

Nov. 30 1943.

J. T. SHANNON ET AL

2,335,545

LIGHTING FIXTURE

Filed May 15, 1941

3 Sheets-Sheet 1

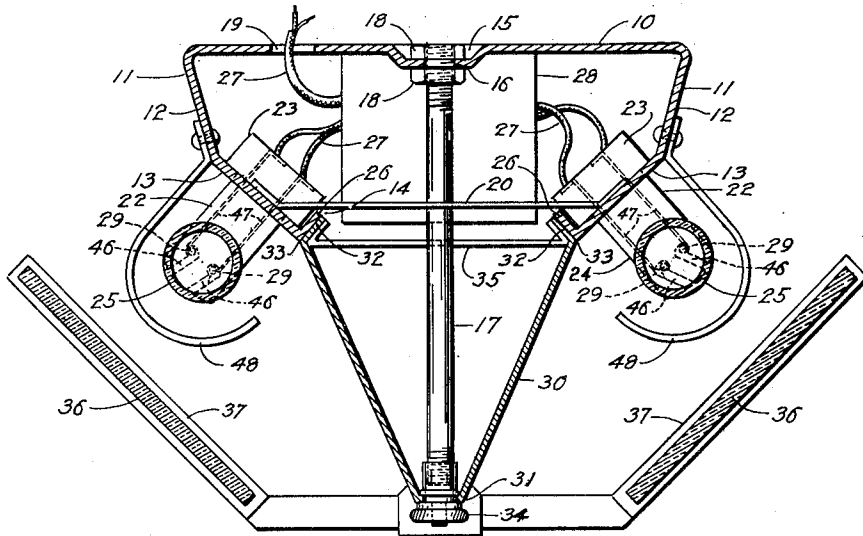


Fig. 1.

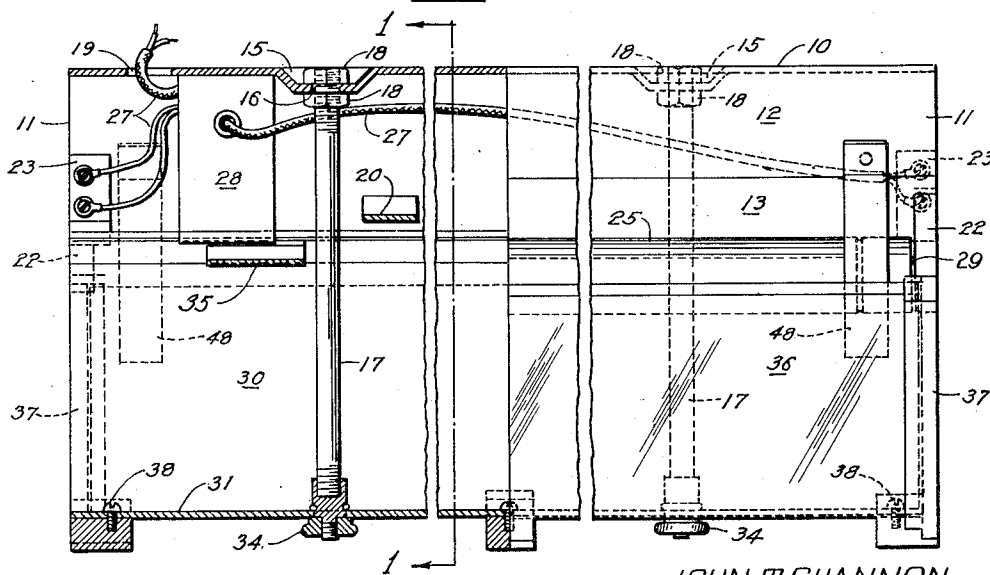


Fig. 2.

