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LUMINAIRE

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Fig. 2

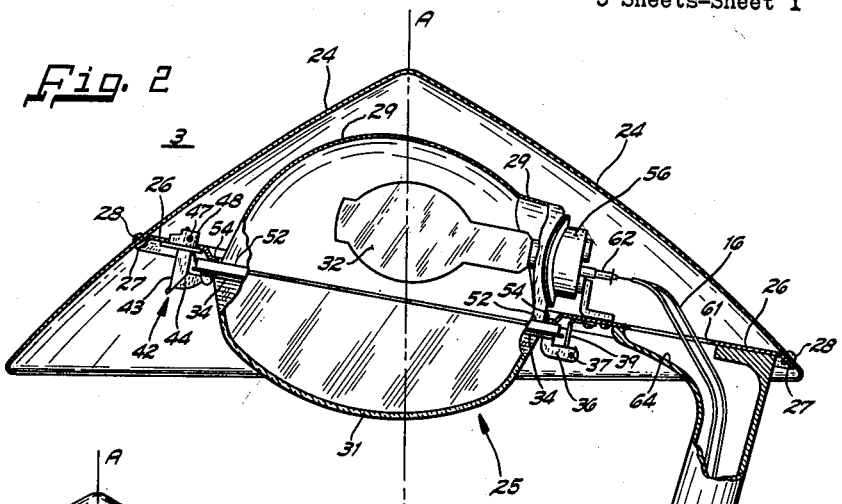
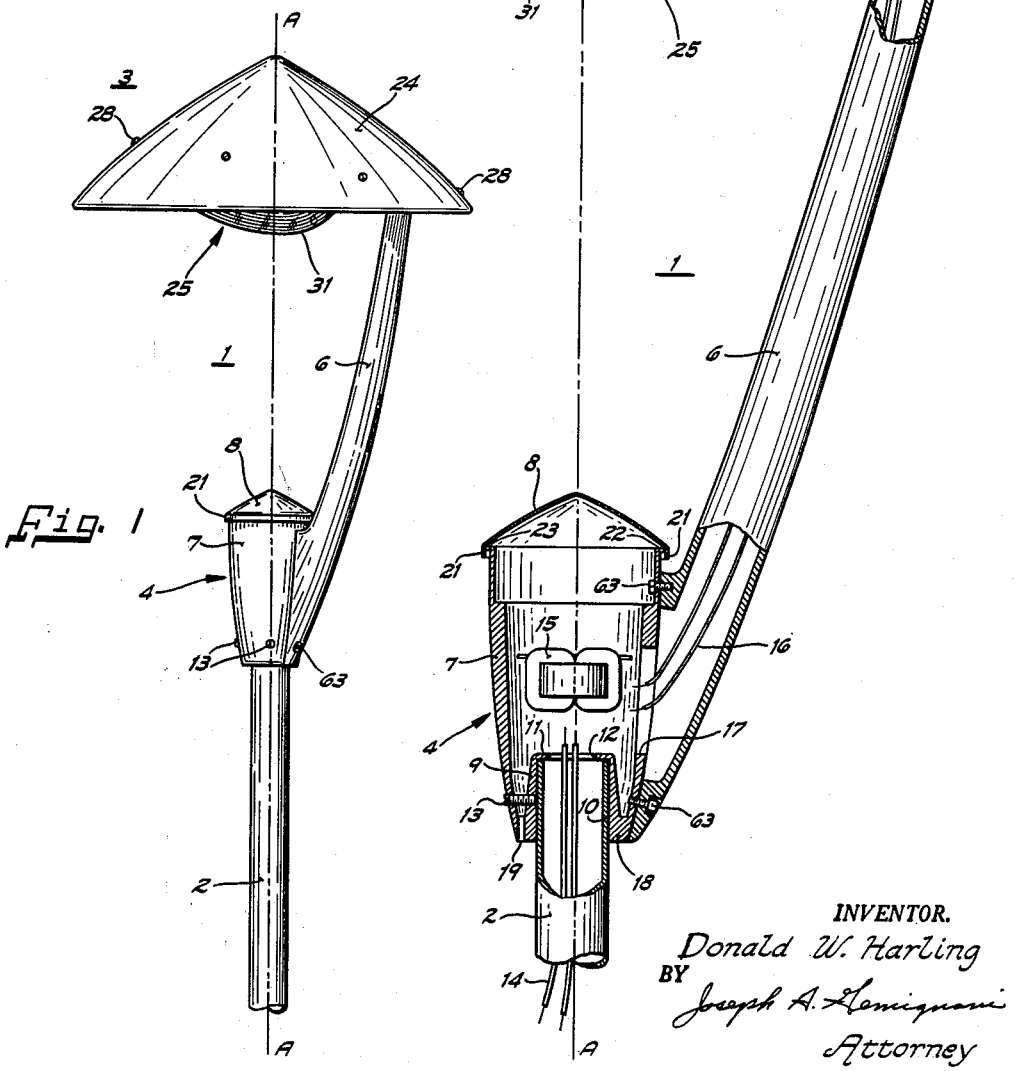



