

July 28, 1942.

S. R. NAYSMITH

2,291,489

RECESSED LIGHTING APPARATUS

Filed May 22, 1940

3 Sheets-Sheet 1

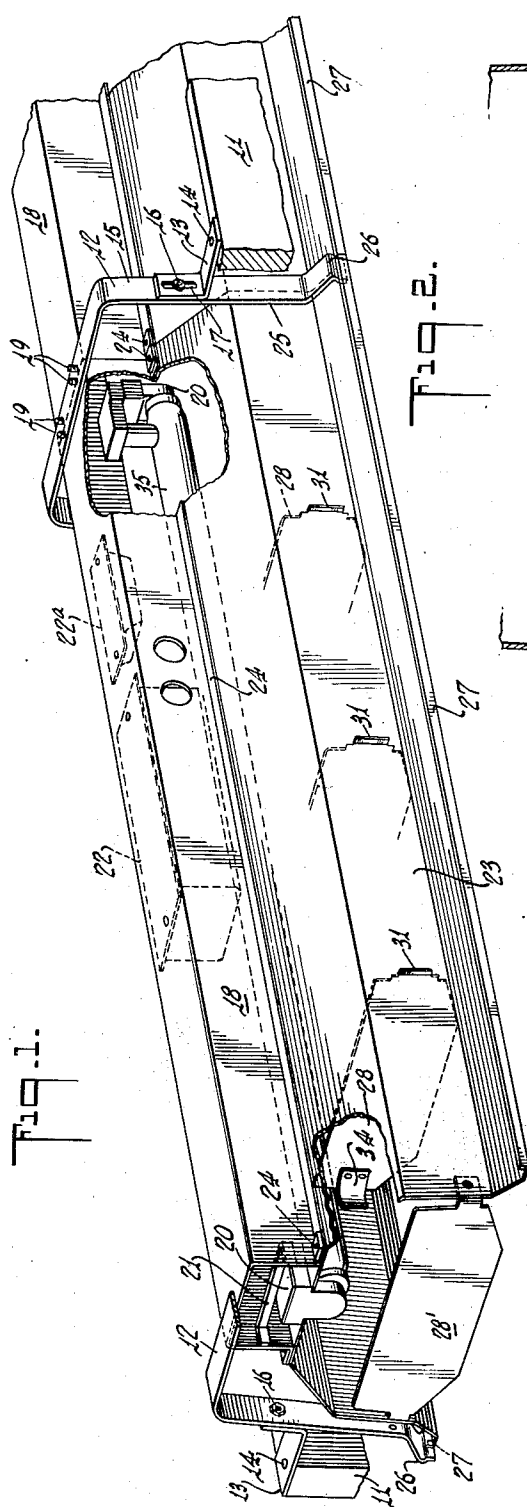


Fig. 1.

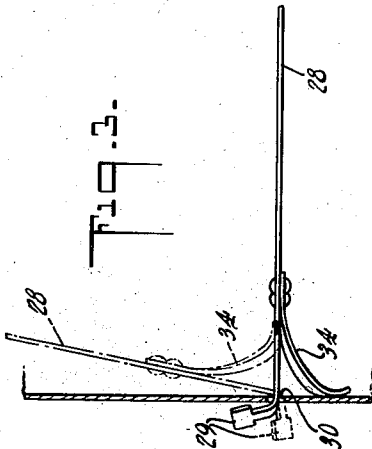
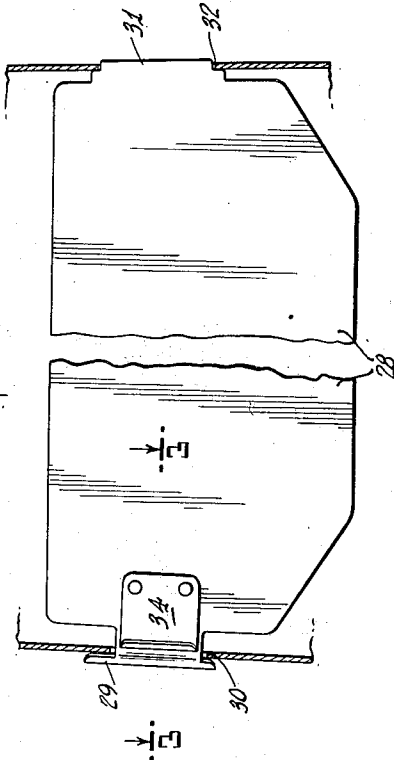


Fig. 2.

