Jan. 14, 1964 J. J. SILVERS ETAL 3,117,729

ILLUMINATION FIXTURES

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FIG. 1.

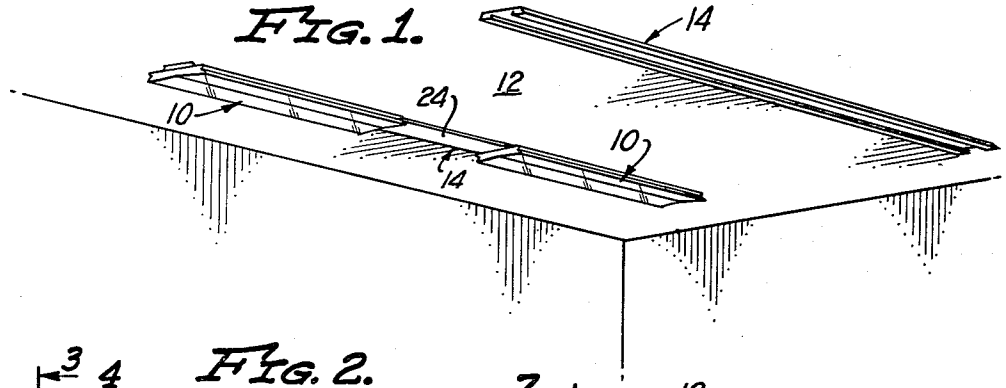


FIG. 2.

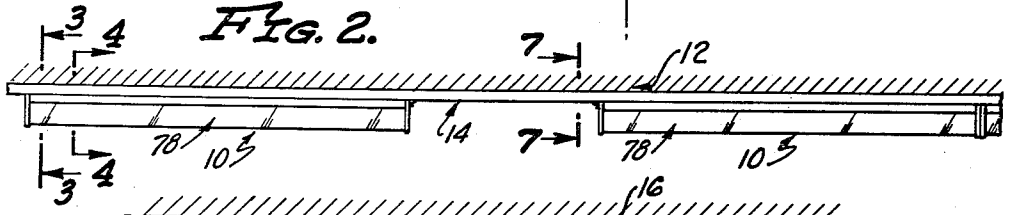


FIG. 3.

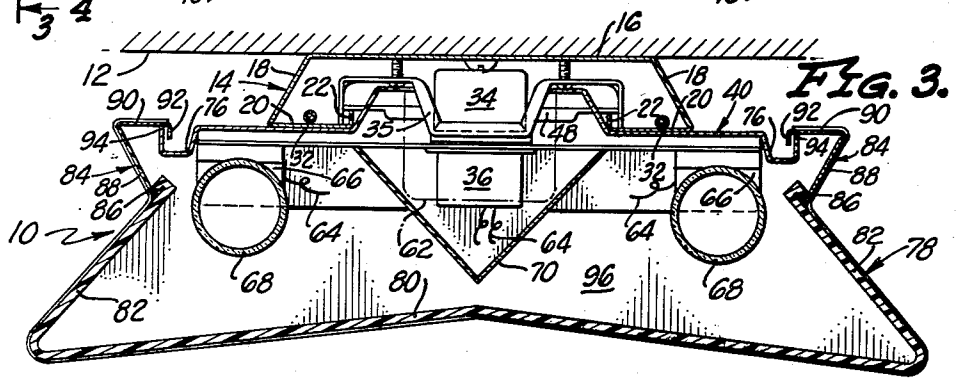


FIG. 4.