Fig. 1

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LUMINAIRE

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Fig. 3

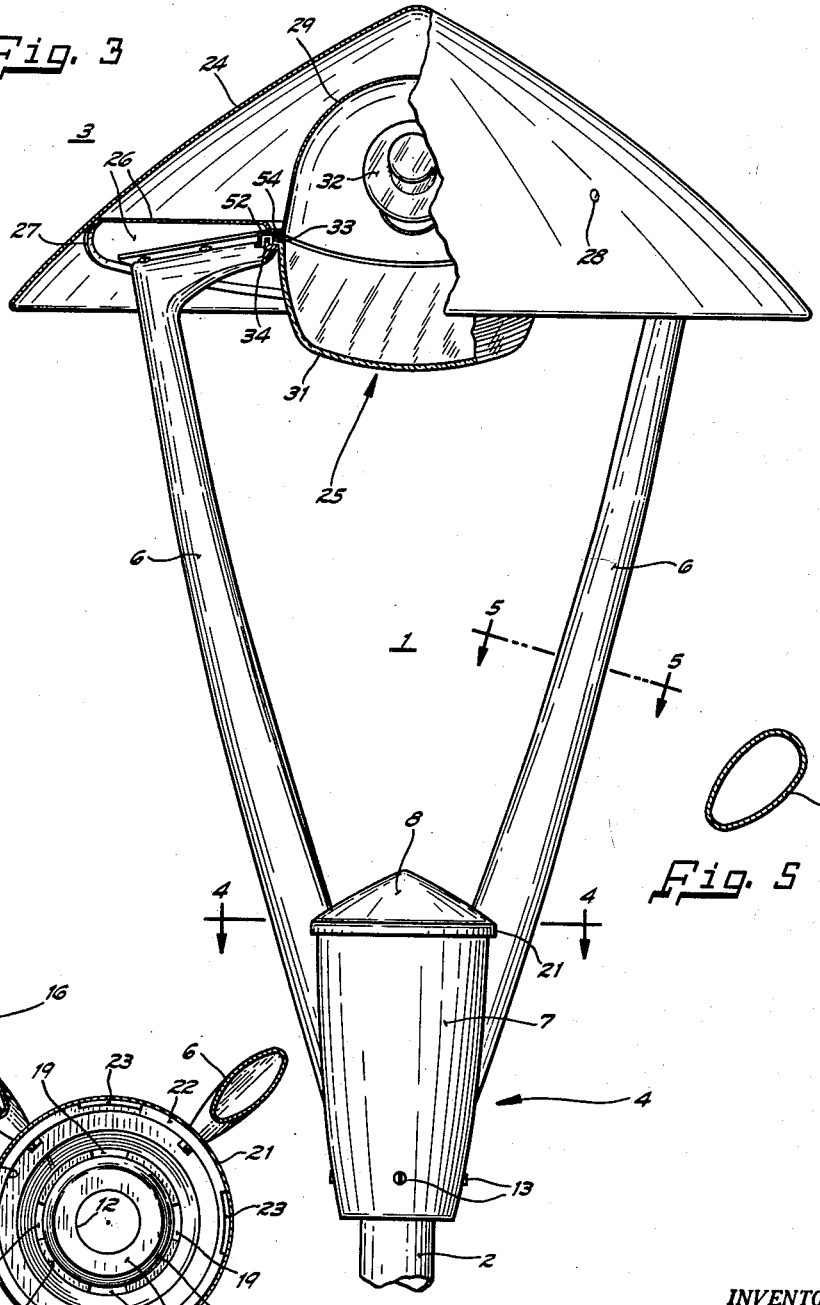


Fig. 5







Fig. 4

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LUMINAIRE

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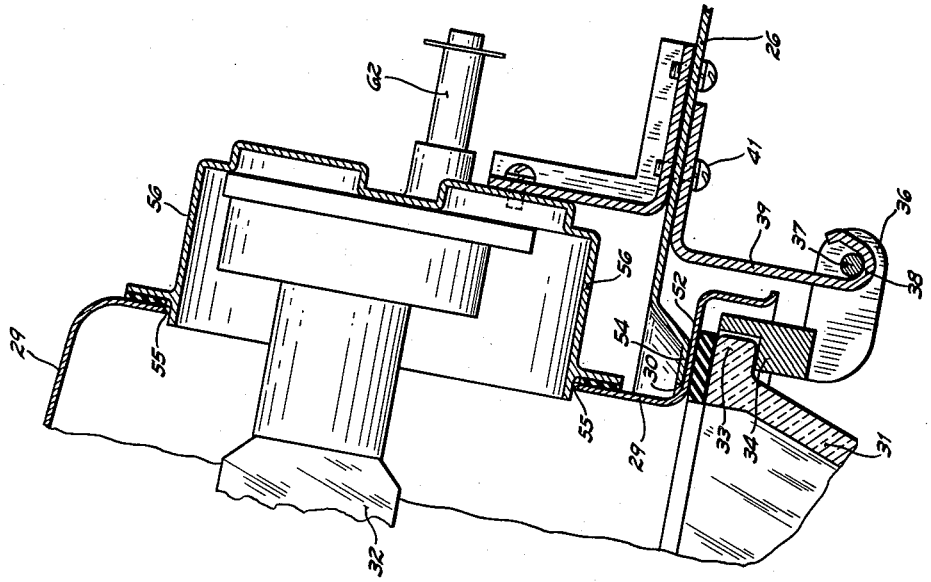
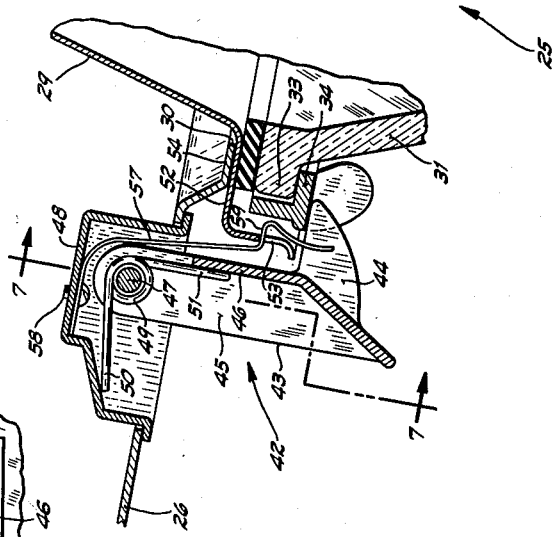



