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LUMINAIRE

3 Sheets--Sheet 1



FIG. 2

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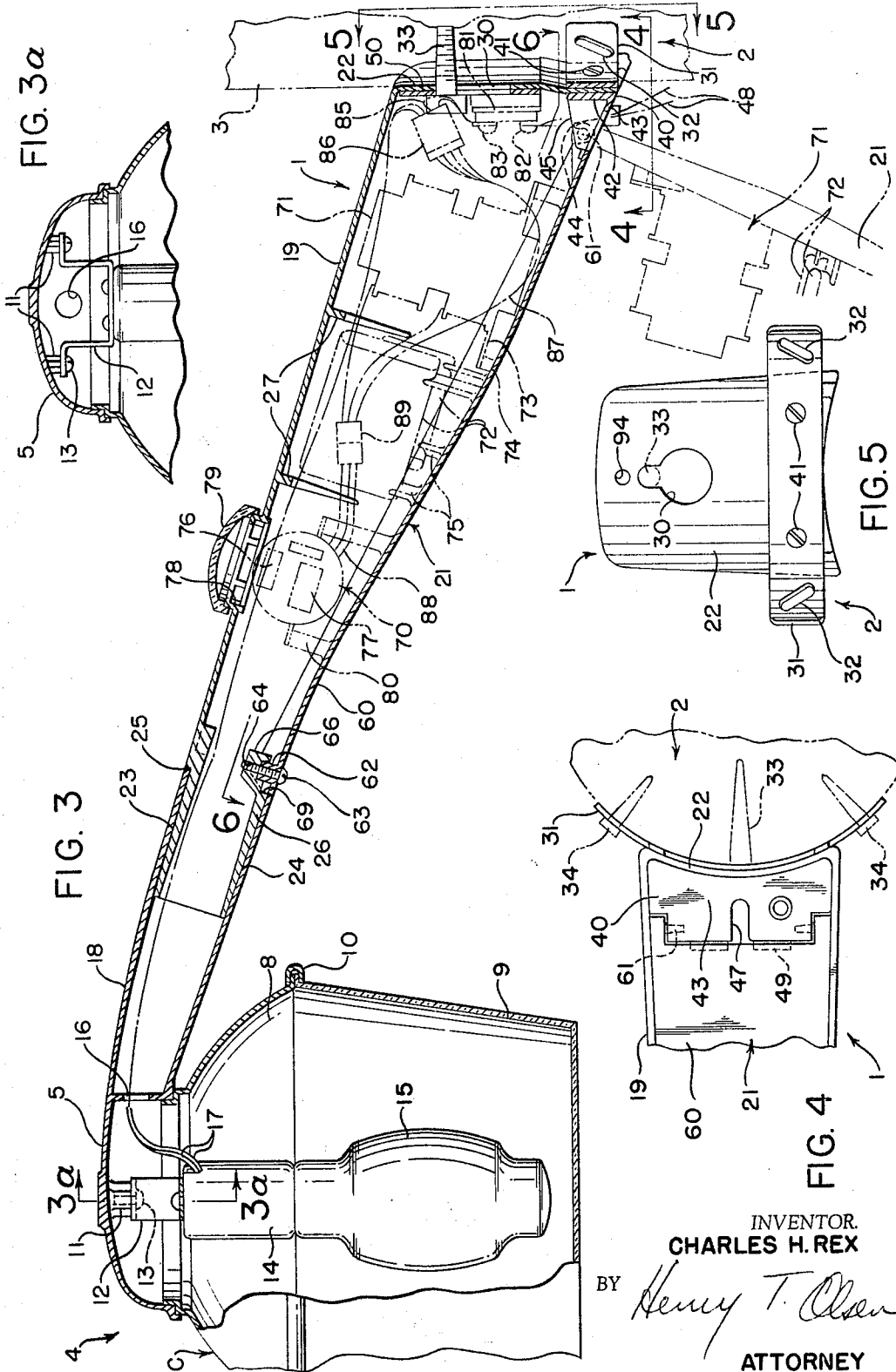
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3 Sheets-Sheet 2



