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3,264,466

LUMINAIRE

Filed Oct. 16, 1963

2 Sheets-Sheet 1

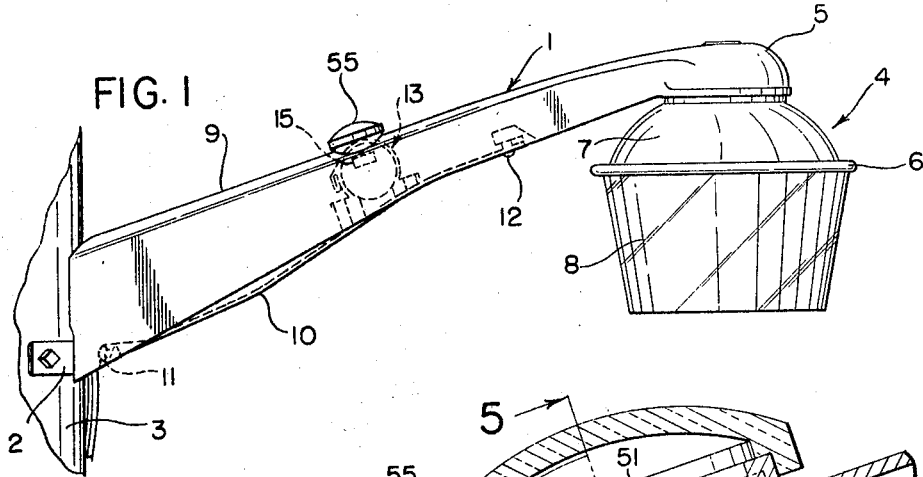


FIG. 2

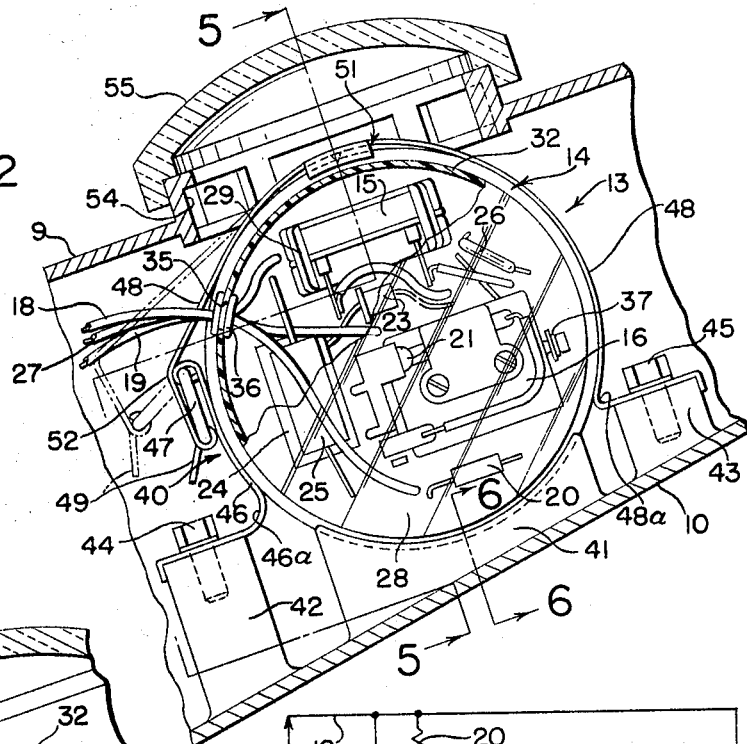


FIG. 3

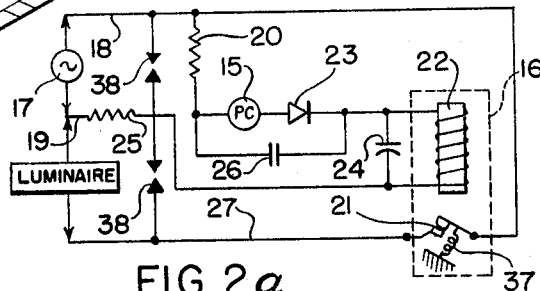
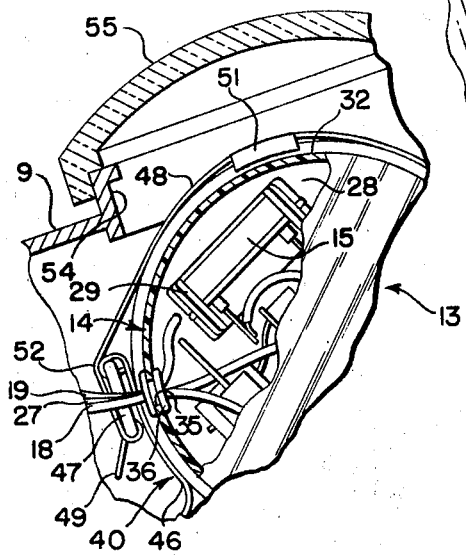