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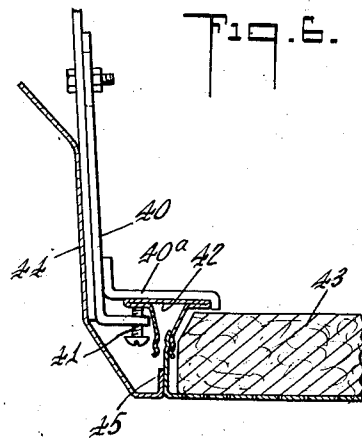
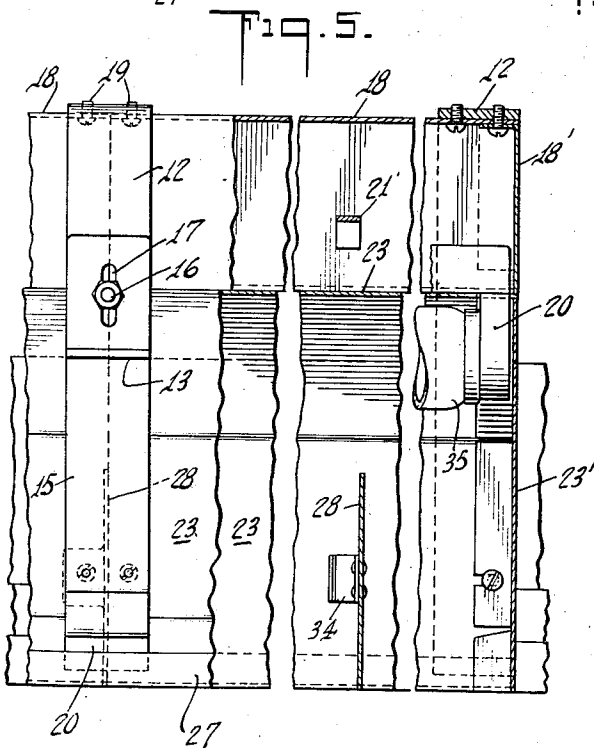
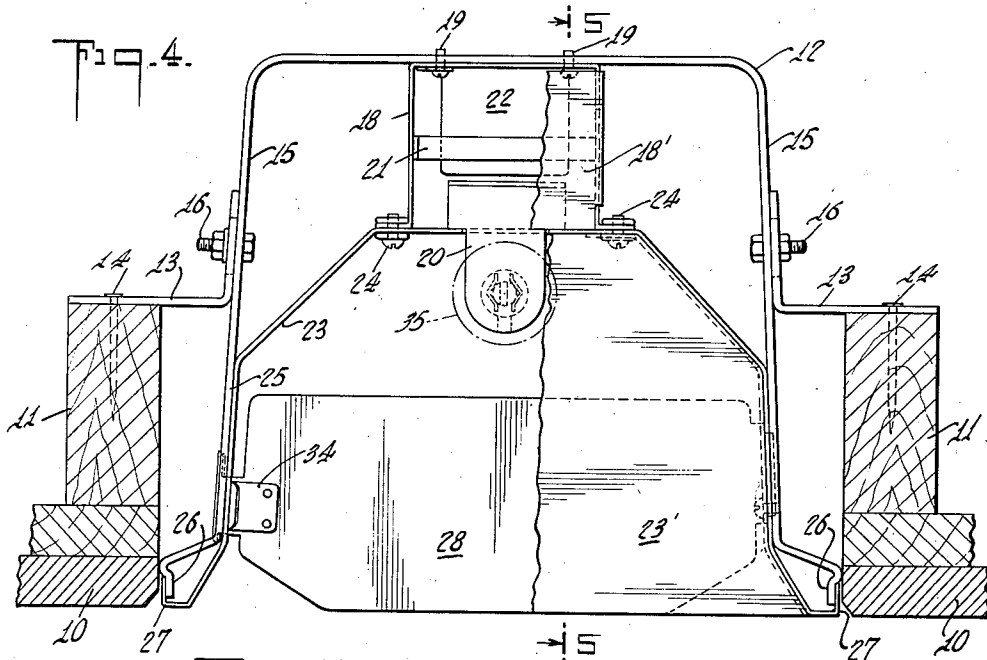
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3 Sheets-Sheet 2



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RECESSED LIGHTING APPARATUS

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Fig. 7.

