Aug. 12, 1958 E. C. HUERKAMP ET AL 2,847,561

FLUORESCENT LUMINAIRE

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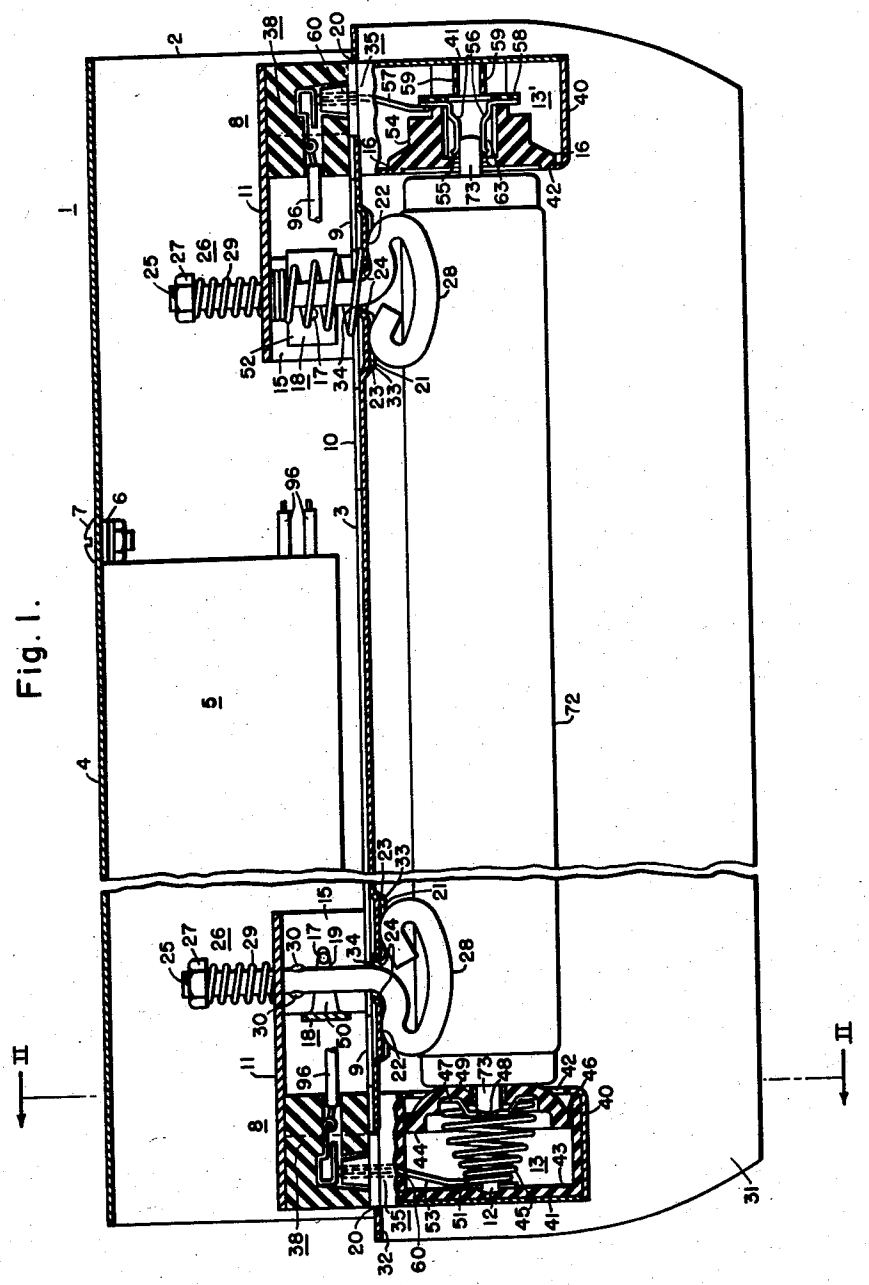


Fig. 1.

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Fig. 2.

