United States Patent

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[54] STREET-LIGHTING LUMINAIRE

6 Claims, 8 Drawing Figs.

[52] **U.S. Cl.** **240/25,** 240/44.2
[51] **Int. Cl.** **F21s 1/10**
[50] **Field of Search** 240/25, 44.2, 11.2, 11.4, 147

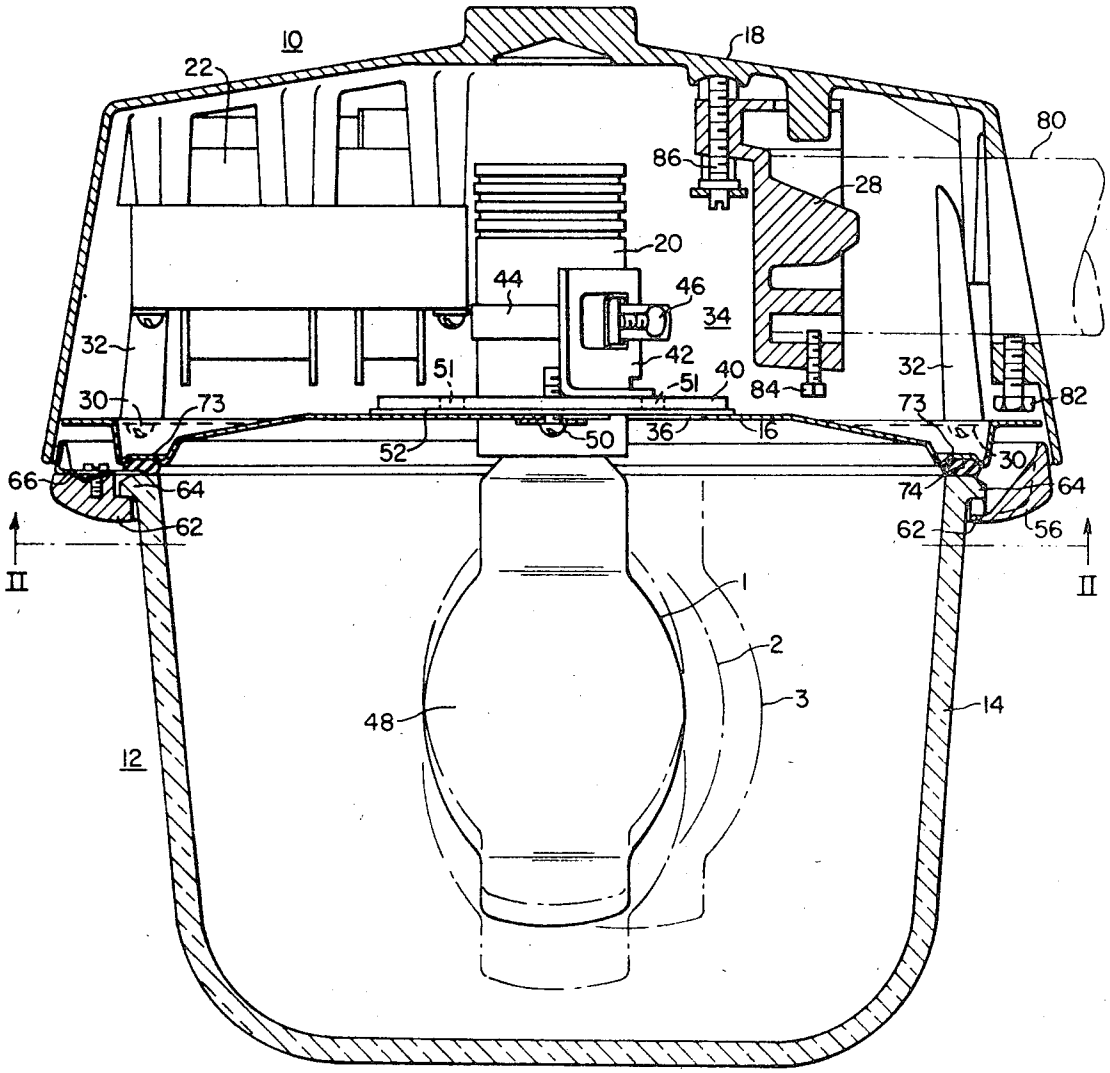
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ABSTRACT: A street-lighting luminaire having an enclosed optical system adapted for containing a vertically burning mercury vapor lamp. The luminaire includes an overhead housing assembly separated by a dish-shaped reflector from a downwardly depending sealed optical assembly. A ballast assembly, socket mounting and positioning assembly and luminaire mounting bracket are located within the overhead housing assembly. The socket mounting and positioning assembly is mounted on the reflector within the overhead housing assembly and is constructed and arranged to provide for the horizontal and vertical adjustable repositioning of a lamp socket which is mounted on the lamp mounting and positioning assembly and which extends, through an aperture centrally located in the reflector, into the sealed optical assembly.