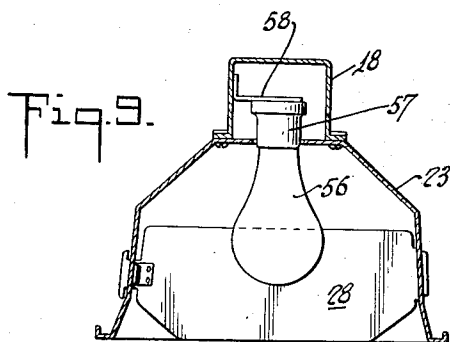
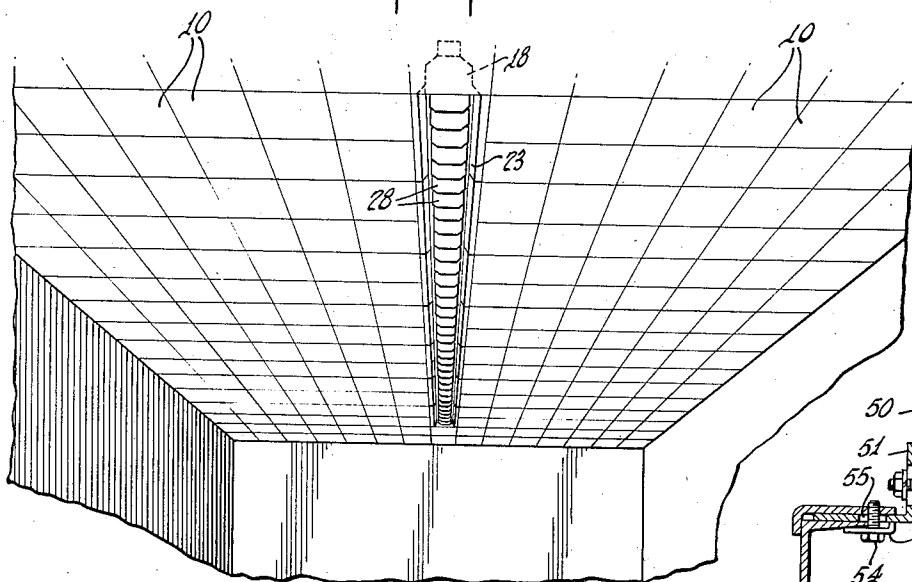
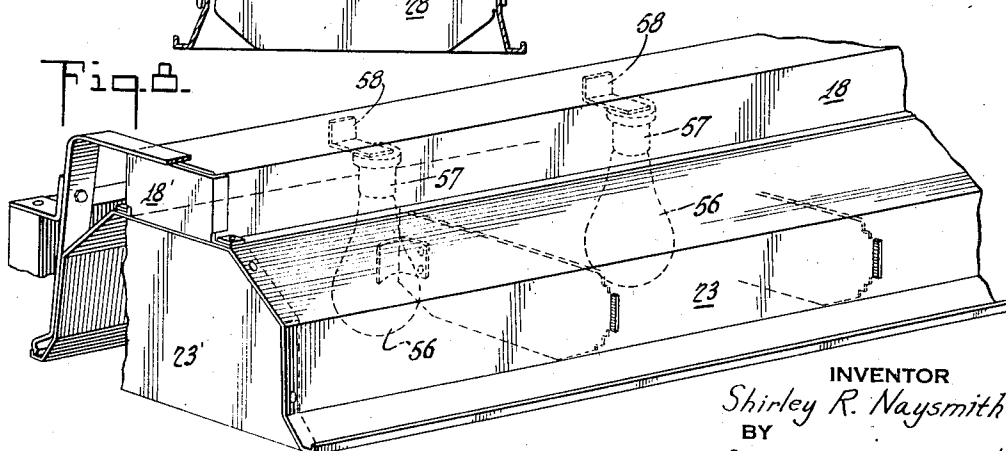
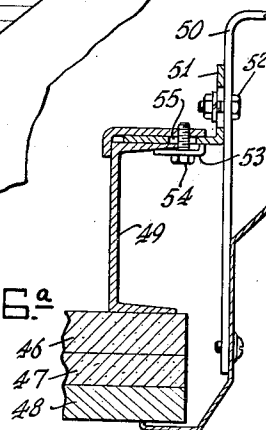


Fig. 6.^a



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RECESSED LIGHTING APPARATUS

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10 Claims. (Cl. 240—78)

The present invention relates to recessed lighting apparatus, and is more particularly directed toward direct lighting apparatus adapted to be recessed into the ceiling.

