STAGE PLANNING 1962

Fifth edition published by
The Strand Electric and Engineering Co. Ltd.
29 King Street, Covent Garden, London, W.C.2
Printed in England 1962

THE OTHER APPROACH TO A THEATRE

In 1949 Strand Electric published a book on " Stage Planning," by P. Corry, which aimed to introduce architects and others to the essentials of planning a theatre. Concentration was in the main on the mysterious area known as the stage and its equipment, including lighting. The provisions were for the Little Theatre and for the substitute theatres created in school and college assembly halls and community centres from time to time. The bare essentials of this book were later condensed by Mr. Corry himself and have formed the booklet " Stage Planning " which, revised from time to time, has run to four editions and 50,000 copies. Of this booklet the reviewer in the *Architects Journal* has said: " It is an interesting commentary on the literature of the subject that this booklet, published by a manufacturer of stage lighting equipment and issued free on application, is not merely the best of its kind, but one of the very few good books obtainable "—and the disposal of all these copies (issued on request only) bears witness to the demand.

Humble though the standards were in " Stage Planning " when judged by, say, expenditure in the United States on the School, College and Community theatre, they were out of reach of many and a companion booklet " Stage Lighting on a Shoestring " was produced.

The time has come to reprint " Stage Planning " once more, but a difficulty arises. This difficulty is born of the fact that not everybody wants the same kind of theatre. The voice of the rebels is heard louder in the land and the one thing that these rebels share is a detestation for the picture-frame stage. " Stage Planning " was always written for the picture-frame stage. All the suggestions assumed a stage at one end of the hall with a proscenium opening separating it from the audience. Sometimes the proscenium was temporary, either demountable or retractable, and sometimes the stage projected out in front of the opening to form a fore-stage or apron. This is *the kind of stage the majority still expect* when thinking of a theatre or of a hall as a theatre. This stage is then furnished with scenery and properties. Whatever the form of décor, naturalistic, stylised, impressionist, whether there is much scenery or little, a complete picture will be presented beyond the proscenium, for that is why the picture frame was invented. Even when no scenery proper is used, a set of drapes will be used. Curtains along the back and sides of the stage with borders overhead —presenting a complete curtain picture.

The other approach is so different that it cannot be written into a booklet which aims to advise on how to produce a picture-frame stage. When such a stage is produced it must be good of its kind and advice on it cannot be confused by asides and qualified statements aimed to help it become what it is not. It is to overcome this difficulty that another booklet " Planning for New Forms of Theatre " has been written (available Autumn 1962). In the present booklet will be found advice on the picture-frame stage and its normal presentation while in Section V a new approach to this type of staging is indicated.

STAGE PLANNING

IN this examination of the problems of planning, the stage that is required is assumed to be small by comparison with any theatre stage. The booklet is intended primarily to assist those who may be planning new stages in schools, colleges, and other types of communal buildings. These stages would, perhaps, be large by comparison with the totally inadequate stages and platforms that were commonly provided in the past, and may be still planned if the requirements are not fully appreciated.

Although it is obvious that an assembly hall, village institute or community centre cannot have all the facilities of a theatre, it must be recognised that if play production is intended, a reasonable minimum of stage accommodation and equipment must be provided. Details of such minimum requirements are presented in a condensed form, without all the arguments in favour of the demands. Those who have doubts or require more support for the statements made are invited to submit their problems for discussion.

It is hoped that those responsible for planning stages within the limits imposed by a restricted budget will not make the mistake of regarding a desirable minimum as the permissible maximum. The equipment scheduled must be capable of expansion. If the users of the stage are keen enough to deserve the minimum, they will work to acquire the additions that will become essential if their standard of production is good enough. They will probably appreciate the extra facilities all the more if they have had to work for them; but the initial planning should avoid restrictions that make future extensions economically or structurally impossible. It is better to provide only the facilities to install equipment, and not supply any equipment at all, than to supply an inadequate amount of equipment and no facilities for future additions.

SECTION I

PLANNING DETAILS & RECOMMENDATIONS

(1) **Auditorium**

A multi-purpose hall is often inevitable but this does not justify a flat auditorium floor unless it is quite certain that flat-floor activities cannot be accommodated elsewhere. In many modern schools such accommodation could be found and a stepped or raked floor would be best suited to the majority of uses to which an assembly hall is put. Nevertheless, it is almost certain that the hall will have a flat floor. It must be recognised that if the floor is flat, the vertical sight lines will be bad for everybody except the occupants of the front rows: at a distance of about 30 ft. from the stage they will be intolerably bad. Good sight lines can only be obtained if the floor is stepped but a reasonable compromise is possible if seats are staggered on a floor that is raked to the permissible maximum of 1 in 10. Although these facts have been repeated *ad nauseam*, it is a sad fact that an assembly hall with a raked or stepped floor is still a rarity.

(2) **The Stage**

It is assumed that a picture-frame stage will be required, although the frame itself might be varied in emphasis. If " production-in-the-round " is intended, or a Tudor-type stage is desired, the planning problems will differ and require independent consideration. The needs appropriate to a " space " stage are not satisfied merely by providing an open platform. (See Section IV, para. 2.) The main function of the proscenium wall is to mask the paraphernalia of production. If the wall is removed, the problem of installing essential equipment must be solved—not evaded.

The stage should be planned as a separate unit and not accepted as being within an auditorium. Stage and auditorium are as separate and as much inter-related as are a canteen and a kitchen.

(3) **Apron Stage**

An apron stage is often useful but there are times when it is undesirable. It is a great advantage, therefore, if portable rostrum and step units are provided. A suitable standard size would be 4 ft. by 3 ft. or 6 ft. by 3 ft. The rostrums could be made collapsible for ease of handling and storage. The type and size of apron could vary and the units could be used on-stage, at times, as parts of the settings.

(4) **Proscenium Opening**

A minimum width of 24 ft. is desirable: a width of more than 28 ft. would probably be a disadvantage. Lateral sight-line problems are, of course, involved but the width of the auditorium should not dictate the total width of the stage (see para. (6)); the auditorium width is, however, related to the width of the opening.

The height of the opening is related to the overall design but 11 ft. or 12 ft. is usually satisfactory. Openings of greater height often have to be masked down by a border.

(5) **Depth of Stage**

A *minimum* of 24 ft. from proscenium to back wall is recommended. A depth of 30 ft. or over would improve production facilities considerably. Although a depth of 16 ft. for what is known as the " acting area " is acceptable, an additional 8 ft. beyond that is desirable for background scenery, lighting equipment, and passage of actors.

(6) **Width of Stage**

The space between the proscenium edge and the side wall is of vital importance. It should not be less than 8 ft. on each side; any additional space would be a boon. When stage and auditorium form parts of the same rectangle the wing space is almost always too restricted. The side walls of the stage should extend beyond the side walls of the auditorium.

(7) **Stage Floor**

The stage should be 3 ft. 8 in. high if the auditorium is flat. But if it is raked or stepped, as it most certainly should be, the stage height could with advantage be reduced to 3 ft. Main joists should run from side to side, with floor boards fore and aft. A central trap about 6 ft. by 3 ft. is an advantage. If storage space is provided under the stage the floor should be of hardwood. A strong cotton duck stage-cloth should cover the acting area.

The stage floor MUST BE FLAT. A raked stage is useless for improving sight-lines and an intolerable nuisance to stage managers. It is a relic from the deep perspective settings of the Georgian theatre and has no modern justification. It is strange that some planners still insist on providing a rake on the stage, where it is not wanted, and deny a rake to the auditorium, where it is vitally needed.

(8) **Height above Stage**

There should be not less than 8 ft. clear space from the top of the proscenium opening to the lowest effective level of the roof. Fig. 1 illustrates masking problems if only 4 ft. is allowed; Fig. 2 shows the difference if 8 ft. is allowed. If a stage is intended to have full production facilities a " grid " should be provided, when the height from stage floor to grid should be at least two and a half times the height of the proscenium opening. Absence of a grid does not remove the need for providing fixings for suspension gear. (See Section II, para. (3).)

(9) **Cyclorama**

The back wall should be free of all such obstructions as skirtings, windows, radiators, pipes, etc.; any doors must be as near the side

walls as possible. The wall should be plastered with a matt-finished hard cement, painted " off-white ". With adequate lighting this background can suggest the infinite distance of the sky, provided the stage has adequate depth and the acting area can be independently lighted. It is not necessary to curve the top and sides of a

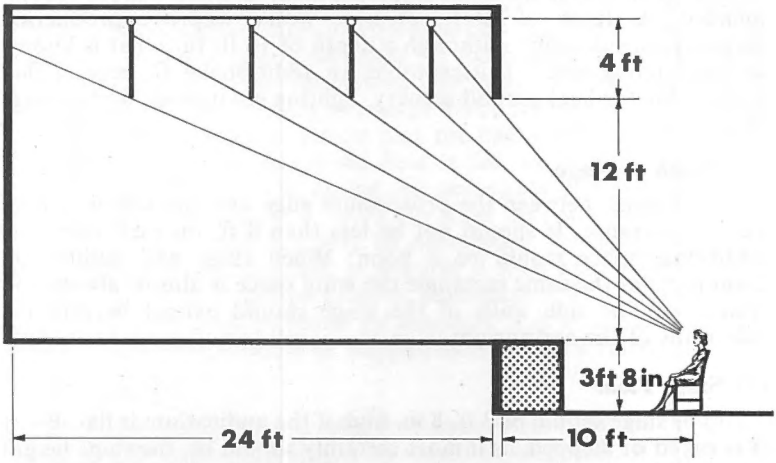


FIG. 1. *Sectional masking requires four borders without adjustment if height above proscenium opening is only 4 ft. Forestage (optional) shown shaded.*

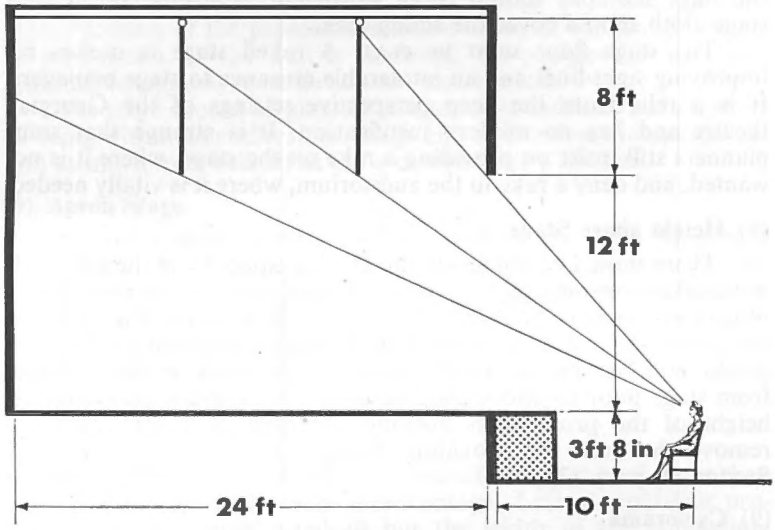


FIG. 2. *Sectional masking obtained by two borders if height above proscenium opening is 8 ft. Forestage (optional) shown shaded.*

cyclorama; the curves help to improve sight lines but can cause complications on the small stage.

