

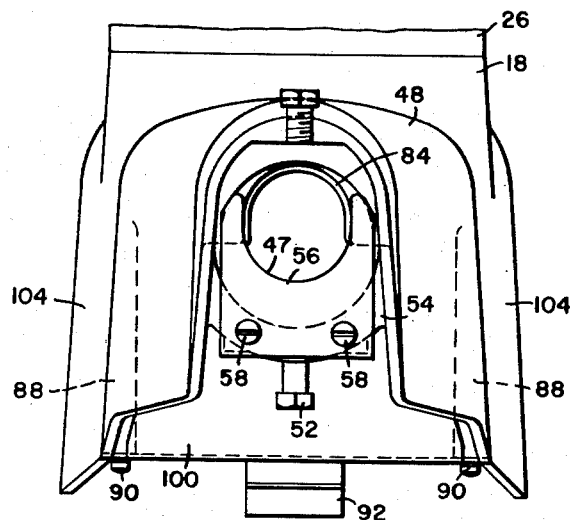
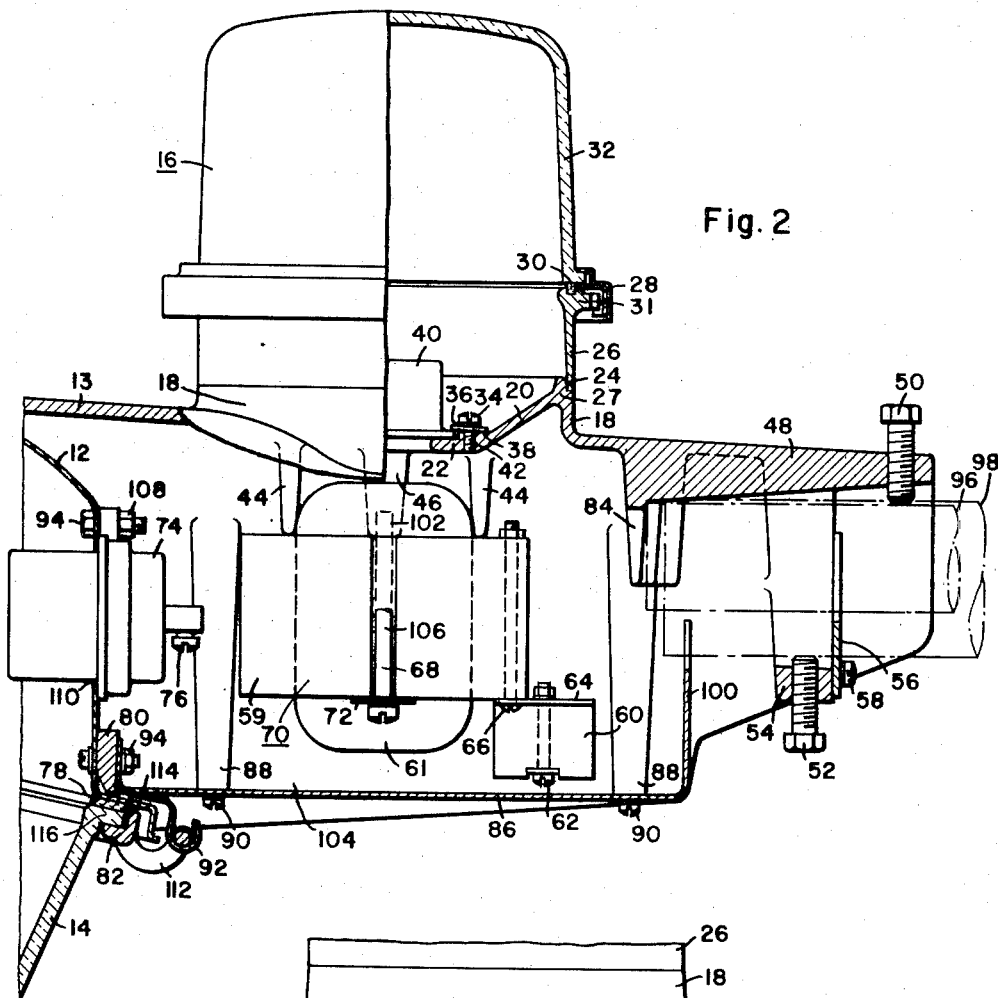
Jan. 31, 1961

