

May 9, 1967

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3,319,059

SECTIONAL LIGHTING FIXTURE

Filed Dec. 30, 1964

5 Sheets-Sheet 1

Fig. 1.

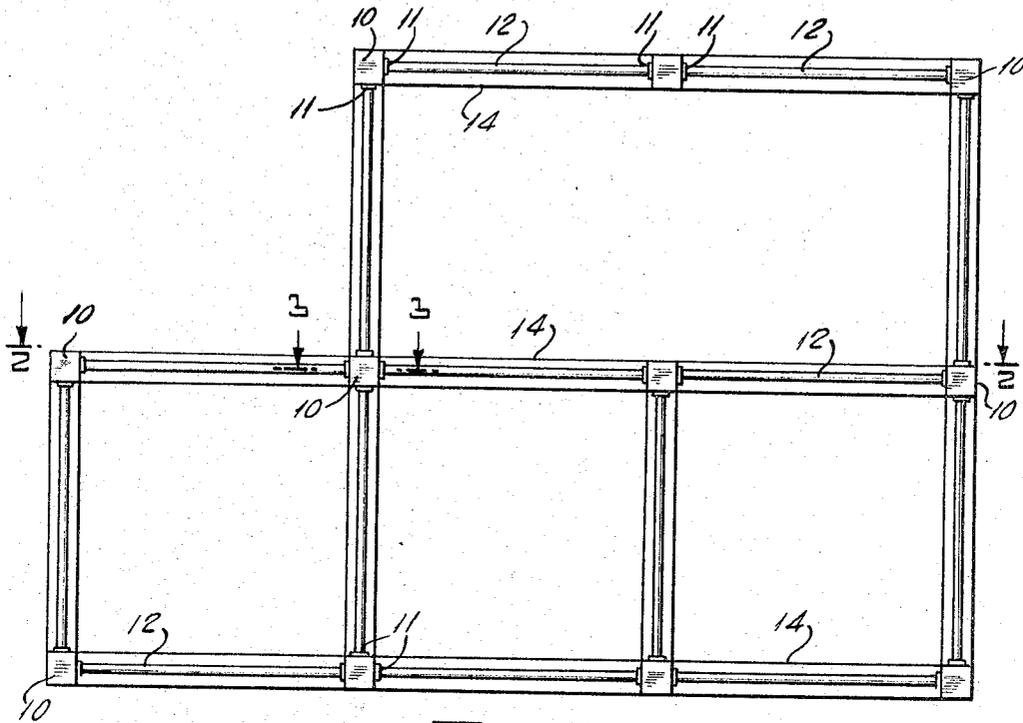


Fig. 2.

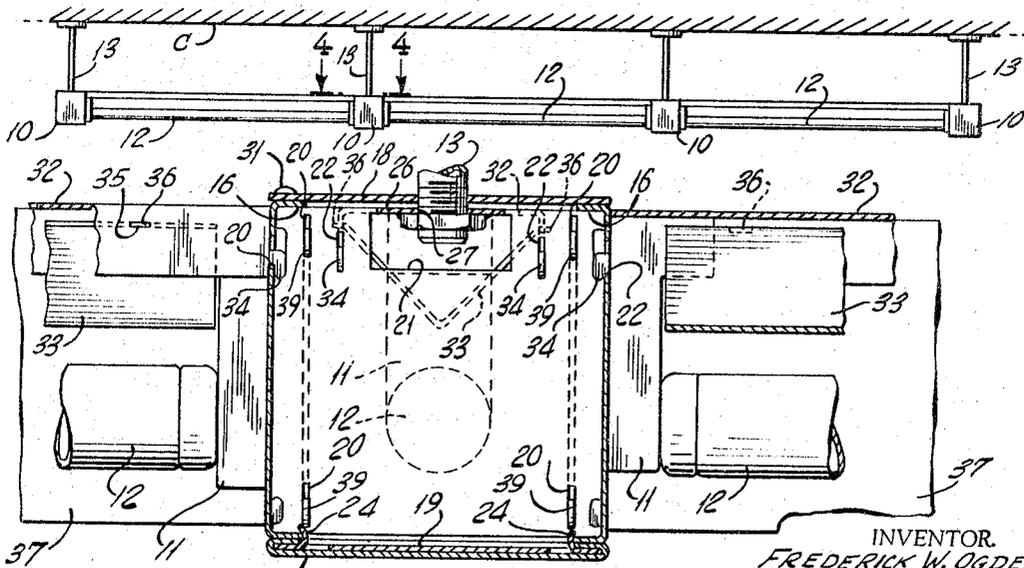


Fig. 3.

