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⑤④ **Lighting bar.**

⑤⑦ A lighting bar for supporting theatre of studio lights has an element of C-section with strengthening elements engaged at spaced intervals within the opening of the C-section to provide increased rigidity.

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This invention relates to lighting bars for use in the suspension of lights in theatres, studios and the like.

It is conventional to mount theatre or studio lights from a lighting bar which is suspended horizontally from the roof or which forms part of a two dimensional grid. Typically, the lighting bar is of C-section and the electrical wiring for the lighting runs within the bar. Electrical sockets are mounted at appropriate intervals to the longitudinal opening within the bar and, between these sockets, the opening is protected by a cover strip. The lighting bar may be formed of aluminium to reduce weight but must of course have the necessary strength to support the weight of a number of lights. It will be recognised that whilst the C-section has the considerable advantage of enabling sockets to be wired in at any point in the length of the bar, the shape is inherently much less rigid than a hollow cylinder of comparable weight. For a given rating in terms of the number of lights that can be supported by the bar, a thicker and heavier section would normally be required, as compared with a hollow cylinder.

It is one object of the present invention to provide an improved lighting bar which is of increased rigidity.

Accordingly, the present invention consists in a lighting bar for use in the suspension of lights in theatres, studios and the like, comprising an elongate support element generally of C-section defining a longitudinal opening, and a cover strip engagable with the support element to cover said opening, characterised in that there are further provided a plurality of strengthening elements removably engagable with the support element at spaced intervals, each strengthening element being an interference fit within the opening so as to resist flexure of the support element tending to close said opening.

Advantageously, the rigidity elements are inserted within the opening through local flexure of the support element.

Preferably, each rigidity element has surfaces abutting, respectively, radially inwardly and outwardly directed surfaces of the support element.

Usually, the support element and the strengthening element are formed of metal and the cover strip of plastics material.

Suitably, each rigidity element comprises a block which is an interference fit within the opening in the support element and which comprises an integral flange abutting a radially inwardly directed surface of the support element, and a separable cover piece abutting a radially outwardly directed surface of the support element, the block and the cover piece of each rigidity element being fastened together subsequent to insertion of the block within the opening in the support element.

In one form of the invention, the wall thickness of the support element is increased in circumferential regions lying one each side of the opening and one

diammetrically opposed to the opening.

This invention will now be described by way of examples with reference to the accompanying drawings in which:-

Figure 1 is a section through a lighting bar according to a first embodiment of this invention, showing a mounting bracket for a light;

Figure 2 is a section through the lighting bar of Figure 1, showing a suspension bracket;

Figures 3, 4 and 5 are, respectively, a front sectional view, a side sectional view and a top plan view of an interconnection between two lighting bars, each as shown in Figure 1; and

Figures 6 and 7 are sections through the lighting bar shown in Figure 1, illustrating alternative uses.

Referring to Figure 1, the lighting bar comprises a support element 10 which is generally of C-section. The element may conveniently be formed of extruded aluminium. Regions 12 and 14 of increased wall thickness lie on opposite sides of the longitudinal opening in the support element. The region 12 has a flat surface 16 which opposes a corresponding parallel surface 18 in the region 14. Each region 12, 14 has a radially inwardly facing shoulder 20 and a radially outwardly facing surface 22 carrying a longitudinal groove 24. Diammetrically opposed to the opening in the support element, there is a further region 26 of increased wall thickness.

At appropriate intervals along the length of the lighting bar, there are provided strengthening elements 30. Each such element comprises a T-shaped block 32 which is dimensioned to be an interference fit between opposing surfaces 16 and 18 of the support element. The block 32 is similarly in close engagement with the shoulders 20. The strengthening element 30 further comprises a cover piece 34 which abuts the surfaces 22 of the support element and has an arcuate outer surface. The cover piece 34 is secured to the corresponding block 32 by means of a screw 36. Location lugs 38, formed integrally with the cover piece, engage within the grooves 24.