D. E. HUSBY ET AL
LUMINAIRE

2,970,222

Filed May 19, 1958

2 Sheets-Sheet 2



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2,970,222

LUMINAIRE

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Filed May 19, 1958, Ser. No. 736,042

6 Claims. (Cl. 250—239)

This invention relates to luminaires, and particularly to streetlighting luminaires, having control elements, such as photoelectric lighting control units, transformers and the like, and more particularly to the luminaire mounting arrangement, and manner of incorporating such elements in a luminaire mounting.

The use of photoelectric control units for turning lights, for example, streetlights, off and on depending upon the intensity of the surrounding general illumination, is well known. It is common practice to provide photoelectric control units for this purpose and these units are usually mounted to the support pole or to a separate bracket attached to the support pole, or directly to the luminaire housing. Likewise, transformers have for most part been separately mounted.

The present invention relates to a luminaire of such construction that control components may be mounted directly to or in an extension of the housing of a luminaire. If it is so desired, the photoelectric control unit may have a mounting integral with the luminaire housing. The use of special mounting brackets for these controls are dispensed with, and a compact and attractive installation is achieved.

This invention has for its general object the provision of a luminaire having a photoelectric control unit which is mounted on the luminaire housing in a novel manner.

Another object of this invention is to provide a photoelectric control unit which is constructed with a novel support to be mounted to the housing of a standard luminaire.

Still a further object of this invention is to provide a luminaire having novel integral mounting means for a photoelectric control unit located on a portion of its housing.

Still another object of this invention is to provide a luminaire having a novel housing construction with a transformer mounted within the housing in a novel manner.

A further object of this invention is to provide a luminaire having a housing with a transformer mounted therein by novel means associated with the transformer laminations.

A more particular object of this invention is to provide a luminaire having a novel housing supporting a photoelectric control unit, which housing has an associated electrical component mounted closely therein in a new and novel manner so as to occupy the least amount of space but having the greatest utility.

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

Figure 1 is a side elevation view of the luminaire and associated photoelectric control unit constructed in accordance with this invention, with certain of the parts shown in section;

Fig. 2 is a side elevation view of a modified form of a

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luminaire and associated integrally mounted photoelectric control unit and transformer constructed in accordance with this invention, with certain of the parts shown in section; and

Fig. 3 is an end view of the luminaire housing shown in Fig. 2 with the refractor globe and the upper transparent portion of the photoelectric control unit removed.

While the invention is herein specifically disclosed as embodied in a streetlighting-type of luminaire, it should be understood that the invention in its various aspects may find application in other types of luminaires, and consequently, the following specific disclosure is not intended as limiting with respect to any of the features of this invention.

Referring to the drawings in detail, Fig. 1 illustrates an example of the streetlighting luminaire having a housing of the type shown in detail and more completely described and claimed in Patent 2,849,574 of Robert T. Burns and Dana W. Rowten, entitled "Luminaire," application Serial No. 518,844, filed June 29, 1955, and assigned to the same assignee as this invention. The housing portion 2 has an integral side extension or cast slipfitter portion 10 extending outwardly from the main portion of the housing portion 2. The housing slipfitter portion 10 has an integral cast mounting sleeve portion 48 at its outermost portion with openings at each of its ends. The housing slipfitter portion 10 has a generally inverted U-shape substantially providing an opening in the bottom thereof. The streetlighting luminaire shown in Fig. 1 has a housing portion 2 with an inverted cup-shaped reflector 11 located therein, and a refractor globe 14 mounted over the open side of the reflector 11 and housing portion 2.

