May 26, 1959 R. A. D. SCHWARTZ ET AL 2,888,113

CEILING AND LIGHTING CONSTRUCTION

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FIG. 1

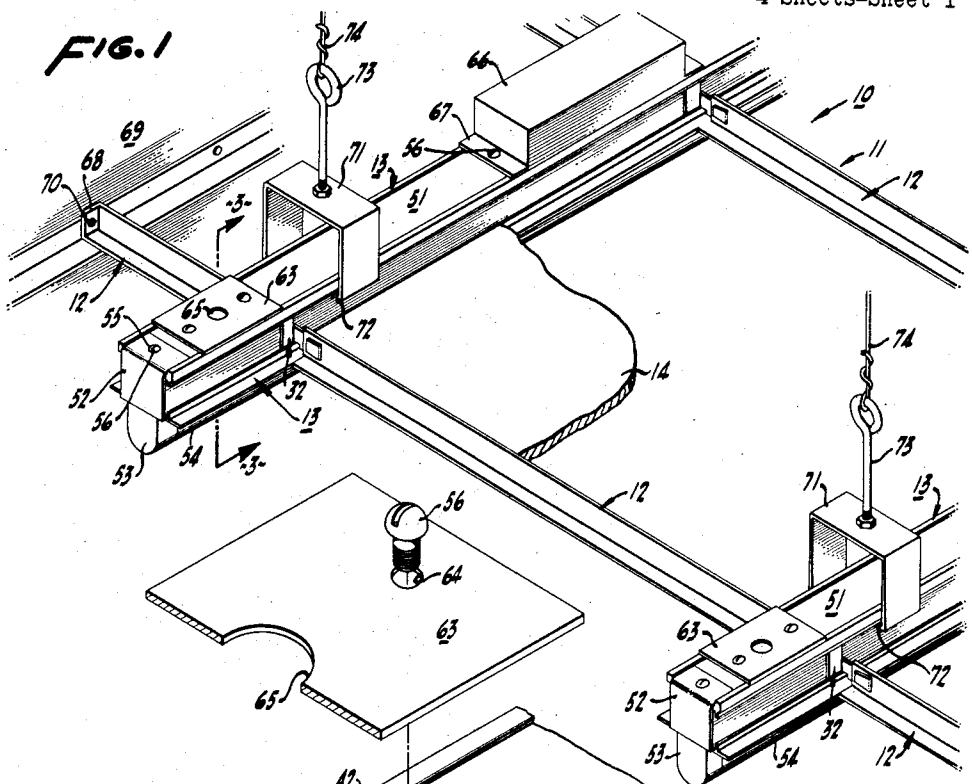
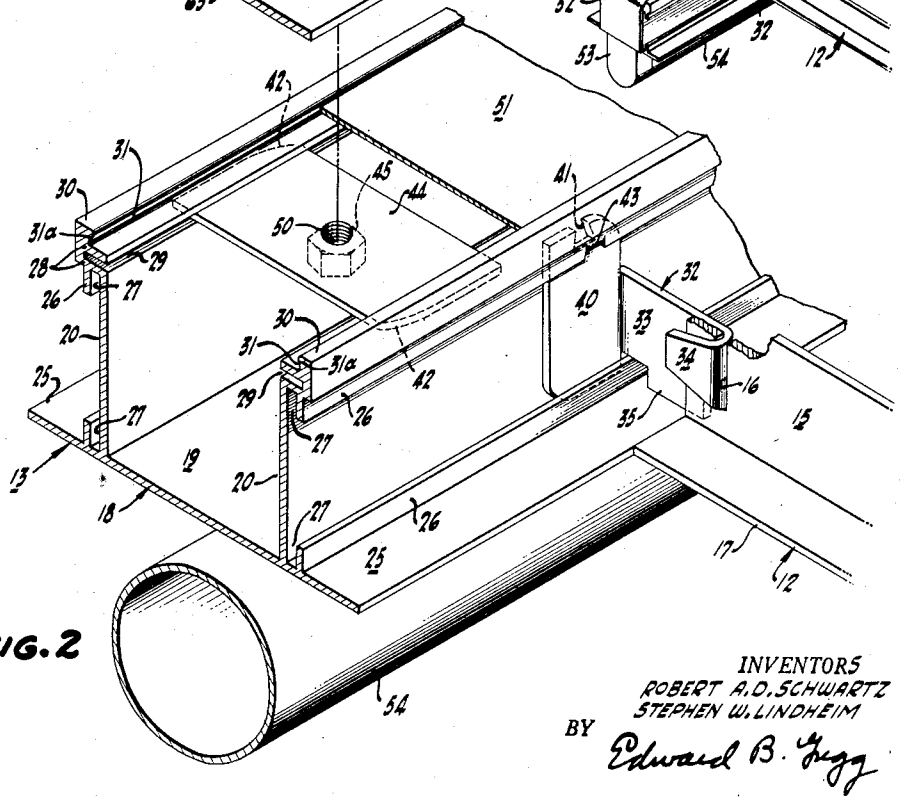


FIG. 2



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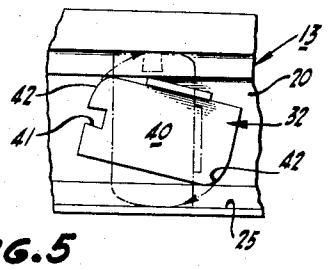