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3 Sheets-Sheet 2

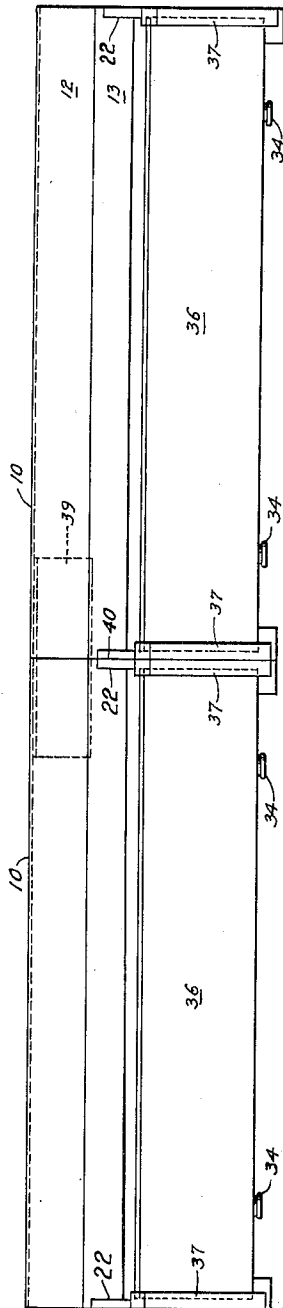


Fig. 3.

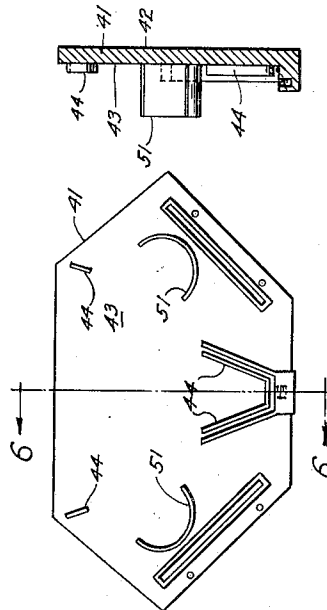


Fig. 5.

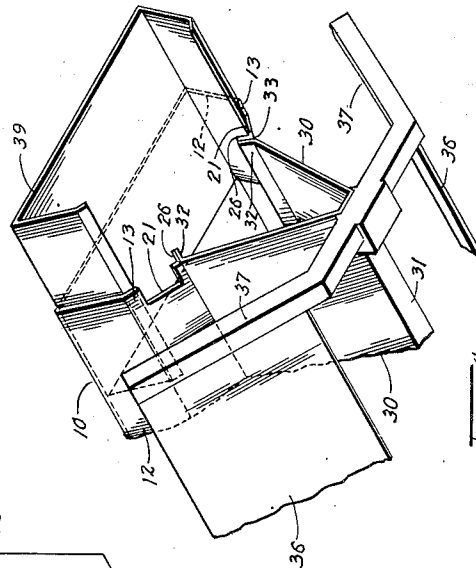
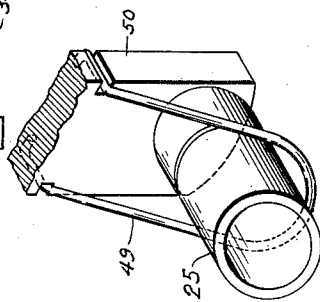


Fig. 4.



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3 Sheets-Sheet 3

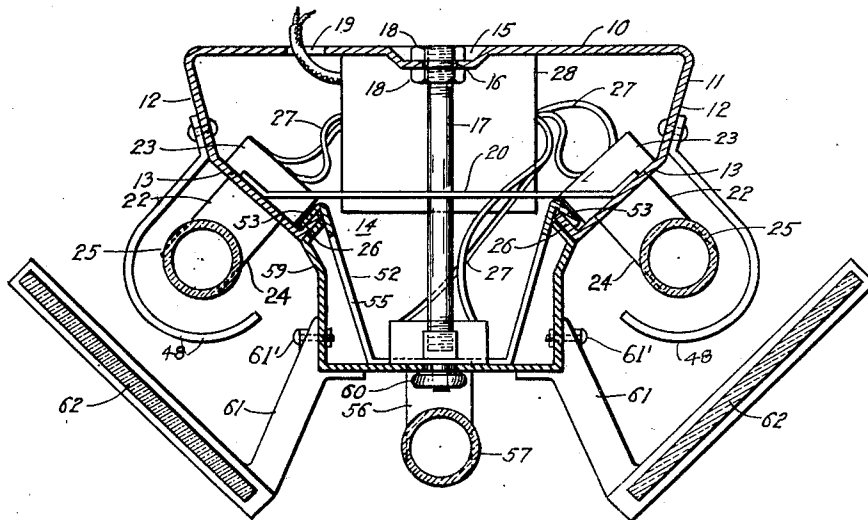


Fig. 7.