In the example shown, the housing slipfitter portion 10 supports a photoelectric control unit 16 on the upper part thereof. The photoelectric control unit 16 is supported on the housing slipfitter portion 10 by means of a tubular adapter fitting 21 having exterior threads to be internally threaded at one end within a threaded opening in a boss 19 formed integral with the top wall of the slipfitter portion 10. The photoelectric control unit 16 has a base housing 23 generally cup-shaped in form with a peripheral shoulder 27 about its outer, upper surface, and an integral hexagonal collar 25 at the bottom thereof with a central opening therethrough provided with internal threads to accommodate the other end of the tubular adapter fitting 21. The hexagonal collar 25 may be used to rotate the base housing 23 to threadedly engage the adapter fitting 21. Once the base housing 23 and the adapter fitting 21 are engaged, the outer portion of the hexagonal collar 25 may also be used to threadedly engage the adapter fitting 21 to the internally threaded boss 19. Lead wires 69 extend through the adapter fitting 21 and are connected to a plug-in receptacle assembly 40 located in the base housing 23. The photoelectric control unit 16 may be threadedly engaged in the boss 19 prior to connecting any of the lead wires 69 to the electrical components located within the housing slipfitter portion 10, which will be described hereinafter.

The plug-in receptacle assembly 40 has a peripheral flange 41 about its base, and is designed to accept a plug-in receptacle cartridge (not shown). For purposes of obtaining the best light to actuate the photoelectric cartridge (not shown) the plug-in receptacle assembly 40 may be rotated within the base housing 23 so as to orientate the photoelectric cartridge in a generally northerly direction. A machine screw 34 inserted in tapped holes 42, located in the inner, bottom surface of the base housing 23, and having a lock washer 36 and a washer 38 thereon, is tightened with the washer 38 engaging the flange 41 of the plug-in receptacle 40, once the northerly direction has been determined, to thereby

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secure the plug-in receptacle assembly 40 on the receptacle assembly seat 22 which is recessed centrally in the upper, inner surface of the base housing 23. A die-cast lock ring 26, preferably made of cast aluminum or the like, peripherally engages the shoulder 27 of the base housing 23 and is attached thereto by means of a liquid body solder, an epoxy resin or by welding 24. A control unit cover 32, made of any suitable transparent material such as glass, is releasably secured to the die-cast lock ring 26 by a cover assembly 28 such, for example, as that described in patent application Serial No. 531,657, now abandoned, entitled "Meter Cover Assembly," by Frederick W. Witte, filed August 31, 1955, and assigned to the same assignee as this invention. A gasket 30, made of a suitable compressible weatherproof material, such as rubber, is mounted in a recess provided in the upper surface of a peripheral flange 31 formed integral with the die-cast lock ring 26, and is engaged by the control unit cover 32 to provide a waterproof seal therebetween.

As previously described, the housing slipfitter portion 10 has a photoelectric control unit 16 mounted on its upper wall. The housing slipfitter portion 10 has integrally formed with its upper, inner surface spaced terminal block bosses 65 adjacent opposite sides which extend downwardly. A terminal block 60, directly mounted to an elongated flat plate 64 by a nut and bolt assembly 62, is mounted to the terminal block bosses 65 by bolt and lock washer assemblies 67 extending through holes in the elongated flat plate 64 and into threaded openings provided in the bosses 65. The terminal block 60 extends substantially entirely across the housing slipfitter portion 10. Laterally spaced reinforcing ribs 71 (only one of which is shown), extend longitudinally of the inner, upper wall of housing slipfitter portion 10.

The mounting sleeve portion 48 which is integrally formed with the housing slipfitter portion 10, has a yoke 51 mounted adjacent its outer end. The yoke 51 is of a generally U-shape and is movable in a slot 49 provided in the lower wall of the mounting sleeve portion 48 with the ends thereof extending through openings in the top wall of the sleeve portion 48 and having yoke nuts 53 threadedly mounted thereon to be drawn up into clamping engagement with a pipe support (not shown), to firmly support the housing portion 2. An upper set screw 50, and a lower set screw 52, located in the mounting sleeve portion 48 are provided to adjustably align the housing portion 2 on the pipe support (not shown). In the mounting sleeve portion 48, inwardly of the yoke 51 is a ring-shaped pipe stop 55 formed integrally with the housing slipfitter portion 10, to prevent a pipe support from extending inwardly of the housing slipfitter portion 10 beyond the pipe stop 55. The pipe stop 55 has a circular gasket 57 made of any suitable waterproof, gasketing material, such as rubber, to which a pipe support may be abutted. The circular gasket ring 57, when the pipe support is in position, will prevent the entrance of any insects or dust present about the pipe support from entering the internal areas of the housing slipfitter portion 10. Conductors (not shown) may easily be inserted from the pipe support into the slipfitter housing portion 10 through the aperture of the circular gasket 57 and the pipe stop 55 to be connected to the terminal block 60.