(10) **Access and Circulation**

Access to back-stage should not be directly from the auditorium. Steps leading to stage level should be outside the stage area. Passages and doors should be wide: 3 ft. minimum. There should be easy access between the two sides of the stage, external to the stage area.

(11) **Siting of Lighting Control Board**

Ideally, the operator of a control board should be in a position from which he has a full view of the stage. The importance of this fact is becoming widely recognised and in very many theatres, professional and amateur, large and small, the control board is installed in a room at the back of the auditorium. This involves some extra cost in the wiring but it is a desirable expenditure. Any on-stage position is to some extent unsatisfactory but if a front-of-house position cannot be given, an effort should be made to give the best position available. It is desirable to avoid having the board at stage level. A platform adjoining the inside proscenium wall is the usual provision.

The position of the lighting control board should be agreed when planning and adequate space allowed, as otherwise it may be necessary to adopt an unsatisfactory compromise later.

(12) **Fly Gallery**

See Section II, para. (3). (Suspension Gear.)

(13) **Safety Precautions**

The requirements of local authorities in Great Britain are not entirely uniform although, in general, their demands are based on the Home Office recommendations printed in the Manual of Safety Requirements in Theatres and Places of Entertainment. It is obviously desirable, whatever the country in question, that details should be agreed with the responsible authorities in the design stage. If a safety curtain and lantern light are demanded, the structural design must be affected. (See Section II, para (4).)

In any case, all draperies and scenery should be made fire-resistant. Electrical equipment and wiring must conform to the I.E.E. or relevant authorities regulations. Where a phase to neutral voltage of 200 or over is present a single-phase supply is desirable when small children have access. In the auditorium, exit signs and some system of secondary lighting should be installed.

(14) **Storage and Other Accommodation**

Some provision must be made for storage of scenery, draperies, properties, costumes, electrical equipment, etc. In a school, special dressing-room and workshop accommodation is not usually provided; it is necessary that such space should be available for use when required.

SECTION II

STAGE DRAPERIES AND EQUIPMENT

(1) Stage Draperies

The curtains which fill the proscenium opening are variously known as " Main Tabs ", " Act Drop " or " House Tabs ". They fit immediately inside the proscenium arch. The designer of the auditorium usually has definite ideas about the colour and texture of these curtains. The most popular material is cotton velour; other materials used include wool serge and mohair. The two latter are inherently fire resistant and therefore more favoured by some licensing authorities. Other materials must be made fire-resistant. It is not unusual for a pelmet to be fitted either for decorative purposes or to reduce the effective height of the opening. Some regulations prohibit the use of a pelmet of combustible material outside the safety curtain. If the height of the opening must be reduced it is often better and cheaper to use a proscenium border matching in colour and fabric the stage draperies, fitted behind the main tabs.

In addition to the main tabs the stage usually requires a complete set of stage draperies, consisting of:

(*a*) Front Traverse Curtains, usually suspended 4 ft. to 6 ft. up-stage, extending the entire width of the acting area, overlapping in the centre.

(*b*) Leg Curtains, usually 4 ft. to 6 ft. wide, at each side of the acting area and completely masking the wing space and side walls. They may be either suspended on swivel arms or fitted to hinged frames; the latter are more flexible in use but are more expensive.

(*c*) Rear Traverse Curtains, suspended at about 15 ft. or 16 ft. up-stage to form the rear boundary of the setting. These may be either a pair of curtains drawn on and off, or single leg curtains to allow insertion of scenery units.

(*d*) Borders. These must mask the space above the stage (i.e. the " flies "). Their number and positions are largely determined by the height available above the proscenium opening. (See Section I, para. (8).)

The stage draperies are of maximum usefulness if of a neutral colour, say grey or beige, and should be specified as requiring 50% fullness; with less fullness the folds appear skimped and graceless.

(2) Curtain Tracks

As it is unlikely that sufficient height will be available to permit the suspended curtains to be " flown ", i.e. hauled up into the flies out of sight, they will be fitted to curtain tracks and drawn to the sides. A special type of silent-running track is manufactured for stage use; the domestic type of curtain rail is not silent in use and not intended for curtains of the weight likely to be used. A stage curtain track may be either fixed to the inside of the proscenium wall with brackets or suspended: if a safety curtain is fitted the main tabs cannot be fixed to the proscenium wall and must be suspended. The curtains are operated by a hauling rope or by cable and a winch.

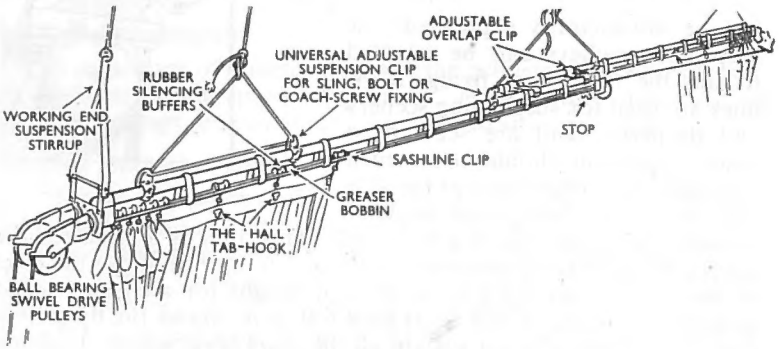
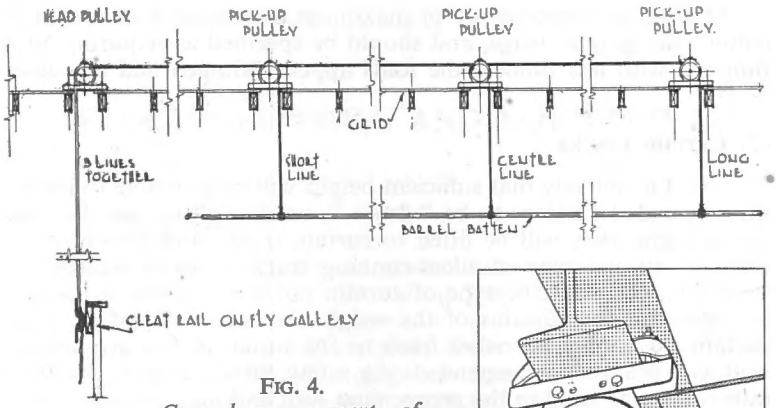


FIG. 3. *Silent-running stage curtain track.*

(3) Suspension Gear (Grid Equipment)

Fig. 4 shows the usual arrangement of grid pulleys when a theatre has a proscenium opening up to about 36 ft. wide. When insufficient height is available for a grid to be fitted it is customary to provide beams or rolled steel joists to which the pulleys can be fixed. The centre pulley should be above the centre line of the stage; the pulleys for the long and short lines should not be more than 15 ft. distance at each side; the head-pulley should be approximately above the cleat-rail. R.S.J.'s running front to back of stage provide the best type of support, the pulleys being clipped to the flanges, as shown in Fig. 4. If R.S.J.'s cannot be provided in the correct positions, any alternative fixing is acceptable provided the weight



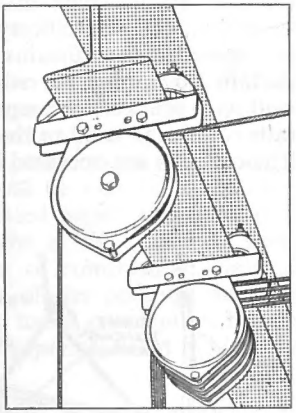


FIG. 4.
General arrangement of pulleys for a theatre and (inset right) girder fixing pulleys.

can be satisfactorily supported; the suspension pulleys can be adapted to suit the method of fixing. Rope lines are used for suspending scenery and draperies, and are secured to cleats. The cleats should be fastened to a cleat-rail either fixed to the side wall, about 3ft. from stage level, or forming the guard rail of a fly gallery. The latter is preferable; the gallery should have a minimum width of 3 ft. and be above the level of the proscenium opening, with clear height for scenery stacked underneath. There should be at least 6 ft. 6 in. above the fly-gallery floor. The cleat-rail must sustain all the suspended weight. Lighting equipment should be suspended by flexible steel cables, being raised and lowered by means of a self-sustaining winch fastened to the wall or the cleat-rail.*

The initial installation will probably not provide the maximum number of sets of lines but in estimating total loads it must be assumed that the additional sets might be fitted at a later date. The capacity may be estimated by assuming sets at 8-in. centres. The loading varies considerably but it would be safe to estimate that on a stage of 24 ft. depth six sets would have a maximum load of 5 cwt. each, ten sets of $1\frac{1}{2}$ cwt. each and about fourteen sets at $\frac{1}{2}$ cwt. each: this excludes the weight of a safety curtain which would vary according to type.

In a theatre it is desirable to have counter-balanced sets of lines owing to smoothness of operation and economy of labour. The capital cost usually precludes this advantage for the small stage.

* *See page* 16 *for detail and for fixed lighting alternative.*

(4) **Safety Curtain**

If the local authority decides that a safety curtain is a necessity it will also stipulate the type of curtain required. If the fire authorities insist on the installation of a one-piece rigid curtain, that requirement will determine the height of building above stage level. A two-piece or three-piece rigid or an asbestos-cloth roller type curtain is usually permitted if the available height is limited. Whatever type is installed, there must be an overlap of 18 in. at each side and top, a quick-release mechanism and a drencher system: there may be other important requirements.

(5) **Lantern Light**

A lantern light is regarded as a necessity when a safety curtain is installed. It is usual to provide the haystack type, the sides of which open automatically when a fusible link is severed by heat. This creates an upward draught and an escape for the smoke and heat, thus releasing pressure. The plan area of the lantern light is required to be equal to one-sixth of the stage floor area. Alternatives to the haystack type are permitted by some authorities.

(6) **Compartmentation**

A maximum of three openings in the proscenium wall is allowed in addition to the proscenium arch. Fire-resisting doors of an approved design are required to be fitted to such openings.