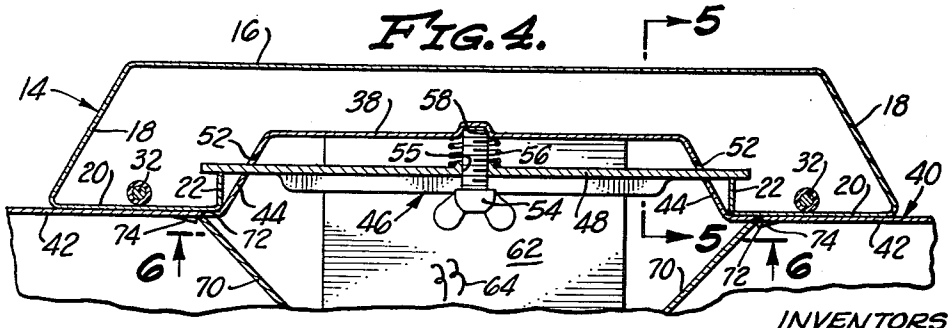
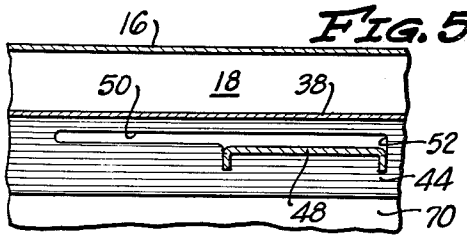


FIG. 5.



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ILLUMINATION FIXTURES

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FIG. 6.

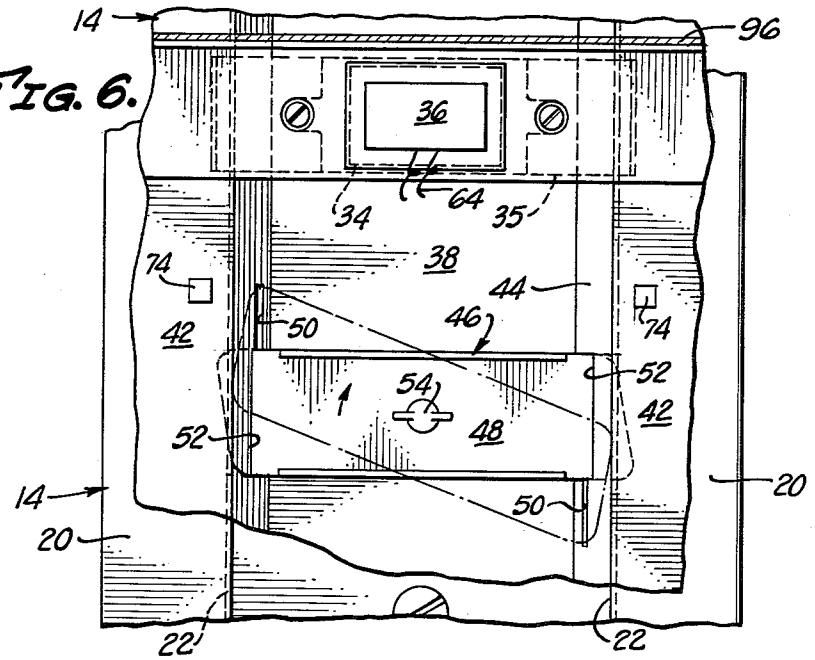
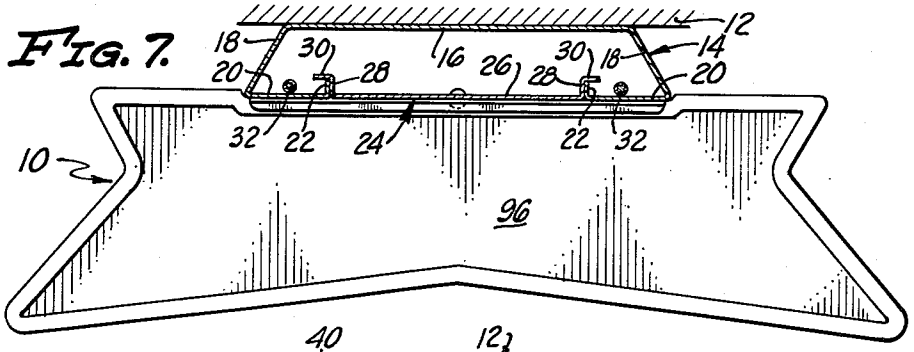


FIG. 7.