Fig. 6



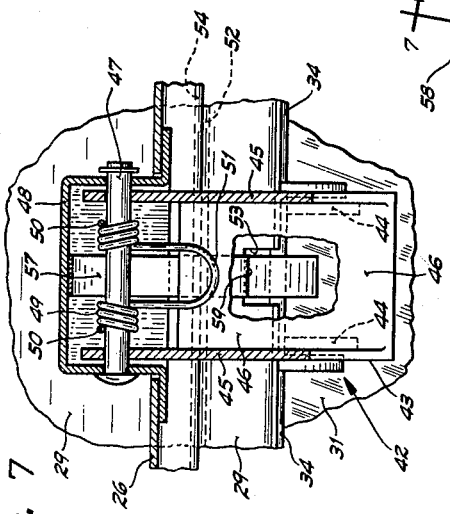




Fig. 7

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LUMINAIRE

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Fig. 8

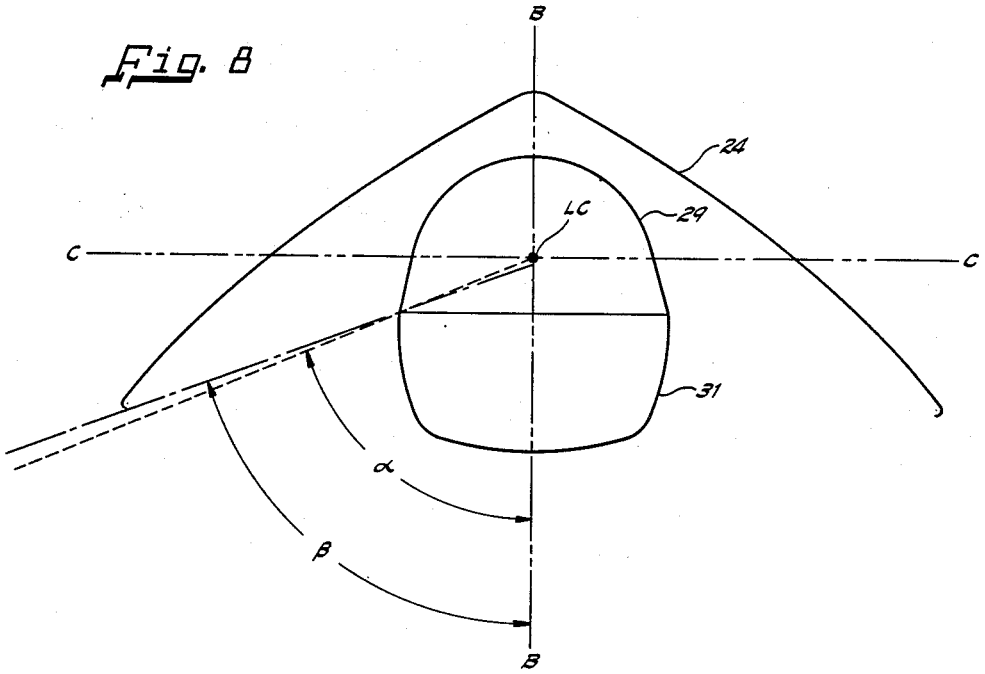
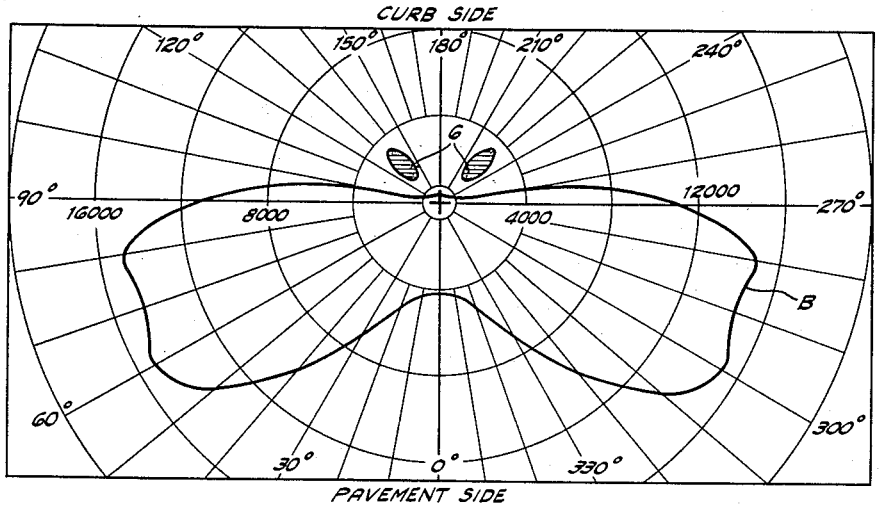



Fig. 9

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LUMINAIRE

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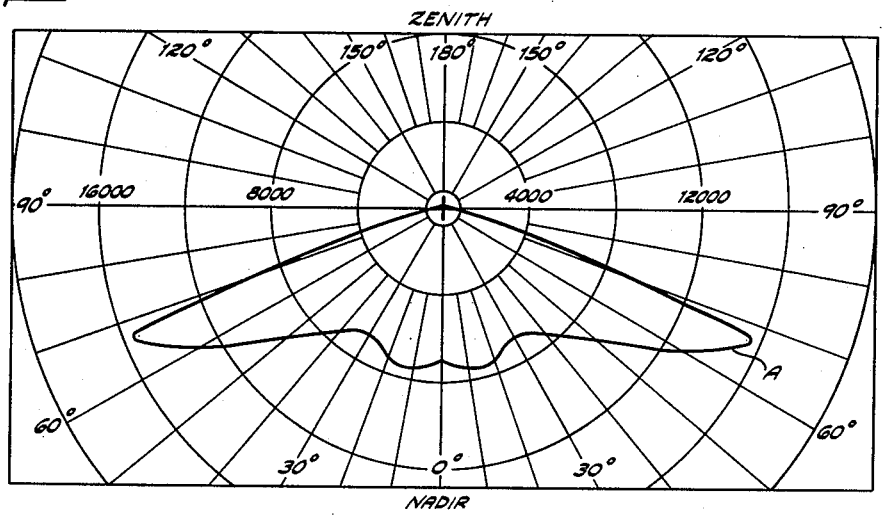
Fig. 10

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United States Patent Office 3,170,634 Patented Feb. 23, 1965



3,170,634

# LUMINAIRE

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Filed June 19, 1961, Ser. No. 118,060
17 Claims. (Cl. 240—25)

This invention relates to street and outdoor area lighting luminaires, more particularly it relates to luminaires adapted for post top mounting.

Present practice, particularly in the case of street lighting, is to support a luminaire, over a street or roadway, from the terminal end of a long mast arm extending laterally from an upright pole. This type of mounting possesses the disadvantage of placing a large load, the luminaire, at the end of a long moment arm. This results in bending moments about the pole top and considerable stress within the pole and the mast arm thereby necessitating heavier poles and specially designed mast arms. A thorough examination and discussion of this load and design problem can be found in U.S. Patent 2,907,543 on a Support for a Pendant Type Luminaire issued on October 6, 1959, to Ruth W. Heinzen and assigned to the assignee of this application.

There have been instances in the prior art of attempts to provide other types of luminaire mounting which would eliminate the above discussed disadvantages. One of these was the positioning of the luminaire on the top of an upright pole, commonly referred to as post top mounting. Such an installation is disclosed in my co-pending patent application, Serial No. 842,275 filed on September 25, 1959, now Patent 3,094,286 entitled Post Top Mounted Lighting Unit and assigned to the assignee of this application. These prior art post top installations position the light sources above the pole top and extending generally parallel with the vertical axis of the pole. In street and area lighting applications, control of the light emanating from a vertically disposed line source of light is difficult and requires involved optical assemblies to direct the light onto the area to be lighted. These types of installations are poorly suited for a lighting application where high levels of illumination and accurate vertical control of light are required.

An object of my invention is the provision of a post top mounted luminaire wherein an elongated light source is supported in such a manner as to present a point source of light, for light control purposes and with respect to the area to be lighted, for facile light control and optimum light distribution.

Another object of this invention is to provide a post top luminaire which supports an elongated light source for more facile light control and optimum light distribution and in which the components are so arranged relative to the support for the luminaire as to result in ideal loading of that support.

Still another object of this invention is the provision of a post top mounted luminaire which provides desired levels of illumination with a minimum of glare.

A further object of this invention is to provide a luminaire wherein the light source and its operating electrical components are relatively spaced apart, and yet are readily accessible and an integral part of the luminaire.

A still further object of this invention is to provide a luminaire the components of which are so constructed and arranged as to provide for ready and convenient original installation and subsequent repair and maintenance.

The novel features of my invention are set forth in the appended claims. The invention itself, together with additional objects and advantages thereof, will be more clearly understood from a reading of the following description in connection with the accompanying drawings in which:



FIG. 1 is a side elevation of a preferred embodiment of my invention;

FIG. 2 is an enlarged side elevation of the luminaire of FIG. 1 with portions thereof broken away;

FIG. 3 is a front elevation of the luminaire with parts thereof broken away.