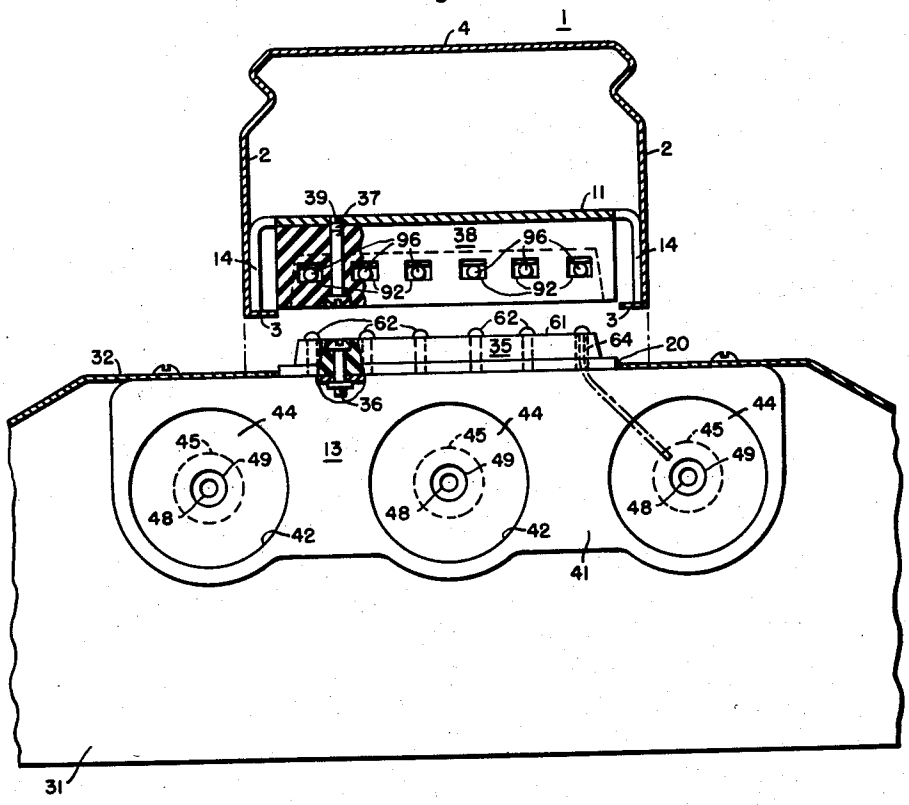
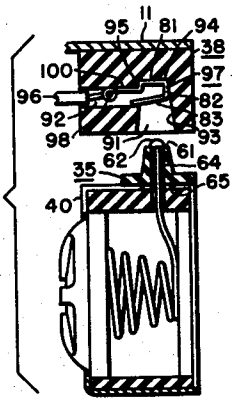


Fig. 3.



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2,847,561

FLUORESCENT LUMINAIRE

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Application February 15, 1954, Serial No. 410,294

5 Claims. (Cl. 240—51.11)

Our invention relates generally to an improved luminaire construction and more particularly to a luminaire for fluorescent lamps which is of simplified construction to facilitate erection and maintenance.

Under many conditions it is quite common to utilize a large number of fluorescent lamp luminaires in order to obtain the desired degree of illumination. Heretofore such luminaires have, in general, employed a fixed supporting trough member to which are secured the various wiring and control components and from which extends lamp holding means. A reflector is thereafter secured to the fixed member, and in order to permit lamps to be located beneath the reflector the reflector is provided with openings through which the lamp holding means extend. Such a construction necessarily requires that the lamps be removed if it is desired to remove the reflector for various maintenance reasons such as cleaning or wiring repairs. As can also be appreciated in many installations, the fluorescent lamp luminaires with the lamps therein may be located a considerable distance above the floor level of the illuminated area, and in order to prevent breakage during maintenance, the lamps and reflectors are separately carried or lowered to the floor level before starting to make the required repairs in the fixed member. After the repairs have been finished the reverse process is followed in replacing first the reflector and then the lamps to the fixed supporting member. In view of the large number of such luminaires it can be seen that considerable unproductive time may be consumed in servicing or repairing such fixtures. Also, such a luminaire construction requires that the relamping be done at the luminaire. At elevated positions, it is quite difficult to carry the required number of lamps by hand, remove the defective lamps, and return to the floor level without consuming a considerable length of time due to the natural tendency to be cautious. For such installations it is desirable that the relamping process be accomplished at the floor level.

Some prior attempts to accomplish these purposes have been unsatisfactory as they have entailed mounting all the electrical control components on a movable unit including reflector, electrical transformer and/or ballast, lamps and lampholders, which unit is movable into and out of engagement with a fixed supporting member. In such luminaires the total weight of the movable unit is so great that they cannot be handled readily. In many cases such constructions have required floor level actuated releasing controls, or complex counterbalanced movable mountings as the movable unit cannot easily be handled at elevated heights.

Another disadvantage of fluorescent light luminaires having lamp holders mounted on the fixed supporting member is that during manufacture, the electrical connections to the lamp holder terminals must be made in final shop assembly or elaborate harnesses provided and handled with the lamp holders attached by wire to the harnesses. Such a method of assembly is inherently relatively expensive.

Accordingly, one object of our invention is to provide an improved luminaire of novel construction to facilitate maintenance and installation.

A more specific object of our invention is to provide an improved luminaire having lamp holders, lamp and reflector means removable as a unit from the fixed supporting member of a luminaire.

