaping up of the entire top scenery on the stage, as advocated by Richter, may seem to us an extreme measure, but it is none the less important and advisable in the event of fire originating among the 'hanging scenes.' As to his wish to discontinue the application of hydraulic power to the 'upper machinery,' I cannot say that I should like to see its manipulation effected by manual labour only. The possibility of using hydraulic power for large combined effects is invaluable, though such movements are not common except in spectacular plays. Manual power, with the possibility of using hydraulic power for important effects, would, to my mind, be the happy medium for working everything above stage floor level.

The 'Asphaleia' Company strongly impresses upon managers the saving in cost of labour by adopting their system. Heinrich Richter does not agree with this, as he contends that the stage hands employed must be skilled hydraulic engineers, receiving higher wages than the unsophisticated scene-shifter, and that there is little or no decrease in staff, as it takes as many men to attach scenery to 'battens' worked by water pressure as to the 'battens' of the old system; and in speaking of this it must be remembered that the bill is changed almost nightly on the Continent, long runs with built-up scenes being almost unknown—at any rate in the State, Municipal and subsidised theatres. The fact that hands will be required regularly for a certain number of hours fixing 'cloths,' etc., and that these men may be called upon any hour of the day if there is any unexpected change of performance, makes it essential to have a strong permanent staff of stage hands, even if the duties are light or perhaps non-existent at the performance proper.

Heinrich Richter's experience is that it is impossible to build-up mountains, hills, valleys, staircases, slopes, rockwork, etc., with the 'Asphaleia traps' pure and simple. These 'traps' may form the foundation, but much has to be built-up as of old if the lines of the mounting are not to be hard and unnatural. Here, however, I hold that my authority misinterprets the purpose of the syndicate. I understand their programme to simply aim at forming a basis. They cannot have imagined that their system could be applied without allowing for some 'building-up.'

Speaking on the question of insurance and the expected reduction in premiums for theatres that have been constructed up to the present time, the experience of my informant is that the rates have not been lowered on the modern Continental playhouse, for the 'foreign companies deem the dangers from the boilers and engines sufficient to retain the high rate usually charged for the theatre risk.' On this point I have gone to some considerable trouble to find out if this is actually the case, and I am afraid I can only bear out this engineer's views. I know of but few theatres where the insurance premiums have been modified after the introduction of improved stage appliances, and I can account for this anomaly, as it appears that those concerned do not realise how considerably the risk of fire is reduced on a clean and light iron stage as compared to the 'tinder-boxes' common to our metropolis. In Germany, where iron stages are now compulsory, even for old playhouses, I was unable to find a single case of reduced premiums on account of stage improvements. If anything, the insurance rates appear to have been raised since 1881, regardless of modern structural advantages.

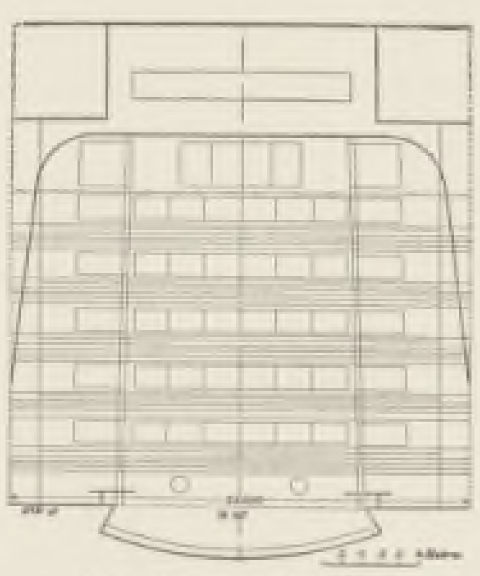
It would lead too far if I were to discuss Heinrich Richter's opinions on minor technicalities, and a few of his most important statements have alone been presented. As already said, this expert has had charge of an 'Asphaleia' stage for some considerable time, and belongs to the newest school of stage engineers. Hence, the few criticisms recited carry the weight of practical experience of the system under consideration.

Passing on to the views on this subject expressed by Julius Rudolph, he draws attention to the fact that 'traps' were originally worked by steam power at the Vienna Opera House, but that subsequently this system was stopped, and steam was used for only one 'trap' which acted as a lift. The reason why this system was discontinued may be found in the argument which Rudolph advanced against hydraulic power as adopted by the 'Asphaleia' syndicate. He explains that accidents occurred to actors using steam 'traps' through catching some part of their body, as, for instance, the foot, in the fixed framing of the stage when the 'trap' was ascending. He points out that in a 'trap' raised by hydraulics an actor has no power to ease or stop its movement, whereas, in the old system of counterweights some effort exercised by the actor would often enable him to disentangle himself. Even the ordinary counterweight 'trap' is not free from danger, as many can testify; one of the greatest dangers, perhaps, being when the 'trap' is 'sent up' before the flap in the floor is removed. There have been frequent cases when the actor has been severely crushed or bruised between the stage floor and the 'trap'; but if such an accident were to happen where hydraulic power is used the body would be simply shattered. Rudolph distinctly contradicts the syndicate's words on the greater safety of the hydraulic 'under machinery' as far as the artistes are concerned.

My informant is well aware of the impetus given by the 'Asphaleia' Company to the modernising of the stage. He is an enthusiastic admirer of its conception, but he has more fault to find than his younger *confrère*, Richter. Like Richter, he considers the 'Asphaleia' system an extreme one, which can easily be modified, and, when making his criticisms, he suggests various improvements. He dwells, as does the former, upon the fallacy of the economy of the 'Asphaleia' system with regard to the working expenses, on account of extra wages required for skilled mechanics. The expense for repairs and the depreciation of the value of the machinery caused by rust and damp, as well as by ordinary wear and tear or accidents, he believes to be very considerable, while he thinks that a theatre fitted with a hydraulic stage is colder, and that, therefore, greater expense is caused in keeping up the temperature by artificial means. This is, of course, a point of high importance in countries subject to cold winters. The loss of space under the stage he also considers a great drawback to the system, and he brings forward arguments to the effect that the presence of so much iron, together with the damp arising from the water, must be very bad for the acoustic properties of the house. A further drawback, pointed out by Engineer Rudolph, is the amount of vibration, and he also doubts the stability of a 'trap' supported only in the centre when a carefully danced ballet has to be put on. He further deems that the principle of the system of 'traps' is wrong, as he says that it requires the stage manager to arrange the 'scenes' according to his stage, and not his stage in accordance with his 'scenes.' Like the former expert whose views I have detailed, this authority strongly condemns the idea of the whole stage being regulated by one person from a point where he does not overlook the entire area and is not able to see that every 'cloth,' 'border,' 'batten,' etc., is in the exact position which it should occupy, and in perfect working order. According to Rudolph, it is like working in the dark if the operator is unable to watch every portion of the scenery as it is raised or lowered, and it is obvious that the handling of a wrong lever may mean confusion, if not an accident.

One of the many advantages claimed by the 'Asphaleia' syndicate is the abolition of the 'flies.' The Vienna engineer's experience here is that one cannot properly work a stage without 'flies'; even in an 'Asphaleia' theatre they are quite as much needed as in the old wood stage. The use of wire ropes, as proposed by the 'Asphaleia' Company, is advocated as more economical in the long run, but it is not recommended for 'hanging cloths,' on account of the impossibility of cutting down a burning 'scene.' Rudolph's ambition is to construct everything of iron, except the floor, which must be of wood. He prefers at present to keep to the old system of the wooden stage, with the sole change of material, and with some of the more modern improvements specially applicable to ironwork. In short, he prefers a stage such as that at Amsterdam to the one at Halle, and we have seen his ideas embodied in the stage of the Christiania Theatre.

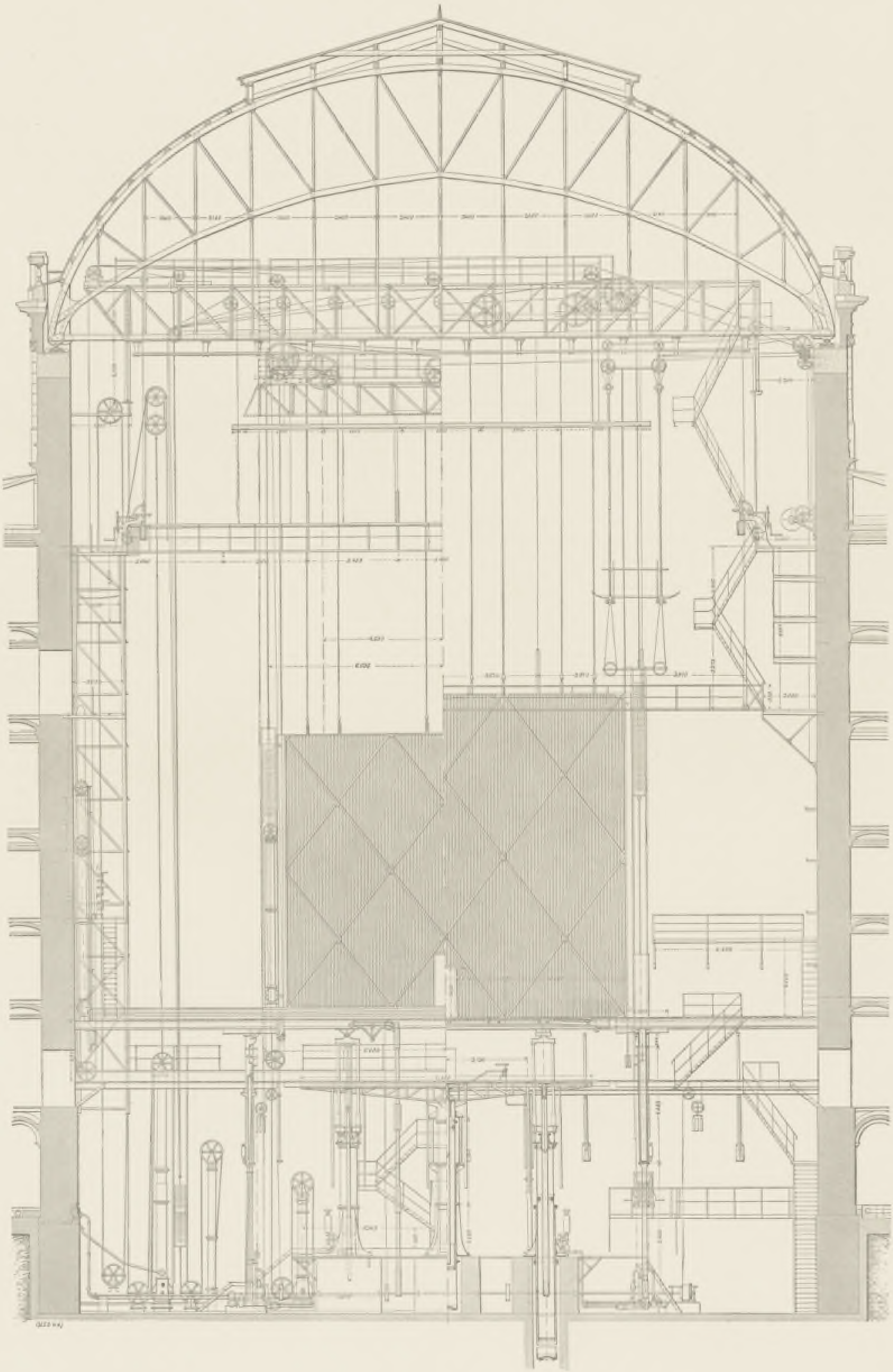
THE 'ASPHALEIA' STAGE AT THE NATIONAL OPERA HOUSE, BUDA-PESTH.



NATIONAL OPERA HOUSE, BUDA-PESTH: STAGE.

FIG. 77. PLAN OF STAGE FLOOR.

WHEN speaking of the stage at the Halle Theatre I remarked on the fact that this building takes a prominent position in the annals of theatre construction on account of the consideration shown for the safety of the audience and the introduction of modern methods and appliances. Besides the Theatre at Halle I mentioned the Opera House at Buda-Pesth as a playhouse in which a stage built on the 'Asphaleia' system might be found in full working order. It was, in fact, at the Buda-Pesth Opera House that the 'Asphaleia' system was first introduced, and though this house by no means compares favourably with the Halle Theatre in its planning—no doubt owing to its much earlier conception—it is highly creditable to the promoters of the building that, after the catastrophes at Vienna and Nice, every effort was made to keep in touch with the improvements of the time. Whilst the idea of the Halle Theatre was conceived and carried out at a time when the 'Ring' Theatre fire was fresh in the mind of every one, the Opera House at Buda-Pesth was designed as early as 1873. The carcase of the building was practically complete when the 'Ring' Theatre disaster occurred in 1881, and hence no material improvements could be made in the general lines of the plan. Nevertheless, the ultimate introduction of modern stage appliances, as well as technical innovations in other parts of



TRANSVERSE SECTION.

Querschnitt. (Fig. 78.) Coupe Transversale.

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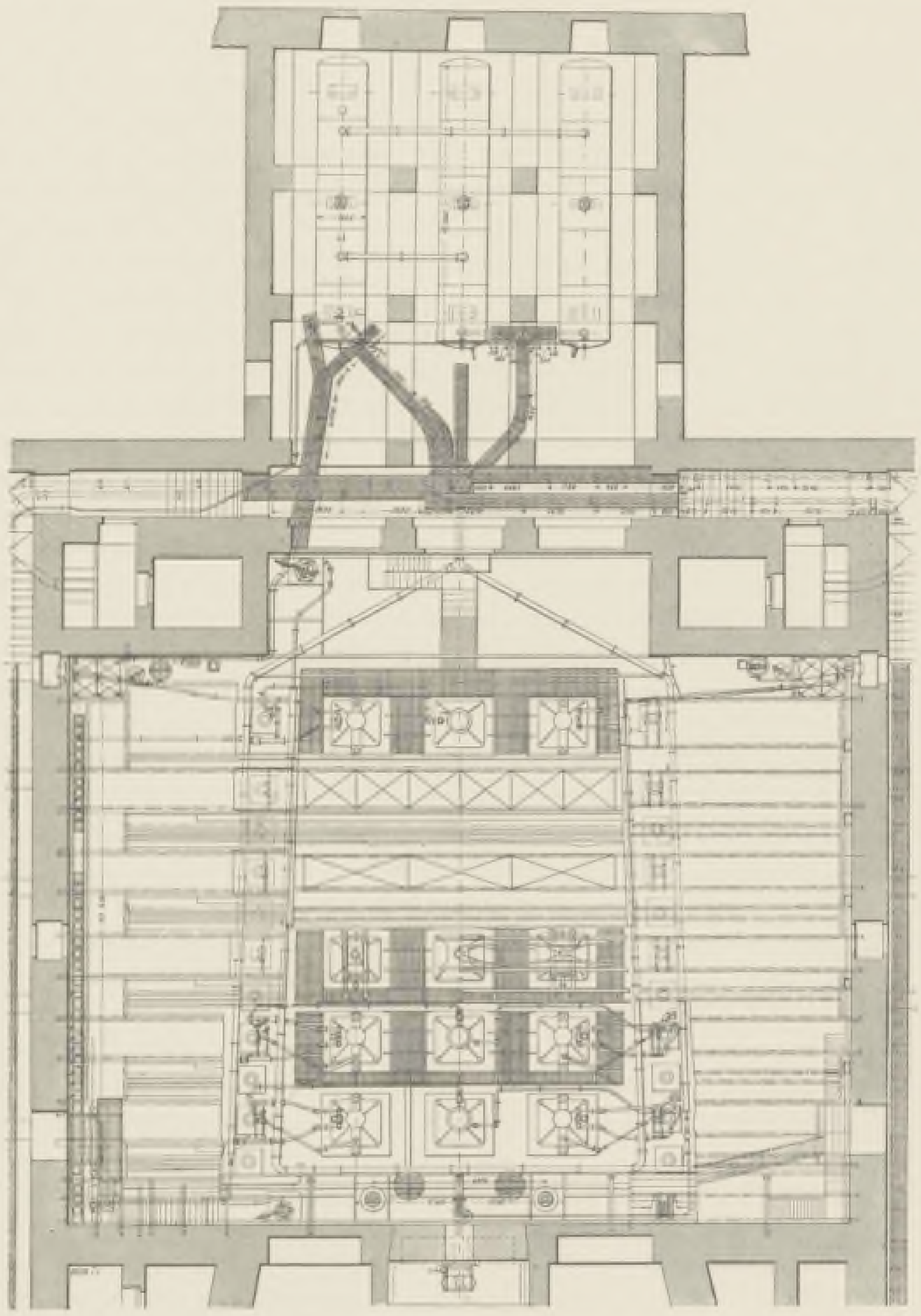
THE STAGE OF THE NATIONAL OPERA HOUSE, BUDA-PESTH.

Feet. Mètres.

the block could still be taken in hand without any considerable difficulty, the equipment of the building not being so far advanced as to preclude this. Such installations were, if I may say so, only a question of expense, and the necessary funds were easily obtainable.

Whilst I have so far indicated the system of the 'Asphaleia' stage by diagrams, and while the plans and sections of the Halle stage have been indicated only in outline, the Buda-Pesth stage is presented in engravings showing some of the detail of the construction. A small general plan (Fig. 77) displays the division of the stage floor as taken from one of the printed forms on which the stage engineer sets out the scenery for his different plays. The large plan (Fig. 79)



NATIONAL OPERA HOUSE, BUDA-PESTH: STAGE.

FIG. 79. PLAN OF 'UNDER MACHINERY.'

shows the stage floor and joists, as well as the 'mezzanine,' 'cellar,' etc., at different levels, and it will also be seen from this illustration that the part underneath the back-stage is occupied by the boiler room. Fig. 78 shows a transverse section taken on two different lines, one half looking towards the proscenium opening and the other towards the back-stage. Figures have been added marking some of the principal dimensions.

As in the case of other 'Asphaleia' stages, perhaps one of the principal features of the Buda-Pesth example is the 'horizon,' which occupies three sides of the stage in the manner already described. Here the height of the 'horizon,' i.e. the depth of the actual 'cloth' when hung, is nearly 56 feet (17 metres), the bottom hem being 6 feet 6 inches (2 metres) above the stage floor, so as to allow the actors to pass underneath it if necessary. The total length of the 'horizon' is nearly 500 feet (150 metres), while the vertical rollers stand about 79 feet (24 metres) apart. The 'cloth' is hung on wires and is worked by two ordinary winches placed on the second 'fly gallery.' As will be seen from the section, the winch is at the upper end of the vertical roller, and the 'fly gallery' from which it is worked has a width of about 7 feet. Of course the 'horizon' can be wound up entirely on either of the rollers, and this is done when the back-stage can be used; but, as a rule, the 'horizon' in an 'Asphaleia' stage is considered a semi-fixture, as it is a somewhat cumbersome appliance to handle. When hung, it can be raised or lowered bodily.

Referring to the small plan of the stage floor, it will be seen that a sequence of 'Kulissengassen' has again been provided, with the minor sequences of 'traps,' 'sliders,' 'chariot slits,' etc. There are five 'Kulissengassen' in the ordinary sense of the term, besides the spaces between the first 'Kulissengasse' and the proscenium opening, and between the last 'Kulissengasse' and the back wall, the former of which spaces has two 'star traps,' as in the case of the Halle Theatre, whilst the last has a set of extra wide 'traps.' In the large diagram showing plans at various levels (Fig. 79) it will again be seen, as in the Halle example, on how few points the stage floor really rests, and also how the large 'traps' running across the stage are divided into six sections, to every two of which is a hydraulic ram. It will be seen, too, how the central one of each set of three rams supports the 'trap' proper, whilst the two rams on either side can be made to work the large 'slabs' or 'bridges' containing openings for 'traps,' 'sliders,' etc. A reference to the perspective views (Figs. 67 and 68) assists us in appreciating the Buda-Pesth stage, as they show how the large rams can be worked, and how again the smaller rams can be utilised to work minor sections. It would almost suffice to say that the combination of the set of three rams with minor rams, and the division of each 'trap' into six sections, gives many possibilities to the scenic artist. Of course, the entire area of all the 'Kulissengassen' can be sunk or raised together as a whole, i.e. a very large part of the stage floor can be moved bodily. Each 'Kulissengasse,' besides being raised or lowered vertically, can be so moved that the 'slab' inclines; in fact, a 'see-saw' movement can be obtained for either one 'bridge' or all five together. I have already stated that there are five of these with a space at front and back, and that the latter has a set of large 'traps' of extra width. The total number of principal rams is hence eighteen. The width of the main 'slabs' or 'bridges,' that is, the depth of the ordinary 'Kulissengasse,' which, of course, includes the width of the 'traps' proper, 'sliders,' 'slits,' and framing, is about 10 feet (3 metres). The width of each 'slab' is about 39 feet (12 metres). The dimensions of the opening for the 'traps' proper in each 'Kulissengasse' is 36 feet (11 metres) by 3 feet 4 inches (1·3 metres), while the 'slider cuts' are 8 inches (0·20 metre) wide. There are five iron joists to each 'slab,' fitted parallel to the proscenium curtain, and these are supported by the outer rams, as already mentioned. Each 'slab' can be raised 13 feet (4 metres) above stage floor level, or lowered 6 feet 8 inches (2·3 metres) below it. The bearings of the five joists of each 'slab' are movable, so that the slope of the 'slab' does not interfere with the vertical position of the rams proper. In respect to the main 'trap' of each 'slab,' which, as already stated, is divided into six sections, the two central sections can, in each case, be raised 19 feet 8 inches (6 metres) above stage-floor level with the aid of a minor ram.

I have referred to the difficulty of tying the main joists of a wood stage, and have mentioned the various makeshifts adopted, such as iron hooks, etc. In the 'Asphaleia' stage no attempt whatever is made to tie the various parallel sections of the stage together. Each 'Kulissengasse' works individually and stands, so to say, on its own legs, and there are no ties from front to back of the 'under machinery.' No doubt this arrangement, if perfect, would be a boon to those in charge of a stage, but, if I am rightly informed, the absence of 'ties' in the 'Asphaleia' system is by no means as satisfactory as the promoters would have it. Each 'slab,' or 'Kulissengasse,' when in its usual position, forming part of the stage floor proper, has a remarkable tendency to vibrate, so that the makeshifts of wooden struts and cords have frequently been employed where a regular movement, such as a dance or march, has taken place. Protracted rhythmical movements are almost impossible.

In respect to the 'upper machinery' of the Buda-Pesth example, though it is perhaps not generally acknowledged to be of the same interest as the 'under machinery' of a hydraulic stage, to my mind takes a position of equal importance in the system. The whole of this 'upper machinery' is practically supported by two main lattice-girders, running from front to back of the stage parallel to the side walls, and only about 6 feet 8 inches (2·3 metres) away from the latter. There are five secondary lattice-girders resting on these two, and running parallel to the proscenium curtain. The section (Fig. 78) distinctly shows the arrangement. Why the five girders do not rest directly on the side walls I am unable to explain, for these are over 3 feet 3 inches (1 metre) thick at the top, and should be able to carry a considerable weight. The two principal girders appear quite unnecessary, unless there was a distinct purpose in transferring the weight of the 'upper machinery' to the front and back walls. It is, however, plain, as already stated, that the two principal girders practically support the whole of the upper appliances, and these in the first place comprise a system of 416 pulleys of 104 'battens' with 104 sets of roping or 'wires.' These 104 sets are worked by thirty-six small hydraulic rams, placed on the left wall when looking 'up' the stage. The hydraulic 'battens,' it will be seen, are in each case hung from three points only, about 19 feet 8 inches (6 metres) apart. There is one hydraulic ram to every three 'battens.' The roping is wire cable of 7 millimetres diameter. The whole of the hydraulic rams are in the front part of the stage, where there is a small raised gallery fitted for the mechanic.

As to the working of the 'horizon' referred to above, I need only add that the canvas is hung from thirteen points running over thirty-nine rollers, the roping or wires being gathered together in such a manner that the appliance can be either raised or lowered bodily by means of one hydraulic ram. The whole 'horizon' can be taken up out of sight, as the dimensions of the stage allow for raising the bottom hem of the canvas to a height of about 26 feet (8 metres) above floor level at curtain line.

Of minor appliances the 'flying gear,' which is shown on the section, is, perhaps, the most interesting. It allows the clever imitation of flying movements in curved sweeps.

It is not my intention to describe technical details, and there is but little that is complicated even in advanced stage mechanism, the principles of the various designs being the main points at issue, not the methods of execution. Given certain requirements and the basis on which they are to be fulfilled, the engineer will, as a rule, find no great difficulty in solving his problem, if he is versed in stage mechanism. The programme for the design will, however, be hard to determine, not only for any one class of playhouses, but more particularly for each individual example, owing to the very different purposes to which stages are put, both on the Continent and in this country. It would, for instance, not be easy to find another theatre in which requirements have to be fulfilled exactly similar to those at the Opera House at Buda-Pesth now under consideration.

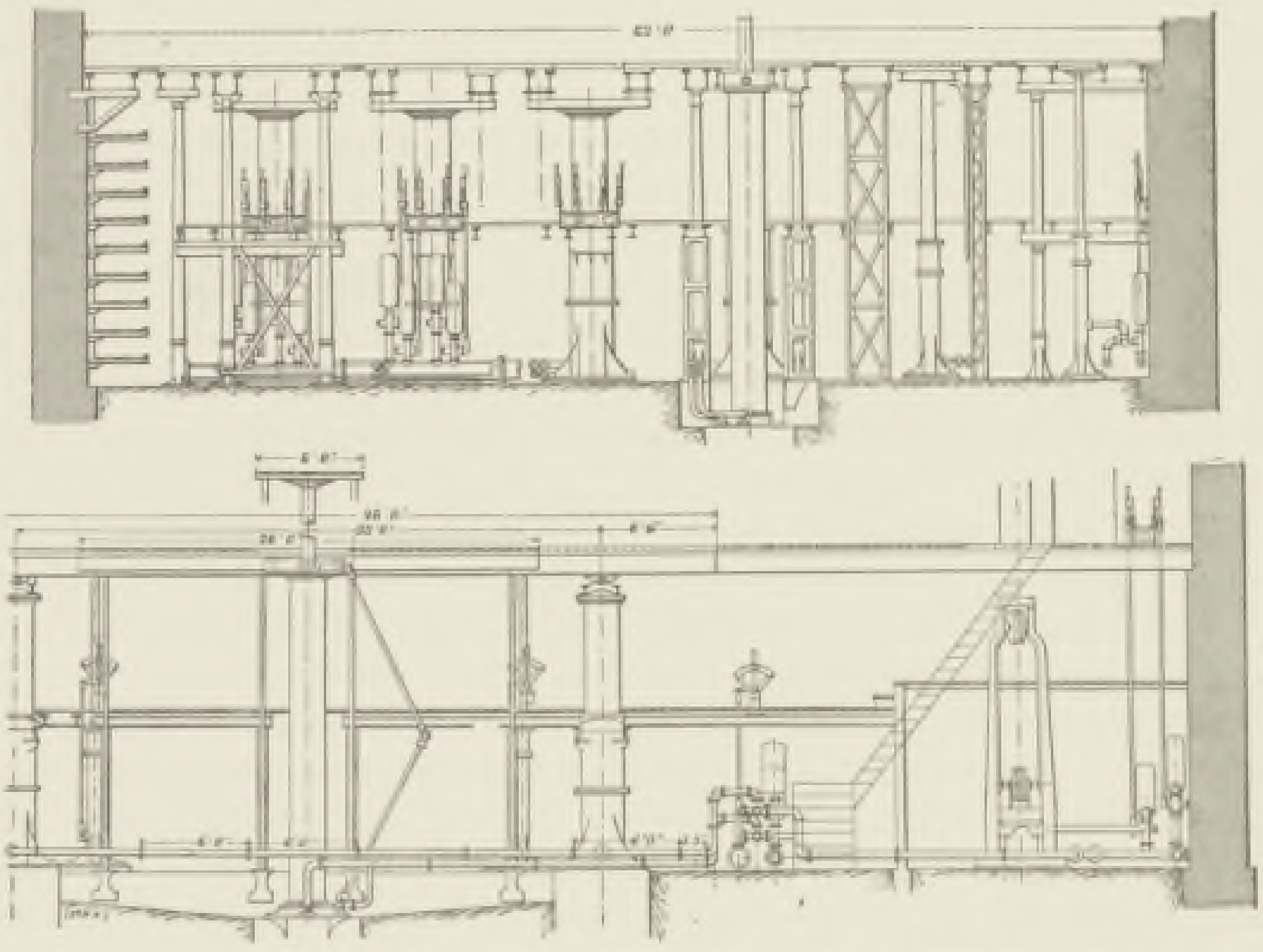
When speaking of the 'Asphaleia' stage at Halle, I quoted at some length the opinions of Richter, who had considerable experience of its working. I should now also detail the opinions of the engineer in charge of the 'Asphaleia' stage at Buda-Pesth, were it not for the fact that I find there is a wonderful similarity in the criticisms of this expert with those of Julius Rudolph, whose comments I have already reproduced. Reference to the remarks of the latter will almost suffice to explain the views of the Buda-Pesth engineer, Josef Christofani, whose opinion, like Richter's, has been founded on long practical experience of the appliances under consideration. There is one point, however, on which Christofani's criticisms are far more severe than Rudolph's, and that is in reference to the acoustic disadvantages of the 'Asphaleia' stage. He states that the resonance produced by the Buda-Pesth stage is most disagreeable, and that he can only prevent this stage from being useless by hanging a large number of extra 'cloths' to his 'gridiron.' These extra 'cloths' are a source of danger in the case of an outbreak of fire, and he recognises them as such. Here, then, one of the principal advantages of the 'Asphaleia' stage, as described in the syndicate's prospectus, is controverted, for we find exactly the opposite state of affairs to those promised in the much-advertised statement, where it is so distinctly set forth that there need be only a minimum of inflammable material at the 'back of the house.' There is, no doubt, little wood in the 'Asphaleia' stage; on the other hand, however, there is too much canvas, and the noxious fumes from burning canvas are even more dangerous than those from burning timber.

It is not my intention to lay special stress on the various defects of the system under consideration, for, as I have already remarked, the stages at Buda-Pesth and Halle were the pioneers of 'Stage reform,' and we are very considerably indebted to the enterprise of the syndicate for the great progress made of late in stage construction. It is by no means remarkable that the first examples of a new system should show numerous defects. Nevertheless, where promoters have used such high-flown language in the laudation of their wares, and promise so much which their appliances are unable to fulfil, it is almost essential to point out faults in a more decided manner than would otherwise be the case. The prospectus of the syndicate presents a too-highly coloured view of the advantages of the 'Asphaleia' system, and the following recapitulation of criticisms should be read side by side with it.

In the first place, the great risk of fire, so evident on all stages, is only partially lessened, for whilst the chance of conflagration is minimised so far as the catching light of structural parts is concerned, the necessarily greater storage of canvas in the 'upper machinery' is an equal source of danger. The great heat of a large quantity of burning canvas would, on the one hand, involve the speedy collapse of the girders and main structural parts of the design, whilst, on the other, as already pointed out, the gases would be particularly disastrous in their effects on the audience. In the second place, the acoustic properties of an 'Asphaleia' stage are far from satisfactory, even if the makeshift of canvas storage just referred to is adopted. Thirdly, the division of the stage floor does not allow the scenic artist sufficient scope to fulfil the requirements of a well-mounted play. Considerable use has to be made of the old makeshift of movable platforms, etc. A fourth defect lies in the excessive centralisation of the levers for working the appliances. The fact that the whole 'upper machinery' is manipulated from one point appears very satisfactory to the layman, but in reality full control of the 'cloths' becomes almost impossible, and the risk of accident is increased. Another serious fault consists in the want of elasticity in the construction of the 'traps,' as far as the risk of accident in the raising and lowering of artistes is concerned. The mechanical appliances do not allow a mishap to be easily averted, as in the case of the old wooden 'trap.' The want of rigidity of a stage floor supported by a few hydraulic rams becomes a serious defect directly plays are rendered which require the presence of large crowds thereon, marching, dancing, or other rhythmic movements. The last, though by no means least important disadvantage of the 'Asphaleia' stage to be recorded here is the excessive initial outlay, and the fact that there is by no means a saving of working expenses, whilst the depreciation of the value of the appliances is very rapid. I have, of course, only touched on the main features of the system in these criticisms, and not on any points in the actual construction.

Though it is not my intention to give particulars of other examples carried out by the 'Asphaleia' syndicate, I do not wish to omit mentioning that a stage has been set up according to their system at the Auditorium Building in Chicago, which is well known to be one of the most interesting blocks of its kind in the United States. Here the movable part of the stage has a depth of about 59 feet (18·80 metres), and a width of 46 feet (14 metres), the depth being divided into six 'Kulissengassen.' Four of these can be moved bodily, whilst the other two can only be raised and lowered in parts, and it appears that the levers are all placed in the first 'mezzanine.' The various sections can be raised as much as from 12 to 15 feet above the stage floor level. The reservoir which supplies the necessary power for the hydraulic rams is in a tower 200 feet above street level. I have included two diagrams (Figs. 80 and 81) to explain the principal features of the 'under machinery,' and these show that the design is very similar to that of the examples already given. It would, however, lead too far to enter into detail in respect to further examples of the same type, whatever variations each may show. The Buda-Pesth and Halle examples are not only typical, but also the best specimens of the 'Asphaleia' system.

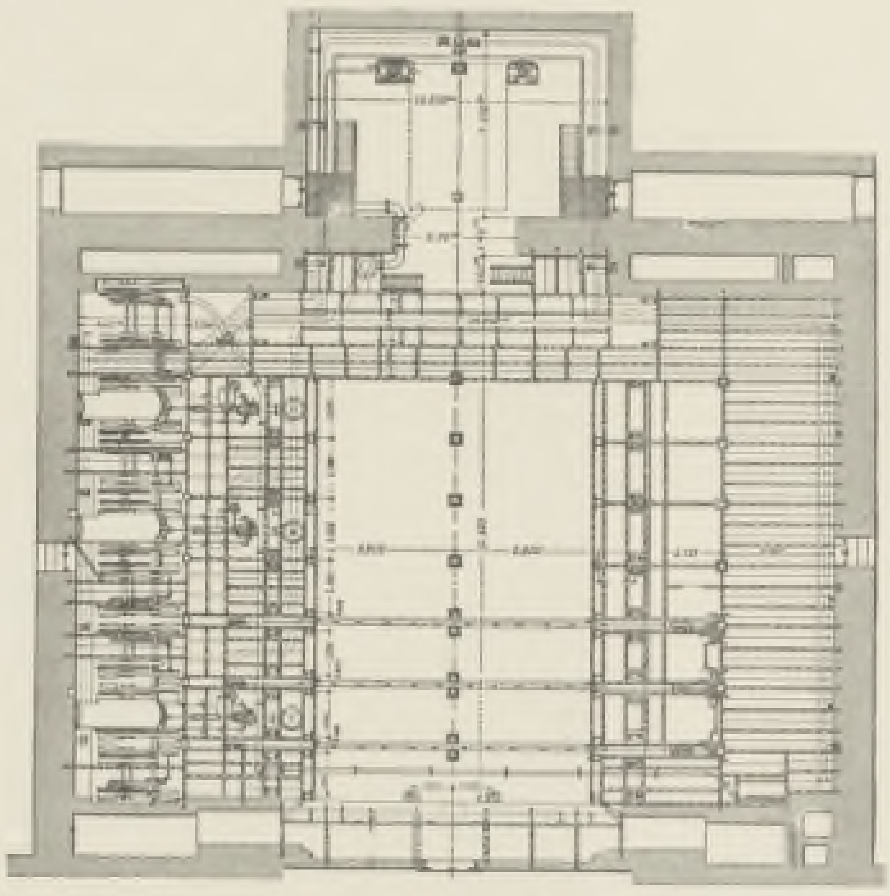
I must now pass on to designs evolved from or based on this system. Stages thus executed are frequently known as 'bastard Asphaleian,' but I prefer not to apply this title, for, among other reasons, comparison of dates and facts have shown me that much which is said to be the direct outcome of the 'Asphaleia' system has been designed quite independently of the work of the syndicate, and was in several instances even designed at a date prior to the formation of that company. The stage of the 'Hofburg' Theatre at Vienna, for instance, must have been planned (if not partly constructed) considerably earlier than the important date in September, 1884, when the appliances of the first 'Asphaleia' stage were set in motion at the Buda-Pesth Opera House.



THE AUDITORIUM, CHICAGO: STAGE. FIGS. 80 AND 81. SECTIONS OF 'UNDER MACHINERY.'

THE STAGE OF THE COURT THEATRE, VIENNA.

UP to the present section my examples have successively increased in elaboration. Beginning with the most elementary form of wood stage, the series has practically comprised every system or type of wood construction; part wood and part iron stages of various design have also been illustrated; and finally the modern iron stage has been brought under consideration. As in the case of the wood stage of old, we have also found that modern appliances have lent themselves to innumerable forms of construction, although the date at which iron was introduced for theatrical stages was very recent, and there has been but little time for development. The great variety of motive power for the modern iron stage has partly been the cause of the great diversity in so small a number of years. We have to deal, for instance, with hydraulic power applied in many different forms, quite apart from its combination with manual labour. I have presented a modern example, such as the Amsterdam stage, which is worked by manual labour alone, and several examples of the 'Asphaleia' system, in which the direct application of hydraulic rams has been introduced. Such stages as those of Amsterdam, Halle and Buda-Pesth are instructive in many ways, and call for admiration; whilst the complexity of the Buda-Pesth stage in particular, and the finish of its appliances, give it a most prominent position. I now propose to present other examples of considerable elaboration, such as Fritz Brandt's new hydraulic stage at the Berlin Court Playhouse, and Karl Lautenschlaeger's electrical stage; but none, even if more practical in their working or more perfect in detail, can rival in brilliance the stage for which the 'Hofburg' Theatre at Vienna is so justly noted, and which is dealt with in the following pages. The stage of the 'Hofburg' Theatre has been built regardless of expense, with the intention that it should be a model of construction in every respect; and, at the same time, we find that those in charge, thanks to their command of ample funds, are also able to keep the installation in most perfect order.



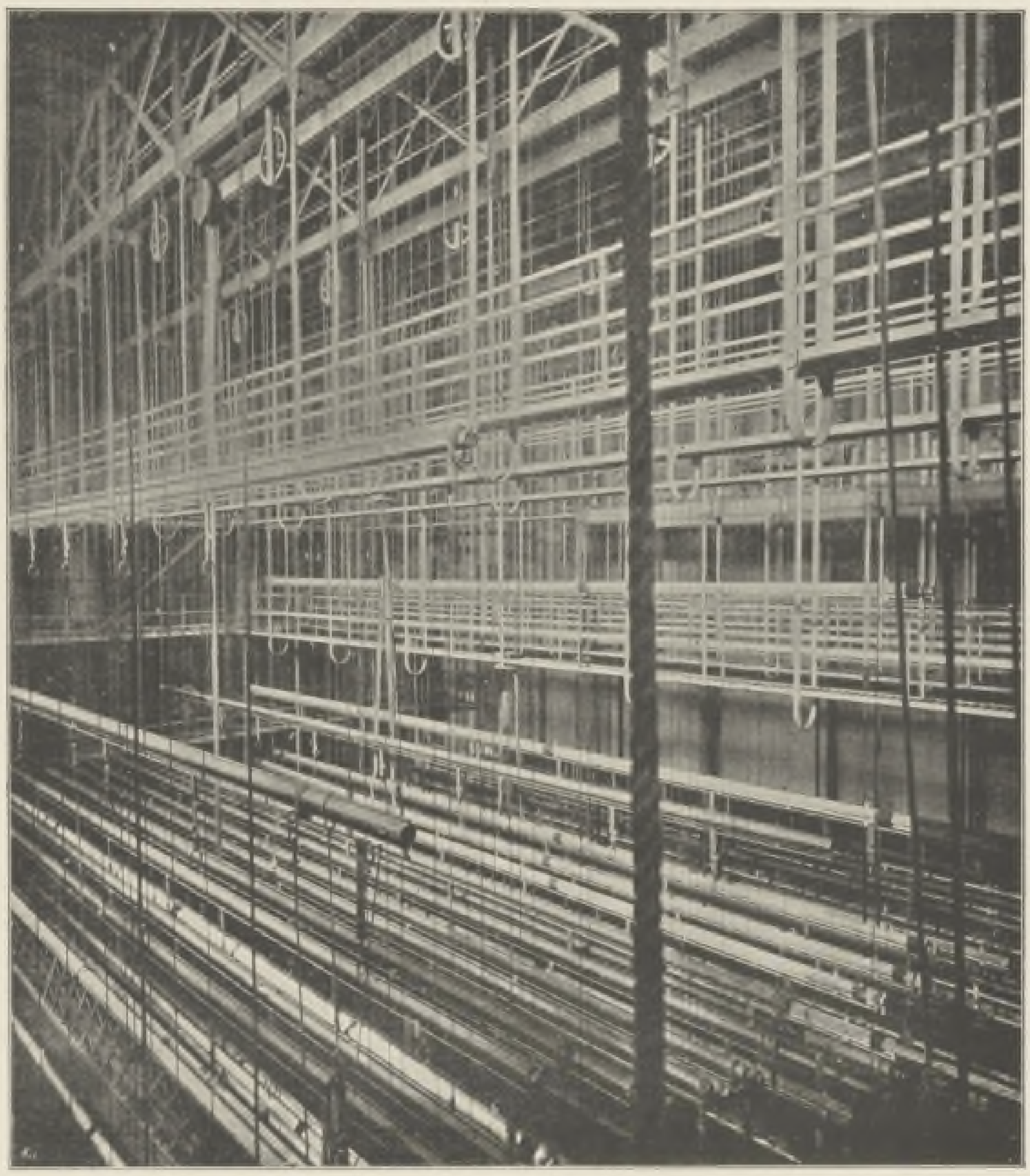
COURT THEATRE, VIENNA: STAGE.
FIG. 82. PLAN OF SECOND 'MEZZANINE.'

COURT THEATRE, VIENNA: STAGE.
FIG. 83. PLAN OF FIRST 'MEZZANINE.'

To be able to appreciate the stage of the 'Hofburg' Theatre it is essential that we should be acquainted with some particulars of the origin of that playhouse, the requirements it had to fulfil, and the principal features of the structure, and I must, therefore, call special attention to my remarks in Volume I. in relation thereto. The theatre was opened in 1888, although this date does not mark the time at which it was originally designed, nor suggest the period of evolution which occurred between the laying of the foundation stone and its inauguration. The 'Hofburg' Theatre has had an unusually protracted and diversified history, rivalled only to a limited extent by that of the National Opera House at Paris, which, it will be remembered, was designed as far back as 1860, and was not opened until 1875. For all that, I can but repeat what I have previously remarked, that as an example of high technical skill in theatre construction, this monument serves as a fitting model for future enterprises of a similar character.

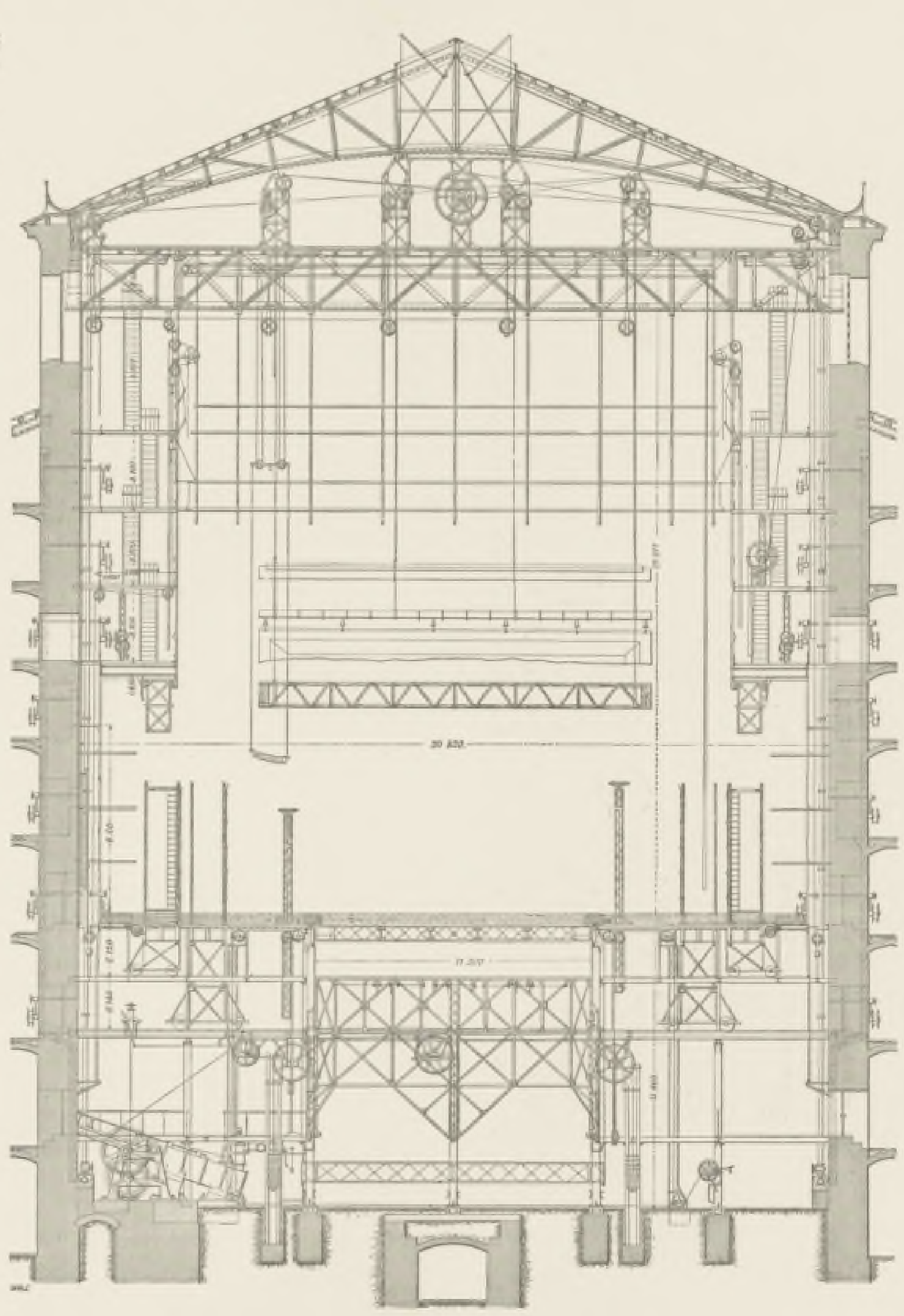
It will be seen from Volume I. how the original commission to Semper dated from 1869, while his final appointment, with Hasenauer as collaborator, was not announced until 1871. The actual operations on the theatre commenced in May, 1874. The stage and the 'back of the house' were finished in 1887, and the remainder of the building in September, 1888, the opening performance taking place in October of the same year. Whilst no such thing as an iron stage existed, or was thought of, at the time when the building was conceived, and only improved wood stages were to be found during the greater part of the twenty-three years of building operations, it was when the carcase was practically completed in 1881 that the great 'Ring' Theatre fire took place at Vienna, following upon two similar catastrophes at Boston and Nice.

The original design for the stage of the 'Hofburg' Theatre, for which a model had been prepared to a large scale, was due to Julius Rudolph, to whom I have had occasion to refer previously. This design showed a large wood stage of an elementary type. As we now find it, it is the result of the combined efforts of the present stage-engineer in charge, Friedrich Brettschneider, and a constructional engineer from the firm entrusted with its execution, Siegmund Wagner, while Baron Hasenauer was responsible for many of the ideas embodied. The works with which Wagner was associated executed the design. Though the late Baron Hasenauer kindly put at my disposal for the purpose of this present work all the



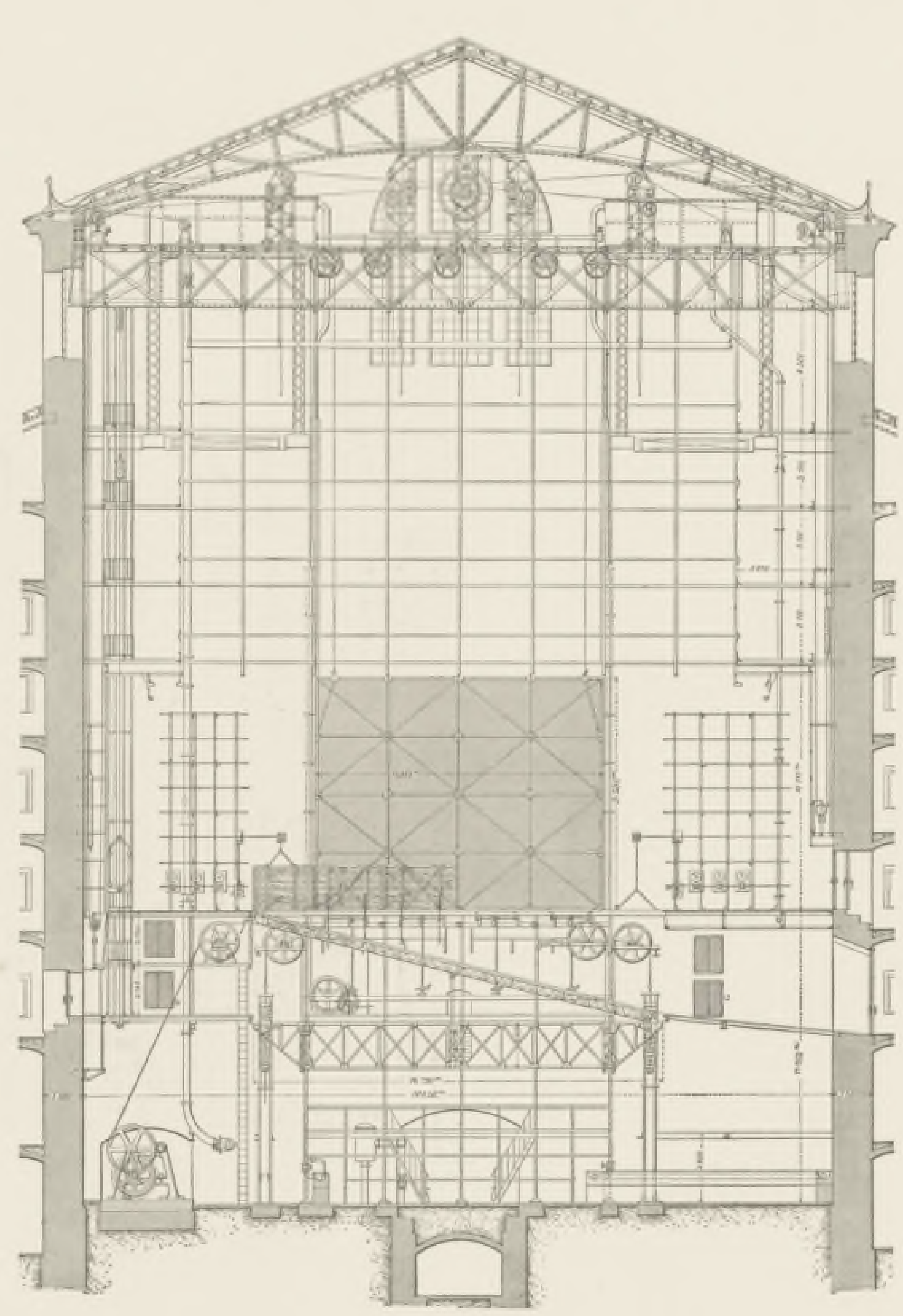
COURT THEATRE, VIENNA: STAGE. FIG. 84. VIEW OF 'UPPER MACHINERY.'

necessary drawings of the 'Hofburg' stage, I unfortunately had but little opportunity of discussing the question of stage mechanism with him, our conversations referring principally to the general planning and architectural rendering of the block. I know, however, that, whilst enthusiastic as regards the introduction of metal in stage construction, he was in no way friendly to such an absolutely radical reform of all the arrangements of the stage as was brought forward in the designs of the 'Asphaleia' syndicate. He was far more in favour of seeing the lines of the old wood stage reproduced in an improved form and in better material, and it is thanks, perhaps, to his dislike of the more violent changes that the 'Hofburg' Theatre has a stage which does not bear evidence of an absolute revolution in theatrical construction. I know Friedrich Brettschneider to have been an enthusiastic admirer of radical 'Stage reform' at the time when the designs for the present stage were prepared. I know also that he has now greatly modified his views on the matter, and, I believe, even considers that certain of the appliances for the introduction of which he is responsible are too complicated for their purpose. He has, indeed, frequently said that if the opportunity were again given him to design the stage of the 'Hofburg' Theatre, the arrangements would



TRANSVERSE SECTION.
(FIG. 85.)

Querschnitt. Coupe Transversale.



TRANSVERSE SECTION.
(FIG. 86.)

Querschnitt. Coupe Transversale.

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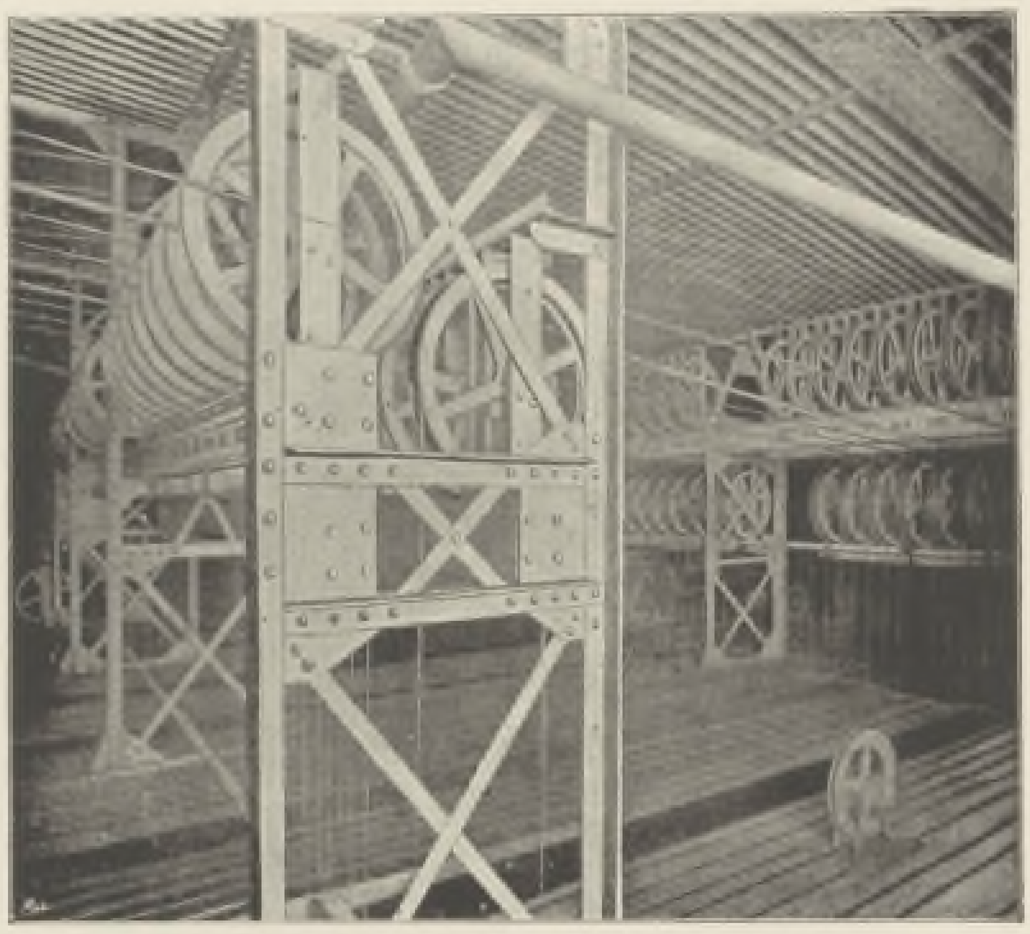
THE STAGE OF THE COURT THEATRE, VIENNA.

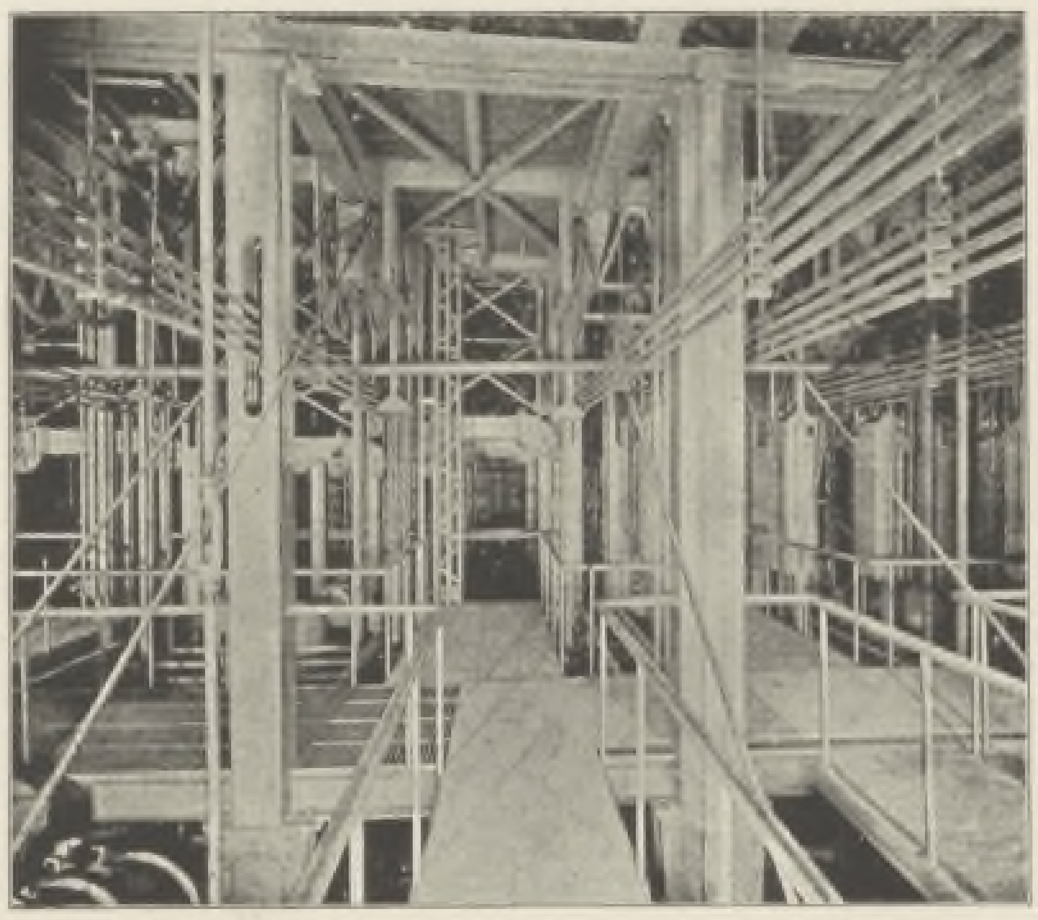
be considerably simpler than they are to-day. I will, however, after the mechanism has been described, introduce some comments made by himself on his own work, of which, by-the-bye, he has been in charge since the opening day.

After the description of the 'Asphaleia' stage it might be well to summarise at once the principal points of difference between the 'Hofburg' stage on the one side and the stages of Buda-Pesth and Halle on the other. In the first place, the whole installation of 'flies,' 'borders' and 'back-cloths' generally to be found in the larger German stages has been retained, and with this also the system of 'chariots.' The general plan and the divisions of the stage are likewise similar to the main features of the large German wood, or wood-and-iron stage. On the other hand, hydraulic power has been introduced for moving all the principal parts of the 'under machinery,' but, unlike the 'Asphaleia' installations, no section of the stage floor or any 'trap' or 'bridge' is raised by the *direct* application of hydraulic rams. All hydraulic pressure is *indirect*, the movements being effected by cables and pulleys which are worked by rams placed at the sides of the stage. Hence, no blocking of the under-stage by vertical rams occurs, as in the case of the 'Asphaleia' system. Engineers abroad have specified the difference in the two systems by calling the 'Asphaleia' arrangement a combination of 'lifts,' whilst to the 'Hofburg' mechanism the term 'hydraulic cranes' has been applied. The 'horizon' which is such a conspicuous feature in the 'Asphaleia' stage is only to be found in a very modified form, as we have here simply a kind of curved 'back-cloth' hanging from a curved 'batten' on rings which can be easily moved up and down, and for which there are no extra lengths of canvas on vertical rollers for panoramic effects. In the form here adopted we also find the excellent arrangement of coupled 'bridges' with a 'rolling way', by which a large section of the stage can be easily sunk, allowing an enormous 'slab,' if I may call it so, to close the gap. Minor 'traps' can be worked through openings in the 'slab,' the coverings to which are constructed on the lines of the ordinary 'grave traps.'



COURT THEATRE, VIENNA: STAGE. FIG. 87. VIEW OF 'GRIDIRON.'

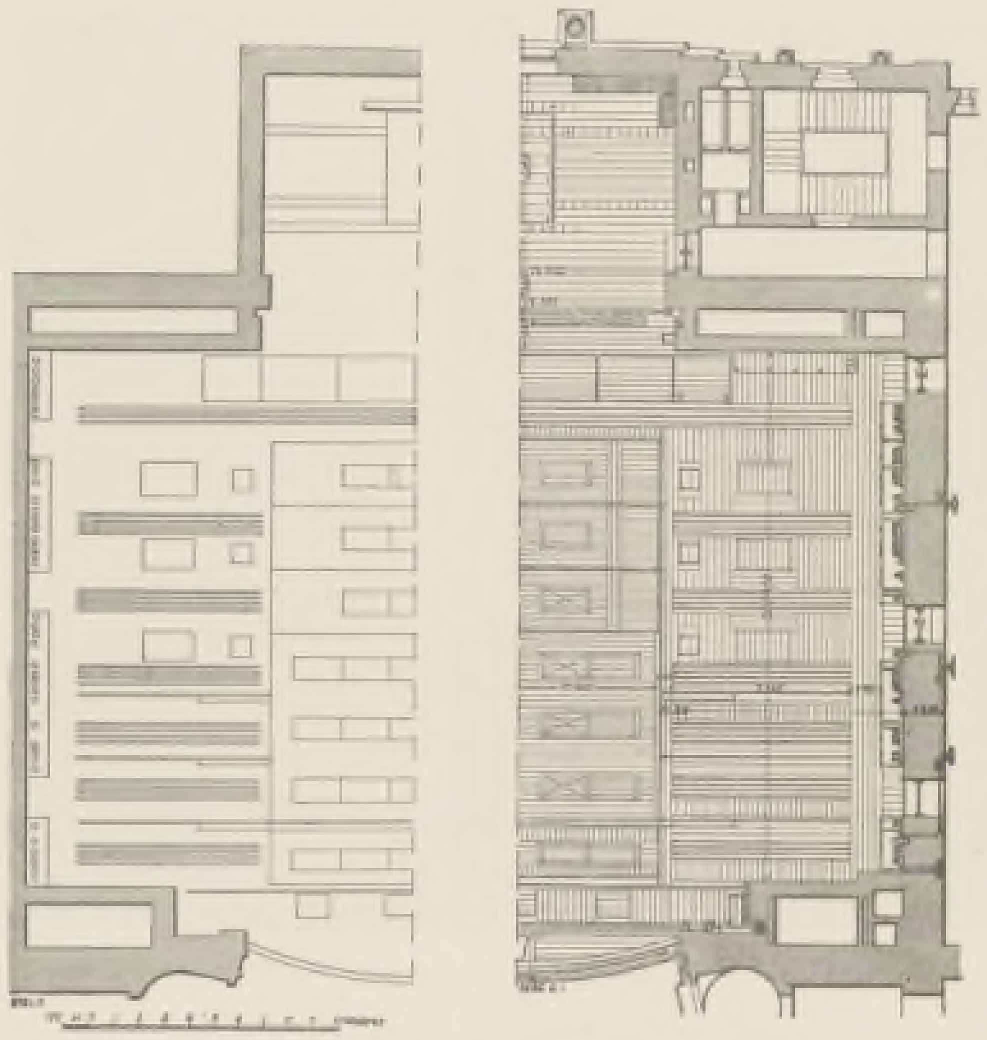
Commencing with the proscenium, I would point out that at the 'Hofburg' Theatre we find a second 'frame' to the stage picture. The opening proper has a width of 42 feet (12·75 metres) and a height of 42 feet 6 inches (13 metres); the latter, however, being reduced by the semi-fixture known as the 'harlequin curtain,' which cuts off over 8 feet (2·5 metres) of the height. The distance between the two 'frames' (the architectural 'frame' proper and the second 'frame' just referred to) is about 3 feet 3 inches (1 metre), and in this space there is sufficient room for hanging the three principal 'act-drops,' as well as the fire-resisting curtain. Both space and position will be clearly seen on the plan (Fig. 89), as well as in the longitudinal section (Fig. 92). The second 'frame' practically serves the purpose of the movable proscenium 'frame,' and comprises only two upright surfaces fixed on 'chariots,' which can be run forward and backward, and a 'top-piece' or 'border' which can be raised or lowered according to the special requirements of the play. The minimum opening obtainable by this appliance measures about 26 feet (8 metres) by 19 feet 6 inches (6 metres). It will at once be seen how different these dimensions are from those of the opening proper. The second 'frame,' I should add, has its own 'act-drop' in addition to the three I have already mentioned, which may be considered to belong to the principal 'frame.'



COURT THEATRE, VIENNA: STAGE. FIG. 88. VIEW OF 'UNDER MACHINERY.'

The 'Hofburg' stage has a width between wall and wall of 101 feet 6 inches (31 metres) and a depth measured from the curtain line of 77 feet 9 inches (23·75 metres), whilst the mean height from stage to 'gridiron' is 90 feet (27·50 metres), and there is a back-stage which has a width of 40 feet 4 inches (12·30 metres), allowing for an extra depth of

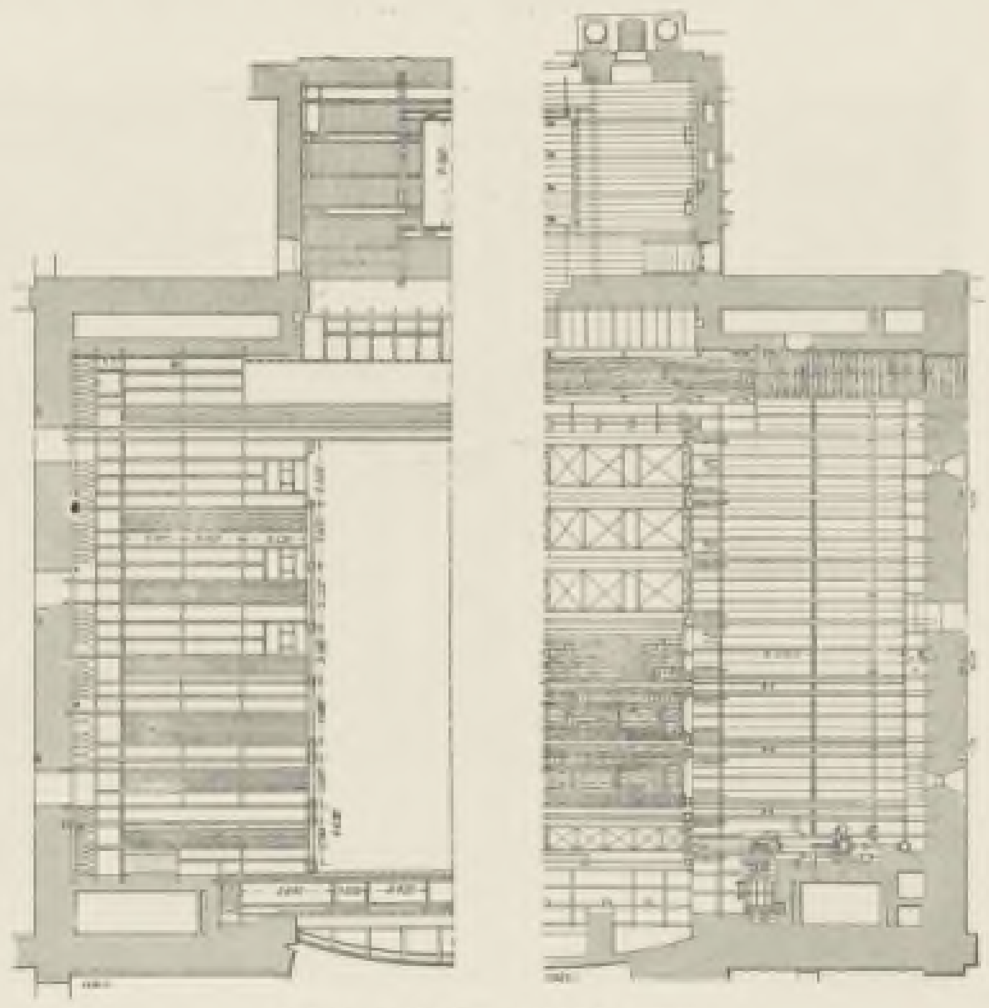
32 feet (9·75 metres). The height of this back-stage is 31 feet (9·50 metres). Hence a scene can be mounted which has a depth of as much as 100 feet, assuming that no part at the back requires a greater height than 29 feet 6 inches (9 metres). The depth of the 'cellar' floor below stage level at curtain line is 36 feet (11 metres), and from 'cellar' floor to 'gridiron' the total height is slightly over 126 feet (38·50 metres).



COURT THEATRE, VIENNA: STAGE.
FIG. 89. PLAN OF STAGE FLOOR.

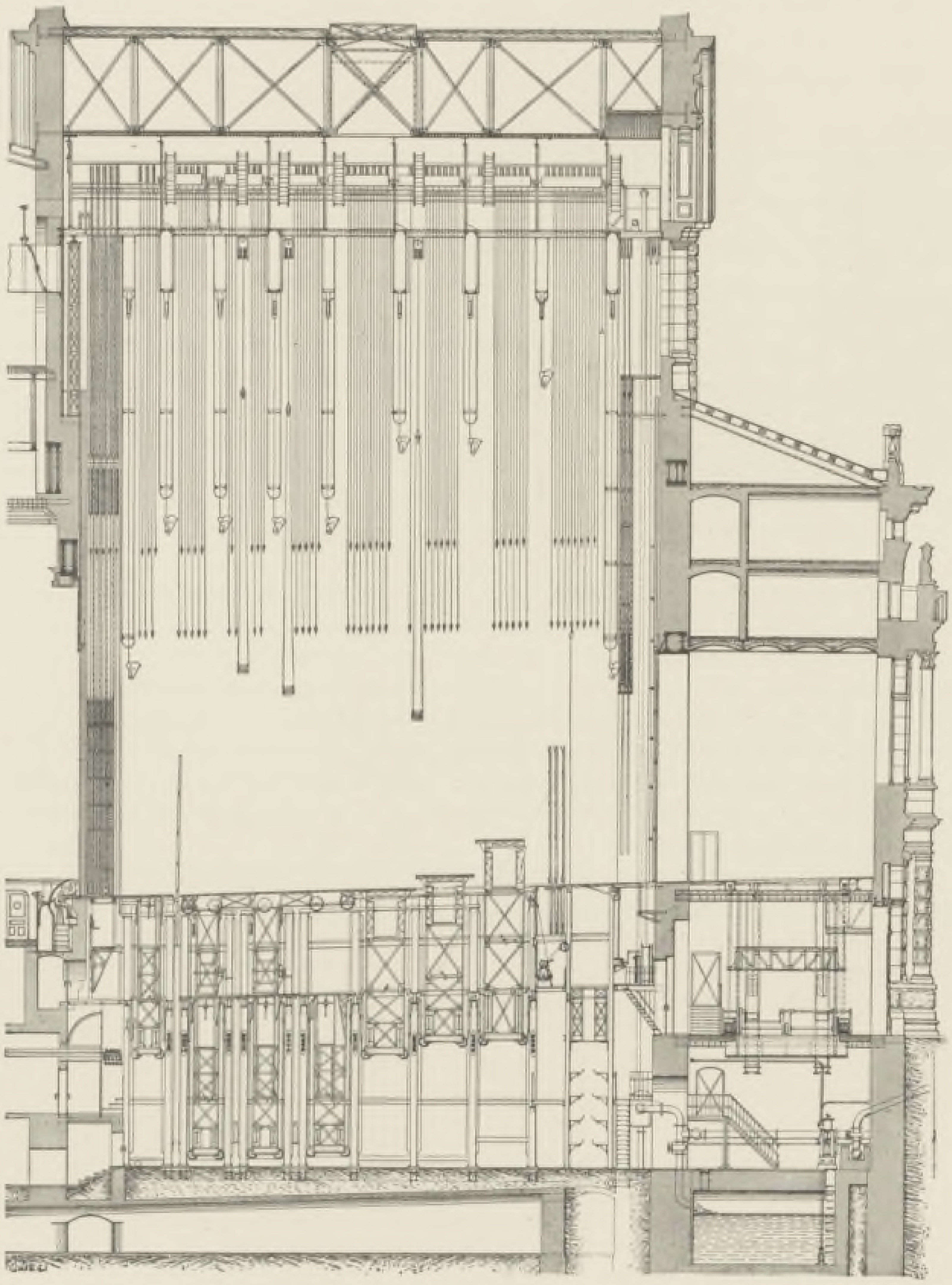
If we examine the plan of the stage floor, we find that it rather resembles the more advanced German composite stage, though the sequences are not so regularly grouped, and there is considerable variation in the position of the various 'bridges,' 'traps,' etc. Using the terms common to these stages, and already fully explained, we find a sequence of 'Kulissengassen.' These, however, cannot be dealt with in the same manner as has been the case with the older stages, since not only do the number of 'chariot slits' vary in their distances from one another, but their position in no way coincides with that of the principal 'traps' or 'bridges.' One might even say that there is an independent arrangement of 'chariot slits' for the 'wings' by which seven 'Gassen' in all are formed on the stage proper, and of which the first is only of small width, while the last three greatly increase in depth. On the other hand, the arrangement of the other movable parts of the stage floor distinctly shows seven equidistant 'Gassen,' comprising seven sets of 'bridges' moved by hydraulic rams.

The first of these 'bridges,' as seen from the auditorium, practically works independently, and has subsidiary or 'star traps' which can either be worked by manual labour or coupled-in so as to be moved by water power. The other six 'bridges' also work independently, but the three nearest the auditorium and the three furthest removed from it frequently work together in sets so as to allow an enormous 'rolling way' or 'slab' to be used by which 'scenes' are moved bodily from front to back of the stage, or *vice versâ*. This 'rolling way' is always on the stage floor level, as it reaches over the independent 'bridges' when they are sunk, to make way for this covering. Thus, not more than four 'bridges' can be visible at any one time. On the stage floor plan (Fig. 89) only the first, fifth, sixth and seventh 'bridges' are shown, as the second, third and fourth are covered by the large 'slab.' The whole of the seven 'bridges,' if sunk together, would form a well measuring 57 feet (17·40 metres) in depth, 38 feet (11·60 metres) in width, and sunk nearly 14 feet (4·25 metres) below stage floor level. Another movable part of the stage floor is the so-called 'scene slide,' or 'scene lift,' at the back of the stage proper, which is practically an enormous 'bridge,' one side of which can be sunk in such a manner that a 'sliding way' is formed for moving scenery out of the building. The whole of the necessary water power for working the rams is contained in reservoirs so placed as to give a head of 131 feet (40 metres). Should there be any sudden defect in the hydraulic working of the 'bridges,' winches can be easily applied to act as makeshifts.



COURT THEATRE, VIENNA: STAGE.
FIGS. 90 AND 91. PLANS OF 'UNDER MACHINERY.'

As regards the 'chariot slits,' I have already said that they are so irregularly grouped as to form 'Kulissengassen' of unequal width. The 'chariots and poles' here take the form of wide frames measuring about 19 feet 6 inches (6 metres) by 4 feet (1·25 metres), fixed to iron stands which run through the 'slits' in the floor to the iron 'chariots' proper below, the width of each 'slit' in this case being 1¼ inches (35 millimetres). There are over thirty 'chariots' of this description, and I should add that I found them to run smoothly, as the rollers had been most practically laid throughout. The average distance between two 'slits' in any group is

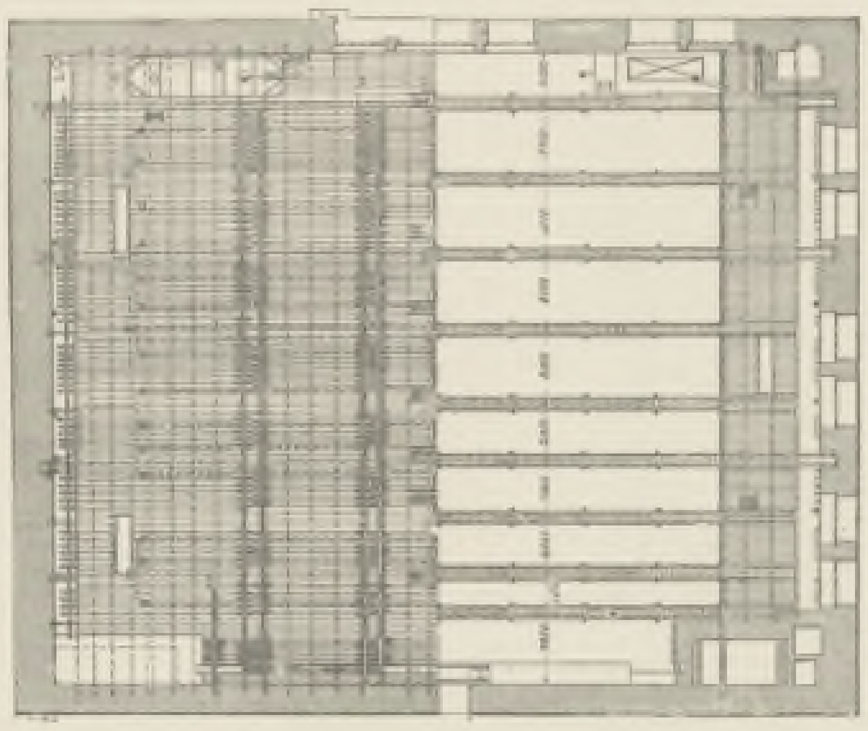


COURT THEATRE, VIENNA: STAGE.

FIG. 92. LONGITUDINAL SECTION.

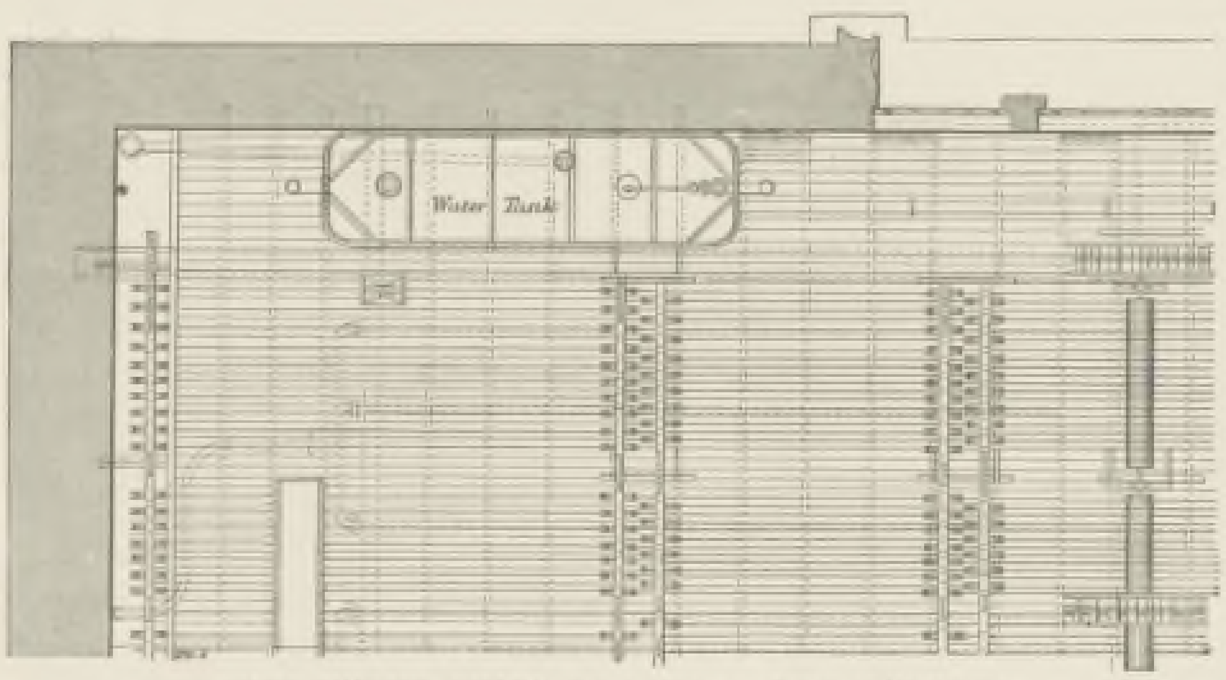
7 inches (0·20 metre), and the various widths of the 'Kulissengassen' already referred to are 4 feet 6 inches (1·40 metres), 6 feet 6 inches (2 metres), and 7 feet 6 inches (2·30 metres) respectively. In three cases only, and at the back, is a special 'slit' to serve the purpose of what is known as the 'Freifahrt,' i.e. a 'slit' which extends over the whole width of the stage and allows 'set pieces' to be quickly moved across. Since there is an arrangement on the same lines as the 'slider cut' in connection with each of these 'Freifahrten,' it is also possible to bring up scenery through them.

With regard to the 'under machinery,' we find that the design includes three 'mezzanines' and a 'cellar,' of which the first and second 'mezzanines,' 6 feet 6 inches and 13 feet 3 inches (2 and 4 metres) below stage floor level respectively, have the same fall as the latter, whilst the third 'mezzanine' is horizontal, and therefore runs parallel with the 'cellar' floor. The whole of the immovable parts of the stage floor and the 'mezzanines' are supported upon a sequence of upright columns standing about 8 feet (2·50 metres) apart, the flooring being held by the usual arrangement of girders and cross-joists. The flooring itself in the 'mezzanines' is of iron grill work, on which linoleum or carpets are laid to prevent resonance when the scene-shifters are working in this part of the stage. It would lead too far were I to explain in detail the mechanism employed, as the diagrams fully illustrate the system on which the whole of the appliances are designed, and it will always be found in stage construction that of no two installations can the details be exactly alike. If this had not been the case, I should have supplemented the diagrams with further details of individual hydraulic rams, and of the 'bridges,' etc. As it is, only certain parts of the drawings (Figs. 94 and 95) are reproduced to a larger scale, for the sake of clearness.



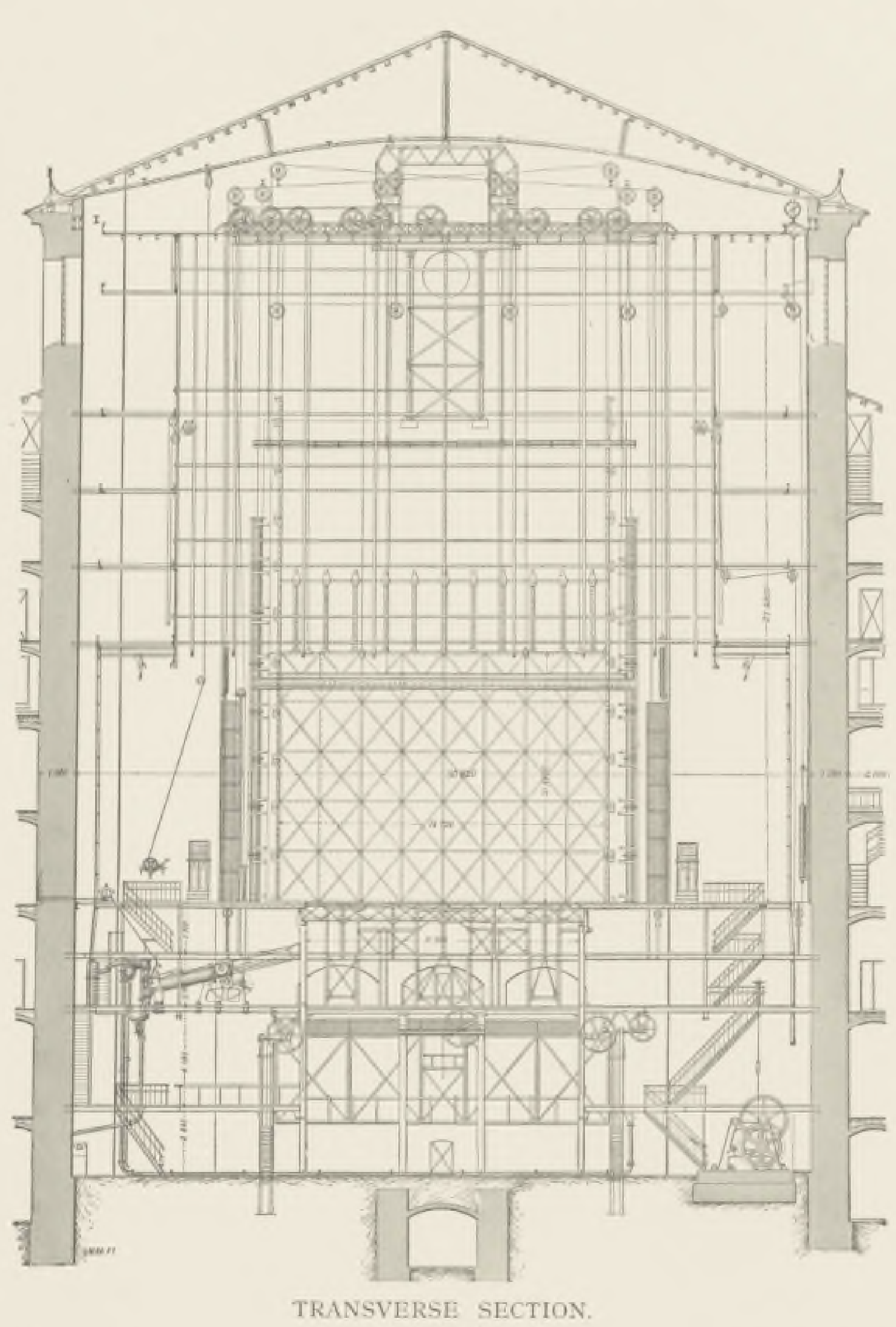
COURT THEATRE, VIENNA: STAGE.
FIG. 93. PLANS OF 'GRIDIRON' AND 'FLY GALLERY.'

As to the 'upper machinery' of the 'Hofburg' Theatre it is in the first place remarkable that, though we are dealing with a modern stage, in which, according to the proposals of the 'Asphaleia' syndicate, no 'fly galleries' whatever should be necesssary, Friedrich Brettschneider has found it advisable to have no less than five tiers, commencing with the first about 36 feet (11 metres) above the stage floor. The galleries, which are known as the first, second, third, fourth and fifth respectively, vary in height, the first three measuring about 10 feet (3·10 metres) from floor to floor, the fourth, 14 feet 9 inches (4·50 metres) from floor to floor, and the fifth, just over 8 feet (2·50 metres) in height. The 'gridiron' proper is supported on five large girders, resting on the side walls, and having a depth of 8 feet each (2·50 metres), while the fifth 'gallery,' with its connecting 'flying bridges,' is carried on the bottom flange of these girders. There are, too, 'connecting bridges' between the other 'fly galleries,' as will be seen from the plans of the 'upper machinery' presented at various levels; but, as will also be observed, the number of 'flying bridges' for the lower galleries is limited to two connecting links at the front and back of the stage, and there is only a full set of 'flying bridges' between the third and fourth tiers. As one of the sections also shows, the 'drop bridge' connection has to be applied to these 'flying bridges,' so as to let the 'horizon' or 'side-cloths' pass along the side of the stage.