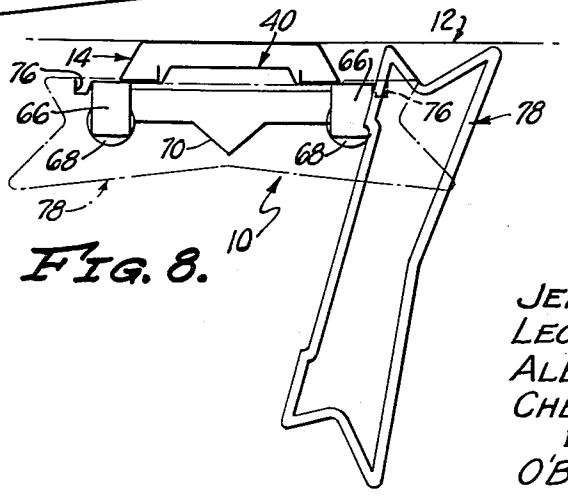


FIG. 8.

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United States Patent Office 3,117,729 Patented Jan. 14, 1964

3,117,729
ILLUMINATION FIXTURES

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Filed Jan. 22, 1962, Ser. No. 167,552
2 Claims. (Cl. 240—51.11)

This invention pertains to new and improved fluorescent illumination fixtures.

Many different types of fluorescent illumination fixtures have been manufactured and sold in the past. Many of such fixtures have been specifically designed so as to be used in particular applications. Many more of these fixtures have been intended to be used in virtually any type of location so as to provide illumination wherever illumination is normally desired. With fixtures of this latter type there is an ever recurring need for comparatively inexpensive fixtures which are much more desirable than those illumination fixtures presently on the market in a number of different regards such as, for example, in ease of installation, in ease of maintenance and serving, and in esthetic appearance.

An object of the present invention is to provide new and improved fluorescent illumination fixtures to meet these needs. Thus, more specific objects of the present invention are to provide relatively inexpensive fluorescent illumination fixtures which may be easily and conveniently manufactured, and which possess relatively attractive external appearances and which provide adequate illumination for general purposes as determined by standard photometric curve measurements. A still further object of this invention is to provide fixtures of this type which may be easily installed as required and which may be easily and conveniently serviced whenever such servicing is necessary. Another object of the present invention is to provide fixtures of the type described which may be changed in location as required because of changes in usage or visual requirements in a specific area illuminated by these fixtures.

These and various other objects of this invention as well as many specific advantages of it will be more fully apparent from a more detailed consideration of the remainder of this specification including the appended claims and the accompanying drawings in which:

FIG. 1 is a perspective view illustrating fixtures of this invention in use in illuminating a room;

FIG. 2 is a side elevational view of the fixtures shown in FIG. 1;

FIG. 3 is a cross-sectional view taken at line 3—3 of FIG. 2;

FIG. 4 is a cross-sectional view taken at line 4—4 of FIG. 2;

FIG. 5 is a partial cross-sectional view taken at line 5—5 of FIG. 4;

FIG. 6 is a partial cross-sectional view taken at line 6—6 of FIG. 4;

FIG. 7 is a partial cross-sectional view taken at line 7—7 of FIG. 2; and

FIG. 8 is a diagrammatic view illustrating the removal of a part of a fixture shown in the preceding figures so as to permit certain conventional servicing operations.

The accompanying drawings are primarily intended so as to clearly illustrate certain presently preferred embodiments or forms of this invention. Those skilled in the illumination field will realize, however, that the various constructional features and principles embodied within the fixtures illustrated in the drawings can be embodied within other differently appearing fixtures

through the exercise of routine engineering skill or ability without departing from these features or principles.

As an aid to understanding this invention it can be stated in essentially summary form that it concerns fixtures which utilize an inverted troughway serving as a wire way and as a base. In a fixture of this invention the troughway holds a reflector, and this reflector in turn supports a diffuser which extends so as to cover or enclose the lower surface of the reflector. Also, in a fixture of this invention this reflector holds end plates which in turn support fluorescent lamps in a conventional manner so that these lamps are enclosed by the diffuser employed.