In the regions between the strengthening elements 30, the opening in the support element 10 is covered by a cover strip 50, as shown in Figure 2. This may be formed of plastics material and is provided with integral ribs 52 which provide a snap fit engagement with the grooves 24 in the support element 10.

In use of the described lighting bar, the location of the required electrical sockets is determined and the necessary wiring laid within the C-shaped support element. Strengthening elements 30 are positioned at the locations of the electrical sockets and at appropriate intervals between the sockets, dependent upon the load to be carried by the lighting bar. To insert the block 32, the surfaces 16 and 18 of the support element are first separated by the use of a lever. This may conveniently comprise a lozenge shaped abut-

ment which is first inserted longitudinally within the opening and then - by means of an integral handle - rotated towards a transverse position. For those strengthening elements not located at an electrical socket, a cover piece 34 is then screwed in place. It would be understood that on tightening of the screw 36, the T-shaped block 32 is drawn into close engagement with the inwardly directed shoulder 20 of the support element whilst the cover piece 34, is drawn into close engagement with the outwardly surface 22. At the location of an electrical socket, the cover piece 30 may be dispensed with and the housing of the electrical socket screwed directly to the block 32.

The lighting bar can be suspended by the use of brackets such as that shown at 60 in Figure 2.

The bracket 60 comprises bracket halves 62 and 64 connected through a hinge 66. This hinge is formed from interengaging parts 68 and 70, respectively formed integrally with the bracket halves 62 and 64. It will be seen that this hinge 66 permits limited opening and closing movements of the bracket halves, with increased angular movement of the bracket half 64 freeing the hinge and enabling disassembly of the bracket. The two bracket halves are clamped together about the lighting bar, through bolt 72. The same bolt provides a mounting to an appropriate suspension strap 74.

The longitudinal spacing of the brackets 60 will of course be selected in accordance with the number of lights to be mounted. The lights themselves can be mounted on the lighting bar using any convenient form of bracket, one example being illustrated at 76 in Figure 1.

Because the support blocks 32 are an interference fit within the opening of the C-shaped support element 10, they resist any flexure of the element which would tend to close that opening and they impart considerably increased rigidity to the lighting bar. With the additional feature of providing regions of increased wall thickness at each side of the opening and diametrically opposed to the opening, a structure is created having the required strength with minimal mass. The use of strengthening elements in two parts which are screw clamped together, provides further strength and also provides for a secure electrical earth connection.

The lighting bar according to this invention can readily be adapted to produce a two dimensional lighting grid.

Referring now to Figures 3, 4 and 5, there are shown two lighting bars 100, 102 intersecting at right angles. It will be understood that the two bars which are illustrated comprise only part of a two dimensional grid which may extend over a significant area of a studio or theatre. The two lighting bars are secured together by a U-clamp 104 of conventional construction. This U-clamp further provides a mounting for a vertical suspension rod shown in part at 106. At a

number of intersections, the precise arrangement depending upon the electrical wiring layout, there are provided junction boxes 108. A back wall 110 of the junction box 108 has a circular aperture 112 permitting cable access to the interior of lighting bar 100. A mounting screw 114 passes through a further, small, aperture in the wall 110 and screws into a T-shaped block 32 - as previously described - located in the lighting bar 100. The screw 114 additionally carries the terminal at one end of an earth continuity strap 116. There are similarly provided in a side wall 118 of the mounting box 108, a cable access aperture 120 and a mounting screw 122 carrying the terminal at the opposite end of the earth continuity strap 116. Appropriate electrical connections are provided within the mounting box 110, for interconnection between cabling in the lighting bars 100, 102.

It will be appreciated that the lighting bar according to this invention lends itself particularly well to the simple formation of two dimensional grids. The mounting box is secured using the same strengthening elements that are provided along the length of each lighting bar. Since these strengthening elements comprise a screw metal-to-metal interconnection, they provide an appropriate mounting for an earth continuity strap with no separate earth connection being necessary. It will be understood that in the case of larger junction boxes, two or more strengthening elements can be used for mounting to each lighting bar.