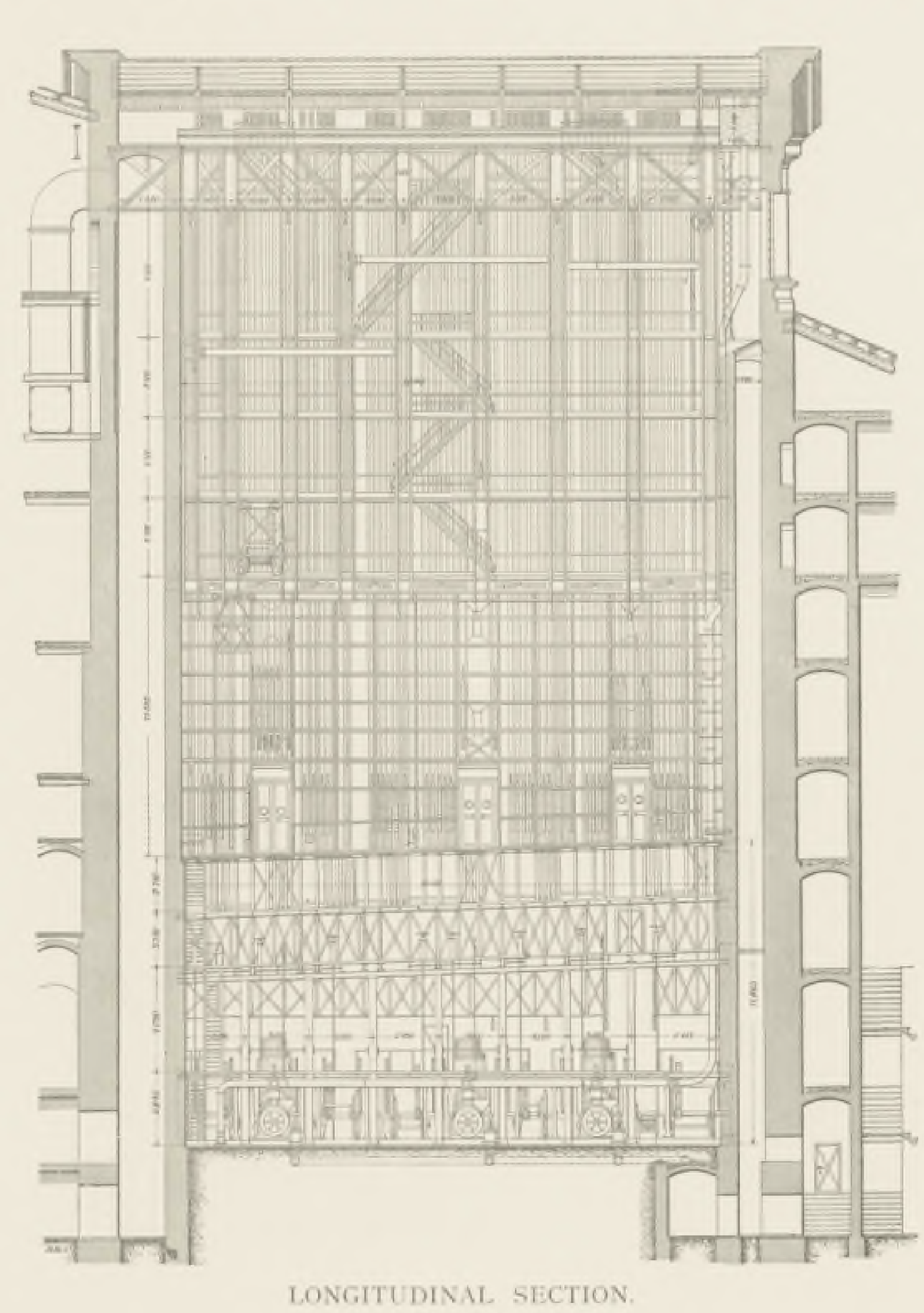


COURT THEATRE, VIENNA: STAGE. FIG. 94. DETAIL OF 'GRIDIRON.'

As regards the number of 'cloths' that can be worked, I would only note that there are sets of pulleys for no less than 104 'battens,' and these, it should be added, are all hung from wires of $\frac{1}{4}$ inch (6 millimetres) diameter, each 'batten' generally being attached at four points. The 'battens' themselves are iron, oval in section, and about 52 feet 6 inches (16 metres) long. Each batten has from eight to ten clamps for fastening on the pole of the 'scene' or 'cloth.' There are the usual special 'battens' in this theatre for lighting purposes, and these, nine in number, are hung from wires $\frac{3}{8}$ inch (10 millimetres) diameter, with distinct sets of pulleys, etc. It may be interesting to give some dimensions relating to the scenery required for a stage of this kind. The 'back-cloths' vary from about 52 to 59 feet (16 to 18 metres) in width, with a height of from about 33 to 39 feet (10 to 12 metres), whilst the 'borders' have the same width and a height varying from 6 feet 6 inches to 10 feet (2 to 3 metres). 'Wings,' when used, must



TRANSVERSE SECTION.
(Fig. 96.)
Querschnitt. Coupe Transversale.



LONGITUDINAL SECTION.
(Fig. 97.)
Laengsschnitt. Coupe Longitudinale.

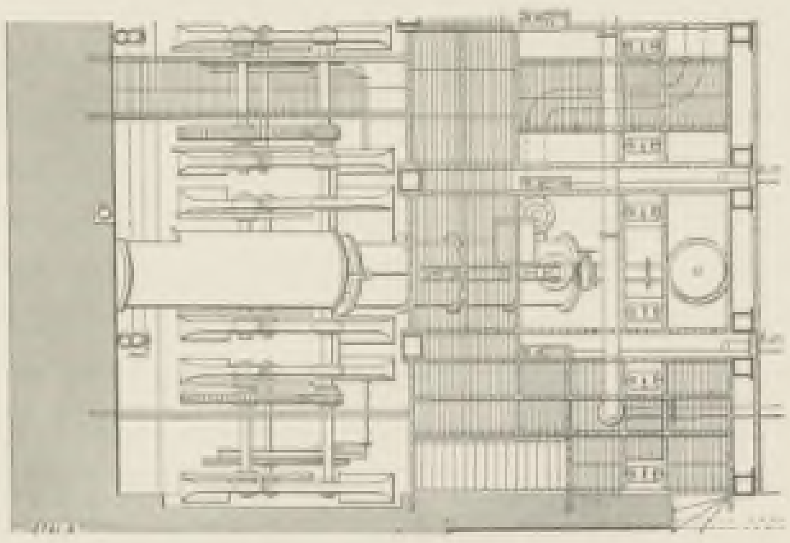
Edwin O. Sachs ed:

THE STAGE OF THE COURT THEATRE, VIENNA.

measure approximately from 26 to 29 feet (8 to 9 metres) vertically, with a width of at least 10 feet (3 metres); whilst, though there is an ample supply of hydraulic power, and the rams can raise parts of the stage above stage floor level, a large number of frames for building up scenes are necessary, many of which reach the size of 10 by 13 feet (3 by 4 metres).

To return to the general requirements of the 'Hofburg' stage, the main lines and dimensions of which have been given, it would be as well to mention that for the actual purposes which have to be fulfilled, it is only too apparent that the expenditure both for the installation and the maintenance must be far greater than the practical value obtained. The working of the stage is by no means facilitated to the extent which the design, its execution and its cost would lead us to anticipate. It is but on rare occasions that the appliances need be employed to any considerable extent, for, with few exceptions, the rendering of works either by classic authors or by modern playwrights seldom necessitates great or even rapid stage effects and transformations. It is true that all the larger sections of the stage are moved by hydraulic power, but the minor 'traps' are almost regularly worked by manual labour, and these 'traps' are far more often required than is the movement of the 'bridges' or the 'rolling way.' The whole of the 'upper machinery' can be worked by hydraulic power, and yet the engineer in charge, for reasons fully explained by me when referring to the 'Asphaleia' stage, prefers to avail himself of the possibility given him to use manual labour, and only regrets that so much money was wasted, as he terms it, on hydraulic appliances above stage floor level.

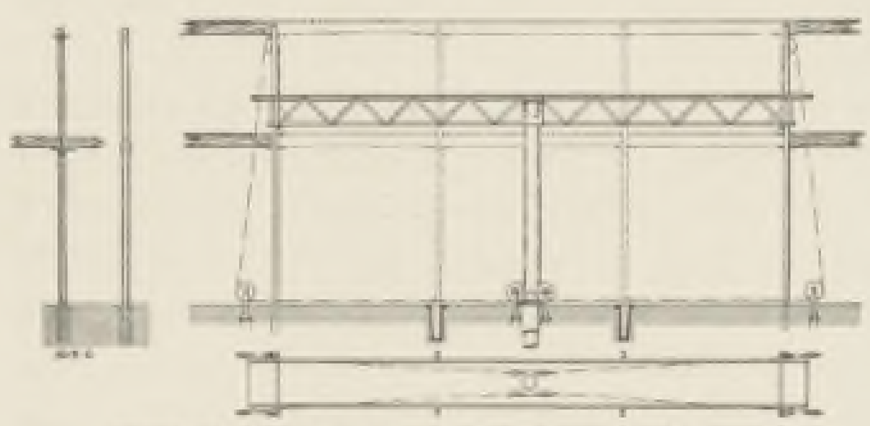
We have before us a most elaborate example of stage mechanism, which, unfortunately however, is somewhat purposeless at the 'Hofburg' Theatre. Given these appliances on a stage where full advantage might be taken of their design, I hold that the general opinion as to practicability would be that the 'under machinery' as it stands, with a few minor alterations, might be safely considered a model for the coming era of modernised stages, whilst the 'upper machinery' would have to be modified to such an extent that while, as a rule, manual labour is employed, the possibility might yet exist of using hydraulic power for facilitating the rendering of important effects. I do not consider that the general working of the 'upper machinery' lends itself particularly to hydraulic installation; manual labour is safer, more practical for obtaining effects to a nicety, and not more expensive, but particularly on large opera stages, the boon of being able to obtain uniform and sudden effects on a large scale is invaluable. In the 'under machinery' the crane system, which takes up but little room, is, on the other hand, immeasurably more safe, practical, and economic. To obtain a perfect stage based on Friedrich Brettschneider's design is a matter of but slight difficulty, as the improvements necessary are only a question of detail requiring some modification from actual experience.



COURT THEATRE, VIENNA: STAGE.
FIG. 95. DETAILS OF HYDRAULIC RAMS.

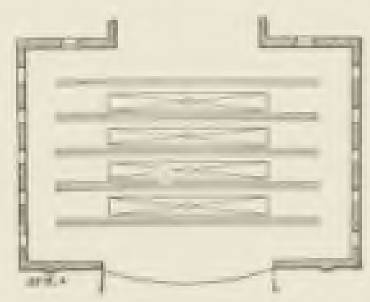
THE STAGE OF THE COURT THEATRE, BERLIN.

In treating of the hydraulic stage, I have laid stress on the fact that the two leading principles of construction adopted are those known by the names of the 'direct ram' system and the 'crane' system. In the 'Asphaleia' stage the 'direct ram' system is used, and in pointing out the advantages and disadvantages of the latter I was careful to explain how unpractical it was to have so much space taken up by the vertical hydraulic ram, or rather, sets of rams. It will be remembered that the principal 'bridges' in the 'Asphaleia' system were supported by three rams, one placed in the centre and one on either side. In the 'Hofburg' Theatre at Vienna the 'crane' system was employed, and all 'bridges' and 'traps' were worked by wires from hydraulic rams placed at the side of the stage 'cellar,' and thus no part of the 'under machinery' situated below that section of the stage floor which is visible to the audience was blocked by uprights. In the example now under consideration will be found a combination of the systems adopted in the 'Asphaleia' stages and at the 'Hofburg' Theatre, for, whilst the 'bridges' proper are principally supported by one vertical central hydraulic ram, each end of the long 'slab' or floor is suspended from cables. This system, which was first adopted at the Berlin 'Schauspielhaus,' was designed and patented as far back as 1888 by Fritz Brandt, the engineer-in-chief to the Court playhouses of the German capital. Several other theatres in Germany also possess stages designed by this engineer on similar lines.

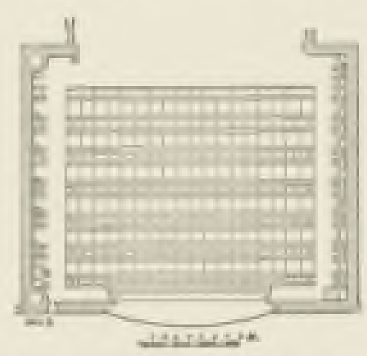


FRITZ BRANDT'S STAGE. Fig. 98. Details of 'Bridge.'

Before referring to this Berlin stage, however, I will quote some of the opinions which Engineer Brandt himself has expressed on the subject. Firstly, a patent specification describing the 'trap' or 'bridge' worked by his system of combined hydraulic rams and cables explains how the central ram and cable-work are connected in such a manner as to ensure rigidity in the 'slab,' the latter being practically held at five points, hung from four and supported by one. From the diagram presented (Fig. 98) it will be understood how this 'trap' or 'bridge,' which in itself is little else than a lift, can be applied any number of times for the purposes of the stage. In Brandt's specification the plan shows four 'bridges' for four 'Kulissengassen' (Fig. 99). The lift can be moved from just above 'cellar' level to stage floor, and *vice versâ*, and hence the 'slab' can be sunk to a considerable depth. The cables are worked from ordinary pulleys, and the guides are of the usual description. The opening in the 'bridge' or 'trap' can be made in the stage floor, either on any of the recognised principles of a 'slider' or otherwise. Of course, both the ram and the cables of a 'trap' are worked from one lever, and this lever can be placed wherever convenient, either on the stage floor or elsewhere. I would add that 'bridges' of this pattern can be introduced in any existing stage.



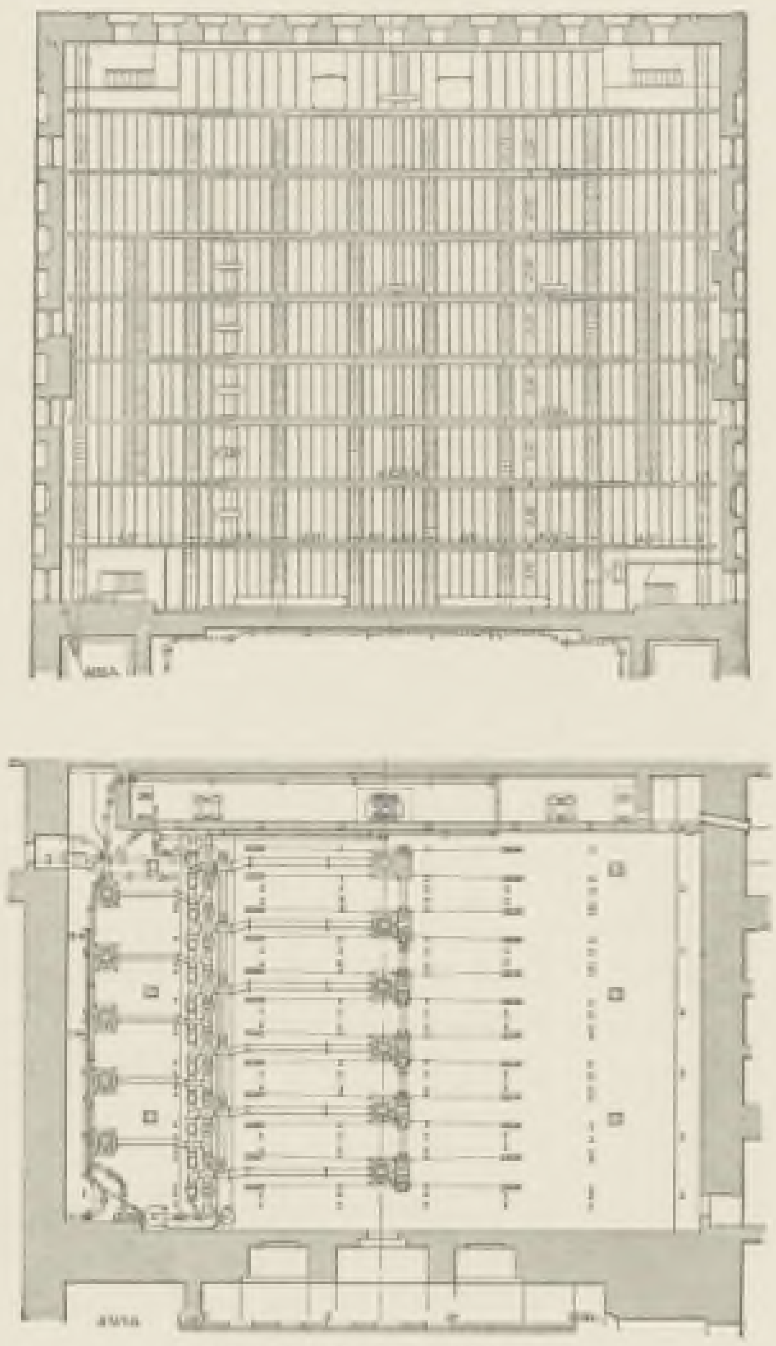
FRITZ BRANDT'S STAGE. Fig. 99. Plan of 'Bridges.'



COURT THEATRE, BERLIN: Stage. Fig. 100. Plan of Stage Floor.

It will be remembered that, when speaking of the 'Asphaleia' system, and again of the design adopted in the 'Hofburg' Theatre, I pointed out that I considered the programme of the 'Asphaleia' syndicate too extreme, and that for practical purposes a modification in the principles of radical reform would be advisable. My comments particularly referred to the dangers of working the whole of the 'upper machinery' by hydraulic power and from one point. Fritz Brandt, in describing his system, always especially directs attention to the fact that he has only adopted hydraulics in the 'under machinery,' and has left the whole of the 'upper machinery' to be worked by manual labour and counterweights. Although worked by manual labour the 'upper machinery' has been so arranged that while, as a rule, any one single part can be worked separately, any two or more may, by a simple arrangement, be connected and worked simultaneously from one point. The same arrangement has been applied to the 'under machinery,' for Brandt's system allows each 'bridge' to be worked individually for ordinary use, or any number can be coupled together.

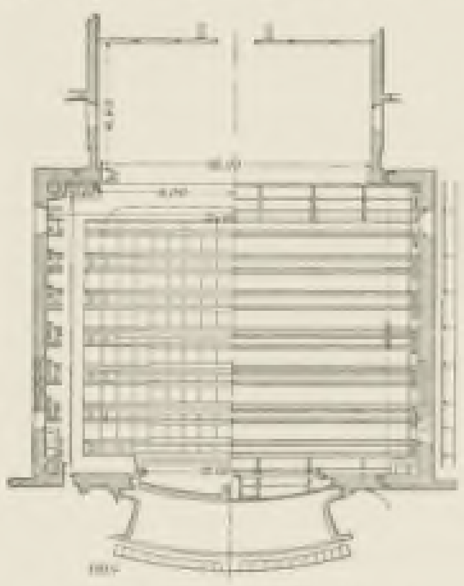
It is interesting to note that Brandt carefully divides his system into sections. He commences with the general lines of his stage, and then follows with the 'upper machinery,' its 'battens,' the 'panorama drums,' and other minor appliances, all situated above stage floor level; he continues with the 'under machinery,' which he treats as a whole without sub-sections, and lastly he speaks of the stage floor, with its divisions into 'traps' and 'sliders,' 'chariot slits,' etc. The order in which he arranges his divisions to a certain extent indicates his idea that the 'upper machinery' occupies the leading place in stage design, followed by the 'under machinery,' and then by the stage floor. This division would also seem to show that he does not attach such primary importance to the planning of the stage floor as is generally the case. As a matter of fact, the stage floors are all very systematically laid out, and show no sign of having been given an inferior position in relation to the 'upper' or 'under machinery.' Perhaps it would be better to assume that my informant gives the three parts of his design equal attention, and that he only objects to the very conservative manner in which precedence is given to the systematic division of the stage floor without much attention being devoted to other parts of the design. There is no doubt that absolutely rigid and symmetrical lines of stage floor divisions are quite unnecessary, and that, though for purposes of perspective the distance between the different sets of 'chariot slits' should not vary to any considerable extent, there is no definite reason why 'chariot slits,' 'traps,' etc., should always be laid out in regular sequences.



COURT THEATRE, BERLIN: STAGE.
FIGS. 101, 102. PLANS OF 'GRIDIRON' AND 'CELLAR.'

On examining a paper describing his stage which Fritz Brandt prepared for me in 1896, little that is new is to be found in his chapter on 'upper machinery,' as far as the main skeleton is concerned, except, perhaps, that he mentions certain narrow extra 'fly galleries.' These are not intended as 'fly galleries' proper, but are simply constructed for purposes of convenience: either for examination of the counterweights, their guides, their covers, etc., or for the working of some special illuminant where a particular effect is to be obtained. He summarises his description by saying that the skeleton of the 'upper machinery' comprises a 'gridiron,' 'fly galleries,' with 'flying bridges,' minor 'fly galleries,' all constructed of iron or steel, but with boarded floors; and, if I remember rightly, he is particularly in favour of oak as a material for this flooring. He adds that too much care cannot be taken to provide easy means of intercommunication between the stage, the various tiers of 'fly galleries' and the 'gridiron' by staircases, lifts, etc.

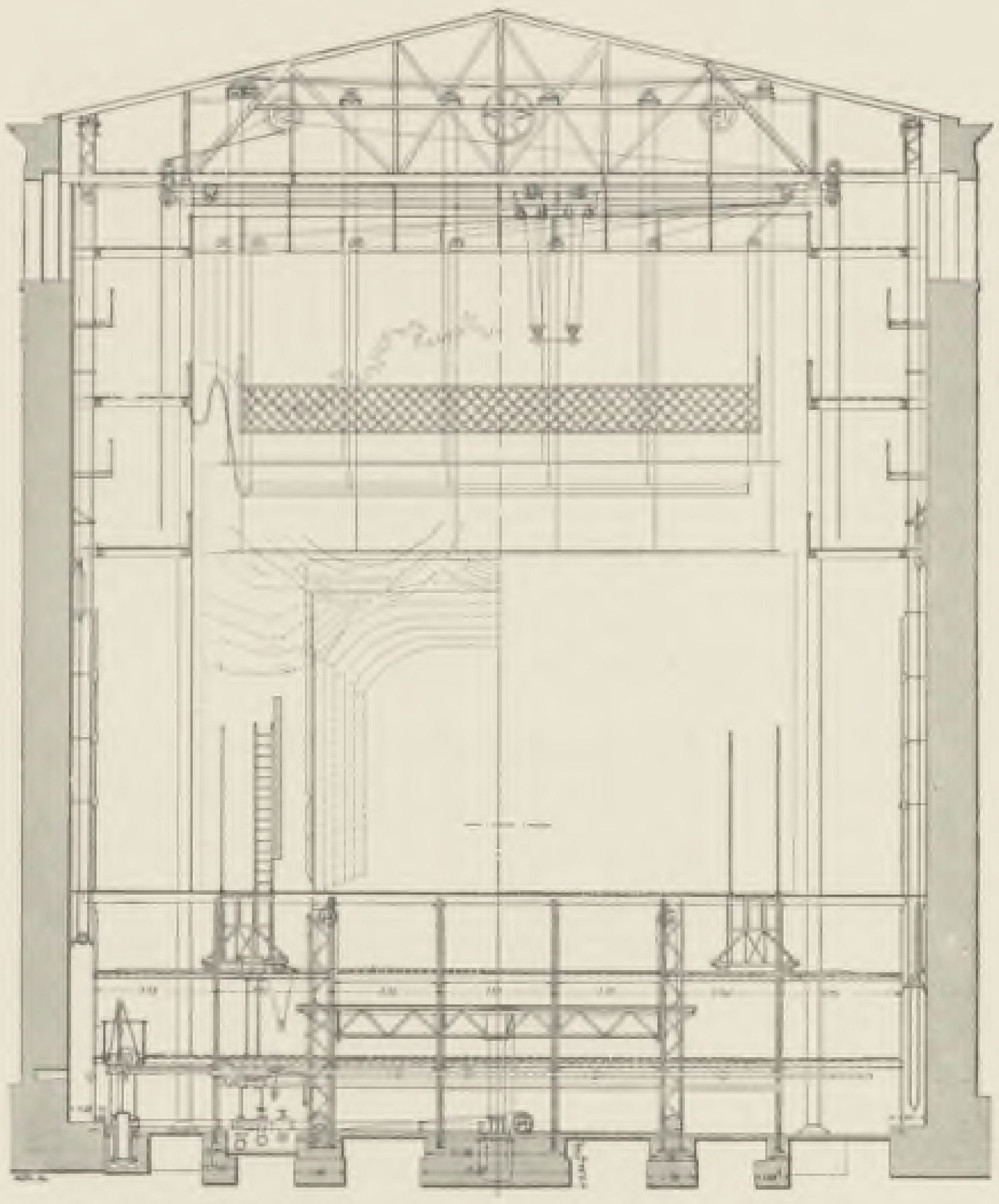
Referring to that part of the 'upper machinery' which cannot be considered part of the skeleton, Brandt speaks of the roping being entirely replaced by wire cables, except only where cords of large diameter are adopted for the purpose of handling certain appliances with greater ease. He speaks of iron pipes for the 'battens,' and in mentioning the counterweights says that there is no necessity for them to run from top to bottom of the stage, since by a simple system of pulleys the same results can be obtained with a small vertical dimension. Referring to the 'battens,' he specially recommends 'girder battens,' which besides being used for scenery can be employed for heavy work, such as lifting groups of angels, etc. A so-called 'girder batten' of this description is shown on the section (Fig. 104). Of minor appliances I need only mention that Brandt, like all stage engineers, has his own patent for obtaining the effect of 'flying'; whilst among other matters I find that he is particularly anxious that the cables and counterweights of the 'upper machinery' should be systematically arranged, so that they can be easily found—even in the dark—by simply counting. According to this plan he would always have the wires of the 'lighting batten' as seen from the auditorium first, next, the wires for the large 'girder batten,' then the wires for the 'back-cloths,' 'soffits,' 'borders,' etc., and, lastly, those for any special appliances or for the so-called 'gauze curtains.' In all cases, Brandt's working side is opposite the counterweight side. Particular attention is called to the necessity of having ample protection against counterweights either breaking away or getting out of position.



COURT THEATRE, WIESBADEN: STAGE.
FIG. 103. PLAN OF STAGE FLOOR.

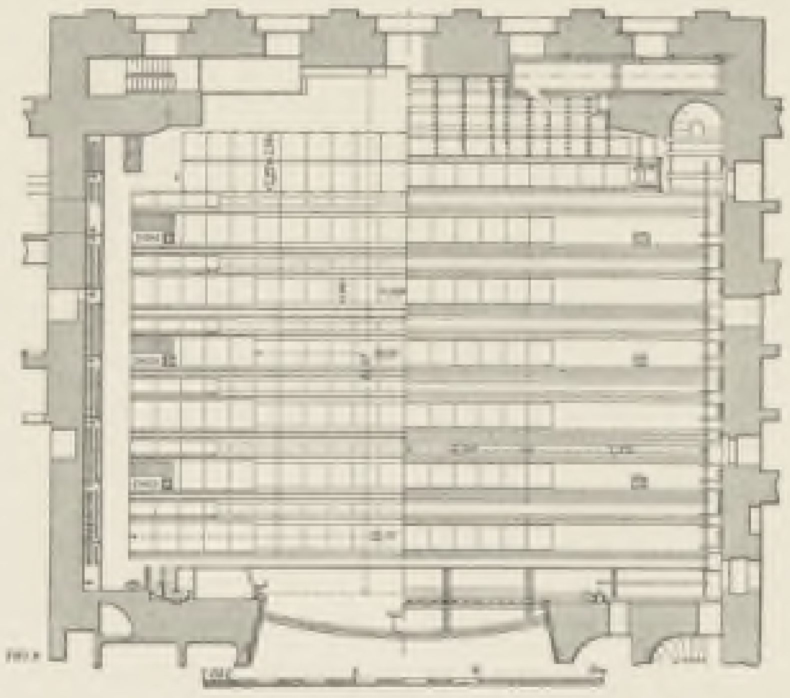
Coming now to the outline of the 'under machinery,' which Engineer Brandt describes at considerable length in his paper, there is likewise, I think, but little that calls for comment, my references to the principles of stage construction in Germany covering this part of the subject. I must, however, say that, besides working the whole of the 'chariots' from the first 'mezzanine,' my informant would also work the whole of his 'traps' and 'bridges' from the same level, and hence place all his levers here, together with every accessory for working his 'sliders,' 'sloats,' etc.

Further, much importance is attached to the facilities which are necessary for rapid intercommunication between the two sides of the stage, the back and the front, and the various levels below the stage floor. Great stress also is laid in the paper on the necessity of providing for the safety of the artists, as far as accidents in connection with the 'traps,' 'sliders,' etc., are concerned. Engineer Brandt is most particular that, in working any 'trap' or 'slider,' it should only be possible to do so when it is apparent to those below that the surface is free to fall, and when those above have been duly warned that the section of the floor will be lowered. The hinged 'slider' will be found in Brandt's system, and here an interesting explanation appears for the application of 'butts' to open a section of the floor quickly, for he points out that it is essential to have ready means of intercommunication by voice, etc., between the stage floor level and the first 'mezzanine,' and that he prefers the quick opening of hatches through which the men may be communicated with, to any system of speaking-tubes, lamp-signals, or other customary methods of giving directions. As regards the stage floor and the 'under machinery,' particular emphasis is laid on the advisability of everything in the skeleton or framework of the stage being of iron or steel, and all flooring of wood. It is argued that if the latter material is not employed the resonance becomes too great, and makes acting most difficult. Brandt also prefers, too, to see his stage supported by as large a number of points as possible, in such a manner that the majority of the uprights are easily movable; for, as he contends, it is but rarely indeed that a stage manager requires an opening in his floor so large as to necessitate the entire absence of supports from that part of the floor which is visible to the audience, though the possibility should be given without weakening the floor. In the 'Hofburg' stage, it will be remembered, the whole of the floor is practically a series of 'traps' or 'bridges' placed next to one another, and if the whole is sunk one enormous well is obtainable. Engineer Brandt advocates two or more movable intermediate supports for the cross-joists to the width of any one 'bridge.' As far as special fittings are concerned, the actual working of the 'bridges,' a partly automatic action, seems to be favoured, for apparently he does not care to place reliance on the memory of his artificers where the lives of artists are concerned. As regards the 'chariots,' he insists on having one 'Freifahrt' to every 'Kulissengasse.'



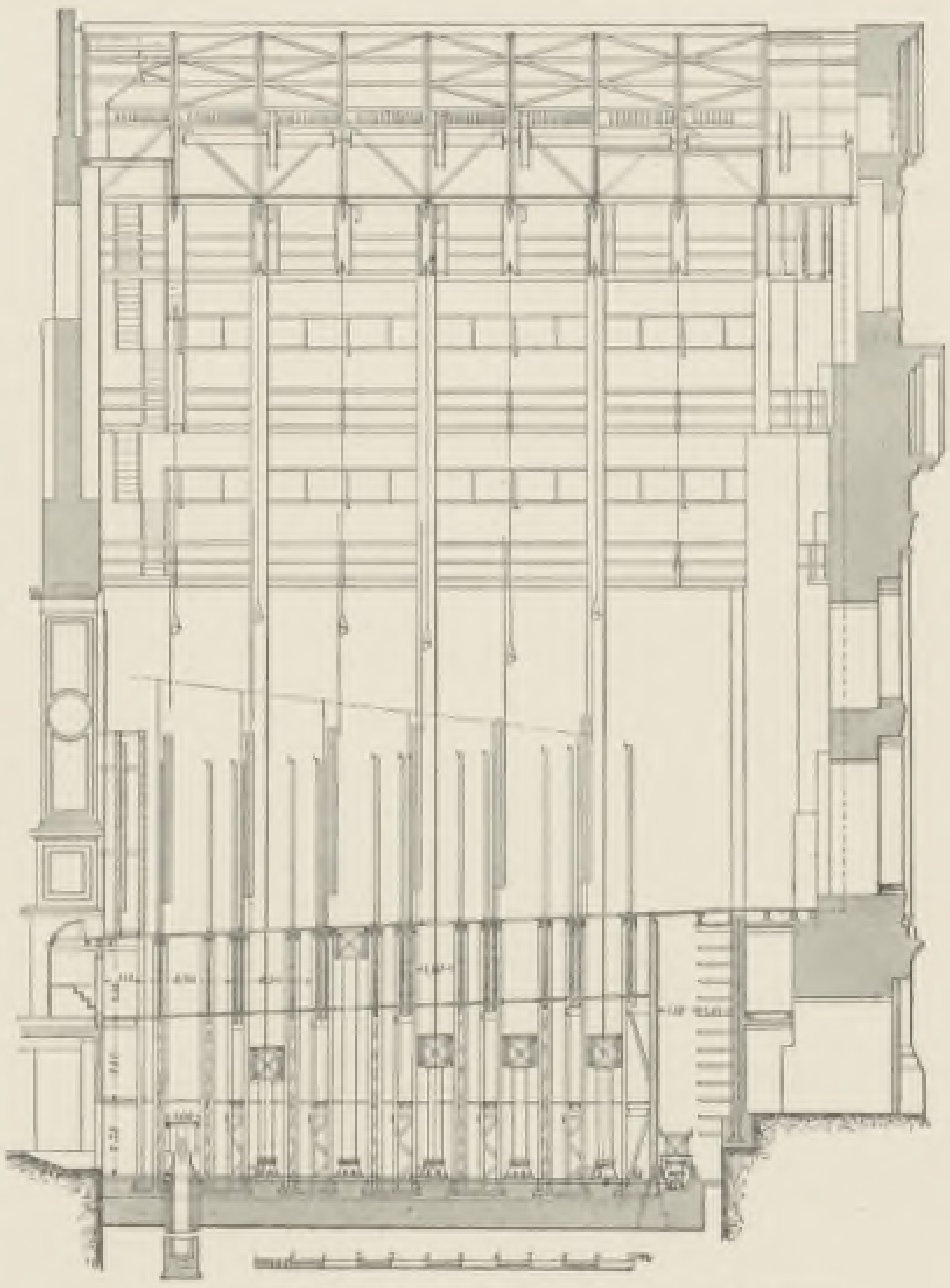
COURT THEATRE, BERLIN: STAGE. FIG. 104. TRANSVERSE SECTION.

Speaking now of the first example of stage mechanism constructed according to the Brandt system at the Berlin Court Theatre, it will be remembered how, in describing the 'Hofburg' stage, I pointed out that the installation was not appropriate for the purposes of the institution, as there was an excessive elaboration of the stage machinery as compared with the requirements of the management. The 'Hofburg' Theatre is renowned for chamber plays, and it is but seldom that great spectacular effects are wanted, and rarer still to find its elaborate appliances made full use of. In the Berlin Court Theatre the circumstances are somewhat different, for grand drama and patriotic plays generally fill the bill. Comparatively speaking, too, the appliances at the Berlin Court Theatre have cost but little money compared with those of the 'Hofburg' stage. They are by no means so extensive, and, though of fair finish, cannot in any way rival the elegance shown in the construction at Vienna. The adoption of hydraulic power is also limited to the few 'traps' and 'bridges'; and, though in every respect a modern iron stage, fully equipped for heavy work, it cannot compare with great hydraulic installations in other establishments. I have remarked that the 'Stage reform' movement in Germany did not only affect new theatre buildings, but also playhouses of old standing where the wood stage had



COURT THEATRE, BERLIN: STAGE.
FIG. 105. PLAN OF STAGE FLOOR AND JOISTS.

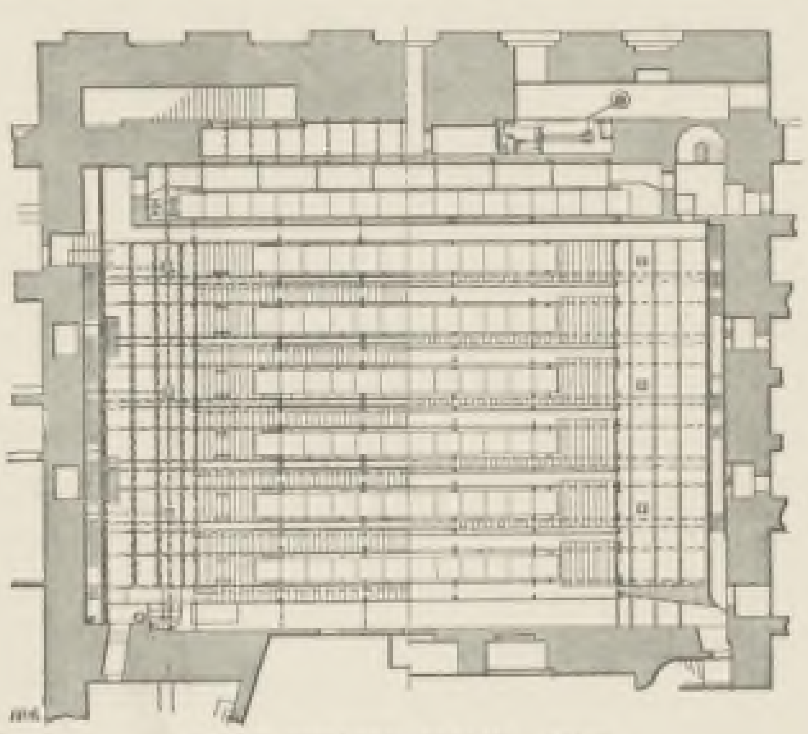
long been installed. In the Berlin Court Theatre we have such an instance of an old playhouse being influenced by the new ideas, for the building is one of Schinkel's most noted monuments, built as far back as 1821, and, at that time, equipped with the most ungainly wooden appliances of the period. This old stage had consequently to be taken out bodily before the appliances, now under consideration, could be installed.



COURT THEATRE, BERLIN: STAGE. FIG. 106. LONGITUDINAL SECTION.

The financial aspect of the stage mechanism of the Berlin Theatre, I should add, is as follows:—The total cost for the stage machinery was 260,000 marks, or about 13,000*l.*, of which 100,000 marks, or about 5000*l.*, were expended on the hydraulic installation proper. The work was executed without material interruption to the 'season,' between the years 1888 and 1890, chiefly in the months of July and August, when the institution is regularly closed. The fact that 'night shifts' of artificers had to work on the stage to facilitate its rapid completion materially increased the cost. The reconstruction had, of course, to be undertaken in sections, and it is noticeable that first the 'under machinery' and then the 'upper machinery' was put in hand. Contemporaneously with this work of reconstruction, no less than 170,000 marks, or 8500*l.*, were expended on improvements at the 'back of the house.' Unfortunately, the reconstruction of the 'upper machinery' was connected with a sad calamity, for the scaffold, which had to be erected when the gridiron was fixed, collapsed and caused several fatalities. The improvements which a modern stage brings about in the working of a theatre will easily be gauged by the fact that whilst on the old stage the management could have only 13 'back-cloths' and 80 'wings,' on the new stage the numbers are 34 and 216 respectively.

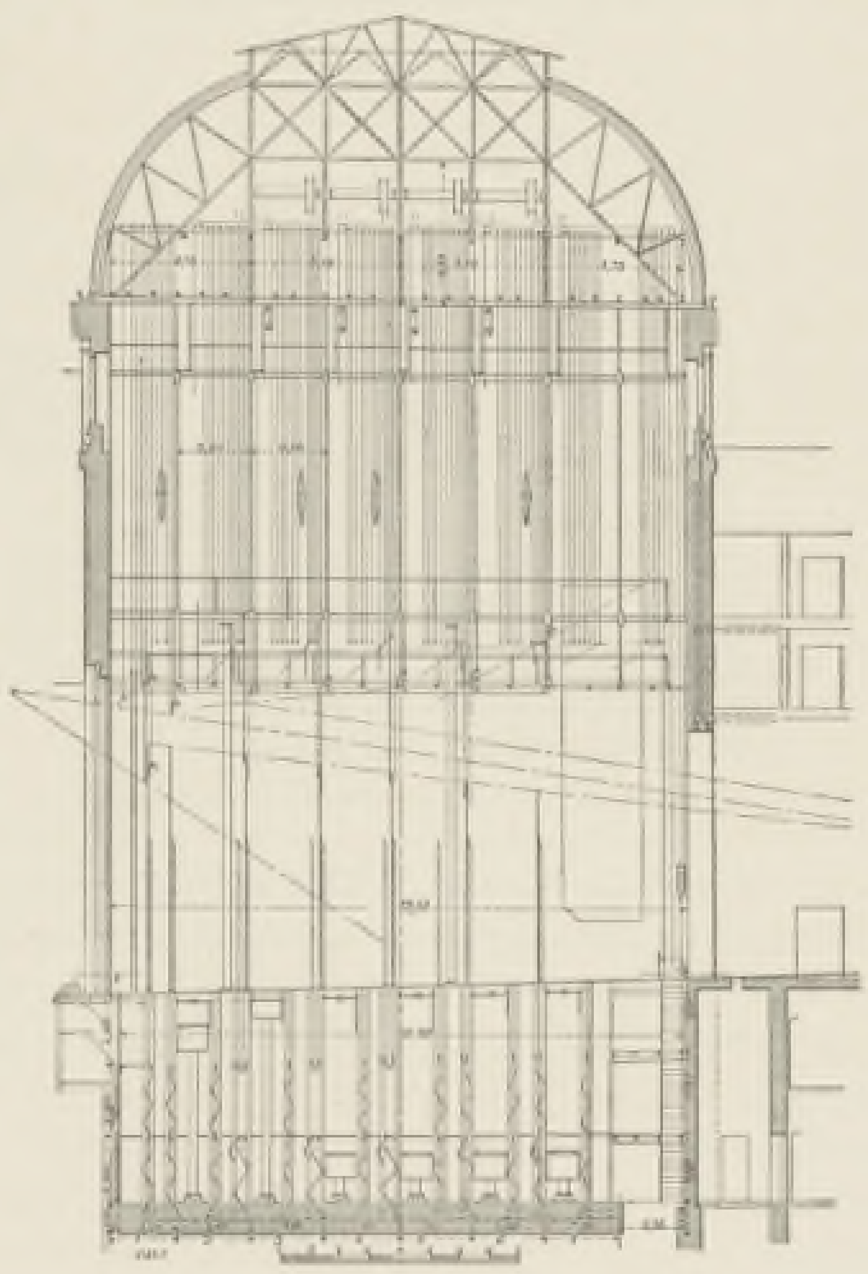
On referring to the plans and sections illustrating the Court Theatre at Berlin, I should like to call attention to Fig. 105, in which half the stage floor is shown as seen from the top, and the other half with the boarding removed. The half showing the stage floor from the top describes fully its division, whilst the other shows how the joists are run to support it. The main dimensions of the stage are about 69 feet (21 metres) in depth to 85 feet (26 metres) in width. The division of the floor is such as to allow a sequence of six 'Kulissengassen' proper—a narrow one at the front, and a broad one at the back. The depth of each 'Kulissengasse' averages 8 feet (2·5 metres). Particular care has been given in this case to the regular division of the stage floor, and the metric system has been applied; which means that the 'bridges' are divided up into series of 'slabs,' each 3 feet 3 inches (1 metre) square. The width of the 'bridges' proper, and hence of the movable part of the stage, is over 39 feet (12 metres); thus it will be seen that there are nearly 23 feet (7 metres) on either side available for the working of the stage. Each sequence comprises a 'chariot slit' followed by a 'trap,' and then a 'chariot slit,' a 'slider,' and another 'chariot slit,' so that between each two sequences two 'chariot slits' adjoin. The 'chariot slits' shown are all 'Freifahrten,' which run right across the stage. There are no 'chariot slits' running only a short distance. The front 'Kulissengasse' does not show any opening in the stage floor, whilst the deep 'Kulissengasse' at the back has only two lines of 'slabs,' or movable coverings, which are primarily used for shifting the scenery on and off the stage. As will be seen from the longitudinal section (Fig. 106) there is a lift in connection with this furthermost 'Kulissengasse,' and the arrangement is such that there are sets of racks from stage floor to 'cellar' level for taking about 300 'cloths' rolled up. As regards the metric system, I should perhaps add that its application generally implies that the same horizontal dimensions are taken for all levels, from 'cellar' to 'gridiron,' in such a manner that any 'slab' or board on the one level



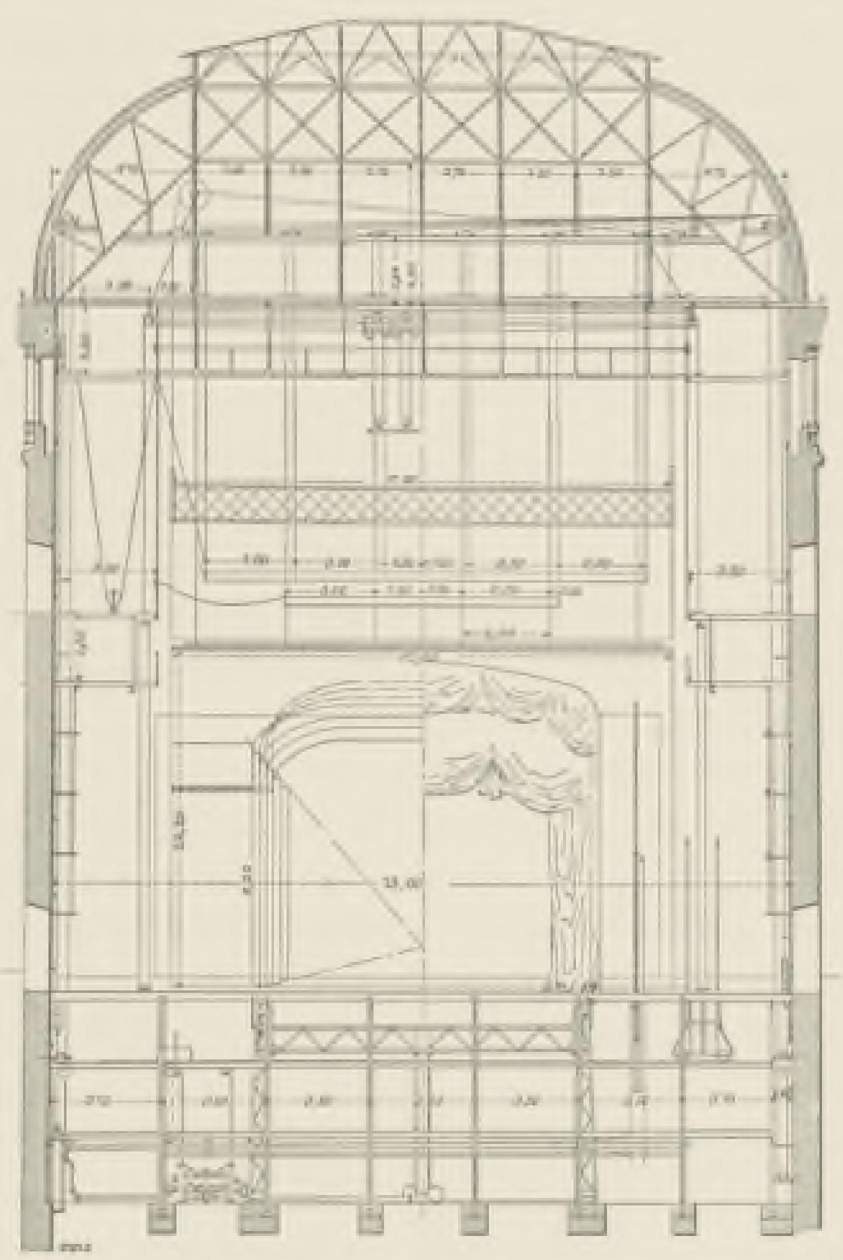
COURT THEATRE, BERLIN: STAGE.
FIG. 107. PLAN OF 'UNDER MACHINERY.'

will be directly over a similar board on the level below, and any rope or cable dropped through any 'slit' or opening—say in a 'fly gallery'—would be able to drop vertically right through to the 'cellar,' as the necessary 'cuts' would be found in the other levels. In connection with Fritz Brandt's stages, I may take the opportunity of pointing out that the first 'Kulissengasse' in his stage is always called a 'Nulgasse,' which, literally translated, would mean 'Entrance No. 0.' The numbering of the other 'Kulissengassen' is Nos. 1, 2, 3, etc., as seen from the auditorium and 'up' the stage. As regards the dimensions of the individual sections in the stage floor and 'under machinery,' the 'bridges' proper measure 39 feet 4 inches (12 metres) by 3 feet 3 inches (1 metre); the openings for the 'sliders' measure 52 feet 6 inches by 1 foot 2 inches (16 metres by 0·36 metre), and the 'Freifahrten' have a length of just over 72 feet (22 metres). The slope of the stage floor is 1 in 20, and the thickness of the stage flooring is $1\frac{1}{16}$ inch (0·04 metre) in two thicknesses of boarding.

It is not my intention here to enter into detail as to the actual mechanical contrivances adopted at Berlin, but I would only point out that particular care has been given to all minor matters, more especially in regard to the practicability of all levers, screws, etc., for opening up any section of the stage floor. The main divisions of the 'under machinery' are 'cellar' level, first 'mezzanine,' and second 'mezzanine,' the first 'mezzanine' sloping to the same rake as the stage floor, and having 7 feet 8 inches head room (2·35 metres). The depth of the 'under machinery' from stage floor level at curtain line to 'cellar' level is nearly 23 feet (7 metres).



COURT THEATRE, WIESBADEN: STAGE.
FIG. 108. LONGITUDINAL SECTION.



COURT THEATRE, WIESBADEN: STAGE.
FIG. 109. TRANSVERSE SECTION.

As will be seen from the section, all the 'bridges' are worked on the same principle, and the diagram has been so drawn as to show these 'bridges' in different positions. I have already pointed out in explaining Brandt's system, that there is a particular advantage in being able to lower each 'bridge' nearly to 'cellar' level. Further, as in other Continental stages, the actual 'chariot carriage' runs on tram lines on the first 'mezzanine.' The whole of the hydraulic gear, as will be seen from the transverse section, is placed at one side of the stage at 'cellar' level, and all supply and pressure pipes run on the 'cellar' floor. The diagrams clearly show that the 'under machinery' is, comparatively speaking, roomy. The stage floor in this case is supported by a sequence of six uprights, which carry the principal transverse joists. Of these six the two central ones are movable, their arrangement being as shown in Fig. 98.

To turn now to the 'upper machinery' at the Berlin Court Theatre: its plan coincides in every way with the division of the stage floor below and in section. It will be observed that there are three principal 'fly galleries' of considerable width, and two minor 'galleries,' built according to the Brandt system. The 'gridiron' and the three principal 'galleries' are supported by strong uprights which have their footings in the 'cellar.' There are three pairs of these uprights, and they practically carry the greater portion of the weight of the whole of the appliances above stage floor level. The top 'fly gallery' is only about 6 feet below the 'gridiron,' and there is a set of 'flying bridges' at this level.

I have previously referred to the large 'battens' which Engineer Brandt favours, and in speaking of his 'girder battens,' I would remark that the girder-work is a wooden framing. As already explained, the whole of the 'upper machinery,' all the 'battens' and the special appliances are worked by a system of counterweights and by manual labour, and the sections clearly show how the counterweights are placed and what system of pulleys has been adopted. The special 'battens' for lighting purposes, it will be seen, are held at six points, as are also the ordinary 'battens,' whilst the large 'girder battens' are only hung at either end. The pulleys for the 'lighting battens' are on the 'flying bridges' of the top 'gallery,' whilst the pulleys for the ordinary 'battens' and the large 'girder battens' are well above the 'gridiron' floor. The flying apparatus has been applied below the 'gridiron' floor, and its principal rail has a length of nearly 66 feet (20 metres). It is particularly to be noticed how ample is the space on the 'gridiron' for working and regulating all cables in use, with sufficient head room for the 'scene-shifters' and other employés. It is further noticeable that the whole of the 'upper machinery' is well lighted from side windows, a feature of considerable importance for the cleanliness and efficiency of the appliances.

Continuing my remarks on the 'under machinery,' I would specially point out that the six principal 'bridges' of this installation can be worked entirely independent of one another and yet be quickly coupled together, so that any two, three or more, not necessarily adjoining, can be raised or lowered by one lever. The working of these 'bridges' is perfectly silent. The 'bridge' or 'slab' measures, as I have already said, 39 feet 4 inches by 3 feet 3 inches (12 metres by 1 metre); the principal girders on which the 'slab' rests measure 39 feet (11·96 metres); the girder-work has a height of 2½ feet (0·8 metre), and the 'ram' in each case has a diameter of 1 foot 4 inches (0·43 metre). Each 'bridge' can be worked a vertical distance of from 18 to 20 feet 6 inches (5·6 metres to 6·25 metres) respectively, according to its position, but no 'bridge' can be raised higher than stage floor level, as is the case in the 'Asphaleia' stages at Buda-pesth, Halle and elsewhere. The system adopted for obtaining a service higher than stage floor level is to fix a framework on the top of the 'slab' of the 'bridge,' and raise it from below to the necessary height. The load which each 'bridge' can carry when at rest is nearly 2 tons (2000 kilogrammes), and its raising power is 1 ton 4 cwts. (1200 kilogrammes). The speed at which the lift can rise is 1⅔ feet (0·5 metre) per second if loaded, and nearly 2 feet (0·6 metre) per second if there is no weight on it. Should, however, five 'bridges' be coupled together and receive their full load, the rate is reduced to 11 inches (0·3 metre) per second. As regards the working of the lifts, each movement is, as a rule, made by the artificer regulating the lever, but automatic regulation is also possible.

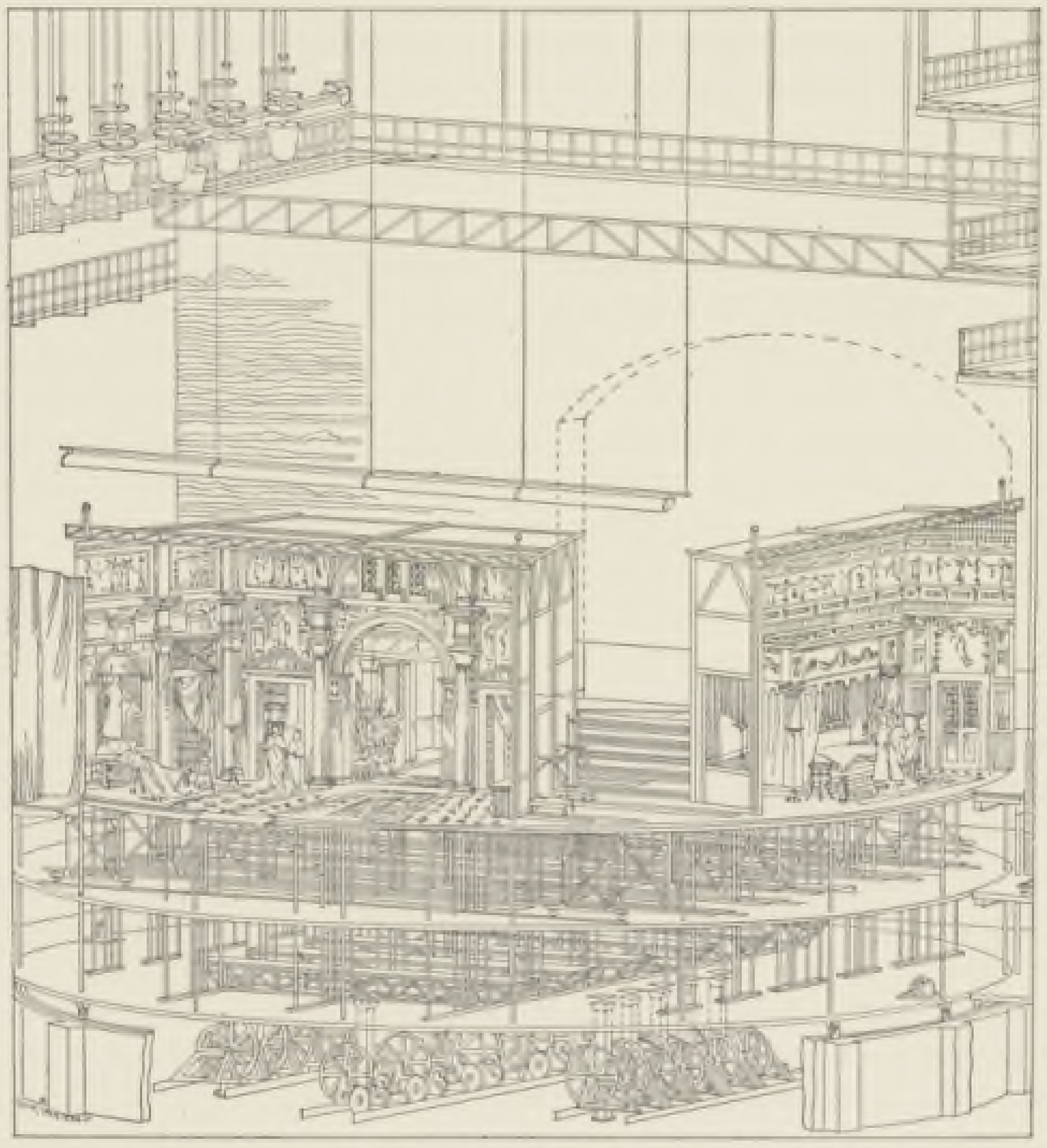
Again referring to the 'sliders' they are supplied with 'sloats' on the same lines as on most German stages. A so-called 'Doppeltcasette' comprises a hollow upright measuring 9 feet 10 inches (3 metres) in length, and 10 inches by 3¼ inches (0·26 metre by 0·08 metre) in section, running inside another about 20 feet (6 metres) long. They are worked in a similar way to the English 'sloat,' only that arrangements are made for moving them together with the aid of hydraulic power, and there are five of these 'sloats' to each of the five sets of 'sliders,' making twenty-five 'sloats' in all. The running is obtained by simple toothed rods and wheels.

I have spoken of the 'bridges' which are provided for the six 'Kulissengassen.' I have also observed that there is a special lift or 'bridge' in the rear 'Gasse,' which is worked on similar principles to the ordinary stage 'bridge,' but is longer than the others, as it measures 59 feet (18 metres) by 3 feet 3 inches (1 metre) and is thus able to take any 'back-cloth' which is rolled up. The only difference in connection with this lift is that the hydraulic power is in this case assisted by counterweights, owing to the special load.

As with other theatres, it has been found necessary to supply a special lift for the rapid movement of 'properties,' horses, and other heavy weights from one level to another, and it will be seen from the plans that a lift of this description has been provided in the back corner of the stage. There is nothing unusual in the construction of this lift, except that the 'slab' forms part of the stage proper. The dimensions of the 'slab' are 28 feet by 4 feet (8·6 metres by 1·25 metres), and the height inside the cage is 13 feet (4 metres).

Of other theatres in Germany for which Fritz Brandt has prepared designs of modern stages, I would first mention the Court Opera House at Berlin and the Court Opera House at Hanover, both of which are old buildings, in which his designs were governed by existing dimensions, levels, etc. Both of these stages may be termed large ones. There is also the stage at Wiesbaden, in the new Court Playhouse. In this theatre the stage is of medium size. Then there are such stages as those at the small private theatre on the Schiffbauerdam at Berlin, and the Municipal Theatre at Essen. I have added some illustrations of the stage at the Wiesbaden Theatre (Figs. 103, 108 and 109), but as it will be seen that the lines are based entirely on the design of the Berlin example just described, I have not prepared the diagrams to a large scale. There is the same combined system of hydraulic 'under machinery' and 'upper machinery' worked by manual labour. Speaking in detail, we find again the 'first mezzanine,' the 'second mezzanine,' and a 'cellar' for the 'under machinery,' the total height being nearly 23 feet (7 metres). The main 'bridges,' six in number, have 'slabs' of 36 feet by 4 feet (11 metres by 1·20 metre), while there is the same system of 'sloats,' which can be worked in sets. The width of the Wiesbaden stage is about 82 feet (25 metres), and its depth 64 feet (19·50 metres). There is also the back stage, measuring 59 feet by 31 feet (18 metres by 9·50 metres). The proscenium opening is 39 feet 4 inches (12 metres) in width. The height from stage floor to 'gridiron,' some 20 feet back from the curtain line, is nearly 57 feet 6 inches (17·50 metres). Of 'Kulissengassen' there are six principal ones, with Brandt's 'Nulgasse' and the 'Kulissengasse' at the back, and each 'Kulissengasse' has a 'chariot slit,' a 'bridge,' a 'chariot slit,' a 'slider,' and another 'chariot slit,' making three 'chariot slits' in all to one 'bridge' and one 'slider,' the two outside 'chariot slits' of each sequence adjoining those of the following sequence. There is a slight variation in the 'Kulissengasse' at the back, where, as in the case of the Berlin Court Theatre, there are special facilities for lowering scenery. As regards the 'fly galleries,' in this case I may mention that there are only three—the first two close together, and the third just below the 'gridiron.' There are two 'gridiron' levels, the roof of this stage being particularly practical for stage purposes. It would be mere repetition were I to go into further detail about this stage, and I need only observe that the number of 'battens' allowed for is 94, and that the whole of the 'roping' is wire cable.

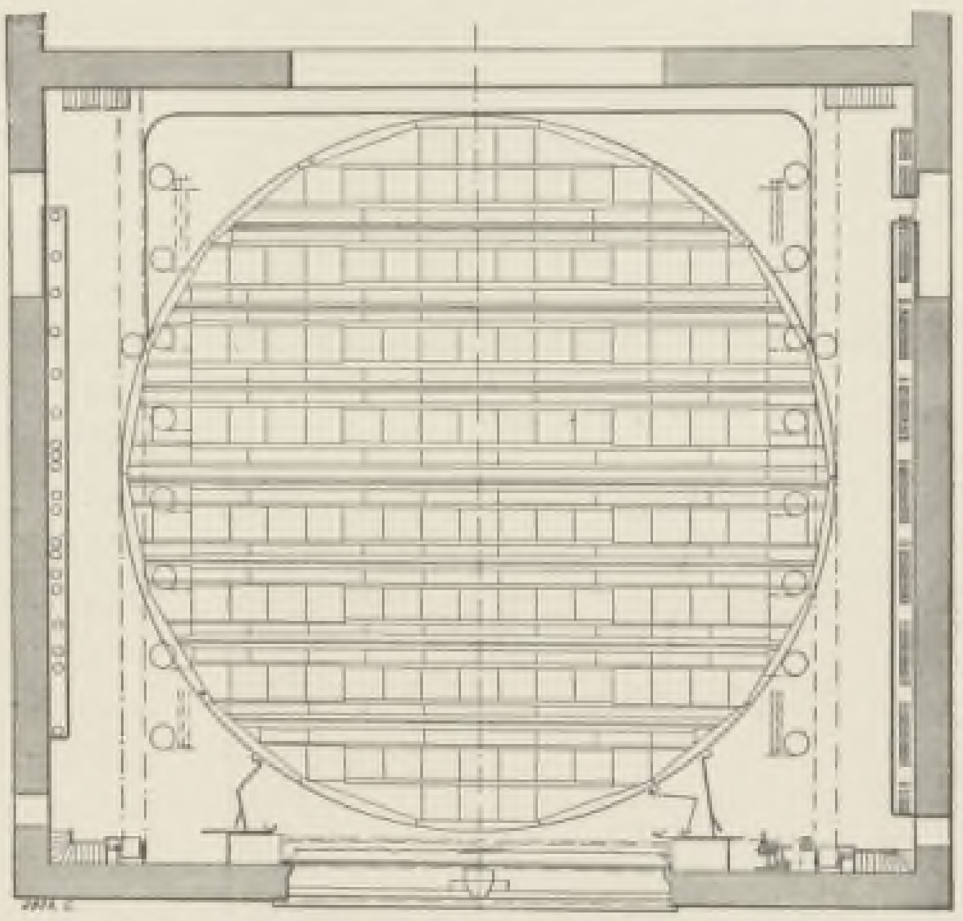
I have now referred to Fritz Brandt's work at some length, but I hold that his appliances are of the utmost importance in the annals of modern stage mechanism, for his work at Berlin and elsewhere embodies much that must be considered perfect, and will serve as a basis for further installations. While in the stages at Budapest, Vienna, etc., we have a more elaborate equipment, the application of hydraulics, as shown in examples erected according to the Brandt system, is nothing if not practical and economical, and forcibly shows what can be done without undue expenditure, and without having resource to the extremist methods and appliances advocated by the original leaders of the 'Stage reform' movement. There is much in the Brandt system that will find favour with the theatrical manager who wishes to economise in the cost of his working staff without incurring too great an outlay of capital.



ELECTRIC 'TURNTABLE' STAGE. FIG. 110. VIEW OF STAGE.

THE ELECTRIC 'TURNTABLE' STAGE.

THE latest development in stage mechanism has been the application of electricity to the working of appliances, and further, the various combinations of hydraulic and electrical power with manual labour. Electricity has, no doubt, already been used to a considerable extent for minor devices, or for special fittings, more particularly known as 'stage tricks,' but it has been the good fortune of Engineer Lautenschlaeger, of Munich—to whose work I have had frequent occasion to refer —to design the first large stage with the most modern of appliances. From several engravings (Figs. 111, 117 and 118) of Karl Lautenschlaeger's design for an installation at the Munich Court Opera House, it will be seen that the stage, and more particularly its 'under machinery,' is entirely different from anything that has, as yet, been presented in this Supplement, and this quite apart from the question of the motive power introduced. Expressed in brief, Lautenschlaeger's stage is an electric 'turntable' stage, in which everything on the stage floor level and in the 'under machinery' is planned on the 'turntable' principle, and adopted in miniature with so much success in the *tableaux vivants* of our Variety Theatres. In the 'upper machinery' the 'turntable' principle has not yet been applied, as there appears to be no advantage in its introduction. Throughout this stage, both in the 'under' and in the 'upper machinery,' we find that for the working of the appliances a combination of electrical power and manual labour has been introduced. The Munich stage is a large one, for its width measures 95 feet (29 metres), its depth 85 feet (26 metres), and its height nearly 89 feet (27 metres). The height of the proscenium opening is 29 feet 6 inches (9 metres), and the width of the opening is 41 feet (12·50 metres).



ELECTRIC 'TURNTABLE' STAGE. FIG. 111. PLAN OF STAGE FLOOR.

In a paper dealing with his system Karl Lautenschlaeger commences by explaining how the modern requirements of 'Stageland,' such as the desire to have roominess, a greater facility of movement, and a greater carrying capacity, absolutely necessitates the application of some other motive power than manual labour. He then proceeds to explain how steam was first applied, with but little success; then, very extensively, hydraulic power. He gives some details as to the application of hydraulics, but concludes by pointing out that water power requires a most expensive installation. He does not consider hydraulic rams applicable to the 'upper machinery,' for which they were first introduced in the stages of the 'Asphaleia' system, and at the 'Hofburg' Theatre, as already explained. He considers that even the most improved hydraulic appliances do not allow the scenic artist sufficient scope, for the lines and position of each individual appliance must be rigid. Portable hydraulic power, or the application of hydraulic power to portable machinery, is too impracticable for the requirements of the stage. He further goes on to show how it was only natural for him to turn his attention to electricity as a motive power for stage appliances, and that his first attempts at applying it were on the minor fittings and 'tricks.' On practically every large stage on the Continent electric power is available, owing to the application of electricity as an illuminant. The protection of the public from fire, which is the subject of so many regulations abroad, virtually compels every theatre manager on the Continent to equip a theatre with its own electric light station. Then, as Lautenschlaeger explains, electro-motive power is easily portable for stage purposes, or, in other words, connections can be easily made, while there is no difficulty whatever in controlling electric plant from one regulating board or table. He ends by saying that everything he proposes has first been constructed and applied to a practical stage before being recommended for the Munich Opera House, and that his design for that building was the result of very extensive experiments.

Turning from the question of motive power, my informant proceeds to discuss the various aspects of his 'turntable,' and I would add that he only suggests it for stages of the average dimensions of a Continental opera house. The Munich stage, I believe, he considers already somewhat too large for the purpose, since the 'turntable' in this design requires a diameter of about 80 feet (24 metres), which is certainly somewhat unwieldy, for where there is a 'turntable,' not only the stage floor proper, but at least the first 'mezzanine,' and often both the first and second 'mezzanines,' would have to revolve on the same pivot. Lautenschlaeger's particular purpose in adopting the 'turntable' for the Munich design was no doubt to fill the requirements of Wagnerian operas, which necessitate many and rapid changes of scene. His device gives particular facilities for mounting several scenes at the same time and then moving them rapidly into position.

ELECTRIC 'TURNTABLE' STAGE.
FIG. 112. 'DON JUAN,' ACT I. SCENE 1.

ELECTRIC 'TURNTABLE' STAGE.
FIG. 113. 'DON JUAN,' ACT I. SCENE 2.

ELECTRIC 'TURNTABLE' STAGE.
FIG. 114. 'DON JUAN,' ACT I. SCENE 3.

On looking at the plan (Fig. 111) we find that the plane of the stage has practically only one enormous opening, i.e. the circular well, which takes the 'turntable,' in this case measuring, to repeat, nearly 80 feet in diameter. The 'turntable' itself, or rather its uppermost level, which serves as the stage floor, is divided up into 'bridges,' 'sliders,' 'chariot slits,' etc., so arranged as to form sequences of 'Kulissengassen' on the same lines which the designer generally adopts on his ordinary stages. The 'Kulissengassen' may be taken to extend right across the stage, but the movable parts are in this case only on the 'turntable slab.' There are seven 'Kulissengassen' proper besides the 'Nulgasse,' and one of extra width at the back. The sequence, which is repeated, is practically that of one 'chariot slit,' 'slider,' 'bridge,' 'slider,' so that there are two 'sliders' to each 'Kulissengasse,' whilst there is only one 'chariot slit.' This 'chariot slit,' however, is a so-called 'Freifahrt,' and runs right across the stage to the extent of the 'turntable.' In the case of the 'Nulgasse,' where the segment of the circle is of course a small one, the full sequence could not be arranged, and hence we only find, in the order seen from the auditorium, a 'grave trap,' a 'bridge,' and a 'slider cut.' A similar arrangement holds good for the furthermost 'Kulissengasse,' where, as seen from the auditorium, we find a 'slider cut,' a 'bridge,' and a 'grave trap.'

Reference to the dimensions of the various sections of the 'turntable' floor shows that the principal 'bridges' have a frontage of 29 feet 10 inches (9·10 metres) and a depth of 4 feet (1·20 metres). Their mechanism allows them to be lowered as much as 13 feet 9 inches (4·20 metres) below stage floor level, and they can be raised 6 feet 6 inches (2 metres) above this level. They are so constructed as to take a maximum weight of 2000 kilogrammes. Each 'bridge' comprises the 'slab' proper, supported by iron girders and carried in the centre by a principal upright, which is known here as the 'piston.' As the stage is on the 'turntable' principle, there is an arrangement for disconnecting the 'piston' from the 'slab'; for, in fact, the piston when at rest has to be lowered below the second 'mezzanine,' so that the whole 'turntable' frame, comprising the stage floor, first 'mezzanine' and second 'mezzanine,' can be turned above it. Counterweights are used to a certain extent in connection with these 'bridges,' so as to lessen the amount of work required from the 'piston.' The 'pistons' themselves are worked by electro-motors, and can be regulated to a nicety. In the longitudinal section (Fig. 117) it will be seen that the first three 'pistons' are shown at rest, the fourth has been raised to stage floor level, the fifth to the height of the first 'mezzanine,' and the sixth 6 feet 6 inches (2 metres) above stage floor level. Of course, any frame or skeleton can be fixed to the 'bridge,' so that the total height for a platform can be a good deal above 6 feet 6 inches (2 metres) if required. In the diagram it will be seen that a framing of this description has been fixed to the fourth 'bridge,' which stands at stage floor level, and though it measures about 9 feet 10 inches (3 metres) in height, and in the diagram stands upon the floor level, it might just as well have been raised 6 feet 6 inches (2 metres), making the total height 16 feet 4 inches (5 metres).

Should a greater width or opening be desired in the stage floor than is obtainable by lowering any one 'bridge,' the so-called 'Bodenversenkungen' have to be used, which allow for a maximum opening of 36 feet by 26 feet (11 by 8 metres), in which the 'slab' or platform can be set from nearly 5 feet 6 inches (1·70 metres) below stage floor level to

8 feet (2·50 metres) above it. An opening of this description is formed by working a combination of 'bridges' and 'sliders.' The 'Bodenversenkung' practically comprises the second, third and fourth 'bridges,' with the intervening spaces, the necessary framing being fixed above the 'bridges' proper, in a manner which I have already described in connection with 'bridge' No. 4. Of course, any part or parts of this opening may be raised or lowered at pleasure, and in the longitudinal section it will be seen that one part, i.e. the second and third 'bridges,' is below stage floor level, whilst the remainder is above it. More preparation than in the case of the 'bridges' is required to work a 'Bodenversenkung'; in fact, it is almost essential that the curtain should be lowered for transformations of this description, while, of course, with ordinary 'bridges' this is never necessary.

ELECTRIC 'TURNTABLE' STAGE.
FIG. 115. 'DON JUAN,' ACT I. SCENE 4.

According to Karl Lautenschlaeger, the 'chariot' is becoming a less important feature of the Continental stage than used to be the case, inasmuch as scenery is more frequently mounted without reference to the sequence of 'Kulissengassen.' This is the reason, too, why a far less number of 'chariot cuts' is to be found in the Munich plan than it is customary to see in the typical German stage. The use Lautenschlaeger makes of his 'chariot' is principally to fix 'set pieces' for enclosed scenes, such as rooms. He appears to have given close attention to the construction of his 'chariots,' as well as to the question of closing the necessary 'slits.'

Speaking of the 'sliders,' which in this case extend to a width of over 62 feet (19 metres) at the broadest part of the 'turntable,' they are constructed on the hinge principle, which allows the cover to open and drop downwards. As I have already said, there are two sets of 'sliders' for each of the seven principal 'Kulissengassen,' and I should state that there are ten sections to each set of 'sliders,' and that any one or any number of these can be easily worked by one man single-handed, an improvement due to a careful arrangement of the levers. This improvement practically means that the whole of the ten sections can be opened and closed by one movement, whilst up to the present each section of the 'slider' required its own 'scene-shifter,' even two men sometimes being necessary to move it. The 'sloats' which are worked in connection with these 'sliders' have also been given careful attention, and any number of 'sloats' can be worked together over a windlass, so that heavy scenery can be rapidly raised from below. The whole of the ten sets of 'sliders' may be worked together by a simple adjustment in coupling the various levers; and, on the other hand, the whole of the 'sloats' can be similarly managed by coupling together the various windlasses. Any single windlass can be worked by its own electro-motor, and the whole of the 'sloats' and 'sliders' by one movement electrically. 'Girder battens' with their 'cloths' can be bodily lowered through the 'sliders,' and other scenery can be simultaneously raised on 'sloats,' the whole movement, together with the opening and closing of the 'sliders,' being effected by one hand.

ELECTRIC 'TURNTABLE' STAGE.
FIG. 116. 'DON JUAN,' ACT II. SCENE 9.

As is the case on all stages, it is necessary to have a number of minor 'traps.' In this example there are four 'traps' of this description, which can be worked either by manual labour or by an electro-motor.

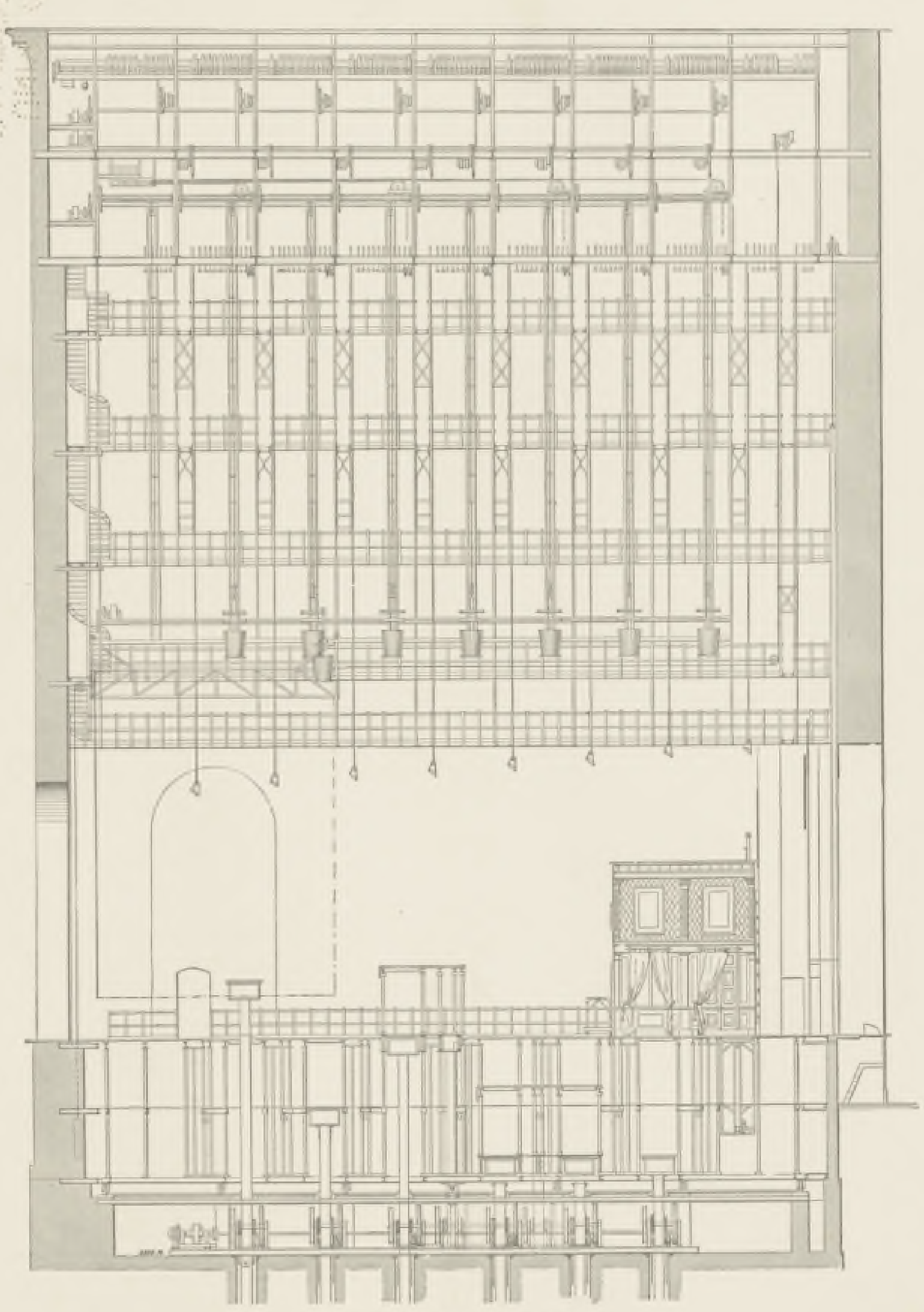
As I have previously remarked, the actual 'turntable' has three floors, i.e. the stage floor, the first 'mezzanine' and the second 'mezzanine,' all well framed together. The 'turntable' rests on a number of rollers, which run on tram-lines, circular in plan. These are bedded on special sleeper walls, also circular in plan, and there are altogether three rings of rails. The circular sleeper walls may be said to enclose the 'cellar.' The 'turntable' can be easily moved round to any position, but, as a rule, it is only moved by a quarter-circle or a half-circle. The whole of the mechanism is so planned that when the 'turntable' takes any position on the quarter-circle or half-circle, the 'pistons' and 'bridges' can be worked, the necessary openings being provided on the two 'mezzanine' and the stage floor levels. Taken as a whole, we have an independent stage of three levels, circular in plan, fitted into the ordinary square stage of three levels and a 'cellar,' and whilst the former contains all the openings necessary for the working of the stage, every part of the latter is practically immovable. I must again refer to the perspective view (Fig. 110) for the better appreciation of the system adopted, more especially as this diagram shows how two scenes of rooms can be mounted at the same time, and the 'turntable' then simply moved round into position. I need scarcely add that the designer has been at pains to provide the whole of his 'under machinery' with the necessary facilities and means of intercommunication. On the other hand, I would lay special stress on the fact that the stage floor is a level one.

Speaking now of the 'upper machinery,' and again referring to the two sections (Figs. 117 and 118) I must, in the first place, refer to the skeleton or framing of the different 'flies,' the 'gridiron,' etc. As will be seen, there are four principal 'fly galleries' on either side of the stage; besides these four, there is one pair of minor 'fly galleries' below the first principal tier. This minor 'gallery,' in Lautenschlaeger's system, is primarily intended for working special stage-effects, 'tricks,' illuminants, etc., and for holding such apparatus as would otherwise be in the way. The first pair of principal 'fly galleries' are connected by a 'hanging bridge' which runs along the back wall, and this is also the case with the second pair of principal 'galleries'; for the third and fourth tiers there are sets of 'flying bridges,' no less than ten in number on each level. The whole of the 'galleries' are well connected by iron staircases, which also lead to the 'gridiron.' As will be seen, there is practically only one 'gridiron' floor to the Munich stage, though there is every facility for moving about on a second or upper level, on which are a number of important appliances. Both 'gridiron' and roof are constructed in one, that is to say, the large iron roof-trusses support the 'gridiron' floor. Should the 'panorama drums' be used, it will be seen that there is the usual system of drawbridges to the 'flying bridges,' as has already been explained in earlier examples of German stage construction.

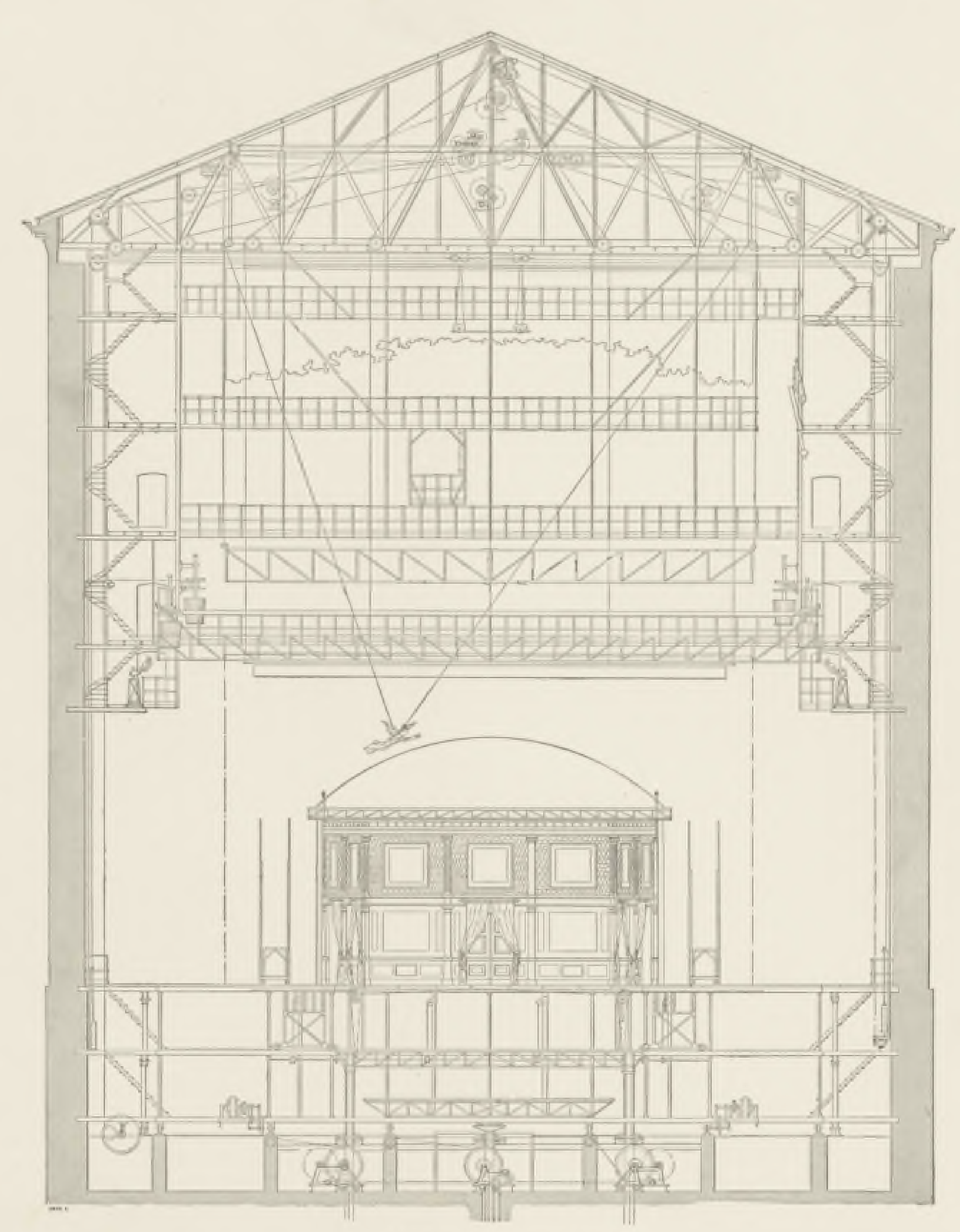
The design for the Munich stage allows for eighty-eight ordinary 'battens,' more distinctly defined by Lautenschlaeger as 'Prospect- und Sofittenzüge.' The 'batten' itself is an iron one, and is hung at five points by wire cables running over pulleys placed at 'gridiron' level and balanced to a certain extent by counterweights. It will be seen that the cables are brought together in such a manner that they can be easily worked by a small electro-motor. The whole of the 'battens' can be worked either separately or together in any specified number by an electro-motor, and, should it be thought advantageous, manual labour can be substituted. The number of loaded 'battens' that can be raised simultaneously by the electric power supplied is limited to forty, which is practically the maximum number required for any movement. Twenty can be raised and the same number can be lowered simultaneously from the same regulating board. The number of 'battens' for lighting purposes is nine, and they are worked on exactly the same lines as the 'battens' already described. Besides these there are a set of 'girder battens,' one to each 'Kulissengasse,' and these are hung from two points only, though worked on the same principle. As I have already stated, these 'girder battens' can be lowered down into the 'under machinery,' through the 'sliders,' and, of course, they are hung exactly above the 'slider' openings. There are three 'battens' in connection with the proscenium, so arranged as to allow for variations in the size of the proscenium opening. These can also be moved by electric power, as is also the case with the 'act drop,' the 'curtain,' and the fire-resisting curtain, all three of which can, however, also be manipulated merely by manual labour.

An important feature in the design is the so-called 'horizon,' the purposes of which I have explained at some length in the course of my description of the 'Asphaleia' stage. In this instance we find a 'horizon,' of considerable dimensions, placed in such a manner that the principal 'cloth' is within a few feet of the back of the stage, whilst the sides are about 72 feet (22 metres) apart. The height of the canvas is considerable, for it measures 42 feet 6 inches (13 metres), whilst the full length of the 'cloth' is 230 feet (70 metres). By a very ingenious arrangement the whole appliance can be moved bodily forward, but, as a rule, it is intended to be used in the position indicated in Fig. 111. The canvas is supported by a rail which, in its turn, hangs from a set of 'girder battens,' whilst the horizontal movement of the canvas is produced by two vertical 'drums,' worked from the second 'fly gallery.' When the 'horizon' is in its original position the whole of the 'turntable,' with everything that is on it, can be moved quite independently of the 'cloth'; but should the 'horizon' be set nearer the proscenium, the 'turntable' would have to be cleared, or the 'cloth' rolled up on one of the vertical 'drums,' before the movement is made. I should add that the 'horizon' can be lifted in its entirety to a considerable height above the stage, to allow for the ordinary working and the movement of people underneath it, but it cannot be raised so high up into the 'flies' as to allow it to clear the height of a 'set scene' on the 'turntable.'

Besides the 'horizon,' which, I must point out, is always an important feature in Lautenschlaeger's scenery, there are no less than eight pairs of 'panorama drums,' which have been so planned as practically to give one pair to each 'Kulissengasse.' The 'panorama drums' are also worked from the second 'fly gallery,' and here again we have a certain difficulty as to their use at the same time as the 'turntable,' for only the first two pairs and the last two stand on the immovable stage, whilst the four others stand on the 'turntable.' It is almost unnecessary to repeat that every movement can be made by electric power, whilst, on the other hand, manual labour can also be substituted if it be found necessary. Any one pair of 'panorama drums' may be worked together, and, should it be desired, two or more can be coupled together. Though they are not generally used at the same time, it will be remembered that at many of our pantomimes, as well as at the great spectacular displays, transformations are brought about by using three or four lines of 'panorama' scenery behind one another. It may, however, be taken as a rule, that only one or two pairs of 'panorama drums' are intended to be used simultaneously on the Munich stage, and that arrangements can always be made to have the 'panorama' in such a position as not to materially interfere with the working of the 'turntable.' Perhaps I should add



LONGITUDINAL SECTION.
(Fig. 117.)
Laengsschnitt. Coupe Longitudinale.