FIG. 5

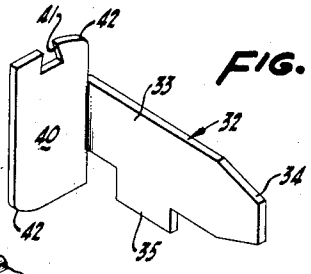


FIG. 4

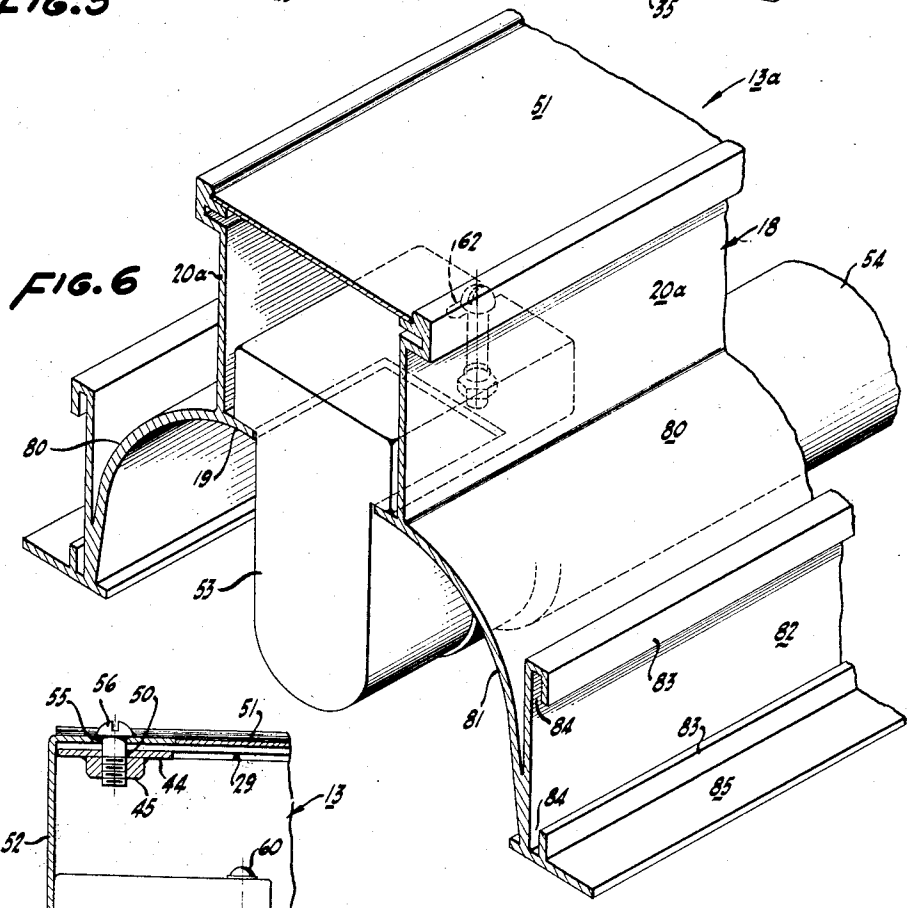


FIG. 6

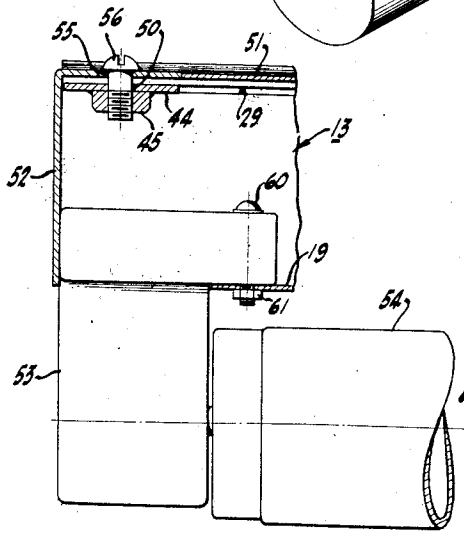


FIG. 3

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FIG. 7

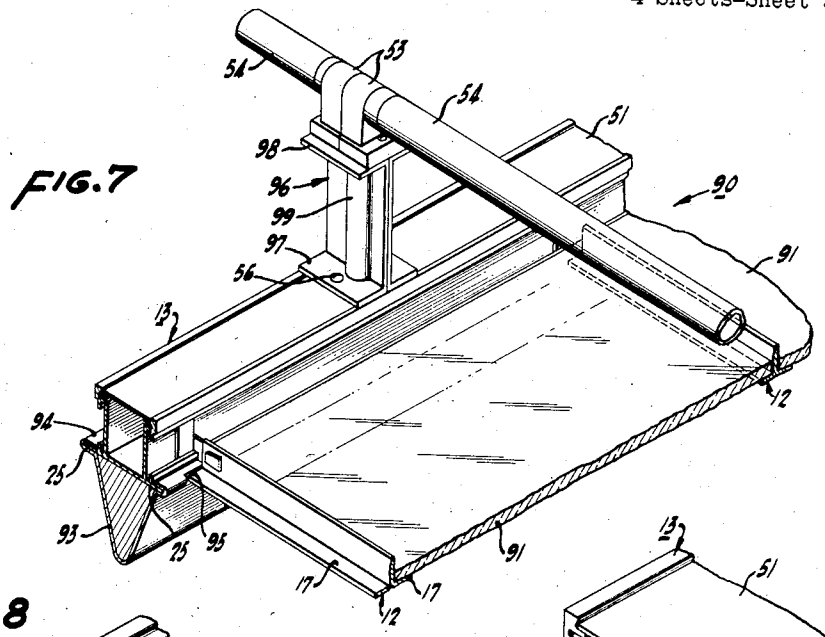
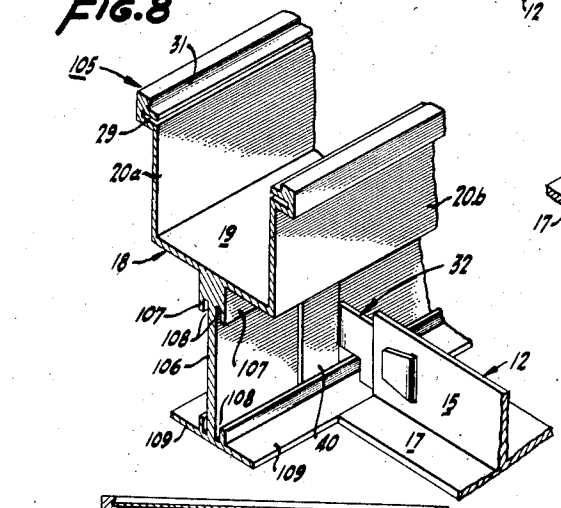