In theatre and studio applications of the lighting bar described above, there is frequently also a requirement for heavy duty mounting of stage curtains. It is proposed that the support element of the lighting bar according to this invention be adaptable for use alternatively as a curtain track. As illustrated in Figure 6, the C-section support element 10 can be mounted with the opening facing downward. A complementarily shaped suspension bracket 200 has arms 202 which encircle the support element 10 and which are provided with tabs 204 engaging within the corresponding grooves 24. Curtain runners such as that shown generally at 220 are provided with rollers 222 or other low friction bearing surfaces which engage the inwardly directed shoulder 20.

Since a typical studio or theatre will use considerable lengths of both lighting bar and curtain track, there is a significant economy in providing a common extrusion serving both purposes.

A further application of the lighting bar according to this invention uses the C-section support element in the same orientation. Referring now to Figure 7, a lighting support carriage 250 is mounted on sets of rollers 252 which run within the support element in the same manner as the described curtain runners. One or more lights can be secured to the carriage 250 to enable rapid changes in position. Conveniently, a parallel lighting bar can be provided, orientated as shown

in Figure 1, to provide a selection of lighting sockets to be used at the appropriate position of the light.

In still further modifications, making use of the same profile support element, a parallel array of lighting bars orientated as shown in Figure 7 can be used to support an array of generally orthogonal lighting bars in a two dimensional grid. By attaching to the free end of a carriage such as lighting carriage 250, an inverted, identical carriage rotated through 90°, a sliding mount can be provided for an orthogonal lighting bar. This orthogonal lighting bar can be used directly to support lighting, or can be used as an intermediate support for a further lighting bar which can be orientated either as shown in Figure 2 or in Figure 7.

This invention has been described by way of examples only and still further modifications will be possible without departing from the scope of the invention. Thus, the strengthening element could be formed in one piece, rather than the described arrangement in which two halves are clamped together. In the modified, one piece form surfaces would be provided which abut respectively the inwardly and outwardly faces of the support element. The strengthening element would, as before, be inserted through local flexure of the support element.

Claims

1. A lighting bar for use in the suspension of lights in theatres, studios and the like, comprising an elongate support element (10) generally of C-section defining a longitudinal opening, and a cover strip (50) engagable with the support element to cover said opening, characterised in that there are further provided a plurality of strengthening elements (30) removably engagable with the support element at spaced intervals, each strengthening element being an interference fit within the opening so as to resist flexure of the support element tending to close said opening.
2. A lighting bar according to Claim 1, wherein the strengthening elements (30) are adapted to be inserted within the opening through local flexure of the support element (10).
3. A lighting bar according to Claim 1 or Claim 2, wherein each strengthening element (30) has surfaces abutting, respectively, radially inwardly and outwardly directed surfaces (20,22) of the support element (10).
4. A lighting bar according to any one of the preceding claims, wherein each strengthening element (30) comprises a block (32) which is an interference fit within the opening in the support element (10) and which comprises an integral flange abut-

ting a radially inwardly directed surface (20) of the support element, and a separable cover piece (34) abutting a radially outwardly directed surface of the support element, the block (32) and cover piece (34) of each strengthening element (30) being fastened together subsequent to insertion of the block within the opening in the support element.

5. A lighting bar according to any one of the preceding claims, wherein the support element and the strengthening element are formed of metal and the cover strip of plastics material.
6. A lighting bar according to any one of the preceding claims, wherein one or more strengthening elements provide a mounting for an electrical socket.
7. A lighting bar according to Claim 6, wherein a strengthening element providing a mounting for said electrical socket serves also to provide an earth connection to the support element.
8. A lighting bar according to any one of the preceding claims, wherein the elongate support element comprises longitudinal regions of increased wall thickness on opposite sides of said opening and diametrically opposed to said opening.