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FIG. 6

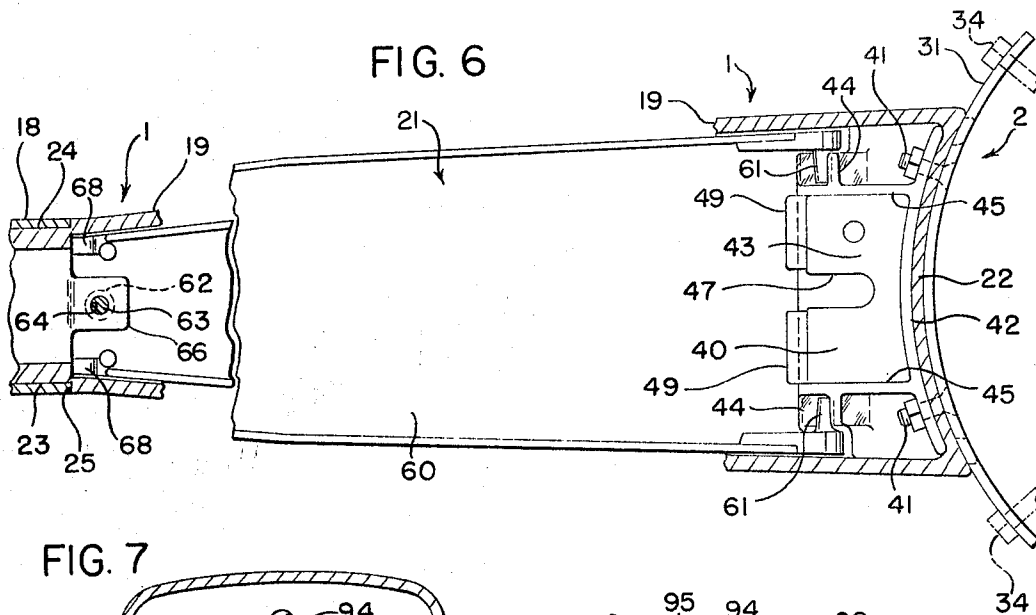


FIG. 7

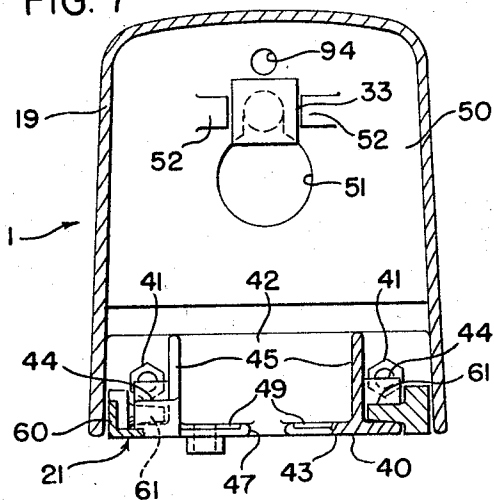


FIG. 8

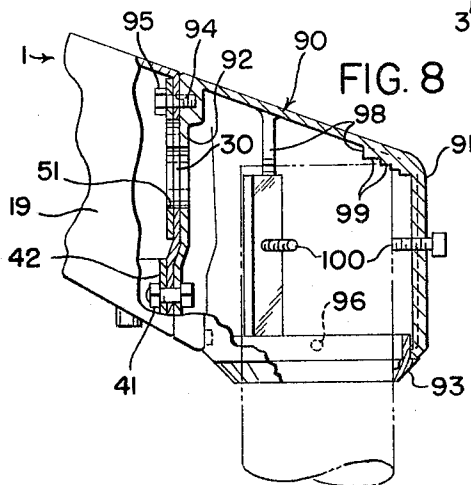


FIG. 9

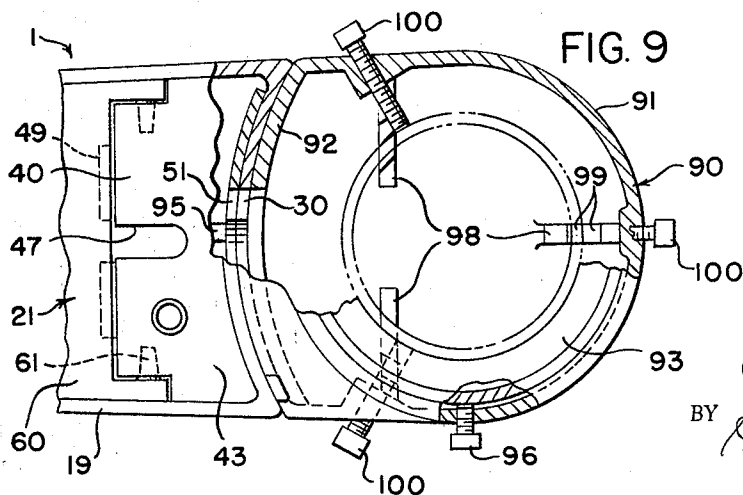
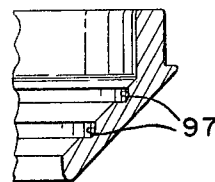


FIG. 10



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3,264,465
LUMINAIRE

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11 Claims. (Cl. 240—25)

This invention relates to a luminaire and more specifically to the combination of a luminaire with a support bracket therefor which bracket contains the electrical control devices for operating the luminaire.

In general, luminaires mounted on mast arms or brackets extending perpendicularly toward the center of the roadway are presently considered the most suitable for highway and roadway lighting, since they enable mounting of the luminaire on poles which are spaced back from the side of the road. The present support brackets are generally pipes or conduits which may or may not contribute to the overall appearance of the luminaire as a whole. It is an object of this invention to provide a suitable support bracket which will enable one to mount a luminaire at the end of the support bracket without detracting from the daylight appearance of the luminaire.

The most suitable lamp for streetlighting purposes presently used is the high pressure mercury discharge lamp. This lamp requires suitable ballasting elements to provide its operation and, as is common in the industry, the luminaires are generally individually controlled by suitable photoelectric control devices to turn them on in the evening and off as the ambient light levels rise. While certain luminaires have been manufactured which provide the ballasting function and the photoelectric function necessary for the proper operation of the lamp in an integral package, the provision thereof has generally obsoleted certain types of luminaire devices which are suitable for all other purposes. It is a general object of this invention to provide an adapting support bracket which will enable one to utilize various luminaire designs with discharge lamps and still provide the ballasting and photoelectric control function without necessarily requiring that these functions be mounted separately on a pole or elsewhere providing an untidy appearance.