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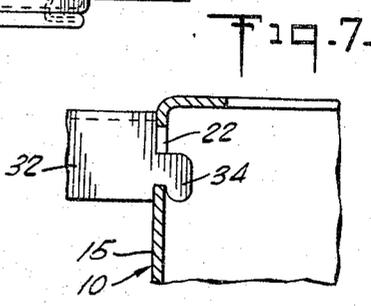
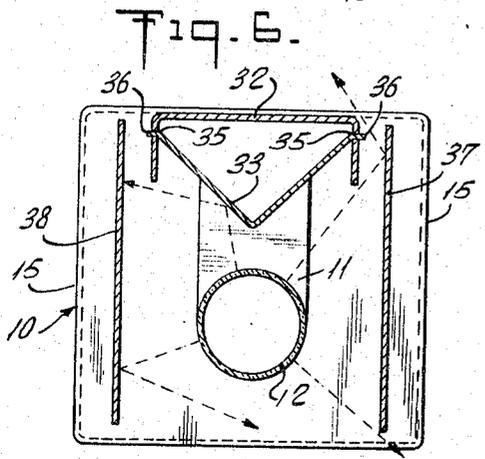
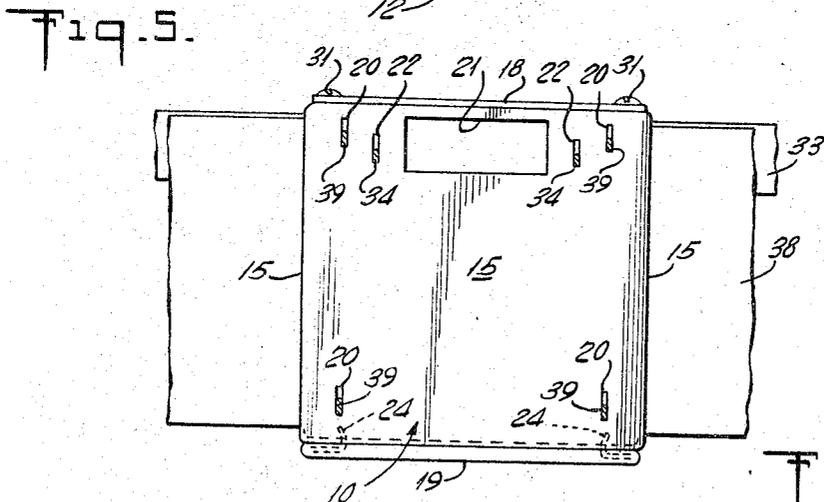
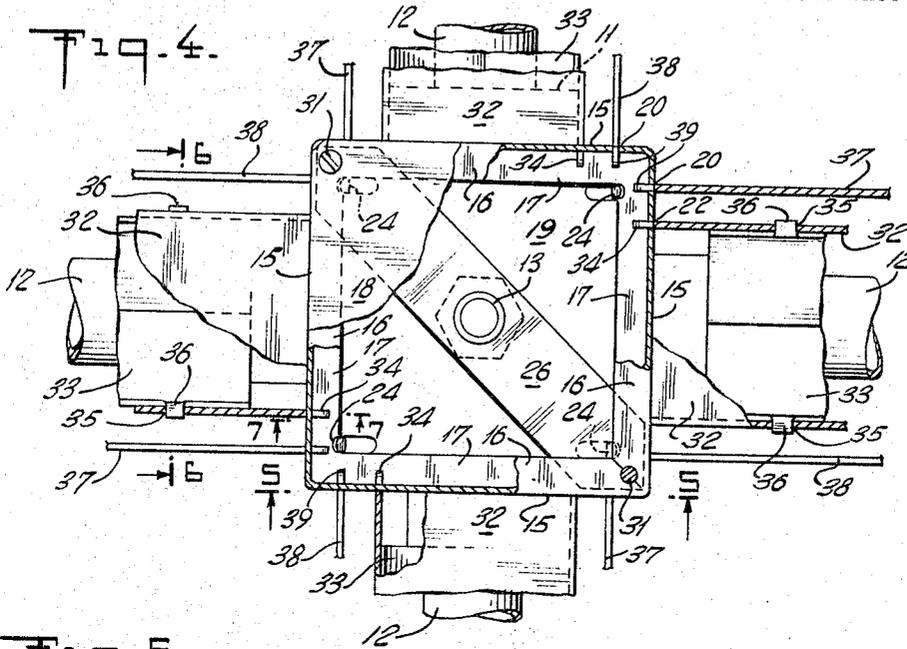
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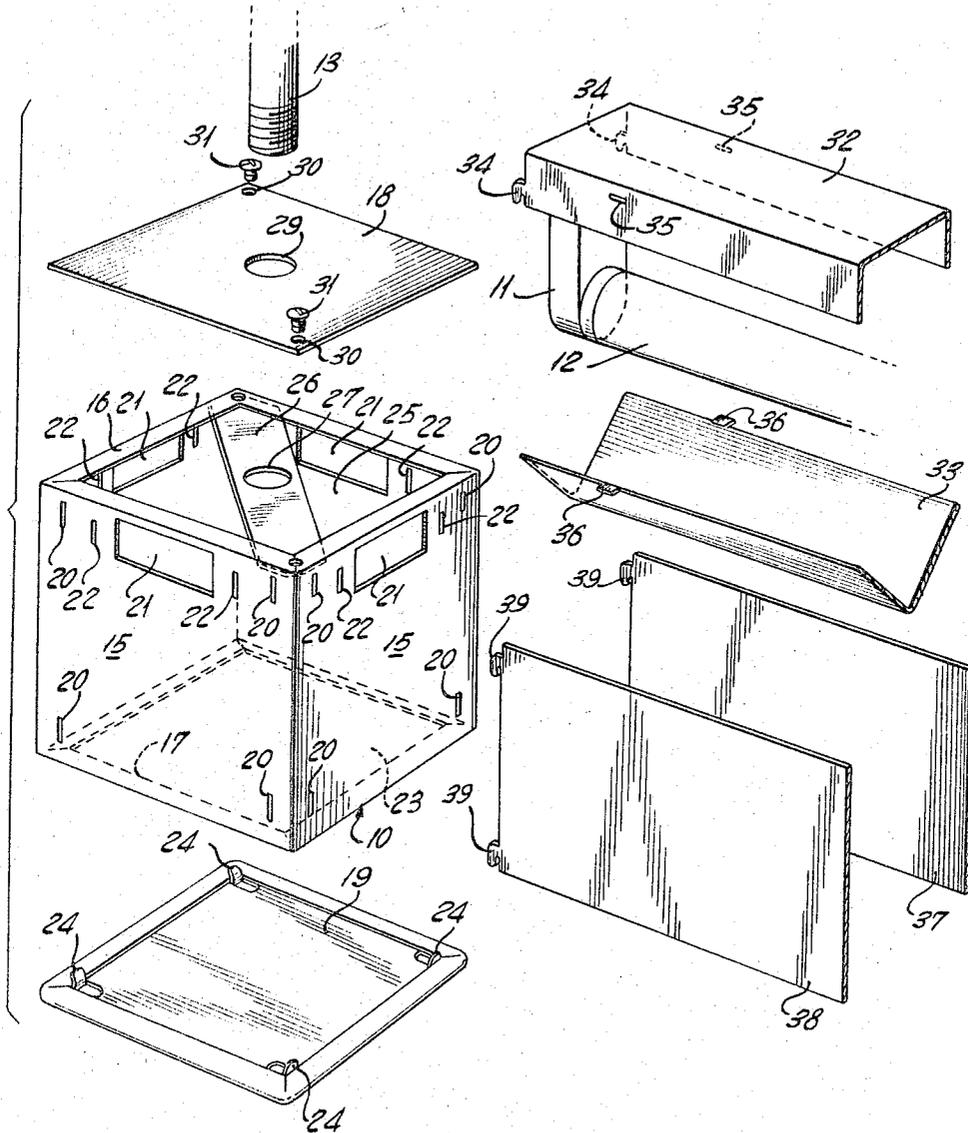
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SECTIONAL LIGHTING FIXTURE