TRANSVERSE SECTION.
(Fig. 118.)
Querschnitt. Coupe Transversale.

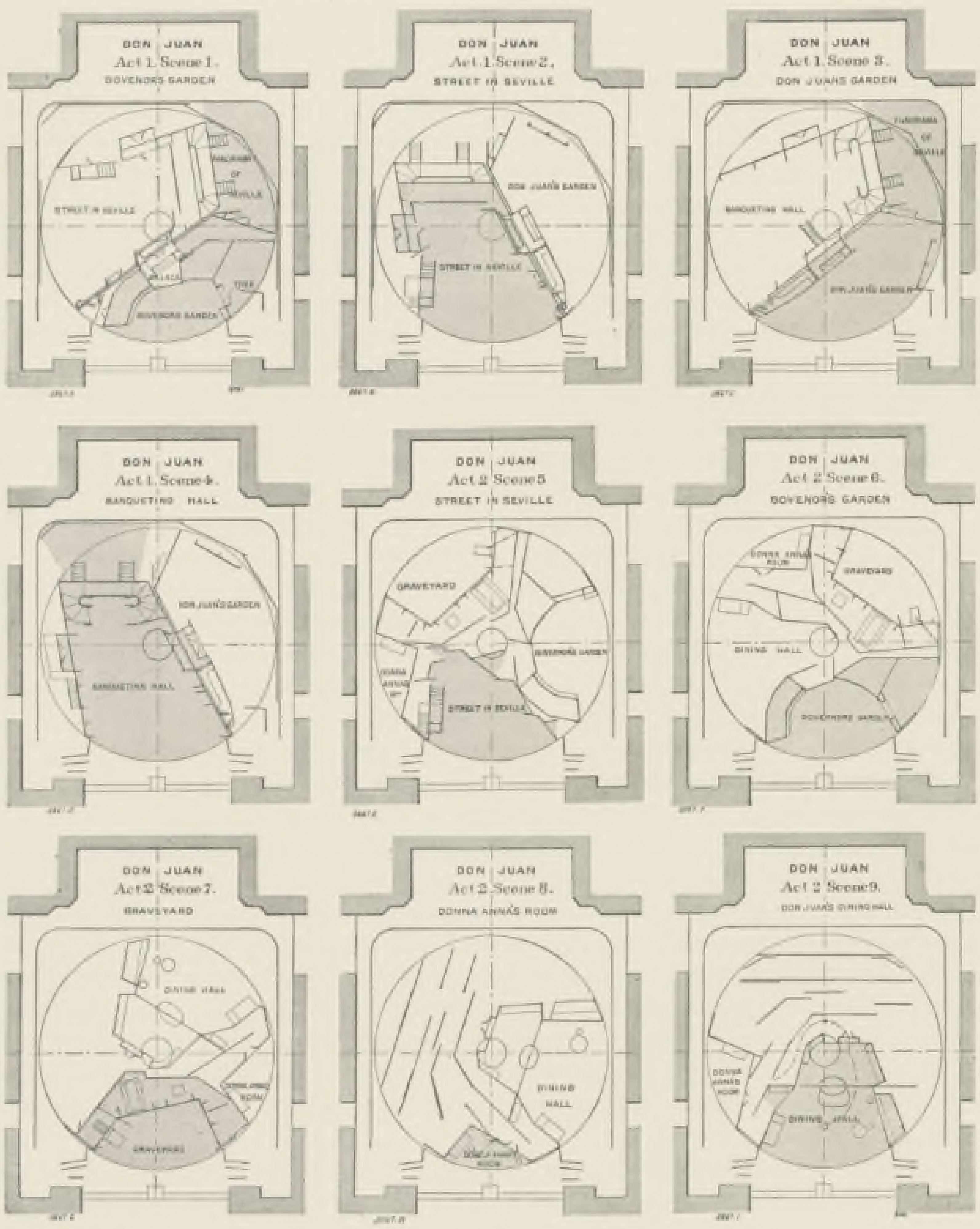
Edwin O. Sachs ed:

PROPOSED STAGE FOR THE COURT THEATRE, MUNICH.

Feet. Mètres.

that the speed at which a 'panorama scene' moves may be regulated to a nicety when electricity is employed, and that a far greater regularity is obtained by the use of a mechanical motor than by manual labour.

It is needless to say that Karl Lautenschlaeger has his own special 'tricks' and appliances for 'aerial' work and other particular effects, and it will be seen from the transverse section how one of the aerial appliances is worked over special pulleys at 'gridiron' level. As in the case of the larger devices, electricity has also been adopted for moving such special gear, and the same can be said of all the minor arrangements which facilitate intercommunication on the stage, since the whole of the heavy lifts and also the rapid passenger-elevators are worked by motors.



ELECTRIC 'TURNTABLE' STAGE. Fig. 119. Plans of Scenes from 'Don Juan.'

The whole of the appliances referred to above, those of the 'under machinery' and those of the 'upper machinery,' can be worked from a central regulating board at the side of the proscenium opening, placed in such a position as to allow the engineer to have a good view of the scenery. It appears to be Lautenschlaeger's ideal to work every part of his installation from this central regulating board, and to place the movement of everything in one pair of hands. He lays particular emphasis, however, on the fact that his electrical stage can at any moment be worked as an ordinary German stage and by manual labour, and that it can then be dealt with by any stage-carpenter of the old school, for the 'turntable' would then be treated as a fixture. He also lays stress on the facilities for combinations of manual labour and motors according to the special requirements of individual plays. He most distinctly states that he does not consider that the 'turntable' should be used for plays requiring simple methods, and primarily advises its adoption for stages on which only grand opera or grand drama is given, or for the Shakesperean play, with its many changes of scene.

To better illustrate the mounting on the 'turntable' stage, nine diagrams (Fig. 119) have been prepared, showing the various scenes of a production when actually in position, together with those in preparation whilst the curtain is open. These are taken from the opera, 'Don Juan,' which Lautenschlaeger mounted on a temporary 'turntable' specially constructed for the 'Residenz' Theatre at Munich, with the view of testing the system which he advocates. Only manual power was employed, as the expense of a full installation would have been too great for an experiment of this description. Perspective views of these scenes are also given (Figs. 112 to 116) to indicate the effects obtained.

Referring to the diagrams (Fig. 119), it will be seen that the first scene (Fig. 112) opens with a view of a garden, while at the same time a scene depicting a street is in course of preparation. A three-quarter turn brings this street scene in front of the curtain (Fig. 113), and during the time that this is open another one, showing a second garden scene (Fig. 114), is being arranged. Only a quarter-turn is necessary to bring the latter into position, and whilst the performance is in progress the banqueting-hall scene of the play is being set up. A three-quarter turn brings the banqueting-hall scene before the audience (Fig. 115). In the second act, it will be observed from the diagrams (Fig. 119), that the street scene, somewhat curtailed, is again before the audience, and it is plainly shown how three other scenes are in course of arrangement; these are again the Governor's garden, the graveyard scene and then the interior of a room. On the first quarter-turn bringing the garden scene before the audience, it will be noticed that a large dining-hall is already in course of construction, in the place previously occupied by the street scene. When the view of the graveyard is before the proscenium opening, that showing Donna Anna's room, which has long been ready, can at once be moved forward, whilst the dining-hall is being completed; and when the room-interior actually comes before the audience the dining-hall, which practically takes up the whole of the stage, is ready to move round. This is the last scene (Fig. 116), followed only by a transformation, in which the hall collapses and takes the form of a ruin.

The difference in the nature of the scenes exhibiting the two gardens, the street and the banqueting-hall will be observed from the illustrations, whilst the rapid change of the dining-hall into a ruin is clearly depicted. When we observe, however, as we have the opportunity of doing in one place, no less than four scenes mounted on the same 'turntable,' I think we must admit that it is scarcely likely that the 'turntable' would, in ordinary practice, be made use of to such an extent. Two scenes mounted on the same 'turntable' will be the ordinary procedure, and three only on special occasions. It would not only lead to inconvenience, but materially hamper the working of the stage, if so much scenery as is necessary for mounting four scenes at a time were on the 'turntable' at once, and no manager would care to have more paraphernalia in use than was absolutely essential. The 'turntable,' it should be remembered, also extends to nearly the whole width of the stage, if used to its full extent, and hence leaves but a small passage for gangways. It is probable, too, that a manager would prefer scenes to be set half 'turntable' deep where possible, instead of building-up in a slanting direction, a method which has to be frequently adopted in the setting above described.

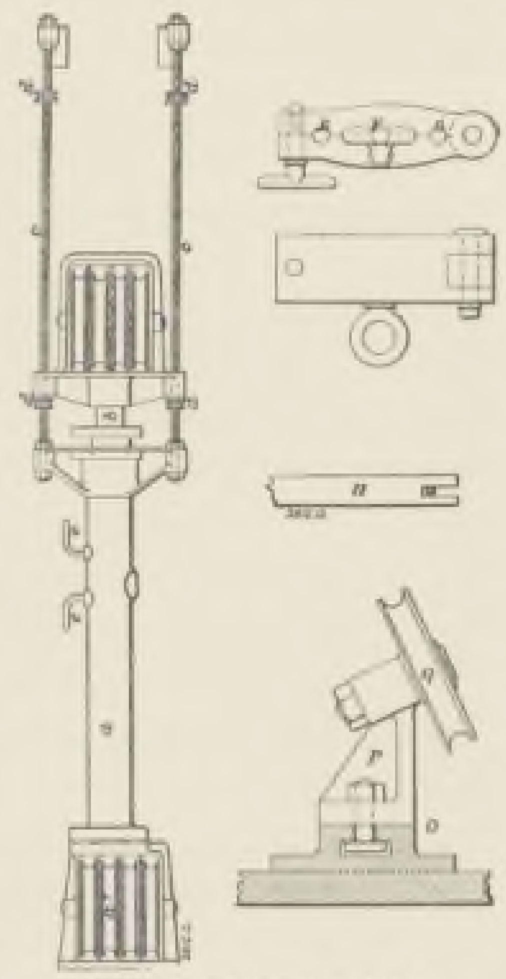
I have little doubt that the application of electricity, which is still in its veriest infancy as far as stage mechanism is concerned, has a great future, as the installation of electrical plant so general in the modern playhouse for illuminating purposes can with little difficulty and expense be utilised for a second purpose. The points, however, which have to be kept in mind when hydraulic machinery is under consideration, are to a great extent applicable to the electric stage. Excessive employment of the electro-motor should be avoided, as well as absolute centralisation for the working of the installation. As for the application of the electro-motor, it is satisfactory to notice that Lautenschlaeger allows for the employment of manual labour, though, to my mind, he oversteps the mark in the use of electricity for stage purposes, and applies it in a manner not always suitable or necessary. With regard to the centralisation, however, I am afraid that the designer has taken an extremist view of the benefits to be derived therefrom. I must repeat that I do not believe that the 'upper machinery' of a stage can be safely worked from only one point, no matter what the power employed may be to move the 'cloths.'

As to the 'turntable' itself, its contrivance is very ingenious, and does the designer great credit. It seems to me, however, that its application should be limited to opera houses, where spectacular effects are more common than in the home of the drama; and to the Variety theatre, where ballets and transformation scenes demand every facility for rapid changes in the displays. It should not be forgotten, too, that an appliance like the 'turntable' becomes unwieldy if constructed to very large dimensions.

CONCLUSION.

I HAVE now completed my series of examples as classified under the headings, 'Wood Stages,' 'Wood-and-Iron Stages,' and 'Iron Stages,' but before concluding my remarks on modern Stage construction and the movement known as 'Stage reform,' I must refer to several minor installations, which, though perhaps not sufficiently important to call for a distinct chapter in this volume, may yet merit some comment in this concluding section.

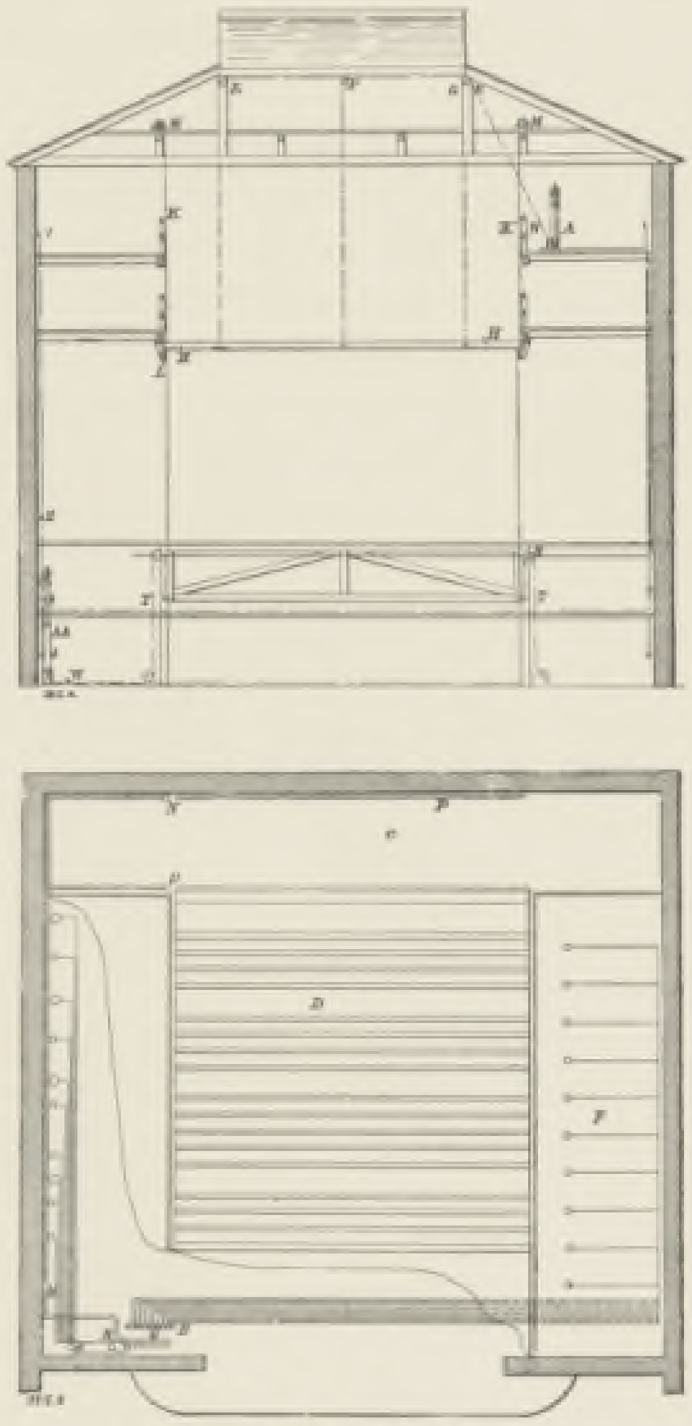
In the earlier part of this Supplement I mentioned how little had been done in the way of modernising English stages, but I also pointed out that there have been several instances of the adoption of steam and hydraulic power for the working of individual parts of the stage. These special installations were generally only intended for the production of some particular play, and hence were only provisional, and disappeared from the theatre when the bill was changed. In fact, I only remember one case in London where a somewhat extensive provision of modern appliances had been made for stage purposes soon after the completion of the building. Unfortunately, however, this installation was practically not employed at all, and was left to rust. This was at the 'Lyric' Theatre, where five hydraulic 'bridges' were constructed. Recently also at Drury Lane Theatre some hydraulic machinery has been set up, which is of too extensive a character to be dealt with as a minor installation, used only for some individual play. In this case the appliances comprise two large hydraulic 'bridges,' which have been brought over from Austria. In Edinburgh, however, a full installation with hydraulic power was attempted, but here the theatre has ceased to exist, and hence we are deprived of even one solitary establishment which can be accepted as an instance of the most modern equipment. In the latter case the installation, which was worked by water power, followed a certain patent taken out by Andrew B. Brown, dating as far back as October 16th, 1875, and known under the title of 'Hydraulic Machinery for Actuating Stage Effects.'



ANDREW BROWN'S SYSTEM.
FIG. 120. DETAILS.

It has not been my good fortune to have seen the last-named installation, and I have, therefore, to rely on the information given by the designer. It is certainly remarkable, however, that the patent is of so early a date, when, as I have already said, so little was done elsewhere in modern theatre mechanism prior to 1881, and it is much to be regretted that a system on which so much labour was bestowed should have had but a brief life, owing to circumstances quite beyond the inventor's control. In presenting some diagrams adapted from the illustrations of the patent specification, I would observe that the stage is apparently of wood, fitted on the old principles so common in this country, and that the modernising solely consists in the adoption of hydraulic power for moving those parts usually worked by manual labour. The method of introducing hydraulic power for this purpose has a certain similarity in its main principles with that in use on the 'Hofburg' Theatre stage. There are no direct rams underneath the 'bridges' on the 'lift' principle, but the indirect, or suspended, or what is here termed the 'groove' system of hydraulic rams placed at the side of the stage is employed. To detail from the specification, I should say in the first place that pressure-pipes are laid down throughout the stage, by means of which the necessary water is conveyed, preferably at a pressure of 800 lb. to the square inch, with the aid of a boiler and pumping engine, which is situated outside the stage proper. For the purpose of raising and lowering the 'battens,' 'bridges,' and other appliances, the ordinary hydraulic hoist, with movable pulleys on ram and cylinder, is made use of, and one of these hoists is placed on each side of the 'scene cloth' or of the 'bridge,' as the case may be. The 'scene' is suspended, as in the English stage, by three or four ropes, according to requirements, these being carried over pulleys immediately above the points of attachment to the 'scene' and afterwards gathered into an iron ring. From the hoists the lifting end of the rope is led over a pulley and attached to this ring, while the ropes on the 'scenes' or 'cloths' are led through eye-bolts to the usual belaying-pins on each side, for the purpose of adjustment. Having set the hoists in position at the sides of their respective 'scenes,' the valves for actuating them are placed in a group immediately under control of the prompter or machinist who has to work them.

In the transverse section, Fig. 121, one of the hoists or rams is shown at A, and again another of a larger size at A A. The rope is shown running round the hoist A in dotted lines, one end being attached to the belaying-pins, whilst the other is attached to the ring B. This ring, however, when found more convenient, may be replaced by the clamp shown in Fig. 120, which enables the ropes to be taken up quickly. This clamp has a joint and a tightening screw, as shown, the holes E, F, G receiving the ropes belonging to the pulleys similarly marked. These ropes, as indicated, run over the pulleys, and lay hold of the wooden beam H carrying the 'cloth.' This beam is grooved at the ends, as shown in Fig. 120, and to prevent its fouling the other 'cloths,' these being necessarily placed close together, it runs over wire or other rope-guides K K, which enter the notches, and are attached and held by spiral springs at L L, the springs keeping the rope-guides quite tight. In this way as many as thirty 'cloths' may be hung, and the rope-guides are all taken up by one roller M M, having ratchet teeth and shaft with a square end, so that the rope-guides may be tightened up or slackened at pleasure. The tension-springs at L L are for the purpose of compensating the difference in the stretch of ropes, so many being all wound on one barrel. When the 'cloths' require to be changed in position it is only necessary to unwind the barrel, and the guide cords K K all become slack, when the 'cloths' may be changed and re-arranged.



ANDREW BROWN'S SYSTEM.
FIGS. 121, 122. PLAN AND SECTION OF STAGE.

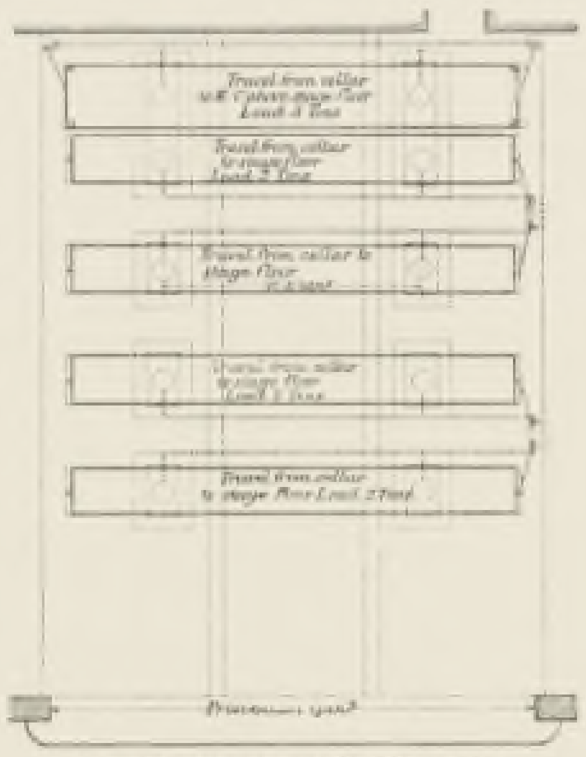
Although the hoists A are placed in the 'flies' as close together as possible, it may happen that the whole are required to be concentrated on a number of 'cloths' occupying a less space, and for that purpose the sliding pulleys shown in Fig. 121 are employed; they are seen in position at N in the 'flies.' The grooved casting O is led along the floor in front of the hoists, and a sufficient number of other castings, P, with T-headed bolts are placed upon it. Each casting carries an angle pulley Q, which inclines towards the 'cloth' pulley G. By such an arrangement the rope from the hoist A can be led laterally to any distance by passing over one of the pulleys Q and under the next one in position opposite the 'cloth' to be raised. In this way a hoist, whatever its position, can be made available to work any one of the 'cloths.' The bridge hoist A A is placed in the basement, and has its rope (or chain by preference) led to the further end of the 'bridge' over the pulleys R and S, laying hold of the foot of the bridge at T, while its other rope or chain passes over the corresponding pulleys at the near end, laying hold of the 'bridge' again at T. These chains are gathered into a ring at W, to which the hoist chain is attached.

In Fig. 122 a plan of the general arrangement of the stage is shown. C is the painter's room, D the stage, E the prompter's corner. The boiler-house and engine-room are not indicated. Ten hoists are shown in the 'flies' at F, opposite the prompter's corner, and to these hoists ten lines of pipes are led from the valves underneath the stage floor near the prompter's corner at G. A similar set of ten hoists is placed in the basement. Four heavy 'bridge' hoists and six light sink hoists are also controlled from another line of valves at G, each having its own individual pipe, as shown. Two hoists at H and I work the curtain and the 'act-drop scene,' also controlled from the position marked G. To show these pipes, the figure has the stage broken by a line exposing the basement. The pressure-pipe from the accumulator passes into the building and communicates with the row of valves at K, while the exhaust main passes back to a tank. A branch M leads to the paint-room hoists at N and O, which work the paint frames P by ropes in a similar manner to those already described in the 'flies.' The valves, however, of N and O are placed in that locality so as to be controlled by the artist using the frames. The manner of reeving the ropes is the same as with the hoists in the 'flies.' The waste steam from the pumping engines passes by a pipe into the theatre to the various heating apparatus. The fire hydrants are situated near the centre of the stage. When it is not convenient to use steam, the pumping engine is placed outside the building, the pressure pipe passing into the theatre, and the water from the large tank supplying the apparatus. The arrangement of pressure and return pipes is the same as that shown in the diagrams presented.

An important detail is, of course, the hydraulic hoist employed for the purposes of lifting in the theatre. This is shown in Fig. 120: *a* is the hydraulic cylinder, and *a'* marks the pulleys turning on an axis carried by a frame attached to the end of the cylinder *a*; *b* is the ram, and *b'* marks the pulleys carried in a frame mounted on its head. The hoist is adapted to suit the use of ropes which make no noise, and it is provided with guide-rods having variable stops to limit the action of the hoist in an upward or downward direction. For that purpose the guide-rods *c c* are screwed throughout, and have nuts and jam-nuts *d d*, by which the stroke of the rams and crosshead can be limited. The rope is led from the belaying-pins *e e* round the first pulley overhead, and to and fro in block-and-tackle fashion until it leads off the last pulley underneath.

No independent opinion has been obtainable as to the actual working of these appliances at Edinburgh, but the specification contains no reason why the installations may not have been of considerable service. It is curious, however, to observe that the inventor has here again adopted the 'centralisation' idea, an idea striven for by so many engineers in earlier efforts.

As regards the installation at the 'Lyric' Theatre, London, it consisted of five sets of 'bridges' supported by hydraulic rams and placed towards the rear of the stage proper. In the illustrations of this installation, Fig. 124 is a section showing the character of the appliances without any regard to the construction of the stage, while Fig. 123 is a corresponding plan showing the position of the 'bridges' with their pipage. The appliances at the 'Lyric' Theatre were the first of their kind, and their construction apparently took some time, for the work was spread over a period of fifteen months. On the other hand, the outlay was comparatively small, for the cost of the five 'bridges' fully installed was only 867*l.* The work of erection, I should add, was carried out after the theatre had been opened. Four of the 'bridges' may be termed 'bridges' proper, for they only rise to stage floor level, but a fifth and larger 'bridge' can be taken 10 feet (3·04 metres) above this level. The loads for the first four 'bridges' are each calculated at two tons, whilst that of the fifth 'bridge' is three tons. The stage has only one 'mezzanine' and the height from the 'cellar' floor to stage at curtain line is 17 feet 3 inches (5·25 metres). There are, of course, two rams to each 'bridge,' and for the four front 'bridges' the diameter of the rams is 3½ inches (90 millimetres), whilst for the larger one the diameter is 4 inches (100 millimetres). The consumption of water for the rise of any of the front 'bridges' is twelve gallons, whilst twenty-nine gallons are required to raise the large 'bridge' a total height of 27 feet (8·20 metres), or 10 feet (3 metres) above the stage floor level.



'LYRIC' THEATRE, LONDON: STAGE.
FIG. 123. PLAN OF 'BRIDGES.'

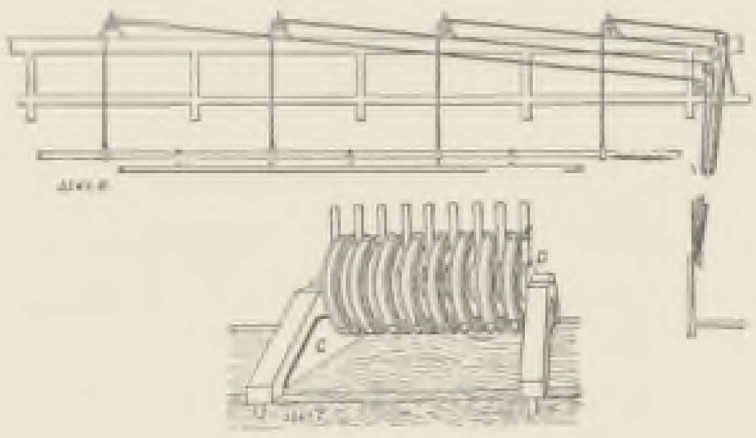
The installation should be considered simply in the light of a set of five ordinary hydraulic lifts which chance to have been added to a stage. There is nothing essentially different from similar hoists or elevators elsewhere or anything calling for special comment. And yet this application of water power at the 'Lyric' Theatre, with the view of assisting theatrical effects, marks an important step in the improvement of stage mechanism in this country. The 'Lyric' installation was the first of its kind in this metropolis.

Again reverting to the Drury Lane stage, I take the opportunity of saying that the production of the pantomime of Christmas 1896, marked the first adoption of hydraulic machinery for spectacular effects in one of our largest London theatres. The late Sir Augustus Harris had for many years been considering the advisability of installing hydraulic machinery at the Drury Lane Theatre, and at the Covent Garden Opera House, but had, as the lessee, to consider the financial outlay and the time it would occupy to set up the appliances. Shortly before his death, however, he decided to order two large 'bridges' for the first-named establishment. These appliances were primarily intended to facilitate the presentation of a large shipwreck scene. The machinery for these two 'bridges' was ordered from Austria, but unfortunately show lines almost identical with those of the earliest 'Asphaleia' work of 1881, instead of the more recent foreign types mentioned in these pages. Each 'bridge' measures 40 feet (12·19 metres) by 7 feet 6 inches (2·28 metres) and can be raised to nearly 12 feet (3·65 metres) above stage floor line, whilst the fall under the stage is 9 feet (2·74 metres). The two 'bridges' adjoin one another, and are only divided from each other and from the surrounding floor by 'flaps' (Casettenklappen) which are fixed to the 'slab' of the 'bridge.' The appliances sent from Austria had, by the bye, to be adapted to suit English requirements in respect to hydraulic pressure, for though the supply by the hydraulic mains is not more than 700 lbs., the valves and cylinders can only stand a much lower pressure, and reducing valves had, therefore, to be introduced.

'LYRIC' THEATRE, LONDON: STAGE.
FIG. 124. SECTION OF 'BRIDGES.'

The cylinders, I would here add, have an abnormally large diameter of about 17 inches (0·43 metre) each. As both 'bridges' are used together, it is curious that no system of coupling has been adopted, since the separate regulation of each 'bridge,' even when in competent hands, is a matter of great difficulty, and the rise between the two 'bridges' certainly fluctuates to the extent of a few inches during the movement. However limited the installation at Drury Lane may be, it is certainly a move in the right direction, and those responsible for the economy of this institution recognise that for pantomime and transformation work a great saving in the wage list should be arrived at by the adoption of modern methods. It is, perhaps, interesting to note that even with two hydraulic 'bridges' at work there are still over 100 men employed in shifting scenery during a production of a pantomime, and that many of the men are practically only required for a few minutes to move certain appliances which could be far better worked by motor power.

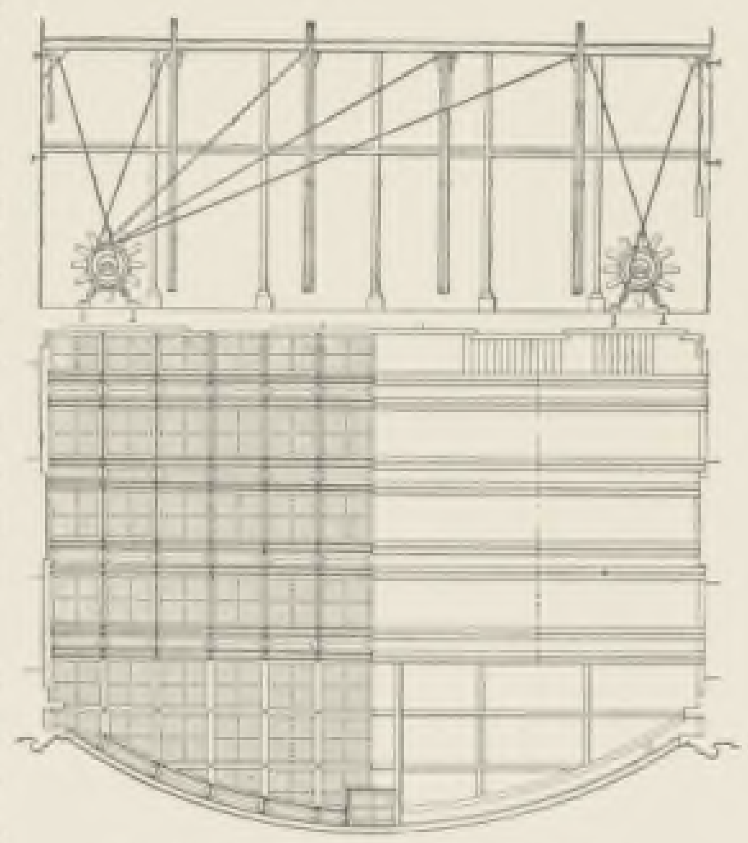
The installation here under consideration, however, also calls for special remark owing to its having been the cause of the closing of Drury Lane shortly before the commencement of a performance during the Autumn of 1897. This is unique in the annals of modern Stage construction, for whatever the economic or mechanical failings of individual examples mentioned in this Supplement may have been, the iron stage worked by hydraulic power has always been considered reliable. I had an opportunity of examining the appliances directly after the establishment had to be closed, and, to my mind, there was nothing to show that the appliances themselves, though, as indicated, constructed on the earliest 'Asphaleia' lines, had any defects. There were, in fact, indications that the cause of the collapse of the 'bridges' was either due to malicious damage or wilful negligence, and, as far as the movement of 'Stage reform' is concerned, it is well that it could be attributed to this, for the charge *unreliability* would be fatal to the development of modern stage mechanism if put forward by its opponents, among whom should be counted many of the stage carpenters of old. Nevertheless, the failure at Drury Lane afforded a warning to this extent, that the vital parts of modern mechanism should be protected from accidental or intentional damage, and that an installation of this description should always be in the hands of skilled engineers and trustworthy mechanics.



AFFLECK'S SYSTEM: STAGE.
FIG. 125. DETAILS OF 'GRIDIRON' PULLEYS.

Speaking of modern appliances introduced into the Metropolis, and with reference to the complaints constantly made as to the dearth of hanging room for a large number of 'scenes' in the wood theatre of to-day, I think I should mention a small device introduced by Robert Affleck, with the aid of which the number of 'cloths' can be greatly increased in any given space as compared with the earlier arrangement. In the old wood stage, whenever the play is changed, a considerable amount of work is invariably found necessary in modifying or rearranging the 'pulleys' working in wood blocks which are bolted or screwed to the joists of the 'gridiron,' etc. A great deal of power, I should add, is also lost by friction, caused by the lines rubbing against the sides of the blocks in the mortise, and in scraping along the 'gridiron' floor. Affleck's patent, as illustrated in Fig. 125, claims to do away with blocks entirely, and to substitute in their place a series of 'pulleys' running on steel shafts, in adjustable lengths of 18 inches (·45 metre) or longer, each of which is supported at its respective end in a metal bearing. These bearings are fixed to the joists of the 'gridiron' by a 'stud' at each end, which drops into holes drilled into the joists at suitable intervals. Guides are provided for each of the 'pulleys' in the shape of 'arms,' which are screwed into and through dividing 'collars' on to the 'shaft,' to keep them in position. The leading pulleys are mounted on similarly adjustable bearings, made in the form of steps one above the other (Fig. 125); and by this system the 'pulleys' are quickly adjusted.

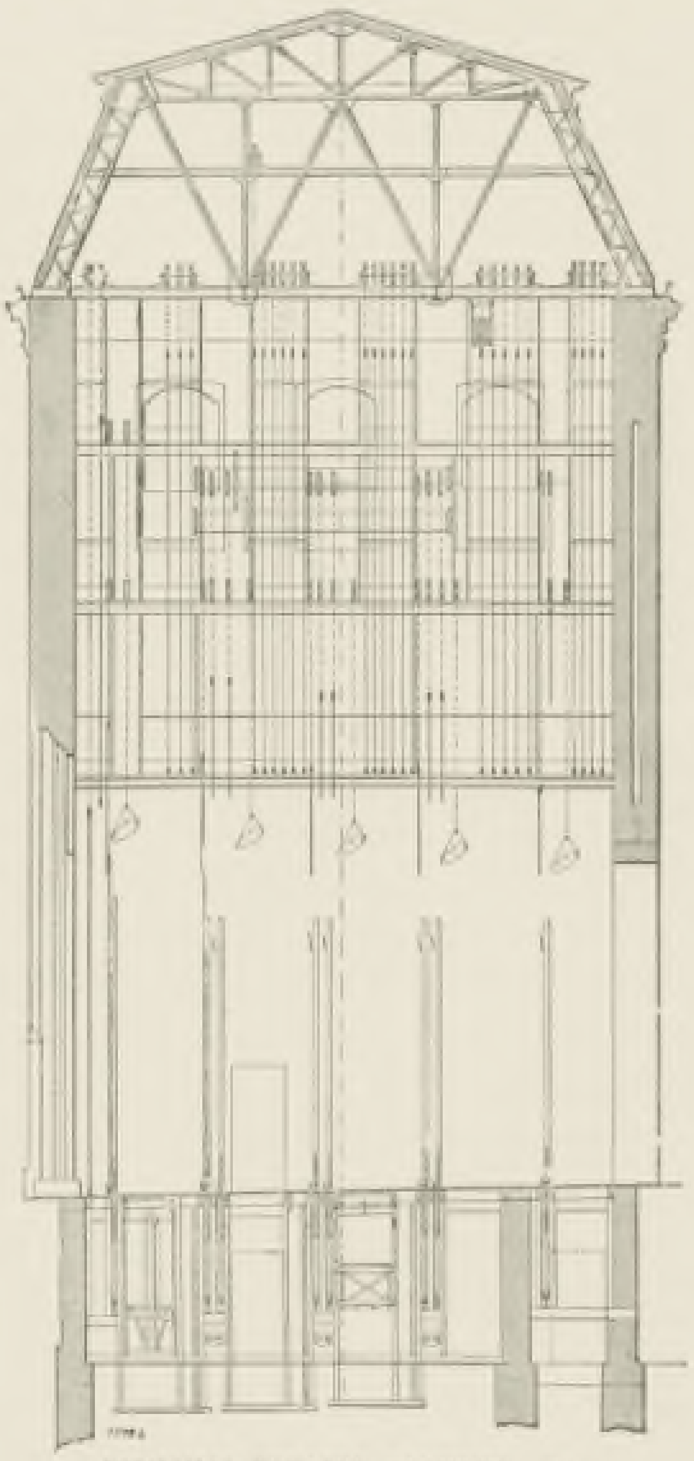
I have now spoken of several appliances, specially connected with stage work in England, which have not been classified under the separate headings of my different chapters. Perhaps I should here take the opportunity of also speaking of a small stage abroad which I could not well classify owing to its peculiarities. It is an example of what an exaggerated influence one stage can have over another, and how even such a gigantic installation as that at the Paris Opera House can be injudiciously used as a model for such a miniature playhouse as the theatre at Monte Carlo. In a sense this example is a negative one, and should serve as a warning to those who think any given system can be adapted to any other purpose.



CASINO THEATRE, MONTE CARLO: STAGE.
FIG. 126. PLAN AND TRANSVERSE SECTION.

At Monte Carlo, as will be seen from Fig. 126, the front stage is devoid of 'cuts' of any kind, the first movable portion being some few feet back from the line of the proscenium wall. The first opening is the 'slit' for the first 'chariot' passing right across the full width of the stage, and the width of this 'slit' is 1½ inch (·04 metre). The joists on either side are 3½ inches (·09 metre) by 8 inches (0·20 metre). A 'trappillon,' 10 inches (0·27 metre) wide, is placed between the first and second 'chariot slits,' and the latter is followed by a 'rue,' 3 feet (0·98 metre) wide; and the sequence, which occurs four times in the depth of this small stage, is 'rue,' 'costière,' 'trappillon' and 'costière.' The stage is laid with such a slight fall towards the footlights as to be practically flat. There is only one 'mezzanine' level, 6 feet 10 inches (2·10 metres) below the stage. Here the uprights are double, there being one support under each joist. From the 'mezzanine' to the 'cellar' the distance is 10 feet 6 inches (3·20 metres), and here the posts are single, measuring 8 inches by 4 inches (0·20 by 0·10 metre). Concrete and stone bases, measuring 3 feet 3 inches by 1 foot by 10 inches (1·00 by 0·30 by 0·25 metre), support these main posts, each block or base taking two posts. The uprights are braced together from back to front with the old shutter-bar system, explained when I dealt with the English wood type. The 'under machinery' is manipulated by 'drums' and counterweights, and the 'sloats' are worked on the lines already described. The 'drums' are all mounted upon iron standards bolted to the 'cellar' floor. But if the lines of the installation be examined, the dimensions, the details, and the appliances of the Casino Theatre at Monte Carlo will be found to be practically the same as those of the Paris Opera House, though, of course, in some places the fittings had to be on a smaller scale. In the same manner as the Paris Opera House stage is one of the largest in the world, the Monte Carlo stage is one of the smallest on which legitimate opera and drama can be mounted, and yet, as I observed, exactly the same system of stage design will be found in both. Surely this is not as it should be.

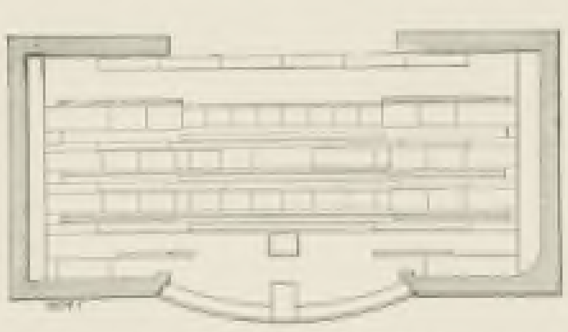
Speaking of this rather unfortunate instance of a miniature stage in France, reminds me that there are several stages in Germany of moderate dimensions which call for attention as examples where the designer has fully mastered the requirements of a small theatre though accustomed to work in much larger playhouses. In the first place I would speak of the stage at Essen—a theatre for which the town is mainly indebted to the Krupp family—and in the second, of the installation of a private establishment in Berlin known as the 'New' Theatre.



MUNICIPAL THEATRE, SALZBURG: STAGE.
FIG. 127. LONGITUDINAL SECTION.

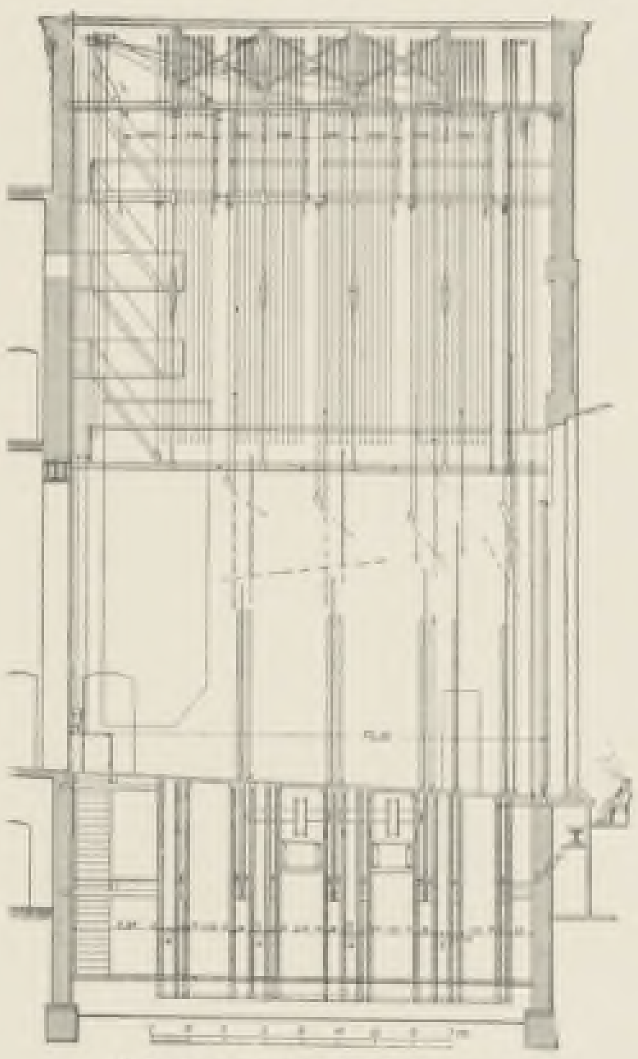
The stage of the Essen Theatre has the modest dimensions of 55 feet 9 inches by 44 feet (17 by 13·50 metres), and the proscenium opening itself only measures 26 feet (8 metres) in width. The floor of the stage is divided into four sequences of 'Kulissengassen,' with the additional 'Nulgasse' and a 'Gasse' at the back of greater depth than the others. The width of an ordinary sequence is 7 feet 9 inches (2·40 metres), while the 'Kulissengasse,' at the back is over 10 feet (3·15 metres) deep. The 'Nulgasse' is taken up by the ordinary arrangement of act-drops. Each sequence comprises two 'chariot slits,' a 'bridge,' a 'chariot slit' and a 'slider,' whilst the 'Kulissengasse' at the back has apparently no opening in the floor for scenic purposes. Each 'bridge cut' is divided into six sections or 'slabs,' but the first 'bridge cut' is a so-called dummy, without a 'bridge' proper. There is only one 'mezzanine' and a 'cellar' to the 'under machinery,' and two 'fly galleries' to the 'upper machinery'; the 'gridiron' has only one level. As will be seen from the diagrams, everything is constructed on very simple lines, but with due regard to the modern improvements in the larger theatres, such as, for instance, the adoption of the pulley system to the 'upper machinery.' Arrangements have also been made for working the 'horizon,' and every facility has been given for rapidly moving every part of the mechanism. The stage is an excellent example of what can be done with small means, while affording, in every way, sufficient facilities for working a theatre of this description.

Similarly the stage of the 'New' Theatre, Berlin, can teach us many lessons, more particularly, perhaps, as this institution is worked entirely on commercial lines, in the same manner as our metropolitan theatres. The stage at the 'New' Theatre has practically the same dimensions as that of the Essen Theatre, for its width from wall to wall is 54 feet (16·50 metres), and the depth is 41 feet (12·50 metres), to which we must, however, in this instance add a back stage, having an approximate depth of 19 feet 6 inches (6 metres). Whilst the Essen stage is used for both drama and opera, the bill of the 'New' Theatre is exclusively devoted to dramatic performances, and more particularly to the chamber play. But in these small establishments, where economy has to be observed, there is very little difference between the arrangement of the two, and we only find the omission of certain apparatus, such as a 'bridge' at the back, which is not often required in chamber plays.



MUNICIPAL THEATRE, SALZBURG: STAGE.
FIG. 128. PLAN OF STAGE FLOOR.

As shown by the plan (Fig. 130) the floor of the 'New' Theatre has been divided into a 'Nulgasse,' four ordinary 'Kulissengassen,' and a deep one at the back. The 'Nulgasse' is again taken up entirely by the act-drops, etc., and has no openings in its floor. The three first 'Kulissengassen' have a regular sequence of 'chariot slit,' 'bridge,' 'chariot slit,' 'slider,' 'chariot slit,' but I should add that the 'bridge' in the first 'Kulissengasse' is again a 'dummy bridge,' that is to say, the division in the floors allows for the installation of a 'bridge' or any particular 'trap,' but no 'bridge' or trap is permanently in position. After the three ordinary 'Kulissengassen' comes the fourth, which is divided up into 'chariot slit,' 'dummy bridge,' 'chariot slit,' 'slider,' whilst the last 'Kulissengasse' has no openings in its floor for scenic purposes. The height from stage floor to 'gridiron,' taken 19 feet 8 inches (6 metres) back from the curtain, is over 57 feet (17·50 metres), whilst the depth of the 'under machinery' is a little more than 16 feet (5 metres). As will be seen from the diagrams, there is only one 'mezzanine' level and the 'cellar.' The proscenium opening, I should add, is 27 feet (8·30 metres) in width. The 'horizon' will again be found at the 'New' Theatre. There are two 'fly galleries,' of which the upper part is connected with the 'flying bridges,' and there is one level to the 'gridiron.' Intercommunication between the various levels of the stage is by means of staircases and minor lifts.

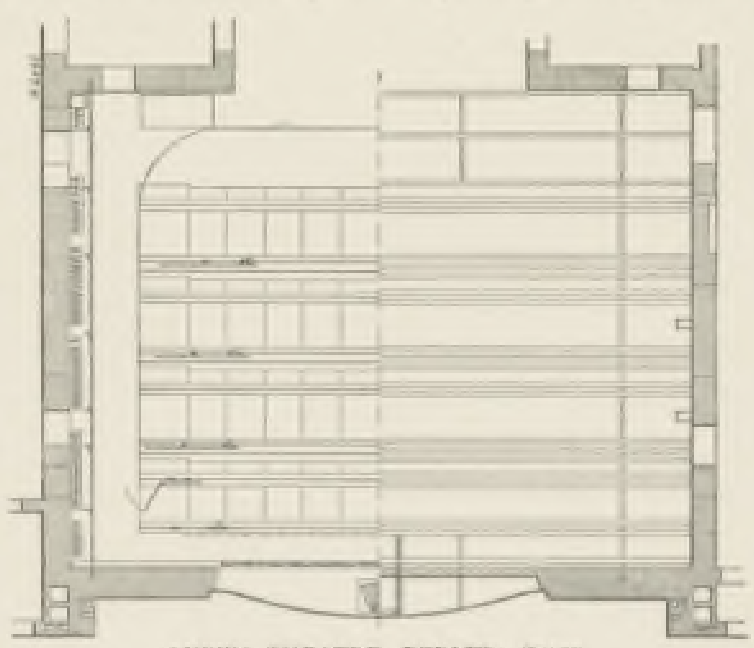


'NEW' THEATRE, BERLIN: STAGE.
FIG. 129. LONGITUDINAL SECTION.

Both these examples are designed by Fritz Brandt, of whose stages at the Court Theatre, Berlin, and at Wiesbaden, I have spoken at length. When referring to those two examples I pointed out the practical and economical design of the author. Here, where we have to deal with two small playhouses, I cannot but again emphasise how well the financial side and actual working of the stage have been considered, irrespective of any extremist theories. Fritz Brandt's small stages also find favour with the manager who is restricted to a certain capital outlay and yet wishes to banish the wooden installation of old.

Yet another stage deserves attention on account of its economical construction, and its due regard to the requirements of a small playhouse. This is the stage at the Municipal Theatre, Salzburg, designed by Friedrich Brettschneider. Here we find a wood-and-iron stage, with its 'under machinery' of wood and its 'upper machinery' of iron construction. The plan shows three complete sequences of 'traps,' with some few additional 'traps' at the front and back. Commencing at the proscenium opening, on either side of the stage are placed the 'slits' for the side pieces of the inner proscenium framing. In the centre of the stage is placed a small 'trap,' not quite so large as the 'grave trap' of the English stage, and this opening is used for a single 'table trap' worked up and down by counterweight and windlass. The first 'cut,' which extends right across the stage, is for a set of 'sliders' divided into four sections, which, however, do not open to the full width of the proscenium. After the first set of 'sliders' there is a pair of short 'chariot slits,' followed by a 'Freifahrt' across the whole width of the working stage. This chariot slit is followed by a 'bridge,' the floor of which is divided into eight sections. On proceeding 'up' the stage the next 'cut' is in the form of another line of 'Casettenklappen,' which, however, when open, have a greater frontage than the first 'cut' of this description, for the dimension is here equal to the width of the proscenium opening, whilst the first one was less. Two 'chariot slits' again follow, and in this manner practically three sequences are arranged, though after the third 'bridge' there are no more 'Freifahrten.' One of the chief features in the general plan is the variation of the lengths of the 'cuts' in the different sequences, no set having all three kinds of 'traps' of the same length as another set, and this provision no doubt has to be made on account of the limited space requiring the greatest possible variation in the position of individual openings.

As shown by the section, the floor of the Salzburg stage is supported by wooden uprights. There is only one 'mezzanine' level, which is used for the 'chariot rails.' A small excavation forms the 'cellar' or well under the centre or working portion of the stage, and in this respect the section resembles the arrangement of the English wood stage, in which great economy is observed in excavation. Ordinary wooden 'sloats' are used, but they are raised on iron windlasses. The appliances and fittings above the stage are almost entirely of iron. There are three tiers of 'galleries' forming the 'flies,' and the usual 'hanging bridges.' All the 'cloths' are worked over pulleys placed in the 'gridiron' floor from a 'shaft' in the 'flies,' and balanced by counterweights.

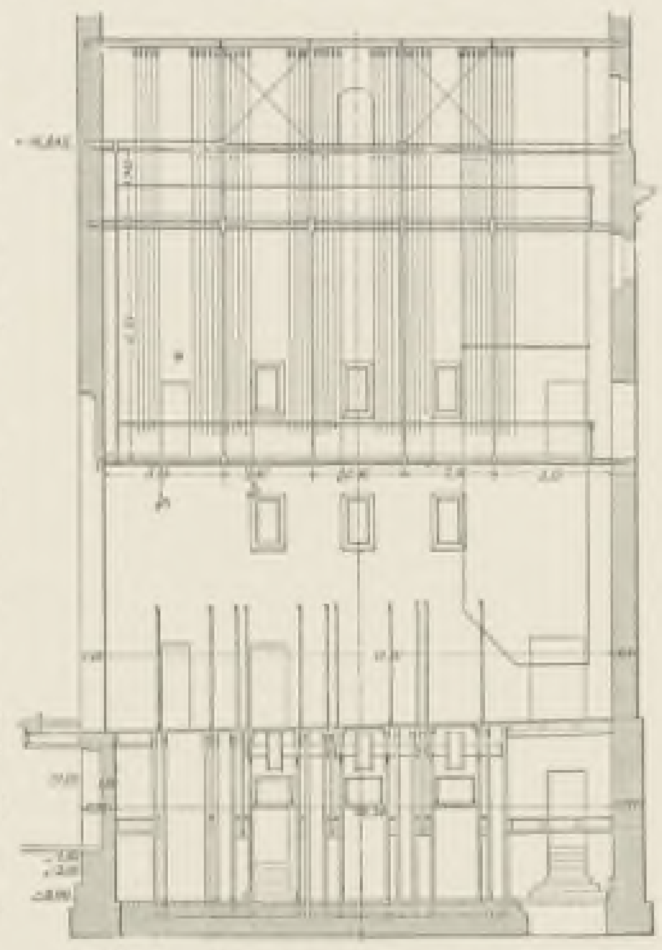


'NEW' THEATRE, BERLIN: STAGE.
FIG. 130. PLAN OF STAGE FLOOR.

Taken as a whole, it will be seen that there is much of practical use in this small Salzburg stage which could well be adapted to our metropolitan and suburban theatres, where but a limited superficial area is available for the 'back of the house.'

Speaking of minor appliances used in connection with smaller Continental stages, the means of attachment used for the 'cloths' is perhaps worthy of note. The usual method is to nail the canvas on to wooden 'battens' round which the ropes are fastened by the scene hands. In this scheme they are fixed to an iron rod over which straps are passed with 'jaws' to catch a wooden roller on which the canvas is mounted. This method enables a 'cloth' to be quickly detached from the working ropes and another 'scene' attached, a matter of great importance on a small stage. Another advantage is that there is no difficulty in getting a 'cloth' to hang straight, whereas in the old methods, with hemp ropes to be tied and untied, there is much waste of time before a 'cloth' can be made to hang properly.

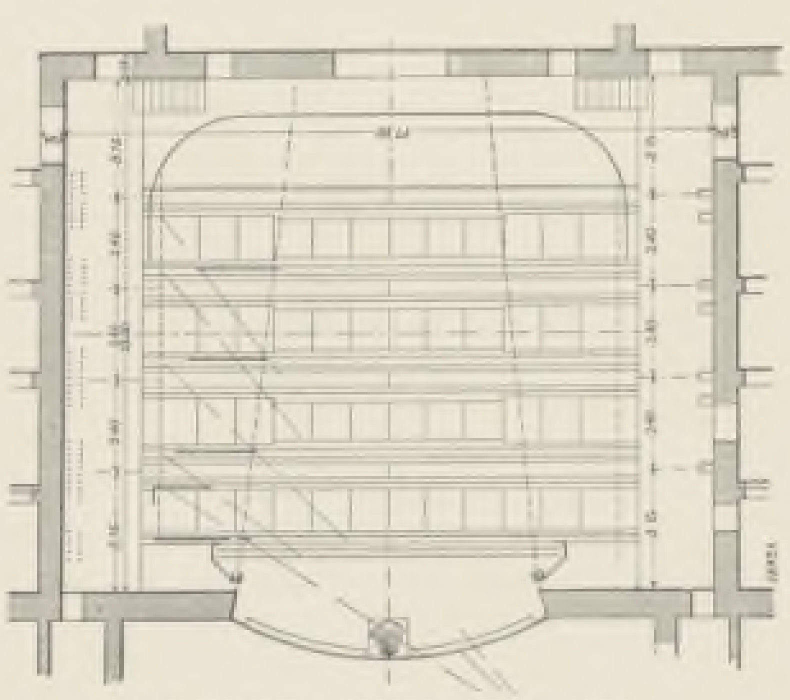
Of other minor appliances, I would again mention that of the 'rostrum,' and point out what an important part it has played in stage-craft. There are but few renderings of our modern plays which would be possible on the English wood stage without these cumbersome contrivances. It is, however, our pantomimes and our ballets where their elaboration becomes stupendous. Take, for instance, the 'Faust' ballet of 1896 at the 'Empire' Variety Theatre. This ballet affords an excellent example of the antiquated methods we have to employ on our wood stage. The whole of the 'Faust' scenery, as originally conceived, was built up with these 'rostrums,' and it is, of course, only possible to arrange for such necessary and extensive paraphernalia when a 'run' is assured. It would be impossible to work the ballet with a nightly change on the lines adopted. The conception of this ballet, and the sketches for the scenery, I would here specially point out, were by the well-known London scenic artist Wilhelm, but the execution of his ideas, their elaboration, and the mechanical parts of the work, were to a great extent due to the skill of Karl Lautenschlaeger, of Munich.



MUNICIPAL THEATRE, ESSEN: STAGE.
FIG. 131. LONGITUDINAL SECTION.

In an article on the 'Empire' scenes of 'Faust,' M. H. Spielmann called special attention to the fact that in no department of stage spectacle has greater improvement been shown in the last quarter of the present century than in that section somewhat roughly denominated the ballet. It is in the ballet of to-day that the great designer has to produce an *ensemble* of effect, spectacular and dramatic, which will do more than charm by mere *éclat*, by subject and costume, even when aided by the best ballet music that was ever written. The designer seeks something more logical, and more of an artistic whole, a creation in which all the resources of the arts of the theatre may be focussed upon one production. In such a work, breadth of effect must not be sacrificed to beauty, nor, if the designer can help it, archæological accuracy to the ordinary demands of scenic expediency. Every law of colour, arrangement, and harmony in his ever-changing, ever-moving scene must be as thoroughly regarded by the designer as by the painter of the most carefully thought-out picture that may be submitted to the popular verdict. Every fact must be tempered and idealised by the fancy animating the whole.

The preliminary plan for a ballet in which these requirements are observed should well illustrate the care with which every detail for the whole conception has to be first thought out before proceeding to arrange the machinery to work the various individual scenes. Such a plan must not only give the lines and position of every part of the three scenes, but also show how the first scene is to be arranged to mask the second, and the second to hide the third, so that as little shifting of scenery as possible is needed to make rapid changes in sight of the audience. Infinite study and nicety of arrangement are needed that the component parts of each scene shall group harmoniously and allow facilities necessary for concealing it. It is only after giving full attention to the delineation of accurate plans, as well as by having models constructed to scale, that successful results are attained.



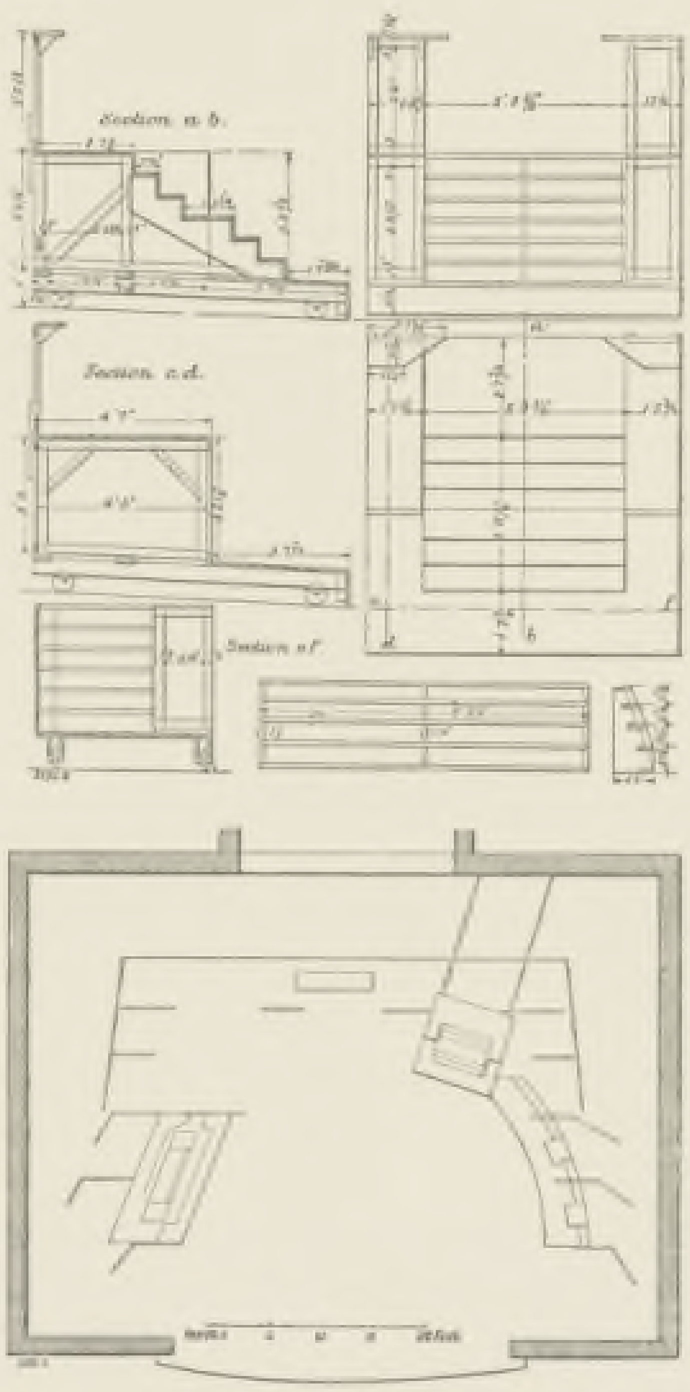
MUNICIPAL THEATRE, ESSEN: STAGE.
FIG. 132. PLAN OF STAGE FLOOR.

In the plans of the 'Faust' ballet, Wilhelm showed this nicety of arrangement, and the result has been that not only the general execution but also the elaboration of the veriest detail was carried out successfully. But what cumbersome makeshifts had to be used in the shape of 'rostrums,' what an expense had to be incurred in their construction, can be judged from the diagrams (Figs. 133, 134). Does it not speak badly for our commercial enterprise that a theatre like the 'Empire,' with its sumptuous ballets, should be constantly hampered by the want of a modern stage with suitable appliances?

There is no doubt that before long considerable improvement will have to be made in the present condition of the English stage, and already a marked tendency towards a practical issue of the movement of 'Stage reform' is apparent. Quite a number of those engaged in theatrical enterprise are fully alive to the defects of the old wood stage which I have attempted to describe in the earlier parts of this series, and I believe that were some influential manager to make a forward move regardless of the prejudice with which every new proposal in 'Stageland' is greeted, many would follow his lead. It would undoubtedly require a man of conviction and determination, for there is nothing more difficult than stage-management when, for instance, the stage-carpenter, with his almost antediluvian notions, too frequently shows contempt for the lessee's innovations. As I have explained, our stages of to-day are rarely in the hands of skilled stage-machinists; they are mostly worked by artisans with little or no interest in their employment, who possess no ambition, and are devoid of any desire to gain fresh experience.

Such a step as that recently taken by Herbert Beerbohm Tree at 'Her Majesty's' Theatre, was of greater importance than is generally understood, for he introduced into this country for the first time a flat stage, and its use has simplified everything in connection with stage mechanism. The sloping stage has always been a hindrance to those who desired to adopt some mechanical power for the working or the handling of scenery. The sloping stage always added to the first outlay for any innovation of this description. The flat stage had been tried and used successfully on the Continent for a considerable time, and in the United States it had for years been a popular improvement in every modern theatre. Nevertheless, the prejudice and ridicule with which Beerbohm Tree's idea of introducing this flat stage into London first met was almost astounding, and even, after its advantages have been recognised, there are many who would at once attribute any mishap, even of the most trivial kind, that might occur on the stage of 'Her Majesty's' Theatre to the absence of the usual slope.

The late Sir Augustus Harris did much for stage improvements when he decided, contrary to the advice of many, to try hydraulic power on the Drury Lane stage; and his successor, Arthur Collins, is to be congratulated on the fact that he saw the ideas of his predecessor carried out, uses the various appliances placed at his disposal, and is at present considering further similar material improvements to the stage he now controls. And, in connection with this it should not be forgotten that I mentioned how Drury Lane had to close its doors on account of an accident in connection with the new installation, a fact that would prevent many from using such appliances in their establishments again. Whilst many of the opponents of modern improvements rejoiced about the accident, the broader minded did not fail to remember that, not many years ago, the opening of a Drury Lane season had to be postponed on account of a not unsimilar collapse, then, however, due to the clumsy appliances of the wood stage of old.



ROSTRUMS.

Figs. 133, 134. Plan and Details for 'Faust' Ballet.

The descriptions I have given in this series, and the opinions I have quoted, will, I trust, be of some use to those who wish to follow the example that has already been set them by Beerbohm Tree, Augustus Harris and Arthur Collins. I trust, also, that the descriptions and quotations may, in some slight measure, give an impetus to many who have not as yet considered the question of 'Stage reform,' but have, without much thought, utilised the methods and appliances which they have inherited from their ancestors, and perhaps, at the most, are doing no more to improve them than grumble at their inefficiency. In any case the diagrams in this Supplement should give an insight into what progress has been made up to the present time in other countries in regard to stage mechanism. The great possibilities for an advance in this direction are clearly shown, and whilst, on the one hand, much in the work presented is worthy of adaptation and development, there is no doubt that a considerable amount of the work which has been done is of an essentially experimental nature, and at times distinctly unsatisfactory. The student, however, will, I am sure, find even in the unsuccessful efforts of others much that will claim his notice, and will learn many a lesson, although perhaps rather in a negative sense, from some of the costliest experiments which extremist stage reformers have undertaken.

In the introduction to this Supplement, I attempted to explain the movement which I termed 'Stage reform,' and which, as I have stated, practically originated some twenty years back in Austria. I have tried to show the disadvantages of the extremist reforms that were tried at that time, and to call attention to what is looked upon as *practical* reform. I am under the impression that those who have followed me through these chapters will agree that, though the extremist measures may have been useful owing to the impetus given to the desire for improvement generally, the ideas embodied by their originators often went too far, and that the outcome of their efforts, such as those which resulted in the production of the 'Asphaleia' stage, lacked those practical qualities which might lead to popularity and general adoption. On the other hand, it will have been seen that those whose endeavours were directed solely towards the practical embodiment of their ideals, have made considerable headway, and have materially assisted in the advance of stage mechanism.

The men whom I have in mind when I say this, are Karl Lautenschlaeger, particularly in respect to the iron stage worked by manual labour, which was constructed at the Amsterdam Municipal Theatre; Friedrich Brettschneider, in connection with the hydraulic appliances introduced by him at the Court Theatre, Vienna; and lastly, Fritz Brandt, whose hydraulic stage at the Court Theatre, Berlin, will, to my mind, serve as a practical basis for future work, and which has already opened a new era of improved stage construction after the long transitional and experimental periods. In England, no doubt, Walter Dando has done excellent work, but the isolated example of his wood-and-iron stage worked by manual labour at D'Oyly Carte's Opera House, cannot call for the same amount of attention as the numerous installations of other countries just referred to. We should also not forget that though I have had to say some hard things about the English stage-carpenter, exceptions are to be noted, for there are a few men like Robert Affleck, a device of whose is illustrated here, and Edward Taylor, of the Drury Lane Theatre, both of whom favour mechanical improvements in the working of the stage.

It is curious, indeed, that we should not have been able to hold our own in constructive work of this description, and that the chief epochs of development should have practically entirely occurred in Austria and Germany. It is true that France and Italy likewise have the same reason to complain, but for all that, it is lamentable that in a country noted for its mechanical skill, an institution such as the theatre and its stage, which particularly require the attention of the engineer, should have been so neglected. To my mind it is not a question of expenditure, and I would emphasise this as I have so often encountered the argument that stage improvements and 'state subsidies' to theatres must necessarily go hand in hand, for the foreign private theatre, a commercial concern on 'all fours' with similar institutions in this country, has also been able to show such advances. The financial aspects of a Continental private theatre are by no means so satisfactory as those of a well-managed establishment in this country, and yet 'Stage reform' has found favour, and the introduction of modern appliances has not only proved satisfactory so far as the working of the stage is concerned, but also, and I would here say, chiefly, as far as the exchequer is concerned. There is not the slightest doubt that for a small London theatre a flat stage, with modern appliances and methods, would be economical, and the same can also be said of the large Opera stage, and the large Variety theatre stage. On the one hand manual labour may be retained, and on the other hydraulics may be introduced; but with good designing—and we pride ourselves on practical designing and economical construction—there is not the slightest doubt that the capital which must necessarily be sunk will be a profitable investment, owing to the decrease in the annual expenditure, both for labour and repairs, and the absence of outlay for the adaptation of scenery to a sloping floor.

Until within a few years ago, many associated with the stage of this country considered that all improvements were questions of experiment, and that experiments would be far too expensive for the ordinary actor-manager. I hold that we have now come to that period where improvements need no longer involve experiments, and when even a glance at this Supplement may be of some assistance in helping to avoid any great mistakes in the modernising of the stage. I cannot but repeat that I hold the experimental period to have passed, and that we are indebted to many of our foreign friends for lessons and examples which they have only learnt by great expenditure of labour and money.

It is usual, I believe, on the completion of a series of chapters of this description, to attempt some recapitulation, or a summary of the conclusions arrived at.

As I originally indicated, however, I have been dealing with a new subject in respect to which little or nothing has been previously written, and certainly no compilation of this kind has yet been attempted, and I think I should hence not go further as regards recapitulation or summary than I did with my classification in the Introduction. It will be remembered that there I only showed how I divided stages generally into Wood stages, Wood-and-Iron stages and Iron stages, and then sub-divided these headings according to the labour employed in working the appliances. My sub-sections were Manual Labour, Hydraulics and Electricity, and it has also been seen that whilst manual labour only is employed on the wood stage, and the wood-and-iron stage also generally only shows manual work, it can also be adapted to the more advanced appliances, where the whole of the equipment is constructed of metal. In respect to the iron stage, however, all three sub-divisions not only hold good, but we have also seen that there were various combinations. Thus we had the iron stage worked partly by hydraulics and partly by manual labour; the iron stage worked partly by electricity and partly by manual labour; and lastly, the stage where manual labour, hydraulics and electricity were used, and the stage where there was a combination of electricity and hydraulics. In fact, on examining the examples of the more advanced iron stages, it will have been seen that the engineers, one and all, except, perhaps, those associated with the 'Asphaleia' Company, were by no means in favour of the total abolition of manual work, and that they advocated combinations to a very considerable extent. Manual labour was retained by many for the 'upper machinery,' though hydraulics were recommended for the 'under machinery.' Personally, I also hold this view, and contend that the extreme employment of mechanical labour is neither practical nor economical, and that the solution of the question lies, speaking comparatively, in the combined application of mechanical and manual power.

Hence, were I actually to classify, there is no doubt that separate positions would have to be accorded, not only to the combinations as such, but also to the different combinations and different ratios in combinations, for there are distinctions of considerable importance between a stage in which manual labour predominates and in which hydraulics occupy a secondary position, and a stage which is worked entirely by water power, or where manual labour is only intended as a makeshift, or, at most, as an auxiliary. The same holds good in the hydraulic stage, where electricity is only supplemental, and *vice versâ* in the electrical stage, where hydraulics have, perhaps, only been used for particularly cumbersome appliances. Further, if I were to classify the wood-and-iron stage worked by manual labour, I should have to determine between stages in which the combination comprises an iron framing with woodwork in a secondary position, or where the timber work predominates in the principal parts of the construction and yet ironwork has been introduced in the minor appliances. Then, again, it is very different if such combinations occur throughout the stage from 'cellar' to 'gridiron,' or if the 'under machinery' is constructed entirely of iron, and the 'upper machinery' entirely of wood.

But, as I have said, it is not my intention to summarise or classify, for though we have passed the stage of initial development, some time will yet elapse before we have recognised 'classes' of stages. As will be remembered, I have shown examples of several 'types' of stages. Take, for instance, those at Halle and Buda-Pesth representing the 'Asphaleia' system. Nevertheless, as a whole, these chapters, so far as the modern stage is concerned, have dealt solely with individual examples and single instances of some specific form of construction or some specific combination. In fact, only in the case of the old wood stages, where types have been defined for several generations, have I been able to indicate distinct 'classes.' I have dealt with the German wood stage as a type, and similarly with the French wood stage and the English wood stage, but in no case have I been able to define a type of wood-and-iron stage, or a type of iron stage with some specific method of working it, excepting only the 'Asphaleia' stages just referred to, and even there the examples in the two cities named, as well as at Prague and Chicago, scarcely go far in making the 'Asphaleia' stage typical for a country or a class. In the same manner, if I chose to frame conclusions, it would, I hold, be almost necessary to specify the results arrived at as regards every individual example, to then make comparisons, and again draw conclusions. This, however, I believe, would not only extend beyond the usual scope of a summary but also be of small practical value, owing to the great difference in the various requirements. I may be asked how it is that in other subjects—perhaps equally new—conclusions are easily drawn, but I reply that there are few subjects where the examples are so varied and have so much individuality, and at the same time fulfil absolutely specific purposes in strictly defined surroundings, as is the case with the modern stage of the last few decades. I am also adverse to adopt conclusions on this subject, taken generally, for I should prefer these chapters to be simply considered as studies. As I have said originally, though I have had manifold opportunities afforded me of testing everything of importance, a new subject far too readily lends itself to prejudice. The diverse opinions quoted from various engineers as regards the different stages are, to my mind, of a far greater importance than the few comments that I have been able to make or could now add.

In closing I would only repeat that I trust my treatment of so new a subject will not only be of practical utility to those already interested in the development of the modern stage, but, above all, will draw the attention of those who have not given much thought to the matter to the great possibilities that exist for mounting our plays, not only in accordance with the facilities afforded us in this era of progress, but also with less danger from fire, with less risks of illness to those employed, and with greater ease and economy. Why should we not take a leading position in stage equipment, banish the dangerous, unhealthy, unpractical and expensive wood stages of 1750, and make room for something far better now that we are approaching the twentieth century?

'EMPIRE' VARIETY THEATRE, LONDON.
FIG. 135. SCENE FROM 'FAUST' BALLET.

SUPPLEMENT II.

THEATRE FIRES.

INTRODUCTION.

Much has been said from time to time as to the frequency of conflagrations in theatres and similar places of public entertainment, and it has not been unusual, after fires involving serious loss of life, to find the publication of statistical information bearing upon the constant recurrence of such fatalities. As a rule these statistics have, however, been presented without any attempt to record the actual causes and effects of the fires, and at the most, particulars were given of, perhaps, some recent sequence of catastrophes without those details which would be of practical service in guiding the architect, the expert, and the public authorities, as to the possibilities of preventing their repetition. The late much lamented engineer, August Foelsch, of Vienna and Hamburg, alone commenced the preparation of what was intended some day to become a complete record of fires at theatres. He commenced his compilation early in the seventies, and continued working on them until some years before his death. Sections of these records were published from time to time during the years 1871, 1878, and 1881, and his first classification of causes, etc., with the issue of 1878, has long been recognised as a piece of research of considerable value. It was not until the executors of the deceased entrusted me with his papers that I commenced an examination of the facts gathered from the data, with a view of strengthening my hands with arguments in favour of the better protection of playhouses. It was then that I discovered it essential not only to continue the work of August Foelsch, but also to materially extend the scope of the research. In gathering further information I always kept in view the fact that the mere tabulation of fires and dates was of little practical service, whilst some considerable use might be made of a compilation which gave authentic particulars as to the life of buildings, cause and location of the outbreak, and other matters of essentially technical detail.

In presenting my remarks with an analysis as a Supplement to this work, I am, to a great extent, guided by the desire to show that what I have said in regard to the dangers of playhouses from fire is not without reason, and particularly to indicate the individual form of risk which has to be dealt with. I am thus, perhaps, also able to place some valuable information at the disposal of those who demand material improvement in the safety of the modern playhouse, for I should add that, with the exception of the lists in August Foelsch's treatise and a few minor publications, no attempt to form a comprehensive record has yet been made in any country, and certainly not in England. I trust that reference to these records and analyses will do something towards preventing the recurrence of the many terrible catastrophes which have been associated with the theatre in both hemispheres.

My record only deals with some eleven hundred fires of the past century, and even as such does not pretend to be complete, for I have, of course, only been able to give data which have come to my knowledge, and there must necessarily be a very large number of fires of which I have received no report whatever. This record, however, as it stands, already gives proof of a very considerable number of fatalities. What number then, may I ask, must represent the aggregate loss of life involved in the conflagrations which have occurred in theatres and places of public entertainment throughout the world?

Then, again, it should be remembered that I am only dealing with those buildings which have for all practical purposes been entirely destroyed, whilst I have in my possession details of innumerable examples of minor accidents, small fires, or fires in isolated wings of a theatre, often associated with loss of life, but of insufficient importance to be included in a record of this description.

In preparing the lists of theatre fires for this Supplement I have naturally limited my remarks to points of practical importance; similarly, the analysis has been kept within the smallest possible compass, as a more thorough rendering of the subject scarcely lends itself to a work of this nature. Knowing the force of illustration, I have added some descriptive diagrams embodying a few of the chief points upon which I have dwelt, more particularly with a view to more markedly showing the fluctuation in the number of catastrophes. Further, I have included a list of conflagrations where the greatest loss of life has occurred, together with descriptions of several notable fires which are intended to give some idea of the usual progress of outbreaks of this kind. Here, again, knowing the value of illustration, I have included in the few instances dealt with drawings of the buildings involved, and views taken after the fires. For the purposes of easy reference I have also attached to my record an alphabetical list of the theatre fires which are dealt with in this Supplement.

In conclusion, I ought to emphasise the fact that a study of this description can scarcely be altogether free from error, though every endeavour has been made to obtain reliable information as to the examples presented, and special care has been devoted to the accuracy of all particulars. Where practicable, I have drawn from official reports, but even these are liable to be coloured by the specific views of those who have supplied the accounts of the occurrence, more especially in those instances where public opinion has, perhaps, attributed the responsibility of the fatalities to those in authority. It should also be remembered that considerable difficulties in translation have had to be contended with, owing to the fact that my correspondents are drawn from a number of different nationalities.

THEATRE 'ROYAL' GLASGOW. *Destroyed* March 1, 1895.

FIG. 1. VIEW OF PASSAGE.

RECORD OF ELEVEN HUNDRED FIRES

FROM 1797 TO 1897.