It is a further object of this invention to provide a support bracket which has mounted on its interior the control devices for the luminaire, the major weight of the control devices being supported therein closely adjacent the pole so as to greatly reduce the stress on the support bracket.

It is a further object of the invention to provide a luminaire and support bracket combination which is relatively economical to manufacture, simple to install and provides great flexibility and ease in maintenance.

In accordance with the invention there is provided a luminaire support bracket comprising an inverted U-shaped open bottom channel member, said channel member including an end wall at one end, a cross brace having a notch facing said end wall at the other end and means defining a conduit for introduction of conductors extending externally of said channel member adjacent said end wall. There is provided means adjacent said end wall for mounting the bracket on a pole, which comprises a first key-hole slot in the above-mentioned end wall, a hanger member secured to said end wall and a reinforcing plate having a second key-hole slot positioned against the interior of said end wall for distributing load on said first key-hole slot more uniformly over the end wall. Suitable means at the other end of the bracket adjacent the cross brace are provided for mounting a luminaire thereon. A bottom closure member with a pair of hinge pins on one end hingedly and removably secured to a pair of hinge hooks on the channel member adjacent the pole mounting

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means is provided on which a discharge lamp ballast is mounted adjacent said pole mounting means. A photoelectric control device which device includes a photo-sensitive cell and a switching means is mounted on said closure member beneath a transparent dome. The end of said closure member remote from the hinge is in abutting relation with the above-mentioned notch whereby said closure member serves as a compression member of the support bracket. A terminal board is mounted on the end wall above said conduit means so that the external conductors may be permanently secured in the bracket. Electrical conductor means having readily detachable connector means as a part thereof electrically connect said ballast and said photoelectric control device to said terminal board, the detachable connector permitting removal of the lower closure and the electric control devices without disturbing the connection to the external conductors.