The actual details of this invention can best be more fully explained by referring directly to the accompanying drawings. Here there are shown fluorescent illumination fixtures 10 of the present invention which are mounted upon a ceiling 12 so as to utilize as a base forming a part of these fixtures 10 an elongated troughway 14. As can be seen in FIGS. 3 and 7 of the drawings this troughway includes an elongated flat top 16 from which there extend elongated sides 18 in such a manner that these sides diverge from the top 16. The sides 18 carry bottom walls 20 which extend toward one another from the extremities of the sides 18 remote from the top 16; these walls 20 terminate in upwardly extending flanges which are directed generally toward the top 16. Thus, with this construction a space (not separately numbered) is formed at the bottom of the troughway 14 between the adjacent ends of the walls 20 and the flanges 22.

When a portion of the troughway 14 is not used as a part of a fixture 10 it is adapted to be enclosed by a closure plate 24 as indicated in FIG. 7 of the drawings. This closure plate 24 consists of a central flat portion 26, at the opposed parallel edges of which there are located right angle walls 28 which in turn terminate in outwardly extending flanges 30. This entire closure plate 24 is designed in such a manner that it may be inserted up into the troughway 14 at an angle to this troughway and then may be twisted and lowered so that the flanges 30 rest upon the extremities of the flanges 22. When this is done, the walls 28 fit against the opposed surfaces of the flanges 22 and the plate portion 26 appears essentially as a continuation of the walls 20. When the closure plate 24 is used in conjunction with the troughway 14 this assembly acts as an enclosed wireway which is adapted to contain conventional electrical conduits 32.

Whenever it is desired to utilize a fixture 10 along the length of the troughway 14 a female socket or connector 34 may be mounted within the interior of the troughway 14 upon a saddle 35 which rests upon the walls 20. This socket 34 is secured to the conduit 32 in a known manner. This socket 34 is adapted to receive a mating male plug 36 which is mounted upon a central section 38 of a reflector plate 40. This plug or connector 36 is held in an opening 37 in this section 38 by a bracket 39. This central section 38 is of a flat configuration and is connected to side portions 42 of the reflector plate 40 by means of sloping walls 44. As can be seen from an examination of FIGS. 3 and 4 of the drawings the walls 44 fit within the flanges 22 so that the side portions 42 are capable of resting against the undersurfaces of the walls 20 when the entire fixture 10 is assembled. When a fixture 10 is assembled the central section 38 extends further toward the interior of the troughway 14 than the walls 20 extend in this same general direction.

This is to enable the use of at least one holding means 46 as indicated in FIGS. 4 and 6 of the drawings in supporting the reflector 40 upon the troughway 14. It will be noted that each of the holding means 46 includes an elongated bar 48 which is capable of being twisted from

a position entirely between the walls 44 to a position in which this bar extends out of slots 50 located opposite one another in the walls 44 so that the bar 48 rests against the extremities of the flanges 22. Preferably the slots 50 are formed so as to have enlarged extremities 52 of greater width than the remainders of these slots 50, so as to permit the bar 48 to be "dropped down" when it is rotated to a position as shown in FIG. 6 of the drawings in which it extends substantially at a right angle across the troughway 14.

Each holding means 46 also includes a central locating screw 54 which is threaded in the opening 55 in the center of the bar 48. The end of this screw 54 fits within a small depression 58 in the central section 38. The screws 54 are used so as to hold small coil springs 56 under the compression between the central section 38 and the bars 48 so as to prevent the bars 48 from being inadvertently rotated. By tightening upon a screw 54 the reflector plate 40 can be effectively "locked" into position and electrically grounded with this type of structure.

The lower surface of the central section 38 of the reflector plate 40 carries a conventional ballast 62 which is connected to the male plug 36 by means of wires 64. This ballast 62 is connected by further wires 64 to small, conventional fluorescent lamp sockets 66 mounted on the side portions 42 adjacent to the ends of these side portions. These sockets 66 support conventional fluorescent lamps 68 in the established manner so as to electrically connect these lamps 68 to the ballast 62. As will be noted from an examination of FIG. 3 of the drawings, the lamps 68 extend parallel to the central section 38 of the reflector plate 40 along substantially all, but not entirely all, of the length of this reflector plate.