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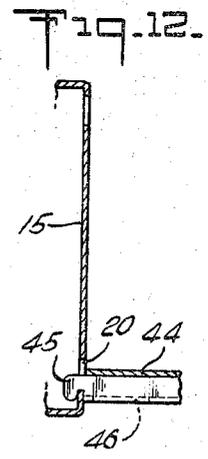
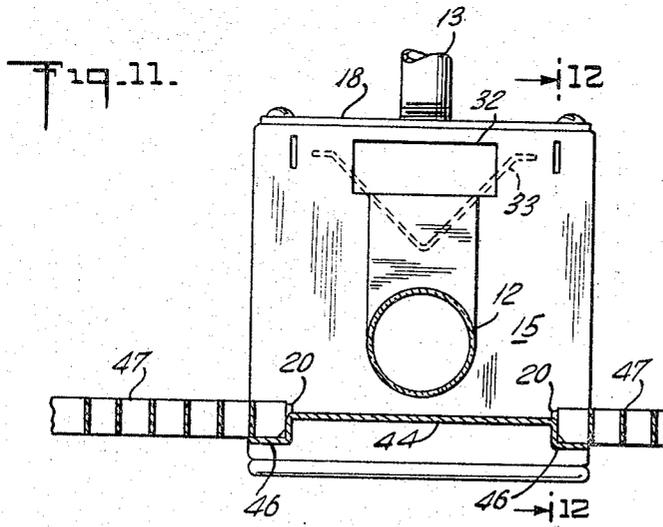
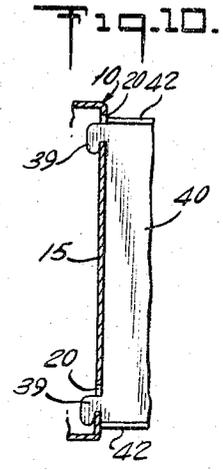
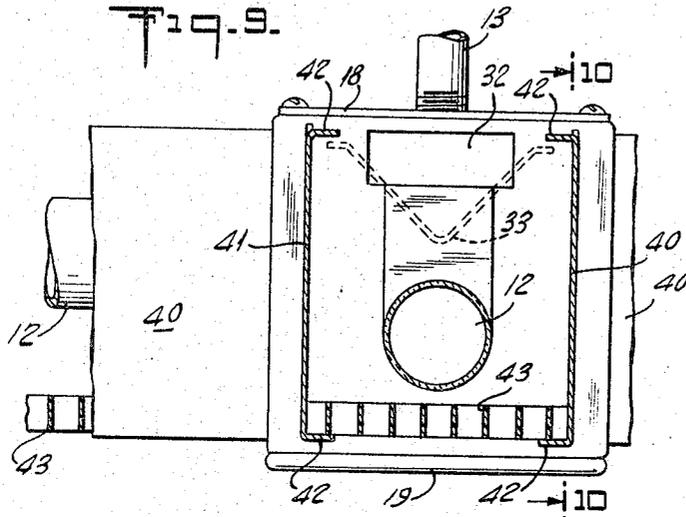
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SECTIONAL LIGHTING FIXTURE