(7) **Film Projection Equipment**

Special regulations affect such equipment and its accommodation, particularly if inflammable films are to be used. It is desirable to obtain the co-operation of the firms specialising in the manufacture of such equipment. Provision must be made for satisfactory siting and storage of screen and sound equipment when the stage is planned. The size and position of the screen should be decided when planning. Vertical sight-lines might be affected by the borders and if these cannot be raised it might be necessary to install a divided border which can be drawn aside.

(8) **Sound Effects**

For numerous stage performances it is necessary to have "noises off". Since the development of sound amplification the use of recorded effects has become common practice. It is desirable that there should be installed double-turntables with pick-ups, and/or tape deck, with amplifiers, either in the stage prompt-corner or, possibly, in the room at the rear of the auditorium in which the stage control board is accommodated. The speakers should be carefully sited and capable of being moved about, since the direction from which the sounds travel to the audience can considerably affect their credibility. If the equipment is not provided initially it should be assumed that it will be added later and electrical supply provided in a suitable position.

SECTION III

STAGE LIGHTING EQUIPMENT

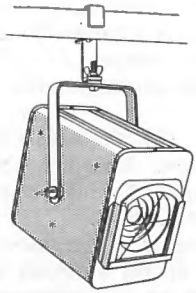
The apparatus available on any stage should be capable of providing some diffused lighting over the whole of the acting area, but more important it must be possible to obtain localised lighting to give emphasis to various parts of the stage picture. It should be possible to vary the intensity, the direction and the colour of the light from each unit. The old practice of providing flood-lighting from footlights and two or three battens is quite useless if light is to be properly employed to give significance and dramatic expression. The harsh colours and unruly spread from fluorescent lamps are an even more troublesome form of flood-lighting. Even the smallest of stages requires controlled directional lighting.

The diffused lighting is best provided by flood lanterns (see Fig. 9), or in some cases by compartment battens, which are small floods joined together. The localised lighting is obtained from lanterns popularly known as " spots ". From within the family of spots there are differing beam characteristics, ranging from the hard clear-cut shaped beams of the Mirror profile spots to the diffuse soft edges of the Fresnel spots.

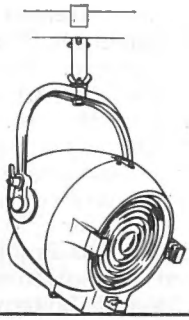
TYPES OF LANTERN AVAILABLE

Soft edge spotlights (Fig. 6) consist of a lens behind which a lamp can be moved backwards and forwards. The result is a more or less circular beam, variable between a spot and a medium angle flood. The beam consists of an enlarged image of the filament. A 250- or 500-watt lamp is in common use on the types of stages here considered. At one time plano-convex lenses were used but now even an inexpensive spotlight such as the Patt. 45 (Fig. 5) has a Fresnel lens. This type of lens is used to even better advantage in the Patt. 123 (Fig. 6) where it is 6 in. in diameter instead of 4½ in. and in consequence more light is collected. All Fresnel lenses used on the stage give much more light than the plano-convex lenses they have supplanted. Furthermore, the light is softer and does not need a frost and there is no filament striation, even when spotted right down. Fresnel lenses have a tendency to give low-intensity stray light beyond the main beam. In consequence they should never be used in the auditorium. They are very suitable for side lighting from the wings across the stage, and to give the effect of sunlight through a window for example. The stray light can be controlled when necessary by using a rotatable four door barn-door attachment.

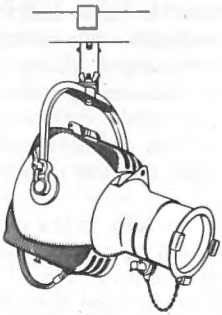
Profile spots (Fig. 7) have a mirror system instead of a lens to collect the light. The beam shape and size is governed by a gate and it is this which is focused by a lens. The profile type of spot is often referred to as a Mirror spot or in America as an elipsoidal spot. It is made in a number of wattages from 250/500 up to and including a high-intensity spot for the " following " of artists common in



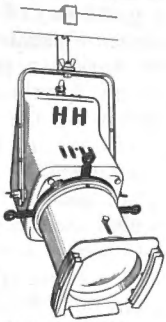
5



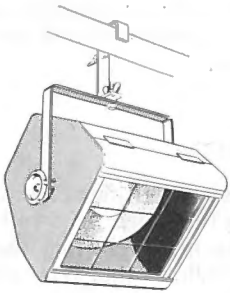
6



7



8



9

FIG. 5. *Junior Spot. Patt.* 45. 250/500*w*.

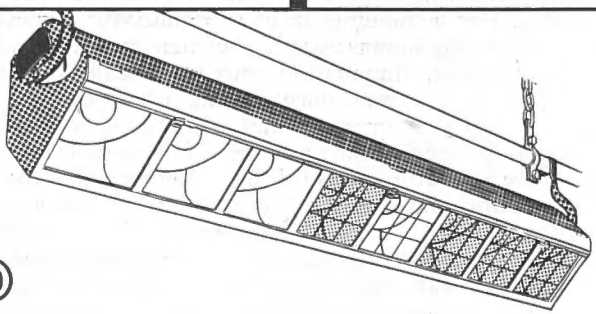
FIG. 6. *Fresnel Spot. Patt.* 123. 250/500*w*.

FIG. 7. *Profile Spot. Patt.* 23. 250/500*w*.

FIG. 8. *Profile Spot. Patt.* 263. 750/1,000*w*.

FIG. 9. *Patt.* 137 *Flood.* 60/200*w*.

FIG. 10. *Batten. Ref. SB.*



10

music halls. A feature of Strand Profile spots is their adaptability to various beam angles by merely changing the lens arrangement. Thus the Patt. 23 in Fig. 7 is available in four beam ranges: 11°, 22°, 30° or 37°. Within the particular range a masking shutter or iris in the gate can do all the rest.

The lanterns in Figs. 5, 6 and 7 take 250/500-watt Class T projector lamps with medium prefocus caps. The Fresnel and Profile spots make very efficient use of this light. A range of similar lanterns exists for 750/1,000-watt lamps, e.g. Patt. 223 Fresnel spot and Patt. 263 Profile spot (Fig. 8). However, where more light is required it is sometimes better to double up on a circuit with a pair of 500-watt lanterns side by side. Such an arrangement also provides a good way of producing the asymmetric beam distribution often needed in theatre work. Where spotlights are completely inaccessible during a performance, as, for example, those out in the auditorium, a colour wheel with pre-set stations operated by a selector switch on the stageboard is a reasonable provision. Incidentally, all colour filters should be of the self-extinguishing acetate sheeting known as " Cinemoid ". Glass is quite unnecessary except as a diffuser for Profile spots.

Floodlights used along with the spotlights would, in the main, be 100/200-watt junior size (Fig. 9) used separately or made up as a compartment batten. Those behind the proscenium No. 1 (spot batten) should have hoods available to localise the light further. The Patt. 137, 60/200-watt Junior Flood and the Patt. 60, 300/500-watt Flood are suitable for combination with the spots just described. The Patt. 60 would be mainly used as a stage flood on a portable stand or as a bank for lighting the larger cycloramas.

AUDITORIUM LIGHTING

All forms of dramatic presentation today use artificial lighting as an essential component. The stage lighting fulfils the need to reveal just as much as the production demands, to high-light this and soft pedal that, and to provide atmosphere. It follows that the hall and stage must be fitted with effective and rapid means to exclude daylight when required. For a building devoted exclusively to theatre provision for day-lighting is unnecessary. The intensity of the auditorium decorative and general illumination must be in scale with the stage lighting. Where, as in a multi-purpose hall, a level of light suitable for school activities (indoor sports and exhibitions) is installed, this must be capable of modification to a level of light suitable for dramatic purposes. There are two reasons for this. The first is that the lighting level of the auditorium sets the standard against which the stage pictures will be judged. A bright auditorium will require imitation daylight intensities on the stage far higher than a limited budget stage lighting installation can achieve. The second reason is that theatre-going, whether professional or amateur, demands a sense of occasion

and atmosphere which can only be achieved by low level rather patchy tungsten lighting. The blaze of revealing fluorescent illumination appropriate to a workshop or gymnasium is the very antithesis of what is welcomed by members of an audience, no matter what their sex or age. In a multi-purpose auditorium therefore two kinds of light for illumination and for atmosphere, respectively, must be installed. The latter circuit(s) should be wired to a dimmer.

LOCATION OF EQUIPMENT

The three schemes illustrated on pages 20–25 show plan and section of a stage of minimum recommended dimensions together with schedules of the essential equipment. The equipment indicated is by no means lavish and a producer who wishes to use light effectively will probably require additional units. Provision should be made, therefore, for the temporary installation of lanterns that would be hired or borrowed for particular productions.

In the following paragraphs the various lighting positions and the functions of the different lighting units are examined.

(1) Front of House Spots

The object is to provide lighting from above, over the whole of the forestage and extending up-stage until it meets the area lit from the No. 1 Barrel position. Spill of light on any part of the proscenium front must be avoided and for that reason flood lanterns are unsuitable. The spot lanterns should be so placed and focused that they will adequately light an actor standing near to the front edge of the stage. The best positions are on the side walls if there is sufficient height to permit the beams of light to be directed diagonally, thus avoiding shadows on the background. An angle of from 35° to 45° from the horizontal is usually the most satisfactory. Two spots from each side are essential, one being lower to help correct facial shadows. If only two spots can be provided at each side initially, it is important that provision should be made for the additional lanterns. Access to Spotlights for focusing, etc., is essential and it must be possible for the man doing this to see where he is directing the light.

The most suitable lantern for F.O.H. positions is the Profile Spot and for the smaller stages, the Patt. 23 Spot illustrated in Fig. 7 is now accepted universally as ideal for the purpose. A model is available (Patt. 23/S) with built-in framing shutters which is particularly convenient when funds allow the small extra cost.

(2) Footlights

The customary misuse of footlights is to treat them as a main source of illumination instead of a very subsidiary one. Indeed, they can be dispensed with when necessary to reduce costs. Their chief

value is to correct unwanted shadows caused by the top-lighting. If economy is essential, the footlights should be the first sacrifice. If they are installed, they must be correctly fixed; as the lamp-filament should be level with the stage-floor a projection above that level is unavoidable. It is an advantage if the footlight can be stored in a trough with removable cover (drawing on request). As footlights in the conventional position are a disadvantage when a cyclorama is used, plugs and wiring should be so arranged that the footlight units may be transferred to the base of the cyclorama. Used in this position they are known as a cyclorama groundrow.