FIG. 4 is a cross sectional view taken along lines 4—4 of FIG. 3;

FIG. 5 is a cross sectional view taken along lines 5—5 of FIG. 3;

FIG. 6 is an enlarged cross sectional view of the optical portion of the luminaire;

FIG. 7 is a cross sectional view taken along lines 7—7 of FIG. 6;

FIG. 8 is a line diagram of the optical portion of the luminaire corresponding to a plane along the vertical axis A—A of FIG. 2;

FIG. 9 is a lateral candle power distribution curve for the luminaire taken thru the vertical angle of maximum candlepower shown in FIG. 10 and showing the relationship between the support arms and light pattern; and

FIG. 10 is a vertical candlepower distribution curve taken thru a lateral angle of 60° shown in FIG. 9.

Although aspects of my invention are equally well suited for use in combination with any type of light source it is particularly well suited for use with an elongated or line source of light and is illustrated and will be described as preferably incorporating an elongated gaseous discharge lamp, such as a mercury vapor lamp.

In the preferred embodiment of my invention a luminaire 1 is mounted atop a vertically extending pole 2, having a vertical axis A—A. The luminaire 1 comprises three basic sub-assemblies for ease in mounting to the pole, an optical portion 3, a base member 4 and a pair of support arms 6.

The base 4 comprises a hollow, generally cylindrical body 7, a removable, dome-shaped cover 8 and an inner, generally cylindrical wall 9 which is spaced from the body 7 and located in the lower end of the base. The upper portion of the wall 9 is provided with an inwardly directed annular flange 11 which defines an opening 12. A chamber 10 is thus provided in the lower portion of the base 4 for receiving the pole 2. The pole 2 abuts the annular flange 11 so that the base members rest on the top of the pole 2. Suitable set screws 13 are threaded through the body portion 7 and the inner wall 9 and engage the pole 2 to securely attach the base to the pole top.

Suitable electrical supply conductors 14 extend up the interior of the pole 2 and enter the base 4 through the opening 12. The conductors 14 are connected to ballast 15. Other electrical equipment used with the ballasts, such as capacitors and electrical terminals, as well as the actual connection of the ballast to the supply leads, are well known in the art and have been omitted from the drawing. Electrical leads 16 extend from the ballast 15 through an opening 17 and upwardly through one of the support arms 6. The base member 4 is then a combination slipfitter and ballast chamber in that it performs the dual function of connecting the luminaire 1 to the pole 2 and also houses the means for electrically energizing the luminaire.

Referring now to FIGS. 1 and 4, the inner wall 9 and the body 7 are connected by a plurality of spaced web portions 18. Apertures 19 between the web portions 18 are then provided in the bottom of the base member 4. The cover 8 is provided with a downwardly turned lip 21. A plurality of circumferentially spaced ribs 22 project outwardly from the top of the body 7 and engage the lip 21 of the cover 8. The ribs 22 hold the lip 21 in spaced relationship from the body 7 to provide openings 23 be-

tween the body and the cover. Through the provision of the openings 19 and 23 in the bottom and top of the base 4, circulation of cooling air, by convection, over the ballast 15 is maintained.

The optical portion 3 includes an optical assembly 25. The optical assembly 25 preferably includes an elongated mercury vapor discharge lamp 32, a reflector 29 and a refractor 31. The reflector 29 may take any suitable shape but in this preferred embodiment is of an elongated, semielliptical, dished configuration. The refractor 31 is disposed below the reflector 29 and forms therewith an enclosure for the lamp 32. The refractor 31 can be provided with any suitable arrangement of interior and/or exterior light refracting prisms. The reflector 29 and refractor 31 cooperate with the lamp 32 to produce a desired pattern of light.

A hollow generally conical hood 24 is provided and forms an outer enclosure for the optical assembly 25 and shields its components from weather. The connection between the hood 24 and the optical assembly 25 is established through a support platform 26. The platform 26 is a generally circular sheet with an inner portion removed to form an opening 30 for receiving the optical assembly 25, and has a peripherally extending down turned edge 27 which contacts the inner surface of the hood 24. Machine screws 28 fixedly attach the platform 26 to the hood 24.

The reflector 29 is detachably connected to the platform 26, as will be more specifically described hereinafter, and extends upwardly into the interior of the hood 24. The refractor 31 is provided with an outwardly projecting, peripherally extending flange 33 adjacent its open end. A support band 34 extends around the open end of the refractor 31 and and beneath the flange 33. A pair of arms 36 (only one of which is shown in the drawings) extend laterally from the band 34 and support a pivot pin 37 therebetween. The pin 37 rests in a hook-shaped portion 38 of a support bracket 39. The support bracket 39 is securely attached to the platform 26 by machine screws 41. The hook-shaped support bracket 39 and the pin 37 provide a hinge connection about which the refractor 31 may be pivoted away from the reflector 29.

A latch mechanism 42 is provided at the opposite end of the refractor 31 to hold it in a closed position. The latch 42 comprises a pivotally mounted catch 43 which has a pair of laterally extending arms 44 disposed to engage the support band 34. The catch 43 is provided with a pair of side portions 45 connected by a web portion 46. A pin 47 is supported from a housing 48 which is suitably connected to the platform 26. The pin 47 engages the side portions 45 and rotatably supports the catch 43. A coil spring 49 is also supported on the pin 47 and has arms 50 and 51 engaging, respectively, the housing 48 and the web 46 to bias the catch toward engagement with the support band 34. The refractor 31 is then pivotally mounted in the optical assembly 25 so that it can be opened to provide access for replacement of the lamp 32 or for any other required repairs. The support arms 6 are spaced circumferentially on the base 4 such that when the optical assembly is opened the refractor will swing between the arms. Further, the refractor can be readily removed from the luminaire by releasing the latch 42 and lifting the pin 37 from the hook shaped portion 37.

Turning now to the reflector 29 and its connection in the luminaire 1, the reflector is provided at its open end with a peripherally extending flange portion 52 having a notch 53 provided therein. The platform 26 has a stepped portion 54 extending peripherally around the opening 30 and which abuts the flange 52 when the reflector is in its assembled position. The reflector 29 has an opening 55 when fits over a socket assembly 56. The socket assemly 56 is suitably connected to the platform 26 and supports both the lamp 32 and one end of



the reflector 29. To support the opposite end of the reflector the latch 42 includes a leaf spring 57. The spring 57 is seated on the housing 48 by a screw 58 and its lower end is formed to provide a shoulder 59 which engages the notch 53 of the reflector. The spring 57, as viewed in FIG. 6, is biased to the right and toward engagement in the notch 53. To mount the reflector 29 in the luminaire 1 it is first slipped over the socket assembly 56 and then swung into place against the spring 57 which snaps into the notch 53 to complete the connection. The spring 57 is merely removed from the notch 53 to release the reflector. The reflector is then supported in the luminaire without the use of screws or the like.

The latch 42 then incorporates releasable retaining means for the reflector and the refractor, both reflector and refractor being assembled in the luminaire by merely snapping them into place.