With this construction the ballast 62 and the wires 64 connecting it to the male plug 36 are normally enclosed by means of a small V-shaped cover 70 which is preferably formed out of resilient metal. This cover is designed so that the edges 72 of it are held in place by engagement with small ears 74 which are formed out of the edges of the side portions 42 adjacent to the walls 44. The wires 64 connecting the sockets 66 to the ballast 62 extend around the extremities of this cover 70; preferably the cover 70 is of slightly less length than the total length of the reflector plate 40. With the preferred construction of this invention the cover 70 may be temporarily deformed so as to decrease the angle between the sides of it so that it may be conveniently either inserted into an operative position or removed from this position.

The edges of the side portions 42 remote from one another are provided with upwardly facing edge grooves 76 which are parallel to one another and which extend the entire length of the reflector plate 40. These edge grooves 76 are utilized in order to support a diffuser 78. This diffuser 78 consists of a bottom, light permeable plastic plate 80 having inwardly directed ends 82 which are secured to metal holding brackets 84 by means of an interlocking flange 86. In the brackets 84 the flanges 86 are connected to walls 88 which extend from the flanges 86. These walls 88 are connected to horizontal walls 90 which lie within the same plane. Each of these walls 90 terminates in a small, vertically extending flange 92.

The assembly of the plate 80 and the brackets 84 is proportioned so that the walls 90 overlie the extremities 94 of the edge grooves 76 when the diffuser 78 is in an operative position and so that the flanges 92 fit within the edge grooves 76 in this position. This assembly is also preferably proportioned so that the flanges 92 are capable of being moved from one side to another across the edge grooves of the reflector plate 40 so as to permit the diffuser 78 to be removed by being first pulled to one side or another of the fixture 10 and then by being lifted so that one of the flanges 92 is spaced from the edge groove 76 within which it normally fits. At this point the entire diffuser 78 may be swung outwardly to a position as indicated in FIG. 8 so that the holding bracket

84 remains in an edge groove 76 to hold this diffuser 78. During this movement the entire diffuser 78 pivots about the extremity 94 which remains in contact with a bracket 84. When the diffuser 78 has been located in this manner in a non-operative position, it remains in place and it is very simple to get to various operative parts within the interior of a fixture 10 for maintenance, service or similar purposes. The diffuser 78 may be replaced on the fixture 10 by a reversal of the operations described in connection with the location of this diffuser 78 in a position as shown in FIG. 8.

When a plurality of fixtures 10 are to be used immediately adjacent to one another so as to be aligned with one another it is not necessary to utilize any end plates upon the diffuser 78 employed with such a fixture. However, it is normally preferred to utilize upon the diffuser 78 end plates 96 as shown in FIG. 7 of the drawing. These end plates 96 are attached to adjacent portions of a plate 80 and the brackets 84 in a fixture 10 so as to extend across the areas generally between the diffuser 78 and the reflector plate 40.

From a consideration of the preceding portions of this specification those skilled in the art will realize that the troughway 14 previously described may be installed directly upon a ceiling or the like in lieu of conventional electrical conduits of a type normally located within or upon a ceiling. This is especially significant in view of the fact that fixtures constructed as herein described meet the requirements of the National Electric Code, 1959 edition, for installation directly upon cellulose fiberboard ceilings, whereas prior units have not been capable of being used in this manner. The reason why fixtures, such as a fixture 10, can be utilized in this manner relates to the fact that the ballasts used in these fixtures are located upon walls which are spaced from a ceiling in such a manner that an adequate insulation between the ballasts and a ceiling is achieved so as to prevent undue heating of such a ceiling. Further, when all of the parts of the fixtures, such as the fixture 10, are constructed of metal, they are, of course, fireproof and, of course, the troughway 14 when used as described herein forms a completely enclosed wireway of a metallic character capable of meeting various requirements for structures capable of carrying electrical conduits.