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SHEET 1 OF 2

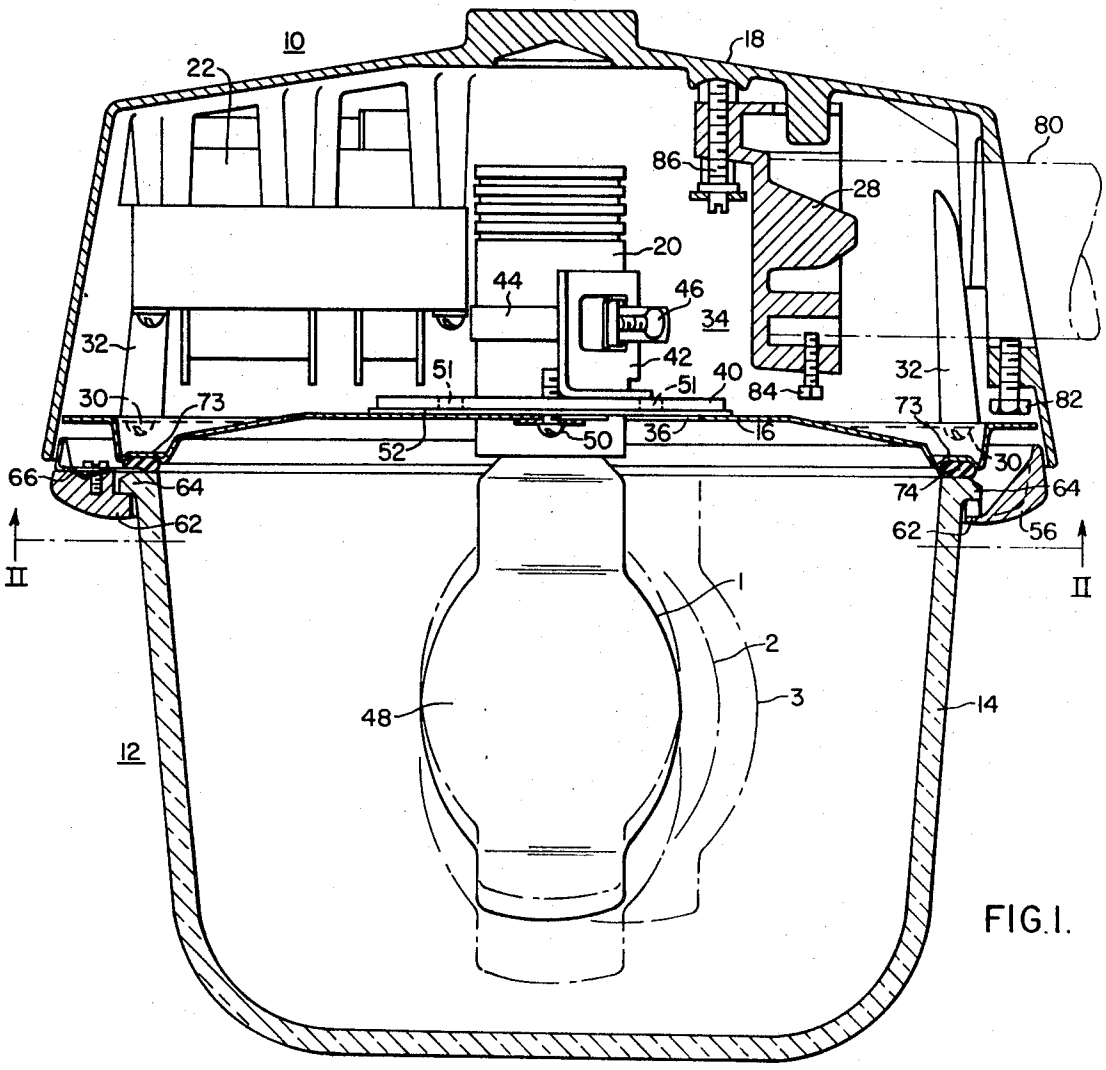
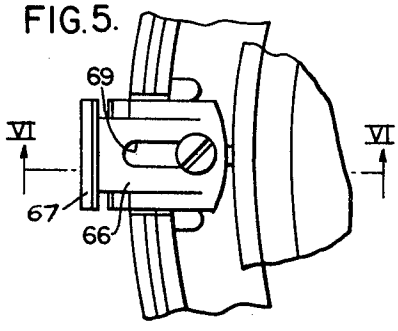