Another object of our invention is to provide an improved luminaire having a removable reflector which automatically electrically disconnects the lamp holding means when removed.

A converse object of our invention is to provide an improved luminaire having an insertible reflector with lamp holder means attached thereto, which automatically electrically connects the lamp holding means when the reflector is attached to the fixed supporting member of the luminaire.

Another object of our invention is to provide an improved luminaire having lamp holding means, lamps, and reflector means assembled as a removable unit which may easily be installed from the underside of the fixed supporting member of the luminaire, and at the same time automatically establishes the necessary electrical connections.

A further object of our invention is to provide a luminaire which may be readily relamped at the floor level.

Still another object of our invention is to provide an improved luminaire which requires only simple wiring assembly operations at final shop assembly of the luminaire.

These and other objects will become more apparent upon consideration of the following detailed description of a preferred embodiment of our invention, when taken in conjunction with the attached drawings, in which:

Figure 1 is a partial longitudinal cross section view of a luminaire construction in accordance with our invention with certain parts shown in elevation;

Fig. 2 is a horizontal cross section view of the luminaire shown in Fig. 1, taken substantially along the line 2—2 of Fig. 1 and with the removable unit shown separated from the fixed support member; and

Fig. 3 is an isolated sectional view of the electrical connecting means utilized in the luminaire shown in Figs. 1 and 2.

One type of luminaire illustrating a representative embodiment of the principles of our invention is shown in the drawings, and it comprises a channel-shaped body member 1 having spaced substantially parallel side walls 2, each of which terminates in a longitudinal inwardly facing flange 3. The body 1 may be formed from any suitable material such as sheet metal and may be mounted either flush against, or supported in spaced relation with various types of ceiling or wall constructions by various well-known supporting means (not shown). In an installation where a large number of luminaires are required, a plurality of bodies 1 may be mounted in spaced relationship, or in one or more continuous rows wherein the body members 1 are placed in end-to-end abutting relationship. Inasmuch as a particular form of mounting for the body member is unimportant with respect to our invention, for the sake of simplicity in describing our invention, only an overhead mounting will be referred to.

A ballast unit 5 for controlling the fluorescent lamps 72 is secured through integral legs 6 at each of its ends to bight portion 4 of body 1 in any suitable manner, such as by the machine screw and nut assembly 7. It will be noted that a single separate subassembly is provided at each end of body member 1; which may easily be inserted into body member 1, both to cross brace the side walls 2 of body member 1, and to provide a support for both the reflector attaching means and the electrical connecting means. While such a subassembly could be inserted and secured in body member 1 in a number

of different ways, the herein illustrated embodiment of the invention includes provision for inserting it from the underside of body member 1. For this purpose, an opposed pair of notches 9 are provided in the flanges 3 inwardly displaced from each end of the body member 1 and a second opposed pair of notches 10 are provided in the flanges 3 inwardly displaced from each pair of notches 9, respectively, so that two pairs of opposed notches are positioned in flanges 3 at each end of body member 1.

Each of the end subassemblies includes a support 8 having a generally inverted U-shaped cross section, which may be fabricated from any suitable material such as sheet metal, and is insertible from the underside of body 1 in a manner to be described. Each support 8 comprises an upper cross plate 11 with integral downwardly extending flanges 14 and 15 at each of its sides. In order ot provide clearance, cross plate 11 is slightly smaller laterally than the lateral distance between the flanges 3. Flanges 15 are longitudinally displaced upon cross plate 11 from flanges 14, whereby two sets of downwardly opposed flanges are provided at opposite sides which are spaced apart a distance corresponding to the longitudinally spaced notches 9 and 10 in flanges 3 at each end of body 1. As shown in Figure 2, flanges 14 and 15 at each side extend beyond the side edges of cross plate 11. By this arrangement, a support 8 may be inserted from the underside at either end of body 1 by aligning flanges 14 and 15 with notches 9 and 10, respectively, and moving support plate 8 upwardly with cross plate 11 clearing flanges 3. After flanges 14 and 15 have cleared flanges 3, and are positioned thereabove, support 8 may then be moved longitudinally within body member 1 towards the adjacent end thereof and lowered so that flanges 14 and 15 engage and are supported on the upper surface of flanges 3. The reverse procedure can be followed if it is desirable to remove a support 8 from the body member 1 at any subsequent time.