Further objects and advantages of the invention shall be apparent to one skilled in the art from the following description of the preferred embodiment thereof and from the drawings wherein:

FIG. 1 is a perspective view showing the luminaire and bracket combination in mounted position;

FIG. 2 is a perspective view with the bracket opened to reveal the interior;

FIG. 3 is a vertical section view along the length of the combination;

FIG. 3a is a section view along 3a—3a of FIG. 3;

FIG. 4 is a bottom view along 4—4 of FIG. 3;

FIG. 5 is an end view along 5—5 of FIG. 3;

FIG. 6 is a section view along 6—6 of FIG. 3;

FIG. 7 is a section view showing the interior end wall of the bracket;

FIG. 8 is an elevational view, partly in section of a modified form of the invention;

FIG. 9 is a bottom view partly in section of the form shown in FIG. 8; and

FIG. 10 is an enlarged detail of the adaptor sleeve shown in FIG. 8.

The preferred embodiment, as shown in FIG. 1, generally comprises a support bracket 1 held at one end by suitable securing means 2 to a pole 3, which support bracket carries a luminaire 4 on its outer extremity.

The luminaire 4, as is conventional, generally comprises a hood 5 secured to an optical assembly 6 by suitable fastening means 7. The optical assembly includes a reflector 8 and refractor 9 fastened together by a clamp band 10.

The hood 5 is provided internally with suitable lugs 11 to which may be secured a yoke 12 by fastening means 13 (FIGS. 3 and 3a). The yoke 12 supports a socket 14 by means of which a discharge lamp 15, such as a high pressure mercury discharge lamp, may be properly oriented within the optical assembly 6. An aperture 16 is provided in the wall of the hood adjacent its connection to the support bracket 1 through which electrical conductors 17 may be threaded for connection to the lamp socket 14. As shown, the hood 5 includes a tubular extension arm 18 which secures the hood to the support bracket.

The support bracket 1 includes an inverted generally U-shaped channel member 19 having an open bottom which is generally covered by a closure member 21. Adjacent the pole 3, an end wall 22 is provided in the support bracket and at the outer end of the bracket a generally tubular member 23 is provided to which the tubular arm 18 of the hood 5 may be secured. As shown in the drawing, the composite hollow arm comprising arm 18 and channel member 19 has a length which is at least twice as long as the overall lateral dimension of optical assembly 8, 9.

As is seen in FIGS. 3 and 6, the tubular member 23 is tapered on its external surface 24, which surface terminates in a shoulder 25 and is dimensioned to provide a wedge fit within the interior of the hood arm 18. Thus, the hood may be secured to the support bracket by the force fit between the hood arm and the tapered tubular member 23. To eliminate very close tolerances on the matching of these parts, it may be desirable to cement the parts together, as for example with an epoxy resin, so as to more completely secure the members together. The lower wall of the tubular member 23 constitutes a brace 26 which serves, together with internal braces 27, to maintain the side walls of channel 19 apart from each other.

The end wall 22 of the support bracket is contoured to provide an abutting structure against the pole 3 onto which the bracket is to be mounted (FIG. 4). The end wall 22 is provided with a key-hole slot 30 (FIG. 5) and has secured thereto a hanger member 31, the hanger member being provided with slots 32 at its outer end. Thus, the support bracket may be readily affixed to a pole 3 by first driving a lag screw 33 (FIG. 4) into the pole. The support bracket may then be inserted onto the lag screw 33 and permit it to slide vertically downward so that the small portion of key-hole slot 30 surrounds the lag screw 33. The support bracket and luminaire will then be supported on the pole while lag screws 34 may be inserted through hanger slots 32 and secured in the pole. The support bracket and luminaire are then completely supported by the lag screw 33.