The lamp 32 is supported within the optical assembly 25 by the light socket assembly 56. As can be seen in FIGS. 2 and 6, the lamp extends transversely of the axis A—A and is positioned in an approximately horizontal plane so that the effective light source thereof, for purposes of light control, presents a point source of light relative to the area to be lighted. In the illustrated preferred embodiment the lamp is at an angle of approximately 10° to the horizontal as this positioning provides for a greater distribution of light from the luminaire which is particularly advantageous in street lighting where light must be projected to the opposite side of the street. Although the lamp is positioned at this slight angle to the horizontal, the effective light source thereof can, for light control purposes, be considered as presenting a point source of light relative to the area to be lighted. By positioning the lamp in an approximately horizontal plane light emanating from its effective light source can be readily directed onto the area to be lighted by the relatively simply constructed reflector 29 and refractor 31.

The conductors 16 extend through an opening 61 in the platform 26 and are connected to electrical terminals 62 to complete the electrical connection between the lamp 32 and the ballast 15.

Referring now to FIG. 3 and particularly FIG. 8, the relative positioning of the reflector 29 and the hood 24 to provide luminaire producing a minimum of glare will be discussed. The effective light source LC of the lamp 32 is located in a vertical plane B—B and a horizontal plane C—C, the vertical plane B—B preferably including the vertical axis A—A of the pole 2 so that the lamp 32 is in substantial vertical alignment with the pole 2. The lower margin of the reflector 29 extends to a point a predetermined distance below the light source so that a line drawn between the lower margin of the reflector and the light source 32, and parallel with the maximum vertical beam angle shown in FIG. 10, defines an angle $\alpha$ with the vertical plane B—B, this establishes the angle of a main cutoff plane for the optical portion 3. In the preferred embodiment the vertical angle of the maximum beam is 68° and the downward extension of the reflector 29 is such that the angle $\alpha$ is equal to that angle. Thus a definite cutoff angle for the main beams of light emanating from the light source is established. The refractor 31 transmits the main beams of light emanating from the light source in a desired light pattern. However, the refractor 31, although it transmits substantially all of the light from the light source as main beams of light which are at or below the main cutoff angle, also has a diffusing effect on a portion of the light and scatters this light at various angles some of which will be above the main cutoff angle and horizontal. With only the reflector 29 and refractor 31 this diffused or scattered light would produce undesirable glare. To eliminate this glare, the hood 24 is designed to extend to a point a predetermined distance below the lower margin of the reflector 29 so that a line

drawn between the lower margin of the hood 24 and the lower margin of the reflector 29 defines an angle B with the vertical plane B—B. This establishes a secondary cutoff angle to intercept the scattered light. In the preferred embodiment, the extension of the hood 24 below the lower margin of the reflector 29 is such that the hood 24 does not interfere with the main beams of light, or the desired light pattern, i.e. the angle B is greater than the main beam angle. Therefore, the hood 24 only intercepts scattered light which is directed above the main cutoff angle and would produce glare. The optical portion 3 will produce a minimum of glare, and in fact directs no light above horizontal.

In the preferred embodiment the angular relationship between the reflector and refractor, and accordingly the main and secondary cutoff angles, is maintained through only a portion of the optical portion 3; this portion being generally coextensive with the longitudinal extension of the lamp 32 as this is the main glare producing area and the one which is most objectionable. More particularly, the luminaire 1, in a street lighting application, has a curb side and a pavement side, to the right and left respectively as viewed in FIG. 2. It will be noted that the extension of the hood 24 below the reflector 29 increases toward the pavement side of luminaire so that the angle between the primary and secondary cutoff angles decreases and the minimum glare characteristics are preserved in the forward portion of the luminaire. It should also be noted that only on the curb side of the luminaire, from which only a minor portion of the light emanates, does the extension of the hood 24 below the reflector decrease, in this area there is no appreciable glare problem.

FIG. 10 is a representative vertical candlepower distribution curve for the luminaire 1 and illustrates the distribution of light through a lateral angle of maximum candlepower shown in FIG. 9. As can be seen in FIG. 10, a sharp cutoff is established and no light is directed above the horizontal. FIG. 8 illustrates the lateral light distribution from the luminaire 3 thru a vertical angle of 68°. The high candlepower beams are then projected at an angle of 68°, where glare will not be a factor, and the luminaire has a sharp cutoff above 68°. It will also be noted that at angles of 80° to 85°, where high candlepower causes glare, the candlepower values for this luminaire are negligible.

Turning now to the support arms 6 which interconnect the base 4 and the optical portion 3, two such arms are provided; however, one arm or a plurality of arms could be used without departing from the scope of my invention. The support arms 6 are fixedly attached at their lower ends to the base member 4 by machine screws 63 and extend upwardly and outwardly therefrom. The upper ends of the support arms 6 engage the platform 26 and each include a laterally extending portion 64 which facilitate attachment of the platform 26 and provide a secure seat for the optical portion 3. The optical portion 3 is fixedly attached to and extends laterally from the support arms 6 with the effective light source of the horizontally extending lamp 32 positioned in substantial vertical alignment with the vertical axis A—A of the pole 2.

The support arms 6 are generally elliptical in cross section, as illustrated in FIG. 5, and their cross sectional area decreases from the bottom to the top of the support arms. The support arms 6 are connected in the luminaire 1 so that the major axis thereof will extend generally radially outwardly from the vertical axis A—A of the pole 2, or with respect to the effective light source of the lamp 32, so as to present the least interference to the distribution of light. A cross sectional representation of the support arms 6 has been superimposed on FIG. 9 to illustrate this relationship. It will also be noted that the support arms are positioned on the curb side of the luminaire, again for least interference with light distribution.

In accordance with my invention the components of the luminaire 1 are so arranged with respect to each other and the pole axis A—A that the luminaire will be in equilibrium when mounted on the pole and will not set up bending moments about the pole top but will only load the pole in compression. In the preferred embodiment, the percentages which the weights of the separate luminaire components bear to the total weight of the luminaire are, in approximate figures, the optical portion 43%, the base member 50% (with the ballast, capacitors and electrical connection installed) and the support arms 7%. The base 4 is symmetrical about the vertical axis A—A of the pole 2 so that its weight acts downwardly along the axis A—A; the optical portion 3 is generally symmetrical about the axis A—A and its weight also acts generally along that axis; and the weight of the arms 6 represents the only eccentric load in the light fixture 1. Since the weight of the support arms 6 represents approximately only 7% of the total weight of the light fixture it can for all practical purposes be disregarded. However, in the preferred embodiment the optical assembly 25 is shifted slightly to the left of the axis A—A, see FIG. 2. The optical assembly is shifted a distance sufficient to counterbalance the support arms so that the luminaire will be in perfect balance. More specifically, the centers of gravity of the support arms and the optical assembly are disposed on diametrically opposed sides of the axis A—A with the distances from the centers of gravity to the axis A—A being inversely proportional to the ratio of the weight of the support arms to the weight of the optical assembly. Because of the relative weights of the optical assembly and the support arms, the distance that the optical assembly need be shifted is very slight so that the optical portion 3 can still be regarded as being generally symmetrical with respect to the axis A—A and the weight thereof acting generally downwardly along the axis A—A so as not to cause an unbalance in the luminaire.