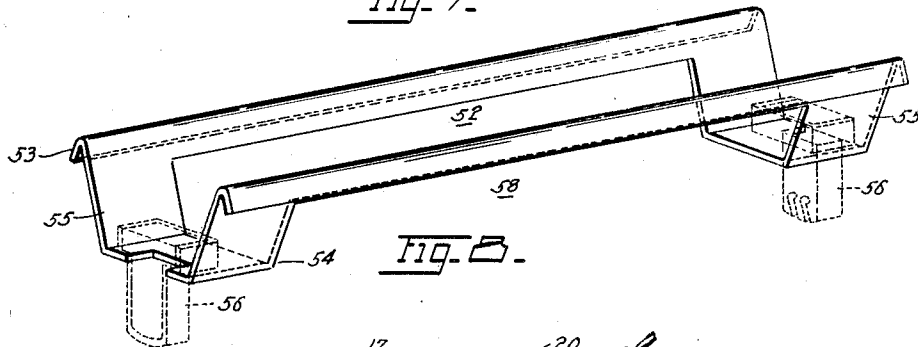


Fig. 8.

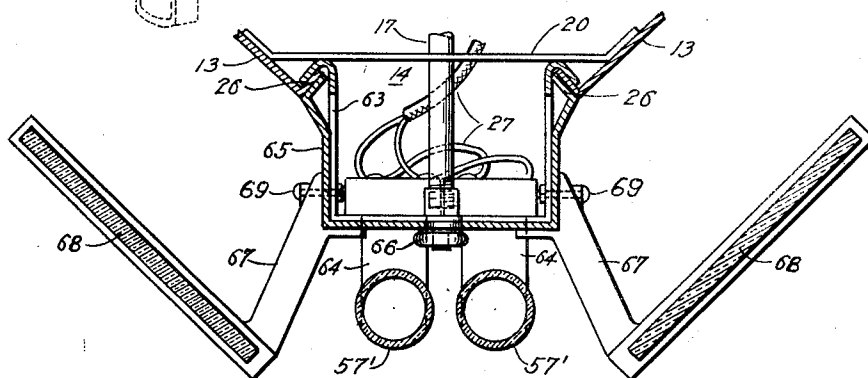


Fig. 9.

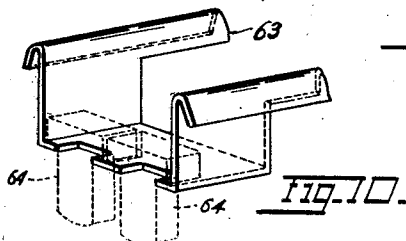


Fig. 10.

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UNITED STATES PATENT OFFICE

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LIGHTING FIXTURE

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Application May 15, 1941, Serial No. 393,618

3 Claims. (Cl. 240—78)

This invention relates to improvements in lighting fixtures, especially those employing luminescent or fluorescent tubing units for supplying light upon being energized by electrical contact.

The principal object of the invention is to provide a lighting fixture of the fluorescent type which shall provide the utmost in lighting abundance efficiently and economically by means of a sturdy, attractive structure which can be made at very low cost, and in which fixture ordinary repairs or replacements of structural parts, wiring, or other contained equipment may be accomplished more easily than on other similar equipment now in use, without disturbing the fixture base in its permanently attached position along ceiling, wall, or other support.

A further object of the invention is to provide a fixture of the class just described, in which easy access may be had to the interior of its base for purposes of repairs, replacements, adjustment, etc., of its essential parts or wiring.

A still further object of the invention is to provide a fixture of this type, the base and attached lighting elements of which need not be lowered or removed from permanently attached position while making needed adjustments, repairs, or replacements in its interior, so that it will be capable of performing its regular lighting function undisturbed during the period in which such work is being done.

Another and further important object of the invention is to provide a fixture of the fluorescent or luminous tube type which shall possess highly desirable safety features not hitherto available in similar devices.

Another and still further object of the invention is to provide a fixture construction by which structural units or sections thereof may be used singly as separate and distinct, independently mounted lighting fixtures, or combined in neatly arranged connected longitudinal multiples to form a row of units or sections which shall have the appearance of one continuous elongated fixture, each section of which is separately wired so that failure of one will not affect the continued functioning of the others, while rendering each section's wiring or other base-contained parts readily accessible for convenient adjustment, repair, or the like, without the necessity of loosening, lowering, or removing its base from permanently attached position.