(3) **No. 1 Lighting Barrel (Pipe)**

This should be situated as close as possible to the inside of the proscenium wall. It is the most important of the lighting positions on the stage proper. There should be provision for both diffused and directional lighting (Fig. 11). A compartment batten (borderlight) will provide diffused lighting but it has limited flexibility. It can only be varied by the degree of tilt and for that reason individual floods are more suitable. On the very small stage a number of Patt. 137 Junior Floods (which are virtually separate batten sections) are better than a large number of rigid compartments. When floods are used for large stages they should be Patt. 60s with 300- or 500-watt lamps.

The most important units used in this position are the spot lanterns, and if sufficient of these are used, the diffused lighting from flooding equipment could be dispensed with. The best compromise is a combination of soft-edged spots and individual floods. Fig. 6 shows the type of spot most suited to this position.

The wiring to the lantern positions must terminate in socket-outlets or plug connectors, to enable the individual units to be moved about to suit the needs of varying productions and even if all the lanterns required cannot be supplied initially, the wiring and plugs should be provided.

(4) **Intermediate Lighting Barrels**

The number required depends on the depth of the stage and the number of borders necessary (see Section I, para. (8)). It is necessary to be able to flood the rear curtains or scenery with an even spread of light and in some cases a compartment batten is the apparatus best suited to the purpose. This lighting should remove any shadows caused by the front borders interrupting the light from the No. 1 Batten, and any other intermediate batten. It is a great advantage to be able to fix individual spots or floods in intermediate batten positions.

(5) **Cyclorama Lighting**

The top of the cyclorama can be lit either by floods or a compartment batten. Normally, two or three separate colour circuits are required and there should be an even overall spread of light from any one circuit. Unless the equipment can be placed at least

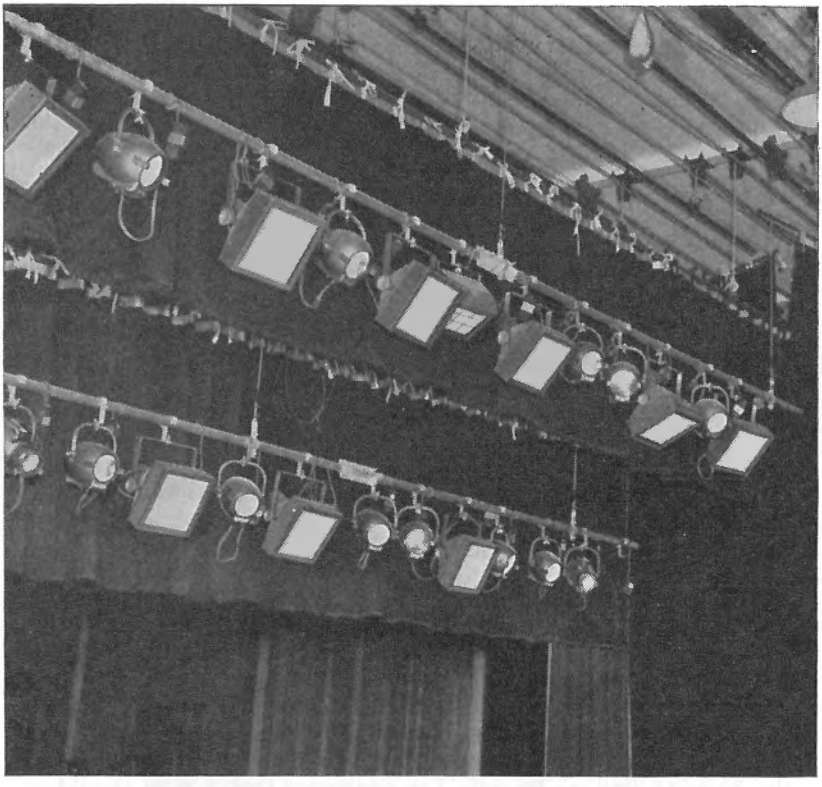


FIG. 11. *Stage lighting at the Hebburn Technical College, Durham.*

8 ft. from the cyclorama, flood lanterns would not be entirely satisfactory; the reflector type compartment batten (borderlight) can be used much closer to the cyclorama but a distance of at least 4 ft. is desirable if there is to be a smooth spread of light and mixture of the colours.

A footlight type of unit or a version with special mountings known as a groundrow normally provides lighting for the base of the cyclorama, and, as stated in para. (2) of this section, the footlight often serves the dual purpose if plugs are wired in parallel at the front and rear of the stage. In some cases the horizon lighting for sunset and sunrise effects can be obtained from individual floods at stage level, and if it is an economic necessity to restrict the purchase of equipment, plugs should be available so that a hired or borrowed groundrow can be used when there is a need for it.

(6) **Portable Equipment**

In almost every production it is necessary to light the off-stage area independently of the acting area. The backings of windows,

doors, arches—in fact any part of rear or wing space that is seen from the auditorium—must be illuminated. It is necessary, therefore, for some equipment to be available for this purpose. The 500-watt Wing Flood (Patt. 60) and the 200-watt Junior Flood (Patt. 137) mounted on telescopic stands are the most popular units; Fresnel Spots in the Patt. 223, 1,000-watt and in the Patt. 123, 500-watt sizes, are also used in off-stage positions, particularly when it is necessary to direct strong beams of light (e.g. sunlight or moonlight) through windows or other openings.

(7) **Stage Plugs and Sockets (Floor Pockets)**

Plug-sockets should be provided for the portable equipment, such sockets being permanently wired to the control board. The sockets are usually distributed about the stage floor and on the fly gallery. The stage-floor socket outlets are known as " Dips " and should be below stage level, with flush-fitting hinged metal covers known as " Traps ". If a stage floor of concrete is planned, the positions of stage dips should be fixed and detailed measurements obtained before the floor is laid. Provision must be made for the sockets and the wiring to them.

Stage-dips should be as numerous as possible. To economise in dimmer-ways it is usual to wire such plugs in pairs. It is recommended that four two-way dips should be regarded as a minimum, two on each side wired in pairs up-and-down stage: thus, the eight plugs would have four control circuits.

Where a fly gallery is provided all the suspended lighting equipment should be connected through plugs and sockets mounted on the fly gallery rail. These sockets are known as Fly Plugs.

In Great Britain the standard socket outlet for stage work is the 3-pin 15-amp. to BS 546. The connector that is used should be to the heavier BS. spec 1778. For really small stages the 5-amp. 3-pin to B.S. 368 may be appropriate. On no account should the 13-amp. size be used on the stage because a ring main has no place on a stage. Other countries will of course follow their own electrical practice but the merits of a single size interchangeable throughout the stage should always be borne in mind.

(8) **Fixing Gear for Lighting Equipment**

(*a*) Batten Suspension. As stated in Section II, para. (3), the suspension lines from the grid should be flexible-steel cable. These lines are usually attached to chain-bridles which are secured to a length of gas or alloy barrel (2-in. outside dia.). The compartment batten is fixed to the barrel by its special bracket-arms; spots and floods are fixed by means of hook type barrel-clamps.

If only a limited height is available above stage, the battens or junior type internally wired barrels may be fixed directly to the ceiling by means of special saddles. As fixed battens avoid the use of flexible multicore cables it is a useful means of economising.

(*b*) Wall-brackets. For the F.O.H. positions in particular, it

is usually necessary to provide special swivel-arm brackets to which the spots can be safely fixed. If required, the swivel-arms can be removable from the wall-plate; this suits those who do not like to see the spot lanterns in position when the stage is not in use.

(9) **Stage Control Board**

It is now generally recognised that for the smallest of stages, some provision must be made for varying the intensity of the lighting circuits to any degree between full-up and black-out. Ideally, there should be a dimmer in each circuit but for economic reasons the ideal may have to be sacrificed. The cost of the board is considerably affected by the type and number of dimmers used and the method of controlling them.

In the case of an installation involving more than about 36 dimmers, it is advisable to consider one of the several forms of remote control. Fig. 14 shows a typical remote control desk.

For the small stage, the types of board recommended for consideration are the following:

(*a*) Junior Board (Fig. 12.). This is a simple, inexpensive control designed by Strand Electric to ensure that all halls, however restricted the budget, would have a switchboard on which the common types of lighting change required in theatre production could be carried out. Originally introduced in 1950, since when several thousand have been installed, it has recently been entirely redesigned (1962) from the circuit up to give facilities appropriate to the style of lighting today. The basic principle allows the dimmers to be shared out among a large number of circuits. The standard unit has 8 circuits, 4 dimmers, the minimum possible for effective stage lighting. Additional units added initially or later cover 16 or 24 circuits. These circuits terminate in socket outlets which by " patching " further increase the lighting controlled by allowing alternatives to be connected. The new Junior 8 circuit allows each circuit to be switched " off ", to a dimmer, or to live. When required, as for a general fade, *all circuits can be switched over to dim simultaneously.* The Junior 8 will be found particularly suitable where costs have to be kept to an absolute minimum and or where it is required to demount and move the control when the hall is used for other purposes. The control can be carried by one man and stowed in a car boot.

(*b*) Junior Sunset Board (Fig. 13). This incorporates a back of board Sunset resistance dimmer operated by a link from a handle in front. The handles are carried on shafts and can be screwed down to them for master operation from capstan wheels at one end. It is usual to supply a dimmer to each circuit but a type known as the Junior Interlock which incorporates the Junior board circuit above can be supplied.