A lamp socket 73, as shown in Fig. 1, is mounted within the housing slipfitter portion 10 to extend inwardly of the reflector 11 to thereby mount an electric light source therein (not shown). The lamp socket 73 is supported in position by a lamp socket strap 77 which extends beneath the socket 73 and has its outer ends attached to laterally spaced lamp socket bosses 75 integrally formed with the housing slipfitter portion 10 and extending downwardly from the upper, inner side portion of the housing slipfitter portion 10. Screws 79 pass through the outer ends of the lamp socket strap 77 and engage tapped holes in the lamp socket bosses 75.

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The refractor globe 14 is illustrated in Fig. 1 as being latched in position where its upper rim 116 is in engagement with a sealing gasket 78, made of any suitable material such as felt, which in turn engages the lower flange 118 of the housing 2. The refractor globe 14 is adapted to be releasably supported in closed relation with the bottom opening of the housing 2 by a pivot support at one end adjacent the housing mounting sleeve 10. The pivot support comprises a pair of supporting arms 83 provided integral with the refractor globe ring 82 and joined at their outer ends by a pivot pin 85. A hook shaped support 87, secured to an integral transverse support extending across the underside of the mounting sleeve 10 adjacent the refractor globe 14 by mounting screws 93, pivotally mounts the pivot pin 85, thereby hingedly mounting the refractor globe 14 to the housing for movement to the open or closed position relative to the bottom openings of the reflector 11 and housing portion 2. There is also provided a leaf spring 81, attached to the refractor globe ring 82 intermediate the pivot pin supporting arms 83 so as to extend downward a distance and then arcuately upwardly and outwardly, so as to engage an integrally formed lip 63 located on the bottom portion of the housing slipfitter 10. The leaf spring 81 is biased by the lip 63 in the closed position as shown in Fig. 1, thereby forcing the refractor globe 14 and the refractor globe ring 82 upwardly against the gasket 78 to form a dust proof and bug-proof joint. It is to be noted, that when the refractor 14 is in its closed position, the refractor globe ring 82 is supported by the leaf spring 81, and the pivot pin 85 is restrained from transverse movement by the hook shaped support 87. To open the luminaire, the refractor globe 14 and the refractor globe ring 82 are rotated downwardly about the pivot pin 85 so that the leaf spring 81 disengages lip 63 allowing the pivot pin 85 to drop to the bottom of the hook shaped support 87. The refractor bowl 14 may be further rotated until the flat surfaces 150 on pivot pin supporting arms 83 are at a position to clear the lip 63 whereupon the refractor globe 14 and the refractor globe ring 82 may be lifted to move the pivot pin 85 upwardly and out of the slots in the hook shaped support 87.

In the particular embodiment shown in Fig. 1, the housing slipfitter portion 10 has its bottom opening 95 located intermediate the hook shaped support 87 and the mounting sleeve portion 48 and it is covered by a removable closure door 89 supported in its closed position by outwardly biased leaf springs 91 secured to opposite ends of the door 89 to engage the opposite ends of the opening in the bottom portion of housing slipfitter portion 10.