A hinge plate 40 (FIG. 3) is secured to end wall 22 by means of fasteners 41, these same fasteners 41 being utilized to secure hanger 31 to the end wall of the bracket. The hinge plate 40 is a generally L-shaped member in cross section and includes a vertical wall 42 which, as best seen in FIG. 6, is contoured to abut the interior surface of end wall 22 and through which fasteners 41 extend. A lower wall 43 provides in part the covering means for the open bottom of the support bracket. A pair of hinge hooks 44 (FIGS. 6 and 7) are mounted on the interior of the bottom wall member 43 and provide a securing means for one end of the lower closure member 21, the hinging hooks 44 being provided with adequate support by bracing walls 45. Aperture 47 is provided in the lower wall of the hinge plate 40 so as to define a conduit permitting the introduction of external electrical conductors 48 into the interior of the support bracket. The hinge plate 40 is provided with stops 49 preventing inward movement of closure 21.

The open bottom channel member 19, as shown, may be die-cast from suitable material such as aluminum, the end wall 22 being cast as an integral part thereof and suitable internal braces such as 27 (FIG. 3) being provided. The die-cast end wall when made of aluminum may not be of sufficient strength to support the weight of the bracket and luminaire so a strengthening face plate 50, preferably of steel, is provided which generally matches the contour of end wall 22. This face plate is also provided with a key-hole slot 51 through which the lag screw 33 will be inserted and tangs 52 which prevent the rotation of the lag screw. By dimensioning the face plate 50 so that it is slightly oversized for the end wall 22, the weight of the bracket and luminaire will be distributed generally uniformly over the entire surface of the end wall 22 and will not necessitate supporting the entire weight of the luminaire and bracket upon a small amount of aluminum material adjacent the key-hole slot 30.

The lower closure member 21 is a generally channel shaped member 60 having hinge pins 61 (FIG. 6), which cooperate with the hinge hooks 44 on the hinge plate 40 to hingedly and removably secure the closure 21 to the channel 19 and cover the bottom opening thereof. The other end of the channel member 60 is provided with a boss 62 in which a fastener 63 may be secured.

The fastener 63 cooperates with a tapped hole 64 in a tongue 66 provided on brace 26 of the upper channel 19 to secure that end of the closure member 21 to the bottom of support bracket 1.

The channel member 60 acts as a compression strut in strengthening the support bracket by the extensions 68 thereof engaging in notch 69 provided on the brace 26. Since the hinge pins 61 are securely fastened against rearward movement by engagement with the hooks 44 on the hinge plate 40, downward bending movement of the support bracket is prevented by the lower closure channel 60 acting in compression.

Electrical control devices for operating the discharge lamp 15 are contained within the interior of the support bracket 1. These control devices include a photoelectric control 70 and ballasting means for the discharge lamp 15 including a transformer 71 and power factor correcting capacitors 72. The greater part of the weight of these combined control devices is in the ballasting transformer 71. Hence, this transformer is mounted closely adjacent the end wall 22 of the support bracket. The supporting means for the transformer 71 includes a plate 73 suitably secured to bosses 74 made integrally with the lower closure member 21. This location of the transformer greatly reduces the stress on the bracket. The capacitors 72 are supported on embossments 75 made integral with the lower closure member 21, these bosses being generally arc-shaped so as to support the rounded sides of the capacitors.

The photoelectric control 70 generally includes a light-responsive cell 76 and a switching means, such as a relay 77. The photoelectric cell 76 is exposed to ambient light conditions through an opening 78 in the channel member 19, the opening being covered by a transparent dome 79 made of suitable material such as a clear plastic. The cover member 79 may be cemented over the opening 78 or may be secured over the opening by some suitable fastening means if required. The support means 80 for the photoelectric control means 70 is so located on the lower closure member 21 that when the closure member is secured in its closed position the photoelectric control 70 is properly juxtapositioned beneath the opening 78.