FIG. 8



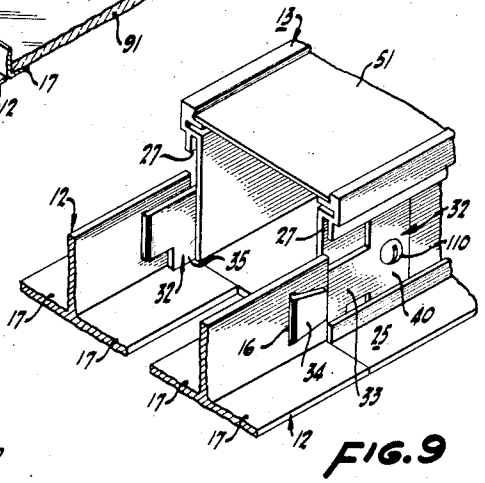


FIG. 9

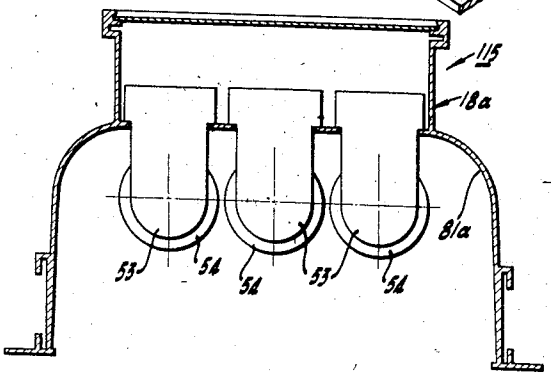


FIG. 10

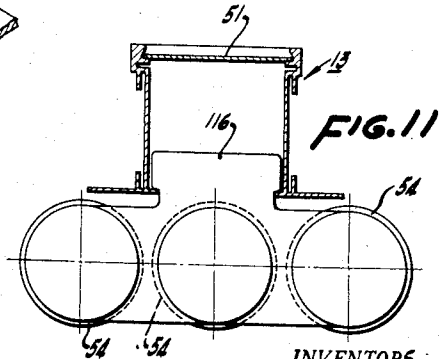


FIG. 11

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FIG. 12

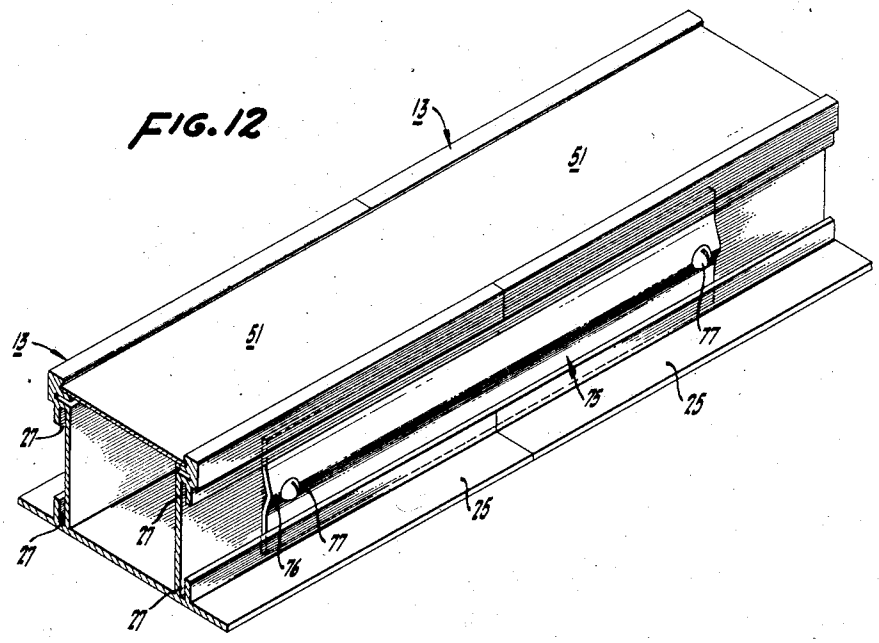
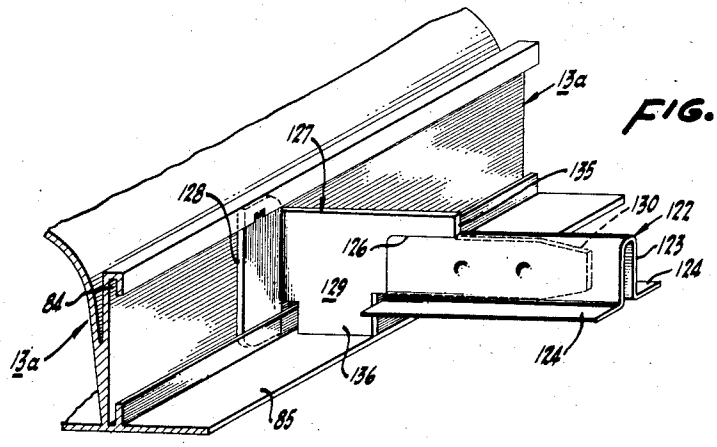


FIG. 13



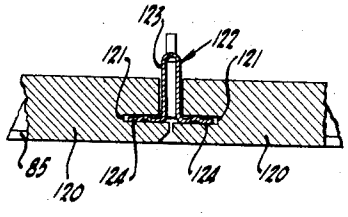


FIG. 14

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2,888,113

CEILING AND LIGHTING CONSTRUCTION

Robert A. D. Schwartz, Concord, and Stephen W. Lindheim, Berkeley, Calif.