(*c*) Saturable Reactor Control. In this case the dimmers are

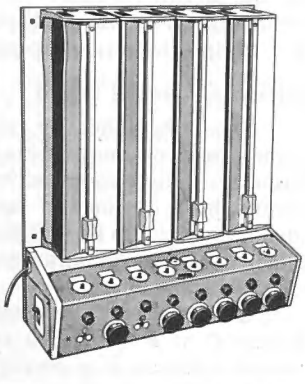
FIG. 12. *Junior 8 Control Board using slider dimmers.*

FIG. 13. *Junior Sunset Control Board JSN/24.*

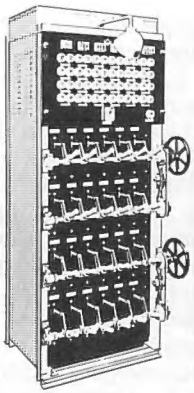
FIG. 14. *Saturable Reactor Remote Control Panel.*

FIG. 15. *Saturable Reactor Remote Control Desk with preset.*

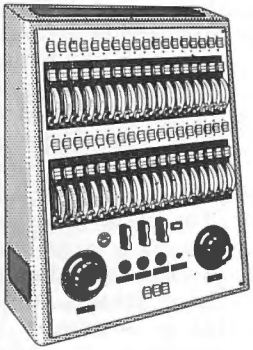
FIG. 16. *Saturable Reactor Dimmer Rack.*



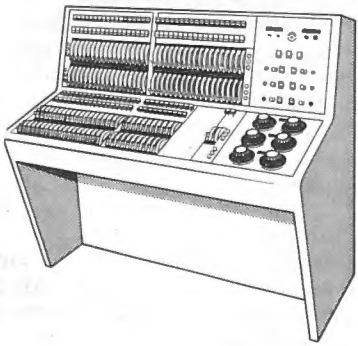
12



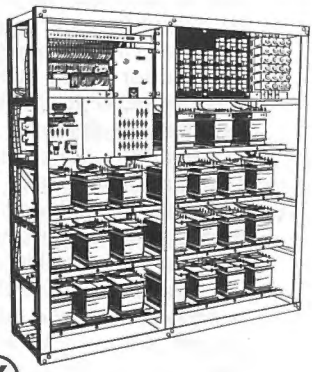
13



14



15



16

mounted on racks (Fig. 16) and will not take up space in the stage area. The dimmers are operated remotely from small levers which form a very compact control panel which can be wall mounting (Fig. 14) or floor mounting. Greatly improved control results and the panel can be sited to give the operator a good view of the stage. More elaborate forms can provide presetting, i.e. the ability to set the next change in advance without interference with the lighting in use. One of these (System LC) is shown in Fig. 15. Both systems SR and LC are fully described with all technical details and dimensions in Strand booklets (on application).

It is necessary that sufficient space is allowed for the board in the initial planning. The following sizes should be taken into account bearing in mind that at least 2 ft. 6 in. should be left clear for the operator in front of boards, and in the case of the Junior Interlock Sunset boards, another 18 in. behind for maintenance purposes.

(10) Electrical Mains Supply

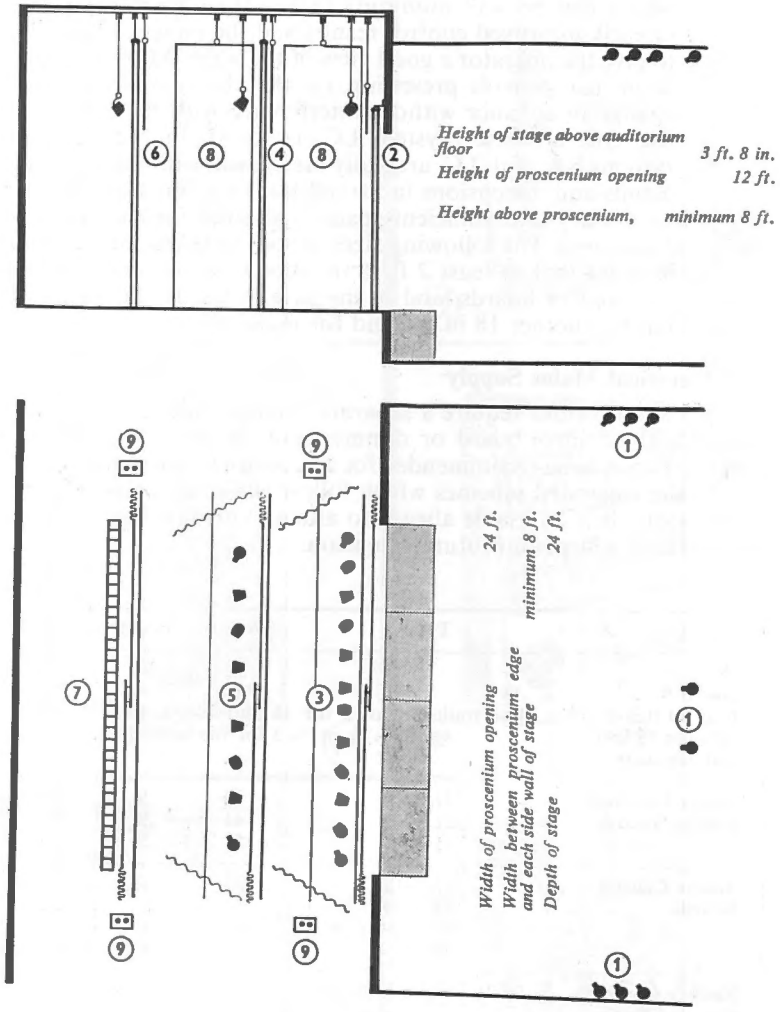
Most authorities require a separate isolator switch on the wall alongside the control board or dimmer rack in the case of remote control. This is to be recommended for all control systems in any case.

In the suggested schemes which follow the total loads are given in kilowatts. It is advisable always to allow a current capacity in the mains which will permit future extension.

	Type		Width	Depth	Height
			in.	in.	in.
Junior 8 Control Board (Weight 58 lbs) with dimmers	**J8**		25	9	28
	Use multiples of 8 for 16 and 24 circuits. Multiply width × 2, or × 3 for the latter two.				
Junior Interlock Control Boards	JI/20		36	28	73
	JI/24		41	28	73
	JI/30		51	28	73
Sunset Control Boards	JS/N18		38	38	78
	JS/N24		38	38	87
	JS/W24		46	40	78
	JS/W32		46	40	87
Remote Control System SR	CCR/18	Cabinet	29	12	28
		Rack	45	19	66
	CCR/24/S	Cabinet	29	13	38
		Rack	64	19	66
	CCR/36/S	Cabinet	29	13	38
		Racks (2)	45	19	66
Preset Control	LCCR/48	Cabinet or	36	16	72
		Desk	44	30	50½
		Racks (2)	64	19	66

SCHEME A

Stage of the minimum recommended dimensions and equipment



Patt. 23/S 500-watt Mirror (Profile) Spot (Fig. 7 page 11)

Patt. 123 500-watt Fresnel Spot (Fig. 6 page 11)

Patt. 137 200-watt Flood (Fig. 9 page 11)

Compartment Batten (Borderlight) (Fig. 10 page 11)

2-way Stage Dip Trap (Floor Pocket)

(1) FRONT OF HOUSE SPOTS. 8 circuits

8 Patt. 23/S 500-watt Mirror Spots with built-in adjustable shutters.
8 Ref. 374 Diffuser Glasses.
8 Ref. 367 Ceiling Plates or Ref. 247 Swivel Arm Wall Brackets.

(2) MAIN TABS & PROSCENIUM BORDER

1 " Hall " Curtain Track No. 292/L with twin-wheeled runners, cable operated.
1 " Hall " manually operated Winch No. 251, wall mounting.
1 Pair trailer curtains, made from No. 305 Quality Cotton Velour.
1 Border curtain, made from dyed cotton twill.

(3) No. 1. LIGHTING BARREL (PIPE). 8 circuits

5 Patt. 123 500-watt Fresnel Spots.
2 Patt. 23/S 500-watt Mirror Spots and ref. 374 Diffuser Glasses.
5 Patt. 137 200-watt Floods (1 circuit). 5—ref. 245 Masking Hoods.
12 Ref. 483 Hook Clamps and a ref. 433 12-way 24 ft. Internally Wired Barrel.*

(4) No. 1. BORDER & No. 1 TRAILERS

1 Border curtain, made from dyed cotton twill.
1 " Hall " Curtain Track No. 220/L with sliding bobbins, cord operated.
1 Pair trailer curtains, made from dyed cotton twill.

(5) No. 2. LIGHTING BARREL (PIPE). 5 circuits

2 Patt. 123 500-watt Fresnel Spots.
2 Patt. 23/S 500-watt Mirror Spots and ref. 374 Diffuser Glasses.
4 Patt. 137 200-watt Floods (1 circuit). 4—ref. 245 Masking Hoods.
8 Ref. 483 Hook Clamps and a ref. 431 8-way 22 ft. Internally Wired Barrel.*

(6) No. 2. BORDER & No. 2. TRAILERS

1 Border curtain, made from dyed cotton twill.
1 " Hall " Curtain Track No. 220/L with sliding bobbins, cord operated.
1 Pair trailer curtains, made from dyed cotton twill.

(7) CYCLORAMA LIGHTING BATTEN. 3 circuits

4 Ref. SB/63 6 ft. sections of Batten with 1 circuit of 10 × 100-watt compartments and 2 circuits of 11 × 150-watt compartments; also 26 ft. Ref. 25 Gas Barrel.

(8) LEG CURTAINS

4 " Hall " Swivel Curtain Arms, barrel fixing.
4 Single leg curtains, made from dyed cotton twill.

(9) PORTABLE & STAGE DIPS (POCKETS). 4 circuits

2 Patt. 60 500-watt Floods.
2 Patt. 123 500-watt Fresnel Spots and ref. 132 Barndoor Attachment.
4 Ref. 66 Telescopic Stands and ref. 484 spigots.
4 Ref. 190 2-way Stage Traps. (2 circuits each side, looped up-and-down stage.)

SUSPENSION GEAR

7 Sets (minimum) of rope line suspension consisting of girder fixing pulleys, barrels, ropes and cleats.
3 Sets of cable suspension for lighting barrels, consisting of girder fixing pulleys, flexible steel cable and self-sustaining winches.

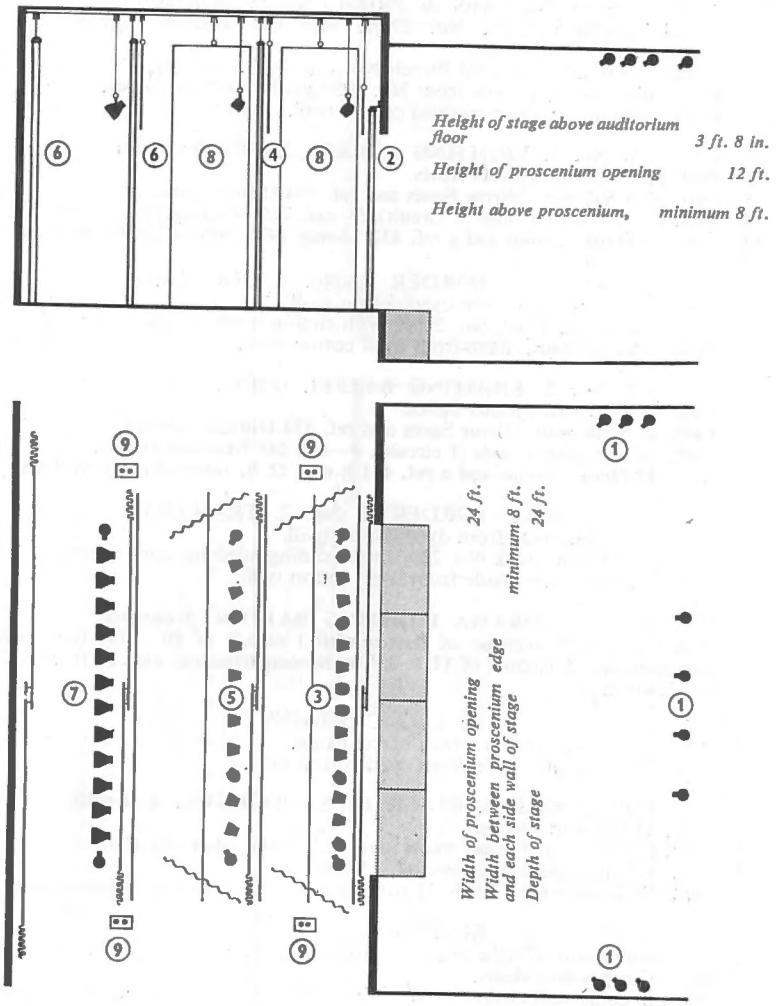
DIMMER BOARD 28 lighting circuits. Total 20 kW

1 Type J.I/30 Junior Interlock dimmer board with 28 circuits sharing fourteen 500/1,000-watt Sunset dimmers and two 1,000/2,000-watt dimmer circuits. Switchover allows all control circuits to be dimmed simultaneously. Plugs and sockets allow patching.