FIG. 1.

FIG. 5.



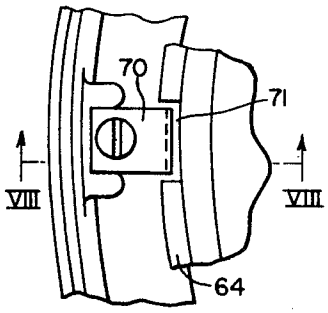
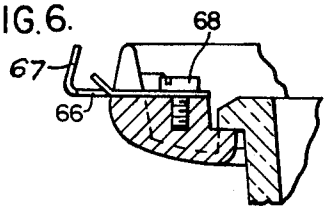


FIG. 7.

FIG. 6.



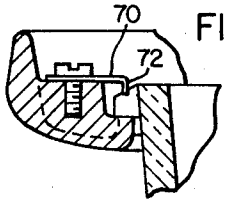


FIG. 8.

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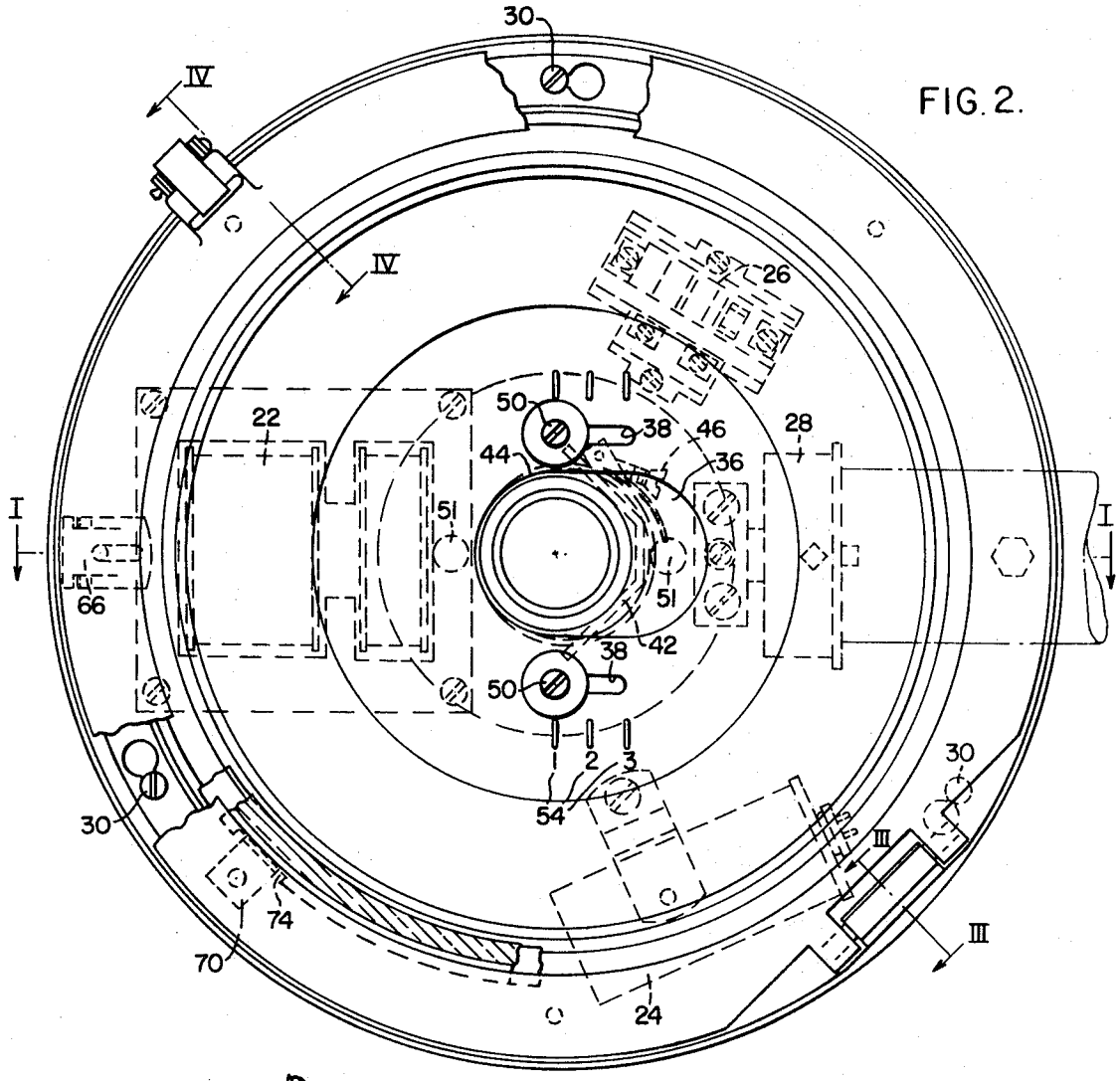