Application September 23, 1954, Serial No. 457,844

12 Claims. (Cl. 189—85)

This invention relates to a combined ceiling and lighting construction in which a ceiling framework is provided which incorporates certain fixtures or elements forming a part of a ceiling lighting system.

Today, in such buildings as large grocery markets, offices and the like, a type of lighting and ceiling construction is commonly used in which the lighting elements are fluorescent tubes and in which the raceways or conduits for the wiring constitute a part of ceiling framework. In such type of ceiling and lighting construction it is desirable that the assembly of the various elements be as simple as possible and as flexible as possible.

It is an object of the present invention to provide a ceiling and lighting construction of the general character described which constitutes an improvement over prior construction.

Another object of the invention is to provide a ceiling and lighting construction of the character described which is simple to assemble and mount.

Yet another object of the invention is to provide a ceiling and lighting construction of the character described which is flexible.

A still further object of the invention is to provide a ceiling and lighting construction of the character described in which the component parts are inexpensive to fabricate.

Another object of the invention is to provide a ceiling and lighting construction of the character described in which the operations involved in joining and fixing together the components of the ceiling framework are simplified by means avoiding the necessity of welding and/or the use of nuts, bolts and screws.

Yet another object of the invention is to adapt the type of ceiling construction described to a luminous type of ceiling in which the ceiling panels are translucent and the lighting elements are located above the ceiling.

These and other forms of the invention will be apparent from the ensuing description and the appended claims.

Several forms of the invention are illustrated by way of example in the accompanying drawings, in which:

Figure 1 is a fragmentary, perspective view of a ceiling and lighting construction in accordance with the present invention.

Figure 2 is an exploded view in perspective, partly in section and on a larger scale than the view in Figure 1, showing in greater detail the construction of the T-members, the channel members and other parts of the ceiling and lighting framework.

Figure 3 is a fragmentary view in vertical section taken along the line 3—3 of Figure 1.

Figure 4 is a perspective view of the connecting clip employed to interconnect the T-bars and channel members of the ceiling and lighting construction of the present invention.

Figure 5 is a fragmentary view in side elevation of a channel member such as that shown in Figures 1 and 2, showing how the connecting clip of Figure 4 is connected to the channel member.

Figure 6 is a view in perspective of a second form of channel member.

Figure 7 is a perspective view of another embodiment of the invention adapted for use with a luminous type of ceiling with the lighting elements located above the ceiling framework.

Figure 8 is a fragmentary view in perspective of a third form of channel member.

Figure 9 is a fragmentary view in perspective illustrating how the T-bars and the channel members of the present invention may be joined together in end-to-end relation by means of the connecting clip of Figure 4.

Figure 10 is a view in end elevation of a modified form of channel member carrying a plurality of sockets and fluorescent tubes.

Figure 11 is a similar view of a channel member carrying multiple sockets and a plurality of fluorescent tubes.

Figure 12 is a fragmentary, perspective view showing the manner in which the channel members of the ceiling construction of the invention are coupled and reinforced.

Figure 13 is a perspective view showing an embodiment of the invention adapted for use with splined construction.

Figure 14 is a fragmentary view in vertical section through two ceiling panels mounted by the frame members of Figure 13.

Referring now to the drawings and more particularly to Figures 1, 2 and 3, a ceiling framework is shown in Figure 1 and is there generally designated by the reference numeral **10**. It comprises a number of identical units or modules **11**, only one of which is shown in its entirety in Figure 1. It will be understood that the ceiling framework **10** constitutes a repetition of identical units or modules **11** except at the edges adjacent the walls of the room in which the ceiling is mounted.

The principal members of the ceiling framework **10** are T-bars **12** and channel members **13**. As will be seen each of the T-bars **12** is of relatively short length, spanning the distance between two channel members **13**. The latter are of greater length, usually about 8 feet corresponding to the length of the fluorescent tubes, one of which is shown at **54** in Figures 1, 2 and 3. The ceiling framework **10** supports ceiling panels, one of which is shown at **14** in Figure 1, there being one such panel for each of the modules **11**. The panels **14** will usually be constructed of acoustical material.

The construction of the T-bar **12** is best shown in Figure 2. As will be seen, each of the T-bars comprises an upright vertical portion **15** and horizontal, coplanar flanges **17**. The upright portion **15** is formed near each end with a slot **16** for a purpose which is explained hereinafter.

The construction of the channel member **13** is also best shown in Figure 2. It will be seen that each of the channel members **13** comprises a raceway **18** formed by a bottom portion **19** and spaced, parallel, vertical side walls **20**. Integral with the raceway **18** are horizontal, outwardly directed flanges **25** which are in the same plane as the bottom **19** of the raceway **18**. The channel member **13** is formed with a pair of vertically spaced ribs **26** on each side of the raceway **18** and spaced from the adjacent side wall **20** to form a pair of vertically spaced grooves **27** on each side of the raceway, each pair of ribs and grooves thus defining a vertically disposed guideway serving the important purpose as will be later explained. The channel member **13** is also formed with horizontally spaced ribs **28** which form a pair of horizontally spaced grooves **29**, and it is also formed with horizontally spaced ribs **30** which form a pair of horizontally spaced grooves **31**. The grooves **31** are tapered outwardly as indicated at **31***a*.