** In Canada a separate trunking attached to the pipe is preferred to internally wired barrel.*

SCHEME B

Stage for an amateur Little Theatre or college which, although lacking many of the desirable facilities of a larger professional theatre, would be handicapped seriously if only the minimum equipment were installed



Patt. 23/S or Patt. 263 Mirror (Profile) Spot (page 11)

Patt. 123 500-watt Fresnel Spot (Fig. 6 page 11)

Patt. 137 200-watt Flood (Fig. 9 page 11)

Patt. 60 500-watt Flood

2-way Stage Dip Trap (Floor Pocket)

(1) FRONT OF HOUSE SPOTS. 10 circuits

10 Patt. 263 1,000-watt Profile Spots with built-in adjustable shutters.
10 Ref. 374 Diffuser Glasses.
10 Ref. 367 Ceiling Plates or Ref. 247 Swivel Arm Wall Brackets.

(2) MAIN TABS & PROSCENIUM BORDER

1 " Hall " Curtain Track No. 292/L with twin-wheeled runners, cable operated.
1 " Hall " manually operated Winch No. 251, wall mounting.
1 Pair trailer curtains, made from No. 305 Quality Cotton Velour.
1 Border curtain, made from No. 305, Quality Cotton Velour.

(3) No. 1. LIGHTING BARREL (PIPE). 10 circuits

6 Patt. 123 500-watt Fresnel Spots.
2 Patt. 23/S 500-watt Mirror Spots and ref. 374 Diffuser Glasses.
8 Patt. 137 200-watt Floods (2 circuits). 4—ref. 245 Masking Hoods.
16 Ref. 483 Hook Clamps and a ref. 436 16-way 24 ft. Internally Wired Barrel.*

(4) No. 1. BORDER & No. 1. TRAILERS

1 Border curtain, made from No. 305 Quality Cotton Velour.
1 " Hall " Curtain Track No. 292/L with twin-wheeled runners, cord operated.
1 Pair trailer curtains, made from No. 305 Quality Cotton Velour.

(5) No. 2. LIGHTING BARREL (PIPE). 6 circuits

2 Patt. 123 500-watt Fresnel Spots.
2 Patt. 23/S 500-watt Mirror Spots and ref. 374 Diffuser Glasses.
8 Patt. 137 200-watt Floods (2 circuits). 4—ref. 245 Masking Hoods.
12 Ref. 483 Hook Clamps and a ref. 433 12-way 24 ft. Internally Wired Barrel.*

(6) No. 2. BORDER, No. 2. TRAILERS, REAR TRAILERS

1 Border curtain, made from No. 305 Quality Cotton Velour.
2 " Hall " Curtain Tracks No. 292/L with twin-wheeled runners, cord operated.
2 Pairs trailer curtains, made from No. 305 Quality Cotton Velour.

(7) CYCLORAMA LIGHTING BARREL (PIPE). 5 circuits

2 Patt. 23/S 500-watt Mirror Spots and ref. 374 Diffuser Glasses.
12 Patt. 60 500-watt Floods (3 circuits).
14 Ref. 483 Hook Clamps and a ref. 434 14-way 24 ft. Internally Wired Barrel.*

(8) LEG CURTAINS

4 " Hall " Swivel Curtains Arms, barrel fixing.
4 Single leg curtains, made from No. 305 Quality Cotton Velour.

(9) PORTABLE & STAGE DIPS (POCKETS). 4 circuits

2 Patt. 60 500-watt Floods.
2 Ref. 223 1,000-watt Fresnel Spots.
4 Ref. 66 Telescopic Stands. 2—ref. 484 spigots. 2—ref. 487 spigots.
4 Ref. 2-way Stage Traps. (2 circuits each side, looped up-and-down stage.)

SUSPENSION GEAR

20 Sets of rope line suspension consisting of girder fixing pulleys, barrels, ropes and cleats.
3 Sets of cable suspension, for lighting barrels, consisting of girder fixing pulleys, flexible steel cable and self-sustaining winches.

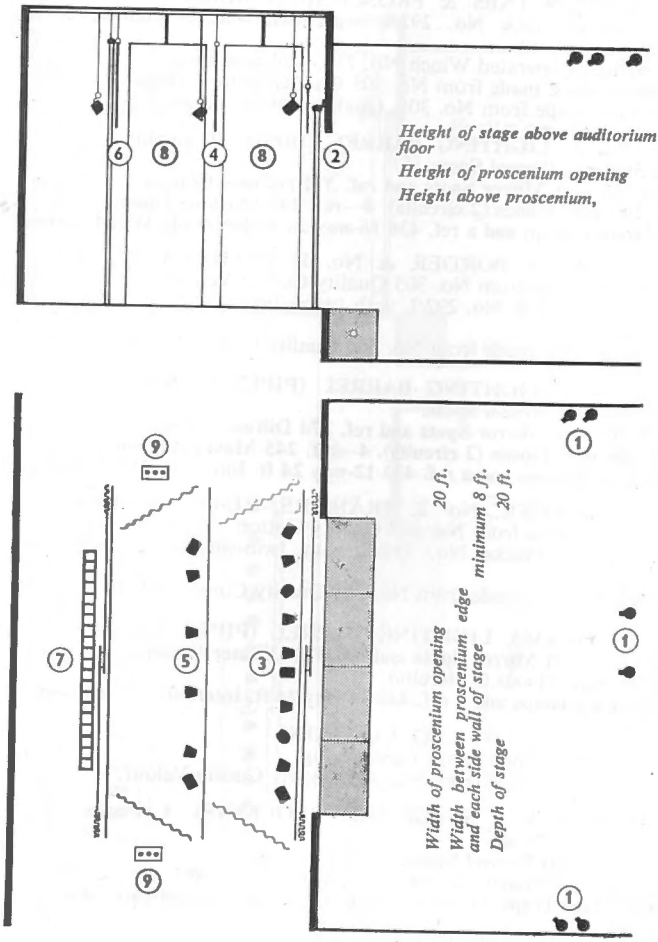
REMOTE LIGHTING CONTROL. 35 circuits. Total 30 kW

1 Type CCR/36/S System SR consisting of a 36-way (1 spare) wall mounting control cabinet (Fig. 14, page 18) and two dimmer racks (Fig. 16, page 18). 32 Ref. SR/1 1-kW and 3 ref. SR/2 2-kW Saturable Reactor dimmers will be required.

** In Canada a separate trunking attached to the pipe is preferred to internally wired barrel.*

SCHEME C

Stage of smaller practical dimensions with the equipment reduced to the basic essentials for simple productions



Patt. 23 500-watt Mirror (Profile) Spot (Fig. 7 page 11)

Patt. 45 500-watt Junior Spot (Fig. 5 page 11)

Patt. 123 500-watt Fresnel Spot (Fig. 6 page 11)

Patt. 137 200-watt Flood (Fig. 9 page 11)

Compartment Batten (Borderlight) (Fig. 10 page 11)

3-way Stage Dip Trap (Floor Pocket)

(1) FRONT OF HOUSE SPOTS. 6 circuits

6 Patt. 23 500-watt Mirror Spots and ref. 364 Adjustable Straight-edged Masks.
6 Ref. 374 Diffuser Glasses.
2 Ref. 367 Ceiling Plates. 2—ref. 238 L-shaped wall brackets for two lanterns.

(2) MAIN TABS & PROSCENIUM BORDER

1 " Hall " Curtain Track No. 220/L with sliding bobbins, cord operated.
1 Pair trailer curtains, made from No. 305 Quality Cotton Velour.
1 Border curtain, made from dyed cotton twill.

(3) No. 1 LIGHTING BARREL (PIPE). 6 circuits

3 Patt. 45 500-watt Junior Spots.
2 Patt. 123 500-watt Fresnel Spots.
5 Patt. 137 200-watt Floods (1 circuit). 5—ref. 245 Masking Hoods.
10 Ref. 483 Hook Clamps and a ref. 432 10-way 20 ft. Internally Wired Barrel.*

(4) No. 1 BORDER

1 Border curtain, made from dyed cotton twill.

(5) No. 2 LIGHTING BARREL (PIPE). 3 circuits

2 Patt. 45 500-watt Junior Spots.
4 Patt. 137 200-watt Floods (1 circuit). 4—ref. 245 Masking Hoods.
6 Ref. 483 Hook Clamps and a ref. 430 6-way 18 ft. Internally Wired Barrel.*

(6) No. 2 BORDER & REAR TRAILERS

1 Border curtain, made from dyed cotton twill.
1 " Hall " Curtain Track No. 220/L with sliding bobbins, cord operated.
1 Pair trailer curtains, made from dyed cotton twill.

(7) CYCLORAMA LIGHTING BATTEN. 2 circuits

2 Ref. SB/64 6 ft. sections and 1—ref. SB/34 3 ft. section of Batten with a total of 20 × 100-watt compartments on 2 circuits and 16 ft. ref. 25 Gas Barrel.

(8) LEG CURTAINS

4 " Hall " Swivel Curtain Arms, rigid fixing.
4 Single leg curtains, made from dyed cotton twill.

(9) PORTABLE & STAGE DIPS (POCKETS). 3 circuits

2 Patt. 60 500-watt Floods.
1 Patt. 123 500-watt Fresnel Spot and ref. 132 Barndoor Attachment.
3 Ref. 66 Telescopic Stands and ref. 484 Spigots.
2 Ref. 192 Stage Traps (3 circuits, looped across stage).

