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D. W. HARLING ETAL

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LUMINAIRE ASSEMBLY FOR A DIVIDED HIGHWAY

Filed Oct. 19, 1965

2 Sheets-Sheet 1

Fig. 1

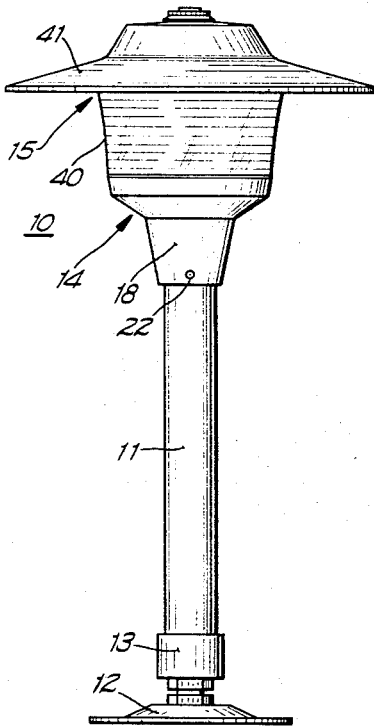


Fig. 2

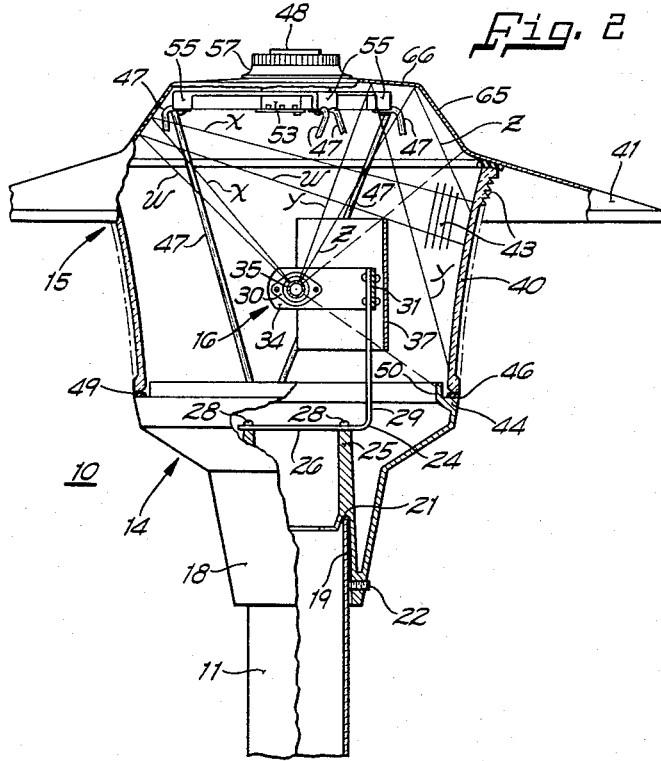
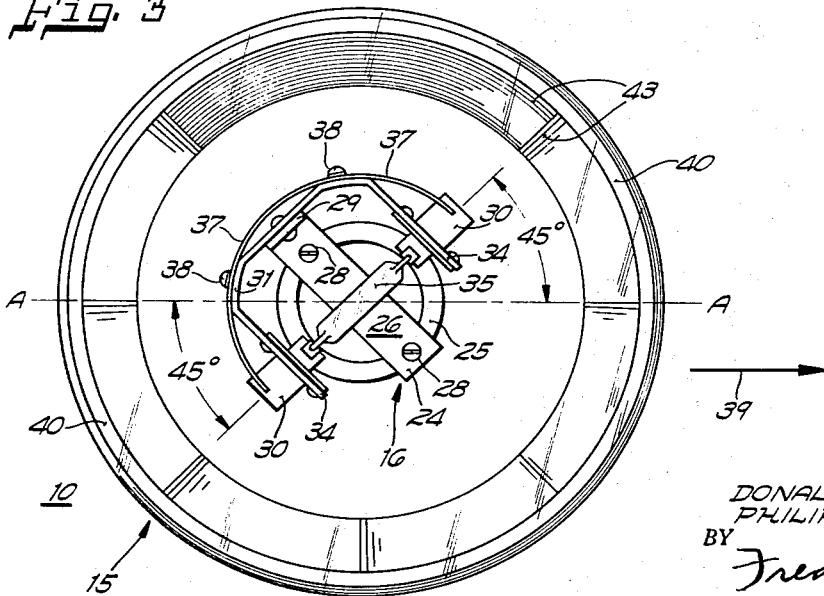