The T-bars **12** and the channel members **13** may be

constructed in any manner desired and of any suitable material. However, they are preferably of metal construction, most advantageously a light alloy such as an aluminum alloy, e.g., ST5 alloy, and they are preferably extruded shapes.

Referring now more particularly to Figure 4, the T-bars 12 and the channel member 13 are interconnected and interlocked in the manner described in detail hereinafter, by means of connecting clips, one of which is shown in Figure 4 and is generally designated by the reference numeral 32. The clip 32 has a body portion 33 terminating in a tapered tip 34. Depending from the body 33 is a gauge member 35. The clip also has a head portion 40 which may be bent as illustrated to lie in a plane perpendicular to the plane of the body 33. The head portion 40 is notched at 41 and it has diagonally opposite, rounded corners 42, for reasons which will now be explained.

Connecting clips 32 are employed to interconnect and interlock the T-bars 12 and the channel members 13 in the manner illustrated in Figures 2 and 5. Referring to Figure 2, the tapered tip 34 of the clip is inserted through the slot 16 in one end of a T-bar 12 and is then bent over upon itself to assume the position shown. This operation securely clamps the clip to the T-bar.

Referring to Figure 5, the connecting clip 32 is then rotated to a position such as that shown in solid lines, so that the head portion 40 will fit between the upper and lower ribs 26 and will be in a position adjacent the side wall 20 of the raceway 18 and in registry with the grooves 27 making up a guideway. It is then rotated to the upright position illustrated in broken lines in Figure 5. As will be seen, the rounded corners 42 permit such rotation and insertion of the head member 40 in the upper and lower grooves 27, thereby securely clamping the connecting clip 32 and T-bar 12 to the channel member 13, except for longitudinal displacement which is prevented by means described hereinafter, at any desired location of a T-bar along a guideway, and it follows that the aforesaid guideway and clip construction also permits removal of a clip and hence its T-bar from said channel member simply by a reverse rotation of the aforesaid clip head member with respect to the upper and lower grooves 27 of the guideway, as desired.

The function of the gauge member 35, as is illustrated in Figure 2, is to contact the flange 25 of channel member 13 and one of the flanges 17 of T-bar 12, thereby leveling the T-bar and the channel member with respect to one another and bringing the flanges 17 and 25 into a coplanar arrangement.

A T-bar 12 thus connected at one end to a channel member 13 may still be moved longitudinally by reason of the sliding engagement of the head portion 40 of the connecting clip 32 in the grooves 27. It is an advantage of this arrangement that longitudinal adjustment can be made very easily. After the T-bar 12 has been adjusted longitudinally in this manner to the desired position, the upper rib 27 of the channel member 13 is struck a blow with a chisel or other suitable crimping tool at a point in registry with the notch 41, so as to form a tongue 43 which is received within the notch 41. This simple operation securely locks the connecting clip 32 and the T-bar 12 in position against longitudinal displacement relative to the channel member 13.

It will be understood that the coupling operations thus described are repeated at each end of each T-bar 12, or of selected T-bars such as every other one, except for the outer extremities of T-bars which are fixed to the wall. This latter operation, and the end-to-end coupling of channel members 13, are described hereinafter.

Referring again to Figures 2 and 3, a number of strap members 44 are provided for a purpose which is explained hereinafter. Each strap 44 is formed with diagonally opposite, rounded corners 42, and a nut 45 is welded to the strap in registry with a hole 50. As will be seen from an inspection of Figure 2, each of the straps 44 is slideable in the horizontal grooves 29 formed in the channel member 13, and by reason of the rounded corners 42 the strap can be inserted in and removed from such grooves in the same manner that the head portion 40 of one of the connecting clips 32 is inserted in and removed from the grooves 27.

A cover member 51 is provided which is of sheet metal construction and is of sufficient resilience to allow its being snapped into place in the grooves 31 in the channel member 13. This snap action is facilitated by the tapered character of the grooves 31.

Referring to Figures 1 and 3, an end cover 52 is provided for each end of the raceways 18, such end cover having a right angular shape as illustrated and abutting a socket 53 to which a fluorescent tube 54 is connected. The end cover 52 is formed with a hole 55 to receive a screw 56 which is threaded into the nut 45 of one of the straps 44. Each socket 53 is affixed by a screw 60 and nut 61 to the bottom 19 of the raceway 18.

As explained hereinabove, the raceway 18 serves as a conduit for the necessary wiring for the fluorescent tubes 54. In order to completely enclose the raceway, one or more cover members 51 are provided. In order to provide easy access to the interior of the raceways 18 without the necessity of removing the cover or covers, removable plates 63 are provided at appropriate intervals. Each plate 63 is formed with holes 64 for reception of screws 56 which are threaded into nuts 45 of straps 44. Each of the plates 63 is also formed with a relatively large hole 65 through which the necessary wires are passed into the raceway 18. The plates 63 can, of course, be readily removed by removing the screws 56, thereby providing access to the interior of the raceway 18 without the necessity of removing the cover members 51.

In certain instances, because of legal requirements or personal preference, it is necessary to make the connections between the house wiring and the wiring in the raceways 18, externally to the raceways. In such instances, a conventional outlet box (not shown) may be located above the raceway 18, and the necessary connections can be made within the outlet box.

Each of the channel members 13 is provided with a ballast box 66 containing a transformer and other equipment necessary for starting and operating the fluorescent tube 54. As will be seen from an inspection of Figure 1, each ballast box 66 has flanges 67 which are punched to receive screws 56 which are threaded at their lower ends into the nuts 45 of straps 44 (not shown).