In order to cross brace body 1 and to definitely locate each support 8 within body 1, each side wall 2 is provided above the flanges 3 between notches 9 and 10 with an opening through which the body of a standard sheet metal screw 17 may be inserted. A V-shaped sheet metal nut 18 may be utilized to hold screw 17 in body 1. Nuts 18 are provided with a hole in their outer leg 50 through which the body of screw 17 extends, and a hole in their inner leg 52 which threadedly engages the screw 17. Screw 17 may be taken up so as to initially slightly compress the legs 50 and 52 of nut 18. Thereafter, due to the spring effect of nuts 18, each nut 18 will hold its screw 17 so that the latter projects inward from each side wall 2 at all times. Each flange 15 of support 8 is provided with a longitudinally tapered notch 19 having its open side towards flange 14, so that when support 8 is moved longitudinally within body 1 toward the adjacent open end of body 1, each flange 15 is located between the legs 50 and 52 of the V-shaped nut 18, and the body of a screw 17 enters notch 19. Thereafter, each support 8 may be rigidly secured to each side wall 2 by tightening screws 17. The specific fastening means described is preferred due to the enumerated advantages; however, it will be realized that other similar fastening means may be employed if desired. For a more complete description of this particular construction, reference is made to the copending application entitled, "Fuorescent Luminaires of Simplified Construction" by Joseph W. Steiner and William S. Kolb, filed June 19, 1953, Serial No. 362,896, and which application has been assigned to the same assignee as this invention.

Each cross plate 11 of support 8 is provided with a hole (not shown) positioned adjacent to, but displaced from, its inner edge through which an upwardly extending stud portion 25 of a wing lock 26 extends. The stud portion 25 may be formed from any suitable material, and is preferably formed from steel rod in order that the stud portion 25 may be threaded to receive a nut 27 at its upper end, and in order that its lower end may be formed into a grip loop 28. A helical spring 29, which may be formed from any suitable spring material such as spring steel is positioned around stud portion 25 of wing lock 26. The nut 27 is threaded on stud portion 25 so that the spring 29 is secured under stress between the upper surface of cross plate 11 and the lower surface of nut 27, thereby biasing the wing lock 26 upwardly. In order to prevent spring 29 from pulling stud portion 25 of wing lock 26 upward beyond a certain point, stud portion 25 is provided with a pair of integral outwardly extending tabs 30 which may be formed by any suitable process, such as cold impact forming, with the tabs 30 located beneath the undersurface of cross plate 11 to be engageable therewith. Wing locks 26 are utilized to secure a reflector 31, which may be of any desired form such as the approximate U-form illustrated, to the body member 1 in a manner hereinafter described.

The reflector 31 may be formed from any suitable material, such as sheet metal, having a bight portion 32 adapted to be held in engagement with the undersurfaces of flanges 3 of the body member 1. Approximately rectilinear offsets 33 are provided adjacent each end of bight portion 32 of reflector 31, having both their longitudinal and lateral center lines located so as to pass through the center of stud portions 25 when aligned therewith. In order to permit grips 28 of wing locks 26 to extend below reflector 31, a laterally extending centrally located slot 34 is provided in each offset 33, and these slots are longitudinally spaced to correspond to the longitudinal spacing of the axes of stud portions 25 of the wing locks 26. Portions of offsets 33 adjacent slots 34 are provided with cam surfaces 24 which are cooperable, when grips 28 are turned around their axes, with the rounded upper surface 22 of grips 28 to cause wing locks 26 to be displaced downwardly and compress springs 29 whereby reflector 31 is secured to the underside of body 1. To insure that grips 28 are securely locked when so rotated, a recess 21 is provided in offset 33, along the longitudinal center line of offset 33, which is joined at each of its sides to the underside of offset 33 by a cam surface 23.

In operation, grips 28 of wing lock 26 are initially turned so that they extend laterally between the side walls 2 of body 1. Reflector 31 may then be manually positioned against the underside of flanges 3 of body member 1 so that grips 28 extend through the slots 34. Thereafter each grip 28 may be individually grasped and initially rotated so that surfaces 22 of the grips 28 engage the cam surfaces 24 at each side of the slot 34. Further rotation of the grip 28 causes the surfaces 22 of grip 28 to ride on cam surfaces 24 onto the undersurface of offsets 33. Upon further rotation of grips 28, surfaces 22 of grips 28 will be lowered by engagement with longitudinal cam surfaces 23 into the longitudinal recesses 21. In order to remove reflector 31, the reverse process is followed. As recesses 21 are above the bottom surfaces of offsets 33, grips 28 will be secured against accidental rotation due to the force required to compress springs 29 to move grips 28 from recesses 21.