Fig. 3



INVENTORS.
DONALD W. HARLING
PHILIP B. CLARK
BY *Fred Wivioth*
Attorney

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Fig. 4

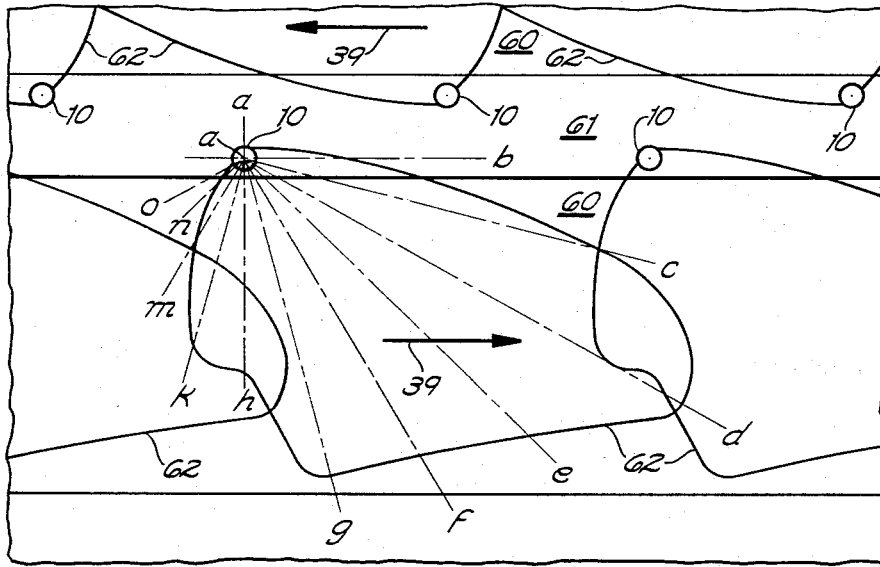


Fig. 5aa

Fig. 5ab

Fig. 5ac

Fig. 5ad

Fig. 5ae

Fig. 5af

Fig. 5ag

Fig. 5ah

Fig. 5ak

Fig. 5am

Fig. 5an

Fig. 5ao

INVENTORS.
 DONALD W. HARLING
 PHILIP B. CLARK
 BY Fred Wierott
 Attorney

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3,363,092
**LUMINAIRE ASSEMBLY FOR A DIVIDED
 HIGHWAY**

Donald W. Harling, Milwaukee, and Philip B. Clark,
 Hales Corners, Wis., assignors to McGraw-Edison
 Company, Milwaukee, Wis., a corporation of Delaware
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 11 Claims. (Cl. 240—25)

ABSTRACT OF THE DISCLOSURE

A luminaire for being mounted atop a relatively short pole in the medium strip of a divided highway and including a generally tubular refractor and a hood for enclosing an elongate high intensity light source disposed generally horizontally and in an oblique angular relation to a plane parallel to the roadway edge, and a semi-cylindrical reflector disposed adjacent one side of the light source for reflecting light rays generally normally to the axis of the light source and in the direction of traffic flow.

Background of the invention

This invention relates to luminaires and, more particularly, to a street lighting luminaire constructed and arranged to be mounted a relatively short distance above the roadway to be illuminated.

This invention is primarily but not exclusively concerned with the illumination of divided roadways having a landscape median strip. In such applications, the luminaire must illuminate a relatively wide roadway on one side of the median strip without producing eye level glare on either side. In addition, mounting poles of normal height are undesirable because they detract from the landscaping of the median strip.

It is an object of the invention to provide a luminaire suitable for being mounted atop a relatively short pole.

Another object of the invention is to provide a luminaire having a precisely controlled light pattern for illuminating one half of a divided roadway from a relatively short pole without producing glare in the eyes of motorists in either roadway.

Brief description of the drawings

FIG. 1 shows the luminaire and support pole according to the instant invention;

FIG. 2 is a side elevational view, partly in section, of the luminaire illustrated in FIG. 1;

FIG. 3 is a top view of the luminaire shown in FIG. 1, with the hood and support members broken away; and

FIGS. 4 and 5a-5ao are horizontal and vertical candle-power curves for the luminaire illustrated in FIGS. 1 and 2.

Summary of the invention

In general terms, the invention comprises the combination of a relatively short pole and a luminaire including a base portion, a refractor mounted on the base portion, a hood mounted above the upper end of the refractor, a high intensity lamp supported within the refractor, and a reflector disposed within the refractor and on one side of the lamp.