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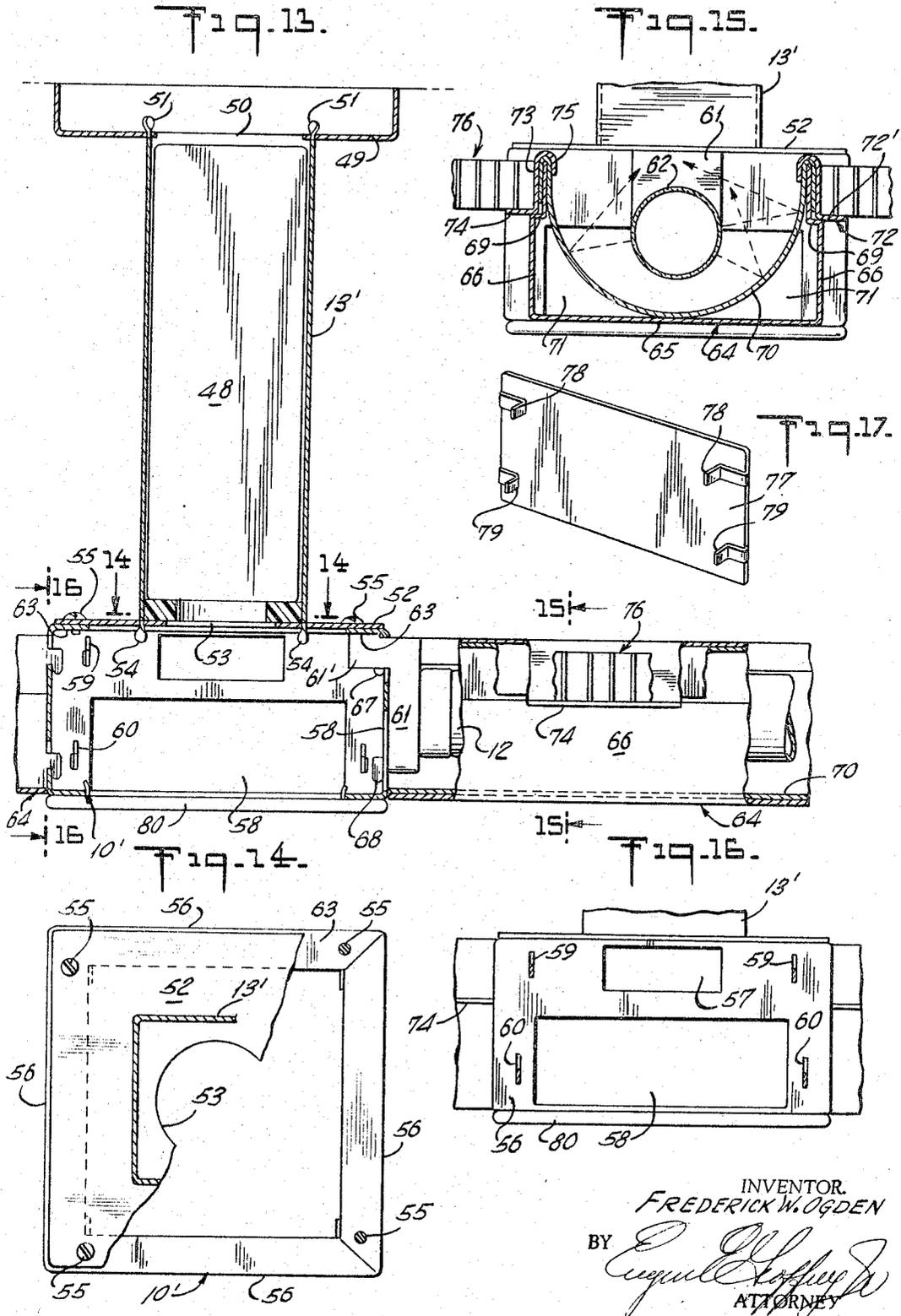
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SECTIONAL LIGHTING FIXTURE