THE following list of Fires at theatres, music-halls and similar places of public entertainment, has been compiled from the best sources available, and where possible from official reports. The locality and the recognised name of the establishment are given, and, when obtainable, the date of the outbreak, the age of the building involved, the number of the fatalities reported, with the characteristic features of the fire, the latter being presented in the briefest form.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1797—Oct. 27	Königsberg	The Theatre in the Kreutzischen Square (I)	Opened November 24, 1755. Burnt down at 3 P.M. Caused by carelessness with the lights. Practically nothing was saved. The fire also destroyed three houses standing opposite.
1798—Feb. 2	Boston	Federal Street Theatre	A large stone building, opened on February 3, 1794. Burnt down at 4 P.M. The fire apparently broke out in one of the dressing rooms through a defective stove.
1798—May 31	Paris	Théâtre Lazary	A small theatre off the Boulevard du Temple, opened 1777. Burnt almost directly after the conclusion of the performance. Seemingly caused by fireworks. One man killed, several injured.
1798—Dec. 15	Paris	Circus Theatre	Opened 1788. A building in the gardens of the Palais-Royal, provided with stage and boxes.
1799—Mar. 18	Paris	Théâtre Odéon (I)	Opened April 9, 1782. Fire broke out at 7 A.M. in the upper part of the stage, where the fire-extinguishing apparatus had only a few months previously been installed. Two of the fire brigade men were killed.
1799—Dec. 17	Philadelphia	Rickett's Circus	Situated at the corner of Sixth and Chestnut Streets.
1802—Mar. 12	Bordeaux	Théâtre des Pantagoniens, later the Gaîeté (I)	Opened April 12, 1801.
1802—June	London	Garrick Theatre	Built 1792. Burnt in the evening.
1802—July 11	Madrid	Teatro del Principe	Building totally destroyed.
1802—Nov.	Stuttgart	The Theatre	Opened 1780. A valuable library attached to the theatre also destroyed.
1803—Jan. 15	Boston	Bowen's Columbian Theatre (I)	
1803—Feb. 10	Bordeaux	Théâtre Lycée	Built 1779. Fire broke out about 2 A.M. The severe frost made the protection of the neighbouring houses very difficult. Nothing saved. At the time, the town had no organised fire brigade.
1803—Sept. 1	London	Astley's Amphitheatre (II)	Opened 1795. Burnt down with forty neighbouring houses.
1803—Oct. 18	Augsburg	Sartor's Theatre	A wooden building in the fruit-market.
1805—Aug. 12	London	The Circus, now the Surrey Theatre (I)	Opened November 4, 1782. Burnt to the ground.
1805	Moscow	The Opera House (I)	Built by order of Katharine II. of Russia.
1806—Sept.	St. Petersburg	German Theatre, opposite the Winter Palace	Opened February 20, 1799. Burnt one hour after the close of performance. The fire commenced on the stage. It was only after much difficulty that the palace itself was saved.
1806	Exeter	The Theatre	Date uncertain.
1807—Jan. 15	Boston	Bowen's Columbian Theatre (II)	Opened November 27, 1806. Fire caused by the explosion of some preparation used in lighting. Six persons were killed and many injured through the falling of a wall.
1808—July 1	Königsberg	The Theatre (II)	Opened April 29, 1808. Burnt at 2 P.M. Fire broke out on the stage. Cause unknown. The adjoining ball-room was also destroyed. Seven people were killed through the falling of walls.
1808—Aug. 30	New York	Bowery Theatre, Vauxhall Gardens (I)	Details unobtainable.
1808—Sept. 20	London	Covent Garden (II)	Opened 1732. Burnt after a representation of 'Pizarro,' owing to the discharge of a gun, the decorations catching fire. Twenty people were killed, and several houses burnt.
1809—Feb. 24	London	Drury Lane (III)	Opened March 12, 1794. The reservoir on the roof, and other appliances for protective purposes could not be used.
1810—Jan. 28	Hâvre	Municipal Theatre (I)	Opened October 16, 1790. Burnt down at 1 A.M. As early as the evening performance smoke had been noticed, but it was attributed to a brazier in the theatre. Nothing was saved. The wife and daughter of the porter, who lived in the house, were suffocated.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1811—Jan. 1	St. Petersburg	The New Theatre	Opened 1784. Burnt down in the night through the carelessness of a theatre attendant. Nothing saved.
1811—March	Munich	Theatre by the Isar	Built of wood.
1811—Dec. 26	Richmond (U.S.A.)	The Theatre	Burnt during the performance through the careless raising of a lustre with lighted candles. 72 persons killed, among them the Governor of the State. Besides these, many injured.
1812—Sept.	Moscow	The Opera House (II)	A wooden building, opened 1806; destroyed through the great fire during the French occupation.
1815	Rome	Teatro Alberti (I)	Date uncertain.
1815	Verona	The Theatre	Further particulars not obtainable.
1816—Feb. 13	Naples	Teatro San Carlo (II)	Opened 1767. Burnt at night during a dress rehearsal. The fire originated in the lamp-room. The Royal palace adjoining was not materially damaged. Nothing belonging to the theatre was saved.
1816—Sept. 26	New Orleans (U.S.A.)	New Theatre, Orleans Street	Three principal streets were burned with it. If the wind had not fortunately changed, a large portion of the town would have been laid in ashes.
1817—July 29	Berlin	Court Theatre	Opened January 1, 1802. The fire began at midday during a rehearsal of the 'Robbers.' One actor burnt. The reservoir and pumps could not be worked.
1818—Mar. 20	Paris	Théâtre Odéon (II)	Opened June 15, 1808. Burnt at 3 P.M. after a rehearsal. The fire, which commenced on the stage, is attributed to an incendiary. The reservoirs could not be used. Twelve firemen were injured.
1819—Jan.	Limerick	The Theatre	Opened 1776. Burnt in the afternoon. Only a small fire, the damage being estimated at £900.
1819—Sept. 8	Philadelphia	Vauxhall Gardens.	
1819—Dec. 16	Bordeaux	Théâtre Gaieté (II)	Opened May 15, 1804. Remained unused between 1806 and 1816. Fire broke out at 8 P.M. during the performance. In consequence of defective heating apparatus the roof over the *foyer* caught fire. The audience succeeded in making its escape into the open. No lives lost.
1819	London	Royalty Theatre	Nothing has been reported of this fire.
1820—April 2	Philadelphia	Chestnut Street Theatre	Building burnt down.
1820—May 25	New York	Park Theatre (I)	Opened January 29, 1798. Burnt after a performance at night. Firearms had been used in the play.
1820	Washington	National Theatre (I)	Built in 1803.
1820	Washington	Carusi's Saloon Theatre	Date of fire unknown.
1821—May 9	Philadelphia	South Street Theatre	No particulars obtainable.
1822—Sept. 5	Natchez (U.S.A.)	The Theatre.	
1823—Jan. 14	Munich	Court and National Theatre	Opened October 12, 1818. Fire broke out during a performance through the igniting of a gauze curtain. The theatre water-supply was not used, as the water was frozen. The spectators happily escaped. No one was killed, though several were injured. The Royal castle, as well as the Residenz Theatre, was untouched.
1823—Dec. 25	Graz	The Provincial Theatre	Opened September 9, 1776. Burnt at 2 A.M. after an evening rehearsal. Origin of fire unknown. The ball-rooms in the same building also destroyed.
1824—Jan.	Cremona	The Opera House.	
1824—Jan. 22	Zolkiew (Galicia)	Theatre in the Royal Castle	Burnt down at night, with a part of the castle. The theatre was only used from time to time by touring theatrical companies.
1824—Mar. 24	Brandenburg	Municipal Theatre	Opened 1817. Fire broke out at 3.30 A.M. Origin unknown. One person killed through the sudden fall of a wall.
1824—Mar. 25	Rio de Janeiro	St. Joseph's Theatre	Opened 1813. Fire broke out on the stage after performance. Building destroyed.
1824—Sept. 30	Este (Italy)	The Theatre	Opened 1808. Burnt at the conclusion of a ballet called 'The Burning of Aquileja.' Fire, caused by the igniting of the scenery, spread to the house. Many spectators were injured in the panic, but no one was killed.
1824	Rio de Janeiro	Teatro Sao Pedro (I)	Date of fire uncertain.
1825—Mar. 14	St. Petersburg	Fontanka Theatre	Elaborate wood building. Opened January 1, 1825. Burnt at 3 A.M. Origin of fire unknown.
1825—Mar. 22	Weimar	Court Theatre	Opened October 12, 1798. Fire broke out at 1 A.M. after the performance. Cause of the fire has never been ascertained. The frescoes, painted from suggestions by Goethe, were all destroyed.
1825—July 24	Cadiz	The Amphitheatre, Puerto Santa Maria	Built of wood. Fire discovered shortly after the people entered the building before the bull-fight. Many people narrowly escaped with their lives.
1825—Nov. 24	Stockholm	The Little Theatre	The fire began under the stage during the performance. The few people who were in the theatre escaped. Three of the theatre company were burnt.
1826—Jan. 7	Birmingham	The Theatre (II)	Date uncertain.
1826—Feb. 19	Bucharest	The Theatre (I)	Particulars not available.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1826—Mar. 15	Paris	Franconi's Olympic Circus	Opened November 8, 1809. Fire broke out after the performance about 1 A.M. Many fireworks had been used. Nothing was saved. The audience let themselves down with ropes into the street.
1826—April 2	Philadelphia	The Opera House.	
1826—April 11	London	Royal Theatre, Wellclose Square	Burnt down through an escape of gas on the stage.
1826—Aug. 6	Hermannstadt	Municipal Theatre	Fire broke out at 3.30 A.M. Cause not definitely known. No lives lost, though nothing was saved.
1826	Berlin	Richter's Circus, near the Brandenburg Gate	Built 1821. Date of fire probably not exact.
1827—July 14	Paris	Ambigu Comique (I)	Opened 1769. Fire broke out at 12.30 A.M. after the performance. The pyrotechnists were experimenting, and set fire to the building. The theatre firemen had already left. Nothing was saved. One man was burnt, and one much injured.
1827	Paris	Gymnase Enfantin, Passage de l'Opéra (I)	Opened February 1827.
1828—May 26	New York	Bowery Theatre (II)	Opened 1826. Burnt with a block of houses. A ballet-girl was burnt.
1828—June	Jassy	German Theatre	Burnt with a part of the town.
1829—Jan. 10	Glasgow	Theatre Royal (II)	Opened 1764. Burnt down at 12 o'clock noon, with all its contents.
1829—April 11	New York	Lafayette Theatre.	
1829—Nov. 26	Philadelphia	The Theatre	Burnt immediately after the performance of 'Faust,' through careless use of fireworks. Several people killed.
1829—Dec. 1	Ramsgate	The Theatre (afterwards Vaudeville) (I)	Burnt down at night.
1830—Feb. 16	London	English Opera House, now Lyceum	Opened June 15, 1816. Fire began at 1.30 A.M. Burnt down with fifteen neighbouring houses. Origin of fire unknown.
1830	London	Astley's Amphitheatre (III)	Opened Easter 1804. Cause of fire uncertain.
1830	Rio de Janeiro	Teatro Sao Pedro (II)	Opened in 1825.
1830	London	The Amphitheatre (Argyle Rooms)	Further particulars not obtainable.
1830	Cincinnati	Lippincott's Amphitheatre	Date of fire unknown.
1831—Jan. 11	Greenwich	The Theatre	Burnt with all its contents and several neighbouring houses. Supposed to have been arson.
1831—April 23	Schwerin	Court Theatre (I)	Opened 1788. Burnt at about 2 A.M., after the performance, in which fireworks had been largely used. Nothing of importance saved. No lives lost.
1831—July 4	New York	Richmond Hill Theatre	No particulars obtainable.
1831—Nov. 30	Augusta (U.S.A.)	The Opera House.	
1833—May 15	Copenhagen	Nörrebroes Theatre	Fire broke out at 5 A.M. No performance the previous night.
1834—July 11	Tula	Municipal Theatre	Burnt down with a great part of the town, including many public buildings. The fire originated in a private house.
1834	Wiener - Neustadt	The Theatre	Built 1793. Formerly a monastery church.
1835—Feb. 21	Paris	Théâtre Gaieté (II)	Opened November 3, 1808. Fire began at 1 P.M., during the rehearsal of a new piece. Caused by the firing off of a rocket. The actors escaped. Two employés were burned. One fireman killed, and many severely injured.
1835—Nov. 6	Christiania	Municipal Theatre	Burnt at 9 P.M. during the performance. The fire broke out in a cloak-room. No fatalities occurred.
1836—Feb. 14	St. Petersburg	Lehmann's Theatre and Circus, Admiralty Place	Burnt down at 4 P.M. during a performance. The fire, which had begun on the stage, spread over the whole of the wooden building. Dreadful panic. Nearly 800 persons burnt or suffocated, and many badly injured.
1836—Sept. 22	New York	Bowery Theatre (III)	Opened in 1828.
1836—Oct. 22	Cincinnati	Caldwell's Theatre	No details available.
1836—Dec. 12	Paris	Folies Dramatiques, Basse du Temple	Opened January 22, 1831. Burnt down at night. Fire broke out in the scene store.
1836—Dec. 14	Venice	Teatro della Fenice	Built 1792. Fire began at 2.30 A.M. The adjoining ball-rooms also burnt. There had been no performance the previous evening. Origin of fire unknown.
1836	Berlin	Circus Dejean	Burnt during the performance. Date doubtful.
1838—Jan. 5	Baltimore	Front Street Theatre.	
1838—Jan. 15	Paris	Italian Theatre	Opened April 28, 1783. Burnt at 12.30 A.M. after a performance. Fire no doubt caused by the fireworks used. Several neighbouring houses also burned. Four people killed, amongst them the impresario. Eight badly injured.
1838—Feb. 3	Baltimore	Cook's Theatre and Circus	Burnt at 4.30 A.M., owing to a small fire, which had broken out earlier from the use of fireworks, not having been properly extinguished. All the contents were destroyed. Out of fifty-two horses, only five were saved.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1838—Feb. 6	Mobile (U.S.A.)	Emmanuel Street Theatre	Burnt, with many adjoining houses in Conti Street.
1838—Feb. 18	New York	Bowery Theatre (IV)	Opened 1837. Burnt down at 2 A.M. Fire broke out at the top part of the stage. Attributed to arson.
1838—Feb. 19	Wexiö	Theatre in the Market Place	Destroyed at night with a number of houses. The fire did not commence in the theatre.
1838—April 28	Charleston (U.S.A.)	New Theatre	Burnt down at 3 A.M., with a portion of the town. The fire probably originated in a private house.
1838—July 9	Geneva	Olympic Circus	A wooden structure. Fire broke out at 2.30 A.M. Caused by the use of fireworks.
1838—July 17	Paris	Théâtre Vaudeville, Rue de Chartres	Opened January 12, 1792. Burnt at about 3.30 A.M. Fire began in the painter's workshop. Nothing was saved, but no lives were lost.
1838—Aug. 8	Sinigaglia (Province Ancona)	Municipal Theatre	Burnt at 1.30 A.M. Caused by fireworks used in the performance. Nothing saved; two persons killed.
1838—Sept. 23	New York	National Theatre (I)	Opened 1834.
1839—Feb. 8	Glasgow	Batty's Theatre and Circus	Built entirely of wood. Fire caused by defective heating apparatus. One horse killed.
1839—Feb. 28	Mons	Municipal Theatre	Burnt down at 2 A.M. Nothing was saved; origin of fire unknown; one woman killed.
1839—March 8	Paris	Salle du Diorama, Rue de Bondy (I)	Burnt at 12.30 P.M. The building was entirely of wood. Two adjoining houses were badly damaged.
1839—May 1	Cheltenham	The Theatre	Opened 1805. Burnt about 3.30 A.M., with three adjoining houses. Cause of fire unknown. Nothing was saved.
1841—May 29	New York	National Theatre, also called the Washington Theatre (II)	Opened 1838. The fire probably due to arson. Nothing was saved. One girl was burnt to death.
1841—June 8	London	Astley's Amphitheatre (IV)	Burnt at 4.30 A.M. Fire caused by carelessness in extinguishing the gas. Twenty-three adjoining houses also destroyed. One person killed. Three horses burnt.
1842—March 13	New Orleans	St. Charles Theatre	Opened November 31, 1835. Fire broke out in the evening shortly before the admission of the public. This theatre was the first in the United States lighted with gas.
1842—June 27	Glasgow	Cook's Circus (I)	Built entirely of wood. Fire broke out during the performance, caused by an escape of gas. No one killed.
1842—July 29	New Orleans	American Theatre (I)	Opened in 1830.
1842—Sept. 22	Cincinnati	Old American Theatre	No particulars available.
1842—Nov. 13	Mobile (U.S.A.)	State Street Theatre (I)	No reliable information has been obtained regarding this fire.
1843—April 29	Hâvre	Municipal Theatre (II)	Opened August 24, 1823. Burnt at 1.30 A.M. Probably caused by fireworks that were used during the evening performance. The Director and his attendant sprang out of the window. The former was killed, the latter badly injured.
1843—July 2	Bédarieux (Hérault)	The Theatre	Small building. Fire broke out at 11 P.M. during the performance. Theatre destroyed. Caused through fireworks exploding.
1843—July 19	Miskolcz	Municipal Theatre	Burnt in a large fire which destroyed half the town.
1843—Aug. 18	Berlin	Royal Opera House	Opened December 7, 1742. Burnt at night shortly after the close of the performance. A smouldering wad used in a gun was carried with some costumes into the cloak room. The water service did not work.
1843	Paris	Gymnase Enfantin, Passage de l'Opéra (II)	Opened in 1828. Date of fire doubtful.
1843	Louisville (U.S.A.)	City Theatre	No information obtainable.
1844—March	Glasgow	Adelphi Theatre (I)	Burnt during a benefit performance. Many people killed in the great crush which ensued.
1844—May 7	Manchester	Theatre Royal	Fire broke out at 6.30 A.M. Nothing was saved.
1844—Aug. 9	Jassy	Municipal Theatre	Building destroyed, together with many houses, in a large fire which raged in the city.
1844—Oct. 24	New York	Providence Theatre	Burnt at night, after the lecture of an English physicist. Nothing was saved.
1845—Jan. 8	Cincinnati	Shire's Garden Theatre.	
1845—Jan. 15	Tetschen	Municipal Theatre	Fire began about noon. The whole building demolished.
1845—March 5	Washington	National Theatre (II)	Opened 1821. Fire broke out before the performance, destroying the theatre and eight neighbouring houses. Caused by the carelessness of a cloak-room attendant.
1845—April 25	New York	Bowery Theatre (V)	Opened in 1838.
1845—May 25	Canton	Chinese Theatre	A light structure enclosed by a high wall. Destroyed during the performance. Some 1670 persons killed and many injured.
1845—Sept. 5	Danzig	Apollo Circus, in a court	Built 1837. Burnt at 8 o'clock in the evening.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1845—Nov. 19	Glasgow	City Theatre	Burnt down at night.
1845—Dec. 2	Glasgow	Cook's Circus (II)	Opened 1843. Built entirely of wood. Burnt down early in the morning. Attributed to arson.
1845	Lyons	Théâtre des Célestins (I)	Constructed entirely of wood.
1846—Jan. 25	Avignon	The Theatre	Opened about 1837. Fire broke out at 10 A.M. Origin of fire unknown. Nothing saved. One employé killed and one musician very badly injured.
1846—Feb. 23	Boston	Howard's Athenæum Theatre	A wooden building, at first used as a tabernacle and afterwards turned into a theatre. Burnt down at midnight, together with adjoining building. Origin of fire unknown. Nothing saved.
1846—June 12	Quebec	Royal Theatre	Burnt during the performance through the upsetting of a lamp. Terrible panic. About 200 persons killed and many injured.
1846—July 27	Paris	Hippodrome (Barrière de l'Etoile)	Opened July 3, 1845. Fire broke out at 3 A.M. The horses were saved.
1846—Sept. 18	New York	Niblo's Theatre	Built in 1828.
1846—Nov. 4	London	Garrick Theatre (II)	Opened 1804. Burnt down at 4.30 A.M. No lives lost.
1847—Jan. 27	Constantinople	The Italian Theatre, in Pera (I)	Opened January 6, 1839. Burnt down with about sixty houses.
1847—Feb. 2	Buda-Pesth	German, or Municipal Theatre	Opened 1830. Burnt at 3.30 A.M. Fire caused through the fireworks used, or from the heating apparatus. The ball-rooms were not damaged.
1847—Feb. 28	Carlsruhe	Court Theatre	Opened October 10, 1808. Burnt after the close of the performance. Fire caused by the kindling of the gas in the royal box. Sixty-three killed and 203 injured.
1847	Bucharest	The Theatre (I)	Opened in 1840.
1848—Nov. 15	Glasgow	Adelphi Theatre (II)	Opened in 1844. Burnt at 1.30 P.M. No lives lost.
1848—Dec. 16	New York	Park Theatre (II)	Burnt just before the public had entered, through careless lighting of the gas.
1848	Brooklyn	Old Amphitheatre, Fulton Street	Date of fire uncertain.
1849—Mar. 15	Cologne	Vaudeville Theatre	Opened 1848. Burnt at 2.30 A.M. Origin of fire unknown. One man killed.
1849—Mar. 29	London	Olympic Theatre	Opened September 28, 1806. Fire broke out in the afternoon about 5.30. Origin unknown. Twenty houses were also damaged.
1849—May 6	Dresden	Old Opera House (Zwinger) (II)	Opened in October 1821. Fired at 7 A.M. by the rebels who were fighting against the military.
1849—May 13	Buda-Pesth	Provisional Theatre	Built 1847 in Elizabeth Place. Burnt at 7 P.M. during the bombardment of the town.
1849—June 18	Regensburg	The New Theatre	Burnt at 10 A.M. through carelessness with the lights. The clubhouse, which was under the same roof, was also destroyed.
1849—July 14	Paris	Salle du Diorama (II)	Opened 1839. Burnt at 8.15 A.M., with a part of the Bazaar known as the Bonnes Nouvelles. Nothing was saved. Five firemen were badly injured, a few others slightly.
1850—Feb. 14	Norfolk (U.S.A.)	Avon Theatre	No particulars available.
1850—Mar. 18	Lafayette (U.S.A.)	The Opera House	No information obtainable.
1850—April 28	Donaueschingen	Court Theatre	Fire broke out at 9 P.M. There had been no performance, but some men had been at work there. The fire commenced in a scene store in the top story. Arson was suggested, though it could not be proved.
1850—May 4	San Francisco	Phœnix Theatre; National Theatre; Washington Hall	Burnt down with a portion of the city.
1850—Sept. 17	San Francisco	Italian Theatre.	
1850	San Francisco	Vaudeville Theatre	Date of fire uncertain.
1851—Feb. 1	Berlin	Kroll's Theatre	Opened February 15, 1844. Burnt at 10 P.M., through a leakage from a gas pipe.
1851—Feb. 20	Vienna	Circus Bach	Particulars not obtainable.
1851—Mar. 13	Philadelphia	Assembly Building	Particulars not obtainable.
1851—April 21	Reggio	The Theatre	Particulars not obtainable.
1851—May 4	San Francisco	Adelphi Theatre; Jenny Lind Theatre; Robinson and Evrard's Theatre; Olympic Circus	Burnt down with a part of the town.
1851—June 22	San Francisco	New Jenny Lind Theatre	
1851—June	Archangel	Municipal Theatre	Fire destroyed many public and private buildings.
1851—July 15	Cincinnati	Wood's Museum Theatre	Details not forthcoming.

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DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1851—Aug. 8	Rio de Janeiro	Grand Theatre, Constitutional Place	Burnt down at night.
1851—Aug. 13	Sacramento	Tehama Theatre	Some adjoining houses were also destroyed.
1851—Dec. 30	Philadelphia	Barnum's Theatre and Museum	Opened 1848. Fire broke out on the stage at 5 P.M. after the close of the performance. Origin unknown. Nothing saved. An adjoining house also burnt down.
1851	Chicago	Rice's Theatre	Date of fire uncertain.
1851	Nashville (U.S.A.)	The Theatre	Date of fire uncertain.
1852—Mar. 31	Boston	Old Tremont Theatre	Opened September 24, 1827. Burnt down at 1 A.M. Origin unknown. Nothing saved. Several adjoining houses also burnt. Two firemen killed, and three injured.
1852—April 22	Boston	National Theatre (I)	Opened as an American amphitheatre on February 27, 1832. Fire began at 3 A.M. after the performance. Attributed to arson. Nothing saved. No lives lost.
1852—Nov. 2	Sacramento	American Theatre	Burnt in a fire which destroyed a large part of the town.
1852—December	Tournay (Belgium)	Municipal Theatre	Burnt at 11 P.M. at the close of a performance. Caused through the carelessness of someone on the stage. The church of St. Quintin was saved with great difficulty.
1853—Feb. 8	Havana	The Opera House.	
1853—Mar. 26	Moscow	Imperial Opera House (III)	Opened January 6, 1825. Burnt at noon. Eleven men killed; number of injured unknown.
1853—May 24	Edinburgh	Adelphi Theatre	Built 1769. Fire broke out after entrance of public at 5 P.M.
1853—July 27	London	Islington Fields Equestrian Theatre	A wooden building opened shortly before. Fire broke out at 2.30 A.M., caused by the use of fireworks. Six horses were killed.
1853—Oct. 27	Providence (Rhode Island, U.S.A.)	Museum Theatre	No details forthcoming.
1853—Nov. 28	Berlin	Circus Renz	Burnt at 11 A.M. through carelessness with the gas. One fireman killed, three severely injured.
1853—Dec. 9	Philadelphia	Sanford's Opera House (I)	Opened some months before. Fire broke out under the stage at 11 P.M., after the performance. Cause unknown. Nothing of any value was saved.
1853	Whampoa	Chinese Theatre	Burnt down through the fireworks used during the performance. Thirty persons killed.
1854—Jan. 24	Nishni-Novgorod	The Theatre	Particulars not obtainable.
1854—Jan. 30	Placerville (U.S.A.)	American Theatre	Details unreliable.
1854—July 5	Philadelphia	National Circus	Opened 1838. Burnt at 10 P.M. during a performance. Caused by the burning of a wad from a gun. The audience fortunately escaped without injury. One actor perished in the flames. Nothing was saved. The fire spread to several adjoining houses.
1854—July 5	Philadelphia	Chinese Museum and Theatre	Opened 1838. Burnt after the close of the performance. Fired by the burning of the adjoining National Circus. Nothing saved.
1854—Sept. 24	Boulogne	Municipal Theatre	Opened September 3, 1827. Fire broke out at 5 P.M. Probably caused by throwing down a lighted cigar in a dressing-room. Napoleon III himself commanded the fire brigade. Several people were badly injured.
1854—Oct. 4	Memel	Municipal Theatre	Opened 1819. Destroyed at 11 P.M. through a fire which had broken out in the town and laid a great part in ashes.
1854—Nov. 21	New Orleans	Placide's Variety Theatre (I)	
1854	Orel	The Theatre	Built about 1834 by Count Kamensky. The date of the fire is most probably inaccurate.
1855—Jan. 21	Brussels	Théâtre Royal de la Monnaie (I)	Opened 1819. The fire broke out on the stage about 8 A.M. Cause doubtful. The cash-box and the theatre books were the only things saved. Two firemen and one stage carpenter were suffocated while endeavouring to extinguish the flames.
1855—Jan. 22	Grimsby	Theatre Royal	Building burnt to the ground.
1855—Mar. 7	Dessau	Court Theatre	Opened December 27, 1798. Burnt down at 6 A.M. Fire due to the heating apparatus. Little saved.
1855—May 6	New Orleans	American Theatre (II)	Fire commenced at 11.30 P.M., after the performance. Caused by thoughtlessness with lights in the property-room. Little was saved. The actor Seitz was killed.
1855—Nov. 3	Revel	Municipal Theatre	Fire broke out under the roof at 3 P.M. Adjoining Club was also burnt. No lives lost.
1855—Dec. 2	Bordeaux	Variety Theatre	Opened November 29, 1800. Burnt at 1 A.M., two hours after the performance. Cause unknown. The fire was first noticed from the outside.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1855	Angers . . .	Municipal Theatre (i) . .	Nothing is reported of this fire.
1856—Feb. 13 .	London . . .	Pavilion Theatre, Whitechapel Road	Fire broke out at 7.15 A.M. The previous evening a burning hut had been represented on the stage. No lives lost.
1856—Feb. 20 .	Rennes . . .	Salle de Spectacle . . .	Opened 1834. Burnt at 6 A.M. On the previous evening fireworks had been used on the stage.
1856—February	Rio de Janeiro	Teatro Sao Pedro (iii) . .	Opened 1852. Fire broke out at 2 A.M. Building burnt down.
1856—Mar. 5 .	London . . .	Covent Garden (iii) . . .	Opened September 18, 1809. Fire broke out at 5 A.M. at the close of a fancy dress ball. Commenced in a joiner's workshop. The water service did not work. No lives lost.
1856—Mar. 12 .	Bourges . . .	Municipal Theatre (i) . .	Burnt down at 12.30 A.M. No one had been in the house for several days. Spontaneous ignition is supposed to have been the cause.
1856—March .	Nantes . . .	Grand Théâtre (ii) . . .	Opened 1812. Building burnt down.
1856	Cincinnati . .	Rockwell's American Theatre	Date of fire uncertain.
1856	Sunderland .	The Theatre (afterwards Lyceum)	Built in 1852.
1857—Feb. 6 .	Washington .	National Theatre (iii) . .	Opened 1845. Burnt at 3 P.M. Origin of fire unknown. Nothing saved.
1857—June 7 .	Leghorn . . .	Teatro degli Acquidotti (Arena)	Burnt down at 8 P.M. during the performance. The decorations were fired by a rocket. Forty-three persons killed, some crushed to death; others trampled under foot, and 134 injured. Other reports state that there were 100 killed and 200 injured.
1857—Aug. 15 .	San Francisco	Metropolitan Theatre . .	Opened 1853. Large stone building. Fire broke out at 10 P.M., no performance being on. Origin of fire unknown. Nothing saved. One man killed through the falling in of a wall.
1858—Jan. 5 . .	Turin . . .	Teatro Alfieri	Built 1854, entirely of wood. Burnt at 3 A.M., probably through the warming apparatus in the prompter's box.
1858—June 2 .	San Francisco	Adelphi Theatre (ii) . . .	Wooden building, opened 1852. Burnt at 2 A.M. Origin of fire unknown. Nothing saved. Two neighbouring houses also damaged.
1858—July 14 .	Leavenworth (U.S.A.)	Union Theatre	The fire broke out on the stage. Thirty adjoining buildings were also destroyed.
1858—Oct. 5 .	New York . .	Crystal Palace Theatre .	Opened July 14, 1853.
1858—Nov. 15 .	Providence (U.S.A.)	Forbes' Theatre	No particulars available.
1858—Dec. 22 .	New York . .	Odeon Theatre, Bowery Street	Building burnt down. Nothing saved.
1859—Jan. 8 . .	Warsaw . . .	Circus Hinné	Burnt at 11.30 P.M., immediately after the performance. Origin unknown. The horses were rescued with difficulty; otherwise nothing saved.
1859—Jan. 29 .	Paris	Théâtre Pré-Catelan . . .	Small stage. Burnt at 4 A.M.
1859—Feb. 7 .	St. Petersburg	Circus Theatre, also known as German Theatre	Burnt at night.
1859—Mar. 17 .	Thisted (Jutland)	The Theatre	A small building. Burnt at night with an adjoining building.
1859—June . .	Kasan . . .	Municipal Theatre (i) . .	Built by Essipow. Burnt down. Cause of fire unknown.
1859—July 22 .	Cologne . . .	Municipal Theatre (i) . .	Opened 1817. Fire broke out at 9 P.M. Caused by the use of some fireworks. One person killed, two severely burnt.
1859—Sept. 4 .	Braila (Wallachia)	The Theatre	Burnt down at night with twelve other buildings and nineteen shops.
1859—Oct. 13 .	Hull	Theatre Royal (i)	Opened in May 1810. The fire commenced in a room next the stage at 7 A.M. Origin unknown. Nothing saved.
1859	San Francisco	Lyceum Theatre (i) . . .	Opened in 1856.
1860—Jan. 23 .	San Francisco	Music Hall	A wooden building, erected 1855. Burnt down at 4 A.M. through a fire which broke out at the Albion House adjoining. Nothing saved.
1860—Mar. 18 .	Namur . . .	Municipal Theatre (i) . .	Opened 1824. Burnt at 7 P.M., through a leakage of gas, during the preparations for a masked ball. Nothing saved, but no lives were lost.
1860—Sept. 27 .	San Francisco	Pickwick Hall	Burnt at 3 A.M. Probably the work of an incendiary. Nothing saved. Some adjoining wooden buildings were also destroyed.
1860—Oct. 3 . .	Sydney . . .	Prince of Wales' Theatre .	Burnt at night with several private houses adjoining. Origin unknown. Three persons killed.
1860—Oct. 29 .	Homburg . .	Casino Theatre	Burnt in the afternoon before the performance. The fire originated in a wooden wing which was to have been used as cloakrooms; caused by carelessness in testing the gas-pipes. The theatre was completely destroyed, and the Casino was damaged.
1860—Nov. 27 .	San Francisco	Lyceum Theatre (ii) . . .	Opened 1860. Burnt at 7 A.M. Origin of fire unknown. Nothing saved. Two neighbouring houses were also damaged. Two firemen were badly injured.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1860	Mobile (U.S.A.)	State Street Theatre . .	Date of fire uncertain.
1860	Springfield (U.S.A.)	Music Hall	No reliable particulars available.
1861—Feb. 20 .	Naples . . .	New Theatre	A small theatre over 100 years old. Fire broke out on the stage at 1 A.M., after the performance. Cause unknown.
1861—April 9 .	Barcelona . .	Lyceum Theatre	Large building, built 1845. Fire broke out in the tailors' workroom at 12.30 A.M. Nothing was saved. The actors only escaped from their dressing-rooms with difficulty. Several adjoining houses were also burnt.
1861—May 12 .	Brussels . .	Novelty Theatre	Fire broke out at 11.30 P.M., just after the close of the performance. No lives lost.
1861—June 11 .	London . . .	Surrey Music Hall (I).	
1861—Aug. 24 .	San Francisco	Russ Gardens Theatre . .	Opened 1853. Burnt down at 1 A.M. Fire attributed to arson. Nothing saved.
1861	Sacramento (U.S.A.)	Forrest Theatre	Date of fire uncertain.
1861	Buffalo (U.S.A.)	St. James's Hall Theatre .	Built in 1851.
1862—April 18 .	Bath	The Theatre	Opened October 12, 1805. Fire commenced at 10 A.M. Attributed to a defect in the heating apparatus. Nothing saved. Several adjoining houses damaged.
1862—Sept. 25 .	Namur . . .	Municipal Theatre (II) . .	Burnt at 2 P.M., before it had been opened to the public. Probably an act of arson. The adjoining concert-room was not damaged.
1863—Jan. 6 . .	Plymouth . .	Royal Theatre	Built 1813. Burnt at 12.30 A.M. after the performance. Origin of fire unknown. The adjoining hotel, with ball-rooms, also destroyed.
1863—Jan. 31 .	Glasgow . .	Theatre Royal (III) . . .	Built 1836. The fire began in the property room at 5 A.M. The whole house was in flames before the arrival of the fire brigade. Nothing saved.
1863—Feb. 15 .	Rome	Teatro Alberti (II) . . .	Built by Prince Torlonia. Burnt at 6 A.M., though well equipped with fire appliances.
1863—Mar. 23 .	Boston . . .	Grand National Theatre (II)	Opened 1852. Fire broke out at 2 A.M. Origin of fire unknown. Probably due to an escape of gas in the upper part of the stage. Nothing of any value saved. No lives lost.
1863—May 7 .	Barcelona .	Teatro Ristori . . . . Teatro Colisseo . . . Circus	These theatres were in a block of municipal buildings. Flames were first noticed coming through the windows at night. The adjoining houses were also burnt. Origin of fire unknown. Nothing of any value saved.
1863—May 24 .	Helsingfors .	Municipal Theatre . . .	Opened 1861. Burnt at night. The cause of this outbreak was not discovered. Nothing was saved.
1863—June 8 .	Vienna . . .	Treumann, or Quay Theatre	Opened September 1, 1860. Built entirely of wood. Fire broke out at 10 P.M., just after the audience had left. Cause of fire unknown. Nothing saved.
1863—June . .	Florence . .	Teatro Politeama	Fire broke out before the commencement of the performance through carelessness with the lights on the stage. Several people were killed.
1863—June . .	Jersey . . .	Theatre Royal	Burnt down within two hours. Cause unknown, as the theatre was shut at the time.
1863—Oct. 23 .	Kiev	Wooden Circus	Opened 1862. Burnt down at 1 A.M., after a performance. Nothing saved.
1863	Vienna . . .	Franz-Josef Theatre . . .	Date of fire uncertain.
1864—Jan. 12 .	San Francisco	Willow's Theatre	Destroyed in a large fire which occurred in the town.
1864—Feb. 13 .	Chambery . .	Municipal Theatre . . .	Fire broke out at 3 A.M., some hours after the performance. The theatre was burnt, together with the Hotel de Ville adjoining it. Origin unknown. Nothing saved.
1864—May . .	Przemysl . .	The Theatre, in the Providence Hotel	Date of fire uncertain.
1864—Nov. 17 .	Marysville (U.S.A.)	The Opera House	No details forthcoming.
1865—Jan. 13 .	Edinburgh . .	Royal Theatre (I)	Opened December 1855. Fire commenced at 4 P.M. while lighting the gas battens. Nothing saved. Six men were killed through the falling in of a wall.
1865—Jan. 30 .	London . . .	Surrey Theatre (II) . . .	Built 1806. Burnt during the performance through the catching fire of the well above the lustre. Through the presence of mind of some of the actors, the public succeeded in escaping from the house without loss of life. Some neighbouring houses were damaged.
1865—Mar. 25 .	Sheffield . .	Theatre Royal	Burnt at 1.30 A.M. The outbreak seems to have begun on the stage; the fire was first perceived from the outside.
1865—May 12 .	Brooklyn . .	Hooley's Opera House . .	Burnt down at 7 A.M. The fire first broke out on the stage, and was probably the work of an incendiary. Nothing saved, but no lives lost.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1865—May 19	Stockholm	Park Theatre, Zoological Gardens	The building was to have been opened on the following day. Burnt in the afternoon through carelessness with the gas pipes. Nothing saved.
1865—May	Kolomea (Austrian Galicia)	The Theatre, in the Casino Building	Scenery and properties destroyed.
1865—June	Verona	Teatro Diurno Mondini	The building completely destroyed. Nothing saved. Five horses burnt.
1865—July 13	New York	Barnum's Theatre and Museum, Broadway (i)	Burnt at 12 o'clock noon, through the bursting of a boiler. Nearly all the curiosities and animals were burnt; twelve adjoining houses were laid in ashes, and a number more damaged. No lives lost.
1865—July 19	Breslau	Municipal Theatre (i)	Opened November 13, 1841. Burnt at 11.30 p.m., after the performance. The fire began in the painters' or joiners' workroom. Nothing saved. Several adjoining houses damaged.
1865—Oct. 6	St. Louis	Bowery Theatre	Particulars unreliable.
1865—Dec. 4	Angers	The Theatre (ii)	Burnt at 12 o'clock at night, after the performance. Origin unknown. Fire first perceived from outside. Nothing saved.
1865	Pittsburg (U.S.A.)	Athenæum and Fred Aim's Melodeon	Date of fire unreliable.
1866—Feb. 15	New York	Butler's American Theatre (i)	Opened 1855. Burnt at 11 a.m., during a rehearsal, through a faulty stove pipe in one of the cloak rooms. Nothing saved. Four adjoining houses badly damaged. One actor injured.
1866—Mar. 11	Brest	Municipal Theatre	Opened 1780. Burnt at 3.30 p.m., after a rehearsal. Origin of the fire, which appears to have begun on the stage, unknown. Four persons injured.
1866—Mar. 22	Cincinnati	Picke's Opera House	Fire occurred at 1 a.m., after a performance. Caused through a gas explosion. Nothing saved. A number of valuable houses were also destroyed.
1866—May 21	New York	Academy of Music (Opera House)	Opened September 30, 1832. Burnt at 11.30 a.m., after a performance. Origin doubtful. A block of houses and an adjoining church were destroyed. Three firemen killed.
1866—May 21	Insterburg	The Theatre	Burnt down during the night. Believed to be an act of arson.
1866—July 12	Cincinnati	Academy of Music	Burnt at 11 p.m., just after the public had left the building. Fire caused by the overturning of an oil lamp. Nothing saved. No lives lost.
1866—Aug. 22	Constantinople	Imperial Theatre	Building completely destroyed.
1866—Aug. 26	Vienna	The Old Universum Theatre	Built of wood. Burnt at 8.30 p.m. Several adjacent buildings damaged.
1866—Oct. 21	London	Standard Theatre	Opened 1854. Fire broke out at 6.30 a.m. Probably caused by the fireworks which had been used. The first sign of the fire was seen from outside. A neighbouring house also destroyed.
1866—Dec. 3	Paris	Novelty Theatre	Opened April 7, 1866. Burnt down at 7 p.m., before the public were admitted. Caused by an escape of gas. The actors had some difficulty in saving themselves. Three persons injured.
1866—Dec. 17	New Orleans	Grand Theatre	The fire, which began in the wardrobe room, destroyed several houses.
1866—Dec. 18	New York	Bowery Theatre (vi)	Opened 1858. Burnt down at 4.30 p.m., probably owing to the careless handling of lights in the ballet room. Nothing saved. Several adjoining houses were destroyed, and a number of others damaged. No one killed.
1866	Pithole (U.S.A.)	The Opera House	Built 1866. Burnt in a fire which destroyed the whole town.
1866	Brussels	Théâtre Royal de la Monnaie (ii)	Date of fire unknown.
1867—Jan. 4	Corunna	The Theatre	Fire broke out at 12.30 a.m., after the close of the performance. Origin unknown. Building isolated; entire contents destroyed. Several persons were killed or injured.
1867—Jan. 14	Namur	Municipal Theatre (iii)	Opened in October 1863. Fire broke out at 1.15 a.m., after the performance of 'Faust.' Caused through carelessness with the lighting arrangements. No lives lost.
1867—Mar. 23	New York	Winter Garden Theatre	Opened 1856. Destroyed by fire at 9 a.m. The fire began under the stage, and is attributed to arson. Nothing saved. Four adjoining houses damaged.
1867—April 20	Madrid	Théâtre du Conservatoire	Burnt in the day during a rehearsal. Apparently caused by a leakage of gas. A portion of the cloak room saved. Decorations and scenes destroyed. The Teatro Real adjoining was not damaged. Several people were injured.
1867—June 5	Bourges	Municipal Theatre (ii)	Burnt during the night. For two days there had been no performances, and no watchmen had been left on the premises.
1867—June 19	Philadelphia	Fox's American Theatre (i)	Opened 1859. Burnt during the performance. The fire began in an adjoining outhouse. The audience dispersed quietly. Nothing saved. Thirteen persons were killed, and sixteen injured through the falling of the front wall.
1867—Aug. 24	San Francisco	Great American Theatre (i)	Opened 1856. Fire broke out at midnight; caused by a defective stove pipe. On the previous evening there had been no performance. Part of the costumes were saved.
1867—Oct. 21	Kaiserslautern	The Theatre	Building burnt down.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1867—October	Unna (Westphalia)	The Theatre	Building destroyed. Nothing saved.
1867—Dec. 6	London	Her Majesty's, Haymarket (III)	Opened September 22, 1791. Fire broke out at 11 P.M. after a rehearsal, which had ended at 4 o'clock. It began either on or below the stage. Cause unknown. First discovered from the outside. Several adjoining houses were also burnt. No lives lost.
1867—Dec. 21	Paris	Théâtre Belleville	Burnt at 3 A.M. Fire probably caused by the use of pistols in the evening performance. Discovered at first from outside. Nothing saved. Two persons killed, and several injured.
1867	St. Louis	Theatre Comique	Date of fire uncertain.
1868—Jan. 29	Albany (U.S.A.)	Academy of Music	Burnt down early in the morning. Origin quite unknown. Nothing saved. A neighbouring house was also destroyed. No lives lost.
1868—Feb. 11	London	Surrey Music Hall (II)	Fire broke out at 3.30 A.M.
1868—Feb. 26	San Francisco	Grand American Theatre (II)	Opened 1867. Fire broke out on the stage at 2 A.M. There had been no performance on the previous evening. Nothing was saved. No lives lost.
1868—Mar. 3	New York	Barnum's Theatre and Museum (II)	Opened 1866. Burnt shortly after midnight. Fire caused through a faulty stove pipe. With the exception of one or two animals the whole menagerie was burnt, including six lions. Two adjoining houses were also badly damaged. One man severely injured.
1868—April 8	New York	Butler's American Theatre (II)	Opened about 1866. Burnt down at 1 A.M. The fire broke out in a dressing room behind the stage. Nothing saved. The adjoining Mechanics' Library damaged considerably. No lives lost.
1868—June 15	Vienna	Orphean Theatre (Music Hall)	Built of wood in 1867. Burnt at 3 P.M. Nothing saved. No one killed.
1868—July 12	Turin	Teatro Nota	Burnt at 8 P.M. during a performance. Caused by the dress of a dancer taking fire. The public fortunately escaped. Nothing saved.
1868—Sept. 28	Stanislau	Holpern's House Theatre	Building completely destroyed in a serious conflagration which burnt part of the town.
1868—Nov. 25	Philadelphia	City Museum Theatre	The fire broke out on the stage just before the admission of the public. Caused through the firing of an oil lamp. Nothing saved. Several houses badly damaged. Three firemen very dangerously injured through the falling of the front wall.
1868—Dec. 4	New York	Theatre Comique	Fire broke out at 3 A.M. Caused by a defect in the heating apparatus. Nothing saved. One fireman injured.
1868—Dec. 23	New Orleans	Olympic Theatre	Burnt, seemingly through carelessness with the lights. Nothing saved. Several adjoining houses damaged. No lives lost.
1868	Treviso	The Theatre	Opened April 18, 1766.
1869—Jan. 14	Glasgow	Prince of Wales' Theatre	Opened August 3, 1867. Fire began at 12.30 A.M. Probably caused by the use of firearms. First observed from outside. Nothing saved. One man injured.
1869—Jan. 23	Detroit (U.S.A.)	Olympic Theatre	Formerly a church, but used as a theatre since 1865. Burnt down at 11 P.M. after the performance. Fire due to a gas explosion in the cellar. Nothing saved.
1869—Jan. 28	Kiev	Municipal Theatre.	
1869—Feb. 5	Hull	Theatre Royal (II)	Opened 1865. Burnt at 12.30 A.M. Caused through the use of firearms. The fire was first observed from the outside. Nothing saved. One man injured.
1869—February	Cologne	Municipal Theatre (II)	Opened 1861. Fire broke out at 4 A.M. Origin unknown. The cashier, with his wife and five children, were burnt, and two people killed by the fall of a wall.
1869—Feb. 28	St. Louis	The Opera House.	
1869—Mar. 11	Durham	Theatre Royal, Sadler Street	Building burnt down. Cause of fire unknown.
1869—Mar. 20	Malaga	Liberty Theatre	Building completely destroyed.
1869—April 17	Naples	Teatro Bellini	Opened 1865. Burnt in the evening before the entry of the public. Fire began on the stage; due, probably, to an escape of gas. Several firemen injured.
1869—May 9	Cologne	Flora Theatre	Wooden building. Burnt down at 10 P.M., at the close of the performance. Probably due to arson. Nothing saved.
1869—May 16	Dayton (U.S.A.)	The Opera House.	
1869—May 28	Atlanta (U.S.A.)	Davis's Theatre	Burnt with two adjoining houses. Origin of fire unknown. Nothing saved.
1869—July 11	Gefle (Sweden)	Municipal Theatre	Destroyed by a fire which demolished the greater part of the town.
1869—July 23	Washington	Canterbury Hall	Burnt down early in the morning. Origin unknown. After some difficulty the adjoining houses were saved. Everything belonging to the theatre destroyed.
1869—Sept. 19	Pernambuco	Teatro Santa Izabel	Opened October 6, 1850. The fire broke out in a dressing room, at 4 P.M., after a rehearsal. Nothing saved.
1869—Sept. 21	Dresden	Court Theatre	Opened April 18, 1841. Burnt at 12 noon, owing to careless handling of inflammable material in the well of the lustre. Nothing of any value saved. Several persons injured.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1869—Sept. 29	Paris	The Hippodrome	An arena constructed of wood, opened May 31, 1856. Burnt at 11 P.M. The horses were saved, otherwise, everything was destroyed. A neighbouring warehouse burnt.
1869—Nov. 6	Rochester (U.S.A.)	Metropolitan Theatre	Fire broke out at 5 A.M. Cause not ascertained. Nothing saved. Five adjoining houses considerably damaged. No lives lost.
1869—Nov. 7	Helena (U.S.A.)	Variety Theatre	A fire broke out on the stage, destroying the building and seven adjoining houses. Nothing saved.
1869—Nov. 15	Milwaukee (U.S.A.)	Gaiety Theatre	A small house, opened 1848. Burnt at 10 P.M., during the performance. Caused through the overturning of a petroleum lamp on the stage. Nothing saved. Two persons killed and thirty injured.
1869—Dec. 3	Galveston (U.S.A.)	Neitch's Theatre	A wooden building, opened 1850. Burnt at 3 A.M., together with a block of houses. No lives lost. The fire did not originate in the theatre.
1869—Dec. 24	Lafayette (U.S.A.)	The Opera House (II)	No details forthcoming.
1870—Jan. 17	Indianapolis (U.S.A.)	The Opera Hall	Burnt down during a performance. Fire caused by defective heating apparatus. The audience escaped, but none of the contents were saved. A block of houses was also burnt.
1870—Feb.	Chicago	Crosby's Opera House (I)	Fire broke out at the back of the stage during the performance. Owing to the presence of mind of the management the public dispersed quietly.
1870—Mar. 8	Philadelphia	Harmonia Hall	This building formerly belonged to a German club, and had only been used as a theatre three months before. Burnt at 7 P.M., before the performance. None of the contents were saved. Origin of fire not known.
1870—Mar. 24	Glasgow	Alexandra Theatre	Burnt at 12.30 A.M., after the performance. Origin of fire unknown. No lives lost.
1870—June 5	Constantinople	Italian Theatre, in Pera (II)	Opened 1849. Destroyed by a fire which did not originate in the theatre, but which burnt down a number of houses.
1870—June 23	Brünn	Municipal Theatre (IV)	Opened January 8, 1787. Fire broke out at 6.15 P.M., before the entry of the public. Caused through careless lighting of the lustre. No lives lost.
1870—July 1	Danzig	Variety Theatre	A half-timber building, opened August 3, 1801. Burnt at 2.30 A.M. Origin of fire unknown.
1870—July 6	St. Jean d'Angely (France)	The Theatre	Burnt on the opening night, during the performance. Fire caused by a gas leakage. Nothing saved. No lives lost.
1870—Sept. 9	Strasburg	Grand Theatre	Opened 1821. Destroyed by fire during the bombardment of the town.
1870—Nov.	Sydney	Prince of Wales' Theatre (II)	Opened in 1861.
1870—Dec. 1	New Orleans	Placide's Variety Theatre (II)	Opened 1855. The fire broke out in the morning in the property room of the theatre. Nothing saved. Some adjoining houses burned. Two persons killed, and two injured.
1870—Dec. 8	Santiago de Chili	Teatro San Lucia	Burnt during the evening, at the close of the performance, in consequence of a gas explosion. Nothing saved. The engineer and three other persons killed.
1871—Feb. 3	Hamburg	Odeon Theatre	Fire broke out on the stage at 1.30 P.M. Building destroyed. Origin unknown. No lives lost.
1871—Feb. 5	Boston	Adelphi Theatre	Burnt at midnight. Origin of fire not ascertained. Nothing saved, but no lives lost.
1871—April 2	Lyons	Théâtre des Célestins (II)	A stone building, opened 1847. Burnt down about midnight, after the close of the performance. Probably the work of an incendiary. The real cause not known. Nothing saved.
1871—April 8	Troy (U.S.A.)	Griswold's Opera House.	
1871—May 24	Paris	Salle des Machines, in the Tuileries.	Burnt by the Communists.
		Théâtre Lyrique, Place du Châtelet	Opened October 30, 1862. Burnt by the Communists.
1871—May 25	Paris	Théâtre Porte St. Martin	Opened October 26, 1781. Burnt by the Communists.
1871—June 13	Breslau	Municipal Theatre (II)	Opened October 1, 1867. Burnt at 7.15 P.M. during the performance. Fire broke out over the lustre. Nothing of any value saved. The public escaped uninjured. The scene-painter was burnt, and several artistes injured.
1871—June	Shanghai	Chinese Theatre	Built of bamboo and matting.
1871—Oct. 8	Chicago	Crosby's Opera House (II)	Destroyed by a conflagration which demolished a large part of the town.
		McVicar's Theatre	
		Hooley's Theatre	
		Dearborn's Theatre	
		King's Opera House	
		Olympic Theatre	
		German Theatre	
1871—Oct. 17	Philadelphia	Sanford's Opera House (II)	Built in 1854. Further particulars unreliable.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1871—Oct. 22	MELBOURNE	HAYMARKET THEATRE	Building destroyed. Particulars unreliable.
1871—Oct. 24	DARMSTADT	COURT THEATRE	Opened November 7, 1819. Burnt at 4.30 P.M., owing to gas escape on the stage. Little saved. One workman suffocated in trying to extinguish the fire.
1871—Dec. 6	WASHINGTON	WALL'S OPERA HOUSE	Burnt down before noon through a fire originating in an adjoining house. Nothing saved. No lives lost.
1872—Jan. 12	CRONSTADT	RUSSIAN MUNICIPAL THEATRE	Built in 1839.
1872—Mar. 11	ALBANY (U.S.A.)	MARTIN'S HALL	Opened 1870. Burnt at 9 A.M.; most likely the work of an incendiary. Only the outside walls remained standing. Nothing saved.
1872—Mar. 19	MELBOURNE	ROYAL THEATRE	Burnt down at 12.30 A.M. The fire broke out in a dressing room. Nothing saved.
1872—Mar. 20	PHILADELPHIA	SANFORD'S OPERA HOUSE (III)	Fire broke out at 7 A.M. in consequence of defective heating apparatus. Nothing saved. Two adjoining houses badly damaged. One fireman injured.
1872—May 6	NEW YORK	NIBLO'S THEATRE (II)	Opened 1849. Burnt down at 8 A.M. The fire began in the dome over the auditorium; most likely in the joiners' workshop. Several adjoining houses damaged. Nothing saved.
1872—May 8	GRAND RAPIDS (U.S.A.)	SQUIRE'S OPERA HOUSE	Fire broke out at 1 A.M. Origin unknown. Nothing saved. The European Hotel, which was under the same roof, and several shops were also destroyed.
1872—May	TIENTSIN	CHINESE THEATRE	Burnt during a performance. 600 persons killed, amongst them many women.
1872—July 15	SEDALIA (U.S.A.)	THE OPERA HOUSE	Building burnt, with post office adjoining.
1872—Nov. 1	LONDON	SURREY MUSIC HALL (III)	Fire broke out at 5.30 A.M.
1872—Nov. 9	BOSTON	BUCKLEY'S MINSTREL HALL	Burnt in a fire which destroyed part of the town.
1872—Nov. 19	SAN FRANCISCO	HAYE'S PARK PAVILION THEATRE	Burnt down after midnight. Origin of fire unknown. Nothing saved. Date of fire possibly inaccurate.
1872—Nov. 28	NEW YORK	LINA THEATRE	Opened 1864. Burnt at 2 A.M. through the carelessness of a workman with the lights. Nothing saved. Five houses in Broadway also burnt. Several persons were with difficulty saved by the police.
1872—Dec. 8	STRASBURG	RAPPO'S THEATRE	Large provisional building entirely constructed of wood. Burnt at 1 A.M. with entire contents. Origin of fire unknown. Nothing saved.
1872—Dec. 24	NEW YORK	BARNUM'S THEATRE AND CIRCUS (III)	Built 1868. Burnt with all contents, including a number of animals.
1873—Jan. 1	NEW YORK	FIFTH AVENUE THEATRE	Opened 1865. Burnt at 3 P.M. after a morning performance. Fire due to defect in heating apparatus. The public had already left the house. Nothing saved. The Fifth Avenue Hotel was also damaged. No lives were lost.
1873—Jan. 14	ODESSA	MUNICIPAL THEATRE	Opened 1819. Burnt at 6.30 A.M. with all contents. Origin of fire unknown; first observed from the outside.
1873—Jan. 28	WASHINGTON	NATIONAL THEATRE (IV)	Opened 1858. Burnt at 11 A.M., just before a rehearsal. Fire caused by the bursting of a heating pipe. Scarcely anything saved. The adjoining hotel was badly damaged. No lives were lost.
1873—April 23	REICHENHALL	MUNICIPAL THEATRE	The theatre was to have been opened on May 3. Burnt at 10.30 P.M. Fire probably due to incendiarism. Nothing saved.
1873—May 3	COPENHAGEN	CIRCUS IN GYLDENLÖVES BASTION	The building was of wood. Burnt down at 3 A.M. Probably caused by the fireworks used on the stage at the previous evening's performance.
1873—May 7	TAUNTON (U.S.A.)	JONES' ATHENÆUM	Burnt down at 7 A.M. with a number of private houses. Nothing saved.
1873—May 25	VALETTA (Malta)	MUNICIPAL THEATRE	Built 1867. Burnt at 10 P.M. during a dress rehearsal, at which 200 people were present. Caused by the ignition of some scenery on the stage. No one killed, but many injured. Neighbouring powder magazine not damaged.
1873—May 30	BOSTON	GLOBE THEATRE (I)	Opened October 28, 1867. Destroyed by a fire which commenced in the city. Many houses burnt.
		JOURDAIN'S MUSEUM	The museum suffered in the same fire.
1873—June 10	LONDON	ALEXANDRA PALACE THEATRE	Opened only fourteen days before. Burnt down in broad daylight with the Alexandra Palace. Fire caused by the carelessness of some workmen at work on the roof.
1873—June 19	BURLINGTON (U.S.A.)	PALMER'S OPERA HOUSE	Burnt in the early morning. Origin of fire unknown. Thirty-five houses were also destroyed, as well as the adjoining Court House.
1873—June 25	MARSEILLES	THÉÂTRE ALCAZAR	Burnt at the close of the performance. Fire probably caused by fireworks used. Eight neighbouring houses and brewery totally destroyed. Nothing saved. The spectators escaped without loss of life.
1873—Sept. 10	BALTIMORE	HOLLIDAY'S STREET THEATRE	Opened 1795. One of the oldest theatres in the town. Burnt at 2 A.M. The fire most likely began in the painters' room. Nothing saved. Many adjoining buildings were also destroyed.
1873—Oct. 29	PARIS	GRAND OPERA HOUSE, Rue le Pelletier (IV)	Opened August 16, 1821. Fire commenced about 1.30 A.M. in the scene store. Origin unknown. Library, costumes and many objects of art were lost. One fireman was killed.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1873—Dec. 12	Baltimore	American Opera Comique	Burnt down at 2 P.M. Nothing saved. The flames were first observed from the outside. Cause of fire unknown.
1874—Jan. 2	Wilkesbarre (U.S.A.)	Frauenthal's Opera House	Burnt at 9.45 P.M., during the performance, through the explosion of a petroleum lamp. No fatalities.
1874—Jan. 29	Philadelphia	Olympic Theatre	Built 1850. Burnt at 3 A.M. Apparently an act of incendiarism. An adjoining house was also destroyed. Two firemen were killed and six injured through the falling in of the walls.
1874—Jan. 30	Toronto	Royal Lyceum Theatre	Burnt at night, after a performance. Nothing saved.
1874—Feb. 10	Bethlehem (U.S.A.)	Hildenberg's Opera House	Opened 1871. Burnt at 1 A.M. Fire probably due to the careless use of fireworks at the previous performance.
1874—April 24	Oshkosh (U.S.A.)	Wagner's Opera House	Burnt at 3 A.M.
1874—April 27	Chicago	Globe Theatre	Burnt down at night. The cashier was arrested for arson, but was released, no proof being forthcoming. Nothing saved.
1874—June 9	Buda-Pesth	The Hippodrome	A large wooden building. Burnt at 1.30 A.M. Origin of fire unknown.
1874—June 22	Cologne	Mosler's Tivoli Summer Theatre	Built of wood. Burnt at 1 A.M. Most probably the work of incendiaries. Nothing saved.
1874—July 14	Chicago	Adelphi Theatre	Destroyed in a large city fire, which burnt down eighteen blocks.
1874—Oct. 13	Baltimore	The Opera House	A small theatre. Burnt down at 2 A.M., with several adjoining houses.
1874—Oct. 18	Werschitz	The Theatre	No reliable details obtainable.
1874—Oct. 23	Tiflis	Russian Theatre	Burnt down at 6.30 P.M. The fire broke out in the wardrobe room, and destroyed a number of adjoining warehouses.
1874—Dec. 16	Kasan	Municipal Theatre (II)	Opened 1860. Burnt at 1.30 A.M. Believed to have been an act of arson. Nothing saved. Two men killed.
1874	Tarnopol	Theatre in the new Castle	Burnt in the day, during a rehearsal.
1874	Lyons	Eldorado Music Hall	Building completely destroyed.
1875—Feb. 6	Edinburgh	Theatre Royal (II)	Built 1866. Burnt at 2 P.M. through fire caused by leakage of gas.
1875—Mar. 14	Edinburgh	Southminster Theatre (I)	Built in 1863, of wood. Burnt at 10 P.M., after the audience had left the building. No lives were lost.
1875—April 13	Bern	Circus Ulrich	Burnt at 6 P.M., before the admission of the public. The fire was probably caused by an escape of gas.
1875—April 28	Oshkosh (U.S.A.)	Harding's Opera House	Burnt during the afternoon, with a number of private houses and several public buildings.
1875—May 7	Cassel	Circus Carré	Burnt at 5.30 A.M., as the company was leaving. It was most probably caused by carelessness. Nothing saved. The fire engine, which was stationed in the circus, was burnt.
1875—May 15	Rutland (U.S.A.)	Ripley's Opera House	Burnt at 4 A.M. Nothing saved. One adjoining house was completely destroyed through the falling of the walls.
1875—May 28	Leeds	Theatre Royal	Burnt at 11.30 P.M., just after the close of the performance. The fire broke out at the back part of the stage. No lives were lost.
1875—June 27	Cheyenne (U.S.A.)	McDaniel's Theatre	The fire broke out in the scene store. Seven adjoining houses were also destroyed.
1875—July 4	Oporto	Trinidad Theatre	Opened March 22, 1874. Burnt at 11.45 P.M. after the performance, in which many fireworks were employed.
1875—Sept. 22	Berlin	Circus Herzog-Schumann	Built in 1873, of wood. Burnt at 10 P.M. The theatre was unused. Fire attributed to an incendiary.
1875—Oct. 12	Avignon	The Theatre (II).	
1875—Oct. 26	Virginia City (U.S.A.)	Pieper's Opera House	Destroyed through a fire which began in the city, and which extended to a number of buildings.
1875—October	Treviso	The Theatre (II)	Built in 1869.
1875—Nov. 3	Lyons	Grand Theatre, Place Bellecour	Opened 1829. Burnt at 6 P.M., before the public had been admitted. Scarcely anything was saved. One fireman killed.
1875—Nov. 25	Barmen	Municipal Theatre	Opened October 24, 1874. Burnt down at 4 P.M., in consequence of defective heating apparatus. Three theatre painters, who were on the roof, were killed. A number of other persons were saved with difficulty.
1875—Dec. 22	Kishinew	The Theatre	Burnt down at 4 P.M. The building was completely destroyed.
1876—Feb. 3	Madrid	Teatro de Romea	Burnt down at 5 A.M. The fire was first discovered from outside, and was most probably due to an escape of gas. Nothing was saved. Two adjoining houses were destroyed. No lives lost.
1876—Feb. 5	Cincinnati	Robinson's Opera House	No details obtainable.
1876—Mar. 2	Leeds	The Amphitheatre	Built 1832. Burnt down at 1.30 A.M., at the close of the performance. The fire broke out at the back of the stage. No lives were lost.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1876—Mar. 17	Springfield (U.S.A.)	The Opera House	Opened 1866. Burnt down at 3 A.M. The fire broke out on the stage. Origin not known. Several adjoining houses were also burnt.
1876—April 25	Rouen	Théâtre des Arts	Opened June 29, 1776. Burnt at 7 P.M., before the admission of the public. The fire was most likely due to the flaring up of a gas light. Nothing saved. Several houses were also destroyed. Some of the actors were dressing, and of these eight were killed and twelve injured.
1876—May 27	Trieste	The Old Theatre	Opened 1828. A wooden amphitheatre. Burnt down at 5 P.M. Origin of fire unknown. Nothing saved.
1876—June 22	Baltimore	Adelphi, or Mud Theatre	Built 1822. Burnt down early in the morning. This theatre was one of the earliest in which gas was used.
1876—July 23	Hamburg	Central Music Hall	Rebuilt as a theatre in 1863. Burnt down at 9.30 P.M. during a performance, in consequence of carelessness with the lights. No lives were lost.
1876—Aug. 19	Rohitsch-Sauerbrünn	Provincial Theatre	Opened July 6, 1872. Burnt at 6 P.M. The fire broke out on the stage. Nothing saved.
1876—Sept. 26	Metz	Walter Theatre	Built of wood. Burnt at 2.30 A.M., after a ball. The caretaker of the house was killed.
1876—Oct. 11	Sandy Hill (U.S.A.)	The Opera House	Destroyed in a great fire which broke out in the city.
1876—October	Lerida (Spain)	The Theatre	Burnt with several other houses. Fire probably due to arson.
1876—Nov. 13	Madrid	Teatro del Circo	Built in 1834 as a circus, but used later as a theatre. Burnt down at 1.30 P.M. during a rehearsal, through the careless removal of some scenery, and the damage to a gas pipe used under the stage. Three persons severely injured.
1876—Dec. 5	Brooklyn	Mrs. Conway's Theatre	Opened October 1871. Burnt at 11 P.M., during the performance. Fire caused by a side light in the wings. 283 killed, and a large number severely injured.
1876—Dec. 8	Albany (U.S.A.)	Adelphi Theatre	Opened October 4, 1869. Burnt at 3.30 A.M. Origin of fire unknown. The fire was first perceived from the outside. Nothing was saved. Several firemen were killed through the falling in of the walls.
1876—Dec. 21	Marseilles	Circus Cortrelly	Provisional wooden building. Burnt at 5 A.M. Origin of fire not known. No lives were lost.
1876	San Sacramento	The Theatre	Building completely destroyed. 110 killed.
1877—Jan. 28	Indianapolis (U.S.A.)	The Opera House	Burnt at 1.30 A.M. after the close of the performance. Five adjoining shops were also destroyed.
1877—Feb. 4	Oerebro	Municipal Theatre (I)	Burnt at 4 P.M. The fire was probably caused by defective heating apparatus under the stage.
1877—Feb. 8	Murcia (Spain)	Teatro de Romea	Opened October 27, 1862. Burnt at 2 A.M. Cause of fire unknown. Nothing saved.
1877—Feb. 22	Waco (U.S.A.)	The Opera House	A new building which had not been opened. Burnt at 1 A.M. Cause unknown. The fire also destroyed the market house, which was under the same roof, as well as an adjoining Baptist chapel and a private house.
1877—Feb. 25	Philadelphia	Fox's New American Theatre (II)	Opened December 17, 1870. Burnt at 12.15 A.M. after the close of performance. The fire broke out in a property room, and was seen from the outside. With the exception of two safes, nothing was saved. A neighbouring carriage manufactory was also destroyed. Two men were killed and several injured through the falling in of the walls.
1877—Mar. 6	Fostoria (U.S.A.)	Leonard's Opera House	Burnt early in the morning. Origin of fire unknown. The adjoining block of houses was nearly destroyed.
1877—Mar. 12	Providence (U.S.A.)	Elliott's Opera House	Burnt down late in the evening. The fire apparently began in a store under the theatre. A neighbouring hotel was also destroyed.
1877—April 4	Edinburgh	Queen's Theatre (II)	Opened 1875 on the site of the previous Southminster Theatre. Burnt at midnight. During the preceding week there had been no performances. Origin of fire unknown. Nothing saved. No lives lost.
1877—June 20	St. John's (Canada)	Academy of Music; Lyceum Theatre	Destroyed in a great fire which laid a portion of the town in ashes.
1877—July 9	Liverpool	Rotunda Theatre	Burnt at 4.30 A.M. The fire was discovered by the police from the outside, who had to arouse the people sleeping in the house. The fire began on the stage. Origin unknown. No lives were lost.
1877—Aug. 30	London	Wilton's Music Hall	Fire broke out at 1.10 A.M.
1877—Sept. 28	Beringer City (U.S.A.)	The Opera House	The fire broke out in a dressing room at 8 P.M., during the performance, through the overturning of a lamp. A great panic amongst the audience ensued, but only one man was killed. A printing office and several houses were also burned down. Nothing saved.
1877—Oct. 10	Papa (Hungary)	Summer Theatre	Built 1874. Burnt in the early morning. The fire was probably due to arson. No plays were being presented in this theatre. The house was completely destroyed.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1877—Oct. 23	Chicago	Wood's Theatre	Opened 1872. Burnt at 6 A.M. Nothing saved. A menagerie in connection with the theatre was burned, and many animals were killed. An adjoining museum was also destroyed.
1877—Nov. 5	Montpellier	Variety Theatre	Burnt at 3 A.M. The fire was noticed from the outside. Nothing was saved.
1877—Nov. 24	Worcester	Theatre Royal	Built 1874. Burnt at 7 A.M. The fire broke out in the joiners' workshop, near the stage. It was first noticed from outside. Nothing was saved.
1877—Dec. 11	Cardiff	The Theatre	Built 1825. The building had just been renovated. Burnt early in the morning. Fire most likely caused by an escape of gas. Nothing was saved.
1878—Jan. 13	Rouen	Théâtre des Fantaisies Lyriques	A small stage, which had only been in use a few days. Burnt at 5.30 P.M. Fire caused through carelessness with the gas.
1878—Jan. 22	Wandsbeck, near Hamburg	Reisner's Tivoli Theatre	Opened 1873. Burnt at 6 A.M. Caused by a petroleum lamp being upset in an adjacent stable. One fireman killed, and another injured by the falling of a wall.
1878—Feb. 4	Wigan	Queen's Theatre	A large structure, built entirely of wood two years and a half before. Burnt at 11 P.M., soon after the close of the performance. The fire was first noticed from the outside.
1878—Feb. 5	Chicago	Academy of Music	Opened autumn 1872. Burnt during the night, after the performance. Fire caused through an iron stove underneath the stage.
1878—Mar. 26	London	Elephant and Castle Theatre	Opened 1872. Burnt at 4.45 A.M. Cause of fire unknown. Fireworks had been used at the evening performance. No watchman was in the theatre. A neighbouring house was burnt, and a few others damaged. Several persons living in the theatre narrowly escaped.
1878—April 6	Oldham	Theatre Royal	Built 1858. Burnt at 6 P.M. Cause of fire unknown; supposed to be due to arson.
1878—April 27	South Shields	Alhambra Music Hall and Amphitheatre	Burnt about midnight, soon after the performance. Cause of fire unknown.
1878—May 1	Wittenberg	Central Hall Theatre and Concert Room	Opened 1877. Fire broke out in ladies' cloak-room. Cause unknown.
1878—May 11	Ahmednuggur (India)	The Theatre	Fire broke out during the performance. Great panic caused among the audience, who, in their anxiety to escape, blocked the exits. About forty people were burnt, and a great number severely injured.
1878—June 13	Plymouth	Theatre Royal (II)	Opened 1863. Burnt at 11 P.M., soon after the close of the performance. The fire was noticed first from outside.
1878—July 16	Bradford	Prince's Theatre	Opened 1876. Fire broke out immediately after close of the performance. Cause unknown.
1878—July 19	Mont de Marsan (France)	The Amphitheatre	Burnt at 5 P.M. Several neighbouring houses were destroyed, and others damaged.
1878—July	Nishni-Novgorod	The Theatre (II)	Opened 1857. Burnt during the illuminations in honour of the Grand Duke.
1878—Aug. 25	Cologne	Gertrudenhof Club Theatre	Fire broke out on the stage at 11 P.M., at the close of a concert. One man was severely injured.
1878—Sept. 2	Canal Dover (U.S.A.)	Sells Brothers' Circus	Opened a few weeks previously. Burnt during the performance; a heavy storm damaged the wooden building, and a lamp set fire to it. A great panic ensued; a number of people were injured.
1878—Sept. 29	Blackburn	Star Theatre	A wooden building, holding about 4000 people. Burnt during the night after a public meeting.
1878—Nov. 14	Bradford (U.S.A.)	Theatre Comique	Fire broke out at 8 P.M., destroying the theatre and fifty neighbouring houses. Caused by a damaged flue on the stage.
1878—Dec. 9	Constantine (Algiers)	The Theatre	Fire broke out at 4 A.M., burning also an adjacent house. The flames were first noticed from the outside. Four firemen were injured.
1878	Valparaiso	Victoria Theatre	Built 1844. Fire broke out at 6 P.M. Building and contents burnt.
1878-9	Osaka (Japan)		In eighteen months five theatres were burnt in this town.
1879—Jan. 21	Elizabeth (U.S.A.)	Clark's Opera House	Fire broke out at 10 A.M. Cause unknown. First noticed from the outside.
1879—Feb. 2	Glasgow	Theatre Royal (IV)	Opened 1867. Burnt at 1 A.M., soon after the close of the performance. Fire broke out on the stage. The few people who remained in the building saved themselves by jumping from the windows.
1879—Feb. 5	Neumünster	Covent Garden Theatre	Burnt during the night.
1879—Mar. 2	Reno (U.S.A.)	Academy of Music	Burnt with a part of the town at 6 A.M. A heavy storm was the cause of the fire.
1879—Mar. 8	London	Theatre in the Royal Polytechnic Institution	Built 1848. Burnt at 1.30 A.M. The remainder of the building saved with considerable difficulty.
1879—Mar. 16	London	East London Theatre, Whitechapel	A new building. Burnt at 8.50 P.M. It is believed that the fire broke out in the scene store. A neighbouring sugar refinery nearly destroyed; also eight houses damaged.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1879—Mar. 25	Derby	Keith's Circus	Building entirely constructed of wood. Burnt after the first performance, at 5 A.M. The fire was first noticed from the outside. The night watchman killed and twenty horses burnt.
1879—April 13	Verden	The Theatre	The theatre and some adjacent buildings were burnt during the night.
1879—April 19	Eureka (U.S.A.)	The Opera House	A large wooden building. Burnt, with a part of the town, during the night.
1879—April 19	Rouen	L'Alcazar	Opened 1871. Burnt at 10 P.M. No performance had been given; fire attributed to smoking. One fireman severely injured by the falling of a gable.
1879—April 24	Reichenberg	Municipal Theatre	Built 1820. Burnt at 2 A.M., after the performance. Cause unknown. Fire first noticed from outside.
1879—June 20	Berlin	Urania Theatre	A small private theatre. Burnt at 3 A.M. Cause of fire unknown. There had been no performance on the previous evening.
1879—July 28	Pillau	Stark's Theatre	A wooden building. Burnt at 10 P.M., during the performance, through a lamp being overturned on the stage. Great panic ensued, but no lives were lost. The people in the upper part of the house were saved with great difficulty.
1879—Aug. 7	Cagliari	Teatro Carboni	A small theatre, formerly used as a church. Opened 1876. Burnt at 1.30 A.M., after a performance, at which a great deal of shooting had taken place. The fire was first noticed from the outside.
1879—Sept. 7	Quincy (U.S.A.)	Academy of Music	The theatre and several adjacent buildings were burnt during the night. One man was killed by the falling of a wall.
1879—Sept. 26	Deadwood (U.S.A.)	Bella Union and Gem Theatres	Burnt with a large part of the town.
1879—Nov. 16	Alessandria (Piedmont)	Teatro Gra	Burnt before the commencement of the performance, through carelessness with the heating apparatus.
1879—Nov. 19	Frankfort-on-M.	Adolfi Theatre	A summer theatre. Burnt at 2 A.M., after a dance.
1879—Nov. 21	Algiers	Théâtre de la Perle	Burnt in the evening, with some adjoining houses. Probably a case of arson. The manager and his wife were injured.
1879—Nov. 29	Toronto	Grand Opera House	Built 1874. Burnt at 3 A.M. Fire first noticed from the outside. Cause unknown. Three people killed.
1879—Nov. 30	Brussels	New Theatre, Place de Vavière	Burnt before it was opened, at 7 A.M. Probably through the carelessness of a workman.
1879—Dec. 9	Stuttgart	Circus Herzog	Temporary wooden building. Burnt after the performance, at 3 A.M. Cause of outbreak unknown. Fire first noticed from the outside. Two lives were lost, and ten horses.
1879—Dec. 26	Marienburg	Summer Theatre	An old building with a small stage. Burnt at 2 A.M. The fire probably broke out in the scene store.
1879—Dec. 30	Sherman (U.S.A.)	The Opera House	Burnt at 7.30 A.M. Ten houses, including the post office, were destroyed.
1880—Jan. 10	Waco (U.S.A.)	Miller's Theatre	Discovered in flames early in the morning. Cause of fire unknown.
1880—Feb.	Pordenone	Teatro della Stella	Particulars of this fire are not known.
1880—Feb. 9	Dublin	Theatre Royal	Opened in January 1821. Burnt at 1 P.M., just before a matinée; caused by the carelessness of an attendant in the Viceroy's box. Nothing was saved. The manager of the theatre perished in the flames.
1880—Feb. 15	Huddersfield	Theatre Royal	Burnt at 1.30 A.M. Fire broke out in the scene store.
1880—Feb. 20	Rostock	Municipal Theatre	Burnt at 8 P.M., through carelessness with the heating apparatus. Nothing saved.
1880—Feb. 23	Brewsters (U.S.A.)	Town Hall Theatre	A small theatre. Burnt, with a whole block of houses, at 11 P.M.
1880—April 2	Bradford (U.S.A.)	Academy of Music	Burnt at 6.30 P.M., together with sixteen neighbouring houses. Caused by the overturning of a lamp. One man burnt.
1880—April 10	Petroleum City (U.S.A.)	The Opera House	A small wooden building. Burnt at 10.30 A.M., destroying a block of houses.
1880—April 27	Belleville (Ont.)	The Opera House	Burnt at 1 A.M., two hours after the performance.
1880—April 30	Temesvar	Franz-Josef Theatre	Opened October 1, 1873. Burnt at 10 P.M., immediately after the performance. Cause of fire unknown. Nothing saved.
1880—May 9	Luttich	Théâtre Vauxhall	A wooden building, built 1870. Burnt 1.30 A.M. Cause of fire unknown. First noticed from outside.
1880—May 14	Milton (U.S.A.)	Academy of Music	Burnt at 12 midday, with a great part of the town. Fire did not break out in the theatre.
1880—May 26	Lyons	Théâtre des Celestins (III)	Built 1877. Burnt at 1 A.M. Fire broke out in a room adjoining the stage; first noticed from the outside. Cause unknown. Nothing saved.
1880—July 4	London	Duke's Theatre (III)	Built 1864. Burnt at 5 P.M. The building had been locked up and left without a watchman. Cause of fire unknown.
1880—July 8	Tyrone (U.S.A.)	The Opera House	Burnt with the post office, Bank and a number of business premises and dwelling-houses.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1880—July 12	Perpignan	Variety Theatre	Burnt at 2 A.M., after the performance. The artistes, who lived on the premises, saved their lives by jumping from the windows; six of them injured. Nothing saved.
1880—July 22	Sydney	Victoria Theatre.	
1880—Aug. 17	Eureka (U.S.A.)	The Opera House (II)	Burnt at 10 A.M., with a great part of the town.
1880—Aug. 19	Sunderland	Lyceum Theatre (II)	Built 1865. Burnt at 7 P.M. Fire broke out in the joiners' workshop. The theatre had not been used for a considerable time.
1880—Sept. 3	Hart's Fall (U.S.A.)	Baker Opera House	Burnt, together with several adjacent houses.
1880—Oct. 12	Chicago	Emmett's Academy of Music	Built 1878. Burnt at 10 A.M. Fire broke out in an attic. Two firemen killed, and several injured. Nothing saved.
1880—Dec. 2	Topeka (U.S.A.)	Crawford's Opera House	Opened September 1880. Burnt early in the morning. Several adjacent offices were damaged.
1880—Dec. 9	St. Louis	Opéra Comique (II)	Built 1868. Burnt 12.30 P.M. Fire broke out underneath the stage in consequence of defects in the heating apparatus.
1881—Jan. 1	St. Charles (U.S.A.)	Mittelberger's Opera House	Burnt early in the morning, with some business premises.
1881—Jan. 5	Lockport (U.S.A.)	Hodge Opera House	Burnt during the night, together with several adjacent buildings.
1881—Jan. 9	Cronstadt	The Theatre (II)	Opened 1875. Burnt at 3 A.M. Fire caused by carelessness in hanging the scenery. Eight people, who lived in the building, burnt, and several firemen injured.
1881—Jan. 25	Marlin (U.S.A.)	Stuart's Opera House	Only recently opened. Burnt with several adjoining houses.
1881—Feb. 3	Chicago	Park Theatre in Independence Hall	Only recently opened. Burnt during the night. Fire broke out on the stage. Nothing saved.
1881—Feb. 4	Fort Wayne (U.S.A.)	Bijou Theatre	Built 1880. Fire broke out at 6.30 P.M., before performance. Incendiarism.
1881—Feb. 7	Brussels	Théâtre du Prado	Burnt at 2 A.M., after the performance. Fire was first noticed from the outside.
1881—Feb. 20	Silver Cliff (U.S.A.)	Silk's Theatre	Burnt at midday, together with a large number of adjoining houses.
1881—Mar. 8	Abo (Finland)	Municipal Theatre	Building completely destroyed. Cause of fire unknown.
1881—Mar. 17	Modena	Teatro Aliprandi	Burnt shortly before the performance, through carelessness in lighting the gas. Nothing saved.
1881—Mar. 23	Nice	Municipal Theatre	Built 1828. Burnt at the commencement of the performance in consequence of defect in the gas pipes. 150 to 200 people burnt, and many injured.
1881—Mar. 29	Leadville (U.S.A.)	McDaniel's Theatre	Theatre burnt, with several adjacent houses.
1881—April 6	Montpellier	Grand Theatre (II)	Built 1790. Burnt after the performance. Noticed first from the outside. Cause of fire unknown.
1881—April 7	Athens	Phalerum Theatre	Burnt before the commencement of the season. Fire probably caused by carelessness of the watchman.
1881—April 20	Stolp	Municipal Theatre	Burnt during the night. Three firemen and one workman injured.
1881—April 20	Ramsgate	Vaudeville Theatre (II)	Burnt at 3 A.M. Noticed first from the outside.
1881—May 14	Spalato	Teatro Bajamonti	Built 1861. Burnt in the afternoon during a rehearsal. The artistes managed to save themselves; several people injured.
1881—June 8	Belfast	Theatre Royal	Burnt during the night.
1881—July 5	San José (U.S.A.)	The Opera House	Burnt, together with eleven neighbouring houses.
1881—July 16	St. Petersburg	Variety Theatre	Building and contents completely destroyed.
1881—July 18	Madrid	Circus in Campos Eliseos	Burnt at the commencement of a bull-fight. Fire broke out in a box beside the orchestra. No lives lost.
1881—July 19	Syracuse (U.S.A.)	Wieting's Opera House	Burnt during the night, with several adjoining buildings.
1881—Aug. 5	Cadiz	Grand Theatre	Built 1871. Burnt at midnight, after the close of the performance.
1881—Aug. 12	Prague	Czech National Theatre	Burnt in the afternoon, before the building was completed, through carelessness of a workman.
1881—Sept. 10	London	Park Theatre	Built 1871. Burnt at midnight, after the close of the performance. Fire was first noticed from outside.
1881—Sept. 30	Eldred (U.S.A.)	Jackson's Opera House	Burnt during the night, with over fifty neighbouring houses.
1881—Nov. 5	Joplin (U.S.A.)	The Opera House	Burnt during the night, together with some business premises. Nothing saved.
1881—Dec. 8	Vienna	Ring Theatre	Opened January 15, 1874. Burnt just before the commencement of the performance through carelessness in lighting gas battens. Great panic caused by turning off the gas, which prevented the audience from finding the exits. 450 killed, many injured.
1881—Dec. 22	Pensacola (U.S.A.)	Tarragona Theatre	The building and an adjoining factory were burnt.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1881—December	Troy (U.S.A.) .	Grand Central Theatre (I)	Date uncertain.
1882—Jan. 6 .	Owensburg (U.S.A.)	The Opera House	The building and an adjoining hotel were burnt in the evening. Fire caused through an overheated stove.
1882—Jan. 16 .	Mankato (U.S.A.)	The Opera House	Particulars unreliable.
1882—Jan. 19 .	Bucharest . .	Circus Kremser	A wooden building, only erected a few months before. Burnt at 2 A.M., after the performance. Twenty-four horses were burnt. Nothing saved.
1882—Jan. 31 .	Sofia (Bulgaria)	The Theatre in the Narodna Sobranje	Burnt during the night, after an amateur performance. An adjoining building, with the State archives, was destroyed.
1882—Feb. 2 .	Sebastopol . .	Circus Taurec	Destroyed during the night. All the costumes and nearly all the horses were burnt.
1882—Mar. 8 .	Richburg (U.S.A.)	Baum's Opera House . . .	A wooden building. Burnt during the night. Fire supposed to be due to the heating apparatus below the stage.
1882—Mar. 17 .	Marseilles	Crystal Palace Theatre .	Opened June 1880. Burnt at 12.45 A.M., soon after close of performance. Fire broke out on the stage. The artists saved themselves with difficulty. One man injured.
1882—Mar. 18 .	St. Petersburg	Winter Theatre, Livadia .	Opened 1879. Fire broke out in a dressing room during the performance; caused by a movable gas bracket. One man killed.
1882—Mar. 20 .	Minesola (U.S.A.)	The Opera House	The building and a block of houses burnt at 3 A.M.
1882—Mar. 20 .	Algiers . . .	National Theatre	Built 1858. Burnt at 3 A.M., after the close of performance. Fire noticed from outside. Cause unknown.
1882—Mar. 21 .	Middleport (U.S.A.)	Compton's Opera House . .	Building burnt, together with a number of business houses, at midnight, after a performance.
1882—April 1 .	Portsmouth	Ginnett's Circus.	Built 1879. Burnt during the night, with nine adjoining houses.
1882—April 9 .	Red Wing (U.S.A.)	The Opera House	Building and several houses burnt.
1882—April 14 .	Titusville (U.S.A.)	The Opera House	Burnt at 3 A.M., with an hotel and several houses. One man burnt, and another injured.
1882—April 15 .	Bolton . . .	Temple Opera House (I). .	A large provincial theatre. Opened October 20, 1877. Burnt at 11.45 P.M., soon after the close of a performance. Fire was noticed first from outside. Nothing saved.
1882—April 16 .	Schwerin . .	Court Theatre (II) . . .	Opened January 17, 1836. Fire broke out at the back of the stage at 8.45 P.M., during a performance. The audience was saved, owing to the presence of mind of the Grand Duke. One fireman burnt. Nothing saved.
1882—April 17 .	Pernau (Livonia)	Club Theatre.	
1882—April 21 .	Hagen (Germany)	Theatre in Feilhauer's Restaurant	Burnt during the night. Fire broke out on the stage. Cause unknown.
1882—April 24 .	Franklin (U.S.A.)	The Opera House (I) . . .	Burnt, with an adjoining hotel, early in the morning.
1882—April 25 .	Portsmouth .	Prince's Theatre	Burnt at 4 A.M., after the performance. Noticed first from outside. Cause unknown.
1882—May 7 .	Nevada (U.S.A.)	Moore's New Opera House	Opened May 1, 1882. Burnt at 1 A.M. The fire prevented from spreading by destroying four adjacent houses.
1882—May 15 .	Sibibel Abbes (Algiers)	The Theatre	Particulars unreliable.
1882—May 19 .	Leadville (U.S.A.)	Academy of Music	Burnt at 2.30 A.M., with an hotel, etc. Several people burnt.
1882—June 1 .	Monte Video .	The Theatre	Fire broke out on the stage during a performance. Great panic ensued. Twenty-one people killed, and 103 badly injured.
1882—June 26 .	Riga	German Theatre	Built 1863. Burnt at 11.30 A.M. Fire broke out in the upper part of paint room through handling a light carelessly. Nothing saved.
1882—July 4 .	St. Petersburg	Arcadian Theatre	Burnt, with adjacent buildings, at 2 P.M. Probably through carelessness at a rehearsal. One fireman injured.
1882—July 6 .	Madrid . . .	Teatro de los Recreos . .	A new half-timber building. Burnt, with an adjoining house, at 5 P.M. Cause of fire unknown. Nothing saved.
1882—Aug. 29 .	Red Oak (U.S.A.)	Bishop's Opera House . .	Fire incurring a loss of about £7000.
1882—Sept. 1 .	Staraja Russa	The Theatre	A wooden building. Burnt during the night, after a performance.
1882—Sept. 6 .	London . . .	Philharmonic Theatre (Islington) (I)	Built 1860. Burnt at 1 A.M., after the close of the performance. Fire was first noticed from outside. Nothing saved.
1882—Sept. 11 .	Louvain . . .	Théâtre Beriot	Opened 1870. Burnt at 5 A.M., after a ball. Fire broke out on the stage. Cause unknown.
1882—Sept. 13 .	Tambov (Russia)	The Theatre.	
1882—Sept. 25 .	Orebro . . .	Municipal Theatre (II) . .	Burnt about 7 P.M., before the commencement of the performance, through carelessness while lighting the gas. The few spectators who were in the building saved.
1882—Oct. 8 . .	Brighton . .	Mellison's Theatre and Concert Hall	Built 1867. Burnt during the night. Fire was caused by the use of fireworks at the previous performance.
1882—Oct. 26 .	Salem (U.S.A.) .	Reed's Opera House . . .	Burnt in the afternoon, together with a large hotel.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1882—Oct. 30	New York	Abbey's Park Theatre (iii)	Opened September 1873. Burnt at 4.30 p.m., through carelessness while decorating one of the proscenium boxes. Two people burnt, and several injured.
1882—Oct. 31	Barcelona	Teatro Massini	Burnt late in the evening. Nothing saved.
1882—Nov. 1	New York	Alhambra Theatre	Opened 1876. Burnt at 10 p.m. Fire broke out in a small room above the stage. No performance that evening. Nothing saved.
1882—Nov. 3	Baltimore	Arlington's Variety Theatre	Burnt at 3 a.m. Fire broke out on the stage. One of the attendants burnt, and five injured. Nothing saved.
1882—Nov. 12	Frankfort (u.s.a.)	Major Opera House	Burnt at 3.30 p.m., together with the post office, two hotels and a number of other buildings.
1882—Nov. 16	Wlozlaw (Poland)	The Theatre	Burnt at 11.45 p.m., shortly after the close of the performance. Fire broke out above the chandelier. One fireman injured.
1882—Nov. 28	South Shields	West End Theatre	Burnt at 4 p.m., shortly after a rehearsal.
1882—Nov. 30	Metropolis (u.s.a)	The Opera House	The building, and a block of houses, burnt early in the morning.
1882—Dec. 7	London	Alhambra Theatre, Leicester Square	Had been used as a theatre since 1875. Burnt, with seven houses, at 1 a.m., soon after the close of the performance. Two firemen killed, and five injured. Nothing saved.
1882—Dec. 15	Toledo (u.s.a.)	The Music Hall	The fire destroyed a whole block of houses.
1882—Dec. 24	Tshernigow (Russia)	The Theatre	Burnt during a performance. Fire caused by an escape of gas. Several people killed, and over 100 injured.
1882—Dec. 25	La Pointe-a-Pitre.	The Theatre	No further particulars obtainable.
1883—Jan. 7	Moscow	Buffo Theatre	Particulars unreliable.
1883—Jan. 15	Berditshew (Russia)	Circus Costali	A wooden building, only a few weeks in use. Fire broke out during the interval, in the stables under the stage. Great panic. 325 people burnt, many of whom were women and children; thirty-eight succumbed subsequently to their injuries.
1883—Jan. 16	Albany (u.s.a.)	Tweddle Hall Theatre	Building burnt, with several adjoining houses, at 7.30 a.m.
1883—Jan. 22	Mitau	Schrickenhofer's Theatre	Burnt at 10.30 p.m. No performance had been given that evening.
1883—Jan. 27	Defiance (u.s.a.)	The Opera House.	
1883—Feb. 8	Toronto	The Royal Opera House (ii)	Burnt in the evening. No performance had taken place.
1883—Feb. 18	Arad	The Theatre	Opened September 21, 1874. Burnt at 3.15 p.m. Fire broke out on the stage. A scene-painter, jumping from the third story, was injured.
1883—Mar. 2	Columbus (u.s.a.)	The Opera House	Fire spread to an adjoining block of houses.
1883—Mar. 13	Virginia City (u.s.a.)	The Opera House (ii)	No particulars available.
1883—Mar. 16	Lima	Grand Theatre	Opened 1750. Burnt, with several adjacent houses, at 1 a.m., after the close of the performance. An actor killed. Nothing saved.
1883—Mar. 18	New Orleans	Circus	Temporary building. Burnt at 9.30 p.m. Fire broke out on the stage during the performance. Great panic ensued. Fifty-eight people killed, and nearly 100 severely injured.
1883—April 1	Augusta (u.s.a.)	The Opera House (ii)	Burnt at 2 a.m., after a performance. Noticed first from outside. Several firemen severely injured.
1883—April 2	Stockton-on-Tees	Star Theatre	Used as a music hall. Fire caused through an escape of gas.
1883—April 4	Berlin	National Theatre	Opened August 28, 1870. Burnt at 12.30 p.m. Fire broke out on the stage, most likely at the preceding rehearsal. First noticed from outside.
1883—April 4	Nice	Theatre in the New Casino	Situated on a pier. Completed, but had not been opened. Burnt at 5.30 p.m., through the carelessness of a workman.
1883—April 8	Moscow	Circus Salamonski	A wooden building, built 1880. Fire broke out at 1 p.m. in the stable. Only a few of the horses saved.
1883—April 22	Savona	Teatro Chiabrera	The building had been closed for two months. Several people were badly injured in their efforts to extinguish the flames.
1883—April 26	Pensa (Russia)	Summer Theatre.	
1883—April	Mantua	Teatro Andriani	Date uncertain.
1883—June 6	Chicago	Barnum's Circus	A temporary building, recently completed. Burnt at 3 a.m. Cause of fire unknown.
1883—June 9	Manchester	Gaiety Theatre of Varieties	Opened 1879. Burnt at 6 p.m., probably through carelessness in lighting the gas.
1883—June 11	Warsaw	Variety Theatre	Opened 1833. Burnt at 8.30 p.m. No performance that evening. Supposed to have been a case of arson.
1883—June 16	Boston (u.s.a.)	Gray's Opera House	Fire broke out at 3 p.m. in a room near the stage, during a matinée. No one injured.
1883—June 24	Dervio	Marionette Theatre	In a stable building. Fire broke out at 11 p.m., just before the close of the performance. Caused by sparks falling from the fireworks. Fifty-three people killed, and thirteen injured.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1883—July 2	Kishinew	Summer Theatre	A wooden building. Particulars unreliable.
1883—July 8	Toulouse	Capitol Theatre	Burnt at 6 P.M. No details obtainable.
1883—July 9	Capetown	Theatre Royal.	
1883—July 23	Miles City (U.S.A.)	Cosmopolitan Opera House	Burnt during the night, with six adjoining houses.
1883—July 31	Jecaterinodar	Municipal Summer Theatre	Burnt at 10 P.M. No performance given that evening. Cause of fire unknown.
1883—Aug. 4	San Francisco	Winter Garden Theatre	A wooden building. Burnt, with several houses, at 1 A.M., after the close of the performance. One actor killed. Several persons injured.
1883—Aug. 11	Sunderland	Star Theatre and Music Hall	Burnt at 7.30 P.M., at the commencement of the performance. The fire broke out above the chandelier. Great panic ensued, but no one injured.
1883—Aug. 13	Tours	The Theatre	Opened August 8, 1872. Burnt at 4 A.M., after a pantomime. Nothing saved.
1883—Aug. 26	Katamotomura (Japan)	Japanese Theatre	Burnt during the performance. A dreadful panic ensued; seventy-five people killed, and more than 100 badly injured.
1883—Oct. 8	Memphis (U.S.A.)	Greenlaw's Opera House	Burnt, with many adjoining houses, at 10 P.M.
1883—Oct. 13	Chicago	Lyceum Theatre (II)	Opened 1876. Fire broke out at 4 A.M., in a dressing room below the stage. One man killed.
1883—Oct. 15	Wateska (U.S.A.)	The Opera House	Burnt with six adjoining houses.
1883—Oct. 19	Moscow	German Theatre (II)	Opened October 1, 1882. Fire broke out at 6 P.M. Building and contents destroyed.
1883—Oct. 30	Buda-Pesth	Circus Herzog	A wooden building, built in 1877. Burnt at 6 P.M., before the entrance of the public. Fire broke out in the stables. Nearly all the horses were saved, but nothing else.
1883—Nov. 12	Shenandoah (U.S.A.)	Academy of Music	Burnt at midday.
		The Opera House	Burnt during a fire, which destroyed sixteen blocks of houses.
1883—Nov. 17	Darlington	Theatre Royal	Burnt at 1 A.M. Fireworks had been used towards the close of the performance. The adjacent buildings were saved with much difficulty.
1883—Nov. 30	New York	Windsor Theatre	Opened in 1864. Burnt, with Hartmann's hotel and eight houses, shortly after midnight. Fire broke out in a dressing-room beside the stage. A number of people were injured.
1883—Dec. 14	New York	Standard Theatre (I)	Opened December 18, 1875. Fire broke out above the stage at 6.45 P.M., before entrance of public. Several badly injured.
1883—Dec. 29	London	Grand Theatre	Opened August 4, 1883. Fire broke out in upper part of stage, at 1 A.M., at close of performance. Fireworks had been used. One man killed.
1884—Jan. 5	Cleveland (U.S.A.)	Park Theatre	Opened October 22, 1883. Burnt at 8.15 A.M., with several adjoining houses. Fire caused by a gas explosion. Many people severely injured.
1884—Jan. 9	Meadville	The Opera House	Burnt with several buildings.
1884—Jan. 20	London	Lusby's Music Hall	The fire broke out at 6.30 P.M., in a hall adjoining the stage.
1884—January	Tokio (Japan)	Theatre Shidzanoka	Burnt a few hours after the close of the performance. Eleven people killed.
1884—Feb. 24	Jackson (U.S.A.)	Union Hall Theatre	Burnt, with a whole block of houses, at 6 A.M. One man killed, and several injured.
1884—Mar. 2	Oil City (U.S.A.)	The Opera House	Fire broke out at 11 P.M., after performance. Caused by heating apparatus. Portion of building saved.
1884—Mar. 17	Jackson (U.S.A.)	King's Opera House	Burnt with several adjoining warehouses.
1884—Mar. 20	Danbury (U.S.A.)	The Opera House	Burnt in the afternoon. Fire broke out below the stage.
1884—April 15	Tarascon	The Theatre	Fire caused by an escape of gas, shortly after the close of the performance.
1884—April 21	Bucharest	Circus Sidoli	A wooden building. Fire broke out during the performance. Five people were killed, and many injured.
1884—April 21	Cleveland (U.S.A.)	The Opera House	The fire was caused by a gas explosion.
1884—April 28	Glen Falls (U.S.A.)	The Opera House	Burnt with the Union Hall, a church and several dwelling-houses.
1884—May 16	Vienna	Municipal Theatre	Opened September 15, 1872. Burnt at 4.30 P.M. Cause of fire unknown. Nothing saved. Several people injured.
1884—June 18	Leadville (U.S.A.)	Variety Theatre	Burnt with several houses. Three people perished in the flames.
1884—June 30	Edinburgh	Theatre Royal (III)	Opened January 13, 1876. Burnt during an afternoon rehearsal. Cause of fire unknown. Several adjacent buildings were also destroyed.
1884—Aug. 5	Athens	Small Court Theatre	Situated in palace, only a part of which was saved. Four persons killed, and eighteen injured.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1884—Aug. 7	Tomsk (Siberia)	Summer Theatre	A wooden building. Burnt during the night, after a performance. Several people were killed while trying to extinguish the flames.
1884—Aug. 13	Erie (U.S.A.)	The Opera House	Burnt at 3 A.M., after a performance. A part of the town also destroyed.
1884—Aug. 17	Greenville (U.S.A.)	The Opera House	Burnt with the law courts and a number of houses.
1884—Aug. 24	Fu-Chow	Chinese Theatre, in the Arsenal	Fired during the bombardment by the French fleet.
1884—Sept. 20	Rome	Teatro Pietro Cossa	Burnt during the afternoon, after a rehearsal. Cause of fire unknown.
1884—Oct. 3	Copenhagen	Small Court Theatre, in the Christiansborg Palace	Burnt at 6 P.M., with the whole palace. Fire caused through defects in the heating apparatus.
1884—Oct. 7	South Bethlehem (U.S.A.)	Grand Opera House	Burnt at 5 A.M., with several houses. Fire supposed to have broken out in a dressing-room below the stage. One man killed, and several injured.
1884—Oct. 15	Montague (U.S.A.)	The Opera House	Burnt with the post office and numerous other buildings.
1884—Oct. 16	Montello (U.S.A.)	The Opera Hall	Burnt with a large number of houses.
1884—Oct. 16	Crisfield (U.S.A.)	Blizzard's Opera House	Burnt at 2 A.M.
1884—Oct. 21	Carthage (U.S.A.)	The New Opera House	Burnt at 11 A.M., with several churches, private houses, etc. A number of firemen severely injured.
1884—Oct. 29	Deckertown (U.S.A.)	Hornbeck's Opera House	Destroyed with the Odd Fellows' Hall.
1884—Nov. 5	Carry (U.S.A.)	Gleason Opera House.	
1884—Nov. 5	Anderson (U.S.A.)	Doxey's Theatre (I)	Opened June 12, 1884. Fire broke out at 12.30 A.M. in adjoining stable after performance. Nothing saved.
1884—Nov. 16	Smyrna	Greek Theatre Euterpe	Burnt at 3.30 A.M., with four adjacent houses. Cause of fire unknown.
1884—Nov. 19	Southampton	Gaiety Theatre of Varieties	Only just opened. Burnt during the night, after a performance, with the old theatre adjoining.
		The Old Theatre	Built 1766. Burnt in the fire which destroyed the Gaiety Theatre.
1884—Nov. 23	St. Louis (U.S.A.)	Grand Opera House	Burnt at 3 P.M., after a rehearsal. Fire probably caused through defects in the heating apparatus.
1884—Nov. 23	Stettin	Thalia Theatre	Built 1869. Burnt at 3.30 A.M., after the performance. Cause of fire unknown.
1884—Dec. 14	Corming (U.S.A.)	Barry's Opera House	Burnt during the night, with an adjoining hotel.
1884—Dec. 14	Chippewa Falls (U.S.A.)	The Opera House	Further particulars not obtainable.
1884—Dec. 23	New York	Hart's Opera Comique	Built 1881. Burnt at 7.30 A.M. Cause of fire unknown. Nothing saved.
1884—Dec. 25	Minneapolis (U.S.A.)	Academy of Music	Particulars unreliable.
1884—Dec. 28	Racine (U.S.A.)	Blake Opera House	Built 1882. Burnt at 1.30 A.M., with the whole block of houses. Three people perished in the flames.
1885—Jan. 29	Rondout (U.S.A.)	Sampson's Opera House	Burnt with a number of houses.
1885—Feb. 6	Mount Sterling (U.S.A.)	The Opera House	No further details obtainable.
1885—Feb. 7	Exeter	The Theatre (II)	Burnt at 6 A.M. Fireworks had been used at the preceding performance.
1885—Feb. 14	Waal (Bavaria)	The Theatre	Building burnt at 2.30 A.M.
1885—Feb. 22	Oscarhamn (Sweden)	The Theatre	Burnt at 7 P.M., during a fête. All the spectators reached the exits in safety.
1885—Feb. 27	Washington	National Theatre (V)	Burnt at 1.30 A.M., after the performance. Fire broke out behind the stage. Several houses were destroyed.
1885—Mar. 8	Albany (U.S.A.)	The Opera House	Burnt with a whole block of houses.
1885—Mar. 20	Macara (Oran)	The Theatre	Burnt at 6 P.M., before the performance. Fire caused by the falling of the chandelier, in which oil-lamps were used.
1885—Mar. 25	Buffalo	The Music Hall	Opened June 1883. Burnt at 8 P.M. Fire broke out in the attics before the performance. Two people perished in the flames. A church and several houses also destroyed.
1885—April 17	Richmond (U.S.A.)	Circus Kloseberg	A wooden building, completed a few weeks previously. Fire broke out during the performance. Great panic caused. Nearly 100 persons suffocated, and a great many injured; about fifty horses burnt.
1885—April 21	Nimes	Théâtre de la Renaissance	Burnt at 5 A.M. Cause of fire unknown.
1885—April 22	Szegedin	New Theatre	Opened 1883. Burnt at 3 P.M., after a rehearsal. A gauze curtain caught fire.
1885—April 29	Rahway (U.S.A.)	Gordon's Opera House	Burnt with several adjoining houses.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1885—May 2	London	Theatre in Japanese Exhibition	Burnt at 8.30 A.M. Cause of fire unknown. One attendant burnt, and several severely injured.
1885—May 5	Vincennes (U.S.A.)	Green's Opera House	Burnt at 3 A.M., with several public buildings and a few private houses.
1885—May 12	Chatham	Barnard's Music Hall	Burnt at 3.30 A.M., after the performance. Fire broke out on the stage.
		Theatre Studenikow	A temporary wooden building on the parade ground. Burnt at 8.30 A.M., with several small buildings.
1885—May 22	St. Petersburg	Theatre Malajero	A wooden building on the parade ground. Burnt at 9 A.M. Caught fire from the Theatre Studenikow, adjoining.
		Theatre Fedorow	A wooden building on the parade ground. Burnt at 9 A.M.
1885—May 28	Medford (U.S.A.)	The Opera House	Burnt with a great many public and private buildings.
1885—June 4	Plainwell (U.S.A.)	The Opera House	Particulars unknown.
1885—June 11	San Francisco	Chinese Theatre	Burnt with several adjoining houses.
1885—Aug. 3	Bowling Green (U.S.A.)	The Opera House	Particulars unreliable.
1885—Oct. 26	Antwerp	Eden Theatre	Built 1884. Burnt at 1 A.M. Fire broke out under the stage. The artists were saved with considerable difficulty.
1885—Dec. 6	Moscow	German Theatre (II)	Rebuilt September 14, 1884. Burnt at 7.15 P.M., one hour before the commencement of the performance. Fire caused through overheating. One fireman injured.
1886—Jan. 1	Detroit (U.S.A.)	Grand Theatre	Burnt at 10 A.M., with several houses. One officer of the fire brigade killed; two men injured.
1886—Jan. 15	Lexington (U.S.A.)	The Opera House	Burnt with several business premises.
1886—Jan. 17	Bay City (U.S.A.)	The Opera House	The post office and several adjoining houses destroyed.
1886—Jan. 28	Franklin (U.S.A.)	The Opera House (II)	Burnt with an entire block of houses.
1886—Feb. 12	Lerida (Spain)	Theatre in Campos Eliseos	Particulars unreliable.
1886—Feb. 20	Piræus	Tivoli Theatre.	
1886—Feb. 27	Orleansville (Algiers)	The Theatre	A wooden building. Burnt with adjoining houses.
1886—Mar. 1	Whitehall (U.S.A.)	Hall's Theatre	Burnt with several other buildings.
1886—Mar. 12	Lemberg (Austria)	Municipal Theatre	Fire broke out at 2 P.M., in ground floor. Hydrants used. Stage unharmed.
1886—Mar. 21	Helena (U.S.A.)	The Opera House	Burnt at 3 A.M., with three entire blocks of houses.
1886—Mar. 30	Key West (U.S.A.)	San Carlos Theatre	Burnt at 10 A.M., whilst preparing for a rehearsal. A large part of the town, with several churches and public buildings, destroyed.
1886—April 1	Mayence	Circus Baese	Temporary building. Fire broke out at 12.30 A.M., in the stables. Nearly all the animals burnt. Many of the fair stalls were destroyed,
1886—April 12	Paris	Prado Music Hall	A wooden building. Burnt at 3 A.M. Fire broke out on the stage. Nothing saved.
1886—April 20	Oestersund (Norway)	New Theatre	Opened 1885. Burnt at 11.30 P.M., after the close of the performance.
1886—May 6	Derby	Grand Theatre	Opened March 25, 1886. Fire broke out at the back of stage at 7 P.M., just before rise of curtain, about 600 people already being present. One actor and two workmen burnt.
1886—May 15	Bochum	The Old Theatre	Particulars unreliable.
1886—May 22	Wilna	Circus Ferroni.	
1886—June 7	Louisville (U.S.A.)	Grand Theatre	Opened 1882. Fire broke out on the stage at 4 A.M. Many adjoining houses destroyed.
1886—June 10	Tonowanda (U.S.A.)	Mozart's Variety Theatre	Built 1883. Burnt at 2.30 A.M., with thirty houses.
1886—June 29	Revel	Circus Ciniselli	A temporary wooden building. Burnt, after the performance, at 2 A.M. One man killed and two injured.
1886—July 6	Denver (U.S.A.)	Academy of Music	Burnt, with several houses, at 1 A.M. One man burnt.
1886—July 26	Tinnevelly (India)	Indian Theatre	A temporary building. Fire broke out on the stage during the performance. 113 people killed, and many injured.
1886—Aug. 7	Buda-Pesth	Circus Frankloff	A temporary building. Fire broke out in the stable at 1.30 P.M. Several of the horses were burnt.
1886—Aug. 8	Hastings (U.S.A.)	Newton's Opera House	Burnt in the evening, with other buildings.
1886—Sept. 14	Elgin (U.S.A.)	Du Bois' Opera House	Burnt with a whole block of houses.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1886—Oct. 2	Amesbury (U.S.A.)	Merrimac Opera House	Burnt during the night.
1886—Oct. 6	Jassy	Circus Richter	A wooden building. Burnt at 4 A.M., with eight adjoining buildings.
1886—Oct. 17	Ravenna	Teatro Filodramatico	Burnt during the night. One woman killed, and several injured.
1886—Oct. 18	Salisbury (U.S.A.)	The Opera House	Burnt at 7.30 P.M., with a large part of the town.
1886—Oct. 18	Oakland (U.S.A.)	The Opera House	Burnt down at 10 P.M. Further details not forthcoming.
1886—Oct. 26	Murfreesboro' (U.S.A.)	The Opera House	Burnt shortly after midnight, with several blocks of houses.
1886—Dec. 2	Brookton (U.S.A.)	The Opera House	Burnt at 10 P.M., with several other houses.
1886—Dec. 5	Washington	Herzog's Opera House	Opened a few years previously. Fire broke out below the stage at 3 A.M. One man killed.
1886—Dec. 22	Oskaloosa (U.S.A.)	The Opera House	Burnt with the post office and four private houses.
1886—Dec. 27	Philadelphia	Temple Theatre	Newly opened. Fire broke out above the stage at midday, during a rehearsal. Two persons killed, and several injured.
1886—Dec. 27	Eggenberg	The Colosseum.	
1887—Jan. 2	New Lisbon (U.S.A.)	Managhan's Opera House	Burnt during the night, with an entire block of houses.
1887—Jan. 11	Gottingen	Municipal Theatre	Fire broke out on the stage at midnight, after a performance. Cause unknown.
1887—Jan. 16	Bucharest	Circus Sidoli	A new building. Burnt before it was opened.
1887—Feb. 12	Northampton	New Opera House	Opened three months previously. Burnt soon after the close of a performance.
1887—Feb. 12	Augusta (U.S.A.)	The Opera House (III)	Burnt at 6 P.M., after the close of a matinée. Several adjoining houses also destroyed.
1887—Feb. 17	Laibach	The Theatre	Built 1764. Burnt at 1.30 A.M., a few hours after the performance. There had been firearms used during the play.
1887—Feb. 18	Salem (U.S.A.)	The Opera House	Burnt with a block of houses.
1887—Feb. 20	Columbus (U.S.A.)	Grand Opera House	Burnt during the night.
1887—Mar. 18	Buffalo (U.S.A.)	St. James's Hall (II)	Built 1862. Burnt at 3.30 A.M., with several adjoining houses.
1887—Mar. 21	Troy (U.S.A.)	Grand Central Theatre (II)	Built 1882. Burnt during the night. Cause of fire unknown
1887—Mar. 28	Ghent	Circus Herzog	Three people killed.
1887—April 2	Berwick (U.S.A.)	The Opera House	Burnt with an hotel and several houses.
1887—April 5	Southampton	Manor House Theatre	Burnt during the night.
1887—April 6	Missoula (U.S.A.)	Maguire's Opera House	Burnt with several adjoining buildings.
1887—May 6	Eperies (Hungary)	The Theatre	Burnt down with a part of the town.
1887—May 25	Paris	Opéra Comique	Opened May 16, 1840. Fire broke out in the upper scenery at 9 P.M. 115 persons killed, and about sixty badly injured.
1887—May 27	Neschin	Circus Nikitin	A temporary wooden building. A sudden storm damaged building and caused an outbreak of fire. About 300 people sustained injuries, to which many succumbed.
1887—June 26	Rotterdam	Cosmopolitan Music Hall	Burnt during the night. The proprietor killed.
1887—June 28	Rouen	Théâtre Lafayette	Burnt with two adjoining houses, at 2.45 A.M. Cause of fire unknown. Nothing saved. Two persons injured.
1887—July 1	New Orleans	Old German Theatre	Burnt at midnight. Seven workmen killed.
1887—July 4	Caceres (Spain)	Variety Theatre	Building completely destroyed.
1887—July 9	Hurley (U.S.A.)	Alcazar Variety Theatre	A light wooden building. Burnt during the performance, with a part of the town. Seventeen people belonging to the company killed.
1887—July 10	Venloe	Municipal Theatre	Burnt during the night.
1887—Aug. 3	Toulouse	Pré-Catelan Theatre	A small theatre. Fire supposed to be due to arson.
1887—Aug. 10	Brooklyn (U.S.A.)	King's New Opera House	Burnt with several other houses. One man killed, and another injured.
1887—Aug. 22	Socorro (New Mexico)	The Old Opera House	Burnt with several other houses in the afternoon.
1887—Aug. 26	Stockport	The People's Opera House	Burnt during the night, after a performance.
1887—Aug. 29	Richmond (U.S.A.)	Green's and the New Opera Houses	Burnt at night, with a number of business premises.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1887—Sept. 5	Exeter	New Theatre Royal (iii)	Opened October 13, 1885. Fire broke out in the upper part of the stage at 10.30 P.M., during a performance. Great panic, in which 180 people were killed, and more than 100 injured.
1887—Sept. 12	Edinburgh	Newsome's Circus	Burnt shortly before midnight, soon after the close of the performance.
1887—Sept. 14	Calais	Variety Theatre	Burnt at 1 A.M., after the close of a performance. Fire noticed first from outside.
1887—Sept. 17	Ironwood (U.S.A.)	Alhambra Theatre	Burnt in the afternoon, with the post office and several adjoining houses.
1887—Sept. 18	Ottumwa (U.S.A.)	Lewis Opera House	Building completely destroyed.
1887—Sept. 21	Metzingen	Circus Lorch	Burnt to the ground. No one injured.
1887—Nov. 2	Hamburg	Circus Renz	Built 1878. Burnt at 11.30 A.M. No performances were being given.
1887—Nov.	Bridgeport (U.S.A.)	Barnum Circus.	
1887—Dec. 26	Wakefield (U.S.A.)	Vaudeville Theatre	Burnt in the evening, with a part of the town. Fire caused through carelessly handling an oil lamp. Nothing saved.
1888—Jan. 1	Antwerp	Alhambra Theatre	Built 1872. Burnt at 9 P.M. Fire first noticed from outside. The porter and his family were saved. This fire caused a panic in two adjoining theatres.
1888—Jan. 4	Bolton	Theatre Royal (ii)	Built 1882. Burnt at 1 A.M. after the performance, with several other houses. Due to arson. The extinguishing apparatus would not work. Nothing saved.
1888—Jan. 16	Steubenville (U.S.A.)	Cain's Wintergarden Theatre	Opened July 4, 1887. Fire broke out on the stage at 5 P.M., after a rehearsal. An adjoining hotel was also destroyed. An actor was killed, and several people injured.
1888—Jan. 28	Madrid	Variety Theatre	Built 1843. Burnt at 5.30 A.M. The last scene in the performance represented a fire. Three people killed.
1888—Jan. 28	Malone (U.S.A.)	The Opera House	Burnt in the night, with several houses. One person killed.
1888—Feb. 6	Rio Tinto	The Theatre	Burnt in the afternoon, just before the opening of the box office.
1888—Feb. 13	Blyth	The Theatre	Burnt during the night, after the performance. No lives lost.
1888—Feb. 18	Providence (U.S.A.)	Theatre Comique	Built 1884. Burnt after midnight, with a number of houses. Cause of fire unknown.
1888—Feb. 20	New York	Gautzberg's Theatre	Burnt during the night, with several houses. Two people killed, and many severely injured.
1888—Feb. 28	New York	Union Square Theatre	Opened September 11, 1871. Burnt, with the Morton House Hotel, at 1 P.M. Fire broke out in the roof. Six firemen badly injured.
1888—Feb. 29	Jassy	National Theatre	Burnt at 11 P.M., after a dress rehearsal. Nothing saved.
1888—Mar. 20	Oporto	Théâtre Baquet	Opened 1860. Fire broke out in the upper part of the stage at 11 P.M., shortly before the close of the performance. 170 people suffocated or trampled to death. Many severely injured.
1888—Mar. 24	Philadelphia (U.S.A.)	Central Theatre	Fire incurring a loss of about £4000.
1888—April 1	Celaya (Mexico)	The Arena	A temporary building of wood and matting. Burnt at 5 P.M., during a bull fight. Fire due to arson. Thirty people killed, and sixty-eight injured.
1888—April 22	Grantham	Theatre Royal	Burnt between 2 and 3 A.M. Fire first noticed from the street.
1888—April	Kjoeng (Corea)	National Theatre	Built entirely of wood. Burnt during a performance. Dreadful panic. About 650 people burnt or suffocated, nearly all natives.
1888—May 9	Tameka (Japan)	Japanese Theatre	The fire destroyed more than a hundred houses.
1888—June 6	New York	Tony Pastor's Theatre	Opened July 4, 1868. Burnt at 6.15 A.M. Cause of fire unknown. The theatre was completely destroyed, and the block in which it was situated damaged.
1888—June 6	Nice	Summer Theatre	A wooden building. Burnt at 7.30 P.M., before the performance. Probably due to carelessness in lighting the gas.
1888—June 12	Montauban	The Theatre	Burnt at 1 A.M., after the performance.
1888—July 3	Bordeaux	Bouffes Bordelaises	Burnt at 4 A.M., after a grand concert. The adjoining buildings damaged.
1888—July 23	Butte (Montana)	McGuire's Opera House	Burnt during the performance. The gas set fire to upper part of scenery. None of the audience were injured. The water apparatus was out of order.
1888—July 25	St. Louis (U.S.A.)	Summer Theatre in Schneider's Garden	A wooden building. Burnt at midnight, an hour after the close of the performance. Nothing saved.
1888—Aug. 20	St. John's (New Brunswick)	Opera House in Dockerill's Block	Burnt at 2 P.M. Fire broke out before the building was completed. Cause unknown.
1888—Sept. 13	Syracuse (U.S.A.)	Linch and Moore's Opera House	Burnt at 3 A.M., after a performance. Fire destroyed a whole block of houses.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1888—Sept. 13	London	Olympic Theatre	Fire broke out shortly after conclusion of performance. Caused by lamp being overturned. Theatre firemen not on the spot. Back of theatre destroyed.
1888—Sept. 14	Washburn (U.S.A.)	The Opera House	Burnt at 2.30 A.M. Thirty other houses destroyed. People rescued with great difficulty.
1888—Sept. 14	Kiev	Theatre in Bojarski Park	Burnt after the close of the performance. Fire broke out on the stage. Three people killed.
1888—Sept. 14	Detroit (U.S.A.)	Grand Opera House	Burnt in the evening, with a block of houses. Fire first seen from outside.
1888—Oct. 6	Dundee	Theatre Royal	Built seventy-eight years previously. Burnt at 1.30 A.M. Preparations for the reopening of the theatre had been in progress.
1888—Oct. 21	Charleroi	Théâtre Casti	An old building. Fire broke out on the stage at 2 A.M., after the performance. Workmen sleeping on the premises were saved.
1888—Oct. 23	Wilmington (U.S.A.)	Proctor and Soulier's Academy of Music	Burnt at 8.30 P.M. Fire broke out below the stage. Cause unknown. No performance.
1888—Nov. 10	Smolensk	Winter Theatre	Burnt at 5 A.M. Noticed first from the outside. Nothing saved.
1888—Dec. 12	Neumünster	The Theatre	Opened 1878. Burnt at 6.30 P.M., with an adjoining factory.
1888—Dec. 25	Nishni-Novgorod	Municipal Theatre	Fire broke out during the performance; caused by defect in gas pipe. A great panic ensued. Several people were suffocated, others injured. No further details are known.
1888—Dec. 30	Kirkcaldy	Grand Theatre	Burnt at 2.30 A.M. First noticed from outside. Workmen had been making preparations for the New Year's performance.
1889—Jan. 3	Newark (U.S.A.)	Union Park Hall	Burnt during the night whilst the building was empty. Fire broke out on the stage. Cause unknown.
1889—Jan. 21	St. Paul (U.S.A.)	Grand Opera House	Burnt at 7 A.M., with several houses. Nothing saved.
1889—Jan. 28	Duluth (U.S.A.)	Grand Opera House	Burnt at 2 A.M., with the adjoining houses. Fire broke out below the stage. One man killed by the falling of a wall.
1889—Feb. 8	Aldershot	Theatre Royal	Burnt at 7.15 P.M., immediately before the performance. Caused through carelessness in lighting a gas batten. The audience, already in the building, as well as the artistes, were saved. An adjoining house burnt.
1889—Feb. 15	Cape Vincent (U.S.A.)	The Opera House	Burnt at 3 A.M., with several blocks of houses. Nothing saved.
1889—Feb. 22	Solarolo	Municipal Theatre	A small building. Burnt at 10 A.M. Cause of fire unknown.
1889—Feb. 26	Manchester	Circus Royal	A wooden building. Burnt after the performance. The audience had already left. Some of the horses burnt.
1889—Feb. 28	Leicester	Paul's Theatre of Varieties	Burnt at 7 A.M. Fire first noticed from outside. Nothing saved.
1889—Mar. 5	Altoona (U.S.A.)	Slack's Mountain City Theatre	Burnt during the night. Cause of fire unknown.
1889—Mar. 7	New Orleans	Farantas Theatre	Built 1883. Burnt at 5 A.M., after the performance. Fire broke out on the stage. Fourteen adjacent buildings were burnt.
1889—Mar. 22	Dover (U.S.A.)	City Opera House	Built 1867. Burnt with the City Hall and many other buildings at 2.30 A.M. Four firemen injured.
1889—April 2	St. Joseph (U.S.A.)	Grand Opera House	Burnt in the night, after the performance.
1889—April 8	Princeton (U.S.A.)	The Opera House	Burnt with a number of adjoining houses.
1889—April 18	Tarentum (U.S.A.)	The Old Opera House	Fire broke out below the stage at 3 A.M. Several adjacent buildings burnt. Cause of fire unknown.
1889—April 22	Melbourne	Bijou Theatre	Built 1876. Burnt in the early morning. Adjoining buildings damaged. Two firemen killed and thirteen injured by the falling of a wall.
1889—April 30	Chicago	Windsor Theatre	Burnt shortly after the performance. Fire broke out on the stage.
1889—May 3	Hazleton (U.S.A.)	The Opera House (1)	Burnt in the night, with several adjoining houses.
1889—May 6	Tuchel (Germany)	Eilers Theatre	Burnt, with the hotel, at 1 A.M. Cause of fire unknown.
1889—May 16	Worcester (U.S.A.)	The Theatre	Built 1868. Burnt at 3 A.M., after a performance. Fire broke out at the back of the stage. Two firemen injured.
1889—June 6	Burnley	The Theatre	Burnt in the night.
1889—June 6	Seattle (U.S.A.)	Frye's Opera House	Burnt at 4.30 P.M., with a large part of the town. Houses nearly all built of wood. More than thirty people killed.
1889—June 29	Bradford	Theatre of Varieties	Built in 1887, almost entirely of wood. Burnt at 5 P.M. Cause of fire unknown.
1889—June 30	Cleveland (U.S.A.)	Academy of Music	Built 1853. Fire broke out on the stage at 4 A.M.
1889—June	Wetelback	State Theatre	Building entirely destroyed.
1889—July 4	Ellensburg (U.S.A.)	Nash Opera House	Burnt at 11 P.M., with ten blocks of houses.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1889—July 9	Witebsk	Municipal Theatre	A large building. Burnt in the afternoon. A flash of lightning set fire to the stage.
1889—August	Catania	San Carlino Theatre	Building entirely destroyed. Date of fire uncertain.
1889—Aug. 4	Spokane Falls (U.S.A.)	Falls City Opera House	Constructed almost entirely of wood. Burnt in the evening, with thirty blocks of houses and many public buildings.
1889—Aug. 11	Livingstone (Montana)	Park Opera House	Burnt with several adjacent buildings. Attributed to arson.
1889—Sept. 1	Milan	Teatro Monte Tabor	A wooden summer theatre. Burnt at 11.45 P.M., after a performance. Nothing saved.
1889—Sept. 18	Rushville (U.S.A.)	The Opera House	Burnt in the night. The building was closed at the time. The fire spread over several blocks of houses.
1889—Sept. 22	Reggio (Emilia)	Teatro Correggio	Burnt at 1 A.M. Believed to be an act of arson. No play had been given on the previous evening.
1889—Sept. 25	Johannesburg (Transvaal)	Globe Theatre	A small wooden building. Burnt during the night.
1889—Sept. 25	Mantua	The Theatre	Two workmen suffocated. No further particulars.
1889—September	Nantes	Priami Circus	Date uncertain.
1889—September	Bologna	Politeama Sparadi	Date uncertain.
1889—Oct. 5	Palermo	Teatrino	Fire broke out at 8.30 A.M. Caused by defective gasfitting. Several adjoining houses burnt.
1889—Oct. 24	Vanticote (U.S.A.)	Smoulter's Opera House	Two adjoining houses burnt.
1889—Oct. 31	Stalybridge	Royal Victoria Theatre	Built 1861. Building destroyed. Fire commenced on the stage at 1.30 A.M. First observed from outside.
1889—Nov. 18	Barcelona	Spanish Theatre	Fire broke out about midnight. Building burnt down. Supposed cause, carelessness with the gas.
1889—Nov. 19	Tunis	Théâtre Français	Built of wood. Fire broke out at 3 A.M. Building and contents destroyed.
1889—Dec. 3	Shell Lake (U.S.A.)	The Opera House	Fire broke out at night in adjoining house. Burnt down with two adjoining hotels and several blocks of houses.
1889—Dec. 6	Paris	Théâtre Duprez	Fire broke out at 4 P.M. No performance. Originated from gas stove, through carelessness of concierge.
1889—Dec. 20	Buda-Pesth	German Theatre	Built 1868. Building burnt down. Fire broke out in the stalls at 3 P.M., immediately after rehearsal. Probably due to incendiarism. Iron curtain used with great effect, keeping fire from the stage for some time.
1889—Dec. 22	Salamanca	Teatro Liceo	Building destroyed. Several people injured.
1889—Dec. 29	Florence	Teatro Umberto	Opened 1870. Fire broke out on the stage at 6 o'clock in the evening. Building entirely destroyed. Caused by carelessness with the gas.
1889—December	Bahia	Teatro Roma	Building burnt down.
1889—December	Boston	Globe Theatre (II)	Building entirely destroyed.
1889—December	Madrid	The Theatre	Building destroyed. Eight persons injured.
1889—December	Paris	Eldorado Music Hall.	
1890—Jan. 1	Zürich	The Theatre	Built 1834. Building completely gutted. Fire broke out during performance. Iron curtain used. Through the presence of mind of an actor, panic prevented.
1890—Jan. 2	Rhondda Valley	The Theatre	Fire broke out immediately after performance. Building completely destroyed. Origin unknown.
1890—Jan. 7	Hâvre	Théâtre de l'Alcazar	Building entirely destroyed. Fire began at 2 A.M. Nothing saved.
1890—Jan. 7	Brussels	Théâtre de la Bourse	Opened December 31, 1885. Building totally destroyed. Fire began on the stage between 2 and 3 A.M. Cause unknown. Watchman not at his post.
1890—Jan. 13	Montauban	Théâtre Sebastien	Built 1889. Building destroyed. Fire broke out in the early morning, after the performance. Origin unknown.
1890—Feb. 19	Black River (U.S.A.)	Poo's Opera House	Theatre destroyed with post-office buildings and several houses.
1890—Feb. 20	Amsterdam	Municipal Theatre	Opened 1874. Fire broke out at 5 A.M., after a special performance on the King's birthday. Interior entirely destroyed. Fireworks had been used.
1890—Mar. 2	Oshkosh (U.S.A.)	Turner Opera House	Fire broke out at 4 A.M., after a performance. Cause unknown.
1890—Mar. 16	Stettin	Summer Theatre	Fire broke out in a dressing room under the stage at 3 P.M. Nothing saved.
1890—Mar. 23	Fairfield (U.S.A.)	The Opera House	Building burnt down with adjoining block of houses.
1890—Mar. 24	Bromberg (Germany)	Municipal Theatre	Built 1840, mostly of wood. Fire broke out at 2 P.M., after a rehearsal. Building completely destroyed.
1890—Mar. 25	Bismark (U.S.A.)	The Old Opera House	Fire broke out at 2 A.M. Attributed to arson. Building destroyed with two other blocks of houses.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1890—March	Lyons	Théâtre Bellecour	A small building. Damage £320.
1890—April 16	Birkenhead	Theatre Royal (i)	Built 1866. Fire broke out at 3.10 P.M., doing considerable damage.
1890—April 22	Harrodsburg (U.S.A.)	The Opera House	Fire broke out in the evening. No performance. Building entirely destroyed, with a number of adjoining houses.
1890—April 22	Kiel	Wriedt's Theatre and Concert House	Fire broke out at 11.30 P.M. Stage and auditorium entirely destroyed.
1890—April 27	Sandy Creek (U.S.A.)	Buckley Opera House	Theatre, with adjoining blocks, including hotel, shops and post office, destroyed.
1890—April 30	Kansas City	Fountain Theatre	Fire broke out early in the morning.
1890—June 9	Constantinople	French Summer Theatre	Building completely destroyed. Fire began during the forenoon; attributed to arson. No performance had been held.
1890—June 10	Brooklyn	Variety Theatre	Building completely destroyed. Fire broke out just after the performance. Cause unknown.
1890—June 30	Troy (U.S.A.)	The Opera House	Building totally destroyed. Fire broke out in the afternoon. Telegraph bureau, shops and several other buildings burnt.
1890—July 1	Alabama	Tray's Opera House	Building burnt to the ground.
1890—July 3	Salt Lake City (U.S.A.)	Grand Opera House	Fire broke out at 10 P.M., after the performance. Originated in upper part of stage. Adjoining buildings badly damaged.
1890—July 12	St. Petersburg	Grand Theatre	Interior materially damaged. Carcass saved.
1890—July 24	Earlville (U.S.A.)	The Opera House	Built 1881; mostly of wood. Fire broke out early in morning at back of theatre. Building destroyed with several adjoining houses.
1890—July 27	Wallack (U.S.A.)	The Club Theatre	Building principally of wood. Fire broke out in the afternoon. The theatre, with many adjoining buildings, destroyed.
1890—July 30	Seneca (U.S.A.)	Daniel's Opera House	Fire broke out at 2 A.M. The building destroyed with many adjoining houses. Several persons injured. Cause of fire unknown.
1890—Aug. 1	Farina (U.S.A.)	Switzer's Opera House	Fire broke out at night. The building and many adjoining houses destroyed. Cause of fire unknown.
1890—Aug. 3	What Cheer (U.S.A.)	The Opera House	Many adjoining houses and a church burnt down. Attributed to arson.
1890—Aug. 17	Manchester	Queen's Theatre (ii)	Fire began at 4.20 P.M. Building and contents practically destroyed; only the stage saved. Fire originated in an outhouse.
1890—Aug. 26	Chicago	MacVicker's Theatre (ii)	Built 1872. Fire broke out under the stage at 3 A.M. Building destroyed. Several firemen injured. Attributed to arson.
1890—Aug. 26	Tokay (Hungary)	The Theatre	Building totally destroyed.
1890—Sept. 1	Aarhaus	Old Vennelyst Theatre	Fire broke out at night, some hours after the performance. Building and contents burnt. Origin unknown.
1890—Sept. 2	Bremen	Lühr's Tivoli Theatre	Built 1845. Fire broke out at 11 P.M., half-an-hour after close of performance. Caused by fireworks used on stage. Building destroyed. Adjoining houses damaged. One fireman killed.
1890—Sept. 4	Catania	Théâtre Arene Calypso	Fire broke out early in the morning. Building destroyed. Spread of fire prevented with considerable difficulty.
1890—Sept. 17	Lourches (France)	Annual Fair Theatre	A wood building. Fire caused by a large petroleum lamp falling into area during children's performance. Eight children killed, twenty-seven seriously injured through a panic. Nothing saved.
1890—Sept. 30	Bordeaux	Grand Hippodrome	Opened April 1890. Fire broke out in early morning, after a performance. Cause unknown. Building completely destroyed, and all properties.
1890—Oct. 27	West Middlesex (U.S.A.)	Barnett's Opera House	Fire broke out on the stage. An adjoining block of houses burnt down, and many others damaged.
1890—Nov. 2	Brussels	Gallery Theatre	Fire broke out on the stage shortly after performance. Carcass saved; contents burnt.
1890—Nov. 13	Irkutsk (Siberia)	Municipal Theatre	Building destroyed. Fire occurred in the afternoon.
1890—Nov. 14	Lublin (Poland)	Summer Theatre	Building destroyed. No performance had been held.
1890—Nov. 23	Madrid	Comedy Theatre	Further particulars unreliable.
1890—Nov. 24	Strasburg	Bruckmann's Variety Theatre	Fire broke out in the gallery at 4.30 A.M. Stage and auditorium destroyed; dressing rooms saved. Fire attributed to carelessness of a smoker.
1890—Dec. 9	Clermont-Ferrand	Variety Theatre	Building destroyed. Fire broke out in the upper gallery about 3 A.M. A fireman was seriously injured.
1890—Dec. 25	Portsmouth	Royal Amphitheatre	Built 1878. Building burnt to the ground. Fire occurred in the evening between two performances. Cause unknown. No lives were lost.
1890—Dec. 25	Baltimore	Theatre in Masonic Hall	Fire broke out on the stage at 11 P.M. an hour and a half after performance. Nothing saved. Several adjoining houses damaged.
1890—Dec. 28	Minneapolis	Bijou Theatre	Built 1887. Fire broke out on stage at 7 A.M. Building destroyed and nothing saved. Several adjoining houses damaged. No fatalities or accidents.
1890—Dec. 30	Augusta (U.S.A.)	Granite Hall	Building completely destroyed. Cause of fire unknown.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1891—Jan. 2 . .	New York . .	Fifth Avenue Theatre . .	Opened December 1873. Fire broke out under stage at 11.45 P.M., directly after performance. First seen by watchman going his rounds. Nothing saved. The adjoining hotel much damaged as well as Hermann's Theatre. No one killed; several firemen injured.
1891—Jan. 20 .	Winona (U.S.A.)	The Opera House	Burnt down at the close of the evening performance. Nothing saved. Cause unknown.
1891—Feb. 12 .	Remscheid (Germany)	Germania Hall	Fire broke out in the early morning. Nothing saved. Cause of fire unknown. An actor and two actresses, living on the premises, burnt.
1891—Feb. 24 .	Evansville (U.S.A.)	People's Opera House . .	Fire began on the stage at 6 A.M. Caused by defective electric installation. Nothing saved. Several adjoining houses burnt.
1891—Mar. 16 .	Fowlerville (U.S.A.)	The Opera House	Burnt down together with post office, express office and several blocks of houses.
1891—Mar. 17 .	Sherburne (U.S.A.)	The Opera House	Fire broke out late at night. Nothing saved. Adjoining factory destroyed.
1891—Mar. 18 .	Joliet (U.S.A.) .	The Opera House	Fire broke out in the early morning; a number of adjoining buildings destroyed.
1891—Mar. 24 .	Ystad (Sweden)	Municipal Theatre	Built 1886. Fire broke out on the stage after the evening performance. Many houses were damaged, together with the post office. The caretaker and family narrowly escaped.
1891—April 3 .	Lessines . . .	The Theatre	Fire commenced during the performance. A great panic ensued; several killed and many injured.
1891—April 13 .	Chicago . . .	Haymarket Theatre . . .	Building destroyed.
1891—April 30 .	Schwedt (Germany)	Summer Theatre (?) . . .	Building entirely destroyed.
1891—May 12 .	Plano (U.S.A.) .	The Opera House	Building burnt as well as several adjoining houses.
1891—May 21 .	Stafford Springs (U.S.A.)	Eaton's Opera House . . .	Building burnt with several adjoining houses.
1891—May 31 .	Nashville (U.S.A.)	Buckingham Theatre . . .	Fire broke out at night. Nothing saved.
1891—June 10 .	Baltimore . .	Concordia Opera House . .	Theatre closed for the summer. Cause of fire unknown.
1891—July 5 .	St. Paul . . .	Park Theatre (formerly the Harris Theatre)	Built 1872. Fire broke out at 2 A.M., after performance. Cause unknown. Nothing saved. No one killed or injured.
1891—July 10 .	Lingras (Philippines)	The Theatre	The building was of wood. Fire broke out during the evening performance. Caused by an accident with a petroleum lamp. Nothing saved. Forty-six killed; many injured.
1891—July 17 .	Wyoming . . .	The Opera House	Fire broke out at daybreak. The building burnt, with a complete block of houses and post office. Cause of fire unknown.
1891—Sept. 2 .	Buenos Ayres .	Teatro San Martino . . .	Fire commenced on the stage at 7.30 P.M., just after entrance of public. Caused by a gas explosion which partly shattered the iron curtain. No fatalities, but six of the audience and sixteen artistes injured.
1891—Sept. 12 .	Rochefort . .	The Theatre	Fire began after the performance. The building was destroyed with the Hotel Rochelle and several other houses. Two people were injured.
1891—Sept. 17 .	Memphis (U.S.A.)	The Theatre	Fire broke out early in the morning after a performance. Building completely destroyed.
1891—Sept. 21 .	Lubeck . . .	Variety Theatre	Fire broke out during the performance. Nothing saved. A great panic ensued, but only few were injured.
1891—Sept. 25 .	Liverpool . .	Gaiety Theatre (now Empire)	Opened about 1860. Fire commenced at 8 A.M. in upper part of stage. Gallery entirely destroyed and other parts of the building seriously damaged.
1891—Oct. 18 .	Grand Forks (U.S.A.)	The Opera House	Fire broke out on stage at 8 A.M. Flames first seen coming through the roof. Practically nothing saved. Five adjoining houses destroyed. No lives lost.
1891—Oct. 22 .	Lancaster (U.S.A.)	The Opera House	Cause of fire unknown. Several houses burnt.
1891—Oct. 26 .	Lacrossa . . .	Germania Theatre	Building destroyed.
1891—Oct. 28 .	Bayonne (U.S.A.)	Newark Winter Club House	Built 1888. Fire broke out just before performance, after some of the public had been admitted. The act-drop caught fire. Nothing saved. Several houses also burnt. No one injured.
1891—Nov. 10 .	Charkow . . .	Summer Tivoli Theatre . .	No performances being given. Building and contents destroyed. No lives lost.
1891—Nov. 21 .	Syracuse (U.S.A.)	Standard Theatre	Fire broke out during the night. Several adjoining houses burnt.
1891—Nov. 23 .	Baltimore . .	Music Hall	Building struck by lightning. Several people killed.
1891—Nov. 24-25	Oldenburg . .	Court Theatre	Opened December 8, 1881. Fire broke out at midnight, two hours after performance. A burning fortress had been represented on the stage. Origin of fire not known. Nothing saved. No lives lost.
1891—Nov. 26 .	St. Aberns . .	Waugh's Opera House . .	Fire broke out at 12.30 P.M. The theatre was destroyed, with several other buildings. Fire originated in adjoining premises. Nothing saved.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1891—Dec. 9	Bremen	Music Hall	Fire broke out at 1 P.M. Some bazaar stalls had been erected, lighted by petroleum, one of which caught fire. No one injured.
1891—Dec. 28	Gateshead	Royal Theatre (now Queen's)	Built about 1882. Slight fire, caused by smoking, in the gallery. Thirteen people were killed through panic.
1891—December	Cleveland (U.S.A.)	Jacobi Theatre	Building destroyed.
1892—Jan. 11	Georgetown (U.S.A.)	McClellon Opera House	Fire broke out at 10 A.M. The theatre, with several houses and an hotel, were destroyed.
1892—Jan. 16	Wansaw (U.S.A.)	The Opera House	Fire broke out early in the day, when there was no performance. Caused by fault in the heating apparatus. A whole block of houses destroyed.
1892—Jan. 22	Leipzig	Music Hall	Fire broke out before noon, when no performance was being given.
1892—Jan. 24	Königsberg	Louis Summer Theatre	A wooden building. Fire broke out in the early morning, and quickly spread over the whole building. Probably caused by some defect in the heating apparatus.
1892—Jan. 25	Columbus	Metropolitan Opera House	Burnt during the morning; no performance had been held. An adjoining block of houses destroyed. The fire did not originate in the theatre. Several people injured.
1892—Jan. 25	Montluçon (France)	Theatre at the Annual Fair	Fire broke out on the stage during the performance. Cause not known. Believed to be a case of arson. No one killed, but many injured.
1892—January	Binchi	Municipal Theatre	Building destroyed. Eighteen people killed.
1892—January	Brussels	Alhambra Theatre	Fire due to an explosion during the performance. Eighteen injured.
1892—Feb. 13	New Orleans	Wenger's Music Hall	Fire began during the evening, and destroyed a large number of business premises as well as the theatre.
1892—Feb. 17	Jesi (Italy)	Teatro Leone	Fire broke out during performance, causing a great panic. The fire was confined to the theatre, and the adjoining houses were but slightly damaged.
1892—Feb. 20	Willem (U.S.A.)	The Opera House	Fire occurred at night.
1892—Feb. 22	Capetown	Theatre Royal	Fire began during the evening performance. Practically everything destroyed. The flames spread to adjoining Freemasons' lodge and the Registrar's office. No loss of life.
1892—February	Breda (Holland)	The Theatre	Fire broke out during the performance. One life lost.
1892—February	The Hague	The Theatre	Fire occurred after the performance; one machinist injured.
1892—Mar. 1	Leipzig	Summer Theatre	Fire broke out at midnight. Attributed to arson. No previous performance.
1892—Mar. 3	Leyden	The Theatre	A panic caused during the performance. Three of the chorus and several of the audience injured.
1892—Mar. 10	Oxford	New Theatre	Fire broke out soon after midnight, doing considerable damage. No lives lost.
1892—March	Trieste	Teatro Politeama	Fire caused by gas explosion during performance; two persons burnt.
1892—April 11	Tokio	The Theatre	Fire broke out in a private house, destroying a part of the town. No performance at the time.
1892—April 27	Philadelphia	Grand Central Theatre (II)	Built 1883. Fire began on the stage shortly before the rise of curtain, causing a great panic. There were few people in the auditorium, but a large number on the stage. Several adjoining houses and an hotel were burnt. The old adjoining Walnut Street Theatre damaged. Fourteen killed, seventy men and boys injured.
1892—April 28	Vienna	Theatre in the Praterstrasse	Fire broke out in the roof about 1 A.M. Building destroyed. Cause of fire unknown; probably a case of arson. Six actors killed and many of the public; seventy badly injured, fifty slightly.
1892—April 30	Troyes (France)	Circus	Fired by anarchists at night, after a meeting held by them on the eve of May 1. An adjoining house also burnt.
1892—April 30	Leadville	Leed's Variety Theatre	Fire broke out under the stage. The theatre and a block of houses destroyed. One woman and one child burnt.
1892—April	Stockton	The Theatre	Building burnt down.
1892—May 1	Winnipeg	Princess' Opera House	Fire began under the stage at 2 A.M. Building destroyed; none of the contents were saved. A block of eighteen houses also burnt.
1892—May 14	Hazleton (U.S.A.)	Grand Opera House (II)	Fire broke out in a dressing room early in the morning. No performances were being given. Nothing saved, and several adjoining houses were destroyed.
1892—May 17	Leipzig	Diorama in Crystal Palace	Fire broke out during the evening.
1892—May 18	Brux	Strobschneider's Amphitheatre	Wooden building. Burnt in the afternoon when no performance was being given. Believed to be due to arson. Nothing saved.
1892—May 20	Lansford (U.S.A.)	The Opera House	Fire commenced at noon. Building destroyed, and several adjoining houses and a school burnt.
1892—May 28	Wellington (U.S.A.)	The Opera House	Building damaged in a storm which set fire to it. Number of killed unknown.
1892—May 28	Liverpool	Olympia (Circus)	Opened 1891. Burnt down at 11.30 P.M., after performance. Building constructed principally of pitch-pine. No lives lost.
1892—May 31	Stralsund	Club Theatre	Fire broke out in the evening, doing considerable damage.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1892—May . .	Antwerp . .	Circus	Date uncertain.
1892—June 1 .	Castellamare .	Teatro Vittorio Emmanuele	Built of wood. Fire occurred at night, after the performance. Building and contents completely destroyed. No lives lost.
1892—June 25 .	Birkenhead .	Theatre Royal (ii)	Built 1866. Fire broke out at midnight on the stage. Scenery and roof damaged to the extent of £150, and building to extent of £200. A watchman on the premises night and day.
1892—July 5 .	San José (u.s.a.)	Californian Theatre . . .	Burnt, together with a large hotel and several private houses.
1892—July 9 .	St. John's (Canada)	Athenæum Theatre . . .	Building destroyed with a large part of the town.
1892—July 17 .	Sydney . . .	Theatre Royal	Fire broke out in early morning. Body of house quite destroyed. Stage saved.
1892—July 19 .	Cordova (Spain)	The Theatre	Fire broke out immediately after the performance. A number of the audience were burnt.
1892—Aug. 19 .	Biella (Italy) .	Teatro Sociale	Fire occurred after the performance. No lives lost.
1892—Aug. 26 .	New York . .	Metropolitan Opera House	Opened October 1883. Fire commenced at 9.30 A.M., under the stage. Façade of building and offices saved. The fire-proof curtain was not lowered. Several artistes injured.
1892—Sept. 2 .	Buenos Ayres	Teatro San Martino . . .	Fire occurred at 7.30 P.M., during the performance, just after the curtain had risen. Not many people present. Sixteen injured.
1892—Sept. 12 .	Paris . . .	Théâtre Cluny	A fire broke out just before the rise of curtain for afternoon performance. No lives lost. Fire caused by gas explosion igniting the scenery. Panic prevented through the presence of mind of the manager.
1892—Sept. 22 .	Hamburg . .	Theatre in Arsenal Place .	Fire began at 7 A.M. Cause unknown.
1892—Sept. 26 .	Constantinople	French Theatre.	Built 1883. Fire broke out above the stage at 10 A.M. Façade, foyer and offices saved. No one killed.
1892—Nov. 5 .	Luxemburg . .	Municipal Theatre . . .	Fire occurred during the performance. Over fifty persons were injured.
1892—Nov. 7 .	Kiel	Municipal Theatre . . .	Fire broke out about 9 P.M., during the performance, which was continued after the fire was extinguished.
1892—Nov. 25 .	Lincoln . . .	Theatre Royal	Fire discovered at 8.15 A.M., but must have been burning for hours. Nothing saved. Cause unknown.
1892—Dec. 21 .	Gothenburg .	The Theatre	Built 1816. Building burnt down. Nothing saved. No one killed or injured.
1892—December	Antwerp . .	The Theatre	During the performance a steam pipe exploded. Many persons injured.
1892—December	Berlin . . .	Cronstadt Diorama . . .	Building destroyed.
1893—Jan. 18 .	Amsterdam . .	Circus Theatre	An explosion occurred in the heating apparatus, and damaged small part of theatre. No fire.
1893—Mar. 9 .	Savona (Italy) .	Teatro Colombo	Fire incurring considerable loss. Particulars unreliable.
1893—Mar. 30 .	Anderson (u.s.a.)	Doxey Theatre (ii) . . .	Rebuilt 1885. Fire broke out on stage at 6.40 P.M. Theatre proper destroyed with contents. Caused by a lighted cigar left in dressing room.
1893—April 2 .	Lisbon . . .	Theatre Bijou	Fire broke out at 2 A.M., after performance. Caused through carelessness with matches. Nothing saved.
1893—April 17 .	Frederikshaven	Casino Theatre	Large fire, causing considerable damage.
1893—April . .	Kamli (China)	The Theatre	Over 2000 people are reported to have been burnt.
1893—May 30 .	Sheffield . .	Stacey's Theatre	Built about 1881. Fire broke out at 3.35 A.M., after performance. Cause unknown. Everything destroyed.
1893—June 3 .	Schwedt . . .	Summer Theatre (ii) . . .	Building destroyed.
1893—June 6 .	Nimes (France).	Scala Theatre	Fire incurring extensive damage.
1893—July 13 .	Oviedo (Spain)	The Theatre	Building burnt down.
1893—Sept. 4 .	Ostend . . .	Eden Theatre	Building destroyed.
1893—Sept. 19 .	Canton (u.s.a.)	The Opera House	Fire broke out during the performance. Caused by fireworks used on the stage. The Park Theatre adjoining and an hotel were burnt down. Ten persons killed and twenty injured in the panic.
1893—Sept. 21 .	Eastbourne .	Theatre Royal (i)	Fire occurred during the performance from an explosion in producing lightning. A small portion of scenery was destroyed. Three persons injured.
1893—Nov. 24 .	Columbus (u.s.a.)	The Theatre	No particulars obtainable.
1894—Jan. 2 .	Boston (u.s.a.) .	Globe Theatre (iii) . . .	Built in 1867. Fire broke out at 1.15 A.M., two hours after performance. Probably caused through electric wire in basement. Very little saved. Two firemen injured.
1894—Jan. 27 .	Rochdale . .	Theatre Royal	Fire broke out at 6.16 A.M. Pit, gallery and circles burning when discovered. Only carcass saved.
1894—Feb. 5 .	Homel (Russia)	Municipal Theatre	Fire broke out during the performance. Panic prevented by energy of police officers, who threatened to shoot down the first person who did not leave quietly.
1894—March .	Warsaw . . .	Small Imperial Theatre . .	Operatic stage. No further particulars available.
1894—April 9 .	Milwaukee (u.s.a.)	The Theatre	The building burnt, together with the Davidson Hotel. Sixteen killed.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1894—June 10	Castellamare	The Theatre	Fire attributed to arson.
1894—June	Llucmajor (Spain)	The Theatre	Building destroyed. Date uncertain.
1894—July 11	Brussels	Palais d'Eté Music Hall	Fire broke out at 3.40 A.M., after a performance. Building destroyed, and nearly all the adjoining houses damaged.
1894—July 14	Rio de Janeiro	Theatre Politeama	Fire broke out in the wings between 9 and 10 P.M., during the performance, through the scenery being too near the gas. Nothing saved. Several adjoining houses burnt. A few people injured.
1894—Aug. 18	Messina	Teatro Arena Beloro	No particulars available.
1894—Aug. 25	Reading	Royal County Theatre	Built of wood. Fire occurred at 8.45 A.M. The theatre was struck by lightning, and only the vestibule and bars were saved. Adjoining stables considerably damaged. One fireman injured.
1894—Sept. 6	Ruda-Gozewska (Poland)	The Theatre	Fire attributed to arson.
1894—Sept. 7	Reading	Cambrian Theatre	Fire occurred at 2 P.M. Building of wood. Totally destroyed, only small portion of costumes saved.
1894—Sept. 28	Longton	Queen's Theatre	Built 1887. Fire occurred at 7 A.M. Building gutted. Portions of wardrobe, etc., only, saved.
1894—Oct. 29	St. Louis (U.S.A.)	Lundberg's Variety Theatre	Rebuilt March 1894. Time of fire, 4 A.M. Building totally destroyed, and adjoining boarding-house burnt down, where one person was killed and three were injured.
1894—Nov. 18	Kutais (Caucasus)	Municipal Theatre	Built 1888. Building burnt down.
1894—Dec. 28	Workington	The Public Hall	Fire started between 4 and 5 A.M., and destroyed the whole building. Adjoining house and shops also burnt.
1894—Dec. 30	Annecy (France)	The Theatre	Fire caused through a defect in the heating apparatus. Auditorium destroyed. No one killed or injured.
1895—Jan. 10	Southend	Alexandra Theatre	Time of fire 2 A.M. Building completely destroyed, except entrance and box office. Caused by smoking in gallery.
1895—Jan. 16	Marion (U.S.A.)	Sweeter's Opera House	Fire broke out during the performance. Caused by fall of curtain breaking a gas pipe. Building totally destroyed.
1895—Jan. 16	Milwaukee	Municipal Theatre	Fire broke out at 11.25 P.M., and completely gutted the building. Caused by light from temporary chandelier erected in centre of stage igniting the scenery.
1895—Feb. 9	Bern	The Theatre	No particulars forthcoming.
1895—Feb. 25	Paris	Casino de Paris	Fire broke out at 11.30 P.M. Two performers were injured.
1895—Feb. 25	Legnago (Ireland)	The Theatre	Fire occurred subsequent to a carnival ball, and spread rapidly. Building destroyed.
1895—Mar. 1	Glasgow	Theatre Royal (v)	Built 1880. Fire broke out at 6.30 P.M., before the performance, and destroyed the auditorium, roof and stage. Adjoining stables also damaged.
1895—Mar. 24	New York	United States Theatre	Fire broke out in the evening. The building was totally destroyed. Believed to be the work of an incendiary.
1895—May 3	Tula (Russia)	Kremlin Garden Theatre	Costumes destroyed. Small fire.
1895—May 4	Dewsbury	Theatre Royal	Fire originated in one of the dressing rooms at 6.30 P.M., through sparks igniting baskets of wool. Stage, scenery and dressing rooms destroyed.
1895—May 14	Rome	Politeama Adriano	Fire started at 5 A.M. The theatre, built of wood, was entirely destroyed, with four large adjoining buildings.
1895—May 29	Beverly (U.S.A.)	Lefavour Opera House	Fire commenced in the early morning. The theatre was totally destroyed, and adjoining shops damaged.
1895—June 6	New York	Proctor's Theatre	Fire broke out at 11.15 P.M. in woodwork of roof. The latter was destroyed.
1895—June 16	New York	Jacob's Third Avenue Theatre	Built 1877. Fire broke out at midnight, when the theatre was closed. Originated on the stage. The building completely destroyed, likewise several adjoining houses.
1895—July 24	Bonn (Germany)	Reichshallen Theatre.	
1895—Aug. 1	Fennimore (U.S.A.)	The Opera House	Fire caused by lamp. Many injured in a panic.
1895—August	Dijon	Casino Theatre	Caused by carelessness with matches. Adjoining premises damaged.
1895—Sept. 1	Buffalo	Academy of Music	Built 1852. Fire broke out under the stage about 2 A.M., after performance. Building utterly destroyed. Three houses badly damaged.
1895—Sept. 9	West Bromwich	Theatre Royal	Fire started in manager's bed-room about 12.40 A.M., after performance. Building gutted. One fireman injured.
1895—Oct. 6	Monte Video	Teatro Politeama	Fire commenced in flies during performance about 10.30 P.M. The building, which was of wood, completely destroyed, and a printing house adjoining burnt. Several persons injured in panic.
1895—Oct. 9	Kansas City	Theatre Comique	Fire broke out at 2.45 A.M., after performance, when building was completely destroyed, and one house badly damaged. One man killed.
1895—Oct. 9	Elizabeth (U.S.A.)	Drake Opera House	Fire caused by rockets during performance. Several women slightly burnt