Description of the preferred embodiment

Referring now to the drawings in greater detail, FIG. 1 shows a luminaire 10 which is mounted atop a relatively short pole 11, that is, in the order of three feet in height or less. This is in contrast to the normal luminaire support poles which generally range from ten to twenty-five feet in height. The pole 11 is mounted at its lower end on a mounting base 12 by means of a break-

away coupling and electrical disconnect 13 so that the pole 11 will not present a traffic hazard.

Referring now to FIGS. 2 and 3, the luminaire 10 is shown to include a base 14, an optical assembly 15 and a lamp support assembly 16. The base assembly 14 secures the luminaire 10 to the pole 11 and supports the optical assembly 15 and the lamp support assembly 16 in their proper relative positions.

The base assembly 14 includes a slipfitter 18 integral with its lower end and which has a cylindrical internal recess 19 for telescopingly engaging the upper end of the pole 11. The upper end of the surface 19 terminates in a V-in-section groove 21 for engaging the upper end of the pole 11 to center the luminaire 10 relative thereto. A plurality of set screws 22 are positioned in spaced relation adjacent the lower end of the slipfitter 18 and extend through threaded apertures formed therein to positively clamp the luminaire 10 to the upper end of the pole 11.

The lamp support assembly 16 includes a generally L-shaped bracket member 24 which is mounted atop a generally cylindrical portion 25 integral with a base assembly 14 and which extends upward from the upper end of the wall portion 19. One leg 26 of the bracket member 24 is secured to the base portion 25 by screws 28 and the other leg 29 thereof extends upwardly from the portion 25 for supporting a horizontally extending yoke member 31.

A pair of spring loaded compressible lamp holders 30 are suitably fixed in an opposed relation to the ends of each of the arms 34 of the yoke member 31 for supporting a high intensity lamp 35 with its longitudinal axis extending substantially horizontally. While the lamp 35 may be of any high intensity type, in the preferred embodiment it comprises a quartz iodine type lamp which consists of a small diameter, hollow, elongate quartz tube which encloses a tungsten filament and is filled with an iodine gas.

A vertically extending semicylindrical reflector 37 is secured to the yoke 31 by screws 38 for reflecting the light rays emitted from one side of the lamp 35. Further, the reflector 37 is oriented so that its axis of symmetry is perpendicular to and lies in the same plane as the longitudinal axis of the lamp 35 so that it will reflect a substantial portion of the light emitted from one side of the lamp 35. In addition, as seen in FIG. 3, the lamp 35 has oriented so that its longitudinal axis is disposed at an angle of substantially 45° to a line A—A which is parallel to the side of the roadway being illuminated and divides the luminaire 10 into a street side comprising the lower portion of FIG. 3 and a curb side which comprises the upper portion thereof. In addition, the lamp 35 and the reflector 37 face in the direction of vehicular travel indicated by the arrow 39.

The optical assembly 15 includes a refractor 40 and a reflector or hood 41. The refractor 40 is a generally tubular open-ended light transmitting member having a plurality of light redirecting prisms 43 formed on its inner and outer surfaces and is provided to redirect the generally horizontally directed light rays from the lamp 35 into the predetermined light pattern. The lower end of the refractor 40 is supported by an annular refractor support ring 44 integrally formed at the upper end of the base 14 and which includes an annular generally horizontally disposed refractor receiving surface 46 which terminates in its inner periphery in an upwardly extending positioning rim 50. In addition, an annular gasket 49, of any suitable compliant material, is disposed between the surface 46 and the lower edge of the refractor 40.

The hood 41 is secured in an overlaying relation to the upper end of the refractor 40 and serves to redirect

upwardly directed light rays downwardly and into the desired light pattern. The reflector is supported in an abutting relation against the upper edge of the refractor by a plurality of V-shaped wire members 47 which are disposed interiorly of the refractor 40 and which are suitably secured at their lower ends to the base 14. The wire members 47 diverge outwardly and engage a reflector support member 48 at their upper ends.

As seen in FIG. 2, the reflector support member 48 has a central hub 53 and a plurality of spaced arms 55 which are affixed at their outer ends to the upper ends of the wire members 47. The reflector 41 is mounted on the reflector support member 48 by a screw cap 57 having internal threads which engage external threads formed on the outside surface of the hub 53.