In another embodiment of applicants' invention, as shown in Figs. 2 and 3, certain of the parts are identical with those described above in connection with the embodiment of the invention shown in Fig. 1, and consequently the same reference numerals are employed to designate such parts, and a detailed description thereof will not be repeated. In this embodiment of the invention, the housing slipfitter portion 13 has an upwardly extending supporting extension 18 formed integrally on its upper wall. The housing slipfitter portion 13 is generally of inverted U-shape in form with support mounting means in an integral mounting sleeve portion 48 located at its outer end, and a bottom opening extending its entire length. The upwardly extending support extension 18 is circular in cross section and has an inwardly projecting peripheral flange portion 20 which extends downwardly from the top periphery of the support extension 18. The inwardly projecting flange 20 extends inwardly to a radius substantially half of the radius of the circular housing extension 18. An integral horizontal ring-shaped receptacle assembly seat 22 is integrally formed with the inner end of the projecting flange portion 20. The circular receptacle assembly seat 22 forms a peripheral flange upon which the plug-in receptacle as-

sembly 40 with its associated electrical conductors (not shown) extending through the opening of the receptacle assembly seat 22. The plug-in receptacle assembly 40 may be positioned to face in a generally northerly direction, and then machine screw 34, cooperating with lock washer 36 and washer 38, may be tightened in a tapped hole 42 to securely hold the receptacle assembly flange 41 of the plug-in receptacle assembly 40 in position. A photoelectric control cartridge (not shown) is inserted in the plug-in receptacle assembly 40 with its light sensitive component part located within the control unit cover 32. The lead wires (not shown) extending downwardly from the receptacle assembly 40 may be readily connected to the transformer assembly 70, terminal block 60 and lamp holder 74. As previously described, relative to the embodiment shown in Fig. 1, a die-cast lock ring 26 is mounted to the shoulder 27 of the housing extension 18 and secured thereto by means of a body solder, epoxy resin or welding 24.

In the particular embodiment of applicants' invention as shown in Fig. 2, the transformer assembly 70 comprising a laminated core 59, and a coil 61, is located in the housing slipfitter portion 13 directly beneath the photoelectric control unit 16. Bosses 46 are integrally formed at opposite side walls 104 of the housing slipfitter portion 13 and each has a tapped hole 102 to accommodate elongated machine screws 68. Elongated laterally extending integrally formed supports 44 extend vertically downward from the upper, inner wall of the housing slipfitter portion 13 and at right angles to the side walls 104. The transformer assembly 70, which is mounted by the machine screws 68, has dove-tailed slots 106 formed in opposite sides of the laminations of the core 59, which may be used for orientation of the transformer core laminations 59 during assembly, and these slots 106 are used to guide and accommodate the machine screws 68. A spacer 72 is located under the head of each machine screw 68, and engages a substantial portion of the adjacent transformer core 59 so as to distribute the load on the transformer core 59 when the machine screw 68 is threadedly engaged with the boss 46 and tightened to secure the transformer core 59 against the supports 44. At the side of the transformer assembly 70 adjacent the housing sleeve portion 48, a nut and bolt assembly 66, passing from top to bottom through the laminations of the transformer core 59, mounts a terminal block 60. The terminal block 60 is mounted to an elongated flat plate 64 by means of a nut and bolt assembly 62, and the plate 64 is mounted beneath the head of the bolt used in the nut and bolt assembly 66, to thereby securely hold the plate 64 and the terminal block 60 in position.

To further support the housing slipfitter portion 13, as shown in Fig. 2, a cross brace 80, shown in cross section in Fig. 2, is integrally formed with the lower portion of the housing slipfitter portion 13 between the side walls 104 at the inner end thereof. Immediately above the cross brace 80 in the housing slipfitter portion 13, another cross brace 108 is integrally formed with the housing slipfitter portion 13 between the side walls 104. An inverted cup-shaped reflector 12 is mounted at one end to the cross braces 80 and 108 by nut and bolt assemblies 94. A lamp socket 74, having connector terminals 76 extending inwardly of the housing slipfitter portion 13 so as to be located adjacent to the transformer assembly 70, is securely fastened to the reflector 12 by nut and bolt assemblies (not shown) located adjacent to the aperture 110 in the reflector 12 through which the lamp socket 74 extends.