Other and further objects of the invention will be apparent from the disclosures in the accompanying drawings and following specification.

In the drawings:

Figure 1 is a transverse section through a preferred form of lighting fixture of our invention.

Figure 2 is a side view of the same fixture, partly in section.

Figure 3 illustrates two of the lighting fixtures mounted end to end so as to give the effect of a continuous fixture, certain parts being removed for purposes of clarity.

Figure 4 is a fragmentary perspective view showing in detail certain important structural parts of our lighting fixture and their manner of assembly.

Figure 5 is an elevation of an optional end plate for our fixture, showing the inner face thereof.

Figure 6 is a sectional view taken on the line 6—6 of Figure 5.

Figure 7 is a sectional view similar to Figure 1, showing the fixture of our invention in slightly modified form.

Figure 8 is a perspective view of an insert adapted for use in the Figure 7 structure.

Figure 9 is a sectional view similar to Figure 7, showing another slightly modified form of our invention.

Figure 10 is a fragmentary perspective view of an insert adapted for use in the Figure 9 structure.

Figure 11 is a fragmentary perspective view showing in detail a combined socket and tube-guard forming part of our invention.

As shown in the drawings:

Our fixture structure comprises essentially an elongated base or shell 10, such as a metal channel element or the like, the upper portion of which is closed and the longitudinal edges of which are bent downward to form a pair of depending flanges or side-walls 11. We prefer to form the side-walls 11 of a slightly inclined upper bend 12 and a second or lower bend 13 inclining at a considerably sharper angle, both bends being in an inward direction, but leaving a relatively wide mouth or opening 14 extending the full length of the fixture.

The upper closed portion of the base 10 is formed with one or more suitably located counter-sunk areas 15 having central orifices 16 capable of clearing standard threaded fixture bolts 17 or the like, by means of which the base 10 may be hung from a concealed ceiling box or other fitting (not shown), through the medium of a pair of adjusting nuts 18, the bolts 17 being of sufficient length to extend through and project a substantial distance below the opening 14 for reasons hereinafter stated. A number of con-

ventional openings 19 commonly known as "knock-outs" may be provided in the upper portion of the housing 10 for wiring purposes.

The channel or base 10 is preferably braced by means of suitably spaced narrow plates 20 which may be spot-welded or otherwise secured to the inner faces of the side-walls 11 so as to provide sufficient rigidity and prevent distortion. The end portions of the side-walls 11 are suitably cut out as shown at 21 for the convenient mounting of pairs of oppositely disposed insulated contact elements or sockets 22 having enlarged base portions 23 located interiorly of the base 10 and tube-retaining ends 24 projecting exteriorly thereof so as to be capable of receiving and supporting luminous tubes 25 horizontally adjacent the outer faces of the side-walls 11. The lower edges of the side-walls 11 are bent inwardly at substantially right angles to form upwardly directed seats 26 adapted to underlie the sockets 22, but spaced therefrom. Wiring 27 and other intermediate equipment such as a fluorescent ballast 28 may be concealed within the base 10 and provide the necessary connection between electric line and sockets 22, each pair of which is adapted to retain one of the luminous tubes 25 through the medium of contact prongs 29 formed integral with the ends of the tubes.

A removable cover member or plate 30, similar in length and composition to the base 10 and preferably trough-shaped with a horizontally disposed bottom 31 forms a neat, light weight closure for the opening 14. Its upper edges may be bent inwardly into a pair of flanges 32 corresponding to and adapted to contact the lower faces of the seats 26 when the cover is mounted in position, so as to seat perfectly thereagainst throughout the length of the fixture and form a dust-tight joint or seam 33.

The horizontal bottom 31 of the cover member 30 is suitably drilled or otherwise cut out to clear the projecting lower ends of the hanger bolts 17 to which the closure 30 is adapted to be attached preferably by means of freely rotatable nuts 34 irremovably mounted in the closure bottom 31. Spot-welded bracing elements 35 similar to the plate 20 may be provided to reinforce the closure member 30.

The outer surfaces of the members 10 and 30 may be suitably coated or plated to serve as reflectors for the elongated tubular lighting elements 25, and represent a continuous reflector area much larger than that normally found in fixtures of this type.