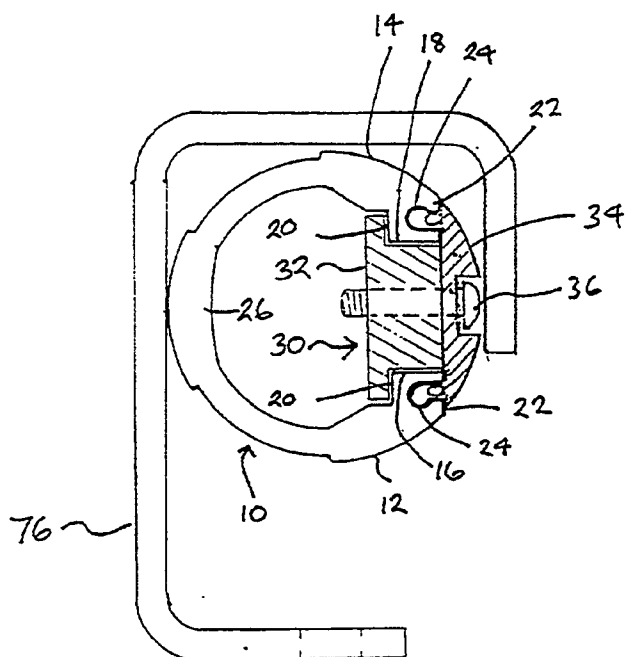


Figure 1

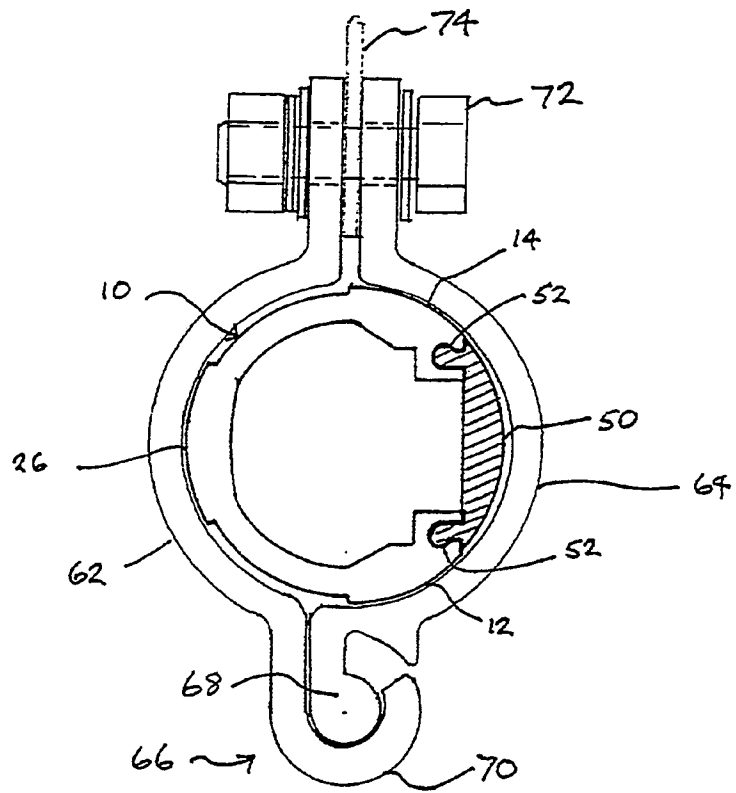


Figure 2