A refractor globe 14, as shown in Fig. 2, is mounted in a refractor globe ring 82. A gasket 78, made of any suitable gasketing material, such as rubber or a fibrous material separates the upper rim 116 of the refractor globe 14 from the bottom outwardly extending flange 114 of the reflector 12. The gasket 78 provides a dust-proof and bug-proof seal for the interior of the luminaire. A

wide, flat hinge spring 92, attached at its upper end to the cross brace 80 by nut and bolt assemblies 94, extends outwardly and downwardly to provide a hook-shaped hinge at its lower end. A refractor globe ring hinge 112 in the general form of a U-shaped rod is integrally mounted to extend outwardly of the refractor globe ring 82 and has its leg portions arcuately bent downward so as not to interfere with the reflector outwardly extending flange 114. The bight portion of the refractor globe ring hinge 112 seats itself within the hook-shaped portion of hinge spring 92 to rotatably mount the refractor globe ring 82.

Opposed bosses 88, integrally formed with the inner side walls 104 of the slipfitter housing portion 13 extend vertically downwardly from the upper to the lower portions of the side walls 104, and have tapped holes at their lower ends to accommodate bolts 90. As previously stated, the bottom portion of the housing slipfitter portion 13 is open. An elongated flat plate bottom cover 86, having an upwardly bent vertical portion 100 at its outer end, may be mounted to the bosses 88 by the bolts 90. The bottom cover 86 substantially encloses the bottom opening of the housing slipfitter portion 13. The vertical portion 100 extends upwardly into the mounting sleeve portion 48 to substantially fit about a pipe support that will be described hereinafter. The bottom cover 86 and its upwardly extending vertical portion 100 will thus provide protection for the electrical components mounted in the slipfitter portion 13.

The mounting sleeve portion 48 is integrally formed with the outer portion of the housing slipfitter portion 13. Similar in shape to the U-shape of the housing slipfitter portion 13, the mounting sleeve portion 48 is tapered to its outermost extremity. Midway the length and at the lower portion of the mounting sleeve portion 48, there is located an integral arcuately downwardly bent cross bracket 54, as shown in Fig. 3. Securing bolts 50 and 52 are located in the upper outer end of the mounting sleeve portion 48, and the cross bracket 54, respectively. The bolts 50 and 52 are used to secure the slipfitter housing portion 13 to a pipe support 96 or 98, shown in dotted lines. The cross bracket 54 has a partially circular shape so that it may accommodate the large pipe support 98 when it is inserted into the mounting sleeve 48 and abuts against an integral pipe stop 84, extending downwardly from the upper portion of the inverted U-shaped mounting sleeve portion 48 at its inner end. If the smaller pipe support 96 is used to mount the housing slipfitter portion 13, a flat plate adapter 56, having a semicircular shaped upper edge 47 to accommodate the outer diameter of the smaller pipe support 96, is mounted to the cross bracket 54 by the adapter screws 58 which threadedly engage tapped holes (not shown) horizontally located in the cross bracket 54 to securely hold the adapter 56 in place. The adapter 56 and the pipe stop 84 will adequately position the smaller pipe support 96, whereupon upper set screw 50 and lower set screw 52 may be tightened to securely hold the pipe support 96 in place after alignment of the housing slipfitter portion 13 has been made. Both the pipe supports 96 and 98 are hollow to accommodate electrical conductors (not shown) which pass therethrough and into the luminaire housing. It is to be noted that the terminal block 60 is located closely adjacent to the end of the pipe support 96 or 98 so that electrical connections may easily be made thereto when the cover 86 is removed.

While certain preferred embodiments of the invention have been illustrated and described in detail, it is to be understood that changes may be made therein and the invention embodied in other structures. It is not, therefore, the intention to limit applicants' invention to the specific construction illustrated, but to cover the invention broadly in whatever form its principles may be utilized. Accordingly, it is desired that the invention be given

a broad scope and that it be limited only as required by the prior art.

We claim as our invention:

1. A luminaire comprising, an inverted cup-shaped reflector, an aperture located in said reflector, a lamp supporting means mounted adjacent said apertures for supporting a lamp in said reflector, an elongated housing located adjacent to and extending outwardly from the apertured portion of said reflector, support means on said housing opposite said reflector, an internally threaded aperture located on a portion of said elongated housing intermediate said reflector and said supporting means, an at least partially transparent enclosure having a base suitable for mounting electrical control components, electrical control components located in said enclosure being light sensitive, a threaded pipe support located in the base of said enclosure suitable for threadedly engaging the aperture, said pipe support being an electrical conduit between the interior of said housing and said enclosure, said electrical components located in said enclosure automatically energizing said luminaire.