SUSPENSION GEAR

3 Barrels for border curtains. Dead-line suspension is assumed.

DIMMER BOARD. 20 lighting circuits. Total 13·5 kW

2 Junior 8 (Fig. 12, page 18) new type dimmer boards ganged together as 16 control circuits with eight 500/1,000-watt slider dimmers and switch-over to allow all control circuits to be dimmed simultaneously. Plugs and sockets to allow patching to the 20 lighting circuits.

* *In Canada a separate trunking attached to the pipe is preferred to internally wired barrel.*

SECTION IV

SPECIAL PROBLEMS

(1) The Open Platform

Many of the older schools and public halls were originally provided with platforms without any proscenium, or overhead suspension facilities. If a permanent proscenium has not been erected to enable the stage to be used for play production, the practice has been to erect what is known as a fit-up to provide the desired picture-frame, and support for borders, backcloths, lighting, etc. Some of the fit-ups in use could be more honoured in their breach of marginal safety than in the observance of basic structural principles.

The most satisfactory type of fit-up frame is constructed of welded tubular metal, and is either suspended from the ceiling or supported on vertical towers standing on the stage. The frames are made in sections so that they may be erected, dismantled and stored comparatively easily. The construction must vary according to the lengths of span involved and the nature of the support that can be provided. Such frames should be designed specially for the particular halls in which they are to be used.

The lighting equipment used on a fit-up frame is best restricted to individual spots and floods. Apart from being the most flexible type of equipment for stage lighting, they are easier to handle than lengths of compartment batten. The supply should be single-phase, unless it can be guaranteed to be under the control of somebody who is technically qualified to treat a three-phase supply with a nice regard for its lethal capacity.

(2) The Open Stage

An open stage may be an End Stage, e.g. Mermaid, London; a three-sided stage, e.g. Festival, Chichester, or a floor space in the centre of steeply tiered seats for theatre-in-the round. The problems then involved are obviously quite different from those of the conventional picture frame stage, and cannot be solved merely by omitting a proscenium from a stage. A point often forgotten is that most open stages do not take kindly to the long rectangular plan commonly used for assembly halls, a square plan is really required.

The open stage in its various forms may not justify all the claims made by those who scorn the proscenium, but it can provide interesting alternative methods of production. Each type of open stage presents its own particular problems of planning and equipment, and detailed advice will be given if required, preferably during the initial design period. Whatever the form of stage advocated its reliance on lighting is not questioned by anyone.

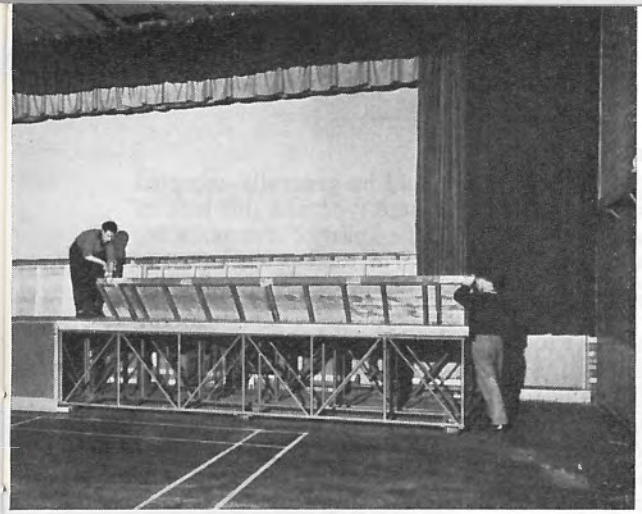


FIG. 17

The Retractable Stage is quickly and easily brought into use. This shows the main sections of the stage floor in process of being extended. The separate end-pieces between the main section and the wall which can be seen in the photograph below are fitted later if required.

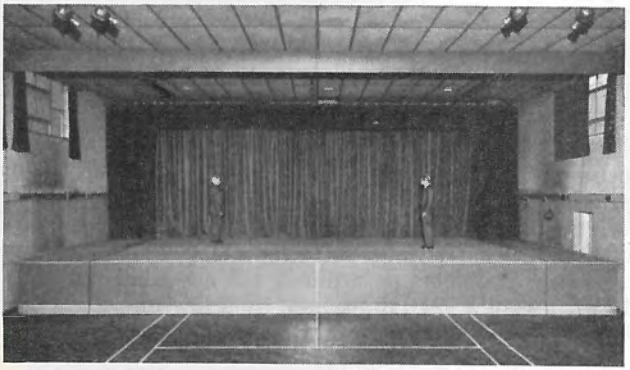


FIG. 18

Stage floor extended to permit open stage production. End-pieces shown fitted but their use is optional with the open stage.

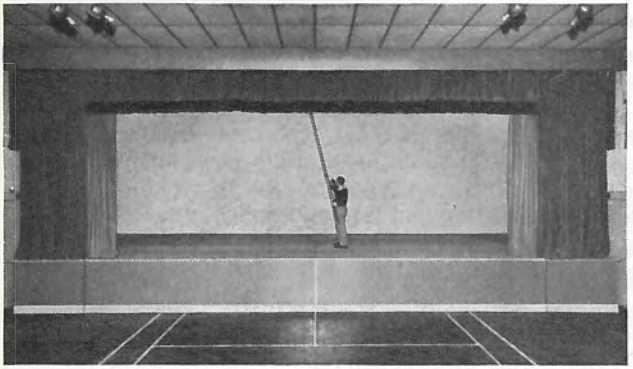


FIG. 19

Curtain tracks, draperies and lighting equipment now brought forward to make complete proscenium type of stage.

FIG. 20

Closed position of Retractable Stage in multi-purpose hall. The stage, the overhead draperies and the lighting equipment are all retractable leaving maximum free floor space for other activities.

(3) **The Retractable and Flexible Stage**

There is no one type of stage that would be generally accepted as an inevitable successor to the picture-frame type and this lack of conviction often results in a demand for " flexibility ", for planning of a stage that may be used in various forms. The type of stage illustrated on page 27 can be varied in size and used as a simple open platform, an end stage or a picture-frame stage, with or without an apron, and where the hall is wide enough a three-sided stage. It can thus provide various alternative methods of production. When a stage is not required, the whole structure can be pushed back to the wall, thus extending the floor area of the auditorium. This stage is particularly suitable for those multi-purpose halls, usually with flat floors, in which the space occupied by a permanent stage is a disadvantage for majority use. In school assembly halls the size of floor required for many purposes is too great for dramatic performances and the retractable stage reduces the auditorium to a more intimate size, but would leave the maximum free floor space available, when needed. This could reduce the overall size of the hall, and economise in cost. It could also make it possible to rake or tier part of the auditorium and still provide enough flat-floor space for the particular activities needing it.

All overhead draperies and lighting equipment, are also retracted. This system can thus provide an alternative to a fit-up frame for a permanent open platform. With the retractable stage and equipment there are no storage problems or arduous labour. The stage can be made ready for use in a very short time by a few unskilled persons. Full details of the retractable stage will be supplied by Watts & Corry Ltd., by whom it was designed.

(4) **Equipment for Existing Stages**

Owing to lack of uniformity in the size, shape and construction of stages, it is necessary to consider specifically each particular attempt to equip an old stage. In general the principles already explained in this booklet would apply, but proposals must necessarily be adjusted to meet existing conditions. The lighting equipment of such stages to a very limited budget is dealt with separately in the booklet " Stage Lighting on a Shoestring ", supplied free on application.

(5) **Planning for New Forms of Theatre**

A companion booklet with the above title deals with various forms of open stage (including theatre in the round), their planning and equipment. It is written by an enthusiast with a great deal of practical experience of these forms of production.

(6) **Advisory Service**

The assistance of experienced members of the staffs of Strand Electric and of Watts & Corry may be obtained, without charge or obligation, by architects and others who may be concerned with the planning and equipment of stages. It is of greatest benefit if the consultations take place during initial planning.

SECTION V

OPENING UP PICTURE FRAME STAGE

This section is written to assist those who have a picture frame stage with a proscenium opening and who wish to adopt a more open form of staging. The section will also help those planning a stage who, while preferring a picture-frame, feel very strongly that the time has come for a release from the tyranny of borders.

Many will be all too aware of the limitations of the stage with which we have to deal. Often there is not much depth to the stage itself and the proscenium opening is overwide and made to appear even wider due to the poor height of the opening. This height is usually made to appear worse than it is because there is a pelmet. Corresponding to the pelmet there are two or three—even more are

FIG. 21

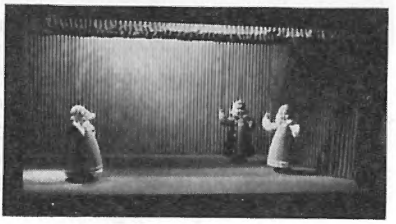


FIG. 22

not unknown—borders overhead. The sides of the stage have either a number of curtain legs to correspond to the borders, making a series of proscenium-like curtain arches up and down stage, or curtains will box in the left and right sides of the stage. Another curtain runs along the back.

What the audience sees is a complete curtain set (as in the model theatre Fig. 21) masking everywhere. This could be considered a reasonably neutral background were it not for the overhead borders which draw far too much attention to themselves stressing thereby the lack of height. They set the actor, boy or man, out of human scale in relation to his surroundings and he appears dwarfed and pressed down by the oppressive horizontal lines. They catch any overhead lighting, indeed a lot of people go out of their way to light the borders. This may have been logical when this was scenery painted to represent intertwining leafy branches of trees but a good rule for lighting curtain borders is ' don't '. However the borders will still be prominent on the kind of stage we are considering and this is because the audience on a flat floor with a high stage (to give some semblance of sight lines) must tend to look upwards. Fig. 22 shows the improvement when seated in a position equivalent to the front row of a theatre dress circle. The floor, hardly seen in Fig. 21, becomes all important. This is appropriate because the relationship of the actors one to another and to what they stand on is important, the floor should never be neutral.

It will be found in investigating the various forms of open stage advocated today that the stage is always intended to be low and the audience seating is stepped high to enable them to look down on it. However in the present case it is assumed that the stage is already high and unless it is the actors cannot be seen thereon. Inevitably the eye is going to wander aloft and to the borders so the only way to make them invisible is to take them very high or away altogether. As in most cases there is insufficient height and the leg curtains are too short anyway it will have to be the latter.