A terminal board 81, which includes input terminals 82 and output terminals 83, is secured to end wall 22 of the upper channel member 19. Thus, input terminals 82 are provided to which external conductors 48 leading to an external source of power may be secured. Output terminals 83 are connected to the lamp 15 through the control devices of the support bracket. In order that the control devices of the luminaire can be easily removed for repair and maintenance, the output terminals 83 are connected by conductors 85 to a readily detachable connection such as a plug member 86, suitable conductors 87 being provided to connect the source of power to the rest of the control components. The photoelectric control device 70 is further connected in circuit with the lamp 15 through a readily detachable plug 89, suitable conductors 90 connecting the photoelectric control and circuit with the control devices.

From the above it will be noted that there is provided a support bracket which is structurally easily capable of maintaining the weight of the luminaire at its outer extremity and is readily mounted on a pole. The electrical components which, at times, require maintenance may be entirely removed by unfastening of the fastener 63 and lowering the closure member 21 so that the closure member may be removed off of the hinge plate 40. Electrical connections may be easily disassembled by the detachable plug 86. The conductors leading from the source of current will not be detached from the support bracket as a whole since they are secured to the terminal board and will be maintained in their proper positions should a replacement closure member 21 be reassembled in place. Then, the closure member 21 with the electrical components mounted

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thereon may be removed to a remote place for repair and maintenance at a convenient time. Since the hinge plate 40 together with hooks 44 require a lifting movement of the closure plate 21 for removal, the opening of the closure member 21 merely to inspect the device does not permit the electrical control devices to drop to the ground; therefore, the inspector may readily open and inspect the control devices without necessitating removal if the case should require it.

A pole top adaptor 90 for the support bracket (FIGS. 8, 9 and 10) is a modification to replace the hanger member 31. The pole top adaptor 90 comprises a generally tubular member 91 having an end wall 92 and a sleeve 93. The end wall 92 is contoured to mate with end wall 22 of the support bracket and may be secured thereto by the fastening means 41 which were used to secure the hanger member 31 thereto at its lower end. A separate aperture 94 may be provided immediately above the key-hole slot 30 through which fastening means 95 may be directed to secure the adaptor to the support bracket. The sleeve 93 is secured to the adaptor by fastening means 96. The sleeve 93 is a cast aluminum ring having a generally conical lower end provided with weakening notches 97 at spaced intervals on its interior surface (FIG. 10). Portions of the sleeve may be broken off to enlarge the opening in the sleeve to fit larger poles. Upward movement of the pole within the adaptor is prevented by three stop members 98 provided generally radially about the central opening of the adaptor. The stop members 98 include spaced steps 99 which engage the various pole sizes. Locking screws 100 are provided to secure the adaptor on the pole.

Thus, it will be seen there is provided a luminaire support bracket which comprises a generally open bottom channel member and a closure member hingedly supported at one end and suitably engaged at the other end thereof to provide a structurally strong support bracket out of a relatively lightweight open structure. There is provided means therein whereby electrical connections from an external source may be easily and permanently attached to the support bracket and permit easy maintenance of the control devices contained within the support bracket. Suitable means are provided for mounting the bracket on the side of a pole or on a pole top. Since it is contemplated that the upper member of the support bracket will be made of cast aluminum, there is provided a reinforcing plate adjacent the end wall thereof which provides sufficient strength to maintain the support bracket on a pole. The support bracket maintains within its interior the control devices necessary for the operation of a discharge lamp, that is the discharge lamp ballasting devices and a photoelectric control for turning the luminaire "on" and "off" in response to changes in ambient light conditions. The lower closure member of the support bracket is easily removable for repair and maintenance of the discharge lamp control devices mounted thereon. When the lower closure member is removed, all of the control devices may be taken to the ground or to a location remote from the luminaire for repair or maintenance. In addition, the photoelectric control device may be removed as an entity in itself because of the readily detachable plug connection provided. It will be readily seen that there is provided a device which can be readily assembled and manufactured.