As shown in Figs. 1 and 2, a spring type lamp holder assembly 13 and a stationary type lamp holder assembly 13' are located adjacent opposite ends of reflector 31 being longitudinally spaced apart to receive therebetween any one of the standard lengths of fluorescent lamps 72. In keeping with the purposes of this invention, lamp holders 13 and 13' are permanently secured to the bight portion 32 of reflector 31, so that when reflector 31 is removed from the body 1 as previously described, the lamp holders are also separated from the body 1. As shown, assemblies 13 and 13' are adapted to support three such lamps 72, however, it will be obvious that other

forms of lamp holders, such as bi-pin types, may be employed for supporting a greater or smaller number of lamps, within the scope of this invention. It will also be apparent that it is immaterial at which end of reflector 31 the assemblies 13 and 13' are located. Referring to lamp holder assembly 13, it will be noted that it includes a metal cover 40 which is attached to a metal base 41 by any suitable means (not shown) such as screws or rivets. Cover 40 is provided with round openings 42 in its face opposite base 41. An insulating cup-shaped member 43 is disposed inside cover 40 at each of the openings 42. A dome shaped insulating member 44 is slidably mounted in the cup member 43 and is biased outwardly against the cover 40 by a spring 45. Dome-shaped member 44 is also provided with a peripheral flange 46 which engages the cover 40 adjacent the edges of its opening 42, and limits the outward movement of the dome-shaped member 44. A cup-shaped contact 47 fabricated from any suitable electrical conducting material having a centrally disposed circular opening 48 therein, is disposed against the inner side of dome-shaped member 44 with the opening 48 in alignment with a centrally disposed circular opening 49 in dome-shaped member 44, to permit the contact pin 73 of a lamp 72 to be inserted in engagement with contact 47 at the opening 48, to thereby establish electrical contact with the contact 47.

In order to provide an electrical circuit, a contact washer 51, which is fabricated from any suitable electrical conducting material, such as copper or brass, is disposed on the bottom of the cup-shaped member 43 around an integral projection 12 of member 43. The stripped end of an insulated electrical conductor 53 is connected to washer 51 by any suitable means, such as soldering, and extends through the side of cup-shaped member 43 by means of a clearance hole 60. As the spring 45 is interposed between washer 51 and the cup-shaped member 43, and is formed from a suitable electrical conducting material, an electrical circuit is established from the conductor 53, through the washer 51, the spring 45 to the contact 47, and to the contact pin 73 of an inserted lamp 72. As shown, the spring 45 biases the contact 47 outwardly toward the cover 40 at all times.

Referring to lamp holder assembly 13', it will be noted that the same cover 40 and base 41 arrangement is utilized, as in lamp holder assembly 13, previously described. An insulating member 54 is provided within the cover 40 and base 41, having a circular ridge 16 on its outer surface disposed to fit in each opening 42. Each insulating member 54 is provided with a centrally disposed opening 63 which has a relatively small outer portion 55. Oppositely disposed L-shaped contacts 56, which are fabricated from any suitable electrical conducting material such as copper or brass, are mounted so that their long legs are located in opening 63 at opposite sides thereof to engage the opposite sides of a contact pin 73 when inserted through portion 55 of opening 63. The short legs of L-shaped contacts 56 are located against the back of insulating member 54. An insulating disc 58 is disposed against the short legs of contacts 56. Insulating spacers 59 engage between discs 58 and the inner surface of base 41, thereby forcing the disc 58 against the short legs of contacts 56, and they in turn against insulating member 54, to thus hold contacts 56 in place at all times. The necessary electrical connections to the contacts 56 are made by conductors 57 which are secured to contacts 56 in any suitable manner, such as soldering.

The lamp holders 13 and 13' described, have been widely utilized in the lighting industry, and the particular construction and operation thereof do not form a part of this invention. Lamp holder assemblies similar to those described, are more clearly shown and described in detail in Patent No. 2,728,057.

As more clearly shown in Figs. 2 and 3, the bight portion 32 of reflector 31 is provided with a laterally extending opening 20, adjacent each of its ends, through which a terminal block 35 extends, so that upon securing reflector 31 to the body 1, terminal blocks 35 are located between the flanges 3 of body 1. As terminal blocks 35 contain various electrical components, they are formed from any suitable insulating material, such as a laminated plastic, and are secured to the covers 40 of lamp holders 13 and 13' by any suitable means, such as by machine screw and nut assemblies 36. The upper surface 61 of each terminal block 35 is provided with a plurality of upwardly extending electrical contacts 62 which are utilized to electrically connect the lamp holders 13 and 13' to the source of supply, as hereinafter described. Contacts 62 may be produced from any suitable electrical conducting material, such as a silver-nickel alloy, and may be secured within terminal blocks by any suitable method such as by an interference fit or by being molded integral therewith. Each contact 62 is accessible from its underside by means of a plurality of openings 64 which extend from the underside of each contact 62 through terminal block 35. In order that each opening 64 is accessible from the inside of the cover 40 of lamp holders 13 and 13', an elongated slot 65 is provided in the upper wall of covers 40 which extends beneath the openings 64 whereby conductors 53 and 57 may be inserted into openings 64 and be secured to contacts 62 of their respective terminal blocks 35, by any suitable means such as by soldering. If desired, conductors 53 and 57 may initially be drawn through openings 64, their ends stripped of insulation, then secured to the underside of contacts 62, and thereafter contacts 62 may be forced into frictional engagement with openings 64 within terminal blocks 35. It will be noted that the number of contacts 62 which may be utilized may be varied, and is limited only by their physical size and the distance between flanges 3 of body 1.