FIG. 4 illustrates the application of the luminaries 10 according to the instant invention to a divided highway having a pair of roadways 60 separated by a median strip 61. The luminaires 10 are disposed in a staggered spaced apart relation along the opposite sides of the median strip and each is oriented so that the center line of its associated lamp 35 is disposed at substantially a 45° angle to the edge of the adjacent roadway and facing generally in the direction of traffic flow indicated by the arrows 39. This produces the horizontal light pattern 62 illustrated in FIG. 4 and light intensities taken through vertical planes *aa-ao* as shown by FIGS. *Saa-Sao*. It will be appreciated from these candlepower curves that the light on the oncoming traffic side of the luminaire is held to a very low candlepower value so that at a distance the luminaire appears as a very dim light. Upon reaching the area of high illumination, the motorist is past the point where he will be looking directly into the luminaire. It can also be seen that the light intensity of the median strip side of the luminaire is also held to a relatively low value so as to illuminate this area while not producing a blinding effect on drivers traveling in the opposite direction.

In addition, because of the low mounting height of the luminaire and because the main light beam is shown in FIGS. *Saa-Sao* is substantially at an 85° angle to the nadir, the light rays do not enter the rear view or side mirrors of the vehicle and reflect back into the eyes of the driver. In addition, because the candlepower distribution curve is quite narrow with the main beam concentrated at 85° from the nadir, there will be no bright pool of light on the roadway near the luminaire.

With reference to FIG. 2, it can be seen that the semi-cylindrical reflector 37 performs the function of cutting off direct light rays for 45° from a line parallel to the roadway and on the oncoming traffic side of the luminaire. In addition, the reflector 37 performs the function of increasing the light intensity in the direction of traffic flow.

The hood 41 performs the function of providing low level light intensity around the base of the luminaire and at the rear of the reflector 37. As seen in FIG. 2, the central bowl-shaped portion 65 of the hood 41 reflects the light rays W and X above the top of the reflector 37 and toward the opposite side of the luminaire. In addition, the outer dish portion 66 of the hood 41 reflects the light rays Y and Z at a relatively steep angle downwardly behind the reflector 37 and at the same side of luminaire. This provides illumination around the base of the luminaire and behind the reflector 37.

While only a single embodiment of the luminaire has been shown and described, it is not intended to be limited thereby but only by the scope of the appended claims.

We claim:

1. The combination of a relatively short pole, a luminaire mounted atop said pole and including a base portion, a refractor mounted on said base portion, a hood mounted above said refractor, a high intensity lamp supported within said refractor and having an elongate light source and including lamp support means mounted on said base for supporting said lamp with the longitudinal axis of said source disposed substantially horizontal, a reflector mounted within said refractor and disposed adjacent one side of said lamp, said luminaire being divided into a curb side and a street side by a vertical plane passing through its longitudinal axis, the longitudinal axis of said light source being disposed at an oblique angle relative to said vertical plane, substantially all of the reflector lying on one side of the longitudinal axis of said lamp for reflecting light rays from said lamp generally toward the street side of said luminaire.

2. The combination set forth in claim 1 wherein said hood reflects at least a portion of the upwardly directed light rays from said lamp downwardly behind said reflector and around the base of said pole.

3. The combination set forth in claim 1 wherein said refractor is generally tubular and has one end engaging said base portion and the other end engaging said hood, and wherein said reflector comprises a cylindrical section with its axis of symmetry disposed generally vertically.

4. The combination set forth in claim 1, wherein said lamp is of the quartz iodine type disposed with its longitudinal axis disposed generally horizontal.

5. The combination set forth in claim 1 wherein the right end of said light source as viewed from the street side of said luminaire is closer to the curb side thereof and wherein the left side thereof is closest to the street side of said luminaire.

6. The combination set forth in claim 5 wherein said reflector faces generally toward the right side of said luminaire as viewed from the street side thereof.

7. The combination set forth in claim 6 wherein said reflector is generally semicylindrical.

8. The combination set forth in claim 7 wherein the longitudinal axis of said lamp is disposed at an angle of substantially 45° relative to said plane.

9. The combination set forth in claim 8 wherein said refractor is generally tubular and has one end engaging said base portion and the other end engaging said hood, and wherein said reflector comprises a cylindrical section with its axis of symmetry disposed generally vertically.

10. The combination set forth in claim 9 wherein said reflector is symmetrical relative to a horizontal line normal to and bisecting the longitudinal axis of said lamp.

11. The combination set forth in claim 10, wherein said lamp is of the quartz iodine type.

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NORTON ANSHER, *Primary Examiner*.

W. M. FRYE, *Assistant Examiner*.