FIG. 2a

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2 Sheets-Sheet 2

FIG. 4

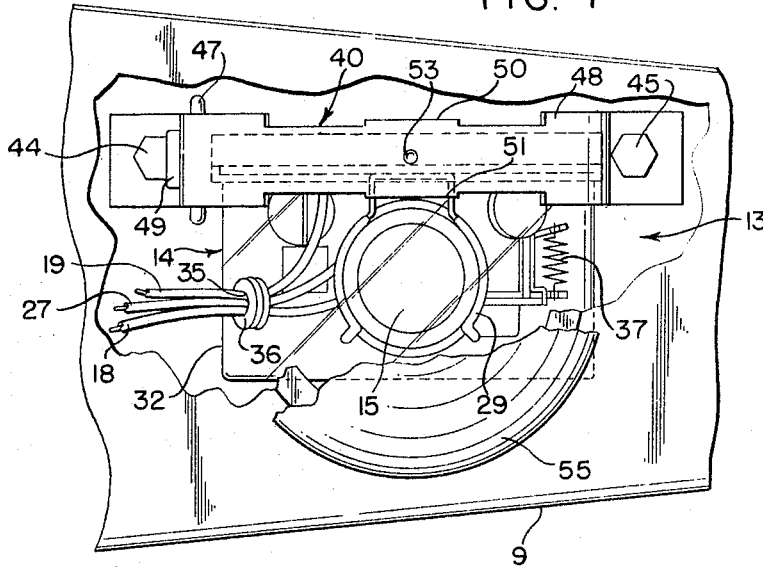


FIG. 5

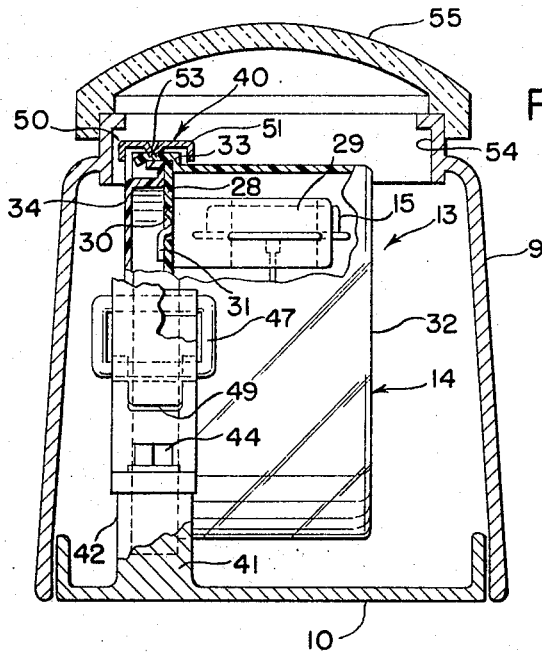
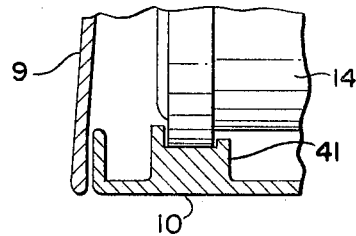


FIG. 6



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1

3,264,466  
LUMINAIRE

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4 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 a photoelectric control device for controlling "on-off" operation of the luminaire.

In the manufacture of photoelectric control devices, it is not commercially possible to produce devices which are identical with respect to their sensitivity to light levels. Similarly, the sensitivity may vary over the period of use of the device. It is therefore an object of this invention to provide means in connection with the photoelectric control device for adjusting the response of the device to light levels. It is a further object of this invention to provide such adjustment means in a manner which is more economical and more easily produced than hitherto.

Therefore, in accordance with the invention there is provided within a partially transparent housing a photoelectric control device which may be readily adjustably rotated to set its light level response.

Further objects and advantages of the invention will be understood by one skilled in the art from the following description of the preferred embodiment thereof and from the drawing wherein:

FIG. 1 is a side elevation of the luminaire and bracket combination in mounted position;

FIG. 2 is a section view of a part of the bracket showing the mounting of the photoelectric control device therein;

FIG. 2a is a circuit diagram of the photoelectric control device;

FIG. 3 is a view similar to FIG. 2 showing the photoelectric control in an adjusted position;

FIG. 4 is a top view of the bracket, certain parts broken to reveal the interior of the bracket; and

FIG. 5 and FIG. 6 are section views taken on lines 5—5 and 6—6 of FIG. 2, respectively.