2. A luminaire comprising, an inverted cup-shaped reflector, an aperture located in said reflector, a lamp supporting means mounted adjacent said aperture for supporting a lamp in said reflector, an elongated U-shaped housing located adjacent to and extending outwardly from the apertured portion of said reflector, support means in said housing opposite said reflector, an at least partially transparent enclosure integrally mounted and located on a portion of said elongated housing intermediate said reflector and said supporting means, a transformer having a core, securing means engaging integral bosses extending inwardly on the inner side of said U-shaped housing for securing said transformer in place, dove-tailed slots located in each side of said transformer core for receiving said securing means, supports extending inwardly of said housing to position and further support said transformer, so that said transformer is closely associated with all electrical components to provide easier wiring for said luminaire.

3. A luminaire comprising, an inverted cup-shaped reflector, an aperture located in said reflector, a lamp supporting means mounted adjacent said aperture for supporting a lamp in said reflector, an elongated inverted open-sided U-shaped housing located adjacent to and extending outwardly from the apertured portion of said reflector, support means on said housing opposite said reflector, an at least partially transparent enclosure located on an integrally formed base portion of said elongated housing intermediate said reflector and said supporting means, a centrally located opening in said enclosure communicating with said housing, electrical components mounted in said housing and enclosure, a detachable cover located on said open side of said inverted U-shaped housing, said cover when in its closed operative position completely enclosing said electrical components located within said housing.

4. A luminaire comprising, an inverted cup-shaped reflector, an aperture located in one side of said reflector, a lamp supporting means mounted adjacent said aperture for supporting a lamp in said reflector, an inverted elongated U-shaped housing located adjacent to and extending outwardly from the apertured portion of said reflector, support means on said housing opposite said reflector, a cross brace located adjacent to said support means and

extending between the sides of said housing at their lower portions, a detachable adapter mounted to said cross brace, securing screws mounted in the upper and lower portions of said housing, said adapter and said securing screws cooperating to firmly hold said housing to a support, an at least partially transparent enclosure located on a portion of said elongated housing intermediate said reflector and said supporting means, electrical control components mounted in said housing and enclosure, said electrical components located in said enclosure being light sensitive and connected to the electrical components in said housing to automatically energize said luminaire.

5. A luminaire comprising, an inverted cup-shaped reflector, an aperture located in said reflector, a lamp supporting means mounted adjacent said aperture for supporting a lamp in said reflector, an elongated housing located adjacent to and extending outwardly from the apertured portion of said reflector, support means in said housing opposite said reflector, an at least partially transparent enclosure integrally mounted and located on a portion of said elongated housing intermediate said reflector and said supporting means, a centrally located opening in the bottom portion of said enclosure, said opening communicating said enclosure with said housing, bosses having tapped holes located integrally adjacent each side of said U-shaped housing directly beneath said enclosure, a transformer having vertical dove-tailed slots grooved in the sides of its horizontally displaced laminations, elongated bolts engageable with said bosses, spacers on said screws to support said transformer, said bolts extending upwardly through said dove-tailed slots to position and align said transformer, said transformer being closely associated with all electrical components to provide easier wiring for said luminaire.

6. A luminaire comprising, an inverted cup-shaped reflector, an aperture located in said reflector, a lamp supporting means mounted adjacent said aperture for supporting a lamp in said reflector, an elongated inverted U-shaped housing located adjacent to and extending outwardly from the apertured portion of said reflector, support means on said housing opposite said reflector, a transformer located within said housing and intermediate said reflector and said supporting means, said transformer having a coil mounted on a core, flat plate laminations horizontally disposed for said transformer core, vertical dove-tailed slots centrally located in said horizontally disposed flat plate laminations adjacent the sides of said inverted U-shaped housing, elongated detachable securing means extending downwardly from the upper inner side portion of said inverted U-shaped housing to engage the bottom surface of said core, said securing means extending downwardly in said dove-tailed slots to detachably secure said transformer to said housing so that it can be easily detached to expose the interior of said housing.

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