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5 Sheets-Sheet 5



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SECTIONAL LIGHTING FIXTURE

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2 Claims. (Cl. 240-9)

This invention relates to lighting fixtures and more specifically to a novel and improved lighting fixture for general area lighting and which may be arranged to conform with regular or irregular areas and which may be combined with opaque or light transmitting ceiling elements to provide both direct and indirect ceiling illumination.

Fluorescent lighting fixtures and particularly those available for commercial applications are generally designed either for installation on a ceiling or for incorporation as part of a ceiling. Such fixtures are of conventional configuration utilizing one or more lamps and can be mounted in end-to-end relationship to provide parallel strips of lighting. When utilizing fixtures adapted for installation in a hung ceiling, it is customary to install the ceiling and, upon completion, install the lighting fixture in openings provided therein. In some cases, it is necessary to provide individual supports for the fixtures within the openings provided in the ceiling and this procedure is relatively expensive and time-consuming.

This invention overcomes the difficulties heretofore encountered in providing recessed ceiling illumination and affords a novel and improved lighting fixture and system wherein the improved fixture elements may be installed for either direct or indirect lighting and covering part or all of the ceiling and then ceiling elements may be supported between the fixture elements to complete the ceiling.

Another object of the invention resides in a novel and improved lighting fixture formed of a plurality of individual elements that may be assembled in any desired configuration and afford either direct or indirect lighting.

Still another object of the invention resides in a novel and improved lighting fixture formed of a plurality of spaced supporting elements each arranged for the accommodation and support of elongated illuminating means and associated reflecting elements extending radially therefrom and supported at their outer extremities by corresponding supporting means.

Still another object of the invention resides in the provision of a novel and improved sectional lighting fixture that can be arranged in any desired configuration for space illumination and which may afford support for opaque or light transmitting ceiling members.

The above and other objects of the invention will become more apparent from the following description and accompanying drawings forming part of this application.