The preferred embodiment of the invention 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 by suitable fastening means (not shown). The optical assembly includes a reflector 7 and a refractor 8, fastened together by a suitable clamp band 6.

The support bracket 1 includes an inverted generally U-shaped channel member 9 having an open bottom which is generally covered by a closure member 10. Adjacent to pole 3 removable hinging means 11 for closure member 10 are provided and securing means 12 are provided adjacent hood 5. The lower closure member 10 is thereby removably hingedly secured to the upper channel member 9. Further details of construction are shown and described more completely in copending application Ser. No. 305,986, Rex, filed Sept. 3, 1963 and assigned to same assignee as herein.

Electrical control devices for operating the luminaire are contained within the interior of support bracket and include a photoelectric control device 13 for turning the luminaire "on" and "off" in response to ambient light level.

The photoelectric control device 13 includes a generally cylindrical housing 14 of a clear light-transmitting plastic

2

material, such as polystyrene, butyrate, or a methacrylate which encloses a light responsive cell 15 and a relay 16. The amount of light transmission of the housing will be understood to be relative to the sensitivity of the cell and hence the material used might be categorized as transparent, translucent or even opaque for other purposes. As will be noted from the circuit diagram (FIG. 2a), the photosensitive cell 15, preferably a cadmium sulfide cell, is connected to a source of alternating current 17 by conductors 18 and 19. A balancing resistor 20 is connected in series with the photosensitive cell 15 to nominally control its sensitivity level. The relay 16 is of the normally closed direct current operated type, which includes a pair of contacts 21 and a spring 37 biasing the contacts to a closed position. The relay 16 further includes an electromagnetic core and coil 22 which, when actuated, opens the contacts 21. The coil 22 is operated on half-wave rectified current through diode 23, capacitor 24 being provided in parallel to the relay coil 22 to sustain operation of the relay during the alternate half-cycle in a well known conventional manner. A current-limiting resistor 25 and a capacitor 26, which capacitor is connected in parallel with the photosensitive cell 15 and diode 23, provides protection for the control elements. An electrical conductor 27 connects contacts 21 of the relay 16 to the luminaire and together with conductor 19 completes the circuit connecting the luminaire to the source of alternating current 17. Spark gap lightning arrestors 38 are provided across conductors 18 and 19 and 19 and 27, respectively, for additional protection of the photoelectric control device 13. The contacts 21 of the relay coil, being normally closed, the photoelectric cell operates to permit closure of the contacts under dark conditions and to hold the contacts open during the daytime.

The electrical components above noted of the photoelectric control device 13 are mounted within housing 14 upon a printed circuit board 28 (FIG. 5), with the photosensitive cell 15 secured facing radially outwardly therefrom by retaining means 29. The retaining means 29 is a generally U-shaped spring clip member which is secured to the printed circuit board 28 in a notch 30 thereof by hook member 31 (FIG. 5).

The enclosure 14 for the photoelectric control device 13 comprises a bowl-shaped cover member 32 having an offset 33 (FIG. 5) adjacent said open end providing a ridge against which one edge of the printed circuit board 28 may be seated. A generally dish-shaped closure member 34 is provided which may be secured to the bowl-shaped member 32 by suitable conventional means to complete a generally dust-proof housing for the photoelectric control elements.

The flexible conductors 18, 19 and 27 extend outwardly from the interior of the photoelectric control device through an aperture 35, which may be closed by a suitable strain relief bushing 36. The photoelectric control device 13 is adjustably, removably retained within the bracket 1 secured on closure member 10 by retaining means 40. A base member 41 is cast integrally with the lower closure member 10 and is channel-shaped in its lateral cross section as viewed in FIG. 6 to conform with the offset 33 of the housing 14. The base member is circular in cross section along a longitudinal cross section as viewed in FIG. 2 to conform to the generally circular shape of the housing 14. The retaining means is secured at its ends to a pair of bosses 42, 43 by suitable fasteners 44, 45. The retaining means 40 comprises a first leg member 46, which is secured to a second member 47 constituting a toggle link or hinge which in turn is pivotally secured to a third member 48. The third member 48 has adjacent its pivotal connection to the link 47 a tab 49 constituting a finger grip or handle by which the retaining means 40 may be disengaged from the photoelectric

control device 13 as shown in the dotted line position in FIG. 2. The first and third members of the retaining means are made of generally conventional spring steel which is permanently bent or creased at points 46a and 48a to firmly conform to the outward diameter of the housing 14. The third member 48 is provided intermediate its ends with tabs 50, 51, which engage opposite sides of offset 33 so as to firmly retain the photoelectric control device 13 on the base member 41. A bend 52 in the third member 48 provides an overcenter position for the toggle link so that the retaining means 40 snaps into position and is retained in such position until force is exerted on the tab 49. A prong 53 is provided between tabs 50, 51 which secures the control device 13 against undesired rotation within the retaining means 40 (FIG. 5).