Acoustical and tile ceilings as well as other forms of "false" ceiling are generally supported below parallel strips of wood or metal suitably supported from above. Suitable openings in such ceilings for installation of recessed lighting equipment may be had by omitting a row of tiles. Where the tiles are, as is usual, one foot wide and of lengths which are multiples of one foot, the opening may be one foot wide and any number of feet long. Owing to these standardized dimensions it is possible to design recessed lighting equipment to be secured to the ceiling supports, fit in the openings and accommodate a long row of incandescent lamps or long fluorescent lamps.

The present invention contemplates lighting apparatus more particularly designed for such purposes. It is made up in sections preferably of a length to correspond with a multiple of the tile length or with the length of the fluorescent lamp to be used, and a plurality of these sections are assembled end to end so that the desired overall length of equipment may be had.

The present invention contemplates that these sections will each include a wiring channel which may be assembled with suitable supports and receive all the wiring, sockets and fluorescent lamp accessories before the mounting in the ceiling. This makes it possible to complete and test the wiring while the apparatus is readily accessible. It may then be secured in place on the ceiling supports, either before or after the ceiling itself is placed. The reflectors and lamps may be placed later. They are readily accessible for replacement, cleaning and inspection of the wiring, sockets and accessories.

Where the apparatus is designed primarily to accommodate fluorescent equipment most of the parts may be readily adapted to use incandescent lamps where special application is desired. This provides generally similar units with many parts interchangeable.

A further object of the present invention is to provide fixtures of the type having long inverted trough reflectors with suitably hinged louvers whereby they may be swung aside to permit easy lamping of the fixture.

Other and further objects of the invention will appear as the description proceeds.

The accompanying drawings show, for purposes of illustrating the present invention, one

of the many embodiments in which the invention may take form, together with modifications of certain parts, it being understood that the drawings are illustrative of the invention rather than limiting the same.

In these drawings:

Figure 1 is a perspective view illustrating the recessed lighting apparatus adapted to use long light sources such as fluorescent lamps;

Figure 2 is an elevational view of one of the louvers;

Figure 3 is a cross sectional view on the line 3—3 of Figure 2;

Figure 4 is a cross sectional view through a ceiling showing the recessed lighting fixture parts being broken away;

Figure 5 is a longitudinal sectional view on the line 5—5 of Figure 4 with parts in elevation;

Figures 6 and 6a are fragmentary transverse sectional views similar to Figure 4 illustrating modified forms of support;

Figure 7 is a perspective view illustrating the installation of the lighting apparatus of Figures 1 to 5 in the ceiling;

Figure 8 is a perspective view of a modified form of recessed lighting apparatus designed for point sources; and

Figure 9 is a cross sectional view on the line 9—9 of Figure 8.

In Figure 4 fragments of ceiling tile are illustrated at 10, 10. These tiles are carried below suitable supporting members 11 which may be wooden strips suitably secured in place. The ceiling tiles 10 are generally spaced one foot apart and hence a long opening one foot wide may be provided between the ceiling tiles. The supports 11 for the ceiling are utilized as the supports for the recessed lighting apparatus.

These supports for the lighting apparatus are here shown in the form of inverted U-shaped straps 12 and angles or brackets 13. The brackets are secured to the supporting members 11, for example, by the nails 14 indicated, and the sides 15, 15 of the U-shaped straps 12 may be adjustably secured to the brackets 13 by bolts 16 passing through slots 17 in the upper side of the brackets. In this way the straps may be mounted at a definite position relative to the opening provided by omitting the ceiling tile where desired.

Channel shaped units 18 are secured at their ends to the upper middle part of the straps 12 by bolts indicated at 19. The straps are so disposed that they will span the joint between two

channel units 18, 18, as indicated at the right of Figure 1 and at the left of Figure 5.