While the invention has been described by way of the preferred embodiment thereof, it will be appreciated that many modifications and changes may be made within the spirit and scope of the invention as set forth in the appended claims.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. A luminaire support bracket comprising an inverted U-shaped open bottom channel member, means at one end of said member for mounting the bracket on a pole, means at the other end of said member for mounting a

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luminaire thereon, a transparent dome mounted intermediate the ends, a closure member with one end hingedly secured to said channel member adjacent the pole mounting means, means for mounting a discharge lamp ballast on said closure member, means for mounting a photoelectric control device on said closure member and means for securing the other end of said closure member to said channel member with the photoelectric control device juxtapositioned beneath said transparent dome.

2. A luminaire support bracket comprising an inverted U-shaped open bottom channel member, means at one end of said member for mounting the bracket on a pole, means at the other end of said member for mounting a luminaire thereon, a transparent dome mounted intermediate the ends, a closure member with one end hingedly secured to said channel member adjacent the pole mounting means, means for mounting a discharge lamp ballast on said closure member, means for mounting a photoelectric control device which includes a photoelectric cell and a switching device on said closure member and means for securing the other end of said closure member to said channel member with the photoelectric control device juxtapositioned beneath said transparent dome.

3. A luminaire support bracket comprising an inverted U-shaped open bottom channel member, a transparent dome mounted intermediate the ends of said channel member, a closure member with one end hingedly secured to said channel member, means for mounting a discharge lamp ballast on said closure member, means for mounting a photoelectric control device on said closure member and means for securing the other end of said closure member to said channel member with the photoelectric control device juxtapositioned beneath said transparent dome.

4. In combination with a luminaire which includes a reflector and refractor for a discharge lamp, a support bracket comprising an inverted U-shaped open bottom channel member, a transparent dome in the top of said channel member, a closure member with one end hingedly secured to the channel member, means for mounting a discharge lamp ballast on said closure member, means for mounting a photoelectric control device on said closure member and means for securing the other end of said closure member to said channel member with the photoelectric control juxtapositioned beneath said transparent dome.

5. In combination with a luminaire which includes a reflector and refractor for a discharge lamp, a support bracket comprising an inverted U-shaped open bottom channel member, means at one end of said member for mounting on a pole, a transparent dome in the top of said channel member, a closure member with one end hingedly secured to the channel member at the end adjacent the pole mounting means, means for mounting a discharge lamp ballast on said closure member, means for mounting a photoelectric control device on said closure member and means for securing the other end of said closure member to said channel member with the photoelectric control juxtapositioned beneath said transparent dome.

6. In combination with a luminaire which includes a reflector and refractor for a discharge lamp, a support bracket comprising an inverted U-shaped open bottom channel member, a closure member with one end hingedly secured to the channel member, means for mounting a discharge lamp ballast on said closure member, means for mounting a photoelectric control device on said closure member and means for securing the other end of said closure member to said channel member with the photoelectric control positioned to be exposed to ambient light.

7. In combination with a luminaire which includes a reflector and refractor, a support bracket comprising an inverted U-shaped open bottom channel member, a transparent dome in the top of said channel member, a closure member with one end hingedly secured to the channel member, means for mounting a photoelectric control de-

vice on said closure member and means for securing the other end of said closure member to said channel member with the photoelectric control juxtapositioned beneath said transparent dome.

8. A luminaire support bracket comprising an inverted U-shaped open bottom channel member, said channel member including an end wall at one end, a cross brace having a notch facing said end wall at the other end, and means defining a conduit extending externally of said channel member adjacent said end wall, means adjacent said end wall for mounting the bracket on a pole, means adjacent said cross brace for mounting a luminaire thereon, a transparent dome mounted intermediate said ends, a closure member with one end hingedly secured to said channel member adjacent the pole mounting means, means for mounting a discharge lamp ballast on said closure member adjacent said pole mounting means, means for mounting a photoelectric control device on said closure member, means for securing the other end of said closure member to said channel member with the photoelectric control device juxtapositioned beneath said transparent dome, the other end of said closure member being in abutting relation to said notch, whereby said closure member serves as a compression member of the support bracket, a terminal board mounted on said end wall above said conduit means, and electrical conductor means having readily detachable connector means as a part thereof electrically connecting said ballast and said photoelectric control device to said terminal board.