As shown in Fig. 1, there is a contact block 38, which may be fabricated from any suitable insulating material, such as a laminated plastic, secured to the underside of each cross piece 11, so as to be located between the flanges 14, by any suitable means such as machine screws 39 threadedly engaging threaded holes 37 in cross piece 11. Each contact block 38 is provided with an elongated downwardly facing flat-bottomed tapered recess 91 into which terminal blocks 35 fit when the reflector 31 is secured to the body 1. In order that electrical connections may be established with terminal blocks 35 when the reflector 31 is secured to body 1, each contact block 38 is provided with a plurality of laterally extending approximately rectangular openings 92 which extend from the inner end of recess 91 through one side of the block at a point below the flat bottom 94 of recess 91, whereby a shoulder 95 is formed at the inner end of each opening 92. As can be appreciated, the various electrical conductors 96, such as the conductors extending from the ballast 5, which are required for controlling lamps 72 are located within body member 1. In order, however to establish a circuit to contacts 62 on terminal block 35, a spring contact 97 is secured to the stripped end of each conductor 96. Spring contacts 97 may be formed from any suitable resilient electrical conducting material, such as a Phosphor-bronze alloy, and may be secured to conductors in any suitable manner such as by soldering. As shown, contacts 97 are provided with an integrally formed eye 98 at their inner end through which the bare wire of a conductor 96 may be inserted and held by crimping or by soldering. As more clearly shown in Figs. 1 and 3, spring contacts 97 are irregularly shaped having an upper end portion 100 which engages the upper surface of an opening 92 and which terminates in an upwardly offset portion 81 which engages the flat bottom 94 of recess 91 behind shoulder 95. Offset portion 81 terminates in a generally downwardly extending

portion 82 which engages the outer sloping surface 93 of recess 91, and which in turn terminates in an inwardly and generally downwardly extending contact portion 83. Spring contacts 97 are fabricated so that they are slightly smaller in width than the width of openings 92, and as both end portions 83 and 100 are located within an opening 92, the spring contacts 97 are held in alignment with recess 91. It will also be noted that by this construction, the top portions of spring contacts 97 are biased upwardly by the lower free end portion 83, so that the offset portion 81 is engaged behind the shoulder 95 in contact block 38, to thus be effectively locked in the position illustrated.

It will be noted that this invention provides a luminaire that may easily be assembled both in the factory and in the field. Prior to assembly of ballast 5 to body member 1, spring contacts 97 may be assembled to ballast conductors 96. Then the ballast unit 5 and the sub-assembly supports 8 may easily be secured in place as described. Spring contacts 97 may then be inserted within appropriate openings 92 of contact blocks 38 and will automatically lock themselves in place. Once offset portion 81 has cleared shoulder 95 of contact block 38, the free end 83 of spring contact 97 forces the offset portion 81 upward against the flat bottom 94 of recess 91. Thus, it will be noted that body member 1 may be completely and quickly prewired in the factory without requiring any wiring harnesses or special tools, and that due to the spring bias of free end 83 each contact 97 will be securely held within its contact block 38 at all times.

It will also be noted that as terminal block 35 extends above the bight portion 32 of reflector 31 they may be designed and located so as to enter recess 91 of the contact blocks 38 when the reflector 31 is secured to the body 1. Contacts 62 are located upon the upper surface of terminal blocks 35 and are spaced laterally so as to respectively engage the free ends 83 of spring contacts 97 and force the free end 83 upward. By this means a positive electrical connection is maintained between each spring contact 97 which is engaged by a contact 62.