FIG. 2.

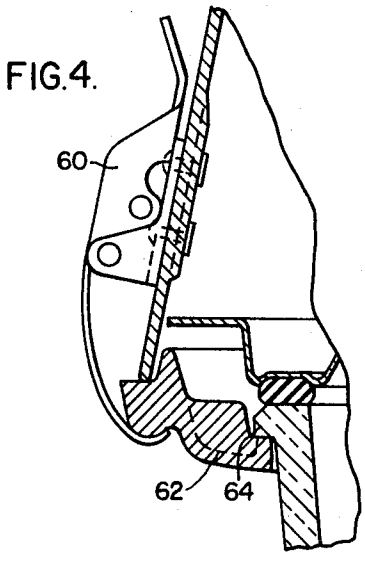


FIG. 4.

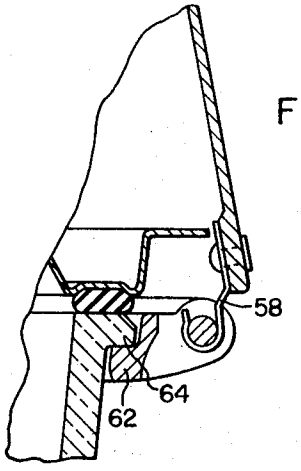


FIG. 3.

STREET-LIGHTING LUMINAIRE

BACKGROUND OF THE INVENTION

This invention relates to street-lighting luminaires and more particularly to a street-lighting luminaire having a substantially sealed optical system and a vertically and horizontally adjustable lamp socket.

In the street-lighting luminaire art two problems that have faced the fixture manufacturer as well as persons responsible for the installation and maintenance of the luminaires in the field have been the ability to adjust the lamp position to provide for a proper or preferred light distribution pattern as well as to reduce the requirement for maintenance in the form of refractor and lamp cleaning due to the ingress of the dirt particles into the optical cavity of the luminaire. These problems are of course applicable to all types of street-lighting luminaires and are not unique to luminaires which employ a base-up or vertical burning light source.