These channel shaped units are made up in lengths of 2, 4, 6 and 8 feet, etc., and therefore singly or combined may extend over any distance which is a multiple of two feet. The extreme ends of the channel are closed by plates 18'. As the ceiling tiles generally are two feet long it is thus possible to provide channel shaped units having the same length as any probable ceiling opening.

When the apparatus is designed to use long light sources, such as fluorescent lamps, sterilizing lamps and the like, the channel shaped member 18 may be used as a long continuous wiring channel. This wiring channel suitably supports at proper spaced intervals downwardly opening sockets 20. These may conveniently be carried by cross straps 21. The channels 18 also support discharge lamp operating apparatus, such as the fluorescent lamp auxiliaries indicated at 22, 22a, as well as wiring supporting straps 21'.

Prior to the installation of the apparatus it is possible to complete the channel 18 by joining together the necessary units. The wiring, lamp sockets and auxiliary apparatus necessary for operating the lamps may be installed and tested while the lighting apparatus is at the factory and at any rate prior to its installation in the ceiling.

The apparatus is also provided with a reflecting trough 23 usually made of porcelain enamelled steel and of the same length as the opening which is to receive the apparatus. This trough is made up in lengths of two and four feet and may be made longer if desired, so that by employing a number of units of standardized length the trough of the desired length may be had. The extreme ends of the trough may be closed by plates indicated at 23'. For convenience in illustration in Figure 1 the trough unit is shown as of the same length as the channel unit. Each trough unit is secured across the lower open face of the channel unit by bolts indicated at 24. The trough unit therefore closes off the wiring channel. The trough unit is suitably apertured to permit the fluorescent lamp sockets 20 to project through as will be obvious. The reflecting trough 23 extends outwardly and downwardly so as to come close to the lower part of the U-shaped straps as indicated at 25 in the drawings. In order to provide suitably finished edges, to support the lower edges of the trough, and to secure alignment between the adjacent ends of the trough section, the structure is preferably designed so that the extreme lower ends 26 of the straps 12 are close to the ceiling line and the outer edges 27 of the trough are bent upwardly so as to receive the lower ends of the straps. With this construction it is apparent that the wiring channel may be secured above the ceiling line, used for temporary lighting, if desired, and adjusted to the proper position and the trough element or elements required may be secured in place later.

As the fluorescent lamp is too bright to be in the line of vision, the present apparatus is provided with transversely extending louvers or light shields 28, 28'. The louvers 28 under the lamps have bent, headed ends 29 adapted to pass through slots 30 in one side wall of the reflecting trough and reduced ends 31 adapted to pass through openings 32 in the opposite side of the trough. Springs 34 urge the louvers or shields to the right, as indicated in Figure 3, so as to hold the end 31 in the hole 32. When one desires

to insert or remove a lamp, such as the fluorescent lamp indicated at 35, these louver members may be swung to the dot-and-dash line position of Figure 3 so that the long lamp may be passed up or down through the trough. The louvers 28' below the sockets may be fixed.

In the arrangement shown in Figure 6 the strap 40 with welded bracket 40a and clamping screw 41 is employed to support lighting apparatus, such as described, above T-bars 42 of the type used in supporting ceiling tile 43. The trough unit 44 is shown as having an upwardly bent edge 45 adapted to fit close to the acoustical ceiling tile.

In Figure 6a the ceiling consisting of back plaster 46, plaster 47 and tile 48 is carried below channel 49 and the trough supporting strap 50 is secured to the channel 49 by angle strap 51, bolt 52, clamp plate 53 and screw 54 passing through an elongated hole 55.

In the arrangement shown in Figures 8 and 9 the wiring channels 18 and reflecting troughs 23 may be the same as before and may be similarly supported. Instead of employing fluorescent lamps the structure is designed to employ pendent incandescent lamp bulbs indicated at 56. These are received in downwardly opening sockets 57 mounted on angles 58 carried in the wiring channel 18. The structure may be otherwise the same as above described.

It is obvious that the invention may be embodied in many forms and constructions within the scope of the claims and I wish it to be understood that the particular forms shown are but a few of the many forms. Various modifications and changes being possible, I do not otherwise limit myself in any way with respect thereto.