In the drawings:

FIGURE 1 is a plan view of one embodiment of a lighting fixture in accordance with the invention and illustrating an arrangement of elements to illuminate an irregular area.

FIGURE 2 is a cross-sectional view of FIGURE 1 taken along the line 2-2 thereof.

FIGURE 3 is a cross-sectional view of FIGURE 1 taken along the line 3-3 thereof and illustrating one of the supports which, in the instant embodiment of the invention, is in the form of a hollow cube secured in spaced relationship with the ceiling.

FIGURE 4 is a plan view of one of the supports shown in FIGURES 1 and 2 and taken along the line 4-4 of FIGURE 2.

FIGURE 5 is a side elevational view taken in the direc-

tion of the arrows 5-5 of FIGURE 4 and with portions removed to illustrate one face of the support.

FIGURE 6 is a cross-sectional view of FIGURE 4 taken along the line 6-6 thereof.

FIGURE 7 is an enlarged fragmentary view in cross-section taken along the line 7-7 of FIGURE 4.

FIGURE 8 is an exploded view of the support or cube and one form of the cooperating light source supporting and reflecting elements.

FIGURE 9 is a side elevation in partial section of a modified form of light source supporting and diffusing elements.

FIGURE 10 is a cross-sectional view of FIGURE 9 taken along the line 10-10 thereof.

FIGURE 11 is a side elevational view in partial section of still another embodiment of the invention.

FIGURE 12 is a cross-sectional view of FIGURE 11 taken along the line 12-12 thereof.

FIGURE 13 is a cross-sectional view of still another embodiment of a sectional lighting fixture in accordance with the invention.

FIGURES 14 through 16 are cross-sectional views of FIGURE 13 taken along the lines 14-14, 15-15 and 16-16 thereof, respectively.

FIGURE 17 is a perspective view of a blank closure plate for use with the embodiment of the invention shown in FIGURES 13 through 16.

The lighting fixture in accordance with the invention constitutes a new and improved arrangement of elements for providing general lighting in regular or irregular areas. The light sources may be supported in any desired configuration for either direct or indirect lighting, and, if desired, the lighting fixture may constitute the supporting structure for a false ceiling of opaque or light transmitting material. These ends are attained through a new and improved concept in lighting fixtures wherein the lighting fixture is formed of a plurality of basic elements which can be arranged in any desired configuration to suit the lighting needs of a particular room or other area. By reason of the versatility of the lighting fixture in accordance with the invention and the fact that certain of the basic elements of the lighting fixture are common to the various forms, the manufacturing and installation costs can be materially reduced and the mode of lighting can be modified quickly and easily and without disturbing the basic installation or electric wiring. For instance, if a lighting system in accordance with the invention is arranged for direct downward illumination, it can easily be changed to provide indirect lighting or any combination of direct and indirect lighting by merely substituting different light controlling elements. This will become more apparent as the description proceeds.

Referring to FIGURES 1 and 2 which illustrates the basic concept of the invention, it will be observed that the lighting fixture in accordance with the invention comprises a plurality of corner housings or supports 10 which may be in the form of a box or cube and sockets 11 for support of lamps 12 therebetween. The corner housings 10 are identical and each is secured to the ceiling C by an appropriate stem 13, one or more of which may accommodate electric wiring for lighting the lamps 12.

Each of the housings 10 is interconnected by light controlling elements such as the elements 14, which, in the instant embodiment of the invention, provide for direct down lighting. These elements mechanically couple the housings one to the other and also provide wireways for the electrical circuits. Ballasts or other suitable devices necessary for illuminating the fluorescent tubes 12 may be mounted within selected housings or wireways as may be desired. The light controlling elements 14 as will be

discussed may also support light transmitting or opaque lighting elements. Since the housings 10 are arranged to accommodate different types of light controlling elements, the type of lighting can be modified in any given installation by merely changing the light controlling elements 14 without disturbing the electric wiring or the corner housings 10.

The invention with one form of light control means is shown in detail in FIGURES 3 through 8. In this form of the invention, the corner housing 10 is in the nature of a tubular member having four walls 15 with each wall having upper and lower flanges 16 and 17 which are relatively narrow and provide means for attachment of an upper cover 18 and a lower cover 19. Each of the walls 15 has four vertically disposed corner slots 20, an enlarged central opening 21 adjoining the upper edge of the wall and a pair of slots 22 spaced from the sides of the opening 21.