The framework or grid thus illustrated and described may be fixed to the walls of a building by any suitable means. As shown in Figure 1, short lengths of T-bar 12 are provided. Each of certain of these lengths is fixed at its inner end to a channel member 13 by means of a clip 32, and at its outer end it is formed with an end flange 68 which is fixed to the adjacent wall 69 by means of a screw 70. As is also shown in Figure 1, hanger straps 71 are provided which are of generally U-shaped configuration and are formed with flanges 72 at their lower ends to receive and support the upper ribs 26 of a channel member 13. An eye bolt 73 is fixed to the hanger strap and a wire or cable 74 is fixed at one end to the eye bolt and at its other end (not shown) to a rafter or other member of the roof structure.

Referring now to Figure 12, two channel members 13 are there shown in end-to-end relation. To provide mechanical rigidity, and to provide good electrical contact for ground connections, the channel members are coupled by the means which will now be described.

As will be seen, a cover member 51 is provided which overlaps the two channel members. This provides an electrical connection and it also provides rigidity in a

horizontal plane. To provide a further electrical connection and to provide rigidity in a vertical plane, a coupling bar **75** is provided on each side of the channel members. This coupling bar is formed with a longitudinal rib **76** to provide stiffness and strength, and it is formed with a threaded hole at each end to receive a set screw **77**. As will be seen, the coupling bar **75** is slideably received in the aforesaid vertical guideways formed by the grooves **27** of channel members **13**, and it is arranged to overlap the adjoining channel members. The set screws **77** are tightened against the adjacent wall **20** to hold the bar in place.

Referring now to Figure 6, a channel member **13***a* is there illustrated which is generally similar to the channel member **13** illustrated in Figures 1, 2 and 3 and which includes a raceway **18** having a bottom **19** (which is recessed as indicated to receive a socket **53**) and parallel side walls **20***a*. The channel member **13***a* has, however, a pair of arcuate extensions or wings **80** which extend outwardly and downwardly from the raceway **18** to provide a longitudinal cavity or recess **81** for light sockets (one of which is shown at **53**) and a fluorescent tube **54**, as illustrated. At its outer and lower edge each of the wings **80** is integral with a vertical plate **82** having vertically spaced ribs **83** which form vertically spaced grooves **84** defining a guideway as aforesaid for reception of the head members **40** of connecting clips **32**. The latter are inserted and fixed in the grooves **84** in the same manner as they are inserted and fixed in the grooves **27** of the channel member **13** which is described above and illustrated in Figure 2. Horizontal flanges **85** are also provided which correspond to the flanges **25** of the channel member **13**.

The channel members **13***a* are assembled with and connected to T-bars **12** in the same manner as the channel members **13** illustrated in Figures 1 and 2. Thus, clips **32** are employed to connect T-bars **12** with the grooves **84** of channel members **13***a*, to level the channel members and T-bars and to bring the flanges **17** and **85** into abutting, coplanar arrangement. Panels **14** will be laid on the flanges **17** and **85**, in which position they will be located below or on a level with the fluorescent tubes **54**. The latter will, therefore, be recessed from the level of the ceiling.

Referring now to Figure 7, a ceiling construction **90** is there illustrated having luminous panels **91** of glass or plastic construction which are transparent or translucent, preferably the latter so as to diffuse the light from fluorescent tubes such as shown at **54**. The tubes **54**, as will be seen, are located above the panels **91**. The luminous panels **91** are supported on the flanges **17** of T-bars **12** and on the flanges **25** of channel members **13**. The T-bars and channel members are of the same construction as the T-bars and channel members illustrated in Figures 1, 2 and 3. A clip-on type of acoustical baffle is also provided, one of which is shown at **93**. This baffle has clips **94** which clip onto the flanges **25** of the channel members **13** and which are recessed as indicated at **95** in registry with the T-bars **12** for clearance purposes. The fluorescent tubes, two of which are shown at **54**, are connected to sockets **53** which are supported on pedestals **96**. Each pedestal has a bottom plate **97** which is fixed by screws **56** to straps **44** (not shown), which are disposed within the raceways **18** in the manner described hereinabove. The sockets **53** are bolted to a top plate **98**. As will be seen, each pedestal **96** is of double construction, consisting of two identical halves arranged in back-to-back relation, and the halves are formed with mating ribs **99** to form a duct for the wiring connections from the raceways **18** to the sockets **53**.

The ceiling framework shown in Figure 7 is assembled and mounted in the same manner as that in Figures 1 and 2. However, the lighting elements **54** are located above the ceiling and as a result a more diffused illumination is produced. The ceiling framework performs not only the function of supporting the luminous panels **91**, but it also performs the function of supporting the lighting elements **54**. It is, therefore, unnecessary to support the latter independently, as has been the practice heretofore. The lighting elements **54** may be supported at right angles to the channels **13**, as shown, or they may be supported in parallelism or diagonally with respect to the channels.

Referring now to Figure 8, a channel member **105** is there illustrated of modified construction which is intended primarily for use in a ceiling structure such as that illustrated in Figure 7, wherein the fluorescent tubes are located above the ceiling framework and above luminous panels supported by the framework. The channel member **105** illustrated in Figure 8 has a raceway **18** including a bottom portion **19**, side walls **20***a* and **20***b* and grooves **29** and **31**, as illustrated. The bottom portion **19** of raceway **18** is integral with a vertical plate **106** formed with vertically spaced ribs **107** which provide two pairs of vertically spaced grooves **108** defining the now familiar guideways for reception of the head portions **40** of connecting clips **32**, as illustrated. At its lower edge the plate **106** is integral with horizontal flanges **109** which are intended to abut and to be coplanar with the flanges **17** of T-bar **12**, in the same manner as the flanges **25** illustrated in Figure 2.