One solution that has been proposed for rendering the lamp socket adjustable with respect to the optical cavity, and thereby provide the ability to adjust the light distribution pattern, has been to permit vertical adjustment of the lamp position. Prior art methods of performing this function have however required generally the substantially total disassembly of the lamp socket from its mounting surface and the insertion or removal of spacers to obtain the desired vertical position for the light center within the optical cavity. Of course, this type of adjustment as well as being cumbersome provided for the adjustment of the light center in only a vertical direction whereas a total ability to provide for selected light distribution patterns requires that the light center be both vertically and horizontally adjustable.

SUMMARY OF THE INVENTION

It is an object of this invention to provide a street-lighting luminaire in which the lamp socket is vertically adjustable with respect to the luminaire housing.

Another object of the present invention is to provide a street-lighting luminaire in which the lamp socket is horizontally adjustable with respect to the luminaire housing.

A further object of the present invention is to provide a street-lighting luminaire of the vertical burning light source type in which the light source is located within a substantially sealed optical system.

Yet another object of the present invention is to provide a street-lighting luminaire of the vertically burning light source type in which the light source is both horizontally and vertically adjustable with respect to the optical cavity and in which the optical cavity is substantially sealed off with respect to the ingress of particle-size contaminants.

The foregoing objects, along with others, are readily achieved in accordance with the present invention by providing a street-lighting luminaire which comprises a top housing assembly, a downwardly depending optical assembly and a reflector secured to the top housing assembly and separating the top housing assembly from the optical assembly. A lamp socket mounting and positioning means is carried by the reflector and constructed and arranged to provide for both selective horizontal and selective vertical positioning of the lamp socket with respect to the optical assembly. The street-lighting luminaire further includes a gasket means between said reflector and the refractor of the optical assembly to provide for a substantially sealed optical system and thereby prevent the ingress of particle-size contaminants during operation of the luminaire.

BRIEF DESCRIPTION OF THE DRAWING

The foregoing object and others, along with many of the attendant advantages of the present invention will become more readily apparent and better understood as the following detailed description is considered in connection with accompanying drawing in which:

FIG. 1 is a vertical sectional view of the luminaire of the present invention taken along the line I–I of FIG. 2;

FIG. 2 is a horizontal sectional view taken along the line II–II of FIG. 1;

FIG. 3 is a sectional view of the hinge mechanism taken along the line III–III of FIG. 2;

FIG. 4 is a sectional view taken along line IV of FIG. 2 illustrating the latch mechanism of the present invention;

FIG. 5 is a top plan view of the holding clip mechanism of the present invention;

FIG.

FIG. 6 is a sectional view taken along the line VI–VI of FIG. 5;

FIG. 7 is a top plan view of an indexing clip; and

FIG. 8 is a sectional view taken along the line VIII–VIII of FIG. 7.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now in detail to the drawing wherein like reference characters represent like parts throughout several view, there is shown in FIG. 1 a vertical section of the luminaire of the present invention. The luminaire conventionally includes a housing assembly generally designated **10** and an optical assembly generally designated **12**. The optical assembly includes the refractor **14**, the reflector **16** and their associated parts.

Mounted within the outer cover **18** of the housing assembly **10** and arranged about the lamp socket **20** are the conventional electrical components required to operate a gas discharge lamp as for example the transformer **22**, the capacitor **24**, the terminal block **26** (FIG. 2) and the luminaire mounting bracket or pipe receptible **28**.

The bottom of the housing assembly **10** is closed off by the reflector **16** which is secured to the housing by means of a plurality of threaded bolts **30** which secure the reflector to bosses **32** in the housing cover member **18**. The socket mounting assembly is mounted to the upper side of reflector **16** about an elongated aperture **36** which has parallel therewith, in the reflector **16**, a pair of elongated slots **38**. The socket-mounting assembly generally designated **34** includes a pressure plate **40** having an upstanding socket bracket **42** integral therewith. The lamp socket **20** is mounted to the socket bracket by a band **44** which extends around the socket **20** and into the socket clamp **42**. A threaded tightening bolt **46** permits the band to be loosened or tightened about the socket **20**. To vertically adjust the position of the lamp **48** with respect to the optical assembly **12** the bolt **46** is loosened slightly thus loosening the band **44** about the socket **20**, the socket is then positioned vertically in a selected position and the bolt **46** tightened to secure the band about the socket **20** and thus firmly hold the socket **20** in any of a number of preselected vertical positions.