Hence, substantially the entire weight of the luminaire 1, approximately 93% thereof, acts downwardly along the axis A—A. The luminaire is in balance and, when assembled and mounted atop the pole 2, it produces no bending moments about the pole 2 and loads the pole purely in compression. In other words, in the preferred embodiment, the resolved center of gravity of the luminaire 1 lies generally on the axis A—A so that the weight of the luminaire acts downwardly along that axis and the pole 2 is loaded purely in compression. Furthermore, it should be noted that the base member 4, which represents approximately 50% of the weight of the luminaire, is positioned in the lowermost portion of the luminaire thereby contributing greatly to the stability and balance of the luminaire.

The structural relationship of the components of the luminaire is then such that the pole 2 is loaded purely in compression, the most advantageous type of loading as pole strength is considerably greater in compression than in bending. Through the practice of my invention larger luminaires can be used in street and outdoor area lighting than could heretofore be used with prior art structures. Furthermore, the structure preserves optimum light control features so that the increase in size is not achieved at the expense of light control efficiency.

Another advantageous feature of my invention should be noted and resides in the fact that the luminaire extends vertically above the pole top so that a shorter pole can be used without a reduction in mounting height of the light source.

It should further be noted that the luminaire 1 permits the physical separation of the lamp 32 and the ballast 15 so that the ballast can be positioned at the pole top for stability and further so that the heat generated by the light source cannot affect the operating charac-

teristics of the ballast. However, the light source and the ballast are still contained as integral parts of the light fixture.

The preceding description of my invention relative to a particular preferred embodiment thereof has been intended for illustrative purposes only and not by way of limitation. In the appended claims it is intended to cover all modifications and embodiments of my invention as fall within the true spirit and scope thereof.

I claim:

1. In combination, a luminaire, a supporting member having a vertical axis constructed and arranged to be mounted coaxially atop a vetrical pole, said luminaire including an inverted dished hood and an optical assembly mounted beneath said hood, an elongate light source mounted within said optical assembly, said supporting member including a chamber, ballast means mounted within said chamber and electrically connected to said source, and support arm means fixedly connected to said support member and extending upwardly therefrom to supportingly engage one side of said hood, said hood extending backwardly toward said axis to position said light source in spaced relation from said support member and in substantial alignment with said vertical axis, said hood, said supporting member and said ballast means being substantially symmetrically arranged relative to said vertical axis, said support arm means being disposed on one side of said vertical axis and said optical assembly being disposed with its center of gravity on a diametrically opposite side of said axis, the distances from the centers of gravity of said arm means and said optical assembly to said vertical axis being inversely proportional to the ratio of their weights.

2. In combination, a luminaire, a supporting member having a vertical axis and being constructed and arranged to be mounted coaxially atop a vertical pole, said luminaire including an optical assembly having a longitudinal axis, an elongate light source mounted within said optical assembly and extending substantially parallel to said longitudinal axis, and a pair of support arms fixedly connected at their lower end to said support member and extending upwardly and outwardly therefrom, the upper end of said support arms engaging one side of said luminaire to support the same with the longitudinal axis of said optical assembly extending substantially horizontally, said luminaire extending backwardly toward said vertical axis to position said light source in spaced relation from said support member and in substantial alignment with said vertical axis, said optical assembly being constructed and arranged to direct substantially all of the light emanating from said source on one side of a vertical plane containing said vertical axis, said support arms being positioned on the opposite side of said plane.

3. In combination, a supporting base having a vertical axis and constructed and arranged to be mounted on a vertical pole, an inverted dished hood, an optical assembly mounted in said hood, said optical assembly including an inverted dished reflector having a lower margin and a dished refractor having an upper margin adjacent the lower margin of said reflector, an elongated light source mounted beneath said reflector and with its longitudinal axis disposed substantially horizontally, support means connected to said base and extending upwardly therefrom, the upper end of said support means engaging one side of said hood to support the same with the longitudinal axis of said light source extending substantially horizontally, said hood extending backwardly from said arm means and toward said vertical axis to position said light source in spaced relationship from and in vertical alignment with said supporting base, said optical assembly being constructed and arranged to direct substantially all of the light emanating from said source on one side of a vertical plane containing said vertical axis, said support means being positioned on the opposite side of said plane, the lower margin of said reflector extending a predetermined distance below the longitudinal axis of said light source and establishing a cutoff for the main beams of light emitted from said light source, the lower margin of said hood being displaced outwardly from and extending a predetermined distance below the lower margins of said reflector and refractor.



4. In combination, a supporting base having a vertical axis and constructed and arranged to be mounted on a vertical pole, an inverted dished hood, an optical assembly mounted in said hood, said optical assembly including an inverted dished reflector having a lower margin and a dished refractor disposed with its margin adjacent the lower margin of said reflector to form an enclosure therewith, an elongated light source, a light socket assembly mounted in said hood and supporting said light source within said enclosure and with the longitudinal axis of said light source substantially parallel to that of said optical assembly, support arm means connected to said base and extending upwardly and outwardly therefrom, the upper end of said arm engaging one side of said hood to support the same with the longitudinal axis of said light source extending substantially horizontally, said hood extending backwardly from said arm means and toward said vertical axis to position said light source in spaced relationship from and in substantially vertical alignment with said supporting base, said optical assembly being constructed and arranged to direct substantially all of the light emanating from said source on one side of a vertical plane containing said vertical axis, said arm means being positioned on the opposite side of said plane, the lower margin of said reflector extending a predetermined distance below the longitudinal axis of said light source and establishing a cutoff for the main beams of light emitted from said light source, the lower margin of said hood being displaced outwardly from and extending a predetermined distance below the lower margins of said reflector and refractor and terminating above said cutoff.

5. In combination, a luminaire, a supporting base having a vertical axis and constructed and arranged to be mounted on a vertical pole, an inverted dished hood, an optical assembly disposed beneath said hood and having a longitudinal axis arranged generally transversely with respect to said vertical axis, said optical assembly including an inverted dished reflector and a dished refractor disposed with its margin adjacent the margin of said reflector to form an enclosure therewith, an elongated light source, a light socket assembly mounted in said hood and supporting said light source within said enclosure with its longitudinal axis substantially horizontal, and first and second latch means, said refractor being hingedly supported at one end of said hood and the opposite end thereof engaging and releasably supported by said first latch means, one end of said reflector being releasably supported by said socket assembly and the opposite end thereof engaging and releasably supported by said second latch means, support arm means connected to said base and extending upwardly and outwardly therefrom to engage one side of said hood to support the same with the longitudinal axis of said optical assembly extending substantially horizontally, said optical assembly being constructed and arranged to direct substantially all of the light emanating from said source on one side of a vertical plane intersecting said optical assembly along its longitudinal axis, said support arm means being positioned on the opposite side of said plane the lower margin of said reflector extending a predetermined distance below the longitudinal axis of said light source and establishing a cutoff for the main beams of light emited from said light source, the lower margin of said hood being displaced outwardly from and extending a predetermined distance below the lower margins of said reflector and refractor and terminating above said cutoff.