The bottom cover 19 may take any desired form as its purpose is to merely close the bottom opening 23 of the housing 10. For this purpose, the cover 19 is provided with tabs 24 which may be bent over the inwardly extending lower flanges 17 to secure the bottom in place. The upper opening 25 has a diagonal strap 26 welded or otherwise secured to the upper flanges 16 and is provided with a central threaded opening 27 to threadably receive the lower end of the stem 13. A lock nut 28 as will be observed in FIGURE 3 may be used to lock the stem 13 in place and prevent rotation of the housing 10 relative to the stem. The upper cover 18 has an opening 29 slidably receiving the stem 13 and a pair of corner openings 30 for attachment of the cover to the housing by means of screws 31.

The wireway is formed of two elements, namely, an inverted U-shaped channel 32 and a V-shaped reflector 33. The channel 32 has a width substantially corresponding to the distance between the slots 22 in the walls 15 and the end of the channel is provided with latching tabs 34 which engage the slots 22 and thereby interlock it with the housings 10. Thus, the channel 32 holds adjoining housings in fixed relationship one to the other and at the same time provides means for accommodating wiring which may be fed through the openings 21. The sockets 11 in the instant embodiment of the invention are secured to the channels 32 in any suitable manner, it being merely necessary that the sockets are somewhat narrower than the opening 21 so that at least a portion of the opening 21 is available to accommodate electrical wiring. The V-shaped reflector 33 completes the wiring channel and is supported by the channel 32. For this purpose, the channel 32 is provided with a series of slots 35 on each side thereof and the V-shaped reflector is provided with cooperating tabs 36. By compressing the V-shaped reflector 33, it may be inserted within the channel and then upon relaxing the pressure on the channel 33 with the tabs 36 in alignment with the openings 35 the tabs will engage the openings and secure the V-shaped reflector 33 in position. The remainder of the light controlling means in the instant embodiment of the invention comprises a pair of parallel plates 37 and 38. Each of these plates has a length identical to the channels 32 and 33 and is provided with locking tabs 39 substantially identical to the locking tabs 34 on the channel 32. The tabs 39 are placed in engagement with the slots 20 to complete the structure. An assembled view of the elements is shown in FIGURE 6, and it will be observed that the fixture provides a small degree of up-lighting with the major portion of the light being directed downwardly. As is evident from FIGURE 1, two or more sides of each housing may be utilized. The unused sides would preferably be closed by a plate such as the plate 19, and, for this purpose, the tabs 24 of the plate 19 are located to engage the slots 20 in the unused side 15 and thereby close the openings therein.

A modified form of the invention is shown in FIGURES 9 and 10. In this form of the invention, the side

plates 37 and 38 are replaced by modified plates 40 and 41, each having inwardly extending upper and lower flanges 42. The upper flanges reduce the percentage of upwardly illumination and the lower flanges hold a suitable grid 43 which extends throughout the entire length of the side plates 40 and 41.

FIGURES 11 and 12 illustrate a still further modification of the invention wherein means are provided for supporting a grid or other translucent or light transmitting element. In this embodiment of the invention, the wireway which is formed of the channels 32 and 33 remains in place and merely the side plates such as 37 and 38 or 40 and 41 are removed and replaced by a horizontal plate 44. This plate includes interlocking tabs 45 for engagement of the lower openings 20. The side edges of the plate 44 have downwardly and outwardly L-shaped flanges 46 for receiving panels 47 to close the ceiling areas between the housings 10. These panels may be in the form of grids or other translucent or light transmitting material. If desired, intervening bracing elements may join intermediate portions of parallel plates 44 to divide each of the areas into small squares or rectangles as may be desired.

In the embodiment of the invention previously described, the ballast or other means required for operation of the fluorescent lamps was intended to be installed within the housings 10 or within the wireways. If desired, conventional elongated ballasts may be mounted in enlarged tubular stems for supporting the housings 10 from the ceiling. Suitable ventilating means would of course be provided where necessary. When the ballast is intended to be incorporated within a tubular stem, somewhat shallower housings may be utilized, and this modified structure is shown in FIGURES 13 through 16.