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1895—Oct. 13	Duluth (U.S.A.)	Temple Opera House	Built 1890. Fire, caused by explosion, started at midnight after performance, burning everything except front wall, which was fireproof. Several small adjoining buildings burnt.
1895—Nov. 5	Decatur (U.S.A.)	Power's Grand Opera House	Fire broke out at 9 P.M. No performance. The theatre and whole block totally destroyed, together with seven houses. The work of an incendiary.
1895—Dec. 4	Bucharest	Théâtre Lyrique	Fire started at 1.30 A.M., after performance. Building totally destroyed.
1895—Dec. 9	Parkersburg (U.S.A.)	Academy of Music	Particulars unreliable.
1895—Dec. 27	Belfast	Empire Theatre	Fire commenced about 5.15 A.M., caused by spark from electric light apparatus. Dressing room wing and engine house destroyed. Auditorium not damaged.
1895—Dec. 27	Baltimore	Front Street Theatre	Panic caused by flare of gas in auditorium, during performance. Damage slight, but twenty-two killed, forty-five injured.
1896—Jan. 20	Ekaterinoslav	Kopyloff Circus	Building entirely destroyed by fire, which broke out in a dressing room during afternoon performance through an explosion in heating apparatus. Forty-nine killed in panic.
1896—Jan. 26	St. Johnsbury (U.S.A.)	Howe Opera House	Totally destroyed by fire. Began in the Avenue House Hotel adjoining, which, with a block next to the Opera House, was also burnt.
1896—Jan. 28	London	Cambridge Music Hall	Building totally destroyed through fire originating in bar on top balcony at 9 A.M. A performance had been given the previous night. Artistes' clothes and musical instruments, etc., saved.
1896—Feb. 8	McKeesport (U.S.A.)	Altmeyer Theatre	Destructive fire; broke out at 4 A.M. Said to be caused by defective electric wire. One person killed.
1896—Feb.	Munich	German Theatre	In course of construction. Considerable damage done.
1896—Feb. 15	Kiev	National Theatre	Building totally destroyed by fire, commencing in dressing room shortly after performance.
1896—Feb.	Toledo (U.S.A.)	Collingwood Music Hall.	
1896—Mar. 4	Paris	Ambigu Comique (II)	Fire broke out in early morning, causing serious damage.
1896—Mar. 23	Buenos Ayres	Cervantes Theatre	Fire started as audience was leaving. Building totally destroyed.
1896—Mar. 27	Springfield (U.S.A.)	Grand Opera House	Built 1884. Building totally destroyed by fire, originating at 11.30 P.M., after performance.
1896—April 3	Saratoga (U.S.A.)	Putnam Music Hall	Fire broke out under the stage between 3 and 4 A.M. A building adjoining, paint store, a printing office and several stores in the block damaged.
1896—April 25	Cripple Creek (U.S.A.)	Holland Theatre	Built 1894. Fire broke out at 1 P.M. Caused by overturning a stove in adjoining building. Nothing saved. Twenty-five blocks damaged.
1896—April	Mâcon (France)	Concert Theatre.	
1896—May 21	Amsterdam (U.S.A.)	Neff Opera House	Built 1882. Totally destroyed by fire commencing in flies. Adjoining hotel damaged.
1896—May 27	Newport (Mon.)	Victoria Theatre	Very destructive fire; broke out at 1.30 A.M. Five neighbouring houses and offices damaged.
1896—May	Cordova	The Theatre	Particulars not available.
1896—July 20	Henderson (U.S.A.)	Park Theatre	Built 1893. Fire broke out at 2 A.M. in adjoining building. Theatre, with Barrett Hotel, destroyed.
1896—July 21	Terre Haute (U.S.A.)	Naylor's Opera House	Built 1870. Fire commenced at 9 P.M. Building totally destroyed. New hotel, three stores and two saloons adjoining burnt.
1896—July 21	Boston	Palace Theatre	Fire broke out in wardrobe room on fourth floor, due to electric wires. Two firemen injured. Damage not considerable.
1896—Aug. 2	Springfield (U.S.A.)	Music Hall	Built about 1880. Fire broke out at 8.30 P.M. Theatre not in use. Building and contents destroyed.
1896—Aug. 7	Niagara Falls	Park Theatre	Fire broke out at 1 A.M. Building totally destroyed. A bazaar, restaurant and hotel damaged. Theatre just rebuilt, having been burnt down a year before.
1896—Sept. 3	Syracuse (U.S.A.)	Wieting Opera House	Built 1881. Fire began at 2.15 A.M. Building completely gutted. Cause unknown.
1896—Sept. 5	Benton Harbour (U.S.A.)	Yoxe's Opera House	Fire broke out at midnight. Building completely destroyed. Six neighbouring stores, etc., burnt. Eleven firemen killed by falling walls.
1896—Sept. 9	Monterey (Mex.)	Progresso Theatre	Building totally destroyed. Cause of fire unknown.
1896—Sept. 28	Tunis	Politeama Tunisino	Building totally destroyed. Theatre built entirely of wood.
1896—Sept. 30	Aberdeen	People's Palace of Varieties	Built 1885-6. Fire commenced in the flies at 7.30 P.M., after admission of the public. Building totally destroyed. Five killed and thirty injured in the panic.
1896—Oct. 25	Milford (U.S.A.)	Lyceum Theatre	Fire broke out at 3 A.M. Building totally destroyed. Milford Reading Room damaged.
1896—Nov. 5	St. Louis (U.S.A.)	Globe Theatre	Fire broke out about 3 A.M. Commenced at back of stage. Garnier Hotel, in rear, suffered considerable damage. Manager sustained fatal injuries.

DATE OF FIRE.	NAME OF TOWN.	NAME OF THEATRE.	PARTICULARS.
1896—Nov. 10 .	Rome	Alhambra Theatre	Fire began in the night. Building totally destroyed. Cause unknown.
1896—Dec. 13 .	Rostoff (Russia)	Theatre in Park Gardens .	Building totally destroyed, with contents.
1896—Dec. 17 .	Pittsburg (U.S.A.)	Summer Theatre	Fire started at 2.15 A.M. Caused by explosion of American cylinder in ice-skating plant. Building totally destroyed. Schenley Park Bridge damaged. Several persons slightly injured.
1896—Dec. 21 .	New Brunswick	Allen Theatre	Built 1872. Fire commenced in rear of stage at 12.20 A.M. Total destruction of building and contents. A two-story house next to the theatre and other buildings in same block damaged.
1896—Dec. 24 .	Anderson . .	Doxey Opera House . . .	
1896—Dec. 26 .	Putnam (U.S.A.)	Campbell's Opera House . .	Building destroyed. Several small stores damaged.
1897—Jan. 7 . .	Pittsburg . .	Eden Musée (Variety Theatre)	Fire broke out at 1 A.M.
1897—Jan. 17 .	Winnipeg . .	Grand Opera House . . .	Built 1896. Fire commenced at 2 A.M. Building and contents totally destroyed. Hotel adjoining theatre flooded.
1897—Feb. 27 .	Jackson (U.S.A.) .	Hibbard Opera House . .	Built 1883. Building totally destroyed. Fire broke out at 7.15 P.M., after performance. Originated from furnace.
1897—February .	Quanton (China)	Performance in a Temple ·	Fire broke out during the performance. 320 men, women and children killed. Date of fire doubtful.
1897—Mar. 7 .	Indianapolis .	Park Theatre	Fire began about 7 o'clock in box office. Caused by fusion of electric wire. Building and contents destroyed. One woman injured.
1897—Mar. 8 .	Bethlehem (U.S.A.)	Bijou Theatre	Fire broke out in one of the dressing-rooms at 9 P.M. Building burnt to the ground. Nothing saved. A case of incendiarism.
1897—May 3 .	Pittsburg . .	Duquesne Theatre . . .	Destroyed, with a number of adjoining buildings.
1897—May 4 .	Paris	Temporary Theatre, in the Rue Jean Goujon (known as the Charity Bazaar)	Built some weeks previously, of wood. Fire commenced during afternoon, whilst hall was being used for a charity bazaar. Outbreak caused by working cinematographe in annexe. Great panic; 124 killed and many injured. Building entirely destroyed.

TEMPORARY THEATRE, PARIS (known as Charity Bazaar). *Destroyed* May 4, 1897.
Fig. 2. General View after Fire.

LIST OF FIRES ARRANGED ACCORDING TO LOCALITY.

Aarhus	Old Vennelyst Theatre, Sept. 1, 1890.
Aberdeen	People's Palace of Varieties, Sept. 30, 1896.
Abo	Municipal Theatre, March 8, 1881.
Ahmednuggur	The Theatre, May 11, 1878.
Alabama	Tray's Opera House, July 1, 1890.
Albany	Academy of Music, Jan. 29, 1868—Martin's Hall, March 11, 1872—Tweddle Hall Theatre, Jan. 16, 1883 — Opera House, March 8, 1885.
Aldershot	Theatre Royal, Feb. 8, 1889.
Alessandria	Teatro Gra, Nov. 16, 1879.
Algiers	Théâtre de la Perle, Nov. 21, 1879—Théâtre National, March 20, 1882.
Altoona (U.S.A.)	Slack's Mountain City Theatre, March 5, 1889.
Amesbury	Merrimac Opera House, Oct. 2, 1886.
Amsterdam	Municipal Theatre, Feb. 20, 1890 — Circus Theatre, Jan. 18, 1893.
Amsterdam (U.S.A.)	Neff Opera House, May 21, 1896.
Anderson	Doxey's Theatre, Nov. 5, 1884; March 30, 1893 —Doxey Opera House, Dec. 24, 1896.
Angers	Municipal Theatre, 1855—Dec. 4, 1865.
Annecy (France)	The Theatre, Dec. 30, 1894.
Antwerp	Eden Theatre, Oct. 26, 1885—The Alhambra Theatre, Jan. 1, 1888—The Circus, May 1892—The Theatre, Dec. 1892.
Arad	The Theatre, Feb. 18, 1883.
Archangel	Municipal Theatre, June 1851.
Athens	Phalera Theatre, April 7, 1881—Small Court Theatre, Aug. 5, 1884
Atlanta	Davis Theatre, May 28, 1869.
Augsburg	Sartor's Theatre, Oct. 18, 1803.
Augusta	Opera House, Nov. 30, 1831; April 1, 1883; Feb. 12, 1887 — Granite Hall, Dec. 30, 1890.
Avignon	The Theatre, January 25, 1846; Oct. 12, 1875.
Bahia	Teatro Roma, Dec. 1889.
Baltimore	Front Street Theatre, Jan. 5, 1838; Dec. 27, 1895—Cook's Circus, Feb. 3, 1838—Holliday's Street Theatre, Sept. 10, 1873—American Opéra Comique, Dec. 12, 1873 —Opera House, Oct. 13, 1874—Adelphi Theatre, June 22, 1876—Arlington's Variety Theatre, Nov. 3, 1882; Theatre in Masonic Hall, Dec. 25, 1890 — Concordia Opera House, June 10, 1891—Music Hall, Nov. 23, 1891.
Barcelona	Lyceum Theatre, April 9, 1861—Teatro Ristori, May 7, 1863—Teatro Coliseo, May 7, 1863 — Circus, May 7, 1863 — Teatro Massini, Oct. 31, 1882—Spanish Theatre, Nov. 18, 1889.
Barmen	Municipal Theatre, Nov. 25, 1875.
Bath	The Theatre, April 18, 1862.
Bay City	The Opera House, Jan. 17, 1886.
Bayonne (U.S.A.)	Newark Winter Club House, Oct. 28, 1891.
Bédarieux	The Theatre, July 2, 1843.
Belfast	Theatre Royal, June 8, 1881—Empire Theatre, Dec. 27, 1895.
Belleville	The Opera House, April 27, 1880.
Benton Harbour (U.S.A.)	Yoxe's Opera House, Sept. 5, 1896.
Berditschew	Circus Castali, Jan. 13, 1883.
Beringer City	The Opera House, Sept. 28, 1877.
Berlin	Court Theatre, July 29, 1817—Circus Richter, 1826—Circus Dèjean, 1836—Royal Opera House, Aug. 18, 1843—Kroll's Theatre, Feb. 1, 1851—Circus Renz, Nov. 28, 1853 —Circus Herzog-Schumann, Sept. 22, 1875 —Urania Theatre, June 20, 1879—National Theatre, April 4, 1883—Cronstadt Diorama, Dec. 1892.
Bern	Circus Ulrich, April 13, 1875—The Theatre, Feb. 9, 1895.
Berwick (U.S.A.)	The Opera House, April 2, 1887.
Bethlehem	Hildenberg's Opera, Feb. 10, 1874—Bijou Theatre, March 8, 1897.
Beverley (U.S.A.)	Lefavour Opera House, May 29, 1895.
Biella (Italy)	Teatro Sociale, Aug. 19, 1892.
Binchi	Municipal Theatre, Jan. 1892.
Birkenhead	Theatre Royal, April 16, 1890; June 25, 1892.
Birmingham	The Theatre, Jan. 7, 1826.
Bismark (U.S.A.)	Old Opera House, March 25, 1890.
Blackburn	Star Theatre, Sept. 29, 1878.
Black River (U.S.A.)	Poo's Opera House, Feb. 19, 1890.
Blyth	The Theatre, Feb. 13, 1888.
Bochum	The Old Theatre, May 15, 1886.
Bologna	Politeama Sparadi, Sept. 1889.
Bolton	Temple Opera House (afterwards Theatre Royal), April 15, 1882; Jan. 4, 1888.
Bonn	Reichshallen Theatre, July 24, 1895.
Bordeaux	Galeté Theatre, March 12, 1802; Dec. 16, 1819—Lyceum Theatre, Feb. 10, 1803—Variety Theatre, Dec. 2, 1855 — Bouffes Bordelaises, July 3, 1888—Grand Hippodrome, Sept. 30, 1890.
Boston	Federal Street Theatre, Feb. 2, 1798—Bowen's Theatre, Jan. 15, 1803; Jan. 15, 1807—Howard's Athenæum, Feb. 23, 1846—Old Tremont Theatre, March 31, 1852—Grand National Theatre, April 22, 1852; March 23, 1863—Adelphi, Feb. 5, 1871—Buckley's Minstrel Hall, Nov. 9, 1872—Jourdain's Museum, May 30, 1873—Globe Theatre, May 30, 1873; Dec. 1889; Jan. 2, 1894—Gray's Opera House, June 16, 1883—Palace Theatre, July 21, 1896.
Boulogne	Municipal Theatre, Sept. 24, 1854.
Bourges	Municipal Theatre, March 12, 1856; June 5, 1867.
Bowling Green (U.S.A.)	The Opera House, Aug. 3, 1885.
Bradford	Prince's Theatre, July 16, 1878—Theatre of Varieties, June 29, 1889.
Bradford (U.S.A.)	Théâtre Comique, Nov. 14, 1878—Academy of Music, April 2, 1880.
Braila	The Theatre, Sept. 4, 1859.
Brandenburg	Municipal Theatre, March 24, 1824.
Breda (Holland)	The Theatre, Feb. 1892.
Bremen	Luhr's Tivoli Theatre, Sept. 2, 1890; Music Hall, Dec. 9, 1891.
Breslau	Municipal Theatre, July 19, 1865; June 13, 1871.
Brest	Municipal Theatre, March 11, 1866.
Brewsters	Municipal Theatre, Feb. 23, 1880.
Bridgeport (N.A.)	Barnum Circus, Nov. 1887.
Brighton	Mellison's Theatre, Oct. 8, 1882.
Bromberg	Municipal Theatre, March 24, 1890.

BROOKLYN (U.S.A.) . Old Amphitheatre, 1848—Hooley's Opera House, May 12, 1865—Mrs. Conway's Theatre, Dec. 5, 1876—King's New Opera House, Aug. 10, 1887—Variety Theatre, June 10, 1890.

BROOKTON . . The Opera House, Dec. 2, 1886.

BRÜNN . . . Municipal Theatre, June 23, 1870.

BRUSSELS . . Théâtre Royal de la Monnaie, Jan. 21, 1855; 1866—Novelty Theatre, May 12, 1861—New Theatre, Nov. 30, 1879—Théâtre du Prado, Feb. 7, 1881—Théâtre de la Bourse, Jan. 7, 1890—Gallery Theatre, Nov. 2, 1890—Alhambra Theatre, Jan. 1892—Palais d'Eté Theatre, July 11, 1894.

BRÜX . . . Strohschneider's Amphitheatre, May 18, 1892.

BUCHAREST . . Theatre, Feb. 19, 1826; 1847—Circus Kremser, Jan. 19, 1882—Circus Sidoli, April 21, 1884; Jan. 16, 1887—Théâtre Lyrique, Dec. 4, 1895.

BUDA-PEST . . German Theatre, Feb. 2, 1847; Dec. 20, 1889—Annual Fair Theatre, May 13, 1849—Hippodrome, June 9, 1874—Circus Herzog, Oct. 30, 1883—Circus Frankloff, Aug. 7, 1886.

BUENOS AYRES . Teatro San Martino, Sept. 2, 1892—Cervantes Theatre, March 23, 1896.

BUFFALO . . St. James's Hall Theatre, 1861; March 18, 1887—Music Hall, March 25, 1885—Academy of Music, Sept. 1, 1895.

BURLINGTON . . Palmer's Opera House, June 19, 1873.

BURNLEY . . The Theatre, June 6, 1889.

BUTTE (U.S.A.) . McGuire's Opera House, July 23, 1888.

CACERES . . Variety Theatre, July 4, 1887.

CADIZ . . . Amphitheatre, July 24, 1825—Grand Theatre, Aug. 5, 1881.

CAGLIARI . . Teatro Carboni, Aug. 7, 1879.

CALAIS . . . Variety Theatre, Sept. 14, 1887.

CANAL DOVER (U.S.A.) Sells Brothers' Circus, Sept. 2, 1878.

CANTON . . Chinese Theatre, May 25, 1845.

CANTON (U.S.A.) . The Opera House, Sept. 19, 1893.

CAPETOWN . . Theatre Royal, July 9, 1883; Feb. 22, 1892.

CAPE VINCENT . The Opera House, Feb. 15, 1889.

CARDIFF . . The Theatre, December 11, 1877.

CARLSRUHE . . Court Theatre, Feb. 28, 1847.

CARRY . . . Gleason Opera House, Nov. 5, 1884.

CARTHAGE . . New Opera House, Oct. 21, 1884.

CASSEL . . . Circus Carré, May 7, 1875.

CASTELLAMARE . Teatro Vittorio Emmanuele, June 1, 1892—The Theatre, June 10, 1894.

CATANIA . . Teatro San Carlino, Aug. 1889—Théâtre Arène Calypso, Sept. 4, 1890.

CELAYA . . The Arena, April 1, 1888.

CHAMBÉRY . . Municipal Theatre, Feb. 13, 1864.

CHARKOW . . Summer Tivoli Theatre, Nov. 10, 1891.

CHARLEROI . . Théâtre Casti, Oct. 21, 1888.

CHARLESTON . . New Theatre, April 28, 1838.

CHATHAM . . Barnard's Music Hall, May 12, 1885.

CHELTENHAM . The Theatre, May 1, 1839.

CHEYENNE . . McDaniel's Theatre, June 27, 1875.

CHICAGO . . Rice's Theatre, 1851—Crosby's Opera House, Feb. 1870; Oct. 8, 1871—McVicar's Theatre, Oct. 8, 1871; Aug. 26, 1890—Hooley's Theatre, Oct. 8, 1871—Dearborn's Theatre, Oct. 8, 1871—King's Opera House, Oct. 8, 1871—Olympic Theatre, Oct. 8, 1871—German Theatre, Oct. 8, 1871—Globe Theatre, April 27, 1874—Adelphi Theatre, July 14, 1874—Wood's Theatre, Oct. 23, 1877; Academy of Music, Feb. 5, 1878—Emmett's Academy of Music, Oct. 12, 1880—Park Theatre, Feb. 3, 1881—Barnum's Circus, June 6, 1883—Lyceum Theatre, Oct. 13, 1883—Windsor Theatre, April 30, 1889—Haymarket Theatre, April 13, 1891.

CHIPPEWA FALLS . The Opera House, Dec. 14, 1884.

CHRISTIANIA . . Municipal Theatre, Nov. 6, 1835.

CINCINNATI . . Lippincott's Amphitheatre, 1830—Caldwell's Theatre, Oct. 22, 1836—Old American Theatre, Sept. 22, 1842—Shire's Garden Theatre, Jan. 8, 1845—Wood's Museum, July 15, 1851—Rockwell's American Theatre, 1856—Picke's Opera House, March 22, 1866—Academy of Music, July 12, 1866—Robinson's Opera House, Feb. 5, 1876.

CLERMONT-FERRAND Variety Theatre, Dec. 9, 1890.

CLEVELAND . . Park Theatre, Jan. 5, 1884—Opera House, April 21, 1884—Academy of Music, June 30, 1889—Jacobi's Theatre, Dec. 1891.

COLOGNE . . Vaudeville Theatre, March 15, 1849—Municipal Theatre, July 22, 1859; Feb. 16, 1869—Flora Theatre, May 9, 1869—Tivoli Theatre, June 22, 1874—Gertrudenhof Club Theatre, Aug. 25, 1878.

COLUMBUS . . The Opera House, March 2, 1883—Grand Opera House, Feb. 20, 1887—Metropolitan Opera House, Jan. 25, 1892—The Theatre, Nov. 24, 1893.

CONSTANTINE (Algiers) . The Theatre, Dec. 9, 1878.

CONSTANTINOPLE . Italian Theatre in Pera, Jan. 27, 1847; June 5, 1870—Imperial Theatre, Aug. 22, 1866—Summer Theatre, June 9, 1890—French Theatre, Sep. 26, 1892.

COPENHAGEN . . Nörrebroe's Theatre, May 15, 1833—Circus, May 3, 1873—Small Court Theatre, Oct. 3, 1884.

CORDOVA . . The Theatre, July 19, 1892.

CORNING . . Barry's Opera House, Dec. 14, 1884.

CORUNNA . . The Theatre, Jan. 4, 1867.

CREMONA . . The Opera House, Jan. 4, 1824.

CRIPPLE CREEK (U.S.A.) . Holland Theatre, April 25, 1896.

CRISFIELD . . Blizzard's Opera House, Oct. 16, 1884.

CRONSTADT . . Russian Municipal Theatre, Jan. 12, 1872; Jan. 9, 1881.

DANBURY . . The Opera House, March 20, 1884.

DANZIG . . Apollo Circus, Sept. 5, 1845—Variety Theatre, July 1, 1870.

DARLINGTON . . Theatre Royal, Nov. 17, 1883.

DARMSTADT . . Court Theatre, Oct. 24, 1871.

DAYTON . . The Opera House, May 16, 1869.

DEADWOOD . . Bella Union Theatre, Sept. 26, 1879—Gem Theatre, Sept. 26, 1879.

DECATUR . . Power's Grand Opera House, Nov. 5, 1895.

DECKERTOWN . Hornbeck's Opera House, Oct. 29, 1884.

DEFIANCE . . The Opera House, Jan. 27, 1883.

DENVER . . Academy of Music, July 6, 1886.

DERBY . . . Keith's Circus, March 25, 1879—Grand Theatre, May 6, 1886.

DERVIO . . Marionette Theatre, June 24, 1883.

DESSAU . . Court Theatre, March 7, 1855.

DETROIT . . Olympic Theatre, Jan. 23, 1869—Grand Theatre, Jan. 1, 1886—Grand Opera House, Sept. 14, 1888.

DEWSBURY . . Theatre Royal, May 4, 1895.

DIJON . . . Casino Theatre, Aug. 19, 1895.

DONAUESCHINGEN . Court Theatre, April 28, 1850.

DOVER (U.S.A.) . City Opera House, March 22, 1889.

DRESDEN . . Zwinger Theatre, May 6, 1849—Court Theatre, Sept. 21, 1869.

DUBLIN . . Theatre Royal, Feb. 9, 1880.

DULUTH (U.S.A.) . Grand Opera House, Jan. 28, 1889; Temple Opera House, Oct. 13, 1895.

DUNDEE . . Theatre Royal, Oct. 6, 1888.

DURHAM . . Theatre Royal, March 11, 1869.

EARLSVILLE (U.S.A.) The Opera House, July 24, 1890.

EASTBOURNE . . Theatre Royal, Sept. 21, 1893.

EDINBURGH . . Adelphi Theatre, May 24, 1853—Theatre Royal, Jan. 13, 1865; Feb. 6, 1875; June 30, 1884—Southminster Theatre, March 14, 1875; (now Queen's) April 4, 1877—Newsome's Circus, Sept. 12, 1887.

EGGENBURG . . The Colosseum, Dec. 27, 1886.

EKATERINOSLAV . Kopyloff Circus, Jan. 20, 1896.

ELDRED (U.S.A.) . Jackson's Opera House, Sept. 30, 1881.

ELGIN (U.S.A.) . Du Bois' Opera House, Sept. 14, 1886.

ELIZABETH (U.S.A.) Clark's Opera House, Jan. 21, 1879—Drake Opera House, Oct. 9, 1895.

ELLENSBURGH . Nash Opera House, July 4, 1889.

EPIRIES . . The Theatre, May 6, 1887.

Erie . . . The Opera House, Aug. 13, 1884.
Este . . . The Theatre, Sept. 30, 1824.
Eureka . . The Opera House, April 19, 1879; Aug. 17, 1880.
Evansville . People's Opera House, Feb. 24, 1891.
Exeter . . The Theatre, 1806; Feb. 7, 1885—New Theatre Royal, Sept. 5, 1887.

Fairfield . . The Opera House, March 23, 1890.
Farina (U.S.A.) . Switzer's Opera House, Aug. 1, 1890.
Fennimore . The Opera House, Aug. 1, 1895.
Florence . . Teatro Politeama, June 1863—Teatro Principe Umberto, Dec. 29, 1889.
Fort Wayne . Bijou Theatre, Feb. 4, 1881.
Fostoria (U.S.A.) . Leonard's Opera House, March 6, 1877.
Fowlerville . The Opera House, March 16, 1891.
Frankfort (U.S.A.) Major Opera House, Nov. 12, 1882.
Frankfort-on-Main Adelphi Theatre, Nov. 19, 1879.
Franklin . . The Opera House, April 24, 1882; Jan. 28, 1886.
Frederikshaven (Jutland). Casino Theatre, April 17, 1893.
Fu-Chow . . Chinese Theatre, Aug. 24, 1884.

Galveston . . Neitch's Theatre, Dec. 3, 1869.
Gateshead . . Theatre Royal (now Queen's), Dec. 28, 1891.
Gefle . . . Municipal Theatre, July 11, 1869.
Geneva . . Circus Olympia, July 9, 1838.
Georgetown . McClellon Opera House, Jan. 11, 1892.
Ghent . . . Circus Herzog, March 28, 1887.
Glasgow . . Theatre Royal, Jan. 10, 1829; Jan. 31, 1863; Feb. 2, 1879; March 1, 1895 — Batty's Circus, Feb. 8, 1839—Cook's Circus, June 27, 1842; Dec. 2, 1845—Adelphi Theatre, March 1844; Nov. 15, 1848—City Theatre, Nov. 19, 1845 — Prince of Wales Theatre, Jan. 14, 1869—Alexandra Theatre, March 24, 1870.
Glen Falls . The Opera House, April 28, 1884.
Gothenburg . The Theatre, Dec. 21, 1892.
Göttingen . . Municipal Theatre, Jan. 11, 1887.
Grand Forks . The Opera House, Oct. 18, 1891.
Grand Rapids . Squire's Opera House, May 8, 1872.
Grantham . . Theatre Royal, April 22, 1888.
Graz . . . The Theatre, Dec. 25, 1823.
Greenville . The Opera House, Aug. 17, 1884.
Greenwich . . The Theatre, Jan. 11, 1831.
Grimsby . . Theatre Royal, Jan. 22, 1855.

Hagen . . . The Theatre, April 21, 1882.
Hague (The) . The Theatre, Feb. 1892.
Hamburg . . Odeon Theatre, Feb. 3, 1871—Central Hall, July 23, 1876—Circus Renz, Nov. 2, 1887 — Theatre in Arsenal Place, Sept. 22, 1892.
Harrodsburg . The Opera House, April 22, 1890.
Harts Fall . Baker Opera House, Sept. 3, 1880.
Hastings (U.S.A.) . Newton's Opera House, Aug. 8, 1886.
Havana . . The Opera House, Feb. 8, 1853.
Havre . . . Municipal Theatre, Jan. 28, 1810; April 29, 1843—Theatre Alcazar, Jan. 7, 1890.
Hazleton (U.S.A.) The Opera House, May 3, 1889; May 14, 1892.
Helena (U.S.A.) . Variety Theatre, Nov. 7, 1869—Opera House, March 21, 1886.
Helsingfors . Municipal Theatre, May 24, 1863.
Henderson . . Park Theatre, July 20, 1896.
Hermannstadt . Municipal Theatre, Aug. 6, 1826.
Homburg . . Casino Theatre, Oct. 29, 1860.
Homel (Warsaw) Municipal Theatre, Feb. 5, 1894.
Huddersfield . Theatre Royal, Feb. 15, 1880.
Hull . . . Theatre Royal, Oct. 13, 1859; Feb. 5, 1869.
Hurley (U.S.A.) . Alcazar Variety Theatre, July 9, 1887.

Indianapolis . The Opera Hall, Jan. 17, 1870—Academy of Music, Jan. 28, 1877—Park Theatre, March 7, 1897.
Insterburg . . The Theatre, May 21, 1866.
Irkutsk . . Municipal Theatre, Nov. 13, 1890.
Ironwood . . Alhambra Theatre, Sept. 17, 1887.