6. In combination, a luminaire, a supporting base having a vertical axis and constructed and arranged to be

mounted atop a vertical pole, an inverted dished hood, an optical assembly disposed beneath said hood and having a longitudinal axis arranged generally transversely with respect to said vertical axis, said optical assembly including an inverted dished reflector and a dished refractor disposed with its margin adjacent the margin of said reflector to form an enclosure therewith, an elongated light source, a light socket assembly mounted in said hood and supporting said light source within said enclosure with its longitudinal axis substantially horizontal, and a latch mechanism supported beneath said hood and including first and second spring biased members, said refractor being hingedly supported at one end on said hood and the opposite end thereof engaging and releasably supported by said first spring biased member, one end of said reflector being releasably supported by said socket assembly and the opposite end thereof engaging and releasably supported by said second spring biased member, a pair of support arms connected to said base and extending upwardly and outwardly therefrom to engage one side of said hood to support the same with the longitudinal axis of said optical assembly extending substantially horizontally, said hood extending backwardly toward said vertical axis to position said light source in spaced relationship from and in alignment with said vertical axis, the lower margin of said reflector extending a predetermined distance below the longitudinal axis of said light source and establishing a cutoff for the main beams of light emitted from said light source, the lower margin of said hood being displaced outwardly from and extending a predetermined distance below the lower margins of said reflector and refractor and terminating above said cutoff, said base being hollow and enclosing means for electrically energizing said light source and including vent means for convectively circulating cool air over said electrical energizing means.

7. In combination, a supporting base having a vertical axis and constructed and arranged to be mounted on a vertical pole, an inverted dished hood, an optical assembly mounted in said hood, said optical assembly including an inverted dished reflector having a lower margin and a dished refractor having an upper margin adjacent the margin of said reflector, an elongated light source mounted beneath said reflector with its longitudinal axis substantially parallel to the longitudinal axis of said optical assembly, support arm means connected to said base and extending upwardly and outwardly therefrom to engage one side of said hood to support the same with its lower marginal edge in a substantially horizontal plane and with the longitudinal axis of said optical assembly tilted upwardly at a small angle relative to the plane of the lower marginal edge of said hood, said optical assembly being constructed and arranged to direct substantially all of the light emanating from said source on one side of a vertical plane intersecting said optical assembly along its longitudinal axis, said support arm means and said one side of said hood being disposed on the opposite side of said plane, the lower margin of said reflector extending a predetermined distance below the longitudinal axis of said light source and establishing a cutoff for the main beams of light emitted from said light source, the lower margin of said hood being displaced outwardly from and extending a predetermined distance below the lower margins of said reflector and refractor and terminating above said cutoff.

8. In combination, a supporting base having a vertical axis and constructed and arranged to be mounted on a vertical support, an inverted dished hood, an optical assembly mounted in said hood, said optical assembly having an inverted dished reflector having a lower margin and a dished refractor having a margin adjacent the margin of said reflector to form an enclosure therewith, an elongated light source, a light socket assembly mounted in said hood and supporting said light source within said enclosure with its longitudinal axis substantially parallel with the longitudinal axis of said optical assembly, support arm means connected to said base and extending upwardly therefrom to engage one side of said hood to support the same in substantially vertical alignment with the vertical axis of said support base, said hood also being supported with its lower marginal edge in a substantially horizontal plane and with the longitudinal axis of said optical assembly tilted upwardly at a small angle relative to the plane of the lower marginal edge of said hood, said optical assembly being constructed and arranged to direct substantially all of the light emanating from said source on one side of a vertical plane containing said vertical axis, said support arm means being positioned on the opposite side of said plane, the lower margin of said reflector extending a predetermined distance below the longitudinal axis of said light source and establishing a cutoff for the main beams of light emitted from said light source, the lower margin of said hood being displaced outwardly from and extending a predetermined distance below the lower margins of said reflector and refractor.

9. In combination, a luminaire, a supporting base having a vertical axis and constructed and arranged to be mounted stop a vertical pole, an inverted dished hood, an optical assembly mounted in said hood with its longitudinal axis disposed generally transversely with respect to said vertical axis, said optical assembly having an inverted dished reflector and a dished refractor disposed with its margin adjacent the margin of said reflector to form an enclosure therewith, an elongated light source, a light socket assembly mounted in said hood and supporting said light source within said enclosure with its longitudinal axis substantially horizontal, support arm means connected to said base and extending upwardly and outwardly therefrom to engage one side of said hood to support the same with the longitudinal axis of said optical assembly extending substantially horizontally, said optical assembly being constructed and arranged to direct substantially all of the light emanating from said source on one side of a vertical plane containing said vertical axis, said support arm means being positioned on the opposite side of said plane, the lower margin of said reflector extending a predetermined distance below the longitudinal axis of said light source and establishing a cutoff for the main beams of light emitted from said light source, the lower margin of said hood being displaced outwardly from and extending a predetermined distance below the lower margins of said reflector and refractor and terminating above said cutoff.

10. In combination, a luminaire, a supporting member having a vertical axis and being constructed and arranged to be mounted on a vertical support, said luminaire including an optical assembly having a longitudinal axis, an elongate light source mounted within said optical assembly and extending substantially parallel to said longitudinal axis, support arm means fixedly connected at its lower end to said supporting member and extending upwardly and outwardly therefrom, the upper end of said support arm means engaging one side of said luminaire to support the same with the longitudinal axis of said optical assembly extending substantially horizontally, said luminaire extending backwardly toward said vertical axis to position said light source in spaced relation from said supporting member and in substantial alignment with the vertical axis thereof, said optical assembly being constructed and arranged to direct substantially all of the light emanating from said source on one side of a vertical plane containing said vertical axis, said support arm means being positioned on the opposite side of said plane.

11. The luminaire set forth in claim 10 and including an inverted dished hood disposed over said optical assembly, said hood having a substantially larger height than said reflector, the lower margin of said hood having a substantially larger circumference than said reflector and

being positoned a substantial distance below the lower margin of said reflector to shield a substantial portion of said refractor.

12. The luminaire set forth in claim 10 and including an inverted generally conical dished hood supported by said support arm means with its lower marginal rim disposed generally horizontally, and wherein said optical assembly is mounted in said hood with its longitudinal axis tilted upwardly at a relatively small angle.