Referring now to Figure 9, a means is shown by which T-bars **12** can be connected in end-to-end relation with channel members of the present invention, such as the channel member **13** shown in Figure 9. In some instances it may be desirable to connect the channel members to a wall. For such purpose, short lengths of T-bars **12** may be used provided they are connected to the channel members **13** in end-to-end relation as illustrated in Figure 9, rather than transversely as illustrated in Figure 1. Such longitudinal connection is readily accomplished by means of the connecting clips **32**, which are identical with the clip shown in Figure 4 except that the head portions **40** are unbent and therefore lie in the same plane as the body portion **33**. The coplanar head portion **40** is inserted in a pair of the guideway grooves **27** and the tapered tip **34** is inserted in a slot **16** and is bent upon itself. To prevent longitudinal displacement, a set screw **110** is provided which is threaded through the head portion **40** and is tightened against the adjoining side wall **20** of the channel member **13**.

The gauge members **35** of the connecting clips **32** serve the same purpose as described above and as illustrated in Figure 2; i.e., they serve the purpose of contacting and leveling the flanges **17** and **25** to bring the T-members **12** and the channel members **13** into horizontal alignment.

Referring now to Figure 10 a channel member **115** is there illustrated which is similar to the channel member **13***a* of Figure 6. However, the raceway **18***a* and the recess **81***a* are wider to accommodate a larger number of sockets **53** and fluorescent tubes **54**. In the form illustrated in Figure 10, three pairs of sockets **53** and three fluorescent tubes **54** are accommodated, but a greater or lesser number may be accommodated by appropriate sizing and proportioning of the channel member **115**.

In Figure 11 there is illustrated a channel member **13** which is identical with the similarly numbered channel member in Figures 1 and 2, but it is fitted with a pair of triple sockets, one of which is shown at **116**, and with three fluorescent tubes **54**.

In connection with the multiple socket construction shown in Figures 10 and 11, it is conventional practice to employ approximately a four foot spacing of single sockets and tubes. Double sockets and tubes may, therefore, be spaced on approximately eight foot centers; triple sockets and tubes such as shown in Figures 10 and 11 on about 10–12 foot centers, etc. Multiple sockets and tubes may be used with or without reflectors.

Referring now to Figures 13 and 14, a modification is there shown which is adapted to a splined construction wherein ceiling panels 120 are to be joined in abutting relation and the T-bars are concealed. To this end the ceiling panels 120 are formed along their edges with grooves 121, and T-bars 122 are provided, each of which is bent and formed to provide an upright portion 123 of double thickness and outwardly projecting, coplanar flanges 124. The flanges 124 are received in the grooves 121 of adjacent panels 120, hence support the panels but are concealed from view from below.

One of the T-bars 122 is shown in Figure 13 connected to a channel member 13*a* which is identical with the similarly numbered channel member in Figure 6. At each end the T-bar 122 is slotted along its upper edge at 126 to receive a connecting clip 127. The latter is generally similar to the clip 32 shown in Figure 4 but is modified for the construction shown in Figures 13 and 14. Thus the clip 127 has a head portion 128 which is the same as the head portion 40 of clip 32 and is intended to be received in the guideway grooves 84 in the same manner. However, the clip 127 has a body portion 129, an outer, tapered end portion or tip 130, a vertical shoulder 135 at the junction of the body portion and tip, and a gauge member 136.

In assembling and connecting the channel member 13*a* and the T-bar 122, the head portion 128 of the clip 122 is inserted in the guideway grooves 84 in the manner described hereinabove, and is secured in the proper position as described hereinabove. One end of a T-bar 122 is seated on the tip 130 of clip 127 with the inner end of the slot 126 abutting the shoulder 135. It will be seen that the gauge member 136 is such that it elevates the flanges 124 of the T-bar above the flanges 85 of channel member 13*a*. More specifically, the flanges 124 are located by this means at a level such that the bottom surfaces of the panels 120 lie in the same plane as the bottom surfaces of the flanges 85 of channel members 13*a*.

By this means, it will be seen that a splined construction is provided which has the advantage of the construction shown in Figures 1 to 3 but in which the T-bars are concealed and the ceiling panels adjoin one another.

In connection with the luminous ceiling construction illustrated in Figure 7, any of several modifications may be employed. Where minimum interference by the ceiling framework with the light-diffusing panels 91 is desired, channel members of the type shown at 105 in Figure 8 may be used instead of the type of channel shown at 13 in Figure 7. Thus, only the flanges 109 and 17 interfere with light transmission from above, whereas with channel members such as shown at 13 in Figure 7, the width of the channel interferes with light transmission.

Where both direct lighting and a diffused, luminous type of lighting are desired, recessed channels such as shown at 13*a* in Figure 6 or at 115 in Figure 10 may be used instead of the type of channel shown at 13 in Figure 7.

The combined use of direct, recessed lighting and concealed, diffused lighting is particularly advantageous. Thus, in a larger area such as a grocery market or an office housing a large stenographic pool, an above-ceiling, diffused lighting such as shown in Figure 7, may be installed to provide general illumination of, say, 100 foot candle intensity. Immediately above display counters or rows of desks, a more powerful, direct lighting, e.g., 300 foot candle intensity, may be employed. Such direct lighting can be best accomplished and focused by the use of channels such as shown in Figures 6 and 10, employing one, two, three or as many more fluorescent tubes as required for more intense illumination and employing suitable means for focusing and controlling the illumination, such as reflectors, louvers, lenses, etc.

It is, therefore, apparent that a type of lighting and ceiling construction has been provided which includes several different modifications and which has several important advantages, among which may be mentioned the following:

The channel members and T-bars can be very easily and quickly connected; adjustments of the assembled elements can be made quickly and easily; and the adjusted elements can be quickly and easily locked together without welding or the use of nuts and bolts.