Jackson . . Union Hall Theatre, Feb. 24, 1884—King's Opera House, March 17, 1884—Hibbard Opera House, Feb. 27, 1897.
Jassy . . . German Theatre, June 1828—Municipal Theatre, Aug. 9, 1844—Circus Richter, Oct. 6, 1886 —National Theatre, Feb. 29, 1888.
Jekaterinodar . Municipal Summer Theatre, July 31, 1883.
Jersey . . . Theatre Royal, June, 1863.
Jesi . . . Teatro Leone, Feb. 17, 1892.
Johannesburg . Globe Theatre, Sept. 25, 1889.
Joliet (U.S.A.) . The Opera House, March 18, 1891.
Joplin . . . The Opera House, Nov. 5, 1881.

Kaiserslautern . The Theatre, Oct. 21, 1867.
Kamli (China) . The Theatre, April 1893.
Kansas City . Fountain Theatre, April 30, 1890 — Théâtre Comique, Oct. 9, 1895.
Kasan . . . Municipal Theatre, June 1859; Dec. 16, 1874.
Katamotomuro . Japanese Theatre, Aug. 26, 1883.
Key West . . St. Charles Theatre, 1896.
Kiel . . . Wriedt's Theatre, April 22, 1890—Municipal Theatre, Nov. 7, 1892.
Kiev . . . Circus, Oct. 23, 1863—Municipal Theatre, Jan. 28, 1869—Theatre in Bojarski Park, Sept. 14, 1888—National Theatre, Feb. 15, 1896.
Kjoeng (Corea) . National Theatre, April 1888.
Kirkcaldy . . Grand Theatre, Dec. 30, 1888.
Kischinew . . The Theatre, Dec. 22, 1875—Summer Theatre, July 2, 1883.
Königsberg . Municipal Theatre, Oct. 27, 1797; July 1, 1808 —Louis Theatre, Jan. 24, 1892.
Kolomea . . Theatre in the Casino, May 1865.
Kutais . . . Municipal Theatre, Nov. 18, 1894.

Lacrossa . . Germania Theatre, Oct. 26, 1891.
Lafayette . . The Opera House, March 18, 1850; Dec. 24, 1869.
Laibach . . Provincial Theatre, Feb. 17, 1887.
Lansford . . The Opera House, May 20, 1892.
La Pointe-à-Pitre The Theatre, Dec. 25, 1882.
Leadville . . McDaniell's Theatre, March 29, 1881—Academy of Music, May 19, 1882—Variety Theatre, June 18, 1884 — Leeb's Variety Theatre, May 1, 1892.
Leavenworth . Union Theatre, July 14, 1858.
Leeds . . . Theatre Royal, May 28, 1875—Amphitheatre, March 2, 1876.
Leghorn . . Teatro degli Acquidotti, June 7, 1857.
Legnago . . The Theatre, Feb. 25, 1895.
Leicester . . Paul's Theatre of Varieties, Feb. 28, 1889.
Leipzig . . Club Theatre, Jan. 22, 1892—Summer Theatre, March 1, 1892—Diorama, May 17, 1892.
Lemberg . . Municipal Theatre, March 12, 1886.
Lerida . . . The Theatre, Oct. 1876—Theatre in Campos Eliseos, Feb. 12, 1886.
Lessines . . The Theatre, April 3, 1891.
Lexington . . The Opera House, Jan. 15, 1886.
Leyden . . The Theatre, March 3, 1892.
Lima . . . The Theatre, March 16, 1883.
Limerick . . The Theatre, Jan. 1819.
Lincoln . . Theatre Royal, Nov. 25, 1892.
Lingras (Philippines) The Theatre, July 10, 1891.
Lisbon . . . Little Theatre, April 2, 1893.
Liverpool . . Rotunda Theatre, July 9, 1877—Gaiety (now Empire) Theatre, Sept. 25, 1891—Olympia, May 28, 1892.
Livingstone . . Park Opera House, Aug. 11, 1889.
Lockport . . Hodge Opera House, Jan. 5, 1881.
London . . Duke's Theatre, July 4, 1880 — Drury Lane Theatre, Feb. 24, 1809 — Her Majesty's Theatre, Dec. 6, 1867—Covent Garden, Sept. 20, 1808; March 5, 1856—Astley's Amphitheatre, Sept. 1, 1803; 1830; June 8, 1841—Garrick Theatre, June 1802; Nov. 4, 1846 — Surrey (formerly Circus) Aug. 12, 1805; Jan. 31, 1865—Royalty Theatre, 1819 —Royal Theatre, April 11, 1826—English Opera House (now Lyceum), Feb. 16, 1830 — Amphitheatre, 1830 — Olympic Theatre, March 29, 1849; Sept. 13, 1888—Islington Circus, July 27, 1853 — Pavilion Theatre, Feb. 13, 1856—Surrey Music Hall, June 11, 1861; Feb. 11, 1868; Nov. 1, 1872 — Standard Theatre, Oct. 22, 1866—Alexandra

LONDON (*cont.*) Palace Theatre, June 10, 1873—Wilton's Music Hall, Aug. 30, 1877—Elephant and Castle Theatre, March 26, 1878—Theatre in the Polytechnic, March 8, 1879—East London Theatre, March 16, 1879—Park Theatre, Sept. 10, 1881—Philharmonic (afterwards Grand Theatre), Sept. 5, 1882—Alhambra Theatre, Dec. 7, 1882—Lusby's Music Hall, Jan. 20, 1884—Exhibition Theatre, May 2, 1885—Cambridge Music Hall, Jan. 28, 1896.

LONGTON . . Queen's Theatre, Sept. 28, 1894.

LOUISVILLE . . City Theatre, 1845—Grand Theatre, June 7, 1886.

LOURCHES . . Annual Fair Theatre, Sept. 17, 1890.

LOUVAIN . . Théâtre Beriot, Sept. 11, 1882.

LÜBECK . . Variety Theatre, Sept. 21, 1891.

LUBLIN . . Summer Theatre, Nov. 14, 1890.

LLUCHMAJOR (Spain) The Theatre, June 1894.

LÜTTICH (Liège) . Théâtre Vauxhall, May 9, 1880.

LUXEMBOURG . Municipal Theatre, Nov. 5, 1892.

LYONS . . . Grand Theatre; Nov. 3, 1875—Théâtre des Célestins, 1845; April 2, 1871; May 26, 1880—Eldorado Theatre, 1874.

MÂCON . . . Concert Theatre, April 1896.

MADRID . . Prince's Theatre, July 11, 1802—Théâtre du Conservatoire, April 20, 1867—Teatro de Romea, Feb. 3, 1876—Teatro del Circo, Nov. 13, 1876—Circus in Campos Eliseos, July 18, 1881—Teatro de los Recreos, July 6, 1882—Variety Theatre, Jan. 28, 1888; The Theatre, Dec. 1889; Comedy Theatre, Nov. 1890.

MALAGA . . Liberty Theatre, March 20, 1869.

MALONE . . The Opera House, Jan. 28, 1888.

MANCHESTER. . Theatre Royal, May 7, 1844—Gaiety Theatre, June 9, 1883—Royal Circus, Feb. 26, 1889—Queen's Theatre, Aug. 17, 1890.

MANKATO . . The Opera House, Jan. 16, 1882.

MANTUA . . Teatro Andriani, April 1883—The Theatre, Sept. 25, 1889.

MARCARA . . The Theatre, March 20, 1885.

MARIENBURG . . Summer Theatre, Dec. 26, 1879.

MARION (U.S.A.) . Sweeter's Opera House, Jan. 16, 1895.

MARLIN (U.S.A.) . Stuart's Opera House, Jan. 25, 1881.

MARSEILLES . . Théâtre Alcazar, June 25, 1873—Circus Cortrelli, Dec. 21, 1876—Crystal Palace Theatre, March 17, 1882.

MARYSVILLE . . The Opera House, Nov. 17, 1864.

MAYENCE . . Circus Baese, April 1, 1886.

MCKEESPORT (U.S.A.) Altmeyer Theatre, Feb. 8, 1896.

MEADVILLE . . The Opera House, Jan. 9, 1884.

MEDFORD . . The Opera House, May 28, 1885.

MELBOURNE . . Haymarket Theatre, Oct. 22, 1871—Royal Theatre, March 19, 1872—Bijou Theatre, April 22, 1889.

MEMEL . . . Municipal Theatre, Oct. 4, 1854.

MEMPHIS . . Greenlaw's Opera House, Oct. 8, 1883—The Theatre, Sept. 17, 1891.

MESSINA . . Teatro Arena Beloro, Aug. 18, 1894.

METROPOLIS . . The Opera House, Nov. 30, 1882.

METZ . . . Walter Theatre, Sept. 26, 1876.

METZINGEN . . Circus Lorch, Sept. 21, 1887.

MIDDLEPORT . . Compton's Opera House, March 21, 1882.

MILAN . . . Teatro Monte Tabor, Sept. 1, 1889.

MILES CITY . . Cosmopolitan Opera Theatre, July 23, 1883.

MILFORD . . Lyceum Theatre, Oct. 25, 1896.

MILTON . . Academy of Music, May 14, 1880.

MILWAUKEE . . Gaiety Theatre, Nov. 15, 1869—The Theatre, April 9, 1894—Municipal Theatre, Jan. 16, 1895.

MINNEAPOLIS . Academy of Music, Dec. 25, 1884—Bijou Theatre, Dec. 28, 1890.

MINESOLA . . The Opera House, March 20, 1882.

MISKOLCZ . . Municipal Theatre, July 19, 1843.

MISSOULA . . Maguire's Opera House, April 6, 1887.

MITAU . . . Schrickenhöfer's Theatre, Jan. 22, 1883.

MOBILE . . Emmanuel St. Theatre, Feb. 6, 1838—State St. Theatre, Nov. 13, 1842; 1860.

MODENA . . Teatro Aliprandi, March 17, 1881.

MONS . . . Municipal Theatre, Feb. 28, 1839.

MONTAGUE . . The Opera House, Oct. 15, 1884.

MONT DE MARSAN The Amphitheatre, July 19, 1878.

MONTAUBAN . . The Theatre, June 12, 1888—Theatre Sebastier, Jan. 13, 1890.

MONTELLO . . The Opera Hall, Oct. 16, 1884.

MONTEREY (Mex.) Progresso Theatre, Sept. 9, 1896.

MONTEVIDEO . . The Theatre, June 1, 1882—Teatro Politeama, Oct. 6, 1895.

MONTLUÇON . . Annual Fair Theatre, Jan. 25, 1892.

MONTPELLIER . Grand Theatre, April 6, 1881—Variety Theatre, Nov. 5, 1877.

MOSCOW . . Petrowsky Opera House, 1805; Sept. 16, 1812; March 26, 1853—Buffo Theatre, Jan. 7, 1883—Circus Salomonski, April 8, 1883—German Theatre, Oct. 19, 1884; Dec. 6, 1885.

MOUNT STERLING . The Opera House, Feb. 6, 1885.

MUNICH . . Isar Theatre, March 1811—Court Theatre, Jan. 14, 1823—German Theatre, Feb. 1896.

MURCIA . . Teatro de Romea, Feb. 8, 1877.

MURFREESBOROUGH The Opera House, Oct. 26, 1886.

NAMUR . . . Municipal Theatre, March 18, 1860; Sept. 25, 1862; Jan. 14, 1867.

NANTES . . Grand Theatre, March 1856—Priami Circus, Sept. 1889.

NAPLES . . Teatro San Carlo; Feb. 13, 1816—New Theatre, Feb. 20, 1861—Teatro Bellini, April 17, 1869.

NASHVILLE . . The Theatre, 1851—Buckingham Theatre, May 31, 1891.

NATCHEZ . . The Theatre, Sept. 5, 1822.

NESCHIN . . Circus Nikitin, May 27, 1887.

NEUMÜNSTER . Covent Garden Theatre, Feb. 5, 1879—Theatre in Imperial Hall, Dec. 12, 1888.

NEVADA . . Moore's Opera House, May 7, 1882.

NEWARK (U.S.A.) . Union Park Hall, Jan. 3, 1889.

NEW BRUNSWICK (U.S.A.) Allen Theatre, Dec. 21, 1896.

NEW LISBON . Managhan's Opera House, Jan. 2, 1887.

NEW ORLEANS . New Theatre, Sept. 26, 1816—St. Charles Theatre, March 13, 1842—American Theatre, July 29, 1842; May 6, 1855—Placide's Varieties, Nov. 21, 1854; Dec. 1, 1870—Grand Theatre, Dec. 17, 1866—Olympic Theatre, Dec. 23, 1868—Circus, March 18, 1883—Old German Theatre, July 1, 1887—Farantas Theatre, March 7, 1889—Wenger's Concert Hall, Feb. 13, 1892.

NEWPORT (Mon.) . Victoria Theatre, May 27, 1896.

NEW YORK . . Park Theatre, May 25, 1820; Dec. 16, 1848; Oct. 30, 1882—Bowery Theatre, Aug. 30, 1808; May 26, 1828; Sept. 22, 1836; Feb. 18, 1838; April 25, 1845; Dec. 18, 1866;—Lafayette Theatre, April 11, 1829—Richmond Hill Theatre, July 4, 1831—National Theatre, Sept. 23, 1838; May 29, 1841—Providence Theatre, Oct. 24, 1844—Niblo's Theatre, Sept. 18, 1846; May 6, 1872—Crystal Palace Theatre, Oct. 5, 1858—Odeon Theatre, Dec. 22, 1858—Barnum's Theatre, July 13, 1865; March 3, 1868; Dec. 24, 1872—Butler's American Theatre, Feb. 15, 1866; April 8, 1868—Academy of Music, May 21, 1866—Winter Garden Theatre, March 23, 1867—Théâtre Comique, Dec. 4, 1868—Lina Theatre, Nov. 28, 1872—Fifth Avenue Theatre, Jan. 1, 1873; Jan. 2, 1891—Alhambra Theatre, Nov. 1, 1882—Windsor Theatre, Nov. 30, 1883—Standard Theatre, Dec. 14, 1883—Hart's Opéra Comique, Dec. 23, 1884—Gautzberg's Theatre, Feb. 20, 1888—Union Square Theatre, Feb. 28, 1888—Tony Pastor's Theatre, June 6, 1888—Metropolitan Opera House, Aug. 26, 1892—United States Theatre, March 24, 1895—Proctor's Theatre, June 6, 1895—Jacob's Theatre, June 16, 1895.

Niagara Falls . Park Theatre, Aug. 7, 1896.

Nimes . . . Théâtre Renaissance, April 21, 1885; Scala Theatre, June 6, 1893.

Nishni-Novgorod The Theatre, Jan. 24, 1854; July 1878—Municipal Theatre, Dec. 25, 1888.

Nice . . . Municipal Theatre, March 23, 1881—Theatre in New Casino, April 4, 1883—Summer Theatre, June 6, 1888.

Northampton . New Opera House, Feb. 12, 1887.

Norfolk (U.S.A.) . Avon Theatre, Feb. 14, 1850.

Oakland . . The Opera House, Oct. 18, 1886.

Odessa . . Municipal Theatre, Jan. 14, 1873.

Oil City . . The Opera House, March 2, 1884.

Oldenburg . . Court Theatre, Nov. 24, 1891.

Oldham . . Theatre Royal, April 6, 1878.

Oporto . . Trinidad Theatre, July 4, 1875; Théâtre Baquet, March 20, 1888.

Orebro . . Municipal Theatre, Feb. 4, 1877; Sept. 25, 1882.

Orel . . . The Theatre, 1854.

Orleansville . The Theatre, Feb. 27, 1886.

Osaka . . . Five Theatres, 1878–1879.

Oscarhamn . . The Theatre, Feb. 22, 1885.

Oshkosh . . Wagner's Opera House, Feb. 24, 1874—Harding's Opera House, April 28, 1875—Turner Opera House, March 2, 1890.

Oskaloosa . . The Opera House, Dec. 22, 1886.

Ostend . . Eden Theatre, Sept. 4, 1893.

Oestersund . . New Theatre, April 20, 1886.

Ottumwa (U.S.A.) . Lewis Opera House, Sept. 18, 1887.

Oviedo . . The Theatre, July 13, 1893.

Owensburg . . The Opera House, Jan. 6, 1882.

Oxford . . New Theatre, March 10, 1892.

Palermo . . Teatrino, Oct. 5, 1889.

Papa . . . Summer Theatre, Oct. 10, 1877.

Paris . . . Grand Opera, Oct. 29, 1873—Théâtre Nicolet (later Gaîté), Feb. 21, 1835—Théâtre Lazary, May 31, 1798—Circus Theatre, Dec. 15, 1798—Odéon Theatre, March 18, 1799; March 20, 1818—Olympia Circus, March 15, 1826—Ambigu Comique, July 14, 1827; March 4, 1896—Gymnase Enfantin, 1827; 1843—Folies Dramatiques, Dec. 12, 1836—Italian Opera House, Jan. 15, 1838—Vaudeville Theatre, July 17, 1838—Diorama, March 8, 1839; July 14, 1849—Circus Barrière Étoile, July 27, 1846—Théâtre Pré-Catelan, Jan. 29, 1859—Novelty Theatre, Dec. 3, 1866—Théâtre Belleville, Dec. 11, 1867—Hippodrome, Sept. 29, 1869; Théâtre Tuileries (Salle de Machines), May 24, 1871—Théâtre Lyrique, May 24, 1871—Théâtre Porte St. Martin, May 25, 1871—Prado Music Hall, April 11, 1886—Opéra Comique, May 25, 1887—Eldorado Concert Hall, Dec. 1889—Théâtre Duprez, Dec. 6, 1889—Théâtre Cluny, Sept. 12, 1892—Casino de Paris, Feb. 25, 1895—Temporary Theatre, Rue Jean Goujon, May 4, 1897.

Parkersburg (U.S.A.) Academy of Music, Dec. 9, 1895.

Pensa . . . Summer Theatre, April 26, 1883.

Pensacola . . Tarragona Theatre, Dec. 22, 1881.

Pernambuco . . Teatro Santa Izabel, Sept. 19, 1869.

Pernau . . Club Theatre, April 17, 1882.

Perpignan . . Variety Theatre, July 12, 1880.

Petroleum City . The Opera House, April 10, 1880.

Philadelphia . Rickett's Circus, Dec. 17, 1799—Vauxhall Gardens, Sept. 8, 1819—Chestnut Street Theatre, April 2, 1820—South Street Theatre, May 9, 1821—Opera House, April 2, 1826—The Theatre, Nov. 26, 1829—Assembly Building, March 13, 1851—Barnum's Theatre, Dec. 30, 1851—Sandford's Opera House, Dec. 9, 1853; Oct. 17, 1871; March 20, 1872—National Circus, July 5, 1854—Chinese Museum Theatre, July 5, 1854—Fox's American Theatre, June 19, 1867; Feb. 25, 1877—City Museum Theatre,

Philadelphia (*cont.*) Nov 25, 1868—Harmonia Hall, March 8, 1870—Olympic Theatre, Jan. 29, 1874—Temple Theatre, Dec. 27, 1886—Central Theatre, March 24, 1888; Grand Central Theatre, April 27, 1892.

Piano (U.S.A.) . The Opera House, May 12, 1891.

Pillau . . . Stark's Theatre, July 28, 1879.

Piræus . . Tivoli Theatre, Feb. 20, 1886.

Pithole City (U.S.A.) The Opera House, 1866.

Pittsburg . . Athenæum, 1865—Summer Theatre, Dec. 17, 1896—Eden Variety Theatre, Jan. 7, 1897—Duquesne Theatre, May 3, 1897.

Placerville . . American Theatre, Jan. 30, 1854.

Plainwell . . The Opera House, June 4, 1885.

Plymouth . . Theatre Royal, Jan. 6, 1863; June 13, 1878.

Pordenone . . Teatro della Stella, Feb. 1880.

Portsmouth . . Ginnett's Circus, April 1, 1882—Prince's Theatre, April 25, 1882—Royal Amphitheatre, Dec. 24, 1890.

Prague . Czech National Theatre, Aug. 12, 1881.

Princeton (U.S.A.) The Opera House, April 8, 1889.

Providence . . Museum Theatre, Oct. 27, 1853—Forbes Theatre, Nov. 15, 1858—Elliott's Opera House, March 12, 1877—Théâtre Comique, Feb. 18, 1888.

Przemysl . . The Theatre, May 1864.

Putnam (U.S.A.) . Campbell's Opera House, Dec. 26, 1896.

Quanton (China) . Theatrical Performance in Temple, Feb. 1897.

Quebec . . Royal Theatre, June 12, 1846.

Quincy . . Academy of Music, Sept. 7, 1879.

Racine . . . Blake Opera House, Dec. 28, 1884.

Rahway (U.S.A.) . Gordon's Opera House, April 29, 1885; March 22, 1897.

Ramsgate . . The Theatre, Dec. 1, 1829—Vaudeville Theatre, April 20, 1881.

Ravenna . . Teatro Filodramatico, Oct. 17, 1886.

Reading . . Royal County Theatre, Aug. 25, 1894—Cambrian Theatre, Sept. 7, 1894.

Red Oak . . Bishop's Opera House, Aug. 29, 1882.

Red Wing . . The Opera House, April 9, 1882.

Regensburg . . New Theatre, June 18, 1849.

Reggio . . The Theatre, April 21, 1851.

Reggio (Emilia) . Teatro Correggio, Sept. 22, 1889.

Reichenberg . Municipal Theatre, April 24, 1870.

Reichenhall . Municipal Theatre, April 23, 1873.

Remscheid . . Germania Concert Hall, Feb. 12, 1891.

Rennes . . Salle de Spectacle, Feb. 20, 1856.

Reno . . . Academy of Music, March 2, 1879.

Revel . . . Municipal Theatre, Nov. 3, 1855—Circus Ciniselli, June 29, 1886.

Rhondda Valley (Wales) Port Theatre, Jan. 2, 1890.

Richburg . . Baum's Opera House, March 8, 1882.

Richmond (U.S.A.) The Theatre, Dec. 26, 1811—Circus Kloseberg, April 17, 1885—Green's Opera House, Aug. 29, 1887—New Opera House, Aug. 29, 1887.

Riga . . . German Theatre, June 26, 1882.

Rio de Janeiro . Teatro San José, March 25, 1824—Teatro San Pedro, March 1824; 1830; Feb. 1856—Grand Theatre, Aug. 8, 1851—Teatro Politeama, July 14, 1894.

Rio Tinto . . The Theatre, Feb. 6, 1888.

Rochdale . . Theatre Royal, Jan. 27, 1894.

Rochefort . . The Theatre, Sept. 12, 1891.

Rochester (U.S.A.) Metropolitan Theatre, Nov. 6, 1869.

Rohitsch . . Provincial Theatre, Aug. 19, 1876.

Rome . . . Teatro Alberti, 1815; Feb. 15, 1863—Teatro Pietro Cossa, Sept. 20, 1884—Politeama Adriano, May 14, 1895—Alhambra Theatre, Nov. 10, 1896.

Rondout . . Sampson's Opera House, Jan. 29, 1885.

Rostock . . Municipal Theatre, Feb. 20, 1880.

Rostoff-on-Don . Theatre in Park Gardens, Dec. 13, 1896.

Rotterdam . . Cosmopolitan Music Hall, June 26, 1887.

Rouen . . . The Art Theatre, April 25, 1876—Lyric Theatre, Jan. 13, 1878—L'Alcazar, April 19, 1879—Théâtre Lafayette, June 28, 1887.

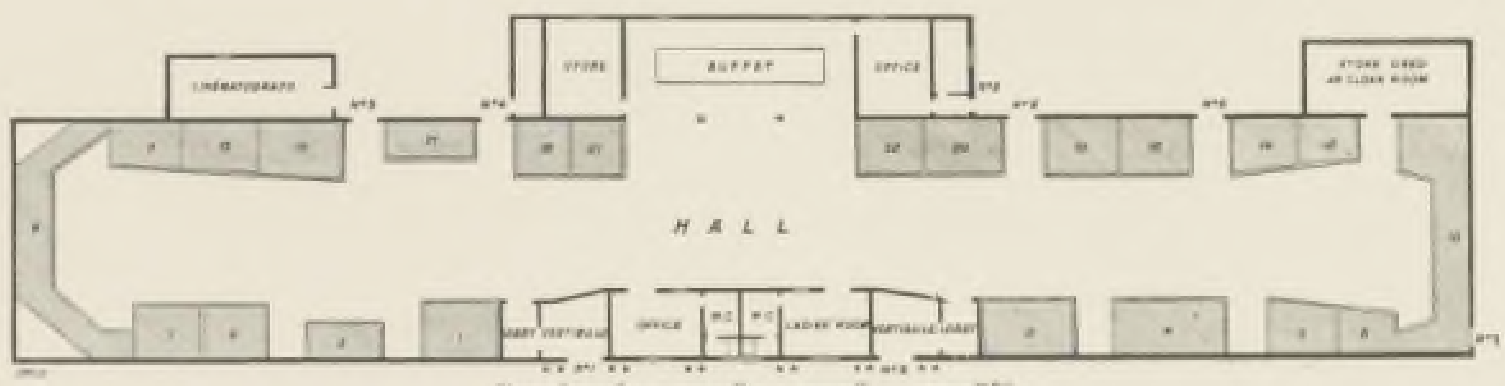
Ruda-Gozewska (Poland). The Theatre, Sept. 6, 1894.

Rushville . . The Opera House, Sept. 18, 1889.
Rutland (U.S.A.) . Ripley's Opera, May 15, 1875.

Sacramento . . Tehama Theatre, Aug. 13, 1851—American Theatre, Nov. 2, 1852—Forest Theatre, 1861—The Theatre, 1876.
St. Aberns . . Waugh's Opera House, Nov. 26, 1891.
St. Charles . . Mittelberger's Opera House, Jan. 1, 1881.
St. Jean d'Angely The Theatre, July 6, 1870.
St. John's . . Academy of Music, June 20, 1877—Lyceum Theatre, June 20, 1877—Opera House, Aug. 20, 1888—Athenæum, July 9, 1892.
St. Johnsburg . Howe Opera House, Jan. 26, 1896.
St. Joseph (U.S.A.) Grand Opera House, April 2, 1889.
St. Louis . . Bowery Theatre, Oct. 6, 1865—Théâtre Comique, 1867—Opera House, Feb. 28, 1869—Opéra Comique, Dec. 9, 1880—Grand Opera House, Nov. 23, 1884—Summer Theatre, July 25, 1888—Lundberg's Variety Theatre, Oct. 29, 1894—Globe Theatre, Nov. 5, 1896.
St. Paul . . Grand Opera House, Jan. 21, 1889—Park Theatre, July 5, 1891.
St. Petersburg . German Theatre, Sept. 1806—New Theatre, Jan. 1, 1811—Fontanka Theatre, March 14, 1825—Lehmann's Theatre, Feb. 14, 1836—Circus Theatre, Feb. 7, 1859—Variety Theatre, July 16, 1881—Winter Theatre, Livadia, March 18, 1882—Arcadian Theatre, July 4, 1882—Theatre Studenikow, May 22, 1885—Theatre Malajero, May 22, 1885—Theatre Federow, May 22, 1885—Grand Theatre, July 12, 1890.
Salamanca . . Lyceum Theatre, Dec. 22, 1889.
Salem . . . Reed's Opera House, Oct. 26, 1882—Opera House, Feb. 18, 1887.
Salisbury . . The Opera House, Oct. 18, 1886.
Salt Lake City . Grand Opera House, July 5, 1890.
Samtschang (China) The Theatre, Nov. 30, 1893.
Sandy Creek . Buckley Opera House, April 27, 1890.
Sandy Hill . The Opera House, Oct. 11, 1876.
San Francisco . Phœnix Theatre, May 4, 1850—National Theatre, May 4, 1850—Washington Hall, May 4, 1850—Italian Theatre, Sept. 17, 1850—Vaudeville Theatre, 1850—Adelphi Theatre, May 4, 1851; June 2, 1858—Jenny Lind Theatre, May 4, 1851—Robinson's Museum Theatre, May 4, 1851—Olympic Circus, May 4, 1851—New Jenny Lind Theatre, June 22, 1851—Metropolitan Theatre, Aug. 15, 1857—Lyceum Theatre, 1859; Nov. 27, 1860—Music Hall, Jan. 23, 1860—Pickwick Hall, Sept. 27, 1860—Russ Garden Theatre, Aug. 24, 1861—Willows Garden Theatre, Jan. 12, 1864—American Theatre, Aug. 24, 1867; Feb. 26, 1868—Park Pavilion Theatre, Nov. 19, 1872—Winter Garden Theatre, Aug. 4, 1883—Chinese Theatre, June 11, 1885.
San José . . The Opera House, July 5, 1881—Californian Theatre, July 5, 1892.
Santiago de Chile Teatro San Lucia, Dec. 8, 1870.
Saratoga . . Putnam Music Hall, April 3, 1896.
Savona . . Teatro Chiabrera, April 22, 1883—Teatro Colombo, March 9, 1893.
Schwedt . . Summer Theatre, April 30, 1891; June 3, 1893.
Schwerin . . Court Theatre, April 23, 1831; April 16, 1882.
Seattle . . Fry's Opera House, June 6, 1889.
Sebastopol . . Circus Tauree, Feb. 2, 1882.
Sedalia . . The Opera House, July 15, 1872.
Seneca . . . Daniel's Opera House, July 30, 1890.
Shanghai . . Chinese Theatre, June 1871.
Sheffield . . Theatre Royal, March 25, 1865—Stacey's Theatre, May 30, 1893.
Shell Lake . The Opera House, Dec. 5, 1889.
Shenandoah . . Academy of Music, Nov. 12, 1883—Opera House, Nov. 12, 1883.
Sherburne (U.S.A.) The Opera House, March 17, 1891.
Sherman . . The Opera House, Dec. 30, 1879.
Sibibel-Abbes . The Theatre, May 15, 1882.
Silver Cliff . Silk's Theatre, Feb. 20, 1881.
Sinigaglia . . Municipal Theatre, Aug. 8, 1838.
Smolensk . . Winter Theatre, Nov. 10, 1888.
Smyrna . . Greek Theatre Euterpe, Nov. 16, 1884.
Socorro . . The Old Opera House, Aug. 22, 1887.
Sofia . . . Theatre in the Narodna Sobranje, Jan. 31, 1882.
Solarolo . . Municipal Theatre, Feb. 22, 1889.
Southampton . Gaiety Theatre, Nov. 19, 1884—Old Theatre, Nov. 19, 1884—Manor House Theatre, April 5, 1887.
South Bethlehem Grand Opera House, Oct. 7, 1884.
Southend . . Alexandra Theatre, Jan. 10, 1895.
South Shields . Alhambra Amphitheatre, April 27, 1878—West End Theatre, Nov. 28, 1882.
Spalato . . Teatro Bajamonti, May 14, 1881.
Spokane Falls . Falls City Opera House, Aug. 4, 1889.
Springfield . . Music Hall, 1860; Aug. 2, 1896—Opera House, March 17, 1876—Grand Opera House, March 27, 1896.
Stafford Springs Eaton's Opera House, May 21, 1891.
Stalybridge . . Royal Victoria Theatre, Oct. 31, 1889.
Stanislau . . The Theatre, Sept. 28, 1868.
Staraja Russa . The Theatre, Sept. 1, 1882.
Steubenville . Cain's Winter Garden Theatre, Jan. 16, 1888.
Stettin . . Thalia Theatre, Nov. 23, 1884—Summer Theatre, March 16, 1890.
Stockholm . . Little Theatre, Nov. 24, 1825—Zoological Garden Theatre, May 19, 1865.
Stockport . . People's Opera House, Aug. 26, 1887.
Stockton-on-Tees Star Theatre, April 2, 1883—The Theatre, April 1892.
Stolp . . . Municipal Theatre, April 20, 1881.
Stralsund . . Club Theatre, May 31, 1892.
Strasburg . . Grand Theatre, Sept. 9, 1870—Rappo's Theatre, Dec. 8, 1872—Bruckmann's Variety Theatre, Nov. 24, 1890.
Stuttgart . . The Theatre, Nov. 1802—Herzog Circus, Dec. 9, 1879.
Sunderland . . The Theatre, 1856—Lyceum Theatre, Aug. 19, 1880—Star Theatre, Aug. 11, 1883.
Sydney . . Prince of Wales Theatre, Oct. 3, 1860; Nov. 1870—Victoria Theatre, July 22, 1880—Theatre Royal, July 17, 1892.
Syracuse (U.S.A.) . Wieting's Opera House, July 19, 1881; Sept. 3, 1896—Lynch and Moore's Opera House, Sept. 13, 1888—Standard Theatre, Nov. 21, 1891.
Szegedin . . New Theatre, April 22, 1885.

Tambov . . The Theatre, Sept. 13, 1882.
Tamera . . Japanese Theatre, May 9, 1888.
Tarascon . . The Theatre, April 15, 1884.
Tarentum (U.S.A.). Old Opera House, April 18, 1889.
Tarnopol . . The Theatre, 1874.
Taunton (U.S.A.) . Athenæum, May 7, 1873.
Temesvar . . Franz-Josef Theatre, April 30, 1880.
Terre Haute (U.S.A.) Naylor's Opera House, July 21, 1896.
Tetschen . . Municipal Theatre, Jan. 15, 1845.
Thisted . . The Theatre, March 17, 1859.
Tientsin . . Chinese Theatre, May 1872.
Tiflis . . . Russian Theatre, Oct. 23, 1874.
Tinnevelly . . Indian Theatre, July 26, 1886.
Titusville . . The Opera House, April 14, 1882.
Tokay (Hungary). The Theatre, Aug. 26, 1890.
Tokio . . . Theatre Shidzanoka, Jan. 1884—The Theatre, April 11, 1892.
Toledo (U.S.A.) . Music Hall, Dec. 15, 1882—Collingwood Music Hall, Feb. 1896.
Tomsk . . . Summer Theatre, Aug. 7, 1884.
Tonowanda . . Mozart's Variety Theatre, June 10, 1886.
Topeka . . Crawford's Opera House, Dec. 2, 1880.
Toronto . . Royal Lyceum Theatre, Jan. 30, 1874—Grand Opera House, Nov. 29, 1879; Feb. 8, 1883.
Toulouse . . Capitol Theatre, July 8, 1883—Pré-Catelan Theatre, Aug. 3, 1887.
Tournay . . Municipal Theatre, Dec. 1852.
Tours . . . The Theatre, Aug. 13, 1883.
Treviso . . The Theatre, 1868; Oct. 1875.
Trieste . . The Old Theatre, May 27, 1876—Theatre Politeama, March 1892.

Troy (U.S.A.)	Opera House, April 8, 1871; June 30, 1890—Grand Central Theatre, Dec. 1881; March 21, 1887.
Troyes	Circus, April 30, 1892.
Tschernigow	The Theatre, Dec. 24, 1882.
Tuchel	Theatre in Hôtel Eilers, May 6, 1889.
Tula	Municipal Theatre, July 11, 1834—Kremlin Theatre, May 3, 1895.
Tunis	Théâtre Français, Nov. 19, 1889 — Politeama Tunisino, Sept. 28, 1896.
Turin	Teatro Alfieri, Jan. 5, 1858—Teatro Nota, July 12, 1868.
Tyrone (U.S.A.)	The Opera House, July 8, 1880.
Unna	The Theatre, Oct. 1867.
Valetta	Municipal Theatre, May 25, 1873.
Valparaiso	Victoria Theatre, 1878.
Vanticote (U.S.A.)	Smoulter's Opera House, Oct. 24, 1889.
Venice	Teatro della Fenice, Dec. 14, 1836.
Venloe	Municipal Theatre, July 10, 1887.
Verden	The Theatre, April 13, 1879.
Verona	The Theatre, 1815—Teatro Diurno Mondini, June 1865.
Vienna	Circus Bach, Feb. 20, 1851—Treumann Theatre, June 8, 1863 — Franz-Josef Theatre, 1863 — Theatre in the Universum, August 26, 1866 — Orphean Theatre, June 15, 1868 —Ring Theatre, Dec. 8, 1881—Municipal Theatre, May 16, 1884 — Panorama Theatre in the Praterstrasse, April 28, 1892.
Vincennes (U.S.A.)	Green's Opera House, May 5, 1885.
Virginia City	The Opera House, Oct. 26, 1875; March 13, 1883.
Waal	The Theatre, Feb. 14, 1885.
Waco	The Opera House, Feb. 22, 1877 — Miller's Theatre, Jan. 10, 1880.
Wakefield (U.S.A.)	Vaudeville Theatre, Dec. 26, 1887.
Wallace	Club Theatre, July 27, 1890.
Wandsbeck	Reisner's Tivoli Theatre, Jan. 22, 1878.
Wansaw (U.S.A.)	The Opera House, Jan. 16, 1892.
Warsaw	Circus Hinné, Jan. 8, 1859—Imperial Variety
Warsaw (*cont.*)	Theatre, June 11, 1883—Small Imperial Theatre, March 11, 1894.
Washburn	The Opera House, Sept, 14, 1888.
Washington	Carusi's Theatre, 1820—National Theatre, 1820; March 5, 1845; Feb. 6, 1857; Jan. 28, 1873; Feb. 27, 1885 — Canterbury Hall, July 23, 1869—Wall's Opera House, Dec. 6, 1871—Herzog's Opera House, Dec. 5, 1886.
Wateska	The Opera House, Oct. 15, 1883.
Weimar	Court Theatre, Mar. 22, 1825.
Wellington (U.S.A.)	The Opera House, May 28, 1892.
Werschitz	The Theatre, Oct. 18, 1874.
West Bromwich	Theatre Royal, Sept. 9, 1895.
West Middlesex (U.S.A.)	Barnett's Opera House, Oct. 27, 1890.
Wetelback	State Theatre, June 1889.
Wexiö	The Theatre, Feb. 19, 1838.
Whampoa (China)	The Theatre, 1853.
What Cheer (U.S.A.)	The Opera House, Aug. 3, 1890.
Whitehall (U.S.A.)	Hall's Theatre, March 1, 1886.
Wiener-Neustadt	The Theatre, 1834.
Wigan	Queen's Theatre, Feb. 4, 1878.
Wilkesbarre	The Opera House, Jan. 2, 1874.
Willem (U.S.A.)	The Opera House, Feb. 20, 1892.
Wilmington	Academy of Music, Oct. 23, 1888.
Wilna	Circus Ferroni, May 22, 1886.
Winnipeg	Princess Opera House, May 1, 1892 — Grand Opera House, Jan. 17, 1897.
Winona (U.S.A.)	The Opera House, Jan. 20, 1891.
Witebsk	Municipal Theatre, July 9, 1889.
Wittenberg	Central Hall, May 1, 1878.
Wlozlaw	The Theatre, Nov. 16, 1882.
Worcester	Theatre Royal, Nov. 24, 1877.
Worcester (U.S.A.)	The Theatre, May 16, 1889.
Workington	Public Hall, Dec. 28, 1894.
Wyoming	The Opera House, July 17, 1891.
Ystad	Municipal Theatre, March 24, 1891.
Zolkiew	Theatre in Royal Castle, Jan. 22, 1824.
Zurich	The Theatre, Jan. 1, 1890.



TEMPORARY THEATRE, PARIS (KNOWN AS CHARITY BAZAAR). *Destroyed* MAY 4, 1897.

FIG. 5. PLAN AT STREET LEVEL.

ANALYSIS OF FIRES.

THE following analysis deals with some 1115 fires, which have occurred between January 1, 1797, and May 4, 1897. From the beginning of 1797 to the end of 1896 my list shows 1108 fires, which I have chosen to term in round numbers eleven hundred. I have omitted from these pages all mention of fires where I was unable to verify, to some extent, the reports that have reached me. Had the whole of the records that are in my possession been included, the number would have risen to nearly fourteen hundred. It should also be remembered that these eleven hundred fires during the last century are almost solely cases where the building has been entirely destroyed or very materially damaged, while the innumerable smaller fires which occur nightly in every city, and of which we hear little or nothing, on account of the great secrecy with which these dangers are concealed from the general public, have been omitted. To repeat, I have to consider, as far as my analysis is concerned, 1115 fires resulting in the entire destruction of or material damage to places of public entertainment, and this number dates back to 1797.

It has, of course, been impossible, even in the case of the fires under consideration, to obtain full particulars in every instance. This desired completeness has, moreover, been prevented by the fact that a number of my correspondents have, on the one hand, regarded certain specific points of importance whilst framing their reports, and, on the other hand, have disregarded features of which I should have desired some information. I might almost say that each correspondent has laid stress on some different characteristic, and that in nearly every instance some important facts have been omitted. Hence, my averages for any particular extract have often had to be based solely on those cases regarding which the specific details were available.

Perhaps one of the most important results of the analysis is the fact that, out of the three hundred and forty-three fires of which I have been able to obtain the necessary dates of erection of the buildings involved, no less than one hundred and seventy-two of the conflagrations took place within ten years of the opening of the establishment. In fact, in one hundred and five instances out of the three hundred and forty-six under consideration, the structure was destroyed within five years of inauguration. The data referring to these three hundred and forty-six fires are as follows:—

TABLE SHOWING LIFE OF BUILDINGS.

Of 346 buildings destroyed by fire—

32 were burnt in the 1st year after they were opened;

73	were burnt	between the	2nd	and	5th	years of their existence;
67	„	„	6th	„	10th	„
72	„	„	11th	„	20th	„
36	„	„	21st	„	30th	„
11	„	„	31st	„	40th	„
26	„	„	41st	„	50th	„
16	„	„	51st	„	60th	„
7	„	„	61st	„	80th	„
6	„	„	81st	„	100th	„

If the figures are worked out, it will be observed that *the average life* of a Theatre, Music Hall, Assembly Room, or similar building, as based upon these three hundred and forty-six instances, is about ***eighteen years***; but even this calculation must be regarded as optimistic, for there are but few of these buildings which have been employed consecutively for public entertainments, and if we wish to arrive at the life of a structure continuously devoted to such uses, I am afraid we could only give a much lower figure as representing the life of the building, say, twelve years. By far the greater number of places of public entertainment are used only for about half the year, and there are others only occupied for a short season of a few weeks, as, for instance, our Covent Garden Opera House. Those interested in the financial aspect of the life of a structure should certainly consider whether it is used consecutively, as is the case with our big Variety Theatres, the 'Empire' and 'Alhambra,' open night after night on every week-day, and the Music Hall of the Continent, which is also used on Sunday evenings; or whether it be the fashionable Court Playhouse which has only a short season, a

Circus building engaged from time to time by travelling companies, or an Assembly Room, where the building is perhaps only used on fifty nights in the year. It would be well to point out, however, that the averages are here taken from buildings which were actually destroyed, whilst, of course, there are a number of structures in which no serious fires have occurred, and it would only be by obtaining the age of all existing theatres, as well as of those burnt down, that a true average of life could be arrived at.

Perhaps the figure next in importance is that of the cause of fire, and here I would say that of the 1115 instances of outbreaks only forty-five can be attributed to premeditation, i.e., to incendiarism, while the remaining 1070 must be regarded as accidental. This should dispel the common belief that so many of this class of fire are due to the ill-will of employees—a reason too frequently put forward, particularly in the United States.

Out of the 1070 accidental outbreaks it would be well to say that in six hundred and sixty-nine the place of origin has not been detailed; that is to say, it has been impossible to arrive at the exact position of the outbreak. In the remaining four hundred and one cases, however, I have been able to obtain the necessary information, and the following table should be of interest:—

TABLE SHOWING LOCATION OF ACCIDENTAL OUTBREAKS OF FIRE.

Of the 1070 accidental cases the position of outbreak in 401 instances is given as follows:—

(I)	In the auditorium of the Theatre, or the principal hall of other places of entertainment	20
(II)	On the stage in Theatres, or on stages temporarily erected in Assembly Rooms, Public Halls, etc.	167
(III)	In other parts of the building involved	141
(IV)	From outside	73

The lesson deducible from this table certainly appears to be that the greatest liability to danger is found on the stage, for, as it will be noticed, no less than one hundred and sixty-seven cases out of the four hundred and one occurred actually on or above the stage floor. If I further add that of the one hundred and forty-one cases where the outbreak commenced in other parts of the house forty are known to have started at the back, near the stage, or in stores, workshops, etc., abutting on to it, it will be seen that the stage proper, with its direct accessories, is the seat of the greatest risk.

As regards the actual cause of outbreaks, reliable particulars are very few, for, as a rule, the progress of a fire in a place of public entertainment is so rapid that it leaves but little evidence of origin. Hence, I have not attempted any extensive analysis on this point, and have limited my extract to a record of cases where the accident can be distinctly traced to either the lighting, the heating of the 'back of the house,' or to such attempts at special stage effects as are necessary for the representation of shooting, explosions, etc. The following table classifies one hundred and ninety-three cases of this description; the figures themselves will tell their own tale:—

TABLE SHOWING CAUSES OF FIRES.

Of 193 fires commencing at the 'back of the house,' the outbreak was due to:—

Open lights	37	Fireworks	31
Lamps	18	Guns	7
Defects in the gas installation	44	Explosions	17
Defects in the electric installation	7	Defects in heating apparatus	32

I next come to the question of the time of outbreak. Here I have been fortunate in obtaining full particulars in no less than 769 cases. The following table shows the hours at which these fires have been known to have commenced:—

TABLE SHOWING TIME OF OUTBREAK OF FIRE.

Of 769 cases in which the time of outbreak is reported:—

183 fires, or	23·8	per cent., began	during the daytime (7 A.M. to 7 P.M.).
25 ,,	3·2	,, ,,	an hour before entrance of audience.
103 ,,	13·5	,, ,,	during presence of audience for the performance.
133 ,,	17·2	,, ,,	within two hours after the performance.
325 ,,	42·3	,, ,,	during the night (before 7 A.M.).

It is a very serious reflection that more than a seventh of the fires of which the particulars are available have occurred during the presence of the audience at the performance; further, that 458 outbreaks commenced at night, after the usual hours of performance and before seven o'clock in the morning, and no less than 133 within two hours of the close of the entertainment, practically proving how considerable is the risk incurred by the performance. Perhaps I should add that the 103 instances of fires during the presence of an audience quoted above, refer to actual conflagrations, and that I have not included those cases where the fatalities have been principally due to panic, and where the fire, if any, has been of little or no consequence. As regards the time of outbreak during a public dramatic performance, I would add that in very many instances I notice that fires have commenced either just before the beginning of the play, i.e., about five minutes prior to the rise of the curtain, or directly after the few opening words have been given. In such instances there is little doubt that the outbreak is due to the lighting up of the stage, which is generally left until the last moment.

The distribution of fires by months or in seasons may not at first sight appear to be of much importance, but a glance at the following table will show that places of amusement are subject to fire to a greater extent in the Winter and Spring than in the Summer and Autumn, and this should be worthy of notice; firstly, because it is during the former period that the majority of Theatres, Music Halls and Assembly Rooms are more regularly in use and may almost be regarded as open on consecutive nights; secondly, because the Winter is the time for the most dangerous of all theatrical productions—i.e., the pantomime, with its transformation scenes, while the so-called carnival with its many fêtes, also takes place in the first months of the year. I have been enabled to tabulate no less than 1069 cases according to the months in which the outbreaks have occurred. Of these it will be seen that almost ten per cent. happened in January, February and March respectively, and about nine per cent. in April, May and December. Only about five per cent. of the fires are reported as having occurred in the month of August.

TABLE SHOWING FIRES ACCORDING TO MONTHS.

Of 1078 fires, of which the dates are recorded:—

108 occurred in	January,	equal to	10·0	per cent.	83 occurred in	July	equal to	7·7	per cent.
106 ,,	February	,,	9·8	,,	58 ,,	August	,,	5·4	,,
107 ,,	March	,,	9·9	,,	88 ,,	September	,,	8·0	,,
100 ,,	April	,,	9·2	,,	79 ,,	October	,,	7·2	,,
99 ,,	May	,,	9·1	,,	77 ,,	November	,,	7·1	,,
73 ,,	June	,,	6·7	,,	100 ,,	December	,,	9·3	,,

Thus 620 occurred between the months of December and May, and 458 between the months of June and November.

It is, of course, a matter of common knowledge that the number of Theatres, Music Halls, Assembly Rooms, etc., erected throughout the world is constantly increasing, yet it should also be remembered that the possibilities of better construction have proceeded contemporaneously, and there is no doubt that a far greater number of these buildings will be found to be much more suitable for their respective purposes and more capable of resisting fire than, say, those built in 1837. I would, however, call attention to the rapid increase in the number of conflagrations during the last thirty years shown so markedly in the table appended, and I would ask if this increase is not extremely anomalous in view of the greater protective facilities we have at our disposal at the present time.

TABLE SHOWING FIRES IN EACH DECADE FROM 1797-1896.

Of the 1115 instances presented in the records, 1107 occurred between January 1st, 1797, and December 31st, 1896.

Of these 1107 fires

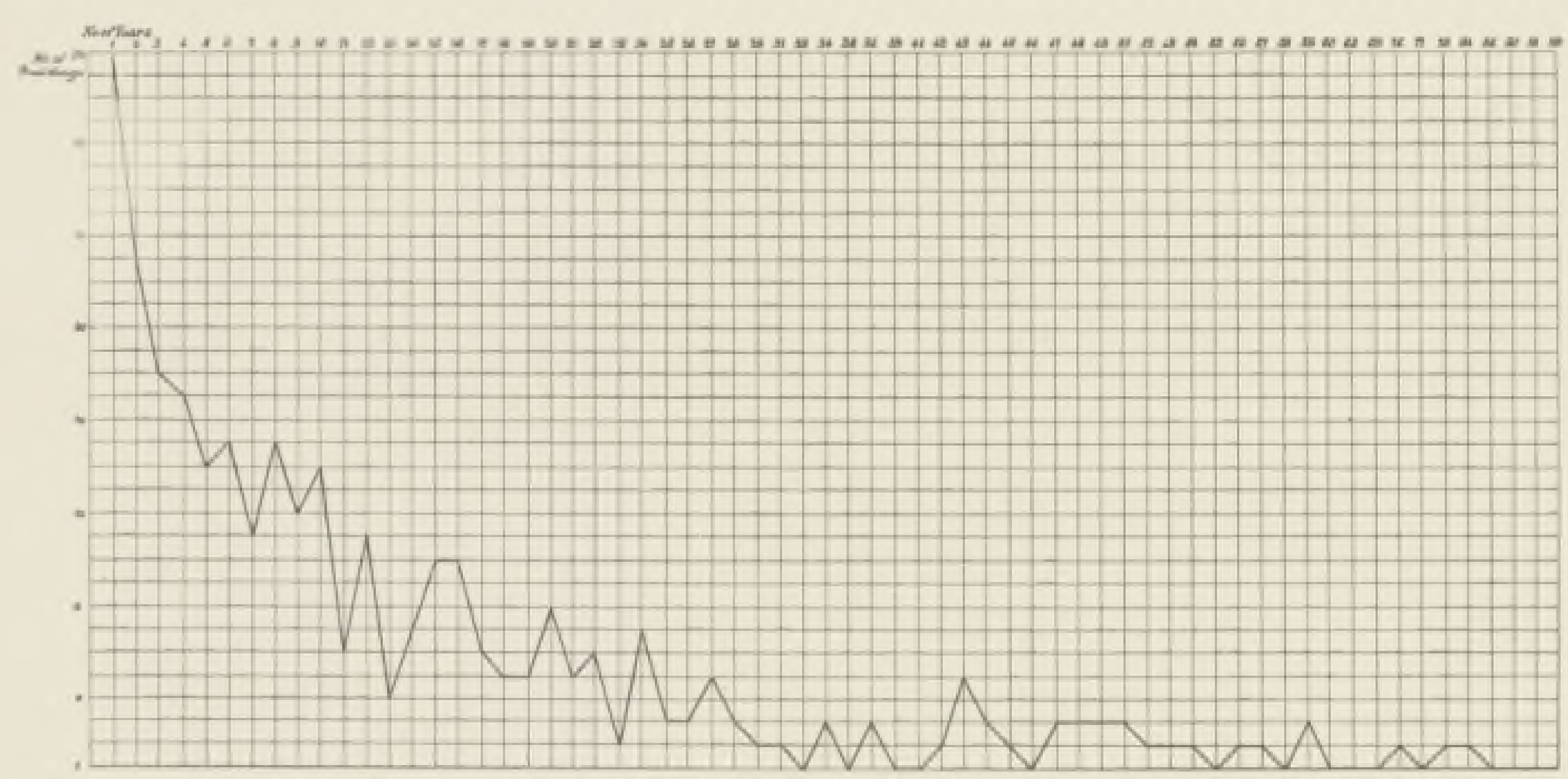
18 are recorded between	1797-1806	70 are recorded between	1847-1856
14 ,, ,,	1807-1816	77 ,, ,,	1857-1866
30 ,, ,,	1817-1826	154 ,, ,,	1867-1876
28 ,, ,,	1827-1836	309 ,, ,,	1877-1886
47 ,, ,,	1837-1846	360 ,, ,,	1887-1896

Of the 1107 fires recorded for the exact century (1797-1896) no less than eight hundred and twenty-three fall within the last thirty years; and six hundred and sixty-nine, which is considerably more than half, within the last two decades. Nearly one-third of the total, or three hundred and sixty, have happened since 1887, and this figure should be most seriously borne in mind. The average number of fires during the last ten years has been thirty-six per annum, during the last twenty years, thirty-three, and during the last thirty years, twenty-seven per annum.

In regard to the distribution of fires and the lives lost in various countries, I now append a table dealing with European countries. It is curious to observe that Great Britain heads the list of fires in Europe, though we have to congratulate ourselves on a considerable immunity from loss of life compared with most other European countries. It will be seen that Germany stands next on the list of fires, France following.

ANALYSIS OF FIRES.
FIG. 4. DIAGRAM SHOWING NUMBER OF FIRES ACCORDING TO DECADES, FROM 1797–1897.

ANALYSIS OF FIRES.
FIG. 5. DIAGRAM SHOWING NUMBER OF LIVES LOST FROM 1870–1897.



ANALYSIS OF FIRES.
FIG. 6. DIAGRAM SHOWING THE AGE OF BUILDINGS AFFECTED.

TABLE SHOWING THE DISTRIBUTION OF FIRES AND LIVES LOST IN EUROPE.

	No. of fires.	No. of lives lost.
Great Britain	139	219
Germany	101	98
France	93	475
Russia	66	1200
Italy	47	46
Austria-Hungary	36	458
Spain and Portugal	33	170
Netherlands	28	25
Other European Countries	41	364

Of course, the number of fires of either Great Britain, Germany or France is small compared with that of the United States, which amounts to four hundred and sixty-two. It should, however, be remembered that in the United States we find a number of structures of a temporary nature, and, comparatively speaking, a far larger number of buildings devoted to public entertainment than is the case in Europe. The United States, however, only shows a death-roll of eight hundred and forty-five to four hundred and sixty-two fires. This is not a very different ratio from that which has characterised the conflagrations in Great Britain.

Altogether, 3055 deaths have been authenticated for Europe, and 845 for the United States, and it should be remembered that these are solely due to actual outbreaks, as distinct from the numerous fatalities in panics caused by false alarms. In addition to these I have records of 79 fires in South America, and 371 in British Possessions. The disastrous fires in China, I would observe, must be considered due to the light construction and materials of the buildings utilised, and the same remark is applicable to the great loss of life reported from Russia, more particularly in connection with circus performances. As regards the total number of deaths, which amounts to 9335, I would only emphasise the fact that it must be regarded as the minimum, for, besides the official number, there are the fatalities which have not been exactly defined by the authorities, and those which I have been unable to verify. Further, I must again remark that, even including these, thus making an aggregate of nearly ten thousand, I am only giving data of which I have personal knowledge. What, may I ask, must have been the number of deaths at the fires of which I hold no record? It will be seen from the lists that quite three-fourths of the fatalities have occurred in the last thirty years. The number of establishments devoted to our entertainment has no doubt materially advanced in that period, but, nevertheless, why should we not be practically free from any risk in pursuing our amusements when we have it in our power to minimise the danger, and prevent the recurrence of these distressing disasters?

In connection with the distribution of fires in European countries, it may be of value to show the relative increase in each decade during the last half century, in which a total of 970 conflagrations have been recorded.

FIRES ACCORDING TO DECADES IN DIFFERENT EUROPEAN COUNTRIES.

Of these 970 fires of the last fifty years, the distribution is as follows:—

	1847–56	1857–66	1867–76	1877–86	1887–96
In Great Britain	8	10	12	44	44
France	6	7	15	7	29
Germany	8	5	20	20	30
Austria-Hungary	3	7	5	9	6
Russia	5	4	7	30	14
Italy	1	6	5	5	16
Other European Countries	5	8	11	29	46

As to the United States, we find the interesting gradational increase of 31, 30, 71, 133 and 147 fires for the five decennial periods under consideration.

In connection with the distribution of fires according to countries, it may be of interest to observe to what extent the more important capital cities of Europe are represented in my tables, and here it will be of value to distinguish between the actual number of conflagrations recorded and the number of places of amusement which have been the scenes of such destructive outbreaks. The following extract shows the respective figures, which I have supplemented by some dealing with important cities in the United States.

TABLE OF FIRES IN IMPORTANT CITIES IN EUROPE AND AMERICA.

Europe.					America.				
London	35 fires	at	27	buildings.	New York	41 fires	at	27	buildings.
Paris	31	,,	28	,,	San Francisco	23	,,	20	,,
St. Petersburg	12	,,	11	,,	Philadelphia	21	,,	18	,,
Berlin	10	,,	10	,,	Chicago	19	,,	18	,,
Madrid	9	,,	9	,,	Boston	15	,,	11	,,
Vienna	7	,,	7	,,	New Orleans	12	,,	10	,,
Rome	5	,,	4	,,	Baltimore	11	,,	10	,,
Constantinople	5	,,	4	,,	Washington	9	,,	5	,,
Berne	2	,,	2	,,	Cincinnati	9	,,	9	,,

One of the most notable features of the above extracts, to my mind, is the fact that London heads the list of capital cities in Europe with thirty-five fires, but it is also very interesting to observe that these conflagrations are distributed among only twenty-seven places of entertainment. After having seen the far greater number of fires attributed to the United States as compared with those of Continental countries, the figures associated with the names of leading American towns are not surprising. If anything calls for remark it is the fact that forty-one fires occurring in New York are also distributed over only twenty-seven establishments. Reference to the records will, however, show that the Bowery Theatre at New York appears no less than seven times as the scene of important outbreaks. Similarly, the National Theatre at Washington is mentioned five times in the records.

THE THEATRE, EXETER, *Destroyed* SEPTEMBER 5, 1887.
FIG. 7. VIEW OF AUDITORIUM AFTER FIRE.

CONCLUSION.

It will be remembered that throughout this analysis I have been speaking of all such places of public entertainment as Theatres, Music Halls, Circus Buildings and Assembly Rooms, and that I have made no difference whatever between the various classes of structure. In a volume dealing with theatre construction it may, however, be of interest to tabulate separately some of the notable theatre fires, with the loss of life incurred, in such a manner that they can be seen at a glance. I have, therefore, prepared the following list:—

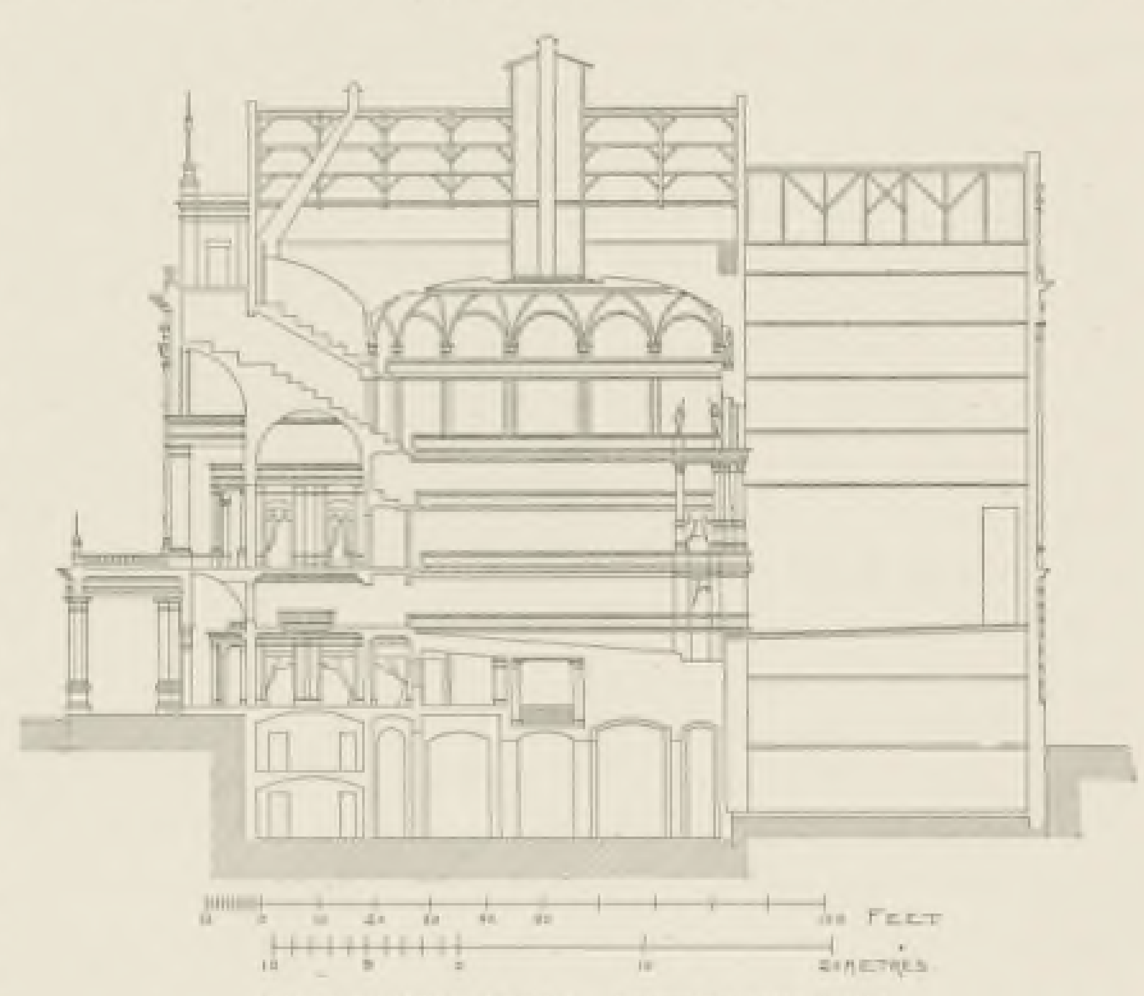
PROMINENT THEATRE FIRES OF THIS CENTURY.

	Date.	Name of Theatre.	No. killed.
1808	Sept. 20	Covent Garden Theatre, London	22
1811	Dec. 26	The Theatre, Richmond, U.S.A.	70
1836	Feb. 14	Lehman Theatre, St. Petersburg	800
1845	May 25	The Theatre, Canton, China	1670
1846	June 12	Royal Theatre, Quebec	200
1847	Feb. 28	Grand Ducal Theatre, Carlsruhe	64
1853	—	The Opera House, Moscow	11
1857	June 7	Teatro degli Acquidotti, Leghorn	45
1867	June 19	Theatre Fox, Philadelphia	13
1872	May	The Theatre, Tientsin	600
1876	Dec. 5	Conway's Theatre, Brooklyn, U.S.A.	283
	Dec. 10	The Theatre, San Sacramento	110
1878	May 11	The Theatre, Ahmednuggur	40
1881	Mar. 23	Municipal Theatre, Nice	200
	Dec. 8	Ring Theatre, Vienna	450
1883	Jan. 13	Circus Ferroni, Berditschew	325
1887	May 25	Opera Comique Theatre, Paris	170
	Sept. 5	The Theatre, Exeter	160
1888	Mar. 31	The Theatre, Oporto, Portugal	170
	April 18	The Arena, Celaja, Mexico	30
	April	National Theatre, Kyoeng in Corea	650
1889	June 6	Fryer's Opera House, Seattle, U.S.A.	30
1891	July 10	The Theatre, Lingras	46
	Dec. 28	Royal Theatre, Gateshead	13
1892	April 27	Grand Central Theatre, Philadelphia	14
	April 28	The Panorama, Vienna	6
1893	April	The Theatre, Kamli	2000
	Sept. 19	Opera House, Canton, N.A.	10
1894	April 9	The Theatre, Milwaukee	16
1895	Dec. 27	Front Street Theatre, Baltimore	22
1896	Jan. 20	Kopyloff Circus, Ekaterinoslav	49
	Sept. 5	Yoxe's Opera House, Benton Harbour	11
	Sept. 30	Palace of Varieties, Aberdeen	7
1897	Feb.	Performance in temple, Quanton, China	230
	May 4	Temporary Theatre, Paris (known as the Charity Bazaar)	124

It is not my purpose here to give particulars of each of these fires, though no doubt many of the details, appalling as they are, are highly instructive to those interested in the construction of playhouses. Nevertheless, perhaps one or two examples should be described, so as to give some idea of the features common to catastrophes of this description; and in going over the lists in the preceding pages with the view of selecting instances, I have chosen the three which I believe are most familiar to our minds. These are, the conflagrations that occurred at the 'Ring' Theatre, Vienna, the Opera Comique, Paris, and the Theatre Royal, Exeter, which have, respectively, a loss of life of four hundred and fifty, one hundred and seventy, and one hundred and sixty. No doubt the catastrophe at Nice with its two hundred fatalities, and a few months previous to that of Vienna the one at Oporto in Portugal, with its loss of one hundred and seventy lives, take a prominent place in the roll of recent calamities so far as Europe is concerned; yet they cannot be said to be as familiar as the three I have just mentioned, nor do I hold them to be equally instructive. The Brooklyn Theatre fire of 1876, with two hundred and eighty-three lives lost, and the one at San Sacramento in the same year, with one hundred and ten lives, are also notable instances from the United States, but it would almost appear as if they had been quite forgotten by the public generally. Again, from countries more distant, having a different form of civilisation, and holding their entertainments on entirely different lines to those to which we are accustomed, we find that China lost as many as two thousand lives in 1893, and quite recently that country had an outbreak of fire at a theatrical performance in a temple, where the death roll reached a total of two hundred and thirty. But these latter will be considered as offering no lessons when we are dealing essentially with modern theatre construction, as is the case in this volume. Curiously enough, I might at once observe, and no doubt it will have been noticed, that the most extensive fires have occurred in batches of twos and threes within short periods of one another. Thus, within the twelve months from Spring 1887 to Spring 1888, we have the Paris, Exeter and Oporto fires. The Vienna 'Ring' Theatre fire was in the same year as the Nice fire, 1881; the two American fires mentioned were also within a week of one another, and though these coincidences are of no practical value, they may be considered interesting; and perhaps I should add that there are some experts who attribute much of the loss of life in any second or third fire of such sequences to the particular nervousness of an audience when danger is imminent shortly after some catastrophe has occurred. What is far stranger, however, than any coincidence in the date of the fires is that such sequences do not seem to make much impression on the public, and that after such a series of fires as occurred, say, from 1887 to 1888, no more energetic steps were taken to prevent a recurrence of this kind of conflagration.

'RING' THEATRE, VIENNA. *Destroyed December 8, 1881.*
FIG. 8. TRANSVERSE SECTION.

Reverting, however, to the three fires of which I wish to give particulars—those of the Vienna 'Ring' Theatre, the Paris Opera Comique, and the Exeter Theatre Royal—I would commence by referring to the plan, the two sections and the elevation which I present of the first-named example. It will be seen from the plan that the 'Ring' Theatre stood on a site open on three sides, i.e. on the front, the back, and the right-hand side, as taken when facing the auditorium. On each of these sides the thoroughfares are of a fair width. Next it will be observed that the planning is by no means complicated as compared with that to which we are accustomed in our own metropolis, that the first row of stalls is nearly 11 feet above the street level, and the highest seat 75 feet above the pavement, these dimensions being small, compared with those, say, of many of the theatres of Paris, where, taking for instance the 'Théâtre de la Renaissance,' the first row of stalls is 25 feet above the thoroughfare. The doors and gangways are not so unsatisfactory as might have been expected. Then it should be remembered that when the fire occurred the building was not quite filled, for the outbreak commenced from ten to fifteen minutes before the raising of the curtain. This, however, is one of the most dangerous moments, for it is the time when there is a great deal of lighting-up going on on the stage and in the various offices, and where gas is used this means even to-day the frequent employment of spirit lamps and the use of matches. It was in using an ordinary lighter on a long pole for some of the battens that one of the gauze curtains at the back of the stage caught fire, and it was therefore only natural, owing to the usual dryness of the canvas and woodwork in the upper part of the stage, that the flames spread with great rapidity. Then it should be noted that the employee of the Austrian stage is by no means very energetic in an emergency, and, as a matter of fact, none of the carpenters or stage hands made the slightest attempt to extinguish the fire or to lower the 'cloths.' There was a general stampede of the whole of the staff, and in this confusion it was even forgotten to lower the iron curtain which was intended to separate the stage from the auditorium under such circumstances. The excitement was so intense that no one thought of telling the audience of what had happened, nor of communicating with the fire brigade. The curtain being down, the audience was entirely unaware of what was going on on the stage, and though some noise was heard owing to the fall of scenery, no notice was taken of it. It was only when the flames had obtained a firm hold of the stage that a draught slightly moved the act-drop, with the result that the flames immediately rushed into the auditorium in full strength accompanied by heavy clouds of smoke. The effect of this gigantic fire suddenly facing the audience was indescribable, and it is not surprising that a panic of the worst description followed. This panic was aggravated by the fact that the whole of the gas in the front of the house was turned out with the view of preventing explosions, which was of course an unnecessary step, and also by the fact that the so-called emergency lamps



'RING' THEATRE, VIENNA. *Destroyed December 8, 1881.*
FIG. 9. LONGITUDINAL SECTION.

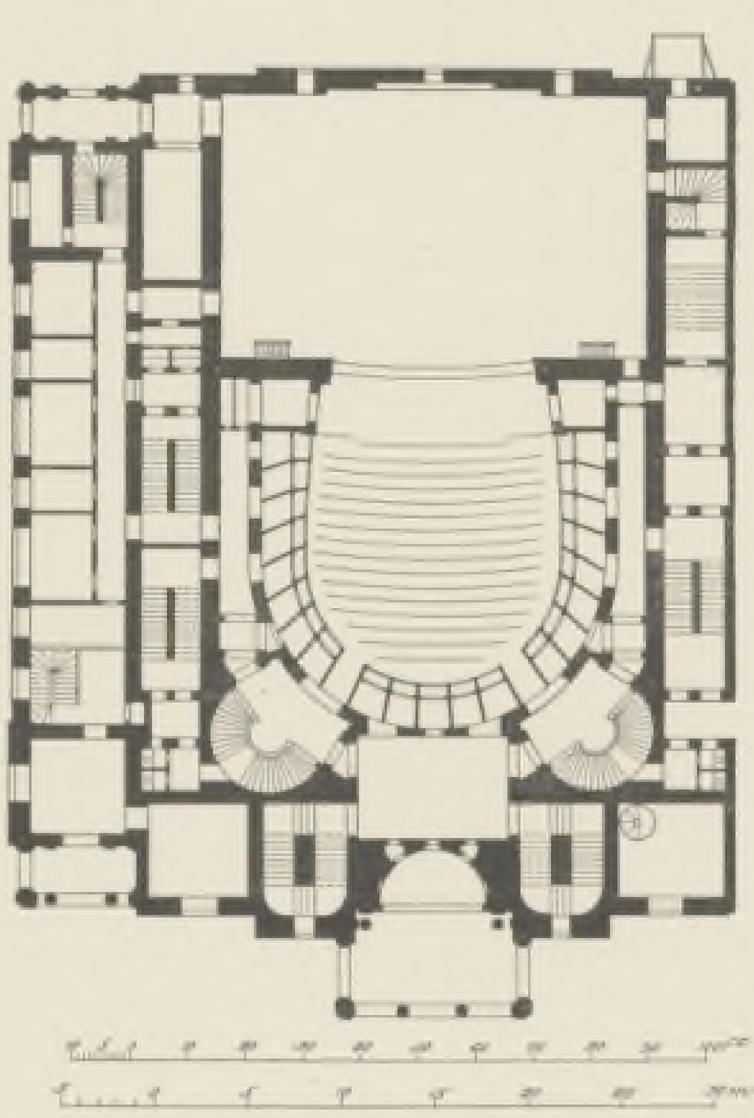
had not been lighted, and that all the passages and staircases were thus in total darkness. The effect of this, more particularly on the staircases, which had no windows into the open, was most disastrous.

I shall not here go into all the details of what happened to the various sections of the audience; or speak of the manner in which the smoke entered the passages and staircases through the doors opening from the auditorium, or how the gases which developed on the stage, and which are more to be feared, perhaps, than any other danger, caused many deaths; nor is it here the place to describe how the badly equipped fire brigade of 1881 showed itself quite incapable of dealing with a disaster of this description. As I have said, the total loss of life at this Vienna fire of December 8th was four hundred and fifty, and as the auditorium of the 'Ring' Theatre provided accommodation for eighteen hundred people, and only about twelve hundred had entered the building at the time of the outbreak, practically one-third of those present succumbed to the fire. Surely this terrible record speaks for itself.

'RING' THEATRE, VIENNA. *Destroyed* DECEMBER 8, 1881.
FIG. 10. FRONT ELEVATION.

Referring now to the fire at the old Opéra Comique, Paris, which broke out on the night of May 25th, 1887, we find that the block stands on a site which, in many respects, is very suitable for a building of its description. It has a clear frontage opening on a public space, as well as two thoroughfares on either side; only the back wall abuts on adjoining property. The first row of stalls is only three feet above the street level, and the highest seat in the gallery is but some forty-five feet above the roadway. The plan, though showing a great dearth of staircase accommodation for modern requirements, is not as unsatisfactory as we are wont to find in many of our older theatres. The principal staircases show a fairly practical arrangement. It should of course be remembered that in this instance we have a building which was erected about the year 1840.

Fortunately, here too, the auditorium was not well filled at the time of the outbreak, for, as is common in Paris, many of the playgoers who attended this theatre did not usually put in an appearance until about ten o'clock, especially those who had booked seats in the better parts of the house. Further, nearly the whole of the *personnel* were present on the stage at the time the fire commenced, which was a matter of some importance, as the bad dressing-room accommodation in the building would otherwise have been responsible for a yet greater loss of life. The fire was first noticed on the stage about ten minutes to nine, and seems to have occurred in connection with a 'batten' at the back of the stage. The accident in this case happened in full view of the audience, who were thus aware of the danger before the fire had taken a firm hold of the scenery. Here again, however, the unnecessary step was taken of turning off the gas in the front of the house, and likewise the curtain between the stage and the auditorium was not lowered—the reason for this here being, I understand, that its gear was not in working order. The same scenes of indescribable panic took place as in the case of the 'Ring' Theatre fire, though the actual extent of the crush was perhaps not quite so disastrous, owing to the audience not having suddenly to face such an extensive fire as was the case at Vienna. But here also the gases developed by the burning canvas were the greatest enemy to human life, and the smoke quickly found its way into the passages and staircases, causing death by suffocation. As in the former instance, I do not intend to enter into sensational details of the experiences through which the audience passed, and I would only say that the loss of life is stated to have been 170, though the figure taken for statistical purposes is somewhat lower, i.e. 117. Unfortunately, however, I must add that, as at Vienna, the fire brigade did not do anything very creditable.

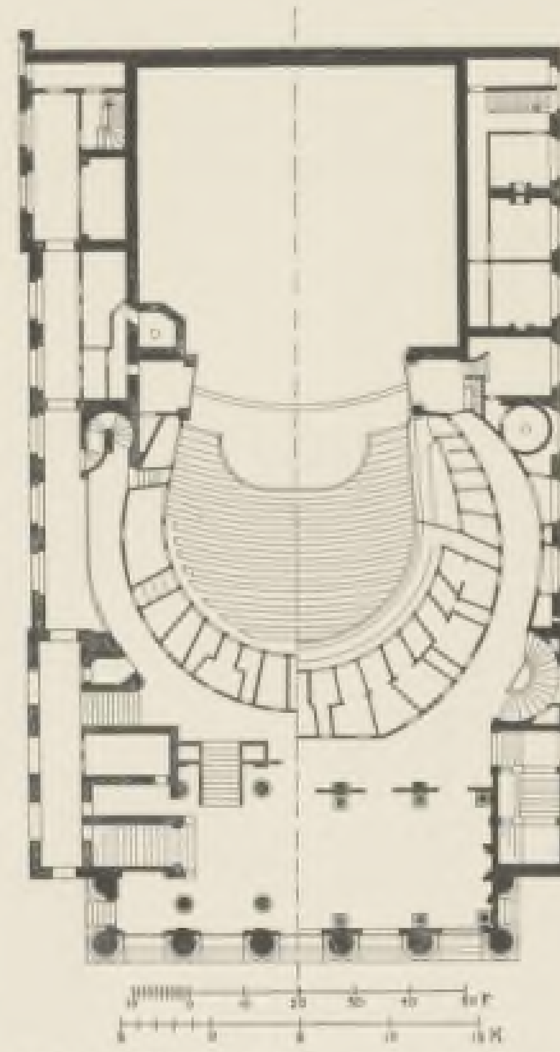


'RING' THEATRE, VIENNA. *Destroyed* DECEMBER 8, 1881.
FIG. 11. AREA PLAN.

Coming nearer home for the third example, we have the Exeter Theatre fire, which broke out on the night of September 5th, 1887. Strange to say, the plan here again shows that this building, at any rate as far as the site was concerned, was by no means so unsatisfactorily placed as many of our London playhouses. At the same time, however, it will be noticed that nearly the whole of one side which abuts on a public thoroughfare was occupied by so-called 'lock-up' shops, which, while no doubt affording additional income to the landlord, made it practically impossible to provide the necessary staircase accommodation. And here a few words with regard to owners of theatre property and their architects. There is not the slightest doubt that the reputation of the late C. J. Phipps suffered considerably owing to the calamity which occurred at this theatre, and yet I cannot but think he was very little to blame for anything relating to the catastrophe. May I ask whether the architect who does not follow implicitly and minutely the instructions of his client—though acting perhaps contrary to his own reason—will not otherwise risk losing his commission? Is it not possible that it was not the architect who was here responsible for any unsatisfactory points in planning, though he may have taken the responsibility upon himself? I have on a former occasion stated that there are architects who are ever ready to oppose existing regulations at any cost, even when their client has called upon them to fulfil the existing requirements; but do we not also know the client who insists upon what may be termed 'dangerous' planning, even going so far as to inform his architect that if he will not comply with his wishes he may have to seek other skilled advice? It would be very interesting to obtain the real facts in regard to the Exeter Theatre now that the architect is no longer among us. Personally, to repeat, I am very strongly of opinion that the blame in connection with the disaster did not rest with him; and that if there was any failing on his part, it was that he followed too implicitly his instructions, thus appearing to take upon himself the moral responsibility for the defects in the building. For my own part, I consider that the loss of life at Exeter was mainly due to the commercial considerations of the venture. At the slight cost of having one 'lock-up' shop less, the extra staircase which was not forthcoming for the emergency could certainly have been arranged.

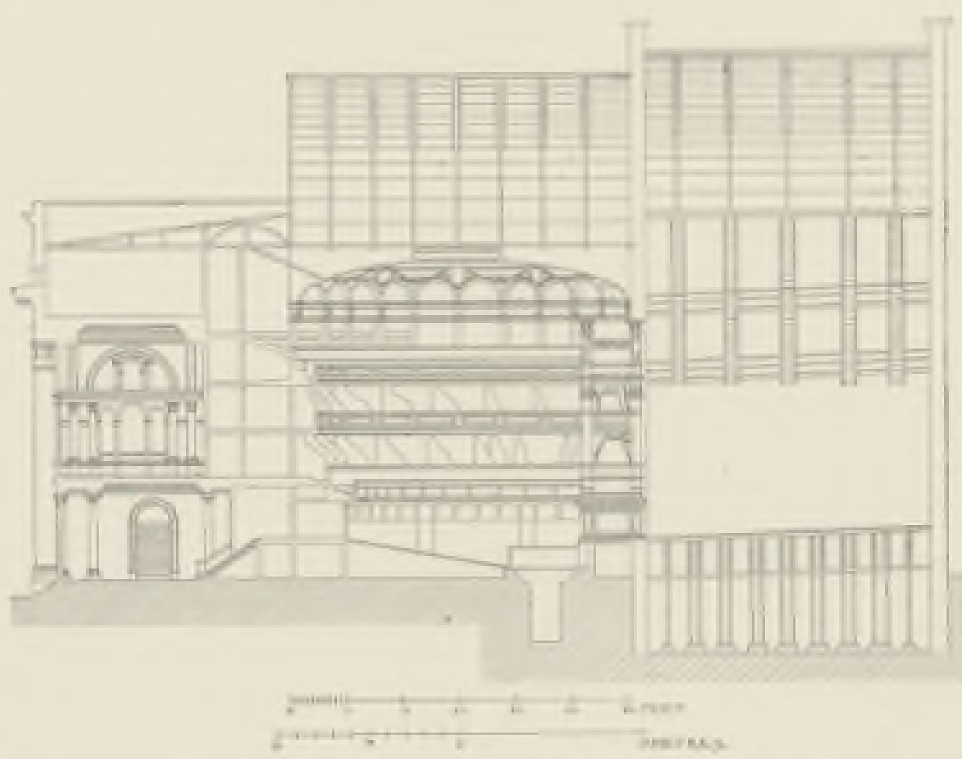
OPÉRA COMIQUE, PARIS. *Destroyed* MAY 25, 1887.
FIG. 12. FRONT ELEVATION.

But, returning to the history of the outbreak of September the 5th, 1887, which, it will be remembered, resulted in the loss of one hundred and sixty lives, I would point out that here we have an instance of a fire occurring in the middle of a performance, when the house was comparatively well filled and the late comers had already arrived. To summarise, it may simply be stated that the fire broke out among the 'cloths' hanging from the 'gridiron' and approximately over the centre of the stage. The ordinary 'act drop' was immediately lowered, but, on the smoke first passing round the sides of this curtain, and, owing to the curtain being blown out, eventually entering the auditorium in large quantities, a panic arose which was particularly severe in the upper part of the house. As before, we again had all the circumstances so common to a theatre fire where no precautions have been taken either to separate efficiently the auditorium and the stage, or to have the necessary appliances available which would allow the smoke and fumes to escape through the roof. In other words, a fire breaking out on the stage develops smoke and gases, the expansion of air blows out any curtain that may have been lowered, and the auditorium is rapidly filled with a poisonous or suffocating atmosphere. The draught into the passages and staircases draws the smoke and gases to the very exits at road level; and thus, quite irrespective of the loss of life and injuries caused by the terrible rush and fight common to every panic, numerous lives are lost solely from suffocation and poisoning. In this instance, a certain door at the back of the stage, which was opened, and created a particularly strong draught from the stage into the auditorium, in all probability facilitated the rapid spread of fire and smoke. It is not my purpose to go into detail, yet I cannot but point out, hard as it may sound, that this catastrophe was a mere repetition of previous disasters, and might well have been guarded against in a playhouse opened as recently as 1886.



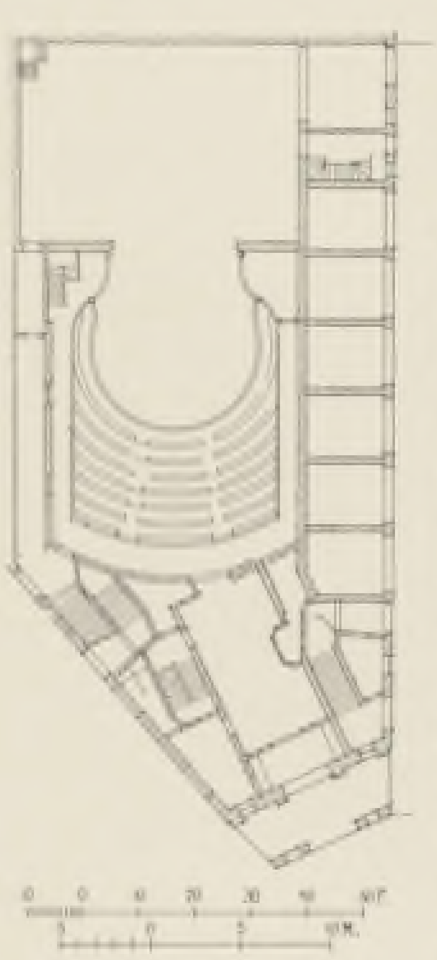
OPÉRA COMIQUE, PARIS. *Destroyed* MAY 25, 1887.
FIG. 13. PLANS OF AREA AND FIRST TIER.

As regards the plan of the Exeter Theatre, I would take the opportunity of mentioning that, as with the site, its general lines were by no means as unsatisfactory as those of the majority of similar places of entertainment in the United Kingdom. But there were, of course, grave errors both in design and construction, and this is said quite apart from any question of responsibility. Some of these facts are concisely expressed in a report on the fire to the Home Secretary, penned by the late Chief Officer of the Metropolitan Fire Brigade, Sir Eyre Massey Shaw, and I cannot do better than quote the opinions of so able an authority on questions of theatre safety. This report, for instance, says that the faults of the building were the following:—"1st. The structure was all in one 'risk.' 2nd. The highest point of the dome or ceiling over the auditorium, which should have been at least ten feet above the highest seat or passage of the gallery, was five feet below this point. 3rd. The roof over the stage, which should have been at least twenty feet above the centre of the dome, was only seven feet above that point. 4th. There was not sufficient outlet for smoke over the stage. 5th. There was not sufficient outlet for smoke over the auditorium. 6th. The gallery, which should have been provided with two staircases, one at each side, had only one staircase, which was obstructed in several places, had an upper door of communication on the upper-circle level, another open door on the dress-circle level, and joined an exit on the ground level which was common to five other parts of the house. 7th. The gas for the sunlight or large chandelier in the centre of the auditorium was on the same meter as the gas for the stage, and when the latter was shut off the whole of the auditorium was instantly plunged in darkness." It would lead too far to quote this valuable report at length. The above sentences explain enough in themselves; but one more quotation I might perhaps make to strengthen what I said above as to the disaster being a mere repetition of former catastrophes. Sir Eyre Massey Shaw, in closing his report, says: "The saddest part of this matter is that no lesson of any kind has been taught by the event, as everyone who has studied the subject either theoretically or practically knew beyond any possibility of doubt what the whole action of the fire and smoke would be under such circumstances; and, moreover, the lessons and warnings of recent years had prepared all concerned for the terrible catastrophe precisely as it occurred." These concluding words should become historical in the annals of theatre architecture, and those interested to-day in theatre enterprise should not forget that these words were said in 1887, i.e. some ten years back. I have little doubt that they can be repeated, word for word, when we hear of our next great theatre conflagration.



OPÉRA COMIQUE, PARIS. *Destroyed* MAY 25, 1887.
FIG. 14. LONGITUDINAL SECTION.