What is claimed is:

1. Lighting equipment adapted for recessed mounting in a ceiling, comprising a plurality of channel shaped units arranged end to end, inverted U-shaped straps in which the ends of the channel shaped units are centrally secured with the backs of the units adjacent the straps, the straps spanning the upper joint between the ends of the channel shaped units and having their lower ends substantially lower than the bottoms of the inverted channel shaped units and spaced wider than the channel shaped units, downwardly opening lamp sockets and wiring mounted in the channel shaped units, and inverted trough shaped reflector units secured across the bottoms of the channel shaped units and extending outwardly below the ends of the straps.

2. Lighting equipment such as claimed in claim 1, wherein each channel shaped unit has two sockets projecting beyond the open side of the inverted channel shaped unit near the ends thereof and of the type to support a linear discharge lamp, the reflector units being apertured for the sockets and having discharge lamp operating apparatus secured in the channel shaped units and wired to the sockets.

3. A ceiling lighting fixture comprising a plurality of inverted channel shaped units arranged end to end, U-shaped straps in which the ends of the channel shaped units are centrally secured with the backs of the units adjacent the straps, the straps spanning the upper joint between the ends of the channel shaped units and extending downwardly below the bottom of the inverted units, downwardly opening lamp sockets and wiring mounted in the channel shaped units, an inverted trough shaped reflector of the same overall length as the overall length of the chan-

nel shaped units, the reflector being secured across the bottom of the channel shaped units to close the same and being disposed within the lower ends of the straps, and lamps carried in the sockets below the top of the reflector.

4. A lighting fixture such as claimed in claim 3, having a plurality of transversely extending louvers spaced lengthwise of the reflector, the louvers each having a hinge mounting at one end so that each louver may be swung aside.

5. In combination, two fixedly carried parallel ceiling supporting members, ceiling material secured below the supporting members and extending laterally therefrom to form a rectangular opening below and between said supporting members, two spaced inverted U-shaped straps supported from the ceiling supporting members with their lower ends terminating adjacent the ceiling line, a downwardly opening channel shaped member secured underneath the top of the straps, two spaced lamp sockets for linear discharge lamps together with discharge lamp operating apparatus and interconnecting wiring secured in the channel shaped member, an inverted reflecting trough secured to the channel shaped member to close the bottom thereof and having its lower edges close to the edges of the ceiling material and its ends secured to the U-shaped straps, the lamp sockets extending below the top of the trough, and a discharge lamp downwardly removably carried between the sockets.

6. A combination such as claimed in claim 5, wherein at least one of the straps extends beyond the end of the channel shaped member and the trough and a similar channel shaped member and trough are secured to said strap.

7. A combination such as claimed in claim 5, wherein the lower ends of the straps are secured to the lower edges of the trough.

8. A combination such as claimed in claim 5, having brackets secured to the ceiling support-

ing members and vertically adjustable connections between the brackets and the U-shaped straps.

9. A luminaire for recessed lighting in a ceiling comprising a plurality of units of standardized length, each unit including an inverted wiring channel, a discharge lamp operating apparatus and wiring in the wiring channel, an inverted reflecting trough secured across the bottom of the wiring channel and extending downwardly and outwardly, lamp sockets adjacent the ends of the wiring channel and projecting into the trough, a linear discharge lamp carried in the sockets, and supporting straps bridging the joints between adjacent wiring channels and to which they are secured, the ends of the supporting straps engaging the ends of adjacent troughs to align the same.

10. Lighting apparatus adapted to be recessed above a long narrow opening in a ceiling having parallel supporting members above the ceiling adjacent the opening, said apparatus comprising a plurality of downwardly opening wiring channel units each secured at each of its ends to the middle of an inverted U-shaped strap of a size to be passed upwardly through the opening, discharge lamp operating apparatus, sockets and wiring carried by the wiring channel, brackets carried by the supporting members and to which the U-shaped straps are secured to space the channel units above the ceiling opening, inverted troughs secured to and closing each wiring channel unit and into which the sockets extend, whereby a line of discharge lamps may be supported, the width of the troughs equalling the width of the ceiling opening and the overall length of all the troughs equalling the length of the opening, and closures for the ends of the wiring channel and of the trough.

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