If after installation it should become necessary to make adjustments, repairs, or replacements to any of the wiring or other equipment concealed inside the base 10, easy access thereto may be had immediately without removing the base from attached position, by simply loosening the nuts 34 and lowering the light-weight cover member 30, thus exposing the interior of the housing 10 for examination throughout substantially its entire length and permitting necessary work thereon by way of the opening 14 while the fixture proper remains in place fully connected and operative, with the illuminating elements 25 burning, if desired. Upon completion of the work the cover 30 is lifted back into position and the nuts 34 tightened upon the projecting bolts 17 with sufficient pressure to reseat the elements 10 and 30 at the seam 33 in the manner previously described.

If it is desired that these fixtures be equipped

with special accessories, such as glass shades or other embellishments, our construction is found immediately adaptable for making such additions either in the course of manufacture of the fixture or following installation, without in any way affecting the ready accessibility of the base interior as above described and without the necessity of making any changes in the original structure, by simply attaching such accessories to the cover member 30 by any convenient fastening means well known in the art. To illustrate, a suitable number of glass shades 36 supported in frame elements or brackets 37 may be attached to the cover 30 by means of screws 38. Such joining of the parts may be accomplished at any convenient point, preferably at or near the bottom of the cover member 30, the only alterations necessary being the drilling of a few holes through the material of the cover member 30 through which the screws 38 may pass.

It will be obvious that by thus attaching such accessories to the cover 30 the parts so joined will thereafter be conveniently removable as a unit from the base 10 in the same easy manner as would be removal of the cover 30 by itself.

It is also possible with the use of our fixture construction to form a continuous sectional lighting unit, as for example along a ceiling or the like, by neatly joining a number of these complete sections end to end as best shown in Figures 3 and 4, whereby any desired length of fixture can be provided, perfect alignment being accomplished by placing inside one end of each channel element 10 a correspondingly shaped telescoping friction plate or insert 39 which is slidable but snug fitting, being restricted to longitudinal movement as best shown in Figure 4, but allowed to project so that the open end of the adjacent channel or base 10 may be slipped thereover until the base elements meet end to end in juxtaposition. All edges, including those of the accessories 36 and 37 are preferably disposed along the same plane vertically and laterally and the adjacent parts are otherwise made complementary so that a close-fitting seam 40 will result which is unnoticeable to passers-by, thus giving the appearance of a unitary, continuous fixture, which, however, will permit of easy removal of any of the cover members 30 together with their attachments, if any, without disturbing any parts of adjacent fixtures, in the event access to the interior of any of the bases 10 is desired.

As best shown in Figures 5 and 6, a pair of webbed solid end plates or closure elements 41, preferably designed so as to be capable of interchangeable mounting with the glass retaining elements 37, and having ornamental outer faces 42, but with their inner faces 43 generally following the contour of the fixture and properly grooved to receive the glass shades 36, may, if desired, be substituted in lieu of the frame members 37 for the purpose of concealing the exposed extreme ends of an individual fixture or of a sectional installation and imparting thereto a more elaborate or decorative effect in harmony with its surroundings, such as might be indicated in other than industrial installations.

Projecting guide elements 44 in the form of lugs or the like may be formed integral with the inner faces of such end plates so as to frictionally contact the adjacent edges of the base 10 and cover 30 to better align the parts and enhance the rigidity of this portion of the structure.

It may be noted here that the sockets 22 illus-

trated herein are of a standard type generally provided in fixtures of this type, and are constructed as best shown in Figure 1, wherein the contact prongs 29 of the tubes 25 are slidable into notches 46 cut into the body of the sockets 22 and adapted to be retained centrally thereof by some form of spring-like electrical contact element 47 which serves the dual purpose of energizing the tubes 25 as well as providing a locking connection for the prongs 29. Such locking elements, being very small and spring-impelled, are normally subject to breakage after considerable use. When breakage occurs, and often in the absence of breakage, as during vibration of the fixture such as is commonly experienced in industrial buildings and in areas subject to earthquake and similar shocks, the tube prongs 29 slip downward past their retaining elements and drop out of their socket. As a result the opposite end also immediately becomes dislodged and the tube falls to the floor. Its glass usually becomes shattered in striking a person or object below, and accidents of a serious nature frequently occur as mentioned above.