In connection with this Exeter Theatre fire there is one interesting aspect that might be considered, with respect to the responsibility for the safety of places of public entertainment. At the official investigation of the fire, and according to the unanimous vote of the jurymen—though giving a verdict of "accidental death"—the responsibility for the catastrophe was practically put on to the shoulders of the architect. According to the views of the general public at the time the fault lay with the employers of the architect, i.e. the owners of the property. According to Sir Eyre Massey Shaw, in his report to the Home Office, the responsibility is attributed to the local authority, for he distinctly says that, notwithstanding the words of the jury, the licensing authority on a certain date assumed the whole responsibility for the safety of life at the Exeter Theatre, and by that act relieved the owners and those who were employed by the owners. Now, since then, as recently as March 1898, we have the finding of an Edinburgh Court, which, though not applicable to England, may throw a clearer light on what the responsibilities of a public entertainer really are, or should be. In a case against the owners of the Aberdeen Palace of Varieties, which was the scene of a fire in 1896, this Court awarded damages to certain members of the audience who had been injured in the panic, and the owners of the property were ordered to pay the sums in question. In summing up, the judge clearly stated that he considered that the responsibility for the life of any member of the audience lay with the entertainer who invited him to the house, and this apparently quite irrespective of any control exercised by the local authorities. To my mind, this is sound reasoning, and all regulations for the construction of a theatre should only be considered either in the light of an official hint, or as the minimum of precautionary measures considered essential by the public authorities. I do not hold that a public authority can, or should take upon itself the absolute responsibility of a building in respect to which it may perhaps pass the plans or express its satisfaction that certain regulations had been observed. Questions of watching are of equal importance with those of plan and construction as far as the safety of life is concerned. The mere survey on the completion of a building is entirely inadequate if a public authority is to take any responsibility, and, similarly, the mere inspection at intervals in order to see that the building has not been altered. It is only in countries where the theatre is practically under the constant control of the public authorities, i.e. where there is a constant attendance of public officials, either firemen, watchmen, or inspectors, as the case may be, and where the authorities are armed with specific powers as to maintenance, that they can be accorded the responsibility for the safety of the public. But such powers must be far-reaching. If the public authority take the responsibility, it must be able to close the theatre, if necessary, even for such a seemingly trivial defect as an unguarded light. Such powers exist in several Continental cities. Of course, if the public authority takes the whole question of the safety of the public out of the owner's hands, i.e. as regards both the structure and the management of the premises, the license must relieve the owner of all responsibility whatever. And yet, no matter how efficient the public authority may be, and how well organised, it is difficult to say in what manner this responsibility can be



THE THEATRE, EXETER.
Destroyed SEPTEMBER 5, 1887.
FIG. 15. PLAN, FIRST TIER.

enforced so as to make officials or a committee know against whom the verdict of manslaughter will be given if any death from fire or panic occurs in the playhouse under their control. But unless full powers are given to a public authority, with constant control in whatever manner it may desire, and unless the authority voluntarily takes upon itself the entire responsibility, there is no reason whatsoever why the owner of the premises should not be held responsible, and should not simply take those requirements which are in force during erection as the minimum of what is considered sufficient for the structure. The tenor of the Edinburgh verdict should make the manager more chary of the safety of his audience. Why, if considered in the most prosaic light, there is not the slightest difference between the caterer who supplies dangerous food and a caterer who affords dangerous accommodation.

THEATRE 'ROYAL,' GLASGOW.
Destroyed MARCH 1, 1895.
FIG. 16. VIEW OF AUDITORIUM AFTER FIRE.

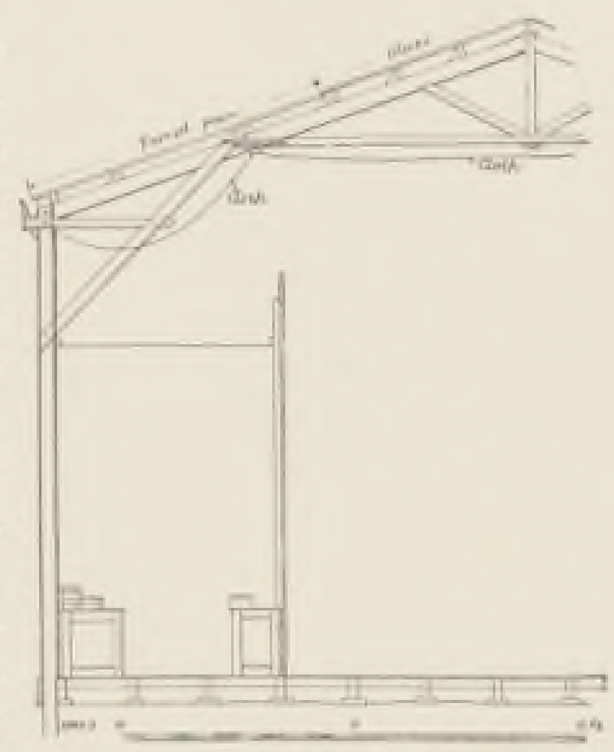
It is of course a recognised fact that the whole question of theatre safety calls for the most serious attention, not only from the representatives of public authorities, but also from the architect and his employee. No argument can carry more weight than the mere tabulation of fires already presented, but the effect of an outbreak in a playhouse cannot be more clearly demonstrated than by the illustration of some modern theatre as it appears after a fire, since such a view only too plainly shows the havoc that is wrought on a building the moment that a fire takes a good hold of its contents. As an instance, I am showing some views of a recent fire at the Glasgow Theatre Royal, which was opened in 1880, and from which the effect of the flames on the auditorium can be clearly seen, as also their effect on the so-called fire-resisting construction. There is no doubt that the heat at a theatre fire is always most intense, and, as far as the structure is concerned, the choice of material and methods requires the greatest attention from the fireman's point of view. It should always be remembered that for practical purposes it is impossible to make the contents of a playhouse entirely non-inflammable, and, what is more, that the contents in every way facilitate the rapid development of heat.

As I have already indicated, this Supplement, and more particularly the analysis, treats primarily of actual fires at places of public entertainment, but it cannot be too strongly emphasised that loss of life can just as well occur through panic, without there having been an outbreak or even the slightest reason for anticipating danger. To give some idea of the many panics of which we regularly hear, and which at times involve the loss of many lives, and at other times fortunately of few, I will here give a list of which information has reached me during one year—for instance, during 1889. Only recently in 1892, here in England, not many miles from the Metropolis, a number of people were killed and injured in a theatre where there was no reason whatever for a panic. The current year has also been particularly notorious for minor panics. The following list of panics in 1889 surely speaks for itself of the danger of an audience who become terrified without the slightest reason for so doing, and this list, I would point out, is of course incomplete, as I only received information of comparatively few panics as compared with actual fires. January 10th, The Theatre, Louvain; March 16th, Folies Dramatiques, Paris; March 29th, Grand Lyric Theatre, Racine, U.S.A.; April 23rd, Guadalajara Circus, Mexico; May 10th, The Theatre, Clermont-Ferrand; June 4th, Théâtre Français, Paris; June 8th, Théâtre des Gobelins, Paris; June 16th, Commenda Theatre, Milan; September 18th, Klatt Theatre, Lourches; November 3rd, Municipal Theatre, Nîmes; December 23rd, German Theatre, Vienna.

THEATRE 'ROYAL,' GLASGOW.
Destroyed MARCH 1, 1895.
FIG. 17. VIEW OF AUDITORIUM AFTER FIRE.

But, speaking of panic, I cannot refrain from giving some particulars of the most recent and terrible example, for which, however, there was some reason. I refer to the panic at the temporary theatre in the Rue Jean Goujon at Paris, better known as the Charity Bazaar, at which no less than one hundred and twenty-five lives were lost, and many persons were injured. Though not actually used as a theatre on the occasion of the outbreak, the building having been provisionally transformed for bazaar purposes, the catastrophe certainly calls for classification among those at the places of entertainment here under consideration, and the features of this disaster are not less important to the architect than the controlling authority. They have, in fact, special bearing on the too frequent adaptation of the auditorium and stage of a playhouse for the purposes of a ball or similar fête, the temporary decorations being almost of an identical character. The number of fires on the occasion of such fêtes will be seen from my record. Now, in regard to the Paris fire, the scene of the catastrophe was, as I have indicated, a temporary structure. When first erected, the purpose which the building had to fulfil was that of a theatre for religious plays, and it had been equipped with a stage and raking floor giving the necessary seating accommodation. Both the stage and seats had recently been removed to enable the structure to be adapted for the organisation of the Charity Bazaar. The site of the building was in a most frequented part of the city, and had a frontage of over ninety metres, or more than three hundred feet, to a depth averaging forty-five metres, or about one hundred and fifty feet. Nearly eighty metres of the frontage were taken up by the building, the average depth of which was thirteen metres, and there were several small additions to the back, namely, a refreshment room, a large store, used at the time of the catastrophe as a cloak-room, and a cinematographe room. The last named annexe, which will be seen from the ground plan, Fig. 3, was not, as far as the drawing shows, in direct communication with the main building for entry and exit, the approach being from the outside, and visitors passing through door marked No. 3. The main building covered about a third of the superficial area of the site, while two-thirds, having an average depth of thirty-two metres, had not been built on. The site was enclosed on the back and two sides by walls of various heights, from fifteen feet upwards, and by the party-walls of some adjoining houses. One of these blocks, the Hôtel du Palais, had windows overlooking the ground.

The plan of the building, Fig. 3, shows a long gallery, constructed of a series of framed trusses, the whole of the work being in timber. All the walls were match-lined on both sides. The roof was partly covered with tarred felt and partly with glass. The principal entry was through two doors placed centrally, No. 1 and No. 2, and the visitors passed through a small vestibule and inner lobby in each case. There were four additional exits at the back, i.e. Nos. 3, 4, 5 and 6, of which No. 3 above mentioned alone seems to have been well known, owing to its forming the approach to the cinematographe annexe. There was another exit, No. 7, used for service purposes, with which only the management and stall-holders were acquainted, and there was also a small door from the refreshment annexe, No. 8, into the open. In the front of the building there were several windows to the office, the ladies' room, etc.



TEMPORARY THEATRE, PARIS (KNOWN AS 'CHARITY BAZAAR'). *Destroyed* MAY 4, 1897.
FIG. 18.
SECTION SHOWING ROOF, VELUM AND STALLS.

On both sides of the gallery there were rows of bazaar stalls, and the construction of these, together with the section of the building, is shown in Fig. 18. The frontages of these stalls were faced with scenery, whilst the top of the hall was closed by a velum of canvas. The decorations were elaborate, and, I must add, particularly inflammable, while the articles for sale on the stalls were, of course, of a similarly dangerous character. Perhaps I should also mention that the decorations to the stalls were old, worn, and very dry. The floors were of wood resting on timber sleepers. On the exterior the only attempt at decoration had been in the central feature, of which I also give a view, Fig. 19, as it affords a good idea of the general character of the structure.

There is no doubt that the fire originated in the cinematographe annexe, owing to the carelessness of those working the apparatus employed. It appears that the flames at once broke through the partition into the gallery, and were drawn immediately across the hall to entrance No. 1, and it will be seen from the drawings that the glass at the top of the building must have been broken almost immediately, through the enormous velum becoming a sheet of fire. Further, it is evident that the velum must have broken away from the points at which it was hung, falling on those beneath it. The tar on the roof also dropped in a molten or burning state. The plan will explain how those farthest away from the centre, on the cinematographe side of the building, must have been cut off directly the fire crossed from door No. 3 to No. 1. It was, further, natural that there should be a stampede towards entrance No. 2, and to that part of the hall farthest from the cinematographe. The extra doors, No. 5 and No. 6, were apparently either so little known or so blocked that they were not used, and it appears that many of the visitors were caught at the entrance to the store annexe, which, as I have already stated, was then serving as a cloak room, and hence well known to many of the ladies, who in the excitement of the moment must have associated it with an exit.

TEMPORARY THEATRE, PARIS (KNOWN AS 'CHARITY BAZAAR'). *Destroyed* MAY 4, 1897.
FIG. 19. FRONT ELEVATION, CENTRAL FEATURE.

It is not my purpose to discuss the plan in detail, but there is one thing certain, and that is, that at first sight the number of exits, eight in all, would appear sufficient for a substantially built structure which has its floor on ground level. Looking at the plan of the building, its construction and contents, and considering well all the defects that the structure contained, such as the tortuous lobbies, I would yet point out that the extent of this calamity was due, in a great measure, to the fact that the majority of those present were ladies, whose clothes must have undoubtedly caught fire immediately the lengths of canvas, velum and burning tar fell.

To those technically interested in the subject, the following recapitulation of the main features of this catastrophe should summarise the disaster. The building had its floor practically on pavement level, and stood on its own ground with its front on a broad public thoroughfare. There was vacant land at the back, a broad passage on the one side and a narrow one on the other. There were eight exits leading direct into the open, with an aggregate width of some forty feet. The visitors were mostly ladies, dressed in Spring attire; the spread of the flames was exceedingly rapid, and their garments became ignited almost immediately. The general aspect of the fire was particularly frightening. There is no doubt that many of the visitors practically died where they stood at the time of the outbreak, being enveloped almost immediately in the burning canvas which fell from above. Of the others who succumbed, many were entrapped, either by being cut off from the exits, by finding these blocked when they reached them, or by not knowing their exact position. Of those who escaped by the principal exits, a large number were injured by the crush at the doors. Though the police and fire brigade were within easy call, even the instantaneous arrival of a large force on the spot could scarcely have lessened the death roll, owing to the appalling rapidity of the fire and the extent of the panic. I have not heard of any watchman or fireman having been stationed in the building; but had this been the case, it is not in the least likely that his efforts would have had any appreciable effect. The great heat from the fire appears to have prevented those who reached the land at the back from utilising this space as a refuge, and as the broad passage opening into the Rue Jean Goujon was apparently overlooked, a window of the Hôtel du Palais was used by many escaping to the rear of the building. A number, however, were also either killed or badly injured in the crush to reach the improvised means of escape.

Now, it will be remembered, in connection with the Exeter fire I pointed out that it was a mere repetition of previous disasters, and might well have been guarded against in a playhouse opened so recently as 1886. What, may I ask, is the reason that the most elementary precautions should not have been taken in a building such as the one in Paris in 1897, opened but a few weeks previous to the disaster? And, to emphasise my question, let me call attention to the fact that Thomas Blashill, the superintending architect to the London County Council, not unlike another authority quoted, took the occasion of this fire to point out that to a really practical man, conversant with the subject of fire protection, the Paris calamity "conveyed no new lesson whatever."

No truer words could have been spoken as to the absence of any new lesson from the Paris Charity Bazaar fire, and yet there are many members of the technical professions, not to speak of theatre managers and the general public, on whom nothing less than such terrible examples as this fire will produce sufficient impression to bring about any general improvement in the safety of playhouses. It is the highest time, however, that the importance of the question of theatre protection shall no longer be underestimated, for with theatres of every description growing up in all parts of the world to an extent quite unknown before, and with that increased desire on the part of the general public of every country for theatrical performances, it is most essential that the hazard common to this particular class of structure should be minimised. And it is this essential limitation of risk that has, as I have indicated in the Introduction to this Supplement, led me to show at such considerable length that what I have said with regard to the danger of playhouses from fire is not without reason. The inclusion of this Supplement with its voluminous record of fires in a work dealing with the design of the modern playhouse is intended to serve as a warning to those who are only too apt to neglect the responsibilities involved in the construction and maintenance of such institutions as are here under consideration. It is to be hoped that the experiences recorded will not pass unheeded.

TEMPORARY THEATRE, PARIS (KNOWN AS 'CHARITY BAZAAR').
Destroyed MAY 4, 1897.
FIG. 20. VIEW OF INTERIOR.

SUPPLEMENT III.

PROTECTIVE LEGISLATION.

INTRODUCTION.

No matter to what extent those responsible for the erection of a playhouse may appreciate the risks to which this special class of building is prone, no matter if the funds be ample or if there be a scarcity of money, and further, no matter whether the architect looks upon his commission with the most ideal views or whether he takes up the reverse position, it will always be necessary for public authorities to take considerable precautions against fire and panic. These precautions may take the form of specific regulations defined in detail, and drafted and enforced regardless of the business and technical requirements of a playhouse, or they may simply take the form of some schedule of "principles" which has been drawn up to serve for the guidance of those interested in theatrical enterprise. There are, of course, innumerable stages between these two extremes of the autocrat's law and what I would term the official hint; but for the purposes of those interested in theatre construction and maintenance generally, the various degrees are of equal importance, inasmuch as they show what ideas of safety are individual to different localities.

Now, for the protection which should be afforded to those who are either employed in the playhouse or who visit it as an audience, theatre regulations in some form or other have already been in force for several decades, and ever since the great catastrophes of 1881 many of these regulations have taken the form of most elaborate codes going into the very minutest of details. But, curious to say, there has been little or no uniformity even in the main principles of theatre safety advocated after 1881; for whilst in one country every effort is made to ensure for the audience clear routes of exit, straightforward planning and other facilities for rapidly reaching the open, elsewhere no stress whatever may be put on the question of direct exit, and attention may alone be directed to the construction of the building, or the materials employed and its equipment. We find playhouses erected in accordance with recent regulations, which veritably have a very high standard of resistance as far as materials and construction go, and yet a panic in any one of these buildings could not result otherwise than in considerable loss of life, owing to the tortuous nature of the passages and the difficulties which have to be encountered in reaching the open. On the other hand, we find a playhouse planned in every way to meet the requirements of such an emergency as a sudden rush of the audience, and yet this same theatre shows the flimsiest forms of construction and an utter disregard of safe methods of lighting and similar installations. As I have before said, any selection from recent regulations must give expression to that curious difference of opinion as to whether the means of exit or the methods of construction should be given preference; and though there are no doubt numerous institutions which show a certain compromise between these conflicting policies, any such compromise must generally be attributed to other circumstances than the requirements of the public authority. It seems scarcely credible that where a number of highly civilised countries have for years been alternately framing regulations for the erection and maintenance of their playhouses there should yet be this difference of principle. Surely the main lines of legislation should be identical? The character of the playhouse is not so very different in different countries, nor is the character of the risk. And here perhaps

I should say a word as to the great advantage of clearly defining the main lines of the official requirements as to theatre construction with due explanation of reasons, while leaving questions of detail to the discretion of officials who are responsible for the execution of the regulations. It is impossible to lay down a set of regulations which shall meet all the varying circumstances of theatre construction, from the small Variety Theatre to the Grand Opera House. Given certain principles as to the requirements of exit and construction, surely it should remain at the discretion of the official entrusted with the supervision of the playhouse to decide to what extent the minor safeguards are to be applied. The almost common error in modern regulations with respect to fire protection in theatres is the over-elaboration of detail without due regard to the main principles to be aimed at. This is not as it should be after the experience gained at the many fires already referred to.

In the following pages I now propose to show examples of various regulations in force in different parts of Europe, and I would at once say that whatever may be the similarity or dissimilarity on paper, we must always remember that there can be a great difference in the effect of almost identical legislation, owing to the different manner in which laws are enforced or construed in various countries. The same regulation, too, which is stringently enforced in a particular country, say, shortly after a great theatre catastrophe, is read very differently some years afterwards when the death-roll has been practically forgotten. Time, circumstances, principles of government, and the personnel in whose hands their execution may lie, all tend to change the tenor of identical words.

In selecting examples of regulations, I have taken the principal countries or cities of Europe in which I considered that precautionary measures have been given considerable attention, and where at some time or other a serious effort has been made to reduce the risk of catastrophes in the class of building under consideration. These regulations have, however, only been presented as far as they concern the scope of these volumes, and in respect to some of them a considerable part has been omitted, more especially where reference is made to the financial control of theatre enterprise as practised, for instance, in Paris. As a whole, however, these examples should give a fair idea of the official requirements in respect to the general protection of theatres in Europe, and any one interested in the subject will be able not only to find for himself that happy mean which should meet all reasonable precautions, but at the same time will be able to comprehend that while different localities must necessarily have somewhat different requirements so far as questions of detail are concerned, the general principles, as I have said, might well be identical. Local circumstances must, of course, be considered, yet these need not involve any great variety in the main idea of any two codes.

In presenting these examples of regulations I think I should point out that, in cases where translations have had to be made from codes issued in foreign languages, the tenor of the requirement is given as nearly as possible, regardless of the actual wording or the legal phraseology, which in many instances would only confuse the English meaning. For purposes of convenience, dimensions given in metres are also shown in feet and *vice versâ*, whilst other foreign scales are rendered in feet as well as metres.

NATIONAL THEATRE, COPENHAGEN.

FIG. 1. PLAN OF FIRE BRIGADE ARRANGEMENTS IN EVENT OF AN OUTBREAK.

EXAMPLES OF OFFICIAL REQUIREMENTS.

THE following are examples of the requirements defined by the public authorities of the principal countries in Europe with a view to afford protection from fire and panic in the theatre. These examples are taken from laws and local regulations of a most varied character, but only such examples of the requirements are presented as have special bearing upon the general arrangement, construction, installation or maintenance of the modern playhouse.

AUSTRIA.—LOWER AUSTRIA.

From the Regulations in force in Lower Austria relating to the Erection and Maintenance of Theatres, Music Halls and similar places of Public Entertainment.

I.—GENERAL.

1. New theatres must be erected perfectly isolated, and not less than 49 feet (15 metres) distant from any boundary of the land on which they stand. (*See* Regulation 101.)

2. All walls must be built of solid materials.

3. The stage, including the space beneath it, dressing, property and tailoring rooms, rehearsal and ballet practising rooms, &c., must be divided from the auditorium generally, by a wall nowhere less than 2 feet (0·60 metre) thick, and reaching 1 foot 6 inches (0·45 metre) above the roof. In this wall only one door is permissible, namely, one leading to the vaulted area corridor (*see* Regulation 10), this opening to have a self-closing iron door.

4. The stage proper, including the space below it, must be divided from the dressing and other rooms by walls reaching above the roof, 'fireproof' passages of as many stories as may be necessary being arranged between the stage and the various rooms.

5. The stage, as well as the auditorium, must, in all essential constructive parts, be built of 'fireproof' materials.

6. The space above the stage must be of sufficient height to allow all drop scenes to be raised without rolling up.

7. On the outer sides of the auditorium the following conveniences only are allowed: corridors, staircases, loggias, foyers, and buffets, in fact, only such offices as are necessary for communication and for shelter in case of fire.

8. Rooms for the police, offices for manager, housekeeper's rooms, wardrobes, &c., are permitted; dwellings, store-rooms, painters' rooms, workshops, and dining or supper rooms are prohibited.

9. Property rooms, if forming part of the building, must be divided from the rest of the theatre by massive walls and corridors, and lighted by windows in the outer walls.

10. Every division of the auditorium must be provided with a 'fireproof' vaulted corridor, not less than 8 feet 2 inches (2·50 metres) wide, and this must communicate direct with the staircases leading to the open air. Outside arcades must also be vaulted, and at least as wide as the staircases. (*See* Regulation 13.)

11. The auditorium must not contain more than four tiers besides pit and stalls.

12. The highest part of the area must not be higher than 6 feet 6 inches (2 metres) above the level of the street, and inclined planes (no steps) must lead from one level to the other in the area.

13. The auditorium, as well as the rooms surrounding the stage, must be provided with a sufficient number of straight staircases (without winders); these staircases must be 'fireproof,' and must lead direct into the street. Each tier or gallery must have at least two staircases, and no staircase may communicate with another. The steps of the stairs to be at least 4 feet 10 inches (1·50 metre) wide, 'fireproof,' bedded on arches, without winders, of equal rise and tread, and protected by a balustrade of solid masonry. The staircases in the auditorium are to be so planned as to ensure a speedy exit; they should be so placed as to be easily found, and should be close to the tiers or galleries. Landings to have the same width as the steps of the stairs.

14. All staircases to be provided with hand-rails on both sides, as also all landings and passages. These hand-rails to be continuous where possible, and fastened strongly to the walls.

15. There must be so many exits generally as to allow of the theatre being emptied in four minutes. All doors must open outwards. Sham doors are prohibited. Doors of boxes alone may open inwards. Doors leading from the area and the tiers or galleries must be at least 4 feet 10 inches (1·50 metres) wide, and 9 feet 8 inches (2·10 metres) high.

16. Separate exits must be provided for the orchestra, prompter, and lamplighter: the first of these must not pass through the area or under the stage.

17. All iron doors must be so hung as to close of their own accord. Hooks, or other arrangements for keeping them open temporarily, are not allowed.

18. All the parts of the house mentioned in Regulations 3, 7, 8, 9, 10, and 13, must be well and sufficiently lighted by windows.

19. No windows whatever may be protected by iron bars or open trellis work.

20. The decorations of the proscenium must not be of wood or any other inflammable material. Wall papers must have a solid backing of wood or other material.

21. Royal boxes are to be provided with an ante-room, separate staircase, vestibule, and covered approach.

22. The approaches to the cellars and roofs shall be 'fireproof,' and provided with iron doors.

23. All ceilings must be 'fireproof,' and the construction of the ceiling over the auditorium such as to be perfectly independent of the roof.

24. The roof to be of iron, covered with 'fireproof' material.

25. Properly fixed lightning conductors to be provided and kept in good condition.

26. A sufficient number of closets and urinals, provided with water and well ventilated, to be arranged in all parts of the house.

27. The theatre must have a covered approach or porch for the general public.

II.—FITTINGS AND FIXTURES.

28. The gangways at the sides of the stage are to be protected by hand-rails, as also the 'service bridges' between the 'flies.'

29. The fire curtain shall be of 'fireproof' material, and always in good order; the lifting gear of metal only. Openings of any kind in this curtain are prohibited.

30. The mechanism for raising the curtain shall be on stage floor level. Non-metallic parts in this machinery are inadmissible. A 'fireproof' exit must be provided for the person charged with the working of the mechanism.

31. The machinery and fittings of the stage shall, as far as possible, be of 'fireproof' material.

32. All combustible parts of the machinery and fittings to be impregnated with fire-resisting solutions. 'Cloths,' 'borders,' wings, set scenes, and other objects (except furniture and portable properties) must be constructed of materials previously subjected to impregnation.

33. Wax and oil colours are excluded from all painters' work, except on the 'fireproof' proscenium curtain, and even here the oil colours must be laid upon some uninflammable material.

34. The chandelier in the auditorium shall be fixed to iron brackets, and hung with counter weights and wire ropes, any one of which alone must be capable of bearing the entire strain.

35. The stall seats are to be hinged, having a depth of at least 1 foot 9½ inches (0·55 metre), a width of 2 feet 3½ inches (0·70 metre), and a clear space in front of 1 foot 3½ inches (0·40 metre). The minimum for numbered seats is 1 foot 7½ inches (0·50 metre) by 2 feet 1½ inch (0·65 metre).

36. When the seats in the area and tiers or galleries can be approached from either side, the space between the rows shall be 4 feet 1 inch (1·25 metres); if only from one side, then the rows may be 3 feet 3 inches (1·00 metre) apart. Cross gangways must divide every six seats, and the exit doors should line with them; where this is impossible, a clear space of at least 5 feet (1·50 metres) must be left all round between the last row and the wall.

37. The approaches to the seats must always be kept clear, and must not be used as standing room. Drop, or movable seats are not allowed in the gangways.

38. Standing room is only permitted in the pit and gallery, and there only in spaces specially set apart for the purpose. These spaces may be filled with four persons for every square yard.

30. The space set apart for the orchestra shall not be used by the spectators.

40. The corridors of the auditorium must not be used as cloak rooms. Special rooms are to be provided for this purpose, so as to leave the passages unencumbered. The passages should be warmed, and free from draughts.

41. All exits (*see* Regulation 15) must be marked as such.

42. Every theatre shall have two separate and distinct gas services; the one for the auditorium, including the chandelier, fronts of tiers, &c., the other for the stage and its adjuncts. The junctions of these two services with the main in the street must be at least 20 yards distant from each other. All the regulations for gas services, &c., must be most strictly observed.

43. Both services must have stop-cocks fixed below the level of the street.

44. The gas pipes shall be of iron, and only where this is impossible may protected tubing be used. Common gutta-percha tubing is prohibited.

45. Each main service is to be provided with two gas meters connected with each other. Those for the service of the stage must not be near the others, but must be fixed in another apartment. Floats in the meters should be avoided.

46. Jointed gas brackets are not allowed.

47. Where the lighting of the house is effected by means of electricity, the service of the stage must be perfectly distinct from that of the auditorium, with separate circuits of wires, and separate dynamo machines. The wires must be strong enough to prevent their getting heated, they must be laid in chases in the walls, and protected from being touched by the public. Where the arc light is used it must be protected by glass shades, which should be so constructed as to receive the falling carbon particles. There should be a reserve engine and dynamo for each system or service, and if the engines are worked by ordinary fuel they should not be in the building.

48. The gas lights over, under, and upon the stage, must be protected with wire guards sufficiently large to prevent the heating of the wire. The lights in the wings should not be less than 5 feet 6 inches (1·50 metres) from the floor. All lights must be at least 3 feet 3 inches (1·00 metre) distant from any ceiling (unless a vaulted one) or woodwork. For shorter distances a good sized 'fireproof' guard must be fixed between the flame and the ceiling or woodwork, at a minimum distance of 6 inches (0·15 metre) from the former, woodwork at a less distance than 1 foot (nearly 0·30 metre) from a gas flame, must be protected by sheet iron, with free circulation of air between it and the wood.

49. Inflammable objects in the auditorium, crush-rooms, passages, and staircases, must be similarly protected; but glass shades may here be used instead of wire guards. The jets of the chandelier and brackets to fronts of tiers to have shades of ground glass. All this glass to be covered with fine wire netting, to prevent injury by the fall of splinters.

50. All gas, oil, or electric lights, at a less distance than 7 feet 6 inches (2·30 metres) from the floor are to be let into recesses or niches in the wall, and to be further protected by wire guards or baskets, so as to prevent injury to passers-by.

51. The footlights shall have a suitable arrangement for the protection of the actors.

52. The lights in the 'flies' must be so fixed that the guards cannot get heated. 'Flies' to be fixed with wire rope only.

53. Movable lights or rows of lights should be so arranged that the gas can be turned off on the stage.

54. The lighting of gas battens must be effected by first lowering the battens. All jets upon and over and under the stage are to be lighted by portable electric lighters, except the jets in the battens, where a "central lighter" may be used. The lighting of the burners in the dressing rooms and in the auditorium must be effected with protected lighters.

55. No open lights of any kind are allowed in the property rooms.

56. The use of lucifer matches and naked wax taper for lighting purposes is most strictly prohibited. Where matches must be used, they should ignite only by friction upon a specially prepared surface.

57. Inflammable liquids, such as petroleum or other mineral oils, &c., must not be used in any part of the house.

58. All parts of the auditorium, and the dressing and other rooms off the stage, if lighted either by gas or electricity, must be provided with oil lamps, those next all exits to be protected with red-coloured glass. All oil lamps to be fed with fresh air from outside, and provided with pipes to take off the products of combustion.

59. Theatres open in winter to be warmed by two central heating apparatus, one for the stage, the other for the part devoted to the public.

60. Ordinary open iron stoves cannot be permitted in any part of the house. Such apartments as are not warmed by the central apparatus may have stoves of earthenware; these, if stoked from the room, must have their doors further protected by a sheet-iron guard with turned-up edges; if stoked from outside, ordinary iron doors will suffice.

61. Where the system of warming is by means of hot air, the openings must be protected by wire netting of close mesh, and no inflammable materials will be allowed near these openings. Such openings, if upon the stage, to be at least 1 foot (nearly 0·30 metre) from the floor.

62. Property rooms must not be warmed.

63. The ventilation should be in proportion to the size of the auditorium. There should be at least 30 cubic metres of fresh air per hour provided for every spectator. The stage and dressing rooms should also be suitably ventilated. The air ducts must be constructed of some 'fireproof' material.

64. The roof of the stage shall have one or two iron ventilators together equal in area to one-fortieth part of the area of the stage, in order to carry off the products of combustion in case of fire. The flaps of these ventilators to be so arranged as to drop by their own weight, when released, and be worked by wire rope from the floor of the stage, and close to the machinery for raising and lowering the metal curtain. (*See* Regulation 30.) A 'fireproof' exit to be provided for the person in charge of these ropes.

65. The building must be in telegraphic communication with the offices of the fire brigade, and call-points are to be affixed on the stage, in the manager's office, and in the porter's lodge.

66. Fire hose in sufficient lengths is to be provided upon, over and under the stage, and a 'fireproof' retreat is to be arranged for the persons in charge of the same.

67. Similar provision must be made in different parts of the auditorium. In the several tiers or galleries especially, there should be on each side a proper length of hose stowed away in a recess or niche in the wall, and accommodation afforded for a fireman in charge.

68. There must be sufficient hose in the loft over the ceiling of the auditorium, or near the door leading into the same.

69. All hose must be in direct communication with a high-pressure water main, or, where such does not exist, with iron tanks placed at a

suitable height. The filling of these tanks to be by means of powerful pumps, but if steam is used for pumping, then the engine must not be in the building.

70. Any cupboards for the lengths of hose must have glass doors.

71. Tanks filled with water must be provided upon the stage, each tank to have near it at least four fire-buckets, also wet swabs and sponges affixed to poles, and at least one long fire-hook on each side of the stage and at the back of the stage; further, a sufficient number of knives are to be kept in special places. In addition, at least two extincteurs are to be kept in perfect working order.

72. An apartment to be provided for the inspectors. In case of accidents or sudden illness this room can be used by the patient; it should therefore be provided with the first-aid necessary appliances for this purpose.

III.—GENERAL MANAGEMENT.

73. All parts of the house set apart for the public must be lighted before the doors are opened. Neither the ordinary lights nor the oil lamps are to be extinguished until after the public and the persons employed in the theatre have left the building.

74. The metal curtain to be kept down, except during the acts and general rehearsals, and to be lowered between the acts.

75. Gauze curtains and drop scenes of light material to have cords for working them on both sides of the stage.

76. The stage proper to be kept as clear as possible, and not to contain more than the decorations and properties necessary for three representations at one time. None but those engaged to be allowed access to the stage. The stowage of properties over or under the stage is prohibited.

77. All exits, such as corridors, passages, staircases and doors, to be kept free of obstacles. The hanging up or piling up of articles of clothing in the corridors is not allowed. The exit doors (Regulations 15, 41) must be kept unlocked from the opening to the closing of the theatre, and just before the closing of the performance all doors must be opened wide.

78. The storage of fireworks, gunpowder, or other explosive materials within the building is prohibited. When such are to be used, they must not be brought in until just before the commencement of the play, and must then be placed in charge of the firemen.

79. For shots, the wads to be of cowhair.

80. All decorations and illuminations prepared for any new piece must, either before or during the general rehearsal, be submitted to the inspection of a representative of the fire police. When straw, hay, or other easily inflammable properties are necessary, such materials are to be taken out of the house after each rehearsal or representation.

81. The articles impregnated (Regulation 32) are to be subjected to examination and test before they can be used; in addition to which all impregnated materials are to be tested at least twice a year. If the trial is unsatisfactory, the articles must not be used at all, as a mere coat of solution is not sufficient. This examination to be made by the authority cited above.

82. It is not permitted to carry about either naked lights or burning coals, except for special scenic purposes.

83. All portable lanterns or lamps must be protected by glass or wire netting. At least one safety lamp is to be kept in constant readiness, so that an apartment may be entered with safety in case it is filled with explosive gas. Rooms not provided with permanent means of lighting must be entered only with safety or other lanterns. Safety lamps only may be used in rooms where the gas meters are fixed.

84. The lighting, or smoking of cigars or pipes in any part of the house is prohibited.

85. All doors are to be protected from draught. Portières or curtains to doors are not allowed. Where necessary, cloth-lined, two-leaved swing doors, with gutta-percha edging, may be used. For outer doors, windguards, or lobbies with swing doors, are to be provided. The windguard must however be so constructed as to open outwards.

86. On days of representation, the air, both on the stage and in the auditorium, must be thoroughly changed, and in case of afternoon and evening performances on the same day, there must be an interval of at least two and a half hours between the two, in order that the air may be absolutely changed.

87. Shavings and rubbish of all kinds in the workrooms or other dependencies are to be carefully swept up and taken outside the building before the performance begins. Cleanliness generally in all parts of the house to be a special duty.

88. The licensed number of seats, whether in the boxes, stalls, numbered and unnumbered seats, or the spaces for standing, may not be increased on any pretence. The authority mentioned above (Regulation 80) are hereby charged to see to this.

89. The persons whose business it is to manage the lighting must be thoroughly acquainted with their duty, and their names are to be registered in the books of the fire police.

90. All alterations in the building or fittings can only be carried out with consent of the authorities, and the plans (*see* Regulation 98 below) shall show that such consent has been duly obtained.

91. The firemen and persons in charge of the fire-hose are to be thoroughly instructed and acquainted with their duties. These men are to wear special uniforms and numbers. The number of firemen for each theatre is to be determined by the authorities above referred to.

92. All arrangements, the working of which is of particular importance in an emergency, are to be placed under the care of specially appointed persons. This refers particularly to the iron curtain, the fire-alarm, and the ventilators (Regulations 30, 64, 65), all of which posts should be near each other.

93. The firemen when on duty are not to be employed in any other capacity.

94. The instructions to the firemen as to the position and relief of their posts, their patrols and duties generally, to be clearly laid down, and to have the sanction of the fire police.

95. The management is further bound to provide for permanent and efficient watchmen during the time that the theatre is closed, as also for a due control over these watchmen by means of tell-tale clocks or other devices. All parts of the house to be thoroughly examined before each representation, and after the same, namely, after the lights have been extinguished.

96. The telegraphic fire alarms to be tested at noon every day, so that any disturbance of the currents may be rectified in good time.

97. Every theatre is to be provided with a specially drawn-up set of rules and regulations as to the daily examination of the house before and after each performance, the carrying about of naked fire or lights, and as to what is to be done in case of fire. These rules to be sanctioned by the proper authority cited above, to be distributed among the actors and all persons employed on the premises, and to be hung up in conspicuous places at the several entrances of the house.

98. The manager's office must contain an accurate set of plans, showing the pipes or wires laid down for lighting.

99. Similarly there must be a set of plans showing the disposition of all seats and gangways, and these plans must be also kept in readiness in the manager's office. So also a plan of each tier or gallery must be hung conspicuously in that tier, with a copy of the rules, so as to afford the public an opportunity of understanding the various positions and situations of staircases, doors, &c. Pamphlets with plans to a reduced scale and a copy of the rules to lie for sale at the ticket offices.

100. The management is responsible for the due, exact, and conscientious performance of all the regulations here enacted, the continuance of the license to be dependent upon such due performance. The management is also responsible for giving the alarm of fire to the public at the right moment.

IV.—MODIFIED RULES FOR SMALLER THEATRES.

101. Theatres of less capacity than 600 spectators may have the wall at the back of the stage abutting on other houses. This wall must be at least 1 foot 5½ inches (0·45 metre) in thickness, and 1 foot 5½ inches (0·45 metre) higher than the roofs on either side thereof. If the wall abuts on a neighbouring area for light and air, it must be of the same thickness and height, and no openings of any kind may be made therein. The other three sides are to stand free, as laid down in Regulation 1.

BELGIUM.—BRUSSELS.

From the Theatre Regulations in force at Brussels, which govern all applications for permission to erect or convert any building for the purposes of theatrical performances.

GENERAL.

1. Every building intended to be used as a theatre should be separated from the adjoining premises by an open space of sufficient width, or by brick walls (*murs pleins*) not less than 1 foot 10½ inches (0·57 metre) thick.

2. When the open space is less than 10 feet 6 inches (6 metres) wide, there must be no windows overlooking it belonging to adjoining premises.

3. The walls separating a theatre from adjoining buildings must be carried up at least 5 feet (1·50 metre) above such adjoining buildings.

4. The stage should be enclosed with walls not less than 1 foot 10½ inches (0·57 metre) thick. The proscenium wall should be extended to the external walls, and should be carried up to a height of 5 feet (1·50 metres) above the roof.

5. These walls may have formed in them such doorways as may be strictly necessary, such doorways being provided with iron doors hung to close automatically.

6. The proscenium opening should be fitted with a metallic wire curtain or other apparatus sufficient to intercept the passage of smoke in case of fire, and to prevent fire being communicated from the stage to the auditorium.

7. The raising and lowering of this curtain, or any other apparatus to be approved by the Council, should be effected from at least two different places, one on the stage, and the other outside of the theatre.

8. The armchairs (*fauteuils*), chairs and seats in every theatre should be so arranged as to leave a clear space between them of at least 1 foot 8 inches (0·50 metre) when unoccupied.

9. The chairs and seats, with the exception of those in the private boxes, should be fixed to the floor.

10. There should be at least two lateral gangways to the rows of seats; the width of these gangways shall be determined in the proportion fixed by paragraph 12, but shall not be less than 2 feet 4 inches (0·70 metre). A central gangway may be required.

11. No tip-up seat (*strapontin*) may be placed in any gangway without the consent of the local authority. Such seats should be of a pattern to be approved, and should tip up in such a manner as not to interfere with the passage-way.

12. Every division of the theatre should have at least two exits, the width of these exits should not be less than 3 feet 3 inches (1 metre) for every 100 seats.

13. The width of the several corridors should be not less than the exits to which they lead.

14. The cloak rooms should not encroach upon the width of the corridors, i.e. they should be set back or recessed.

15. The aggregate width of the several exits next the street should not be less than 3 feet 3 inches (1 metre) for every 100 spectators. The exits for the dressing rooms shall be independent of the stage exits, and their widths shall be calculated in a similar manner to the exits of the other parts of the theatre.

16. The movable barriers at the entrance to a theatre should be so arranged that they may be easily removed in the case of a panic, without being overturned or pushed towards the doorways.

17. All doors should be made to open outwards, and should not obstruct the passages. The inside doors should not be fastened during a performance, and they should have fastenings of a simple character. The external doors only may have locks, which should all open with one pass key. Every emergency door should have a key, placed in a glazed box, within reach of the public.

18. Every floor or tier shall have, at least, two staircases. The width of the staircases should be proportionate to the corridors leading to them.

19. The staircases should be constructed of incombustible materials, and have solid steps. The stairs should be in short straight flights of a uniform rise, with proper landings.

20. The staircases should have stout handrails or balustrades on both sides.

21. The roof of the theatre should be covered externally with incombustible materials.

22. The roof over the stage should be provided with movable louvres (*vantaux basculants ou glissants*), the area of the openings in which will be determined by the local authority.

23. The roof over the auditorium should have openings of an equal area, at least, to that of the opening over the sunburner (*lunette du lustre*).

24. The louvres (*vantaux*) on the stage and to the auditorium should be made to open and shut from points to be arranged by the local authority.

25. The opening in the centre of the ceiling of the auditorium shall be closed in such a manner as to permit it being readily opened by means of some simple mechanism, placed in some accessible portion of the building.

26. In the case of there being no opening for a sunburner, a sufficient number of openings should be provided in the ceiling to carry off any smoke which may penetrate into the auditorium in the event of a fire occurring upon the stage.

27. Every theatre should be provided with such means of warning and escape as may be approved by the local authority.

28. The whole of the fixed and movable woodwork, the scenes, &c., of every theatre shall be treated with or steeped in some material to render them uninflammable.

29. The property rooms, wardrobes and workshops should be distinct from the theatre or separated from it by walls and ceilings of incombustible materials with iron doors.

30. No portion of the theatre shall be used either temporarily or permanently as a store unless specially approved for that purpose.

31. A convenient room in the proximity of, and as nearly as possible on the level of the stage, shall be reserved for the fire brigade.

32. Every theatre should have a caretaker's office (*loge de concierge*) on the ground floor, abutting upon the street, and communicating with the auditorium. No other portion of a theatre shall be used as a dwelling.

33. The method of warming should be approved by the local authority.

34. The boilers for the heating apparatus should be non-explosive, and should be placed in vaults separated from the rest of the building by double doors.

35. The warming apparatus and air chambers should be constructed in such a manner as to allow of them being easily examined.

36. The pipes for heating should be of sheet iron, stoneware (*grès*), earthenware (*terre réfractaire*), or other materials to be approved. The pipes should be enclosed with brickwork. If constructed of sheet iron, they shall be enclosed in a second pipe, separated from the first by a distance of at least 1½ inch (0·3 metre) at every part, and surrounded by some incombustible, non-conducting material. The sheet iron shall be galvanised or protected in some manner from oxidisation.

37. No flue, or stove-pipe, in direct communication with any fireplace is permitted on the stage. Every flue should be enclosed with brickwork at least 9 inches thick.

38. The warm air openings should be so arranged as to prevent the warm air coming in contact with the adjacent woodwork. They should be capable of being easily examined and cleaned.

39. Every theatre should be provided with such water mains both on the inside and on the outside as may be considered necessary, the number and position of which will be determined by the local authority. The mains should be provided with the necessary hydrants and lengths of hose.

40. The upper part of the stage should be provided with an apparatus for saturating it with water, regulated by a fire-cock fixed on the outside of the theatre.

41. The fire-plugs should be placed as near as possible to the kerb of the pavement.

42. The lighting of the theatres should be so arranged that in the case of an accident the lighting of the auditorium, corridors, staircases, and public exits would remain intact, although the gas were cut off from the stage. The gas-plate on the stage should only extinguish the gas on the stage, in the dressing rooms, and property rooms, and a portion of the auditorium. For this purpose there shall be provided such separate gas services as may be required, with a sufficient number of by-passes from the main.

43. The gas in the corridors and exits should be extinguishable only by a cock with a special key placed on the outside of the building.

44. The gas pipes shall be of iron or copper. Lead pipes are not allowed, nor any rubber pipes or connections which are not indispensable.

45. The footlights should be reversed or be protected by regulators and a guard of metal trellis.

46. The 'battens' (*herses*) should be movable and suspended by at least four ropes. The guards should be of metal.

47. No other method of lighting shall be used without the consent of the local authority, with the exception of hand lamps lit by electricity.

48. All lights in the 'wings' (*bois des portants*) should have glass chimneys furnished with smoke consumers, and arranged in such a manner that the breaking of a chimney extinguishes the jet.

49. The flexible tubes of the 'battens' or other lights should be covered with leather, and the pieces for forming joints should be of metal.

50. All gas jets with chimneys should be fitted with cocks, smoke consumers and fixed wire guards of an improved pattern.

51. All gas jets without chimneys should be placed in fixed lanterns of an approved pattern.

52. The gas cocks should be arranged so as to avoid as much as possible their being opened by an accidental blow.

53. No gas jet, even when enclosed in a fixed lantern, shall be placed at a less distance than 8 inches from any ceiling, unless the ceiling is protected by sheet-iron. The wood supports to which the lanterns are affixed shall also be lined with sheet iron to a height of 8 inches above the lanterns.

54. The gas meters shall be placed in strongly-vaulted chambers, properly ventilated and separated from the stage. These chambers should be lighted by a safety lamp, or by other means to be approved. The meters should be dry meters.

55. The lanterns used by the persons employed in the theatre should be of thick glass in metal frames.

56. No apparatus for electric lighting may be fixed without the permission of the local authority.

DENMARK.—COPENHAGEN.

From the Regulations for the erection and maintenance of Theatres, Assembly Rooms and similar places of Public Entertainment at Copenhagen.

I.—GENERAL.

1. All theatres shall be provided with 'constant water supply,' and shall have ample water tanks and such fire extinguishing apparatus as the fire brigade authorities may determine. These shall be easy of access, ready for immediate use, and always kept in good order. The 'fire-watch,' deputed by the fire brigade, shall keep the extinguishing apparatus in proper working condition. Should they require assistance the same shall be provided by the stage hands, who must also be thoroughly acquainted with the methods of handling the gear.

2. The theatre shall be in telegraphic communication with the nearest fire station. The fire brigade authorities shall determine the number of call-points in the theatre in proportion to its size and importance.

3. The manager of the theatre shall see that before and after every performance a careful examination of all parts of the theatre be made by specially appointed members of his staff.

4. Smoking, as well as the lighting of cigars and pipes in the theatre, is prohibited, except in those parts which are used as tenements, or for which the authorities have granted a special permit.

5. Petroleum, benzine, or other similar highly inflammable liquids, are not to be used or kept in the theatre.

6. The 'fire-watch' shall be informed immediately of even the most insignificant fire in the theatre.

7. No windows shall have bars.

8. The chief officer of the fire brigade and his officers shall at all times have free access to every part of the building, and shall always have seats reserved for them at the end of one of the first rows of the stalls in the auditorium.

II.—LIGHTING AND HEATING.

1. No movable lights shall be allowed in the building, i.e. no light shall be allowed which can be turned horizontally.

2. Above all lights which are less than 3 feet distant from a non-'fireproof' ceiling a metal shade shall be hung at least 6 inches distant from the ceiling, and on no account shall a light which is thus protected be nearer than 18 inches to the aforesaid ceiling.

Woodwork which is nearer than 12 inches to the light horizontally shall be protected by sheet iron, so fixed that the air can freely pass between it and the wood it protects.

All gas lights on the stage, in the store-rooms, dressing rooms and workshops, shall be protected by a wire netting.

3. The lowest light fixed in the 'wings' shall be at least 4 feet above the floor of the stage.

4. The lights in the 'gas battens' shall be protected from above by metal shades, and from below and at either side by wire netting. These guards are to be so fixed that there is no fear of them becoming so heated as to cause the ignition of any combustible material resting on or against them.

5. All passages and staircases for the use of the audience, the staff of the theatre, or the 'fire-watch,' shall have, besides the usual gas lights, 'emergency' oil lamps placed in such a number that there is sufficient illumination even if the gas is extinguished. These lamps shall be kept alight from the time of the opening of the theatre until the audience and staff have left the building.

6. The use of matches, as well as the carrying of open lights, is forbidden. Gas lights on the stage shall only be lit with 'safety lighters.' The gas 'battens' shall be lowered to at least 5 feet from the top scenery before they are lit.

7. All gas jets in the auditorium, passages, or staircases, shall have a direct supply service quite independent of that of any other part of the building.

The gas service shall have no leakage, and shall be examined at least every three months to ascertain what amount of gas is lost per hour when all jets are shut off, but the mains are open.

8. In front of all fireplaces a metal ash-receiver shall be provided. The store-rooms shall have no heating apparatus.

III.—THE STAGE.

1. The stage shall be divided from the other parts of the building by a solid wall.

2. The proscenium opening in this wall shall be provided with a metal curtain, which shall only be raised during the performances or rehearsals. The curtain shall move easily and quickly, and it must be possible to work it from some sheltered point not on the stage, as well as from the stage itself.

3. All other openings in the divisional wall shall have well-fitting iron doors with locks.

Doors in frequent use shall be self-closing.

4. There shall not be more scenery on the stage than is requisite for two performances; and on no account shall scenery, properties, or other such articles, be stored on the stage, above or below it, or in the auditorium.

5. Care shall be taken in hanging the counterweights of 'cloths' or other scenery, and that in case of their breaking loose and falling there must be no possibility of risk to life.

6. Rockets and other fireworks may only be used with the special permission of the Fire Brigade authorities, and then only if all the scenery on the stage at the time shall have been made 'fire resisting' by impregnation, or by some other means.

Great care should be taken in using fire-arms. The wads must be of a non-combustible material.

7. 'Back-cloths'—of gauze or other flimsy material—shall be so hung that there is no danger of their coming too near to the gas jets through a draught, or through the manipulation of the gas-battens or other lighting apparatus. Curtains and wall coverings made of jute or similar highly inflammable material shall not be used.

8. If hay, straw, and such like, must be employed, they shall be removed directly after the rehearsal or performance at which they are required to a special 'fire-proof' store-room.

9. All rubbish, especially the wood shavings of the workshops, &c., shall be removed from the building daily, before the admission of the public.

IV.—THE FRONT OF THE HOUSE.

1. During a performance, and until the audience have vacated the theatre, all exits (including the "emergency" exits) shall be kept clear.

2. All gangways, passages, stairs, doors, or other means of exit which are used by the audience, shall be kept clear and free from all obstructions. Tickets shall only be issued for seats which are fixtures.

3. The stairs shall have hand-rails on both sides. Staircases having a width of 9 feet or over shall also be provided with a fixed hand-rail with balusters down the centre.

4. All doors shall open outwards.

5. The 'emergency' exits shall be clearly indicated.

During the performance the 'emergency' exit doors shall be kept closed with one movable bolt only, fixed to the inside at a proper height from the floor, and easily opened.

6. Pegs for the hanging up of the hats and coats of the audience may only be fixed in those receptacles specially set aside for this purpose, so that they in no way hinder the free passage to the exits.

ENGLAND.—LONDON.

From the Regulations made by the London County Council with respect to the requirements of Protection from Fire of Theatres, Houses, Rooms, and other places of Public Resort within the Administrative County of London.

PART I.—STRUCTURAL.

APPLICATIONS AND DRAWINGS.

1. Every person who for the first time after the making of these regulations shall be desirous of obtaining authority to open any such premises within the said County, shall first make an application in writing to the Clerk of the Council for a certificate under the above Act.

Such application shall contain a statement as to the nature and extent of the interest of such person in such premises, and the character of the entertainment for which such premises are proposed to be used, and be accompanied by complete plans, elevations and sections, drawn on tracing linen, to a scale of ⅛th of an inch to a foot; and by a block plan showing the position of such premises in relation to any adjacent premises, and to the public thoroughfares upon which the site of such premises abuts, drawn to a scale of not less than $\frac{1}{16}$th of an inch to a foot.

Such drawings shall be coloured to distinguish the materials employed in the construction of the building; the width of all staircases, corridors, gangways, and doorways, together with the heights of the tiers, and other parts of the building.

The thicknesses of the walls and scantlings, of the various materials shall be clearly shown by figured dimensions; and the cardinal points shall be marked upon each plan.

Such drawings shall be accompanied by a specification of the works to be executed, describing the materials to be employed and the mode of construction to be adopted, together with such other particulars as may be necessary to enable the Council to judge whether the requirements of these regulations will, when such premises have been completed, have been complied with.

Such drawings shall also show the respective numbers of persons to be accommodated in the various parts of such premises, and the area to be assigned to each person, which shall not be less than 1 foot 8 inches (0·50 metre) by 1 foot 6 inches (0·45 metre) in the gallery, and not less than 2 feet 4 inches (0·70 metre) by 1 foot 8 inches (0·50 metre) in other parts of such premises.

Such drawings and specification to be deposited with the Council. A duplicate copy of approved drawings and specification shall be signed by the Chairman of the Committee and returned to the applicants.

SITE.

2. One-half at least of the total length of the boundaries of the site of any such premises which consist of an entire building, and in case of a room or other such premises not consisting of an entire building, one-half at least of the total length of the boundaries of the site of the building of which such room or other such premises form part, shall abut upon public thoroughfares, of which one thoroughfare at least shall not be less than 40 feet (12·20 metres) wide, and of the remainder none shall be less than 30 feet (9·15 metres) wide if a carriageway, or 20 feet (6·09 metres) wide if a footway.

If, in compliance with Regulation No. 10, an additional passage or way should be necessary, it may be provided by means of a private passage or way. Such passage or way shall not be less than 10 feet in width, and under the complete control of the owner of such premises, and no doors, windows or other openings of the adjoining premises shall communicate therewith, or overlook any portion of such passage or way.

3. No such premises shall be erected upon a site within 20 feet of any windows or other openings belonging to any other premises overlooking the site.

WALLS.

4. All such premises shall be enclosed with proper external or party walls of brick or stone.

The thickness of such walls shall not be less than the thickness prescribed by the Metropolitan Building Act, for walls of similar height and length in buildings of the warehouse class.

DRESSING-ROOMS.

5. Dressing-rooms shall be arranged in a separate block of buildings, or divided from the place of public resort by party walls, with only such means of communication therewith as may be approved by the Council.

All such dressing-rooms shall be constructed of fire-resisting materials, and connected with an independent exit leading directly into a thoroughfare or way.

All such dressing-rooms shall be ventilated to the outer air by windows in the external walls.

The walls of all such dressing-rooms shall be hung, for decorative purposes, only with materials completely adhering to the surface of such walls.

No such dressing-rooms shall be situated more than one story below the street level.

Sufficient and separate w.c. and urinal accommodation, properly ventilated to the outer air, shall be provided for the use of the male and female artistes.

AUDITORIUM.

6. No theatre shall be constructed underneath, or on the top of, any part of any other building.

7. No such premises shall have more than three tiers or horizontal divisions including the gallery, above the level of the pit.

Where the front seats of the gallery are separated from the gallery by a partition, such seats shall not count as a separate tier.

8. Where the first tier or balcony extends over the pit, stalls, or area, the height between the floor of the pit and the first tier shall not be at any part less than 10 feet (3·04 metre), and the height between the floor of the highest part of the gallery and the lowest part of the ceiling over the same shall not be less than 12 feet (3·65 metres).

9. In all such premises the floor of the highest part of the pit, or of the stalls where there is no pit, shall not be more than 6 inches (0·15 metre) above the level of the street adjoining the principal entrance to the pit, and the lowest part of the floor of the pit or stalls shall not be more than 15 feet (4·57 metres) below such level.

ENTRANCES AND EXITS.

10. Two separate exits, not leading into the same thoroughfare or way, shall be provided to every tier or floor of such premises.

If any tier or floor shall be divided into two parts, two separate exits, not leading into the same thoroughfare or way, shall be provided to each of such parts.

Such exits shall be arranged so as to afford a ready means of egress from both sides of each tier or floor, and shall lead directly into a thoroughfare or way.

VESTIBULES.

11. Where vestibules are provided, not more than three tiers or floors (or where such tiers or floors are divided into two or more parts, such parts of tiers or floors) shall communicate with one vestibule.

The width of each vestibule shall be at least one-third greater than the united width of all the doorways or passages that lead thereto.

The united widths of all the doorways or passages that lead from a vestibule towards a thoroughfare or way, shall be at least of the same width as such vestibule.

Not more than one exit from each separate part of a tier or floor shall be used as an entrance.

PROSCENIUM.

12. In all such premises where a stage with a proscenium shall be erected, such stage shall be separated from the auditorium by a brick proscenium wall not less than 13 inches (0·30 metre) in thickness, and such wall shall be carried up the full thickness to a height of at least 3 feet (0·91 metre) above the roof, such height being measured at right angles to the slope of the roof, and shall be carried down below the stage to a solid foundation.

Not more than three openings shall be formed in the proscenium wall, exclusive of the proscenium opening.

No such opening shall exceed 3 feet (0·91 metre) in width and 6 feet 6 inches (2 metres) in height, and each of such openings shall be closed by a wrought-iron door of not less than ¼th of an inch in thickness in the panel, hung in a wrought-iron frame so as to close of itself without a spring.

No openings formed in the proscenium wall shall, at the lowest part, be at a higher level than the floor of the stage.

All the decorations around the proscenium shall be constructed of fire-resisting materials.

13. The proscenium opening shall be provided with a fire-resisting screen to be used as a drop curtain, of such pattern, construction and gearing, and with such arrangements for pouring water upon the surface of the screen which is towards the stage as may be approved by the Council.

STAGE ROOF.

14. The height of the wall plate carrying the rafters of the roof over the stage shall not be less than twice the height of the proscenium opening, such height being measured from the level of the stage at the curtain line.

An opening shall be formed in the roof near the back of the stage, of a superficial area at the base of at least $\frac{1}{10}$th of the superficial area of the stage. Such opening shall be covered with a lantern light, glazed on the top and sides, and be fitted with suitable exhaust cowls.

CORRIDORS, STAIRCASES AND GANGWAYS.

15. Every staircase, landing, lobby, corridor or passage intended for the use of not more than 400 persons of the audience, shall be formed of fire-resisting materials, and shall not be less than 4 feet 6 inches (1·35 metres) wide, but, if communicating with any portion of the house intended for the accommodation of a larger number of the audience than 400 persons, it shall be increased in width by 6 inches (0·15 metre) for every additional 100 persons until a maximum width of 9 feet (2·74 metres) be obtained.

16. Every staircase for the use of the audience shall have solid square (as distinguished from spandril) steps of York or other stone or fire-resisting materials, to be approved by the Council, with treads not less than 11 inches (0·27 metre) wide and with risers not more than 6 inches (0·15 metre) high, without winders, in flights of not more than 12 or less than 3 steps each.

The treads of each flight of steps shall be of uniform width, and be pinned into brick walls at both ends.

The several flights of such steps shall be supported and enclosed upon all sides by brick walls not less than 9 inches thick, to be carried down to the level of the footways.

No staircase shall have more than 2 flights of 12 steps each without a turn.

All landings shall be 6 inches (0·15 metre) thick, be square upon plan, and have brick arches 9 inches (0·22 metre) deep turned under them in the middle of such landings.

Every staircase shall have a roof of fire-resisting materials to be approved by the Council.

A continuous handrail shall be fixed on both sides of all steps and landings, supported by strong metal brackets built into the wall.

Such handrails shall be chased into the walls, where the thickness of the walls will permit, but in all cases where the flights of steps re-turn, the newel wall shall be chased so as to allow the handrail to turn without projecting on the landing.

17. A clear passage or gangway not less than 3 feet (0·91 metre) wide shall be formed at the sides and in the rear of the seating in every part of such premises.

Such passages or gangways shall at all times be kept entirely free from chairs, flap seats, or other obstructions, whether permanent or temporary.

IRONWORK.

18. All constructional ironwork in such premises shall be embedded in fire-resisting materials in a manner to be approved by the Council.

WORKSHOPS, ETC.

19. All workshops, store-rooms, wardrobe or painting rooms, in connection with such premises shall be separated from such premises by brick walls not less than 9 inches (0·22 metre) thick.

All openings in such walls shall be closed with self-closing wrought-iron doors hung in a wrought-iron frame.

All such doors, if consisting of a single fold, shall be made to overlap, when closed, the door frame at least 3 inches (0·07 metre); and, if made in two folds, such folds shall overlap each other, when closed, at least 3 inches (0·07 metre) on each side.

All floors and ceilings of such rooms shall be formed of fire-resisting materials.

All such rooms shall be ventilated by windows in the outer walls.

LIMELIGHT TANKS, ETC.

20. All limelight tanks, boilers with engines, and dynamos with engines, shall be each placed in a ventilated chamber or building of 'fire-proof' construction.

Such chambers or buildings shall be separated from such premises, and from each other, by brick walls and 'fire-proof' floors without openings, and shall be enclosed upon one or more sides by external walls.

SCENE DOCK.

21. All scene docks or stores and property rooms in connection with such premises shall be enclosed by brick walls not less than 9 inches thick, and shall have floors and ceilings of fire-resisting materials.

All openings from such docks, stores, or rooms to such premises shall be closed by self-closing wrought-iron doors, hung in wrought-iron frames.

All such doors, if consisting of a single fold, shall be made to overlap, when closed, the door frame at least 3 inches (0·07 metre): and, if made in two folds, such folds shall overlap each other, when closed, at least 3 inches (0·07 metre) on each side.

ENCLOSURES.

22. No enclosure shall be allowed in any such premises where the public can assemble for any other purpose than to view the performance, except so far as the Council shall consider necessary for the provision of refreshment bars, or, in the case of a theatre, for the provision of a foyer.

SKYLIGHTS.

23. All skylights, and the sloping sides of lantern lights, shall be protected by galvanised iron wire guards, securely fixed on the outside of such skylights or lantern lights.

GAS.

24. All such premises when lighted by gas shall have separate and distinct gas services and meters as follows—(*a*) To the stage; (*b*) To the auditorium; (*c*) To the staircases, corridors and exits.

Such meters shall be placed in properly ventilated chambers of 'fire-proof' construction.

All gas brackets shall be fixed without joints; and all burners within reach of the audience shall be fitted with secret taps, and be efficiently protected by glass or wire globes.

All gas burners within 3 feet (0·91 metre) of the ceiling shall have hanging shades of uninflammable material to distribute the heat.

All gas pipes shall be made of iron or brass.

Where there is a stage or 'wings' with scenery, the footlights or floats shall be protected by fixed iron-wire guards, and the burners shall be provided with glass chimneys.

The rows and lines, and gas burners in the 'wings' (which must commence 4 feet (1·21 metres) at least from the level of the stage) shall be protected by fixed iron-wire guards.

All 'battens' shall be hung by at least three wire ropes, and be protected at the back by a solid metal guard and wire fixed to a stiff iron frame at such a distance from the gas jets that no part of the scenery or decoration can become heated.

All movable lights shall be fitted with flexible tubes, and the gas in every case shall be turned off by the tap on the stage as well as by that on the flexible tube.

All flexible tubes shall be of sufficient strength to resist pressure from without.

An indicating gas plate shall be provided at a convenient place at the side of the stage.

DOORS AND FASTENINGS.

25. All doorways used by the public shall be at least 4 feet 6 inches (1·97 metres) wide in the clear, with doors hung in two folds made to open outwards towards the thoroughfare or way.

All internal doors shall be so hung as not to obstruct, when open, any gangway, passage, staircase, or landing.

No door shall open immediately upon a flight of steps, but a square landing at least the width of the doorway shall be provided between such steps and such doorway.

All exit doors having fastenings shall be fastened by automatic bolts only, of a pattern to be approved by the Council; but where such doors are also to be used by the public for entrances, they shall be fastened with espagnolette or lever bolts only, of a pattern to be approved in each case by the Council, and fitted with lever handles at a height of 3 feet 6 inches (1·07 metres) from the floor.

All doors used for entrances, and all gates, shall be made to open both ways, and shall, when opened inwards, be locked back against the wall in such a manner as to require a key to release them.

All barriers and internal doors shall be made to open outwards, with no other fastenings than automatic bolts.

No locks, monkey-tail, flush or barrel bolts, or locking bars, or other obstructions to exit, shall be used on any doors, gates or barriers.

VENTILATION.

26. All parts of such premises shall be properly and sufficiently ventilated in a manner to be approved by the Council.

All openings for ventilation shall be shown on the plans, and described in the specification, which shall be submitted to the Council for its approval.

WARMING.

27. No fire-place shall be formed in any portion of the auditorium or stage of such premises.

All open fire-places or stoves in any other part of such premises shall be protected by strong fixed iron-wire guards and fenders, part of which may be made to open for all necessary purposes.

All heating apparatus shall be placed in a position to be approved by the Council, and enclosed upon all sides by brick walls not less than 9 inches thick, and shall be properly ventilated.

All hot-water pipes or coils shall, where necessary, be recessed in the walls, or otherwise arranged so as not to diminish the clear width of the gangways.

Where such premises are heated by artificial means, the high pressure hot-water system with sealed pipes will be inadmissible, and either hot-air or the low pressure hot-water circulation system shall be adopted, having an open cold-water supply cistern, and the pipes throughout the system shall be of galvanised wrought iron, with the exception of those in immediate contact with the boiler, which may be either of galvanised wrought iron or copper.

The boiler shall be made of wrought iron, copper, or mild steel, and shall be provided with a dead weight or other approved safety valve, which must be attached to the boiler by an independent galvanised wrought-iron or copper pipe, and must not under any circumstances be fixed to the circulating pipes, and must be placed in such a position as will ensure protection from soot and dirt.

The term "low pressure" shall be understood to mean the pressure due to the vertical head of water between the boiler and the supply cistern.

WATER SUPPLY.

28. All such premises containing a superficial area for the accommodation of the public of 1000 feet (92·88 metres) and upwards shall be provided with a sufficient number of hydrants, each of a diameter of not less than 2½ inches (0·06 metre), to be connected by a 3-inch (0·07 metre) main with a water company's high pressure street main.

Each of such hydrants shall be provided with at least a 30-feet (9·14 metres) length of hose, with fittings of the Metropolitan Fire Brigade pattern.

In all such premises where there is no constant supply of water, there shall be provided on the top of the proscenium wall, or at some other place to be approved by the Council, two cisterns, to be kept always filled with water.

Such cisterns shall be each capable of containing at least 250 gallons of water for every 100 persons of the audience to be accommodated in the building.

Such cisterns shall be properly protected from all danger from frost.

Fire mains shall be connected with such cisterns to hydrants to be fixed in such places and manner as may be approved by the Council.

ADDITION OR ALTERATION TO PREMISES.

29. Notice shall be given to the Clerk of the Council of any intended structural addition to, or alteration of, any such premises, in respect of which the Council may have granted a certificate under the said Act of 1878, to the effect that such premises were, on their original completion, in accordance with the Council's regulations.

Such notice shall be accompanied by plans, elevations and sections, block plan, and specification of the works to be executed similar to those required in the case of premises to be certified for the first time by the Council, and showing such intended addition or alteration.

The Council will, if necessary, cause a fresh survey of such premises to be made.

No doors, bolts or other fastenings, obstructions to the means of egress, flap seats or other means of diminishing or stopping up the gangways, shall be put, nor shall any alterations of a like nature be made to such premises without the previous consent of the Council being obtained thereto.

PART II.—GENERAL.

30. Additional means of lighting, for use in the event of the gas or the electric light being extinguished, shall be provided for the auditorium, corridors, passages, exits and staircases, by a sufficient number of oil or candle lamps, of a pattern to be approved by the Council, properly secured to an uninflammable base out of the reach of the public.

Such lamps shall be kept alight during the whole time the public are in such premises.

No mineral oils shall be permitted to be used in such lamps.

31. Every theatre, and, where considered necessary by the Council, all other premises licensed by the Council, shall be connected with the nearest Fire Brigade Station by telephone.

32. All exit and other doors used by the public shall be indicated by painted notices in 3-inch white block letters upon a black ground.

Such notices shall be painted on the doors and walls at least 6 feet 9 inches above the floor.

The words "no exit" shall be painted at least 6 feet 9 inches above the floor, in 3-inch white block letters upon a black ground, upon all doors, in sight of the audience, which do not lead to exits.

33. Wet blankets or rugs, and buckets filled with water shall be always kept on the stage or in the flies, scene-docks, or wings, and attention shall be directed to them by placards legibly printed or painted, and fixed immediately above them.

Some person shall be held responsible by the management for keeping the wet blankets or rugs, and buckets ready for immediate use.

Hatchets, hooks and other appliances, for taking down hanging scenery in case of fire, shall be always kept in readiness for immediate use.

The regulations as to fire shall be always posted in some conspicuous place in such premises, so that all persons connected with such premises may be acquainted with such regulations.

PART III.—ELECTRIC LIGHTING.

34. Where the electric light is permitted in such premises, it shall be on condition that a competent electrical engineer do certify in writing to the satisfaction of the Council once in six months that the system is in proper working order.

(i) All such premises when lighted by electric light shall have at least three separate and distinct circuits (*a*) for the stage, (*b*) and (*c*) for the auditorium, corridors and exits.

The circuits referred to in (*b*) and (*c*) shall be so arranged that half the lights in each division of the auditorium and half those in each corridor and exit shall be on (*b*) and the other half on (*c*) circuit.

When the current is supplied by a public lighting company these circuits shall be taken separately from the street mains.

Under all circumstances complete metallic circuits must be employed.

Gas and water pipes shall never form part of any circuit.

The number of lamps shall be so sub-divided that no sub-circuit shall carry more than 65 ampères; and each sub-circuit shall start from a distributing board.

(ii) All conductors used within buildings shall be of copper, having a conductivity equal to not less than 98 per cent. of that of pure copper, and shall be so proportioned to the work they have to do that, if double the normal current be transmitted, their temperature shall not rise to above 150 degrees Fahr.

The conductors shall be insulated with pure and vulcanised india rubber.

The insulation resistance shall be not less than 300 megohms per statute mile, at 60 degrees Fahr., after one minute's electrification, when tested with at least 400 volts, and after 48 hours' immersion in water.

The insulated conductors shall be protected on the outside by stout tape or braiding impregnated with preservative compound.

If it is desired to use any other means of insulation than that above specified, special permission shall be obtained from the Council, and no material shall be used which is not waterproof, or which will soften at a temperature below 170 degrees Fahr.

In all cases conductors conveying currents of high electromotive force inside buildings, shall be specially and exceptionally insulated, and cased in, and the casing made fireproof.

The positive and negative terminals connected to such conductors shall not be nearer to each other than 12 inches (0·30 metre), and shall be efficiently protected from risk of contact.

Flexible conductors in connection with movable lights shall be insulated with vulcanised india rubber, and protected on the outside by a stout braiding; should any of these flexible conductors be damaged, it shall be at once replaced.

No circuit of this nature shall carry more than 10 ampères, and each circuit shall be protected by a double pole fuse.

(iii) All conductors shall be efficiently protected from mechanical injury.

Where conductors pass through walls, 'fire-proof' floors, or ceilings, they shall be protected by iron pipes or by glazed stoneware or porcelain tubes, and precautions shall be taken to prevent the possibility of fire or water passing along the course of the conductors.

In special cases, or where necessary for protection from the depredation of rats, mice, or other vermin, armoured cables may be used. These need receive no further mechanical protection.

Lead covered cables shall not be used unless protected by external armour of iron or steel.

Metal fastenings for fixing conductors shall be avoided; but when unavoidable some additional covering shall be used to protect the conductor, unless armoured, from mechanical injury at the points of support.

If casing be used, it shall be of hard wood, and each conductor shall be laid in a separate groove; the cover shall be secured with screws.

Casings shall, as far as possible, be placed in sight, and the conductors shall always be accessible.

Joints in conductors shall be avoided, but when unavoidable, they shall be electrically and mechanically perfect. Soldering fluids shall not be used in making such joints.

(iv) All external conductors shall be specially insulated and laid in iron pipes, properly jointed, and of ample size.

Such iron pipes shall be protected where necessary, and securely fixed and supported when not underground.

(v) All exposed metal work, such as fittings, switch and fuse covers, &c., shall be efficiently insulated from the circuits.

All switches, cut-outs, ceiling roses, wall and floor sockets and lampholders shall have uninflammable bases.

All switches shall be of ample size to carry the currents for which they are intended without heating, and shall be so constructed that it will be impossible for them to remain in any position intermediate between the "on" and the "off" positions, or to permit of a permanent arc.

All circuits shall be efficiently protected by cut-outs, placed in positions easily accessible to the staff, but inaccessible to the public.

The main cut-outs shall be of such pattern and be fixed in such a position as to admit of quick replacement.

All circuits carrying a current of 20 ampères or more shall be provided with a cut-out on each conductor, and the two cut-outs shall not come in the same compartment.

All cut-outs shall be so constructed that fused metal in falling cannot cause a short circuit or an ignition.

All cut-outs shall be so marked as to show what circuit or lamps they control.

All wall or floor sockets shall be provided with fuses in their fixed portions.

The sockets for the stage shall be of hard wood with metal guards, care being taken to avoid risk of ignition, and they shall be of specially substantial construction.

(vi) Resistances for regulating the power of the lights shall be mounted on incombustible bases, and shall be so protected and placed at such a distance from any combustible material that no part of the resistance, if broken, can fall on such material.

Principal resistances shall be placed in a 'fire-proof' room reserved for the purpose.

(vii) Arc lamps shall not be used inside buildings without special permission from the Council.

When they are used special precautions shall be taken to guard against danger from falling glass or incandescent particles of carbon.

All parts of the lamps, lanterns and fittings which are liable to be handled (except by the person employed to trim them) shall be insulated.

(viii) Where there is a stage, special care shall be taken that all works in connection with the lighting of the stage are carried out in as substantial a manner as possible.

No metal work in connection with the circuits shall be exposed or so fixed or constructed as to be liable to cause a short circuit.

Lamps on 'battens,' footlights, &c., shall be protected by stiff wire guards, so arranged that no scenery or other inflammable material can come in contact with the lamps.

No readily combustible material shall be used in connection with any lamps on the stage in such a manner that it might come in contact with the lamps.

No soft or readily inflammable wood shall be used in connection with the lamps on the stage, and all wood shall be protected by uninflammable material from the possibility of ignition by an arc between any two parts of the two conductors, or by heated particles from any conductor or part of a conductor which may connect together the two main conductors.

Where a number of lights, as in the footlights, 'battens,' &c., are supplied under control of one switch, and protected by one single or double pole cut-out, as the case may be, the conductors shall be maintained throughout of such a section that they will be effectually protected by the cut-outs against heating.

The leads to the 'battens' shall be specially guarded, particularly at the points where they join on to the 'battens,' and a sufficient length shall be allowed to prevent the leads receiving any injury through any movement of the 'battens.'

The 'battens' shall be suspended by at least three wire ropes attached to insulators on the battens.

On no account shall the same 'battens' be adapted for both gas and electric light.

(ix) A switchboard, containing all the necessary switches, cut-outs, and other fittings for the control and regulation of the stage lighting shall be fixed in some convenient position overlooking the stage.

This board shall be inaccessible to all but the persons employed at such premises to work it.

(x) Boilers, steam engines, gas engines and dynamos, when used for the supply of electricity to such premises, shall be placed in such positions as shall be sanctioned by the Council.

Gas engines shall be placed in rooms so adequately and continuously ventilated that no explosive mixture of gas can accumulate by any leakage through the engine in the event of any of the gas cocks being left turned on.

A hood, connected with a pipe carried into the external air, shall be fixed over the ignition tube when this is used.

(xi) Primary or secondary batteries shall be placed in rooms so adequately ventilated that no fan shall be necessary.

The batteries shall be well insulated.

(xii) Transformers used to transform either direct or alternating currents, together with the switches and cut-outs connected therewith, shall be placed in a fire and moisture proof structure.

Where the primary current is of high potential, such structure should be preferably outside the building.

No part of such apparatus shall be accessible except to the person in charge of its maintenance.

No transformer which, under normal conditions of load, heats above 130 degrees Fahr., shall be used.

Transformer circuits shall be so arranged that under no circumstances shall a contact between the primary and the secondary coils lead an electro-motive force of high pressure into the building. The term "high pressure" means in all cases pressure above 200 volts.

(xiii) The insulation resistance of a system of distribution shall be such that the greatest leakage from any conductor to earth, when all branches are switched on, the lamps and motors being removed, shall not exceed one fifteen thousandth part of the total current intended for the supply of the said lamps and motors; the test being made at the usual working electro-motive force. Provided that this rule shall not be held to justify a lower insulation resistance than 5000 ohms, nor to require one higher than 5 megohms.

(xiv) The generating plant and switching gear shall be in the hands of thoroughly competent manipulators, and the engine room (if any) shall be inaccessible to the general public, and shall where possible have an independent entrance.

(xv) A plan of the wiring shall be always kept in a prominent position in the office of the manager of such premises.

FRANCE.—PARIS.

From the Regulations relating to the Control, the Erection and Maintenance of Theatres, Music Halls, and other Places of Public Amusement in force in the Departments of the Seine and Seine-and-Oise.

I.—THEATRES.

A. PRELIMINARY FORMALITIES.

1. Every person desiring to build or carry on a theatre must make application to the Ministry of Public Instruction and Fine Arts, as well as to the Prefecture of Police.

This application must be accompanied by detailed plans in triplicate, with sections and elevations to the scale of 0·02 metre to the metre or one-fiftieth full size (very nearly one-quarter of an inch to the foot), together with a description of the proposed premises.

2. Before the commencement of the works the administration shall cause to be notified to the applicant, whether or not any modifications are required in the carrying out of the deposited plans.

3. After the approval of a theatre no alteration shall be permitted in its construction or arrangement without complying with the necessary formalities.

B. CONSTRUCTION AND GENERAL MANAGEMENT.

4. A theatre comprises—1st. The auditorium and its approaches (vestibules, staircases, lobbies, refreshment rooms, &c.); 2nd. The stage, with the cellar and the 'flies'; 3rd. The portion of the building in which the dressing rooms and administrative offices are situated.

GENERAL CONSTRUCTION.

5. The theatre may be either detached or attached. In cases of its being detached, there shall be left on all sides, with the exception of those adjoining the public way, a clear space or passage-way not less than 9 feet 10 inches (3 metres) wide, provided the neighbouring houses have no openings upon the said passage. If such is not the case, the width shall be increased in proportion to the size and general arrangement of the building.

Where any portion of a theatre adjoins another building, an independent brick wall, at least 10 inches (0·25 metre) thick, shall be constructed to protect the party walls.

6. No doorway shall be formed between the passage-way and the adjoining premises in case the theatre is detached, nor any communication formed between any portion whatever of the theatre and the adjoining premises in case the theatre is attached.

7. The three divisions of the theatre shall be separated by solid walls of brickwork, and be entirely enclosed and divided by incombustible materials.

The auditorium and the administrative section of the building should have separate exits leading into the street.

8. The roofs and the ceiling of the auditorium shall be constructed of iron and cement concrete.

No erection, such as telephone wire standards, shall be placed on the roofs without permission.

AUDITORIUM.

9. No openings shall be allowed in the proscenium wall with the exception of:—1st. The proscenium opening, which shall be closed by a movable curtain of iron wire gauze with a mesh, of not more than 1¼ inch (0·03 metre). This curtain must be hung with incombustible cords. Counterweights, suspended by metallic ropes, should be provided to check the rapidity of its descent; 2nd. The position of the necessary openings for the firemen shall be determined by the theatre commission, and shall be closed by iron doors, one key of which shall be deposited with the commissary of police in attendance, and another with the fire brigade. A third key shall be kept at the side of the stage, near the doors, in a box glazed in front, with an explanatory inscription.

10. The fixed curtain in the upper part of the proscenium opening must be of an incombustible material, as well as any inner framing to the opening.

11. All decorative plastic work should be particularly well fixed, especially any on the central part of the ceiling of the auditorium.

The space above the ceiling should be left entirely free without any obstruction, with the exception of the necessary machinery for the lowering and raising of the chandelier.

CHANDELIER.

12. The chandelier must be supported by an iron girder, and raised and lowered by means of a winch. The movement of the chandelier should be regulated by counterweights, and it must be suspended by two metal ropes, each having a breaking weight equal to the total weight of the fitting.

A wire gauze must be provided to protect the spectators in the case of the fall of any glass globes or prisms.

THE STAGE.

13. The wall at the back of the stage and the side walls shall have a level surface without breaks or sets-off. No openings shall be formed in this wall, with the exception of those necessary for the persons employed in the theatre. These openings shall be provided with iron doors, hung folding, and in such a manner as to always remain closed. Where these walls abut on a surrounding passage there shall be erected at the height of each 'fly gallery' an external gangway with a hand-rail, and a fixed iron ladder for the use of the firemen.

In other cases the roofs of contiguous buildings belonging to the theatre shall be arranged in such a way that an escape may be constructed in a similar manner.

The openings to the escapes shall be provided with iron doors, fastened only by a latch, and opening outwards.

14. The prompter's and musicians' lobby shall be inclosed with incombustible walls, and shall be ceiled, paved with tiles, flagged or cemented.

15. No dressing-room shall be erected on the stage without the consent of the Theatre Commission.

16. The whole of the scenery shall be rendered uninflammable by means of a special preparation. Before being used, its uninflammability shall be tested by the Theatre Commission or by one of its members delegated for that purpose. These tests shall be repeated every six months, at least, and shall be certified on each occasion by the affixing of a seal at different points.

DRESSING-ROOMS AND ADMINISTRATION BUILDINGS.

17. The doors of the dressing-rooms, lobbies, foyers, crush-rooms, green-rooms, as well as those of the administrative offices, shall be provided with a peep-hole placed in such a position as to facilitate inspection by the firemen during the regulation patrol.

If these rooms be parqueted, the slips of parquet must be fastened upon the flooring.

18. The walls may be hung with wall paper, or with cloth hangings completely adhering to their surface. All coat-pegs, curtains, and door hangings shall be fixed at least 2 feet 3½ inches (0·70 metre) from the vertical plane in which jets of gas are fixed.

WORKSHOPS AND STORE-ROOMS.

19. No workshop or store-room whatsoever may be formed in the parts of the theatre constituting the auditorium, the stage, and their dependencies. They may not be formed in other parts without special authority from the administration.

20. Any scene docks or property rooms must be placed outside the walls of the theatre. Only the scenery and properties necessary for any one performance shall be allowed to be kept inside the theatre. All store-rooms (*lieu de dépôt*) must be separated from the rest of the buildings by brick walls with iron doors.

21. No workshop, firework store (*magasin d'artifice*), or store for any explosive substance whatever, shall be permitted in a theatre.

STAIRCASES AND EXITS.

22. The staircases generally, including those leading to the dressing-rooms and the administrative offices, and those used by the public, unless built entirely of stone, shall be constructed in such a manner that the steps shall be formed of solid concrete held together by an iron framework. The treads of the stairs may be of wood. The staircases to be used by the public shall always be in straight flights.

23. Every staircase for the use of the public, and the landings thereof, shall be at least 4 feet 10 inches (1·50 metres) wide. Commencing at the highest story, this width should be increased at each flight in proportion to the number of persons using it, unless the builder prefers to make the staircase throughout its entire height the same width as the flight from the first to the ground floor.

24. The landings of the stairs devoted to the public shall not be provided with doors, except by express authority from the administration.

25. Every theatre shall have at least two staircases entirely devoted to the use of the audience, and independent of each other. These staircases shall communicate with each story, and lead out into the street.

26. The width of the exit corridors and doors, as well as the passages from the auditorium to the vestibule and from the vestibule to the outside shall be in proportion to the size of the theatre.

27. The total width of the openings communicating from the passage to the vestibule shall not be less than 19 feet 7 inches (6 metres) for theatres containing 1000 or fewer seats. The opening from the vestibule to the outside shall fulfil the like condition. If it be divided by several doors separated by piers, they shall not be less than three in number, and each shall have a minimum width of 8 feet 2 inches (2·50 metres).

Doors leading from the vestibule to cafés, passages or outhouses having an exit to the outside are not to be reckoned.

28. When the auditorium contains more than 1000 seats, these openings shall have their regulation width increased by 1 foot 11½ inches (0·60 metre) for every 100 seats.

29. The auditorium shall have a passage way all round on each floor of the uniform width of not less than 8 feet 2 inches (2·50 metres).

30. The doors opening from the auditorium into this passage shall be hung in such a manner that they shall open outwards, and fold back against the external face of the box partitions. The internal doors on the ground floor shall open from the auditorium into the vestibule.

31. The external doors of the theatre must remain open during the whole time of the performance. These doors must be provided with entrance lobbies.

32. These entrance lobbies shall have their side openings made to open both ways, and their width shall equal the width of the opening screened by the entrance lobby. The front of these entrance lobbies shall have an opening with two folding doors which must not be locked, of the same total width.

33. All the seats upon the ground floor of the auditorium and those of the galleries shall be provided with two side gangways having a minimum width of 3 feet 3⅓ inches (1 metre), unless they have a single passage in the middle 4 feet 3⅓ inches wide (1·30 metre) leading to the exit passage.

The collective width of the doorways leading from the ground floor to the corridor circumscribing the auditorium shall not be less than 19 feet 7 inches (6 metres). These doors shall be situated as near as possible to the exit vestibule.

34. The depth of every row of chairs, stalls, or benches, shall be 1 foot 8 inches (0·50 metre), measured from the front of the seat to the back of the seat in front. The same distance shall be maintained between the fixed seats. The seats of the chairs or stalls shall be constructed so as to fold against the backs.

C. HEATING, VENTILATION AND LIGHTING.

HEATING.

35. No part of the theatre may be warmed except by hot air, the furnaces being placed in the basement. The hot-air conduits shall be constructed of earthenware, the material of which, including the coating (*enduit*), shall be 2⅓ inches thick (0·06 metre).

36. The hot-air openings (*bouches*) situated on the stage shall be raised 1 foot (0·30 metre) above the floor, and shall be covered by a wire netting (*grillage*) placed at a distance of 1 foot (0·30 metre) from their outside surface. The openings for warming, situated in the other parts of the theatre, shall be at a distance of 6 inches (0·16 metre) from all woodwork, such as floorings, skirtings, wainscotings, &c.

VENTILATION.

37. The auditorium must be properly ventilated by means of arrangements which must be submitted for the approval of the Theatre Commission.

LIGHTING.

38. If gas be employed for lighting a meter shall be provided for each portion of the theatre.

Pipes of a larger diameter than ⅓ inch (0·01 metre) shall be of iron.

39. If the theatre be lighted by the electric light, and steam engines be employed, these machines must be placed outside the theatre, except with the special approval of the Theatre Commission. The wires shall be insulated by a coating of gutta percha, and laid throughout their entire length in incombustible tubing.

The lighting apparatus shall be arranged in such a manner as to prevent the fall of incandescent carbons.

40. The use of portable gas, mineral oils and hydrocarbons is expressly forbidden.

41. Oil lamps furnished with glass globes and kept lighted from the time of the admission until the departure of the public, shall be placed in a sufficient number in all parts open to the public to prevent complete darkness in case of the sudden extinction of the gas or electric light.

The instruments, cloths, &c., used in the trimming of these lamps shall be kept in a metal box.

LIGHTING OF THE STAGE.

42. The 'floats' (*herses*) shall be encased by wire netting at a sufficient distance to prevent contact with any moving object.

43. The gas connections and the 'floats' shall be fixed in the same vertical plane, in order to prevent accident to the supply pipe (*boyau d'alimentation*).

44. The 'floats' shall be hung with at least three metallic wires.

The supply pipe to the 'battens' and 'floats' shall always be fixed in a suitable manner, at an elevation higher than that of the wings (*chassis*).

45. The 'floats' shall always be worked vertically; they must not be lighted except in the presence of a fireman, who shall determine the height at which the light may be turned on without danger.

Torches shall be protected by a cover of wire netting, and mounted on a rigid rod.

46. The footlights shall be constructed with reversed jets.

The 'ground lines' (*les lumières des rampes de terrain*) shall be furnished with a basket-like covering formed of wire of close mesh.

47. The lights in the 'wings' shall be protected to the height of 6 (1·82 metres) feet by a net-work of close mesh, and they shall be equipped with suitable smoke consumers.

LIGHTING OF DRESSING-ROOMS.

48. The dressing-rooms and green-rooms lighted with gas shall have fixed jets without elbow joints; the jets shall be enclosed by a glass globe or by wire gauze. Portable standards are not allowed in this part of the theatre.