Another important feature of our invention is the facility by which different types of lamps may be controlled, and the different type of control circuits which may be utilized, by using a single standard contact block 38, and a single standard terminal block 35. Such a feature is particularly important from an initial fabricating cost standpoint, however, it is also of value in the field, in that it permits a particular luminaire installation to be altered without requiring any extensive changes in the fixed components of the lighting system. In Figs. 1 and 2 a three lamp fixture is illustrated wherein lamps 72 have a single contact pin 73 at each of their ends which are energized through the contact blocks 38 and the terminal blocks 35. Such a system requires that each contact pin 73 at each end of lamp 72 be individually energized, which necessitates a minimum of three openings 92 in contact blocks 38 and three openings 64 in terminal blocks 35. Also, if desired, one spring contact 97 and conductor 62 may be utilized to make and break the primary electrical supply circuit of the luminaire upon the insertion or removal of terminal block 35, with respect to contact block 38 and another spring contact 97 and conductor 62 may be utilized to electrically ground the reflector assembly. It can be realized that once the greatest number of spring contacts 97 is determined which it is desired to supply commercially, the same contact blocks 38 and terminal blocks 35 may be utilized for circuits requiring less spring contacts 97, and that the unnecessary openings 92 and 64 may be left blank. Such an installation may also be readily altered in the field.

As has been indicated, one of the primary purposes of our invention is to provide a reflector and lamp assembly which may readily be detached from the stationary part of the luminaire as a unit. It will be noted that our construction entails a separate sub-assembly comprising a reflector 31 to which lamp holders 13 and 13' are secured, and that lamps 72 may be held between the lamp holders 13 and 13' at any time. This entire sub-assembly may be secured in operative position simply by means of wing locks 26, as previously described. In order that such a sub-assembly may be secured to body member 1 without requiring an examination as to whether it is properly located with respect to body 1, slots 34 in the bight portion 32 of reflector 31 may be displaced from the longitudinal centerline of reflector 31, so that reflector 31 can only be secured to body 1 in one relative position. It is obvious that in a three lamp luminaire wing locks 26 must be displaced from the longitudinal centerline of reflector 31 as the center lamp is on such centerline and that adequate space must be provided between lamps to permit rotation of grips 28. If desired, reflector 31, wing locks 26, contact blocks 38, and terminal blocks 35 may be fabricated so that it is immaterial what the relative position of the reflector 31 is relative to body member 1. In such case slots 34 in reflector 31 would be on the longitudinal centerline (or symmetrically displaced therefrom) of the reflector 31 and duplicate wiring of contact blocks 38 and terminal blocks 35 would be required at each end.

It should also be noted that spring contacts 97 are recessed from the underside of body 1 in order to prevent accidental engagement therewith. However, when the reflector 31 is secured to body 1, the spring contacts 97 are engaged by contacts 62 on terminal blocks 35, and the contact pins 73 of lamps 72 are energized as previously described. Upon removal of reflector 31 from body 1, the electrical circuit to lamps 72 is broken. Although the particular description hereinabove given is with relation to fluorescent lamps 72 having one contact pin 73 at each of their ends, it is obvious that the principles of our invention are equally applicable to bi-pin or other type lamps and holders. It is believed that it is equally obvious that a greater or smaller number of lamps 72 may be located within the luminaire rather than the three lamp construction shown illustrated herein.

In many present day lighting installations it is also desirable that body 1 be of sufficient length so that a plurality of reflectors 31, either in spaced or end-to-end relationship, may be secured thereto. It is believed apparent that a luminaire constructed in accordance with the principles of our invention is readily adaptable for such type of installations. Such purposes are easily accomplished by providing body 1 with a plurality of mounting openings and means, as previously described, and wiring the various electrical components together within body 1. Thereafter, a plurality of reflectors 31 may be secured, as previously described, to body 1.

Having described a preferred embodiment of the invention in accordance with the patent statutes, it is desired that the invention be not limited to such specific construction, inasmuch as it is apparent that modifications in addition to those specifically pointed out herein, may be made without departing from the broad spirit and scope of this invention. Accordingly, it is desired that this invention be interpreted as broad as possible and that it be limited only as required by the prior art.

We claim as our invention:

1. A luminaire comprising, an elongated inverted trough member, spaced transverse supports in said trough member extending across parts thereof adjacent the lower edges of the sides of said trough member and at each end thereof, means securing opposite ends of each of said supports to opposite sides of said trough member, respectively, ballast means mounted in said trough member intermediate said supports, a terminal block mounted on each of said supports and having terminals supported

thereby, electrical conductors in said trough member connecting said ballast means and said terminals, an elongated reflector formed of a single sheet of material having opposite sides bent downwardly and an intermediate longitudinally extending portion adapted at its operative position to directly engage the lower ends of the sides of said trough member to close the lower open side thereof, lampholders mounted on each end of said reflector, contact means on the upper side of said reflector at each end thereof and positioned to engage said terminals when said reflector is at its aforesaid operative position, means electrically connecting said lampholders to said contacts, and releasable means on each of said supports engaging said intermediate part of the reflector for holding the latter at its operative position with said contacts engaging said terminals.