The photoelectric cell 15 is exposed to ambient light conditions through an opening 54 in the channel member, the opening being covered by a light-transmitting dome 55 made of a suitable material such as glass or acrylic. The cover member may be cemented over the opening or may be secured on the opening by some suitable fastening means if required. The base member 41 for the photoelectric control is located on the lower closure member so that the photoelectric control is properly juxtapositioned beneath the opening 54 when the lower closure member 10 is secured in its closed position.

The photosensitive cell 15 in the absence of light operates substantially as an insulator thereby preventing current flow therethrough. Accordingly, in the absence of incident light on the cell, the rectifier 23 will pass no actuating current energy to the relay coil 22 and the relay contacts 21 will remain closed. As the intensity of incident light on the photosensitive means 15 increases from a condition of substantial darkness, the cell becomes progressively more electrically conductive thereby permitting the delivery of actuating current. The relay accordingly will operate as soon as the intensity of incident light on the photosensitive means reaches a value permitting delivery to the coil of sufficient current to actuate the relay, opening the contacts 21 and turning off the luminaire. Similarly, as the intensity of incident light on the photosensitive means decreases from a condition of substantial brightness, the cell becomes progressively less conductive, thereby reducing the delivery of current to the operating coil of the relay to an amount insufficient to hold the relay contacts open and, thus, turning on the luminaire.

In order to allow the device to be set for operation at a desired intensity of incident light, the photoelectric control device 13 as a whole is mounted for rotatable adjustment about the base mounting 41. Thus, it will be readily apparent if the photoelectric control device is mounted so that it faces fully the opening in the bracket, the greatest intensity of light is introduced onto the face of the photocell. If the photoelectric device is rotated to a position as shown in FIG. 3, less light intensity is applied to the surface of the photocell for any given ambient light condition and the cell will operate the relay at a difference value of ambient light. In this way, the variance between different photoelectric controls may be accommodated in the installation of the photoelectric control device within the bracket, and also may be calibrated at later time if, during the life of the photocell, its response to ambient light conditions changes during the course of operation. The various users of the device are also provided with a means whereby they can select the lumen level of turn-on or turn-off.

The use of flexible conductors 18, 19, 27 coming out of the photoelectric control device housing 14 readily

permits rotation and, if a proper quick-detach or plug connection (not shown) is utilized to connect the photoelectric control device with the rest of the electrical components in the bracket as shown in the above-mentioned patent application, it may be easily removed from the bracket and replaced by another such photoelectric device if desired.

While the invention has been described by the preferred embodiment thereof, it will be understood that numerous changes may be made in the form, construction and arrangement of several parts without departing from the spirit and scope of the invention or sacrificing any of its intended advantages, the forms herein disclosed being for the purpose of illustrating the invention only.

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

1. In a luminaire, an opaque housing having a light transmitting window in one wall thereof for transmitting light into the housing interior, photoelectric control means having a photosensitive portion for receiving light transmitted through said window, said window being of such size and so positioned relative to said photoelectric control means as to transmit light thereagainst along substantially a single axis, and means adjustably mounting said photoelectric control means within said housing for selectively arranging said photosensitive portion thereof at different positions relative to said window for varying the intensity of light incident on said photosensitive portion.

2. In a luminaire, an opaque housing having a light transmitting window in one wall thereof for transmitting light into the housing interior, photoelectric control means having a photosensitive portion for receiving light transmitted through said window, said window being of such size and so positioned relative to said photoelectric control means as to transmit light thereagainst along substantially a single axis, and means rotatably adjustably mounting said photoelectric control means within said housing for rotation about an axis perpendicular to said first mentioned axis for selective arrangement of said photosensitive portion thereof at different angular positions relative to said window for varying the intensity of light incident on said photosensitive portion.

3. A device as defined in claim 2, wherein said mounting means comprises a base member fixed to said housing in the interior thereof on which said photoelectric control means rests and clamp means secured in the interior of said housing and adjustably holding said photoelectric control means against said base member.

4. A device as defined in claim 3, wherein said clamp means comprises a strap member fixed at opposite ends to said housing and having a toggle link intermediate its ends, said strap member being expandable to an open position for disengaging said photoelectric control means to enable rotatable adjustment thereof and being contractible to a closed position for securely holding said photoelectric control means in selected adjusted position relative to said window.

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