FIGURE 13 illustrates the utilization of an enlarged stem 13' having a ballast 48 housed within the stem. The top of the stem 13' may be secured to a recessed ceiling plate 49 of any suitable type. In the instant embodiment of the invention, the plate 49 has an opening 50 therein and further includes openings surrounding the central opening 50 to accommodate tabs 51 extending upwardly from the tubular stem 13'. These tabs may be bent outwardly or may be twisted as desired to secure the stem in the ceiling plate 49. The bottom of the stem 13' is provided with a flat plate 52 having a central opening 53 therein. The plate 52 is fastened to the stem by means of tabs 54 in the same manner as described in connection with the attachment of the upper plate 49. Each housing 10' is secured to its associated plate 52 by a plurality of screws 55.

The housing 10' in the embodiment of the invention shown in FIGURES 10 through 16 is intended for supporting light controlling elements which direct all of the light upwardly and at the same time provide for the support of translucent or light transmitting ceiling elements. For this purpose, each side wall 56 of each housing 10' is provided with a small upper opening 57 and an enlarged lower opening 58. Upper slots 59 are provided in each wall and spaced from the sides of the openings 57. A pair of lower slots 60 are spaced from the edges of the bottom opening 58. The sockets 61 for the fluorescent lamps 62 have base portions 61' which extend through the openings 57 in the side walls 56 and are fastened to the upper flanges 63 of the side walls 56. The adjoining housings 10' are connected by an elongated upwardly facing channel 64 having a horizontal bottom 65 and upwardly extending side walls 66. The side walls 66 have latching tabs 67 and 68 for engaging the slots 59 and 60 respectively. The upper portions of the side walls 66 are offset as indicated at 69 to accommodate ceiling supporting elements to be described. A cylindrical reflector 70 having a diameter substantially equal to the distance between the offset wall portions 69 of the channel 64 is disposed within the channel as illustrated in FIGURE 15 and forms a wireway 71 for accommodation

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of the electric wiring. The reflector and channel are held in position by supporting brackets generally denoted by the numeral 72. Each bracket 72 has an L-shaped cross-section with the vertical leg 73 lying flat against the outer face of the associated offset portion 69 of the housing 64. The bottom leg 74 of the support 72 rests on the shoulder formed by the offset portion 69 and extends outwardly to a point substantially coincident with the edge of the housing 10'. The upper end of the leg 73 is bent upon itself to form a hook-like portion 75 which overlies the top edges of the housing walls 66 and the reflector 70, thereby holding them in firm engagement one with the other. The shoulder formed by the leg 74 of the bracket 72 provides support for intervening ceiling elements 76 which may be in the form of an open grid or of other translucent or transparent material.

As in the case of the previous embodiment of the invention, blank panels are provided for the sides of the housings 10' which are not utilized in a specific lighting arrangement. One such panel is shown in FIGURE 17 and denoted by the numeral 77. This panel has tabs 78 and 79 for engagement with the openings 59 and 60 respectively in a side wall 56. The bottom of each box is closed by a blank panel 80 which is similar to the panel 19 shown and described in connection with the previous embodiment of the invention.

From the foregoing description, it is apparent that the novel and improved lighting fixture provides an exceedingly high degree of versatility and enables the attainment of a wide variety of lighting effects. This is attained through the utilization of certain basic fixture elements, namely, corner housings or units which are individually suspended from a ceiling at predetermined intervals and may accommodate any type of light directing means therebetween. With this arrangement, the cost of custom lighting installations is materially reduced, since certain basic elements are common to all forms of the invention.

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Furthermore, the type of lighting can be modified merely by interchanging light directing elements. It is also to be understood that, while a shallow corner housing 10' is shown in FIGURE 13 and the deeper housings 1 are shown in the preceding figures, they may be interchanged or modified as may be desired.

While only certain embodiments of the invention have been illustrated and described, it is apparent that alterations, modifications and changes may be made without departing from the true scope and spirit thereof as defined by the appended claims.

What is claimed is:

1. A lighting fixture having a rectangular configuration comprising a relatively small rectangular box disposed at each corner of said fixture and having supporting means for securing each box to a supporting surface, light controlling means releasably carried by and between said boxes and elongated light sources disposed within said light controlling means, said light controlling means comprising an elongated upwardly facing channel, a generally cylindrical concave reflector disposed within said channel and elongated means engaging the elongated edges of said channel and reflector to secure them one to the other.

2. A lighting fixture according to claim 1 wherein said elongated means each include an outwardly extending flange for the support of light transmitting ceiling elements.

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