Figure 3

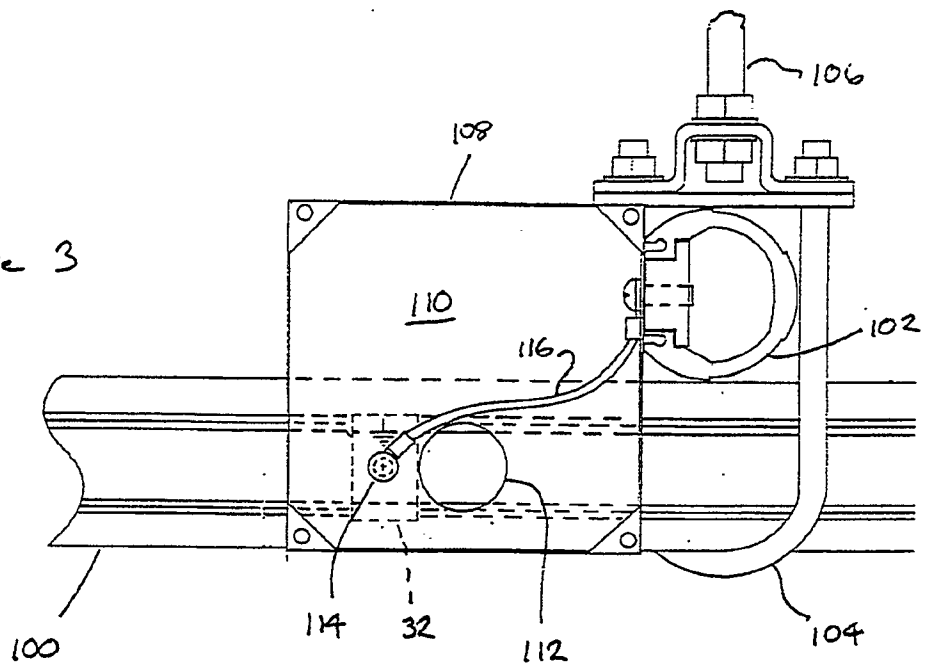


Figure 4

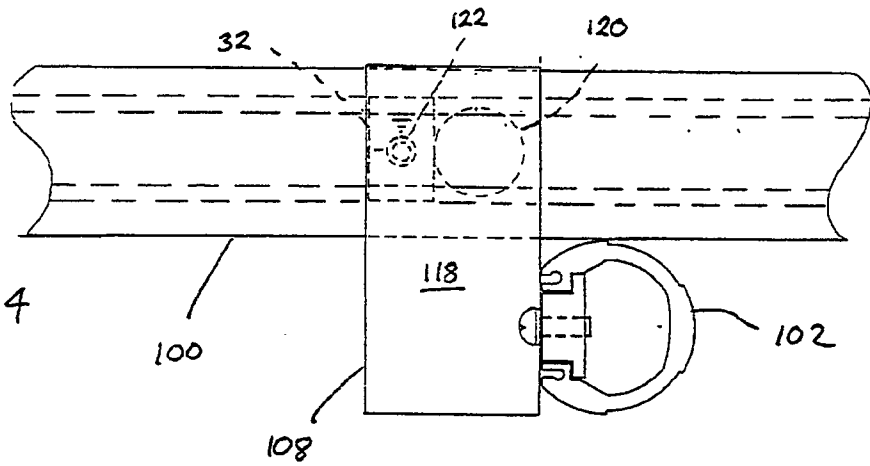


Figure 5