It will also be realized from a consideration of the foregoing that with the present invention fixtures, such as the fixture 10, may be located wherever desired along a complete troughway such as the troughway 14. The positions of the saddles 35 used in these fixtures may be varied wherever and whenever desired. This permits various individual fixtures to be moved from one location to another so as to vary the location of illumination. With the present invention it is exceedingly important that the parts of a fixture 10 attached to a troughway 14 may be changed whenever and wherever desired with a minimum of difficulty so as to vary the level of illumination achieved.

From the preceding portions of this specification it will also be realized that fixtures such as the fixtures 10, are comparatively simple to manufacture and construct. They will also realize that the ease with which these fixtures may be partially or completely assembled or disassembled either during installation or removal from buildings or during normal maintenance operations contributes materially to the commercial acceptability of these units. Because of these factors and the fact that obviously many changes of routine engineering or design character may be made in fixtures, such as the fixtures 10, without departing from the various inventive features described in this specification, this invention is to be considered as being limited solely by the appended claims forming a part of this disclosure.

We claim:

1. An electrical fixture which comprises:

an elongated troughway having a top wall adapted to

be secured to a ceiling, said troughway including opposed side walls extending away from said top wall, and bottom walls directed inwardly toward each other in spaced relation from said top wall to opposed extremities of said bottom walls to define a central opening between said extremities of said bottom walls extending the length of said troughway, flanges extending from said opposed extremities toward said top wall defining support edges spaced from said top wall;

a closure plate having side flanges resting on said support edges closing said central opening and extending a portion of the length of said central opening, said closure plate having a bottom surface flush with said bottom walls;

a reflector plate located against an extremity of said closure plate, a raised central portion of said reflector plate extending into said central opening between said flanges and spaced from said top wall and laterally extending side panels in flush engagement with said bottom walls and extending beyond said side walls, said side panels terminating with upwardly facing grooves extending parallel to and outwardly spaced from said walls;

means supporting the raised central portion of said reflector plate on said support edges;

electrical conduit means located within said troughway so as to be supported on at least one of said bottom walls;

first and second coacting plug and socket electrical connector means located within said troughway and upon said reflector plate, respectively, said first connector means being connected to said electrical conduit means;

fluorescent lamp and ballast means carried by said reflector plate and electrically connected together and to said second electrical connector means;

light diffuser means having a bottom surface disposed beneath said lamp and ballast means, and upwardly extending side walls extending from each side of said bottom surface disposed so as to have the lamp and ballast means positioned therebetween; and

flange means attached to the extremities of said light diffuser means side walls, said flange means having opposed downwardly extending edges freely resting in said upwardly facing grooves to support said light diffuser means in encompassing relation to said lamp and ballast means.

2. An electrical fixture which comprises:

an elongated troughway having a top wall adapted to

be secured to a ceiling, said troughway including opposed side walls extending away from said top wall, and bottom walls directed inwardly toward each other in spaced relation from said top wall to opposed extremities of said bottom walls to define a central opening between said extremities of said bottom walls extending the length of said troughway, flanges extending from said opposed extremities toward said top wall defining support edges spaced from said top wall;

a reflector plate, a raised central portion of said reflector plate extending into said central opening between said flanges and spaced from said top wall and laterally extending side panels in flush engagement with said bottom walls and extending beyond said side walls, said side panels terminating with upwardly facing grooves extending parallel to and outwardly spaced from said walls;

means supporting the raised central portion of said reflector plate on said support edges;

electrical conduit means located within said troughway so as to be supported on at least one of said bottom walls;

first and second coacting electrical connector means located within said troughway and upon said reflector plate, respectively, said first connector means being connected to said electrical conduit means;

fluorescent lamp and ballast means carried by said reflector plate and electrically connected together and to said second electrical connector means;

light diffuser means having a bottom surface disposed beneath said lamp and ballast means, and upwardly extending side walls extending from each side of said bottom surface disposed so as to have the lamp and ballast means positioned therebetween; and

flange means attached to the extremities of said light diffuser means side walls, said flange means having opposed downwardly extending edges freely resting in said upwardly facing grooves to support said light diffuser means in encompassing relation to said lamp and ballast means.

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