In order to prevent such accidents as well as for the purpose of preventing destruction of the lighting elements involved, our fixture provides pairs of oppositely disposed safety guard elements 48, preferably fastened to the housing or base 10 as best shown in Figure 1, and shaped so as to extend underneath the tubes 25 and catch the same immediately upon their dislodgement from the sockets 22, and adapted to retain the fallen tube adjacent the fixture until repairs are made.

These safety guards 48 may be made of any shape or material desired, as for example, of relatively thin spring metal which is rigid enough to properly support a fallen tube, yet sufficiently flexible so that it may be drawn aside to provide ample clearance for insertion or removal of tubes. An alternative form of guard is shown in Figure 11, consisting of a section of spring wire 49 looped and securely but removably attached to the specially grooved or notched socket 50, its looped end portion being disposed below the tube 25 so as to be capable of catching the latter in the event it should fall out of its socket.

It will therefore be apparent that in installations including the features above referred to and most clearly depicted in Figure 1, the unit comprising the cover member 30 and its attached accessories 36-37 will be instantly removable from the base 10 by loosening the nuts 34 so as to allow work on the interior parts of the fixture, while any danger of falling of the tubes 25 is positively prevented by the presence of the guard elements 48 or 49.

In installations where such guard elements are desired but their permanent retention under the tubes at all times is not deemed necessary, the guards provided may be in the form of arcuate lugs 51 cast integrally or otherwise attached to the inner faces 43 of the end plates 41 so as to be disposed beneath the tubes 25 when the fixture is assembled, as indicated in Figures 5 and 6, or they may extend or project from the elements 30 or 37, in an obvious manner.

It is also the purpose of this invention to supply an attractive fixture of this general type which permits of the convenient addition thereto of more luminous elements than provided in the original installation, so as to supply more abundant light when required to meet changing conditions. Such additions of extra lighting elements may be easily effected in our construction

without removing the fixture base from attached position or making alterations therein, and without changing its design in any way, while at the same time preserving the important feature of accessibility of its interior for repair purposes after the additions have been made.

Assuming that it is desired to add one luminous tube to the fixture of Figure 1, we remove the cover 30 and add to the base 10 a trough-shaped channel member 52 having outwardly and downwardly directed flanged edges 53 which are slightly narrower than the flanges 26 of the base 10, but directed in the same plane. The bottom 54 of this trough-shaped insert is cut out longitudinally so that only a pair of offset end portions 55 remain, to which offset portions are securely attached a pair of oppositely disposed properly wired sockets 56 adapted to mount the additional luminous tube 57. The trough-shaped member 52, which is preferably made of the same type of material as the elements 10 and 30, namely, of sheet metal which is rigid but springy enough so that slight bending thereof will not cause same to lose its shape, is attached to the base 10 by inserting its upper flanged edges 53 upward through the opening 14 by compressing its sidewalls slightly so as to allow proper clearance. The pressure is then released and the insert allowed to drop into seated position, whereby its edges 53 return to normal expanded position and come to rest upon the up-turned flanges 26 of the base 10, causing the offset end portions 55 to become suspended from interiorly of the said base and project below the plane of the opening 14. The necessary connection of wires can easily be made either before insertion of the element 52 or after the same has been mounted in place, by working through its cut-out portion 58, which conforms substantially to the opening 14. A substitute cover 59 interchangeable with the cover 30, and also having freely rotatable, irremovably mounted tightening nuts 60, but with cut-out end portions adapted to clear the newly projecting pair of sockets 56, is then fastened to the base 10 in the same manner as the original cover member 30. This results in the structure illustrated in Figure 7, wherein pairs of slightly modified frame elements 61 carrying glass shades 62 are shown attached to the substitute cover 59 by means of bolts 61'.

As best shown in Figures 9 and 10, the addition of a set of two extra luminous tubes 57' can be accomplished just as easily, by substituting a dual type insert element 63 having two pairs of oppositely disposed sockets 64 mounted in the usual manner, in place of the element 52, and replacing the former cover member 30 or 59 with a third cover member 65 which is cut out to clear the two pairs of sockets 64 and adapted to be attached to the base 10 by means of nuts 66 similar to the nuts 34 and 60, engaging the bolts 17, all the cover members being interchangeable so far as such fastening is concerned, by providing therein properly spaced openings adapted to register with the bolts 17. Glass shade assemblies comprising frame elements 67 carrying glass sections 68 may be attached to the cover 65 by means of bolts 69.