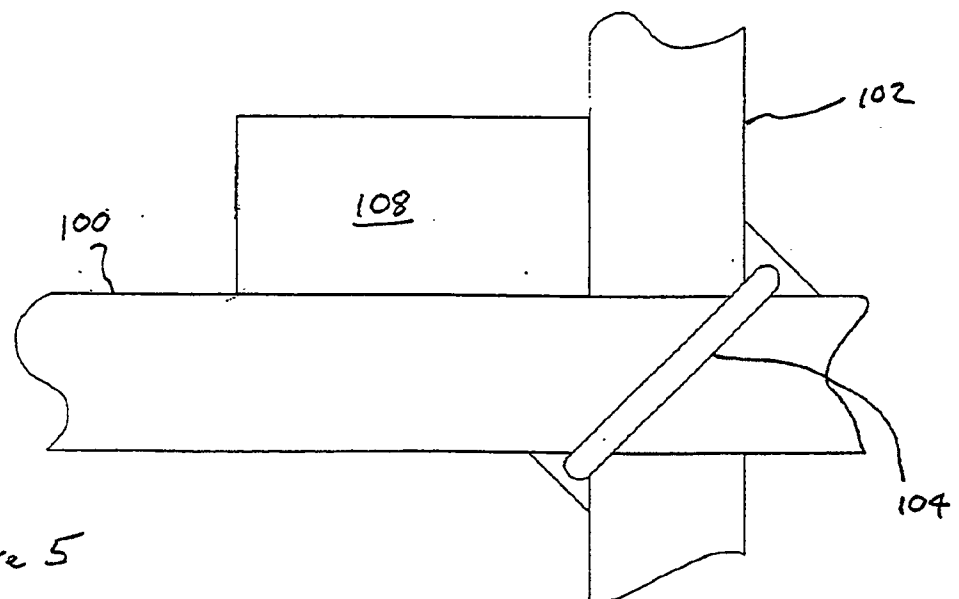


Figure 6

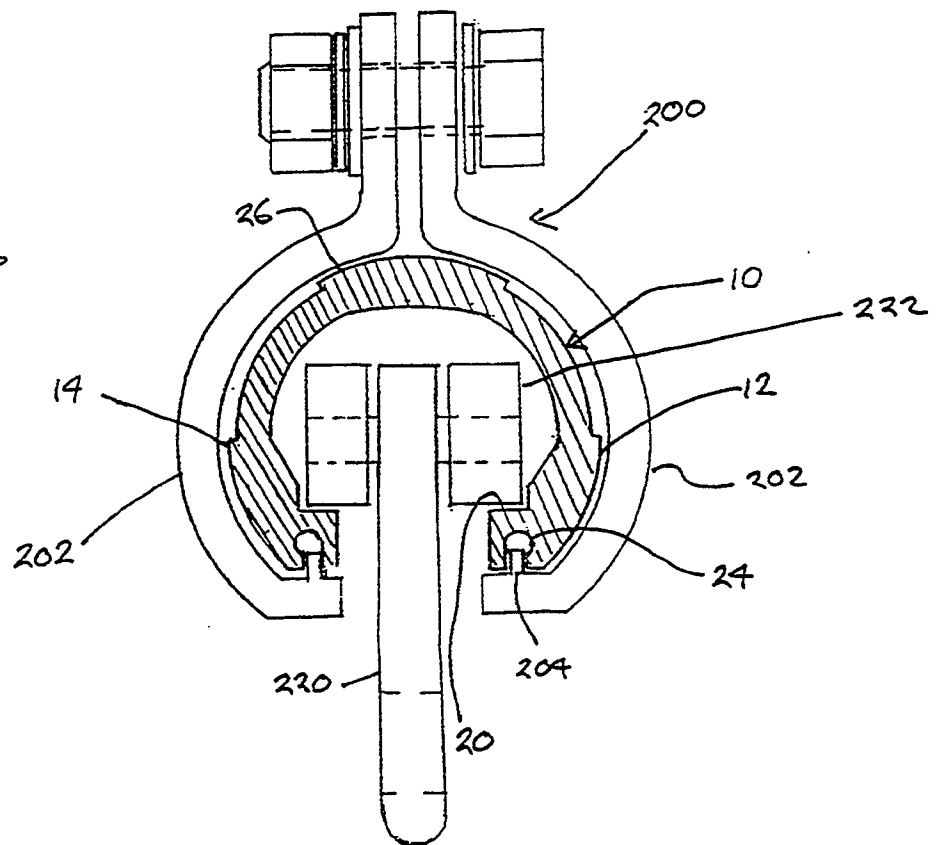


Figure 7