13. In combination, a luminaire, a supporting base having a generally vertical axis and constructed and arranged to be mounted on a vertical support member, an inverted dished hood, an optical assembly disposed beneath said hood and having a longitudinal axis extending generally transversely with respect to said vertical axis, said optical assembly including an inverted dished reflector and a dished refractor disposed with its margin adjacent the margin of said reflector to form an enclosure therewith, an elongated light source, light source support means mounted in said hood for supporting said light source within said enclosure and with its longitudinal axis substantially horizontal, and a latch mechanism supported beneath said hood and including first and second spring biased members, said refractor being hingedly supported at one end on said hood and the opposite end thereof engaging and being releasably supported by said first spring biased member, one end of said reflector being releasably supported by said light source support means and the opposite end thereof engaging and being releasably supported by said second spring biased member, support arm means connected to said base and extending upwardly and outwardly therefrom to engage one side of said hood to support the same with the longitudinal axis of said optical assembly extending substantially horizontally, said hood extending backwardly toward said vertical axis to position said light source in spaced relationship from and in alignment with said vertical axis, the lower margin of said reflector extending a predetermined distance below the longitudinal axis of said light source and establishing a cutoff for the main beams of light emanating from said light source, the lower margin of said hood being displaced outwardly from and extending a predetermined distance below the margin of said reflector and refractor.

14. In combination, a luminaire, a supporting base having a generally vertical axis and constructed and arranged to be mounted on a vertical support member, an inverted dished hood, an optical assembly disposed beneath said hood and having a longitudinal axis extending generally transversely with respect to said vertical axis, said optical assembly including an inverted dished reflector and a dished refractor disposed with its margin adjacent the margin of said reflector to form an enclosure therewith, an elongated light source, light source support means mounted in said hood and supporting said light source within said enclosure with its longitudinal axis substantially horizontal, and a latch mechanism supported beneath said hood and including first and second spring biased members, said refractor being hingedly supported at one end on said hood and the opposite end thereof engaging and being releasably supported by said first spring biased member, one end of said reflector being releasably supported by said socket assembly and the opposite end thereof engaging and being releasably supported by said second spring biased member, support arm means connected to said base and extending upwardly and outwardly therefrom to engage one side of said hood to support the same with the longitudinal axis of said optical assembly extending substantially horizontally, said hood extending backwardly toward said vertical axis to position said light source in spaced relationship from and in alignment with said vertical axis, said optical assembly being constructed and arranged to direct substantially all of the light emanating from said source on one side of a vertical plane containing said vertical axis, said support arm means being positioned on the opposite side of said plane.

15. In combination, a luminaire, a supporting base having a vertical axis and constructed and arranged to be mounted on a vertical support, an inverted generally conical dished hood, support arm means connected to said base and extending upwardly and outwardly therefrom to engage one side of said hood for supporting the same with its lower marginal rim disposed substantially horizontally, an optical assembly mounted in said hood with its longitudinal axis tilted upwardly at a relatively small angle to the plane of said lower marginal rim and to one side of said hood, the axis of said optical assembly also extending generally transversely with respect to said vertical axis, said optical assembly having an inverted dished reflector and a dished refractor disposed with its margin adjacent the margin of said reflector to form an enclosure therewith, an elongated light source, means mounted in said hood for supporting said light source within said enclosure with its longitudinal axis generally parallel to the longitudinal axis of said optical assembly, said optical assembly being constructed and arranged to direct substantially all of the light emanating from said source on one side of a vertical plane intersecting said optical assembly along its longitudinal axis, said support arm means and said one side of said hood being positioned on the opposite side of said plane, the lower margin of said reflector extending a predetermined distance below the longitudinal axis of said light source and establishing a cut-off for the main beams of light emanating from said light source, the lower marginal rim of said hood being substantially larger and displaced outwardly from and extending a substantial distnace below the lower margin of said reflector and terminating a relatively short distance above said cutoff.

16. In combination, a luminaire, a support base having a vertical axis constructed and arranged to be mounted on a vertical support, an inverted dished hood, support arm means connected to said base and extending upwardly and outwardly therefrom to engage one side of said hood to support the same in substantial vertical alignment with said supporting base and with its lower marginal rim disposed generally horizontally, an optical assembly mounted in said hood with its longitudinal axis tilted upwardly at a relatively small angle to the plane of said lower marginal rim and to said one side of said hood, the axis of said optical assembly also extending generally transversely with respect to said vertical axis, said optical assembly having an inverted dished reflector disposed with its margin adjacent the margin of said reflector to form an enclosure therewith, an elongated light source, a light socket assembly mounted in said hood for supporting said light source within said enclosure with its longitudinal axis generally parallel to the axis of said optical assembly, said optical assembly being constructed and arranged to direct substantially all of the light emanating from said source on one side of a vertical plane intersecting said optical assembly along its longitudinal axis, said support arm means and said one side of said hood being positioned on the opposite side of said plane, the lower margin of said reflector extending a predetermined distance below the longitudinal axis of said light source and establishing a cutoff for the main beams of light emitted from said light source, the lower margin of said hood being substantially larger and displaced outwardly from and extending a substantial distance below the lower margins of said reflector and terminating a relatively short distance above said cutoff, and first and second latch means, said reflector being hingedly supported at one end on said hood and the opposite end engaging and being releasably supported by said first latch means, one end of said reflector being releasably supported by said socket assembly and the opposite end thereof engaging and releasably supported by said second latch means.

17. In combination, a luminaire, a supporting base having a vertical axis and constructed and arranged to be mounted on a vertical support, an inverted generally conical dished hood, support arm means connected to said

base and extending upwardly and outwardly therefrom to engage one side of said hood to support the same with its lower marginal rim disposed generally horizontally, an optical assembly mounted in said hood with its longitudinal axis tilted upwardly at a relatively small angle to the plane of said lower marginal rim and to said one side of said hood, the axis of said optical assembly also extending generally transversely with respect to said vertical axis, said optical assembly having an inverted generally ovate dished reflector and a dished refractor disposed with its margin adjacent the margin of said reflector to form an enclosure therewith, an elongated light source, a light socket assembly mounted in said hood and supporting said light source within said enclosure with its longitudinal axis generally parallel to the longitudinal axis of said optical assembly, said optical assembly being constructed and arranged to direct substantially all of the light emanating from said source on one side of a vertical plane intersecting said optical assembly along its longitudinal axis, said support arm means and said one side of said hood being positioned on the opposite side of said plane, the lower margin of said reflector extending a predetermined distance below the longitudinal axis of said light source and establishing a cutoff for the main beams of light emitted from said light source, said hood having a substantially larger height than said reflector, the lower margin of said hood having a substantially larger circumference than said reflector and being positioned a substantial distance below the lower margin of said reflector to shield a substantial portion of said refractor.




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NORTON ANSHER, *Primary Examiner.*

# UNITED STATES PATENT OFFICE

# CERTIFICATE OF CORRECTION

Patent No. 3,170,634 February 23, 1965

Donald W. Harling

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 10, line 24, for "stop" read -- atop --.

Signed and sealed this 27th day of July 1965.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

EDWARD J. BRENNER
Commissioner of Patents