2. A luminaire comprising, an elongated inverted trough member, spaced terminal blocks mounted in said trough member, ballast means mounted in said trough member at a point spaced intermediate of said terminal blocks, electrical conductors permanently connected to said ballast means and having terminals permanently secured thereto, said terminal blocks being of insulating material and having openings facing said ballast means for receiving said terminals, said terminals being of a resilient material and of a shape to be stressed upon insertion into said openings, cooperating latch means on each terminal and the wall of its block opening responsive to insertion of a terminal in its block opening to automatically latch the terminal at an operative position therein, said blocks also having downwardly facing openings exposing inner portions of said terminals, an elongated reflector formed of a single sheet of material having opposite sides bent downwardly and an intermediate longitudinally extending portion adapted at its operative position to directly engage the lower ends of the sides of said trough member to close the lower open side thereof, lampholders mounted on said reflector, contact means on the upper side of said reflector positioned to engage said terminals when said reflector is at its aforesaid operative position, means electrically connecting said lampholders to said contacts, and releasable means engaging said reflector for holding the latter at its operative position with said contacts engaging said terminals.

3. A luminaire comprising, an elongated inverted trough member, spaced terminal blocks mounted in said trough member, ballast means mounted in said trough member at a point spaced intermediate of said terminal blocks, electrical conductors permanently connected to said ballast means and having terminals permanently secured thereto of U-shape with devergent legs and the conductors being connected to the upper leg of each terminal, said terminal blocks being of insulating material and having openings facing said ballast means for receiving said terminals, each terminal being of resilient material and of a size such that its legs are forced toward each other by insertion of the terminal bight portion foremost into its block opening, cooperating latch means on the upper leg of each terminal and the upper wall of its block opening responsive to insertion of a terminal in its block opening to automatically latch the terminal at an operative position therein, said blocks also having downwardly facing openings exposing a portion of the lower leg of each terminal, an elongated reflector formed of a single sheet of material having opposite sides bent downwardly and an intermediate longitudinally extending portion adapted at its operative position to directly engage the lower ends of its sides of said trough member to close the lower open side thereof, lampholders mounted on said reflector, contact means on the upper side of said reflector positioned to engage said terminals when said reflector is at its aforesaid operative position, means electrically connecting said lampholders to said contacts, and releasable means engaging said reflector for holding the latter at its operative position with said contacts engaging said terminals.

4. A luminaire comprising, an elongated inverted trough member, spaced terminal blocks mounted in said trough member, ballast means mounted in said trough member at a point spaced intermediate of said terminal blocks, electrical conductors connected to said ballast means and having terminals secured thereto, said terminal blocks being of insulating material and having openings facing said ballast means for receiving said terminals, said blocks also having downwardly facing openings exposing inner portions of said terminals, said terminals being of resilient material having one portion secured in the first-mentioned block openings and another leaf spring portion extending across said downwardly facing openings, an elongated reflector formed of a single sheet of material having opposite sides bent downwardly and an intermediate longitudinally extending portion adapted at its operative position to directly engage the lower ends of the sides of said trough member to close the lower open side thereof, lampholders mounted on said reflector, rigid contact means projecting from the upper side of said reflector positioned to engage said terminals when said reflector is at its aforesaid operative position, means electrically connecting said lampholders to said contacts, and releasable means engaging said reflector for holding the latter at its operative position with said contacts engaging said terminals under stress.

5. A luminaire comprising, an elongated inverted trough member, spaced terminal blocks mounted in said trough member, ballast means mounted in said trough member at a point spaced intermediate of said terminal blocks, electrical conductors connected to said ballast means and having terminals secured thereto, said terminal blocks being of insulating material and having openings facing said ballast means for receiving said terminals, each of said blocks having a single downwardly facing elongated opening exposing inner portions of all the terminals associated therewith, said terminals being of resilient material having one portion secured in the first-mentioned block openings and another leaf spring portion extending across said downwardly facing openings, an elongated reflector formed of a single sheet of material having opposite sides bent downwardly and an intermediate longitudinally extending portion adapted at its operative position to directly engage the lower ends of the sides of said trough member to close the lower open side thereof, lampholders mounted on said reflector, rigid contact means projecting from the upper side of said reflector positioned to engage said terminals when said reflector is at its aforesaid operative position, means electrically connecting said lampholders to said contacts, and releasable means engaging said reflector for holding the latter at its operative position with said contacts engaging said terminals under stress.

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2,487,467	Naysmith	Nov. 8, 1949
2,596,336	Leinen	May 13, 1952
2,615,123	Guth	Oct. 21, 1952
2,624,773	Mears	Jan. 6, 1953
2,678,380	Westby	May 11, 1954
2,702,378	Talty	Feb. 15, 1955