Horizontal adjustment of the lamp is accomplished by means of a pair of bolts **50** which extend through slots **38** in reflector **16** and are threaded into the mounting plate **40**. To adjust the lamp socket **20** to any of a number of horizontal positions with respect to the optical assembly the bolts **50** are loosened and the socket assembly slid laterally in the aperture **36** until the preselected position is reached at which point the bolts **50** are tightened to firmly retain the lamp socket **20** in its selected horizontal position. To prevent the ingress of dirt and other particle-size contaminants into the optical assembly through the aperture **36** a gasket **52** which may be of Dacron or fiber glass is fitted around the lamp socket and compressed between the socket-mounting plate **40** and the reflector **16** as illustrated in FIG. 1. At least one of the breather holes **51** in the socket-mounting plate **40** are always in communication with the portion of the aperture **36** not filled by the lamp socket to permit the ingress and egress of filtered air as will be later described.

As can be seen from the foregoing the socket-mounting assembly **34** provides for the selective adjustable positioning of the lamp socket **20** both in the horizontal and vertical

directions as well as providing a seal between the housing assembly and the optical assembly about the lamp socket. Several of the adjustable positions of the lamp 48 are illustrated in phantom in FIG. 1. If desired, horizontal position indicia can be provided on the underside of the reflector as illustrated at 54.

The globe or refractor 14 is mounted in a globe ring 56 which is hinged at 58 (FIG. 3) and latched to the housing assembly opposite the hinge 58 by a single acting overcenter latch 60 (FIG. 4). The globe ring 56 includes an annular internal flange 62 which coacts with an annular external flange 64 on the globe or refractor 14 to facilitate the carrying of the globe or refractor by the globe ring 56. To firmly secure the refractor 14 to the globe ring 56 a plurality of releasable spring clips 66 (FIGS. 5 and 6) are secured to the globe ring by holddown screws 68. Spring clips 66 have an upstanding finger flange 67 which permits the spring clip to be moved toward or away from the refractor flange 64. The holddown screws 68 slide in a slot 69 in the spring clip to retain the clip on the ring but allow relative movement with respect to the ring. FIG. 6 illustrates the spring clip 66 in its retracted or open position which permits the refractor to be lifted from the globe ring. FIG. 1 illustrates the spring clip 66 in its operative position with the leading edge of the spring clip overlying the top of the upper rim of the refractor thus providing a positive grip of the refractor flange 64 between the flange 62 of the globe ring and the leading edge of the spring clip 66.

As illustrated in FIGS. 7 and 8 an indexing the optics 70 may also be secured to the globe ring 56 to provide for the accurate mounting of the refractor 14 in the globe ring 56. Since the refractor 14 may have a wide variety of optics and it is customary for such optics to provide a specific light distribution pattern about the luminaire, it is therefore essential that the refractor be located in a specific orientation with respect to the mounting bracket or pole to which the luminaire is affixed. This accomplished in the luminaire of the present invention by the index clip 70 which includes a downwardly projecting flange 72 which coacts with a separation 71 in the refractor flange 64 to position the optics of the refractor in a specific orientation with respect to the globe ring 56 and hence the mounting pole to which the luminaire is attached.

In order to complete the seal of the optical assembly the reflector 16 includes therein an annular depression 73 in the underside thereof in which there is secured an annular gasket 74. The annular gasket 74 is preferably of the silicon or neoprene type and is cemented into the annular depression 73. When the optical assembly is closed and the globe ring latched to the housing assembly 10 by the latch 60 the upper edge of the refractor 14 slightly depresses the gasket 74 to thereby provide a seal between the reflector and refractor and produce a substantially sealed optical cavity. The Dacron or Fiberglass gasket 52 situated between the reflector and the socket-mounting plate serves as a filter for contaminants and dirt particles which would normally flow into the optical cavity during operation of the luminaire. As the optical cavity is heated up during operation of the lamp 48, pressure within the optical assembly also increases and causes a flow of air out of the optical cavity through that portion of aperture 36 not filled by the lamp socket and breather holes 51. When the lamp is shut off and the optical cavity cools there is then an inflow of air into the optical cavity and in the luminaire of the present invention such inflow also occurs through breather holes 51 and that portion of aperture 36 not filled by the lamp socket 20 and therefore occurs through the gasket 52 which serves as a filter to prevent dirt and other particle-size contaminants from accompanying the airflow into the optical cavity.