49. The passages and staircases shall be lighted by fittings having suitable glass globes with wire guards.

D. FIRE APPLIANCES.

WATER SUPPLY.

50. Every theatre shall have a supply of water, with sufficient pressure to protect the upper parts as well as the lower parts of the house. This water supply shall be taken from two of the city mains, independent of each other, and of sufficient pressure and volume. The diameter of these pipes and the nature of the metal employed shall be determined by the Theatre Commission. These pipes shall be furnished with stop cocks in sufficient number to obviate any danger which might result from their breaking.

WATER CISTERNS.

51. In addition, there shall be placed in one of the highest parts of the proscenium wall, or of the wall at the back of the stage, and under the roof, one or more water cisterns, with a constant supply. The capacity of these cisterns shall be determined by the size of the theatre.

HYDRANTS.

52. Finally, with such exception as the Theatre Commission shall approve, one or more hydrants shall be placed on the ground floor, or in the cellar in a recess separated from the adjoining parts of the premises by brick walls, and having a direct communication with the outside. These hydrants shall be furnished with a special supply of water.

53. There shall be complete separation between the water service for protection against fire, and that for the general purposes of the theatre.

54. A fire-plug of 4 inches diameter (0·10 metre) shall be fixed outside of the theatre, in front of each of the entrances, in a position to be determined by the Theatre Commission.

FIXED LADDERS.

55. If the building be separated from adjacent premises, or if it has internal areas suitable for escape in case of fire, the side elevations of the building and the area walls shall be furnished with fixed iron ladders running near the windows, or such openings as are to serve as an approach to these ladders. Similar ladders shall be fixed on the main façade unless otherwise determined by the Theatre Commission.

TELEGRAPHIC COMMUNICATION.

56. Telegraphic communication shall be established between every theatre and the nearest fire-brigade station.

E. SPECIAL OFFICES.

57. Every theatre shall contain:—1st. An office for the police; 2nd. A room for the doctor in attendance; 3rd. A guard room for the police in attendance; 4th. Watch-room for the firemen, in immediate proximity to the stage. These offices should be properly fitted up.

58. The cloak-rooms shall be so situated as not to interfere with the circulation of the public.

59. When a smoking-room is planned, its position and arrangement shall be approved by the Theatre Commission.

60. Water-closets and urinals shall be planned in such number, and under such conditions of propriety and sanitary arrangement, as shall be approved by the Commission.

61. No shop under the same roof as the theatre shall be let for any business or trade which may cause danger from fire. The flues of such shops or warehouses and stores shall not pass through any part of the theatre, or of its dependencies, except by special authority, and with the approval of the Theatre Commission.

62. No person shall be permitted to reside in any part of the theatre, with the exception of the caretaker (*concierge*) and the treasurer.

GERMANY.—PRUSSIA.

From the Regulations in force in Prussia concerning the general Construction, Equipment and Maintenance of Theatres, Circus Buildings, and all similar Places of Public Assembly.

I. LARGE THEATRES.

SITUATION. APPROACHES.

3. The principal front of a theatre with its main entrances and exits shall either stand on or behind the frontage line of a public thoroughfare. If, however, the position be behind the frontage line, it shall not be so far back as to permit of the erection of a building between the theatre and the thoroughfare. The distance between the front of the theatre and the opposite frontage line of the thoroughfare shall, as a rule, be 65 feet 7 inches (20 metres). This distance may be reduced to 49 feet 2 inches (15 metres) if a theatre stands free on all sides or is situated on a corner site. And, further, if a theatre, built in on three sides, has an approach from another thoroughfare besides the one it faces, this approach must be in the form of a passage 9 feet 10 inches (3 metres) in width and, if covered, 11 feet 6 inches (3·50 metres) in height.

Where a theatre is erected between the party walls of contiguous buildings, an open area of at least 19 feet 9 inches (6 metres) in width must be planned on either side of its auditorium. These areas shall be of, at least, the same depth as the auditorium and extending from the back of any lobby or vestibule to the line of the proscenium; and, further, they shall be connected with a public thoroughfare by means of passages of at least 9 feet 10 inches (3 metres) in width and 11 feet 6 inches (3·5 metres) in height.

Openings for windows or doors in the walls enclosing the stage shall only be made where they will be at least 29 feet 6 inches (9 metres) from an adjoining site. This dimension holds good for the distance of these openings from any other building on the same site, excepting in the case of small one story out-houses, where it can be reduced to 19 feet 8 inches (6 metres).

Openings in the walls of the auditorium shall only be made where they will be at least 19 feet 8 inches (6 metres) from any adjoining site or buildings on the same site.

III.—4 F

CONSTRUCTION.

4. The external walls of a theatre, its proscenium walls, and the containing walls of its staircases, shall be of brick or stone; the other inner walls, with the exception of the partitions between the boxes, shall be of the same or of some other 'fire-proof' material.

The trusses and supports of the roof shall be iron. The outer covering of the roof shall be of some material which affords protection against a spread of fire from the outside.

All wood used in the roof shall either be protected by plaster, or smoothly planed and prepared in some other way to prevent rapid ignition.

Both the supports and the flooring of the 'gridiron' shall be of 'fire-proof' materials.

Ventilation shafts and skylights shall have 'fire-proof' casings, which must project 1 foot 7 inches (0·50 metre) above the roof.

The containing walls of all covered areas shall likewise project 1 foot 7 inches (0·50 metre) above the roof, and also be of 'fire-proof' material. The frames of windows looking over such areas shall also be of 'fire-proof' material.

The floors of the vestibules, lobbies and passages shall be of 'fire-proof' material. Wood flooring shall only be permitted if it lie on 'fire-proof' material.

The ceilings of the vestibules, lobbies, passages and staircases shall be of 'fire-proof' material. All cellars shall be vaulted, with the exception of those underneath the stage. If used for storage purposes, the cellars shall have no direct communication with the corridors or staircases. All corridors or staircases shall receive direct light from the outside, and the former shall have no skylights.

5. Winding staircases are prohibited. Staircases with straight

flights shall not have any winders. The landings shall not be narrower than the flights. No tread shall be smaller than 10 inches (0·26 metre), and no rise shall be higher than 7 inches (0·18 metre). Where winders are permitted, the least width of the tread at its narrowest point shall be 9 inches (0·23 metre). Stairs shall be provided on both sides with continuous hand-rails. Enclosures under stairs shall not be permitted. Wooden staircases, where permitted (Pars. 6, 15, 21 and 22), shall have plaster soffits. In ascertaining whether a staircase has the prescribed width, all measurements shall be taken between the hand-rails.

6. No tenement shall be situated in the back of the house at a higher level than the ground floor. These tenements shall be divided from any other part of the building by means of solid walls without openings, and 'fire-proof' ceilings. Access to these tenements shall be from the outside only.

No tenement situated in the front of the house shall have its floor more than 32 feet 9 inches (10 metres) above the street level. Such tenements shall have their own 'fire-proof' staircase in direct communication with the street, and in no way connected with the cellars.

No shops, offices, public restaurants, &c., shall be allowed in a theatre at a higher level than the ground floor. Such premises shall be separated from any other part of the building by means of solid walls without openings, and with 'fire-proof' floors or ceilings. Access to these premises shall be from the outside only.

No restaurant of larger area than 164 feet (50 square metres), not having a direct exit into the open air, shall be placed at a higher level than the ground floor.

This provision does not apply to rooms with buffets for the supply of light refreshments during the performance.

No store-rooms shall be allowed in the front of the house. No part of the stage, not even the 'gridiron' or 'cellar,' shall be used for storage purposes.

In cases where store rooms are provided at the back of the house they must not be in direct communication with the stairs and passages in use in that part of the house.

7. There shall be at least two means of access to the loft under the roof. The doors shall be 'fire and smoke proof' and self-closing, but without locks.

If such entrances require special lobbies these shall be of 'fire-proof' construction.

8. All theatres shall be provided with lightning conductors.

Fixed iron cat-ladders shall be attached to the front and side elevations of all theatres, in accordance with the special requirements of the local Police authority. These ladders shall be for fire-brigade purposes, and shall commence 9 feet 10 inches (3 metres) or 13 feet 1 inch (4 metres) above the street level.

9. There shall not be more than four tiers above the pit and the stalls.

The ceiling of the top tier must be at least 8 feet (2·5 metres) above the highest level of its floor.

All seats on the floor of the auditorium, or in the tiers, shall be fixed seats. Benches and automatic tip-up chairs shall be the only kind of seats allowed.

10. The number of the audience shall be specially regulated by the police authorities according to the following data:—

The width of individual seats shall be at least 1 foot 7 inches (0·50 metres), and the space between the rows shall be at least 2 feet 5 inches (0·80 metres).

Movable seats shall only be permissible in boxes, and to the extent of ten in each box.

On the floor of the auditorium, and on the first tier, the number of seats in a row, without an approach from a gangway, shall not exceed fourteen. On the other tiers the number shall not exceed twelve.

In the space set aside for standing room not more than three persons shall be allowed to 10 square feet.

Seats shall be divided from each other by arms.

11. The width of the gangways in the auditorium, as well as the number and the width of the doors leading to passages, shall be in the ratio of 3 feet 3 inches (a metre) for every 70 persons. The minimum width for a gangway or door shall be 2 feet 11 inches (0·90 metre).

12. No tip-up seats or chairs shall be allowed in the gangways.

No steps shall be allowed in the gangways on the floor of the auditorium.

13. The floor of the auditorium and each tier shall have a passage which, as a rule, shall be carried around the whole length of the containing walls.

Steps in the corridors shall only be allowed in exceptional cases.

The width of a passage shall be in the ratio of 3 feet 3 inches (1 metre) to every 80 persons using it. In no case, however, shall a passage be narrower than 9 feet 10 inches (3 metres).

14. Each tier shall have two separate staircases; one used as an entrance to the tier in question, and one as an exit direct into the open.

No flights of outside steps are allowed to exceed in height 6 feet 6 inches (2 metres) as measured from street level.

The number of staircases shall be regulated as follows:—

(1) For the floor of the auditorium, at least two staircases of 4 feet 10 inches (1·50 metre) in width for each 300 persons, this width to be increased 3 feet 3 inches (1 metre) for every additional 100 persons.

(2) For the tiers: two staircases of 4 feet 10 inches (1·50 metre) width for each 270 persons, this width to be increased 1 metre for every additional 90 persons. If the stalls and first tier have joint staircases, then the widths shall be taken for the total number of persons as if all belonged to the tier.

15. When a theatre is built between party-walls, outside iron balconies shall be provided in addition to the regulation staircases. These balconies shall be placed in the areas as described in Par. 3; their width shall be at least 5 feet (1·25 metre), and at least two doors shall connect the balconies with the passages of the respective tiers. Iron staircases shall lead from these balconies to the ground.

16. All exits shall be conspicuously indicated, and at all times be free to the public.

The nearest way to the exits must be indicated by directing arrows.

The doors and staircases shall be so situated that the greater part of the audience must turn its back to the stage to reach the exits.

Lobbies, landings and passages shall be kept clear of all fixed projections. Side tables and shelves are only allowed in recesses in the walls. Any seats for the box attendants must be of the 'tip-up' character.

17. All doors shall open outwards, and in such a manner that, when open, they do not project into the corridors or staircases. In exceptional cases the doors may, however, be so constructed that their leaves can swing to 180°, in which case self-acting springs must be provided to fix them back against the walls. In such cases, however, the regulation minimum width of the corridors (Par. 13) shall be enlarged to the extent of the width of the whole door.

Sliding doors are prohibited.

The fastenings shall be such that they can be easily opened from the inside by a single handle or knob, situated 3 feet 11 inches (1·20 metre) above the floor level.

Curtains shall only be used on the doors of the vestibules and in passages, subject to special control. These curtains shall be hung on movable rings only.

18. All windows shall open easily from the inside. No railings shall be fixed in front of the windows.

19. The cloak-room accommodation for the audience must be in specially provided rooms, with ample space in front of the counters. If, however, any part of a passage is used for cloak-room purposes, its regulation width (see Par. 13) must be proportionally enlarged along the whole length of the 'hat and coat' counters.

THE STAGE.

20. The 'gridiron' must be at least 9 feet 10 inches (3 metres) above the level of the auditorium ceiling

(1) The stage shall be separated from the other parts of the building by solid walls projecting 1 foot 7 inches (0·50 metre) above the roofs.

(2) There shall be no doors in these walls, excepting on the ground and basement floors.

(3) The doors shall be 'fire and smoke proof,' and shall open outwards and be self-closing.

The proscenium opening shall be provided with a 'fire and smoke-proof' curtain.

The material of this curtain shall have at least the same strength as a sheet of corrugated iron of 1 millimetre gauge. The curtain must be so constructed as to bear a pressure of 198 lbs. (90 kilogrammes) on 1 square metre superficial without bending.

It shall be possible to work the curtain from at least two separate points, one of which shall be quite independent of the stage. Only one movement shall be necessary for working the curtain. The curtain may have a small self-closing door in it.

21. All rooms at the back of the house shall be in direct connection with passages of at least 6 feet 6 inches (2 metres) width. Two staircases of at least 4 feet 4 inches (1·30 metre) width shall lead from the passages direct into the open.

If, however, the stage (exclusive of a back stage) has a larger area than 300 square metres, the minimum width of the passages shall be increased by 4 inches (0·10 metre) for every extra 50 square metres area. The width of the staircases shall likewise be increased for every 50 square metres area. The passages and staircases shall have solid containing walls. The ceilings and the stairs shall be of 'fire-proof' materials.

Doors of at least 4 feet 10 inches (1·50 metre) shall be provided on either side of the stage. These doors shall lead direct into a passage or into the open.

22. There shall be at least two staircases of 'fire-proof' material for the stage carpenters, and these staircases shall have at least a width of 2 feet 11 inches (0·90 metre), and be provided with hand-rails.

These staircases shall be contained in walls of fire-resisting materials, and shall lead from the stage 'cellar' to the roof. At the street level there shall be an exit direct into the open. Direct lighting shall not be essential for these stairs.

23. The stage fittings and internal arrangements of the back of the house shall be of 'fire-proof' materials. All wood used on or in the stage shall be planed or protected by some other means against rapid ignition.

'Cloths,' 'wings,' 'borders' 'set pieces' and other decorative accessories shall, if possible, be 'fire-proof,' or, at least, of not easily inflammable material.

All scenery shall, as far as possible, be worked by wire cables.

Proper precautionary measures must be taken to prevent all possible accident through persons getting in the way of counter-weights, lifts, &c.

24. The landings, floors and corridors shall be kept free from every obstruction.

In case of danger there shall be means of warning the entire staff by a pre-arranged signal.

LIGHTING, WARMING AND VENTILATION.

25. The use of gas and oil for lighting purposes of any sort is prohibited.

All parts of the building, even including those parts that may be sub-let, and therefore do not actually belong to the theatre proper, shall be provided with electric light.

The lighting of the building shall be so arranged that if any part of the supply or service be out of working order, complete darkness does not ensue.

26. A service of 'emergency' lighting shall be provided to meet the special requirements of the local authorities. This service shall be chiefly for the staircases and lobbies. The service shall consist of candles or oil-lamps properly protected against draughts and smoke. Where specially ordered, these lights must show a red colour.

The 'emergency' lights shall be so placed that the exits can be easily found if the ordinary service happens to completely break down.

27. The auditorium and the stage, with its adjoining rooms, shall be heated from one central system only, the heating chambers for which shall have solid walls and 'fire-proof' ceilings.

These chambers shall be completely isolated from all parts of the building, and shall only have their approaches from the outside.

All ducts or conduits for hot air, or the chases for steam pipes, coils, &c., shall be of 'fire-proof' material, and so constructed that they can be easily cleaned.

Openings to ducts for hot air heated to more than 50° Celsius, and further, all hot-water and steam pipes, shall be at least 10 inches (0·25 metre) distant in every direction from any inflammable material.

All openings to heating or ventilation ducts or conduits must be provided with flaps of a 'fire-proof' material to prevent the transit of smoke in case of fire. In a few exceptional cases rooms distant from the stage may be heated by tiled stoves if adequate precautions be taken in their construction and in the position of the flues and receptacle for ashes.

No heating apparatus is allowed in the store-rooms.

28. In arranging ventilating ducts, special care shall be taken that their position is not likely to increase a possible spread of fire.

Ventilators shall be provided in the roof of the stage, and must be situated as near to the ridge as possible. These ventilators shall be so constructed that they can be opened by a single movement. The handles regulating the same shall be in such a position that the person working them shall be sheltered from possible danger. The total area of the openings of these ventilators shall be at least 5 per cent. of the superficial area of the stage.

The ceiling of the auditorium shall have an exhaust ventilator, the inlet to which shall be at least 3 feet 3 inches (1 metre) above the level of the ceiling of the highest tier. The area of the opening of this ventilator shall be at least 3 per cent. of the superficial area of the auditorium. It shall be so constructed that it can be opened by a single movement from a similar protected point as in the previous case.

All staircases and passages shall be adequately ventilated.

FIRE-EXTINGUISHING APPARATUS.

29. Where there is a constant water supply, a service shall be laid on from it.

Where this is not available, there shall be a water-service with sufficient pressure from tanks specially provided for this purpose.

Hydrants shall be provided throughout the building, and 'sprinklers' fitted over the stage.

The local police authorities shall determine the number and position of the hydrants necessary for the building, and the quantity of water and pressure to be available. The local authorities shall further determine the number and kind of minor appliances to be kept on the premises, and they shall have power to frame regulations bearing on the manner in which all fire-extinguishing apparatus in the building is to be kept.

In no case shall the aforesaid fire-extinguishing apparatus be used for any other purpose than that for which it is provided.

An adequate number of fire alarms shall be provided in the building, by the ringing of which the immediate attendance of the local Fire Brigade is insured.

30. On no account, whatsoever, shall the storing of any scenery, properties, &c., be permitted in the front of the house, nor shall it be allowed in any of the cellars adjoining the stage or 'mezzanine.' Such scenery, &c., only shall be kept on the stage and 'gridiron' as is destined for immediate use.

Carpenters' or painters' workshops shall only be allowed in the basement in the front of the house, provided that they are isolated from the rest of the building, and have their approaches from the outside only. Workshops at the back of the house shall have no direct communication with the stage, the 'mezzanine,' or the dressing rooms. All workshops opening on to passages shall have fire- and smoke-proof doors.

31. Smoking is prohibited, but may be allowed in the refreshment rooms and in those parts of the building which are used as tenements or business premises.

32. The use of open lights, movable lamps, &c., for stage-effects, shall be limited to the absolute requirements of the performance, and shall in every case be subject to special permission of the local authority. A special permit of this kind need, however, only be obtained once for every individual play. The use of fireworks is prohibited. If shooting is necessary, the wads used must be made of a not easily inflammable material, such as hair or asbestos.

The building must be thoroughly cleaned at least once a year, due notice being given to the local authorities as to the date of its commencement. All parts of the building, as well as its contents, must always be kept free from dust.

34. There shall be a free passage between the scenery in use and the containing walls of the stage. This passage must have a width of at least 3 feet 3 inches (1 metre), and must not even be blocked during a change of scene. The space between the first and second wings on either side of the stage shall be kept free for the use of firemen on duty.

35. The working of the safety curtain or sliding doors, as the case may be, shall be tried daily during the 'season' at least once in the presence of a member of the fire brigade.

The safety curtain shall be lowered after every performance, and the proscenium opening shall be kept closed during the night.

36. The emergency lamps must be alight from the time of the opening of the doors for any performance until the auditorium and stage have been entirely vacated.

37. Plans of the building drawn to a large scale shall be hung up at the box office, in the vestibule, and in prominent positions in every passage, both in the front and the back of the house. These plans shall show the seating accommodation, and the amount of space allotted for 'standing room,' as well as all staircases, exits, and hydrants. All wires or pipes, &c., for the lighting of the building shall be shown on these plans, and the disconnecting switches or cocks must be clearly indicated. Copies of these plans shall be at the disposal of the authorities.

38. The local authorities shall be responsible for the attendance of an efficient 'fire-watch' at every performance, and these authorities shall have the control of these firemen. The 'fire-watch' shall be on duty at least an hour before the commencement of the performance, and shall remain on the premises until at least half-an-hour after its close.

No fireman shall have any other duty than that for which he is present.

Besides having this official 'fire-watch' for the performance, the management must provide an efficient service of watchmen for the rest of the day, and proper arrangements shall be made to control this service.

39. Due notice shall be given to the local police authorities of the dress rehearsal of any new play, so that special precautionary measures may be taken if necessary.

II. SMALL THEATRES.

40. In small theatres the requirements of Pars. 3 to 39 shall apply, with the following easements:—In Par. 3 read, "The distance between the front of a theatre and the opposite frontage line of the thoroughfare on which it stands shall, as a rule, be at least 49 feet (15 metres)."

Under exceptional conditions this distance may even be further reduced, but a special petition must then be handed in to the local authority. The requirement that the building must stand on a public thoroughfare may also be modified if a special petition be made.

The ceilings over the staircases must be of a fire-resisting material. The floors over the lobbies and passages need, however, only be constructed of wood if their lower surface (i.e. the ceiling proper) be of plaster, the joists well pugged, and floor boards well fitted.

41. The use of gas shall be allowed for lighting purposes in small theatres, subject to the following conditions:—

The gas services for the auditorium and the other parts of the front of the house, and further, for the stage and the other parts of the 'back of the house,' shall be kept separate, and their disconnecting cocks shall be so placed that they cannot be handled by others than the gas men.

Lead piping shall not be used. The pipes shall be protected against damage, but shall be easily accessible for repair. No gas bracket shall be movable, not even in the dressing-rooms.

The distance between gas jets and combustible materials shall be at least 3 feet 3 inches (1 metre) when measured from above, and 1 foot 11 inches (0·60 metre) when measured from the side. If these dimensions be reduced, protecting metal shades or screens shall always be fixed and attached to a 'fire-proof' substance. Chandeliers shall be hung from double cables or chains.

No part of any light or fitting in the auditorium, in the passages, or on the stairs, shall be at a lesser distance from the floor than 6 feet 6 inches (2 metres).

The gas-jets in the auditorium, with the exception of those on the chandelier, shall be provided with globes.

All gas-jets at the back of the house shall be protected by wire guards or some similar fitting.

The gas 'battens' shall be provided with metal protectors besides a wire netting, and shall be easily movable, so that they can be let down and lit from the stage.

Only electric gas lighters shall be used for lighting jets.

No ordinary india-rubber tubing shall be used for gas, not even in short lengths. Only properly armoured and air-tight flexible tubes with screw unions shall be used.

The gas-meter room shall have solid containing walls and a 'fire-proof' ceiling, and shall have direct air and light from the outside.

The use of gas for large scenic effects shall be subject to special permission.

The gas services shall be carefully examined at least once a quarter, both as regards leakage and the condition of cocks and burners.

42. Where gas-lighting is provided, the following additions will have to be made to Pars. 9–14:—

In Par. 9 read, "There shall not be more than two tiers above the pit and stalls."

In Par. 10 read, "On the floor of the auditorium the number of seats in a row without an approach from the gangway shall not exceed 12, and in the tiers this number shall not exceed 10."

In Par. 11 read, "The width of the gangways of the auditorium, as well as the number and the width of the doors leading to passages, shall have their dimensions at least proportional to the ratio of a metre for every 60 persons. The minimum width for a gangway or door shall be 2 feet 11 inches (0·90 metre)."

In Par. 13 read, "The width of a passage shall be at least proportional to the ratio of 3 feet 3 inches (1 metre) to every 70 persons using it. In no case shall a passage be narrower than 9 feet 9 inches (3 metres).

In Par. 14 read, "There must be provided—

"For the area, two staircases of 4 feet 10 inches width (1·50 metres), should the audience in that part of the theatre not exceed 270. Where the audience in the area exceeds 270, the width is to be calculated in the ratio of 3 feet 3 inches (1 metre) to 90 persons.

"For the tiers, two staircases of 4 feet 10 inches width (1·50 metres) if the audience in the tier does not exceed 240. Where the audience exceeds 240, the width is to be calculated in the ratio of 3 feet 3 inches (1 metre) for 80 persons."

HOLLAND.—AMSTERDAM.

From the Regulations in force at Amsterdam for the Prevention of Fire in Theatres and similar Places of Public Entertainment.

1. Dramatic performances shall not be given in theatres where payment is not taken from the audience, unless sanction be given by the authorities (Gemeenteraad) according to the Regulations of 3-4 following.

2. In those theatres where there is a gas supply there shall be gas meters provided in number and position according to the requirements of the authorities.

3. From the time when the theatre is open to the public until it is vacated, the bolts on the doors shall be so arranged that they yield on the slightest pressure.

4. Theatres shall be provided with the necessary hydrants and other fire-extinguishing apparatus according to the requirements of the local authorities. The stage must be in telegraphic communication with a fire-brigade station.

5. On the stage, in the stage 'cellars,' 'gridiron' or dressing-rooms, store-rooms and workshops there shall not be—

(*a*) Any open lights which are not in accordance with the requirements of the authorities.

(*b*) Any light placed below woodwork or other combustible material at a less distance than 2 feet 5 inches (0·75 metre) unless a metal screen be provided for protection, according to the requirements of the local authorities.

Smoking is prohibited behind the curtain, neither shall any fires be allowed (*see* par. 10); nor shall any illuminant, with the exception of gas and electric light, be used otherwise than in a closed lantern.

6. To separate the stage from the auditorium, one or more 'fireproof' curtains shall be provided, according to the special requirements of the local authorities. An efficient staff shall be provided for the working of these curtains, which shall always be kept closed except for the performances and rehearsals.

7. All doors must be kept clear of any obstruction. In the passages and corridors, on the staircases, and in the gangways of the auditorium there shall be no 'standing room' and no loose seats. There shall be no crowding on the benches, the seating capacity of which is to be determined by the local authorities.

8. From the time of the opening of the theatre to the time when the audience has vacated the building a sufficient number of 'emergency' lamps shall be burning in the auditorium, in the refreshment rooms, on the stairs, in the passages and corridors. The position and maintenance of these lamps shall be controlled by the local authorities. The nearest way to the exits shall be clearly indicated in large letters on the walls close to these lamps.

9. Explosives, &c., which require special protection from fire, shall not be used unless such measures have been taken in regard to them as will meet the requirements of the authorities.

10. Stoves are not to be used either on the stage, in the dressing-rooms, store-rooms or workshops, unless by special permission of the local authorities.

11. During the theatre season, no scenery or other combustible materials which are not absolutely necessary for the performance shall be stored on the stage, in the dressing-rooms, store-rooms, or workshops, unless by a special permission of the local authorities.

12. No petroleum may be used in the building, and no open grates shall be fixed in any part of the building.

13. These Rules shall be conspicuously posted up by order of the local authorities, as directed by them, in corridors, passages and 'foyers.'

14. Smoking shall be prohibited in the auditorium and corridors as the case may be, unless the local authorities grant a special permission to the owner or lessee for any particular part of the premises.

15. The holding of public meetings where payment is not taken from the audience is forbidden, unless the local authorities deem the building suitable for such purposes.

16. The rules which have been laid down in clauses 1–15 above shall in no way be deviated from.

17. The due execution of these Rules shall be controlled by the Fire Brigade authorities, the police authorities and the general administrative authorities, who, at all times, have the right to enter and inspect the various classes of buildings referred to herein.

RUSSIA.—ST. PETERSBURG.

From the Regulations in force at St. Petersburg concerning the Construction and Maintenance of Theatres, Circus Buildings, Assembly Rooms, and similar Places of Public Resort.

PART I.

THE arrangement of performances in Theatres, Circus-buildings, and Music-halls in St. Petersburg and its suburbs is only permissible if the general rules for building, and the following theatre-regulations are duly observed.

The plans of theatres, circus-buildings and halls used for public assembly must be presented to the board for ratification, and they must also show the arrangement of the heating apparatus, as well as of the water and gas-pipes, and the electrical installation.

In these regulations large theatres are those which contain, besides the pit and the boxes near it, more than one row of boxes or galleries, or which can accommodate more than 700 visitors; small theatres are those which contain, besides the pit and the boxes near it, not more than one row of boxes or single gallery, and which do not accommodate more than 700 visitors. Halls for public meetings with theatrical stages, come under the rules laid down for small theatres.

Every theatre, circus or hall, on its completion must be examined by a special Commission composed of persons authorised by the Governor and Board appointed for the control of such buildings. If the examination proves that all requirements of the Building Act, and of the present regulations are observed, a certificate will be issued by the Board for the opening of the theatre, circus or hall.

Theatres and circuses, not exceeding in height 35 feet (10·66 metres) must face an open space or thoroughfare measuring not less than 35 feet (10·66 metres) in width. If the building be higher than this, the width of the open space must be not less than the height of the building itself, but when the height of the theatre or circus exceeds 70 feet (21·33 metres) an allowance of 70 feet (21·33 metres) of open space shall be considered sufficient.

SMALL THEATRES.

Small theatres in connection with private houses must not be of more than two stories. Such theatres must have their own staircase, not connected with the dwelling-house, and must be separated from the latter by solid fire-resisting walls, and from the basement by stone vaulting.

Halls for public meetings must similarly have their own staircase entirely separate from any dwelling, and be separated from the basement by vaults, and from the upper stories, if the latter are used as a residence, by a fire-resisting ceiling.

The regulation that small theatres in connection with private houses shall not be of more than two stories, is not applicable to existing theatres of this description, but the construction of separate staircases is compulsory for existing establishments, and if not already erected these staircases must be built in the course of the first building season after the publication of this regulation. The construction, however, of non-inflammable ceilings in theatres existing in private houses and in halls for public meetings, as well as the separation of theatres and halls by vaults from the story underneath them, must be carried out within ten years from the publication of these regulations.

LARGE THEATRES.

In the building of large theatres no residence may be provided, even for watchmen, but in the case of circuses, rooms for watchmen and grooms are allowable. Commercial accommodation of any kind is prohibited, whereas workshops are allowed, but must have stone walls, fire-resisting floors, and windows looking into the street or yard. In existing establishments any alterations necessitated by the above must be carried out in the course of the first building season after the publication of these regulations.

LIGHTNING CONDUCTORS.

A theatre or circus (except where the former is situated in a private house) must be provided with a lightning conductor.

CAPACITY.

The capacity of halls for public meetings is determined by eight persons to every 7 square feet, including passages.

FLOORS, WALLS AND CEILINGS.

All walls, ceilings and floors to corridors must be constructed of non-inflammable materials.

DOORS AND WINDOWS.

All doors must open in the direction of the main exits on both sides, and the doors at the exits themselves must open outwards. The windows must have no bars. The doors and windows must be provided with suitable fittings with handles not lower than 4 feet 8 inches (1·42 metres) from the ground, and must not have any bars, bolts, &c.

STAGE AND CURTAIN.

The stage must be surrounded on all four sides by stone walls projecting 4 feet 8 inches (1·42 metres) above the roof. In the wall separating the stage from the auditorium, there must be no other opening than that of the proscenium, and that for communication with the prompter's box. In the remaining three walls no less than four doors must be provided to enable artists to reach the corridors. In the case of small theatres two such exits are sufficient. From the 'cellar' or 'mezzanine' and from the 'fly galleries' there must be not less than two doors leading to the staircases or corridors.

One or more outlets must be constructed on the stage for the escape of smoke in the case of fire; the total surface of which in small theatres must be not less than 10½ square feet (0·96 metre carré), and in large ones not less than 21 square feet (1·94 metres carrés). These outlets must not be more than 2 feet 8 inches (0·81 metres) from the level of the stage floor.

DRESSING-ROOMS.

The dressing-rooms shall not be situated on the stage, nor shall they open directly on to the stage. They must in all cases be separated from the stage by a green room or a corridor.

All dressing-rooms must be provided with windows opening into the street or into an open yard. The dimensions of the windows must be sufficient to enable a man to get through.

The floors of the dressing-rooms and the corridors belonging to them must be constructed of non-inflammable materials.

In the corridors near the dressing-rooms there must be hydrants, with hose and branch attached.

THE BOXES.

In large theatres it is not permissible to construct more than four tiers of boxes or galleries. In small theatres only one tier of boxes or a gallery is permissible.

For every two tiers or two rows of boxes shall be constructed not less than one suitable foyer with windows to the open. This is not compulsory for existing theatres.

CORRIDORS, PASSAGES AND VESTIBULES.

The corridors round the upper tiers or boxes in large theatres must be in communication with their respective foyers, separate staircases to the foyers being constructed if necessary.

The rows of seats in the auditorium must have gangways leading to the exits and be arranged so that no seat is further than 6 seats from its nearest gangway, and there shall not be more than 12 seats in any one row. The central passages must be not less than 4 feet 8 inches (1·42 metres) wide, and the passages near the boxes or the sides of the auditorium not less than 2 feet 7 inches (0·78 metre) wide.

For every row of seats, the depth of the seat together with its passage must not be less than 2 feet 6 inches (0·76 metre).

The vestibules must be spacious, arched in stone, and have their floors constructed of non-inflammable material. The erection of wooden partitions in the vestibules is prohibited, but stone draught screens may be used. The number and dimensions of the exits must be proportionate to the number of persons which the theatre or hall is capable of accommodating.

Proper cloak room accommodation must be provided at least for the stalls, and in large theatres, if possible, for every section of the auditorium.

STAIRCASES AND EXITS.

All staircases must be of fire-resisting materials, arched in stone or brick, and equipped with hand rails on both sides. The widths of the staircases and their landings shall not be less than 4 feet 8 inches (1·42 metres.)

Every staircase 4 feet 8 inches (1·42 metres) wide may be regarded as sufficient for the exit of 150 persons.

It is not permissible to have steps on the landings and corridors. The inclination of the staircase shall not exceed 25 degrees.

The number of staircases must be not less than two for each tier or for every 150 persons, and their width not less than 4 feet 8 inches (1·42 metres) for every 150 persons.

It is indispensable that the staircases leading from the upper tiers should have windows into the open; the position of windows in staircases from the remaining tiers must be according to circumstances.

From the corridors surrounding the area of a theatre, must be arranged as many exits as possible into the vestibule or into the open, while the minimum width of all exits must be not less than 4 feet 8 inches (1·42 metres), for every 150 persons.

The upper tiers of an auditorium must have exits into the surrounding corridors of a width not less than 4 feet 8 inches for every 150 persons.

On both sides of the orchestra, exits must be provided for the musicians as far as possible directly into the open.

On the doors of exit there must be a transparency with the inscription "Exit."

LIGHTING.

The lighting shall only be by electricity, gas, or oil. Should there be any new invention in lighting, it may only be employed by special permission.

Electric wires, or gas-pipes, and generally all lighting fittings must be so arranged, that they shall not soon get out of order, and in case of damage shall not become a source of danger; they must also be easily accessible in the event of their getting out of working order. Electric wires, however, which are dangerous to life by contact, must be placed in strong tubes. In general it is required that all appliances for illumination shall be the most modern, and those offering the least danger in regard to fire.

The rooms or cellars where the gas meters are placed, must be fitted with ventilators. These rooms or cellars must have windows looking into the open.

The fittings for controlling the lighting of the stage and auditorium may be placed on the stage, but those for controlling the corridors and parts surrounding the auditorium and stage, must be fixed near an exit and in a position well protected from fire.

In the dressing rooms, store rooms, painting rooms and workshops, the gas brackets must be immovable.

Lights in the 'wings' must not be placed lower than 4 feet 8 inches (1·42 metres) from the stage floor.

All fixed lights on, above and below the stage, and in the dressing rooms, must have wire globes with meshes not more than ½ inch square.

Moreover, these lights must be at a safe distance from easily inflammable materials, and not less than 3 feet away from them. In the case of other open lights they shall not be less than 2 feet from inflammable material.

Pendent lights near the ceiling must be protected by shades.

HEATING.

In theatres it is permissible to adopt heating apparatus in which is employed steam or water, or both, under low pressure, but no other methods. In front of the radiator there must be a free space of not less than 7 feet (2·13 metres), and on all other sides a space of not less than 3 feet (0·91 metre). The chimneys must be of stone and isolated, and must rise not less than 7 feet (2·13 metres) above the roof of the theatre. The boilers, in the case of a water apparatus, may be placed in the cellars of the theatre, but must be surrounded by brick walls and covered with brick vaults. The brick compartments for steam or water-heating, must also fulfil the general conditions for safety.

PRECAUTIONS AGAINST FIRE.

All curtains, draperies, &c., surrounding the opening of the proscenium, for a distance of 7 feet (2·13 metres), must be made of non-inflammable materials.

The hydrants must be of such a number and so arranged that if an outbreak of fire occurred, streams from at least two could be brought to bear upon the flames. These hydrants must be of the same type as those used by the local fire brigade. They must be fixed in suitable conspicuous positions, and so placed that there is a safe retreat for the firemen.

There shall be suitable fire-call points connecting the various parts of the theatre with the watch-room, and in this watch-room there must be telegraphic communication with the nearest station of the local fire brigade. In cases where the city fire brigade is stationed in or near the theatre, an ordinary alarm bell may be substituted for communication by telegraph or telephone.

For the supply of the hydrants it is necessary to have a considerable supply of water under such pressure that the stream will be able to reach the roof. The supply pipes shall be so laid that it is possible to use a number of hydrants simultaneously, without materially affecting the pressure. If the supply be from waterworks there must be several connections to the mains. If, however, there be no waterworks, or if they cannot deliver a sufficient supply of water under suitable pressure, reservoirs must be specially constructed. Where possible, these reservoirs should be built on a high level, kept constantly filled with water, and exclusively retained for fire purposes. The reservoirs should be connected with one another, so that they form, as far as possible, a single main reservoir. The combined capacity of the reservoirs of a building should be from 300 to 1000 cubic feet, according to the size of such building. If the pressure of water from the reservoir in the building is not sufficient to be effective on the upper part of the roof, the requisite pressure must be obtained by the installation of pumps or otherwise.

Iron fire-ladders must be fixed to the outer walls of the back of the house in such a manner that each floor and the roof can be easily approached.

PART II.

CONDITIONS OF MANAGEMENT.

GENERAL REGULATIONS.

The curtain which is intended to separate the auditorium from an outbreak of fire on the stage, must not be raised until immediately before the performance, and must be lowered immediately at the conclusion of the performance.

In the event of an outbreak on the stage and immediately after lowering the iron curtain, all obstructions must be removed from the stage-entrances and passages.

Passages between the chairs and seats for visitors must, during the performance, remain as free and as unobstructed as possible.

No exits must be locked, bolted, or otherwise blocked, during the performance, and on each door of exit the inscription 'Exit' must be made perfectly visible at all times.

It is prohibited to block up the corridors with objects, such as chairs, tables, &c., likely to hinder the free movement of the public.

EMERGENCY LIGHTS.

Independent of electric or gas lighting, all the corridors, staircases and vestibules must be lighted up during the time of the performance by oil or by candles in lamps.

SCENERY.

The following parts of any scenery used on the stage must be impregnated or coated with a composition capable of withstanding the action of fire; 'back-cloths,' 'wings,' 'sky borders,' 'gauzes' and 'set pieces.'

All scenery, &c., not required for any performance in the course of the current week, must be removed from the stage. The stage, dressing rooms, stores, and work-shops, must be kept free from dust, shavings, paper, &c. The passages leading to the stage entrances must not be blocked with scenery or other objects.

The lighting of fire-works and other explosives must not be entrusted to boys or inexperienced persons. During the use of Bengal lights, a pail of water must be kept near at hand, and during any particular lighting effects on the stage special care must be taken, and firemen must always be in readiness for an emergency.

Smoking is strictly forbidden in all parts of the building except in the rooms set apart and fitted up for it, bearing the inscription 'Smoking Room.'

The hose must always be rolled up on the hydrant or hung up in open boxes, and its easy withdrawal not prevented in any way. The hose must be unrolled and prepared for immediate action, before the commencement of every performance.

The principal hydrants must be arranged in groups, for each of which groups a fireman must be posted during the time of the performance there. The determination of the number of firemen for the watch in every theatre must be left with the Commissioner whose business it is to superintend the theatre. There must always be one person in charge of the firemen.

The firemen must daily verify the good condition of the mains, fire stop-cocks, &c., entrusted to them. Moreover, the stop-cocks and hose must be tested, at least once a week during the theatrical season, by those specially appointed to the duty.

The working of the fire hydrants must be understood by the stage hands, and by all the members of the staff concerned with engineering and stage appliances.

During the performance there must always be a person in the telegraph or telephone room ready to communicate with the local fire brigade in the event of an outbreak.

All necessary tools and appliances likely to be required in the event of a fire, must be in perfect readiness, that is, fire-buckets must stand ready filled with water, and tanks with water must be placed in different parts of the house; axes, knives, &c., must also be at hand. All such gear must be kept in the place appointed for it, and must on no account be employed for other purposes than that for which it is intended.

For purposes of reference I would add to the above examples of official requirements, those which in the Metropolis govern the general management of theatrical enterprise, not only in respect to the precautionary measures for the safety of the audience, but also as regards the general conduct of the institution. This general control is vested in the Lord Chamberlain, whose jurisdiction, however, only extends to theatres within the Parliamentary boundaries of the City of London, the City of Westminster, the Boroughs of Finsbury, Lambeth, Marylebone, Southwark and the Tower Hamlets.

ENGLAND—LONDON, ETC.

The Regulations of the Lord Chamberlain in respect to Theatres within his Jurisdiction.

1. All doors and barriers to open outwards, or to be fixed back during the time that the public are within the theatre.

2. All gangways, passages, and staircases, intended for the exit of the audience, to be kept entirely free from chairs or any other obstructions, whether permanent or temporary.

3. An ample water supply, with hose and pipes, to be available to all parts of the house, where possible on the high-pressure main.

4. All fixed and ordinary gas-burners to be furnished with efficient guards. Movable and occasional lights to be, where possible, protected in the same manner, or put under charge of persons responsible for lighting, watching, and extinguishing them. A separate and independent supply of light for the stage and auditory.

No white metal pipes to be used in the building.

5. The footlights or floats to be protected by a wire guard. The first ground-line to be always without gas, and unconnected with gas, whether at the wings or elsewhere. Sufficient space to be left between each ground-line, so as to lessen risk from accident to all persons standing or moving among such lines.

6. The rows or lines of gas-burners at wings to commence four feet at least from the level of the stage.

7. Wet blankets or rugs, with filled buckets or water pots, to be always kept in the wings; and attention to be directed to them by placards legibly printed or painted, and fixed near them. As in Rule 4, some person to be responsible for keeping the blankets, buckets, &c., ready for immediate use.

8. Hatchets, hooks, or other means to cut down hanging scenery in case of fire to be always in readiness.

9. The regulations as to fire to be always posted in some conspicuous place, so that all persons belonging to the theatre may be acquainted with their contents. A report of any fire, or alarm of fire, however slight, to be at once sent to the Lord Chamberlain's office.

10. Counterweights, where possible, to be carried to the walls of the building and cased in. The ropes attached to them to be constantly tested.

11. An annual inspection is made of all theatres. It is expected that all alterations suggested for the safety and convenience of the public will be carried out before the issue of the annual license.

12. No structural alterations to be made in the theatre without the sanction of the London County Council. Plans of such alterations to be sent to the Lord Chamberlain's office.

13. A copy of every new piece, or alterations of old pieces intended to be produced, to be forwarded for license to the examiner of plays seven clear days before such intended production. No alteration of the text when licensed for representation to be permitted without sanction.

14. Copies of all play bills to be sent to the Lord Chamberlain's office every Monday, and whenever a change of performance is announced.

15. Notice of the change of title of a piece to be given to the examiner of plays.

16. The name and private address of the actual and responsible manager to be printed in legible type at the head of each bill.

17. Admission to be given at all times to authorised officers of the Lord Chamberlain's department, and of the police.

18. No profanity or impropriety of language to be permitted on the stage.

19. No indecency of dress, dance, or gesture, to be permitted on the stage.

20. No offensive personalities or representations of living persons to be permitted on the stage, nor anything calculated to produce riot or breach of the peace.

21. No exhibition of wild beasts or dangerous performances to be permitted on the stage. No women or children to be hung from the flies, nor fixed in a position from which they cannot release themselves.

22. No masquerade or public ball to be permitted in the theatre.

23. No encouragement to be given to improper characters to assemble, or to ply their calling in the theatre.

24. Refreshments to be sold in the theatre only during the hours of performance, only to the audience and company engaged in the house, and only in positions which do not interfere with the convenience and safety of the audience.

25. No smoking to be permitted in the auditorium.

26. Theatre licenses are granted for one year, from the 29th September. Licenses are granted also for shorter periods, but all licenses cease on the day above mentioned.

27. No public entertainment to be given in the theatre on the days excluded from the license.

28. Applications for licenses, with the names and addresses of the actual and responsible manager and of his two proposed sureties, who must be resident householders and ratepayers, must be forwarded to the Lord Chamberlain's office seven clear days before the day for which the license is required.

29. Theatre licenses are granted, after consultation with the County Council so far as the structural condition of the theatres is concerned, only for buildings in which the above regulations can be carried out, and on the express condition that these and every other reasonable and practicable precaution against fire or the dangers arising therefrom are adopted.

30. The Manager is held solely and entirely responsible for the carrying out of the above regulations, for the management of his theatre before and behind the curtain, and for the safety of the public and the members of his company.

31. All exits from the theatre must be plainly indicated by placards, and kept always available for the use of the audience.

32. The service of light for the auditorium and entrance passages must be separate from that of the stage.

CONCLUSION.

It will have been noticed that in the preceding chapter examples of theatre legislation have been presented only where they refer primarily to the construction or maintenance of buildings used for the presentation of plays, for assembly, or similar purposes. But, quite apart from any question of construction or maintenance, we should not forget that the safety of a place of entertainment depends to a great extent on the permanent control of the premises and every section of the equipment. What is known as the 'fire-watch' is one of the first essentials of theatre protection, and there are many who even go so far as to say that if a theatre has an efficient 'fire-watch,' this body will make up to a considerable extent for any deficiencies in plan, construction, or equipment.

Now we all know that so far as the 'fire-watch' of a Metropolitan theatre is concerned, we have little or nothing to speak of. The watching arrangements are in the hands, as a rule, of one or two private firemen, who often also fulfil the more general purposes of the 'odd man' of the establishment. These men are expected to lend a hand in anything that may be required of them. Being frequently underpaid, they are not averse to increasing their remuneration by acting as cab-runners, and they may be found thus occupied whenever an audience disperses. Even just preceding the performance, when the stage is being lit up, i.e. at a notoriously dangerous moment, they may be seen acting as porters for arriving carriages. The members of such a 'fire-watch' are the servants of the manager, and he can use them for whatever purpose he likes. There is no regulation in London indicating the necessity for a 'fire-watch,' much less defining the character or training of such a body. As far as the management is concerned, the fireman has become by custom only part and parcel of the establishment, owing to his position as cleaner of the fire-extinguishing apparatus, which has to be kept in order to meet the requirements of the public authority as to efficient appliances. There are, of course, no doubt exceptions; I know of at least two theatres where every possible care is given to the 'fire-watch,' and where any tendency of the fireman to act as 'odd man' is strictly prohibited. But, taken as a whole, such instances will be rarely met with, and the whole question of watching is in a very unsatisfactory state as far as London is concerned.

On the Continent of Europe, it is true, we also have the private 'fire-watch,' if I may call it so, comprising men engaged by the manager for the particular duties of watchmen and firemen. But the 'fire-watch' either has the serious consideration of the employer of his own accord, or, owing to specific regulations in force, its efficiency is subject to examination and its duties subject to the control of the public authority. In other words, the private 'fire-watch' receives due recognition. But even then, the private 'fire-watch' is the exception on the Continent; for we find the public 'fire-watch' to be the rule, and the public 'fire-watch' is generally manned by efficient representatives of the local fire brigade, i.e. by the employees of the public authority. Of course there are also combinations of the 'fire-watch' of official, municipal firemen with private watchmen in the employ of the management subject to the control of the former. Such combinations have, in fact, certain advantages.

It is not my purpose here to demonstrate the various arrangements made for watching a theatre on the Continent, and yet I am anxious to show how, where the management of a play-house is not subject to any control whatever from the local authorities, as for instance at the Court Opera House in Vienna, every possible effort is made on behalf of the theatre administration to secure the careful observance of all of those points which are of importance where the protection of the public is at stake. The Court Opera House at Vienna has its own 'fire-watch,' of considerable strength—a private 'fire-watch' in the full meaning of the term, and in no way subject to outside control. Yet the organisation of this 'fire-watch' is highly instructive, and I cannot do better than quote its rules in order to show what care has been accorded to the definition of its duties. I do not wish to infer, by presenting this example, that this is a code that is in every way model. In fact its elaboration does not accord with my view, that main principles alone should be defined in writing and that matters of detail should be left to the executive officers. Similarly, it is no more my purpose to criticise these regulations than to criticise those from which I have made extracts regarding the erection and maintenance of the play-house. I only present this instructive example as an instance of the extent to which an institution which is regarded as a secondary consideration in England may voluntarily receive well-merited attention elsewhere.

Regulations for the 'Fire-Watch' of the Court Opera House, Vienna.

1. The Superintendent of the building acts as chief inspector of the 'fire-watch,' and is known as the 'fire-inspector.' The permanent clerk-of-works acts as his representative.

2. The 'fire-watch' comprises: Two foremen, sixteen firemen, one mechanic for the iron curtain, one plumber and one chimney sweep.

3. The fire inspector has general control over the staff and over all matters relating to the protection of the building from fire. Any infringement of the rules shall be reported to him. Every fireman shall be thoroughly acquainted with his duties, and shall report himself to the foreman before and after every performance. Substitutes shall only be allowed by special permission. Every fireman to keep strictly to his own duties.

4. The rules relating to smoking must be strictly adhered to throughout the whole of the theatre.

5. The use of open lights is strictly prohibited in the theatre, except where the lighting of oil lamps, candles, torches, and fireworks cannot conveniently be done otherwise than with a wax taper. Only safety lamps shall be used in the cellars in which the gas meters are kept.

6. The main gas supply shall only be turned off by the express instructions of the fire inspector.

7. The firemen shall be thoroughly acquainted with all entrances, exits and passages throughout the building, shall know exactly where the hydrants are to be found, and have a thorough knowledge of all extinguishing apparatus. Any defects in the same or in the lighting apparatus, doors, locks, &c., shall be reported at once to the inspector.

The firemen shall see that only the requisite number of lamps are burning, especially in the 'gridiron' or under the stage; and that the doors which are intended to be closed or locked are securely fastened. They shall also see that great care is used in the manipulation of articles of an inflammable nature, and that the rules relating to smoking and open lights are strictly adhered to. Every fireman shall keep all apparatus under his care clean and in good working order, so that no delay shall be caused in the event of an outbreak of fire.

8. During the performance every fireman shall be fully equipped, but before and after the same he may be in 'undress' uniform, having, however, his full equipment easily accessible.

9. The foreman shall generally supervise the men while on duty, and also shall see that the apparatus, alarm signals and ventilators are in good order. Before the performance both foremen shall examine the back and front of house, and shall see that firemen are at their posts one hour and a quarter before each performance. During the performance one foreman shall be on the stage and the other on the 'flies.' After the close of the performance the foreman on the 'flies' shall inspect the auditorium; the foreman on the stage shall remain there until the inspection of the front of the house is reported. Before and after the performance one foreman at least shall always remain in the house. During holidays, or the off season, when strange workmen are in the building, the foreman shall daily, after their departure, inspect the rooms in which they have been working.

10. Service of firemen,

(*a*) On duty during the performance (i.e. one hour and a quarter before the beginning of the performance, until after the inspection of the house at the close of the performance).

(*b*) On duty before and after that time.

During the performance the whole of the 'fire-watch' must be on duty. At other times the daily watch shall be in the hands of eight men, arranged as follows: Four men on duty from noon to midnight; the other four from midnight till noon. The eight firemen on duty on one day shall be arranged in three sections; two men each in Sections I. and III. and four men in Section II.

Section I. shall be on duty on the stage in the tailors' department, and in the offices below the stage, and in the basement.

Section II. shall be on duty in the 'mezzanine,' costume store, 'flies,' painters' workshop, property room and on the stage.

Section III. shall be on duty in the auditorium, the ground floor, first, third and fourth tiers.

11. Before and after the performance each of the four firemen on duty shall individually make the round of the whole house once in every hour, excepting only from 6 a.m. to 8 a.m.

The fireman of Section I. shall start his round at the hour, the fireman of Section II. shall start at the first quarter, the other member of Section II. at the three-quarters, and the fireman of Section III. shall start at the second quarter of the hour. The first round shall begin after the performance as soon as the house inspection is finished. The last round shall commence at 4 p.m., before the performance. When no performance takes place, an interval in the watch service shall be allowed from 6 p.m. to 8 p.m. in addition to that from 6 a.m. to 8. a.m. During this interval one man shall be on the stage and another in the 'flies.' The fireman in Section III. shall open the doors at 6.30 a.m. and close them at the end of the inspection. The same fireman shall also turn off certain gas lamps as directed, and attend to the night bell.

12. If a fireman notices a smell of gas, or the presence of smoke, or hears a crackling noise or the like, and cannot discover the cause or overcome the danger alone, he shall immediately inform his foreman, and shall then return to his post, and in case of actual danger do his utmost to meet it. In urgent cases, however, especially on discovery of fire which cannot be immediately extinguished, he shall at once sound the house alarm; but, if the fire is in an out-of-the-way part of the building, he shall give the alarm at the nearest telegraphic call-point, and shall then, without any thought for his own personal safety, hasten back to the fire and do his utmost to extinguish it. If the fire cannot be extinguished immediately with the assistance of the theatre 'fire-watch' alone, and a spread is to be feared, the City Fire Brigade Head Quarters shall at once be warned of the outbreak, by means of one of the special call-points in the building. If a fire breaks out on the stage which cannot be extinguished immediately, one of the firemen of the first or third sections shall, after the alarm has been given for the house, open the ventilators over the 'gridiron.'

13. Firemen's duties during the performance: In addition to the four firemen on duty of an afternoon, as already mentioned, the other twelve have to be on duty during the performance. Of these twelve, the four who went off duty at mid-day shall present themselves two hours before the commencement of the performance to relieve those on afternoon duty for three-quarters of an hour.

The sixteen firemen shall be on duty one hour and a quarter before the commencement of the performance, and in the following positions:—

Four men on the stage.
Two men in the corridors at the side of the stage, and near the doors leading on to the stage.
Four men in the 'flies.'
Two men in the adjacent passages.
Two men in the side passages of the third tier.
Two men in the side passages of the fourth tier.

The firemen in the passages of the auditorium shall fill their fire-buckets before the performance, and empty them after it.

The four men on the stage and in the 'flies' shall see that all the necessary apparatus is ready for instant use two hours before the commencement of the performance, and see that their pails, towels, sponges, &c., are at hand, and their hose laid out.

The men in the passages shall see that the hose is properly attached to the hydrants.

At five minutes to six, the fireman of Section I. shall visit the joiner's workshop and see that the fires are extinguished. He shall see that all the iron doors of the various basement stores are shut, and inspect the various other workshops, and shall report the result to the foreman.

One of the firemen of Section II. shall inspect the tailor's department and the chorus rehearsal room, as well as the Manager's offices.

At the same time and in the same way one of the firemen in the 'flies' (Post 1) shall inspect the gentlemen's costume store, and the painting rooms, and the other fireman in the 'flies' (Post 1, castle side) shall inspect the ladies' costume store and the ballet room.

During every interval the firemen on both sides of the 'flies' (Post 2, beginning) shall make a general inspection. The firemen on the stage shall leave it alternately—Section III., I., II. ($\frac{1}{4}$) and II. ($\frac{3}{4}$)—to inspect the 'under machinery.' The result of the inspection shall be reported to the foreman on each occasion.

14. At the close of the performance, the 'fire-watch,' assisted by the lamp-man (whose duty it is also to extinguish the grease warmers and curling-iron heaters) shall inspect the whole house as follows:—

One fireman of Section III. shall inspect everything below stage-floor level. The 'gridiron' shall be inspected either by Post 1 or 2, Section II. The other two firemen of this section shall accompany the foreman on his inspection of the auditorium. The inspection is arranged as follows: The foreman shall visit the passages leading to the boxes on the area level and first tier, also the Court boxes and ante-rooms, and the whole of the ground floor. The firemen shall take a side each of the galleries, the passages leading to the boxes of the second and third tiers, and all the various offices, &c.

The dressing-rooms on one side of the house shall be visited by a fireman of Section II., those on the opposite side of the house by Section I. The stoves and heating apparatus shall be inspected with particular care, and the fact that the fires are properly extinguished ascertained.

The result of the inspection shall be reported by the foreman on the stage to the fire-inspector.

The two firemen in the 'flies' shall remain there until the dressing-rooms (which shall be the last visited) are inspected.

15. If a fire break out during the performance, the chief object of the firemen shall be to extinguish the fire in an energetic and quick manner, and if possible to prevent any further spread. Each man shall work with energy, but carefully, and keep cool and collected. If a fire break out on the stage during a performance and it cannot be extinguished by means of the wet towels, buckets, &c., the nearest fireman shall immediately inform the firemen posted in the passages at the back of the house, and then, without waiting for further assistance, use his utmost efforts to extinguish the flames. The firemen posted in the passages at the back of the house shall, as soon as they are informed of the fire, turn on the hydrants and go to the assistance of their comrades. Prior to giving this assistance they shall, however, sound the alarm and see that notice is duly given to the headquarters of the City Fire Brigade.

The chief duty of the firemen posted in the passages of the galleries in the front of the house, in the event of an outbreak, shall be to see to the safety of the audience. They shall, therefore, caution the audience not to become excited, assisting them to the exits as quickly as possible. After the audience has vacated the building, they shall hurry to the scene of danger and give all assistance in their power.

In case of the fire breaking out in the galleries, which cannot be extinguished immediately, the firemen posted in the passages shall at once give the alarm by means of a call-point, and without waiting for further help, attempt to extinguish it.

As soon as the alarm is given from one of the passages in the front of the house, the firemen in the passages round the stage and those posted in the 'flies,' as well as their foreman, shall at once attend to the call. If a fire breaks out in some isolated part of the house, the fireman on the stage shall attend to whatever happens on a lower level than the first tier, whilst firemen in the 'flies' shall see to anything happening on a higher level. In both cases the men posted in the passages in the front of the house, shall hurry to the place of danger, as soon as they hear of the outbreak, and do their utmost to extinguish the flames.

The firemen posted in the passages shall take some reserve hose with them, and inform the men posted near of the outbreak before leaving their posts.

Should further help be necessary, the firemen of Post 2, Section II., on the stage and in the 'flies,' shall also hurry to the place of danger.

The other firemen, i.e. those on the 'flies' or those on the stage, shall only vacate their posts on receiving special instructions from the fire inspector to do so.

16. The chimney sweep, who has charge of the chimneys and flues, shall see that they are in good condition, and he must keep them thoroughly clean. Any defect shall be reported to the fire-inspector at once. He shall be on the stage at least one hour before the commencement of the performance and remain there until the close. In case of fire he shall assist the firemen.

17. The iron curtain shall always be kept lowered, excepting at performances and important rehearsals. The mechanic appointed for the working of the same during a performance, shall be at his post two hours and a quarter before the commencement of the performance, and shall not leave for a moment until the end of the same, without having previously arranged with the fire-inspector for a substitute. He shall raise the iron curtain half an hour before the commencement of the performance and drop it again at the close.

It shall also be the duty of this mechanic to attend to the ventilator over the stage in accordance with any special instructions given him by the inspector.

In case of an outbreak of fire on the stage the mechanic shall open the ventilator at once, and if the fire is not forthwith extinguished, he shall let down the iron curtain. Instructions to do so shall be given him either by the foreman or the fire-inspector.

If the necessity arises to open the ventilator during the day, this can only be done by order of the fire-inspector or of the foreman, excepting only in a case of danger.

In this case the opening of the ventilator shall be done by a fireman of Section I. or II.

18. The plumber shall see that everything in connection with his department is in good condition, that the reservoirs are filled every day before the commencement of the performance, and that the hydrants can be used at any moment. He shall also render assistance to the mechanic at the iron curtain if such be required. He shall be on the stage a quarter of an hour before the commencement of the performance and shall remain there until the close of the same. Should he be called away for any special duty during this time, he shall inform the nearest fireman, so that his whereabouts may be known. In case of emergency he shall take the place of a fireman, but shall always be posted in the stage passage. In case of fire he shall help to extinguish it.

19. The two automatic call-points to the City Fire Brigade headquarters shall, as a rule, only be used on instructions from the fire-inspector. In case of immediate danger they shall be used without his special instructions. The signal given daily at noon from the Fire Brigade headquarters by way of a trial call to the theatre, shall be responded to by a fireman on duty in Section I.

He shall respond alternately from the call-points on the right and on the left of the stage, and he shall be in attendance at one of the call-points fully ten minutes before signalling time. If no signal be noticed by 12.15 p.m., the fireman in question shall at once report this fact to the inspector.

20. The regulations for the firemen in the event of very important or dress rehearsals are the same as for a performance, but the number of firemen required for duty shall be specially arranged each time.

21. Once a month the fire-inspector inspects the whole staff and the whole of the fire-extinguishing plant. Besides this, the foremen shall inspect some part of the plant once a week. Four off-duty firemen shall accompany him on those rounds.

22. Any negligence in attending to any duty shall be punished by a fine. A repetition of the same, drunkenness or vacating his post without orders, shall be punished by dismissal.

I would now, however, point out that, while the above example embodies the regulations for a private 'fire-watch,' a public 'fire-watch' must also have its specific rules defining its duties. The example in respect to the private watch was one where the theatre is permanently in the hands of one and the same body. But my example of a public 'fire-watch' will be taken from one where the attendance is limited to the actual entertainment at which members of the general public are present, whilst during the remainder of the time only private watchmen of the manager are engaged. This is an instance of a very common combination of the private and public systems, and the arrangements are based on a policy which infers that only when the general public is present is it necessary that the 'fire-watch' be composed of public servants. It is perhaps interesting to observe what is required in this direction at Berlin, where public 'fire-watches' have been in existence at the theatres for a considerable time. These regulations at Berlin may be taken to serve as a basis for what is generally in force throughout Prussia where public 'fire-watches' are stationed in accordance with the official requirements. In reading these regulations it should not be forgotten that the public 'fire-watch' at a private theatre has a somewhat onerous task, as the representatives of a public authority are seldom popular with the private employer. At Berlin, more particularly, it took many years before a workable arrangement was arrived at between the theatre managers and the public authorities. Where, however, a public official observes the ordinary forms of courtesy in carrying out his duties, and shows a little tact in overcoming the difficulties which must arise from time to time, there is not the slightest reason why his labours should not be satisfactory to all concerned. And the manager himself is, as a rule, greatly relieved when he sees the responsibility of the 'fire-watch' taken off his hands; for with this organisation of public control during the performance, the responsibility for the safety of the audience generally rests entirely with the authorities and not with the management.

The following are the regulations for the firemen acting on 'fire-watches' in the theatres of Berlin, the men being members of the Royal Police Fire Brigade of that city. I would only again repeat that I purposely refrain from commenting on the examples here presented.

Regulations for the 'Fire-Watches' stationed in the Theatres, Circus Buildings, Music Halls, etc., at Berlin.

1. The appointed number of firemen shall parade in full uniform at the headquarters station of their district one hour before the commencement of the performance.

The foremen shall muster their men, report their 'watches' to the officer on duty, and then march them to the theatres at which they are to be stationed.

2. On arrival at the theatre the firemen shall test the telegraphic instruments and call points, they shall see that all the exits are clear, that all the fire-extinguishing apparatus is in perfect order, and that the small hand pumps are filled with *clean* water; further, that the necessary water pressure be forthcoming, and that the 'emergency' lamps are alight.

If irregularities be noticed, the foreman shall at once inform the manager of the theatre or his representative of the same, and shall do all in his power to lessen or remove the danger.

Notice of such irregularities shall be immediately given at the headquarters of the Fire Brigade if the defects are of importance, as, for instance, in case of the fire-mains being out of order.

3. As soon as the 'fire-watch' has completed its round, and in any case before the commencement of the performance, the foreman shall station his men on or about the stage according to instructions, and shall then take up his own assigned position, from which he shall not absent himself, except to see that his men are at their posts and are duly attending to their respective duties.

4. Both the foremen and the men shall make themselves thoroughly acquainted with the entire arrangements of the theatre, the situation of the store-rooms, workshops, the position of the iron doors, the passages, as well as the working of the extinguishing apparatus under their charge.

No fireman shall on any account whatever turn off the gas in the passages, &c., leading to the auditorium; nor shall they extinguish the gas elsewhere while those entrusted with this duty are about.

5. While the firemen are on duty in the theatre they shall always be on the alert for any occurrence which might be the cause of an outbreak of fire. Special attention shall also be given to all movable lights, gauze curtains and such parts of the scenery as may happen to project over, or near a light, and warning shall at once be given to the theatre officials of any dangerous arrangements on the stage.

6. In case of fire breaking out, the firemen shall go about their work quietly, and all shouting or loud talking is strictly forbidden. Special care shall also be taken that as little damage as possible is done by water, and that any sprinklers, if installed, are not brought into play until it is absolutely necessary.

In case the fire is not extinguished at once, the foreman must see that the iron curtain is lowered, and that the occurrence is communicated to the nearest fire station by telegraph as well as by special messenger. He shall also see that the iron doors are closed, and that every possible step is taken to prevent the spread of the fire.

In the event of the fire originating on the stage, no fireman shall leave that part until it becomes utterly impossible for him to remain at his post. If this necessity arises he shall, on leaving the stage, carefully close all doors through which he has to pass.

7. The foremen and their men shall behave in a respectable and sober manner, and act courteously to every one with whom they come in contact. Under exceptional circumstances, and if it is to prevent an outbreak of fire, the firemen may assist the 'stage hands' at their work. They shall always take special care not to disturb the performance in any way.

8. If a member of the 'fire-watch' notice any irregularity whatever likely to be the means of causing an outbreak of fire, he must at once inform those concerned of the fact, and at the close of the performance, shall report the same to his superior officer, together with any important facts which may have happened in connection therewith.

The firemen shall remain on duty at their posts until the audience has vacated the theatre.

The 'watch' shall then parade on the stage, and, unless there is any sign of fire shall be marched out of the theatre by their foremen, and dismissed.

As an example of a 'fire-watch' which is, however, in constant attendance, and is yet duly manned by members of the local fire brigade, I would here add particulars of the body stationed at the Frankfort Municipal Opera House. These particulars are in the form of extracts from the rules or instructions of the 'fire-watch' in question, and are so arranged as to describe its method of working more concisely than would be possible by the mere literal quotation of the whole of the various clauses. The example affords a valuable instance of public control exercised not only during the actual presence of the audience on the premises, but at all hours of the day, with a view to guarding against the risk of an outbreak from some latent source not easily noticeable, or from some neglect which might be avoided by constant supervision.

The 'Fire-Watch' of the Municipal Opera House at Frankfort.

The number of public firemen in attendance varies proportionately with the risk to human life on the premises.

The number of days or hours firemen have to be in attendance at the Opera House at a stretch, varies with the functions they are expected to fulfil.

According to these functions the staff of firemen in attendance is divided into three groups, distinguished by the names :—

I. 'House Watch.'
II. 'Patrol Watch.'
III. 'Performance Watch.'

The 'house watch' consists of four firemen and a foreman. The four men are stationed at the Opera House for a month at a time, the change of 'personnel' taking place on the first day of each month. The foreman, who has the rank of a senior non-commissioned officer in the fire brigade, and at the same time holds the position of a responsible caretaker to the managers of the establishment, is stationed at the Opera House for several years in succession.

The 'patrol watch' consists of two firemen, who are stationed at the Opera House for twenty-four hours at a time.

The 'performance watch' consists of four firemen and a non-commissioned officer. They are stationed at the Opera House for the actual duration of the performance, the two hours prior to the commencement, and an hour after the fall of the curtain.

The staff of firemen in attendance at the Opera House can either be 'on duty' or 'off duty'; and when 'on duty,' their instructions require them either to be 'on watch' or 'at ease.' The term 'on duty,' according to the instructions, simply implies an 'attendance under orders.' When 'off duty,' the men are not only permitted, but required to leave the premises, and receive full freedom to employ their time as they like, the only conditions being, that they are not permitted to leave the precincts of the town, and, when called upon to attend a fire, have to appear on the scene with the least possible delay. The term 'on watch' infers actual duty, such as patrol inspection or sentry duty, whilst 'at ease' is meant to imply the state of readiness for duty, the guard-room at the disposal of the firemen being considered their headquarters.

Of the four men of the 'house watch' two are constantly 'on duty' day and night, and a third 'on duty' for the time of the performance as well as the two hours prior to the commencement. The distribution of duty among the four firemen has been so arranged as to give each man alternately the same functions every four days. Each man commences his spell of four times twenty-four hours with a full twenty-four hours 'on duty,' he then has ten hours of daylight 'off duty,' then another twenty-nine hours 'on duty,' and he finishes with a full thirty-three hours (or two nights and a day) 'off duty.' The commencement of the spells always being timed at seven o'clock in the morning, the hours for each man's four days run as follows :—

'On duty,' 7 A.M. of first day to 7 A.M. of second day.
'Off duty,' 7 A.M. of second day to 5 P.M. of second day.
'On duty,' 5 P.M. of second day to 10 P.M. of third day.
'Off duty,' 10 P.M. of third day to 7 A.M. of fifth day.

Of the two men of the 'house watch,' who are constantly 'on duty,' No. 1 and No. 2 are alternately 'on watch' and 'at ease,' the change taking place every two hours. The ordinary function of the man 'on watch' is to patrol the house according to a certain 'beat.' In event of the great divisional iron curtain, which is kept closed as a rule, having to be raised either for a performance, rehearsal, or other cause, this man breaks his 'beat,' and stands 'sentry' at the detaching hook of the apparatus which moves it, this position (situated on the left of the stage) being taken up either half or one-quarter of an hour before the actual commencement of a performance or rehearsal as the case may be. Ordinarily, when 'at ease,' the man has no special function, his presence in the guard room being all that is required of him. During the time of the performance, on the other hand, and half an hour before and after the same, the instructions require the man 'at ease' to go 'on watch' as sentry in the left gallery of the stage. The third man in attendance and 'on duty' at the Opera House during the performance, and two hours before commencement, has some special out-of-door functions to perform on his arrival 'on duty,' and then takes up his position 'on watch' in the right gallery of the stage until the fall of the curtain.

The foreman of the 'house watch' is considered to be constantly 'on duty' throughout the year. He only leaves the premises with a special permission, either on those days on which a public performance is not given in the Opera House, or in consequence of a request for extraordinary leave.

The foreman commences his 'watch' two hours before the commencement of the performance, and is 'at ease' one hour after fall of the curtain. His duties when 'on watch' consist of inspection and control of the whole of the men 'on duty,' independent patrol at irregular times also being made. Directly after fall of the curtain, he makes a full round of the house. During the performance his usual position, when not occupied with inspection or patrol, is on the left of the stage, where he also has to fulfil the functions of a private constable, responsible for the non-appearance on the stage of any superfluous members of the working-staff of the theatre, or strangers not employed in the rendering of the play. When 'at ease,' the foreman attends to his duties as house-inspector, controls the firemen 'on duty,' and examines the state of the fire-extinguishing and other appliances for which he is responsible.

The 'patrol watch,' and the 'performance watch,' when in attendance at the Opera House, are considered to be 'on duty' for the whole of the time being.

Of the two men of the 'patrol watch,' No. 1 and No. 2 alternately take four hours 'on watch,' and four hours 'at ease.' The man 'on watch' has to make two rounds through the house in the four hours, each 'beat' having two hours' duration. The man 'at ease' always has charge of the guard room.

The four men and the foreman of the 'performance watch' are 'on watch' for the whole of the time they are 'on duty' in the Opera House. The four men, when commencing their 'watch,' immediately take up positions as sentries on the stage and remain there until an hour after the performance. Their foreman, a non-commissioned officer (junior to the foreman of the 'house watch'), makes a round through the building prior to the rise of the curtain, and then takes up a position, as sentry, on the right side of the stage during the performance. After the fall of the curtain, he makes a second round or inspection of the premises, this time accompanying his direct superior, the foreman of the 'house watch.'

For the purpose of increasing the efficiency of the staff of firemen 'on duty' at the Opera House, and at the same time keeping the authorities informed as to the different functions being properly performed, two systems of control have been adopted, the first consisting of unexpected personal inspections, made daily at irregular times by the officers of the municipal fire brigade, the second comprising several methods of automatic notation.

The personal inspections of the officers of the brigade are not subject to special regulations. The times at which they are made must, however, be entered in the 'occurrence-book' in the guard-room of the Opera House, and notified in the daily reports on the management of the 'fire-watch' which are sent to the authorities by the senior foreman in charge.

For automatic control, either an ordinary watchman's watch or the telegraph system of the house is made use of; the latter method having been adopted for the men on 'patrol duty' (who are obliged to pass forty-two signal points on their two hours' 'beat' through the premises), and also for the fireman at the detaching-hook of the iron curtain (who has to signal his watchfulness every ten minutes), whilst the more simple means is made use of by the foreman when inspecting the house before and after the performance.

In accordance with the arrangements above explained, one finds that there are always 'on duty' (and under supervision of their superiors) four firemen in the Opera House, a responsible foreman to these men being generally on the premises and within call. During the time of actual presence of the audience or part of the audience in the house, the strength of the staff 'on duty' is raised to nine firemen, headed by two foremen. Of these eleven men, eight have positions within the precincts of the stage, one has charge of the guard-room, one patrols through the house, and one has no fixed position; so that if consideration be taken of their rank, and the watches to which they belong, the following description of the 'fire-watch' during the performance would be—

House Watch	Senior foreman	varies position according to circumstances.
Performance Watch ..	Junior foreman No. 1. No. 2. No. 3. No. 4.	have charge of the stage proper.
House Watch	No. 1.	has charge of detaching-hook of curtain.
	No. 2. No. 3.	have charge of the fly galleries.
Patrol Watch	No. 1.	patrols the premises.
	No. 2.	has charge of the guard-room.

These firemen, armed as they are with definite instructions pertaining to their vigilance in tracing risks, and taking active measures to obviate any danger that may arise in case of fire or risk of fire, have but little time to attend to the safety of the public when in panic, since the stage, with the number of human lives on it, or in closest proximity to it, would fully occupy their attention.

For the purpose of having a staff of men in the 'front of the house,' whose ordinary duties tend to prepare them, firstly, for emergency work, and, secondly, in the right treatment of excited crowds, the authorities of the city supply the Opera House with a staff of constables and police officers for the time of the audience's presence in the building; these men, distributed in the auditorium, the passages, lobbies and street approaches, having instructions as to the steps to be taken by them under various circumstances.

Both firemen and constables having arduous duties in case of fire or panic, the owners of the Opera House have thought it advisable to organise auxiliary bodies, for the purpose of rendering assistance in matters of detail. For the purpose of giving the firemen all possible assistance in matters pertaining to the water supply, and the stoppage of a spread of fire from one risk of the building to another, a number of men employed on the premises as engineers and stokers, headed by the chief engineer to the house, have been systematically trained to fulfil certain functions, such as the setting in motion of the steam pumps, attending to the water cisterns of the house, closing of all heat-proof doors in main partition walls, stopping unnecessary currents of air in the ventilation shafts, and the turning on of extra lights. On the other hand, the constables in charge of the front of the house are to receive assistance from the box openers and ticket collectors who are employed in this part of the building, and who have been instructed in regard to the opening of important doors and turning on of full light in all passages and staircases.

Whatever may be the duties of the private or the public 'fire-watch' with respect to the protection of places of entertainment, it should not be forgotten that in many cases the local police force takes over certain duties with regard to the assemblage of the audience, not only within the walls of a playhouse, but also outside in respect to its approach. It is only natural that in many countries the services of such members of the police as are on this special duty should also be requisitioned by the public authorities in order to insure every attention being given to questions of safety. Though the police may not in some instances be armed with powers to enforce the fulfilment of specific requirements, yet a hint given by a constable on duty seldom fails to have its effect. I will now present the general instructions as to theatre safety which are in the hands of the constables of Berlin, and which were originally issued in the form of an ordinary 'order' to the whole force. Again, I do not criticise, but simply quote this order, which will, I am sure, afford an interesting example of what is done on the Continent.

Instructions for the Police Officials attending performances at Theatres, Public Halls, etc.

1. Every internal and external door must remain unlocked and unobstructed; each wing of a door shall be easily opened by means of a single knob. To make sure of this, every door, as well as the wings of double doors, which are usually fastened, is to be opened to its full extent, and then shut again.

Only bolts which can be easily reached are allowed. Side bolts are prohibited.

2. Every door shall be marked 'Exit,' e.g. 'Exit to the yard,' or 'Side exit,' and no tables, chairs, &c., shall obstruct the free passage.

The term "Emergency exit" is not explicit enough, and shall not be used.

3. Passages, landings, stairs, &c., must be kept free from all obstruction; loose chairs, benches, tables, &c., must not be placed there.

4. Keys must not remain in the doors, nor in the hands of the subordinate staff. If keys be found in the doors, they shall be taken out, and delivered to the owner, tenant, or his representative.

5. Any outside or courtyard gates which open inwards shall be opened to their full extent, and then fixed so that they cannot swing to again.

6. Curtains over doors and in passages shall be hung on movable rings.

7. Besides the ordinary lighting in the saloons, passages, entrance halls, and stairs, there shall be an ample installation of emergency lights (other than petroleum lamps).

8. The owner or manager shall see that a printed notice is put up at all the principal entrances indicating the number of persons admissible. This fixed number shall not be exceeded. In the event of any part of the building not being accessible to the public, notices to this effect shall be posted up.

9. In case of danger any official present shall do all in his power to induce the audience to leave the building quietly. He shall also immediately have all exits opened and communicate with the Fire Brigade.

10. Transgression of the foregoing regulations shall be at once reported. Any alteration in the structural arrangement of the building shall also be similarly reported.

I would also take the opportunity to quote an example of the full instructions which are given to the Berlin constables on duty at any one specific play-house. I have taken as an instance the instructions for the 'German' Theatre of that city.

Regulations for the Police Patrol at the 'German' Theatre, Berlin.

The police patrol shall be composed of a serjeant and four constables. On Sundays and on fête days an extra constable shall also be in attendance. The patrol shall be on duty a quarter of an hour before the opening of the box office, and shall be posted as follows:—

A. *Before the Performance.*

A constable shall stand in the lobby of box office, in order to prevent any crowding. A constable in front of the entrance to said lobby shall regulate the traffic. He shall only permit slow driving on the asphalted approach.

A constable, whose duty it shall be to see that the carriages drive slowly through the gateway, shall be stationed in the Schumannstrasse near the principal entrance, while another constable shall be posted in the open place in front of the theatre to see that carriages keep in line.

After the opening of the box office, the serjeant, accompanied by a constable, shall see that all doors are unlocked and free from obstruction. For this purpose every door, besides the wing of the double doors (usually closed), shall be opened to its full extent, and then shut again.

Where doors lead directly into the open this inspection shall be repeated immediately before the commencement of the performance.

Keys are not to be left in the doors; nor shall the attendants or cloak room employees have any keys at their disposal.

When keys are found in the doors, they shall be taken out and handed over to the representative of the owner.

The serjeant shall also see that 50 'emergency' lamps are lighted in the theatre as soon as the box office is opened, and are so kept until every one has vacated the building. These lamps shall be placed as follows:—

Vestibule	4 lamps	Stairs to 2nd tier (each 3)	6 lamps
Ground-floor corridor	10 ,,	2nd tier cloak-room	1 ,,
Near stage box	1 ,,	,, passage	4 ,,
Stalls and pit	4 ,,	,, gallery, boxes	6 ,,
Stairs to 1st tier	2 ,,	Stairs to 2nd tier	1 ,,
1st tier, passage	4 ,,	Passage to right	1 ,,
,, behind the boxes	2 ,,	Stairs to Royal box	2 ,,
,, auditorium	2 ,,		

The gangways of the auditorium, excepting the standing room in the area for 10 persons, and similar space for 100 persons in the gallery, must be kept free and unobstructed. The same remark applies to the staircases, landings, &c., and special attention shall be paid that no loose chairs, tables, benches and such like are placed here even temporarily.

Special attention should also be given to curtains to doors and in the passages. They should hang on movable rings and no two curtains must be tied together.

B. *During the Performance.*

The arrangements during the performance shall be as follows: One constable, box office lobby; one constable in the courtyard of the theatre; two constables in the gallery, one seated on the right, the other on the left of the entrance. These places shall be labelled 'Police.'

The seat for the inspecting officer shall be situated in the stalls to the left (No. 74), and the serjeant's on the second tier (No. 13), to the right.

During the performance the serjeant shall occasionally inspect the doors leading to the open to see that the free passage has not been obstructed.

Smoking is prohibited in all parts of the theatre.

Any infringements of the above regulations, or any alteration in the structural arrangement of the building, noticed by the serjeant, shall be mentioned in the 'theatre' report.

The constable in the courtyard shall regulate the arrangement of carriages arriving to take up.

He will receive assistance from one of the constables in the gallery, who will leave his seat at the beginning of the last act.

The officials who are posted in the auditorium shall, in case of danger, call upon the audience to leave the theatre quietly. The constable posted in the vestibule shall immediately open all doors to their full extent, and immediately inform the Fire Brigade by means of the call-point in the vestibule.

C. *After the Performance.*

One constable in front of the entrance to the office vestibule shall attend to the taking up of the carriages. One constable in the Schumannstrasse between the theatre and the Luisenstrasse, shall regulate the vehicular traffic. One constable in the Schumannstrasse in front of the theatre shall see that all vehicles drive away in the direction of the Albrechtstrasse. One constable at the crossing of the Schumannstrasse and Albrechtstrasse shall see that no fast driving occurs at this point, and shall prevent carriages from turning round in the Schumannstrasse or from causing any obstruction in the traffic.

It may seem to go rather far afield to have here quoted instructions which govern not only the arrangements for the safety of the audience within the theatre, but those arrangements also which the police have to make with the view of affording the necessary traffic facilities for the public visiting an entertainment. Nevertheless, as both go hand in hand, inasmuch as they have the attention of the identical officials on duty at any given performance in the theatre in question, the separation of the individual paragraphs would have been impracticable, and an insight into the general duties of the police can only be useful to those who have to take the traffic facilities into consideration when designing a play-house.

And here, speaking of traffic facilities in connection with the theatre, and the arrangements for the police, I cannot but mention that, quite irrespective of the character or duties of the 'fire-watch,' it is of considerable importance that the local fire brigade should not only be thoroughly conversant with the fire geography and peculiarities of every play-house in its district, but that such regulations or instructions should be framed as are necessary to define its action when called upon to render assistance at an actual outbreak. Up to the present, I regret to say that it has been but a rare occurrence for a local fire brigade to distinguish itself by the excellence of its tactics at a theatre catastrophe. The reverse has generally been the case. It is, no doubt, impracticable to organise a fire brigade in such a manner as to allow for the safety of the theatres to be a first consideration, and yet the particular risk in this class of building should not be left entirely unconsidered by those responsible for the selection of positions for fire-stations, determining the strength of the force, its auxiliaries, or its equipment. But above all, it is not only possible, but essential, that every fire-brigade should have its preconcerted plan how to deal with a theatre fire under various circumstances. Its arrangements for rapid and effective concentration are of particular importance, as quick action and absence of confusion are indispensable in dealing with cases where large numbers of lives are involved and the general excitement is unusual. The regulations or instructions referred to must empower the local fire brigade not only with the right of entry and inspection in theatres at the reasonable convenience of the occupiers, but also the right to drill in and around such premises. The instructions for the fire brigade must also include particulars as to attendance, the positions and distribution of the force on its arrival, with due regard to questions of manœuvring space and water supply. It should not be forgotten that the concentration of life-saving plant is one of the first essentials in fire-brigade work at a theatre fire occurring during a performance, whilst in most fire departments all the arrangements as a rule point to the concentration only of fire-extinguishing apparatus. It is also exceptional for fire brigades to have to handle at any one time extensive life-saving plant. Such plant generally requires not only an unusually large *personnel*, but also very considerable room. Examples of the regulations, &c., might perhaps well be taken from the fire departments of Berlin and Copenhagen, where particular care has been given to the question here under consideration; but it would lead too far to go here again into detail. At Berlin and Copenhagen, however, the arrangements include certain attendance plans, of which I believe it is of value to present specimens. The plan of the Berlin Court Theatre (Fig. 2), for instance, shows the positions the various detachments of the brigade are to take up on answering a call of fire at this institution. The plan of the Court Opera House at Copenhagen (Fig. 1) shows the position to be taken up by certain appliances, and the first lines of hose to be laid out in case of an outbreak originating on the stage when there is no audience in the house. These plans can only be regarded as skeleton dispositions applicable to common cases, and variations of course exist to meet other circumstances. But whatever their value may be in the individual instances here given, they go far to show that the whole question of theatre safety has had the careful consideration of the authorities in the cities in question. In our metropolis precautionary measures of this description are as non-existent as an efficient 'fire-watch.' The unfortunate absence of preparation on the part of the Paris and Vienna fire brigades to meet the catastrophes of the Opéra Comique and 'Ring' Theatre respectively has apparently not yet served as a lesson for London, as it has for Berlin and Copenhagen. It is only to be hoped that the apathy on this subject may not some day be rudely awakened.

In concluding this Supplement on Protective Legislation, I cannot but repeat that, to my mind, the tendency towards elaboration of detail in the specification of requirements or instructions should not be encouraged. Experience only too plainly shows that an elementary code, if executed by capable officials, gives the best results, without incurring unnecessary friction between the public authority and those interested in theatrical enterprise. A few simple principles, as regards the construction and maintenance of a building, with the details left in the hands of competent officials, would often do more for the safety of an audience than many of the detailed codes in force at present, and one of the reasons for this is that the owner or manager of a play-house is more ready to recognise the value of a few clearly expressed general requirements, especially if he can easily comprehend the reasons for their enactment, and, further, can better appreciate precautions in matters of detail if he is sure that his case is being treated on its merits, and not merely dealt with according to some common specification which does not apply particularly to the building he is interested in. Similarly, I must say that whatever may be the requirements, as regards the construction of a building and its maintenance, the whole effect of good planning, construction and equipment, may be annulled by the reckless disregard of what, in general terms, is called the 'fire-watch,' but what, more clearly defined, may be termed such precautionary measures as tend to influence the general management of a place of entertainment, with particular regard to the ever-present risk of fire. Without due supervision of the actual working of a theatre, the mere control of the structural arrangement of the premises loses much of its value—much more, in fact, than is often recognised by those conversant with questions of safety. Surely nothing more strongly goes to prove the necessity of dealing seriously with the question of watching than the large number of fires prevented by the 'fire-watch' of Continental countries, and by the alert stage-hand who so often acts as an amateur guardian of the public in this country. It is no doubt very fortunate that our resourceful stage-hands should so often have done good service, yet why should we wait for some great catastrophe in our midst to adopt such simple precautionary measures as have been satisfactorily practised elsewhere?

But, as a final word, let me again repeat that, as far as protective legislation is concerned, I advocate simplicity in the codification of the precautionary requirements, combined with a competent executive, and, further, the constant supervision of the play-house by an efficient 'fire-watch,' quite irrespective of the structural advantages or defects of the premises. I also consider that every public department directly or indirectly concerned should always be well prepared to deal with the emergency of a theatre fire should one arise. The fire brigade in the first instance and the police in the second should, above all, be ready to meet such cases, and have the necessary powers and instructions. To summarise, it cannot be denied that, regrettable as it may be, the presentation of dramatic art is associated with certain risks. The theatre fire is an unpleasant reality which has to be borne in mind in the construction and maintenance of the play-house. With so many examples of catastrophes before us, we cannot afford to forget the advantages of Protective Legislation.

COURT THEATRE, BERLIN.
FIG. 2. PLAN OF FIRE BRIGADE ARRANGEMENTS IN EVENT OF AN OUTBREAK.

GENERAL INDEX.

COURT THEATRE, VIENNA.
Lounge, Small Chandelier.

GENERAL INDEX.

Large Roman Numerals indicate Volume; the Letter S. indicates Supplements;
Pl. *indicates Plate;* p. *indicates Page;* opp. *indicates opposite.*

III.—4 U