9. A luminaire support bracket comprising an inverted U-shaped open bottom channel member, said channel member including an end wall at one end, a cross brace having a notch facing said end wall at the other end, and means defining a conduit extending externally of said channel member adjacent said end wall, means adjacent said end wall for mounting the bracket on a pole, means adjacent said cross brace for mounting a luminaire thereon, a transparent dome mounted intermediate said ends, a closure member with a pair of hinge pins on one end hingedly secured to a pair of hinge hooks on said channel member adjacent the pole mounting means, means for mounting a discharge lamp ballast on said closure member adjacent said pole mounting means, means for mounting a photoelectric control device on said closure member, means for securing the other end of said closure member to said channel member with the photoelectric control device juxtapositioned beneath said transparent dome, the other end of said closure member being in abutting relation to said notch, whereby said closure member serves as a compression member of the support bracket, a terminal board mounted on said end wall above said conduit means, and electrical conductor means having readily detachable connector means as a part thereof electrically connecting said ballast and said photoelectric control device to said terminal board.

10. A luminaire support bracket comprising an inverted U-shaped open bottom channel member, said channel member including an end wall at one end, a cross brace having a notch facing said end wall at the other end, and means defining a conduit extending externally of said channel member adjacent said end wall, means adjacent said end wall for mounting the bracket on a pole, means adjacent said cross brace for mounting a luminaire thereon, a transparent dome mounted intermediate said ends, a closure member with a pair of hinge pins on one end

hingedly secured to a pair of hinge hooks on said channel member adjacent the pole mounting means, means for mounting a discharge lamp ballast on said closure member adjacent said pole mounting means, means for mounting a photoelectric control device which includes a photo-sensitive cell and a switching device on said closure member, means for securing the other end of said closure member to said channel member with the photoelectric control device juxtapositioned beneath said transparent dome, the other end of said closure member being in abutting relation to said notch, whereby said closure member serves as a compression member of the support bracket, a terminal board mounted on said end wall above said conduit means, and electrical conductor means having readily detachable connector means as a part thereof electrically connecting said ballast and said photoelectric control device to said terminal board.

11. A luminaire support bracket comprising an inverted U-shaped open bottom channel member, said channel member including an end wall at one end, a cross brace having a notch facing said end wall at the other end, and means defining a conduit extending externally of said channel member adjacent said end wall, means adjacent said end wall for mounting the bracket on a pole, said last mentioned means comprising a first key-hole slot in said end wall, a hanger member secured to said end wall, and a reinforcing plate having a second key-hole slot positioned against the interior of said end wall for distributing load on said first key-hole slot more uniformly over the end wall, means adjacent said cross brace for mounting a luminaire thereon, a transparent dome mounted intermediate said ends, a closure member with a pair of hinge pins on one end hingedly secured to a pair of hinge hooks on said channel member adjacent the pole mounting means, means for mounting a discharge lamp ballast on said closure member adjacent said pole mounting means, means for mounting a photoelectric control device which device includes a photoelectric cell and switching means on said closure member, means for securing the other end of said closure member to said channel member with the photoelectric control device juxtapositioned beneath said transparent dome, said other end of said closure member being in abutting relation to said notch, whereby said closure member serves as a compression member of the support bracket, a terminal board mounted on said end wall above said conduit means, and electrical conductor means having readily detachable connector means as a part thereof electrically connecting said ballast and said photoelectric control device to said terminal board.

References Cited by the Examiner

UNITED STATES PATENTS

55	2,540,784	2/1951	Hocher	248—221
	2,849,574	8/1958	Burns	240—25 X
	3,064,123	11/1962	Anderson et al.	240—25
	3,071,683	1/1963	Queale	240—25
	3,094,220	6/1963	Harling	

FOREIGN PATENTS

1,122,167 1/1962 Germany.

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