We wish to again emphasize the important fact that each of the fixture sections or units hereinbefore described will at all times retain its own individuality and separate function regardless of the type of installation of which it may become a part, whether arranged singly, end to end, or combined in any other fashion, and re-

gardless of the number of luminous tubes with which the individual sections may be equipped from time to time. As best exemplified in Figure 3, the cover assembly of each section is separately removable for purposes of providing convenient access to the interior of its base from below without loosening or removing its base and without disturbing its contained parts or connections, the adjacent sections being totally unaffected thereby. For example, should the interior of one of the bases 10 of the Figure 3 installation require attention, its cover assembly may be separated from its base and lowered out of position, exposing the opening 14 for ready and convenient access to the contained parts so as to permit servicing thereof immediately regardless of their particular location within the base and without the necessity of doing any shifting. Since each of the sections may be originally wired to function independently and continue such function in the event of failure of an adjacent unit, the sections other than that under service remain undisturbed, fully assembled and lighted, there occurring no change whatever in the permanently aligned, securely attached position of the bases 10 as originally installed, regardless of placement.

Furthermore, changes in the number of illuminating elements carried by each section may be made at will by even the most inexperienced person without danger of injury to the installation and under the safest possible conditions, due to the interchangeability of the various parts and the protection afforded by the guards which serve to prevent accidents due to falling of illuminating elements as above stated. Such guards are in themselves a very important extremely valuable development in this art, and the modification above described which allows the lighting elements to continue their function with their guards remaining constantly in position therebeneath during servicing of the fixture while the fixture base remains undisturbed in securely attached position on ceiling or other support, represents what we believe to be an outstanding achievement.

The manner of mounting the cover members in place as illustrated throughout the foregoing description represents the preferred form of attachment, whereby all of the desirable and novel features named may be accomplished in a single installation. When, however, merely the basic feature of ready accessibility of the interior of the base is desired in a fixture, the cover member may be mounted in other ways, such as, for example, by supplying a hinged connection with the base rather than a removable connection. The weight and nature of any equipment to be attached to the cover member would obviously govern its preferred manner of mounting. It will be understood, however, that those skilled in this particular art could readily, on the basis of the foregoing disclosures, embody the maximum number of features mentioned in a single device by slight changes in design and construction detail, without departing from the spirit of this invention.

We claim:

1. A lighting fixture, comprising in combination, an inverted trough-shaped base having a pair of depending sidewalls forming an opening therebetween and adapted to mount exteriorly directed luminous elements, means positioned interiorly of said base for energizing said luminous elements, a trough-shaped cover member for the opening formed between said depending sidewalls, said cover member being disposed oppositely to the inverted trough-shaped base and including upwardly directed side walls forming therebetween an opening registering with the opening between the side walls of the base and having their upper edges in engagement with the lower edges of the side walls of the base, means carried by the base and cover member for securing them together, and an auxiliary base for connectively supporting an additional luminous element, said auxiliary base comprising a pair of spaced plate sections removably mounted adjacent said opening and adapted to be supported by said first-named base in a manner so as to allow convenient access to the interior of said first-named base from below upon lowering of the said cover member.

2. A lighting fixture, comprising in combination, an inverted trough-shaped base having a pair of depending sidewalls forming an opening therebetween and adapted to mount exteriorly directed luminous elements, means positioned interiorly of said base for energizing said luminous elements, a trough-shaped cover member for the opening formed between said depending sidewalls, said cover member having side walls disposed in a vertical plane between said luminous elements on the respective side walls of the base, an auxiliary base for connectively supporting an additional luminous element, said auxiliary base comprising a pair of spaced plate sections removably mounted adjacent said opening and adapted to be supported by said first-named base in a manner so as to allow convenient access to the interior of said first-named base from below upon lowering of the said cover member, and guard means for preventing falling of said luminous elements when the latter become detached from operative position on the fixture.

3. A lighting fixture comprising an elongated hollow base member providing a housing for fluorescent lamp energizing means and having an elongated opening in its bottom to provide ready access to the interior thereof, means projecting from the base member for mounting a pair of fluorescent lamps adjacent to and on opposite sides of said opening, a closure for said opening detachably connected with the base member and having a portion extending between said lamps to provide reflective surfaces therefor, and shade members carried by said closure and extending beneath said lamps throughout the lengths thereof.

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