The connecting clip is simple in its construction; it is simple to use; and it is effective for the intended purpose. It also incorporates a very desirable self-leveling feature.

The shapes of the channel members and T-bars lend themselves to fabrication by extrusion methods.

The strap 44 is advantageous because of the ease with which it can be inserted and shifted to any desired position.

The luminous type of ceiling shown in Figure 7 is advantageous because it incorporates the lighting system with the ceiling framework, yet carries the lights above the ceiling.

As shown in Figures 13 and 14, the construction of the present invention also lends itself to splined construction.

We claim:

1. An adjustable ceiling framework of the character described comprising a plurality of longitudinal members of relatively great length arranged in parallelism and in a horizontal plane, and being spaced apart, and a plurality of transverse members extending between each adjacent pair of longitudinal members to form a grid-like framework made up of repetitive units each bounded on at least one side by a longitudinal member and on at least one other side by a transverse member; each said longitudinal member and each said transverse member being formed with a pair of horizontal, outwardly projecting flanges on each side thereof, the flanges of each repetitive unit providing support for ceiling panels; and connecting means for securely and adjustably attaching the ends of transverse members to the sides of longitudinal members and permitting sliding movement of the ends of transverse members along the sides of longitudinal members, said connecting means comprising a vertically disposed guideway formed on each side of each longitudinal member above the flanges of said member, and a connector clip for each end of at least certain of said transverse members, each said connector clip having a head portion inserted in a guideway and being slidable therein and supported thereby, said head portion including means enabling it to be operatively received in and/or removed from a guideway at any desired location along the length thereof, each said connector clip having also a body portion projecting outwardly from said head portion and being operatively connected to an end of a transverse member; said framework being assembled in said repetitive units with the heads of the connector clips received by said guideways and the body portions of the connector clips connected to the transverse members.

2. The ceiling framework of claim 1, wherein at least certain of said longitudinal members have inverted T-section and said guideways are disposed on opposite sides of the vertical leg of the T.

3. The ceiling framework of claim 1, wherein at least certain of said longitudinal members each includes a raceway for the reception of electrical wiring, fittings and the like disposed generally intermediate said guideways.

4. The ceiling framework of claim 1, wherein at least certain of said longitudinal members each includes a raceway for the reception of electrical wiring, fittings and the like which is disposed intermediate and at a higher level than said guideways.

5. The ceiling framework of claim 1, wherein at least certain of said longitudinal members each includes a raceway for the reception of electrical wiring, fittings and the like which is disposed generally intermediate and at a

higher level than said guideways and is connected to said guideways by arcuate wings.

6. The ceiling framework of claim 1, wherein at least certain of said longitudinal members have inverted T-section and includes a raceway for the reception of electrical wiring, fittings and the like which is disposed above and extends along the top of said T-section.

7. The ceiling framework of claim 1, wherein at least certain of said longitudinal members are made up in sections disposed in end-to-end relation, and wherein coupling bars are slidably received in the adjacent ends of the aligned guideways of adjacent sections and secure said sections together.

8. The ceiling framework of claim 1, wherein each connector clip has a downwardly projecting portion contacting the adjacent flange of the respective longitudinal member whereby the flanges of the longitudinal members are located in predetermined relation to the flanges of the transverse members.

9. The ceiling framework of claim 1, wherein the body portion of each connector clip is formed with a tip, the ends of transverse members are formed with slots to receive said tips, and said tips are received within said slots and are bent to secure them to the transverse members.

10. The ceiling framework of claim 1, wherein each connector clip has a downwardly projecting portion and also a tip, said downwardly projecting portions contacting the adjacent flanges of the respective longitudinal members whereby the flanges of the longitudinal members are located in predetermined relation to the flanges of the transverse members; said transverse members being formed with slots to receive said tips, and said tips being received in said slots and being bent to secure them to the transverse members.

11. A ceiling framework comprising longitudinal members and transverse members, said transverse members being in the form of inverted T-bars each having a vertical plate and a pair of horizontal, coplanar flanges extending oppositely from the lower edge of the plate; said longitudinal members comprising an elongated, upwardly open raceway channel serving as a raceway for wiring, a downwardly open lamp channel formed by arcuate wings extending downwardly and outwardly from said opposite sides of said raceway channel, said lamp channel serving as a recess for tubular lighting elements, a pair of coplanar horizontal flanges extending outwardly from opposite sides of said lamp channel, and a guideway for each horizontal flange, each said guideway being located in a vertical plane above its flange and being adapted to receive and to hold connecting members for connecting a plurality of said transverse members to one said longitudinal member; said framework also comprising connector clips connecting said transverse and longitudinal members, each such clip having a body portion attached to an end of a transverse member and a head portion bent perpendicularly to said body portion and slidably received in a pair of said guideways.

12. A ceiling frame member and raceway for reception of electrical wiring, for reception of tubular lamps, for edge support of ceiling panels and for end support of transverse ceiling frame members, comprising an upwardly open raceway channel serving as a raceway for electrical wiring; a downwardly open lamp channel formed by arcuate wings extending downwardly and outwardly from opposite sides of said raceway, said lamp channel serving as a recess for tubular lighting elements; a pair of coplanar, horizontal flanges joined to and projecting oppositely and outwardly from opposite sides of said lamp channel and extending substantially the length of said lamp channel; and a guideway for each wing of said lamp channel, each said guideway being located above the respective flange and extending substantially the length of said lamp channel, each said guideway being moreover operative to permit insertion and removal of a slidable connector member and being located in a vertical plane which is intersected by the junction of the respective flange and wing; said flanges serving as edge supports for ceiling panels; said guideways serving to slidably receive connector members attached to the ends of transverse ceiling frame members.

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