The absence of borders presents a problem because the eye still wanders in that direction and will see curtain tracks and lighting. It is all very well leaving such things in view at the Mermaid theatre and for " Oliver " at the New theatre, but in those cases the equipment hangs high up. In the present scale one will be all too aware of an untidy distracting mess hanging near the actors' heads. The borders have to be replaced by something and the best solution seems to be a false ceiling. A complete ceiling would be a nuisance as it would prevent the hanging of lighting and curtain tracks anywhere except down- and perhaps up-stage. If however the ceiling takes the form of the two angled sections which appear in Scheme D there is no difficulty in hanging curtains or lighting at half stage. These ceiling baffiles do not have to extend to the full width of the stage and the result is as shown in Fig. 23. The ceiling pieces can be frames covered with material without folds, or they could be made of hardboard. If of this latter material it may be found appropriate to paint them dark grey, or even to leave them natural in colour. It is not intended that they should form any part of realistic scenery. They are frankly view

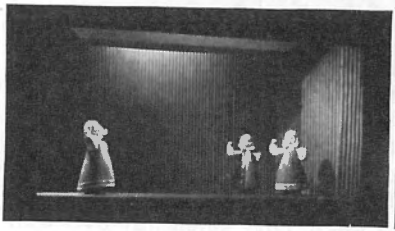


FIG. 23

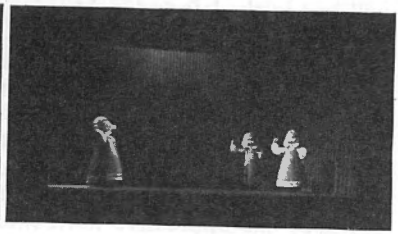


FIG. 24

limiters and are quite neutral. In Fig. 23 they are painted white, but this is to make them show up in the photograph, they are by nature retiring and neutral as Fig. 24 where they are grey shows.

Finishing the ceiling pieces well clear of the leg curtains allows these to be pivoted and the curtains can be light in colour on one side and black on the other. The actual roof of the hall over the stage and the rest of the equipment there should be painted flat black and no light allowed to stray. The lighting of the stage itself will come from spotlights as it will have to be localised (see Scheme D).

Once there is really neutral masking such as has been described

and the lighting can be localised to just those areas to which attention needs to be directed the whole question of decor can be approached on a different basis. Scenery as hitherto, exists in large part to mask the edges of the stage and such scenery tends to be designed from the *edges inwards*. Once the problem of masking is ignored scenery can be designed from the *centre outwards* and restricted to just those pieces (Fig. 25) essential to set locale, scale or whatever. Even where the play is a drawing-room comedy and needs a box set the present suggestions will be found helpful. The box set is constructed of flats only 8 ft. high. This cut-down scenery, as it is called, is easier to make and of course much easier to strike where a scene change is necessary. It can be as naturalistic as one wishes and yet the total absence of scenery above the 8 ft. line is readily accepted. Two things help the conversion, the neutral masking of the stage and the lighting concentrated in the scenic area.

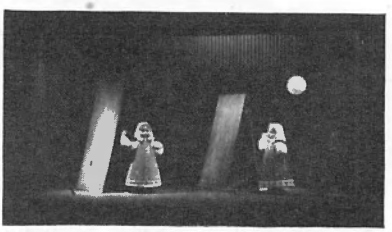


FIG. 25

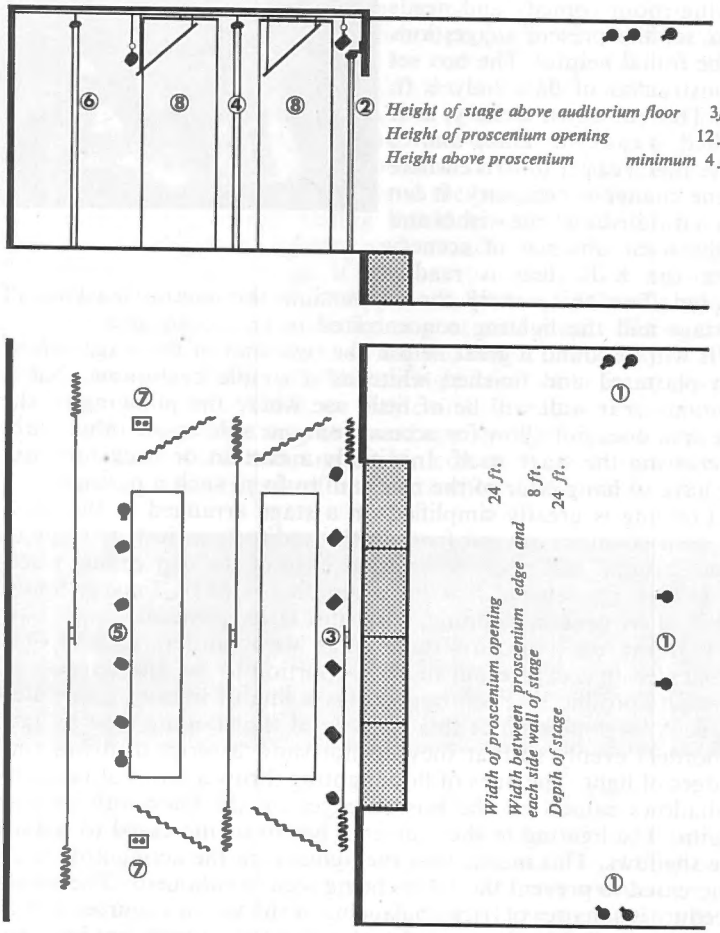
It will be found a great help if the rear wall of the stage can be plain plastered and finished white as a simple cyclorama, but a cyclorama rear wall will be of little use where the planning of the stage area does not allow for access from one side to the other without crossing the stage itself. Inevitably a curtain or backcloth will then have to hang clear of the rear wall to form such a passage.

Lighting is greatly simplified on a stage arranged in this way. The main positions are out front in the auditorium, just up-stage of the proscenium and over the up stage edge of the rear ceiling piece. It is part of the scheme that the cyclorama is lit by Fresnel Spots, instead of by general flooding, from this latter position.

Lighting on a picture-frame stage with borders can become complicated to a degree out of all proportion to the effectiveness of the results produced. Each border has a line of lighting associated with it. A large portion of this must be of the flooding type to light the borders evenly so that they do not show a series of distracting splodges of light. The lines of floodlighting throw a series of horizontal shadows caused by the border edges on the backcloth or rear curtains. The lighting in the rear area has to be increased to reduce these shadows. This means that the lighting on the acting area must be increased to prevent the actors being seen in silhouette. The whole procedure is a matter of tricky balancing of the various sources and to what purpose? Merely to light the borders. Once borders are removed and replaced by something such as a ceiling, which merely catches light diffused from the stage, lighting can then be re-assessed. What is the lighting there for? Primarily to light the actor so that he can be seen and to provide the atmosphere in which, for that particular time in that particular play, he has to live.

SCHEME D

The lighting layout below has been designed to contrast with the orthodox stage of legs and borders shown in scheme C on pages 24 and 25. It should be noted that the proposed non-masking scenic set-up requires a layout of wholly adjustable lighting units. Thus there is no flooding of any kind, all sources being spotlights of one type or another. Even where a cyclorama, back wall or a plain backcloth is used it would not be the intention to light this evenly but to create a pool of light from one or two soft edge spots behind the main centre of interest.



Patt. 23 500-watt Mirror (Profile) Spot (Fig. 7 page 11)

Patt. 45 500-watt Junior Spot (Fig. 5 page 11)

Patt. 123 500-watt Fresnel Spot (Fig. 6 page 11)

2-way Stage Dip Trap (Floor Pocket)

(1) FRONT OF HOUSE SPOTS. 6 circuits

6 Patt. 23 500-watt Mirror Spots.
6 Ref. 364 Adjustable Straight-edged Masks. 6 ref. 374 Diffuser Glasses.
2 Ref. 367 Ceiling Plates. 2 ref. 238 L-shaped wall brackets for two lanterns.

(2) MAIN TABS

1 " Hall " Curtain Track No. 220/L, with sliding bobbins, cord operated.
1 Pair trailer curtains, made from No. 305 Quality Cotton Velour.

(3) No. 1 LIGHTING BARREL (PIPE). 6 circuits

4 Patt. 45 500-watt Junior Spots.
2 Patt. 123 500-watt Fresnel Spots.
6 Ref. 483 Hook Clamps and a ref. 430 6-way 24 ft. Internally Wired Barrel.*

(4) No. 1 TRAILERS

1 " Hall " Curtain Track No. 220/L with sliding bobbins, cord operated.
1 Pair trailer curtains, made from No. 305 Quality Cotton Velour.

(5) No. 2 LIGHTING BARREL (PIPE). 4 circuits

4 Patt. 123 500-watt Fresnel Spots (2 circuits).
2 Patt. 23 500-watt Mirror Spots.
2 Ref. 364 Adjustable Straight-edged Masks. 2 ref. 374 Diffuser Glasses.
6 Ref. 483 Hook Clamps and a ref. 430 6-way 18 ft. Internally Wired Barrel.*

(6) REAR TRAILER

1 " Hall " Curtain Track No. 220/L with slding bobbins, cord operated.
1 Pair trailer curtains, made from No. 305 Quality Cotton Velour.

(7) PORTABLE AND STAGE DIPS (POCKETS). 2 circuits

2 Patt. 60 500-watt Floods.
1 Patt. 123 500-watt Fresnel Spot and ref. 132 Barndoor Attachment.
3 Ref. 66 Telescopic Stands and ref. 484 Spigots.
2 Ref. 190 Stage Traps. (2 circuits, looped across stage).

(8) LEG CURTAINS AND CEILING MASKS

4 " Hall " Swivel Curtain Arms, rigid fixing.
4 Single Leg Curtains, made from dyed cotton twill.
2 Ceiling Masks.

SUSPENSION

Rigid fixing and dead-line suspension is assumed.

DIMMER BOARD. 18 lighting circuits. Total 11 kW.

2 Junior 8 (Fig. 12, page 18) new type dimmer boards ganged together as 16 control circuits with eight 500/1,000-watt slider dimmers and switch-over to allow all control circuits to be dimmed simultaneously. Plugs and sockets to allow patching to the 18 lighting circuits.

**In Canada a separate trunking attached to the pipe is preferred to internally wired barrel.*

THE STRAND ELECTRIC & ENGINEERING CO. LTD.

29 KING STREET, COVENT GARDEN

LONDON, W.C.2.

Telephone: TEMple Bar 4444

Strand Electric (Australia) Pty. Ltd.
212 Graham Street
Port Melbourne
Victoria

Strand Electric Limited
261 Davenport Road
Toronto
Ontario

5M.79.562.