



The trellis

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Topic: Educational Lighting Site

Plan of the trellis Fire-prevention measures Project considerations

Almost all the movements to create scenic effects take place on the trellis

One of the fundamental technical areas of a stage is the trellis. By trellis we mean the trafficable level located on the stage tower above the stage at approximately two metres from the covering, used for the organization of the controls and the movements necessary for stage effects. This level is structured so as to make possible the positioning and the clamping of the suspension ropes of the scenes and of the technical equipments suspended above the stage. The trellis must allow the positioning of individual or grouped pulleys for the sliding of metal ropes, of the reels for hemp ropes, of the electrical motors and of the devices that are necessary from time to time to set up the scenic effects. The trellis must also allow to move the installed equipments easily and rapidly and to adjust the disposition of the scenes pulls of the planned performance.

The trellis level

The trellis level comprises a series of parallel rafters placed in parallel with the proscenium and distanced between in order to create a trafficable level with a continuous series of fissures through which the ropes are lowered. The fissures, called cuts, must be as narrow as possible to contain the highest number of fissures (and thus of controls) and must also allow the insertion of groups of pulley, while the rafters must have dimensions that guarantee the required capacity and an easy practicability. The trellis that is traditionally used in small- and medium-sized theatres is the one described above in which the ropes slide and are shifted by pulleys and reels fixed on the shafters of the trellis. This trellis is normally placed at about 1.80 m from the covering in order to allow the technicians to walk on it easily thus exploiting to the maximum the height of the stage tower. Only wood was used in the past. Today, steel girders are used for the load-bearing structure and wooden or steel (or mixed) rafters for the walkable trellis. The dimensions of the main girders guarantee a capacity of the finished trellis of about 350 Kg/Sq m. they are perpendicular to the proscenium with a centre distance of approximately 2 m since the girders next to the side walls must also support the load represented by the vertical return of the scenic pulls. When positioning these terminal girders it is indispensable to take into consideration the necessity of allowing the lowering of the ropes to the winches, to the counterweighted pulls or simply to the control platforms.

Fire prevention measures

In the past rafters were made of wood, this meant that it was possible to fix the pulleys and the reels rapidly with nails and to remove them just as easily. Following the sadly famous fire of the Statuto cinema and the consequent tightening of regulations and inspections of

public premises, all wooden structures were condemned thus accelerating the introduction in theatres of metal trellises. Steel staves are easily welded on metal support girders and thus rapidly installed and do not require the maintenance required by a wooden trellis. However, they present many disadvantages compared to wooden staves. First of all, they make the fitting up less flexible: since it is not possible to nail the equipments it is indispensable that these rafters have button-holes on the higher side and that all the equipments that are to be fixed on the trellis are specifically made for this trellis and that are either equipped with pins in order to be able to rapidly fix them on the trellis or with holes to fix them to the trellis with bolts. Another disadvantage of the metal trellis is the natural slipperiness of the metal surface, which makes it dangerous for the technicians who often have to work on the trellis in the dark. This condition, however, can be avoided with anti-slip treatments on the treaded surface. One of the aspects of the metal trellis that cannot be remedied is the noise made by the technicians which, on the other hand, was absorbed by the wood and which obliges the technicians to pay a lot of attention to their movements during the shows. In some cases a compromise has been sought by using metal sections with a wooden insertion which also makes it possible to use nails for the fitting up; naturally it is a more expensive solution and justified only from a psychological and not technical point of view, because if the equipments are adequate there is no need to use nails. For bigger stages equipped with mechanical lifting systems the trellis is undoubled into a walkable trellis and a countertrellis placed about 1.80 m above the trellis. The countertrellis is not a real trellis, but is made of a series of girders orthogonal to the proscenium to which are fixed groups of pulleys for the return of the motorized pulls. In this way the walkable level is not crossed by ropes at foot level (certainly a dangerous element), but by ropes that are lowered vertically. With this solution the calculation of the countertrellis can be made with precision because the loads on the motorized pulls and the exact position of the groups of pulleys are known, while the walkable trellis will not have to consider overloads, only slight pulls. For this reason, with completely motorized stages, the walkable level of the trellis is generally replaced by a grid that allows the passage of the ropes that are lowered from the countertrellis and the trellis is made more comfortable and safely practicable by the technicians.

Project considerations

The design of the trellis must take into consideration the necessity of including an uncoverable area with a trapdoor in order to facilitating the lifting on the trellis of the motors and the other equipments installed on the trellis, both for their installation and for their subsequent maintenance. It is also indispensable to include protection parapets along the whole perimeter of the trellis and possibly two access staircases at the to extremes provided with gates. The trellis must be considered a machine and as such must be duly protected and maintained. The trellis is often considered a technical area where the machinery are installed, but if that was the case, it would be indispensable to protect not only the installed machine but also all the moving appliances, such as pulleys and ropes, which is practically impossible. When the trellis is considered as a whole a machine then the access to moving devices must be prohibited and the regulations related to machines and their protection must be implemented by prearranging the prescribed protective measures.

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