The luminaire of the present invention is adapted for mounting with the light source 48 in a vertical, base-up, position and may be mounted to a conventional mounting pole 80 by the pipe or mounting bracket 28. The luminaire is secured to the pole 80 by a threaded bolt 82 in the housing cover and a threaded bolt 84 in the mounting bracket 28. Adjustment or leveling of the luminaire is accomplished by the adjusting mechanism 86 which permits the luminaire to be tilted with respect to the mounting pole 80.

As will be apparent from the foregoing the luminaire of the present invention provides for both the horizontal and vertical adjustment of the light source with respect to the luminaire and also provides a substantially sealed optical assembly which inhibits the entrance of dirt or other particle-size contaminants from entering therein.

Since numerous changes may be made in the above-described invention and different embodiments thereof may be made without departing from the spirit thereof, it is intended that all matter contained in the foregoing description or shown in the accompanying drawings, shall be interpreted as illustrative and not in a limiting sense.

I claim as my invention:

1. A street-lighting luminaire comprising:
a top housing assembly and a downwardly depending optical assembly,
a dish-shaped reflector secured to said top housing assembly separating said top housing assembly from said optical assembly and having an elongated aperture therein located substantially centrally thereof,
lamp socket means extending through said aperture in said reflector adapted to receive a vertically burning light source,
socket-mounting and positioning means releasably secured to said reflector adjacent said aperture by a first adjustment means and having thereon second adjustment means for releasably securing said lamp socket means, in a vertical orientation, to said socket-mounting and positioning means, said first adjustment means selectively adjusting the lateral position of said lamp socket means with respect to said reflector and said second adjustment means selectively adjusting the vertical position of said lamp socket means into or out of said optical assembly.

2. A street-lighting luminaire according to claim 1 wherein gasket means is positioned about said lamp socket means between said socket-mounting and positioning means and said reflector for closing off the area of said elongated aperture not filled by said lamp socket means.

3. A street-lighting luminaire comprising:
a top housing assembly and a downwardly depending optical assembly,
a dish-shaped reflector secured to said top housing assembly separating said top housing assembly from said optical assembly and having an elongated aperture therein located substantially centrally thereof and a pair of smaller elongated apertures parallel to said elongated central aperture on each side of said elongated centrally located aperture, lamp socket-mounting and positioning means, means for releasably securing said lamp socket-mounting and positioning means to said reflector through said smaller elongated apertures and for providing adjustable lateral selective positioning of said lamp socket-mounting and positioning means with respect to said reflector, a lamp socket mounted on said lamp socket-mounting and positioning means and extending through said larger elongated aperture in said reflector into said optical assembly, said socket-mounting and positioning means releasably retaining said lamp socket in a vertical orientation for vertical repositioning of said lamp socket with respect to said optical assembly.

4. A street-lighting luminaire according to claim 3 wherein said lamp socket-mounting and positioning means includes a baseplate member overlying said larger elongated aperture and an upstanding socket-mounting flange and clamping-band assembly, said mounting-flange and clamping-band assembly permitting the selective vertical positioning of said lamp socket with respect to said optical assembly.

5. A street-lighting luminaire according to claim 4 wherein said baseplate member is adjustably secured to said reflector by means of said smaller elongated apertures to permit lateral movement of said lamp socket-mounting and positioning

means with respect to said reflector to thereby permit selective horizontal positioning of said lamp socket with respect to said reflector.

6. A street-lighting luminaire according to claim 5 wherein gasket means is situated between said baseplate member and said reflector seal off communication between said housing and said optical assembly through said elongated apertures in said reflector.