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STREET LIGHTING LUMINAIRE

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FIG. 1

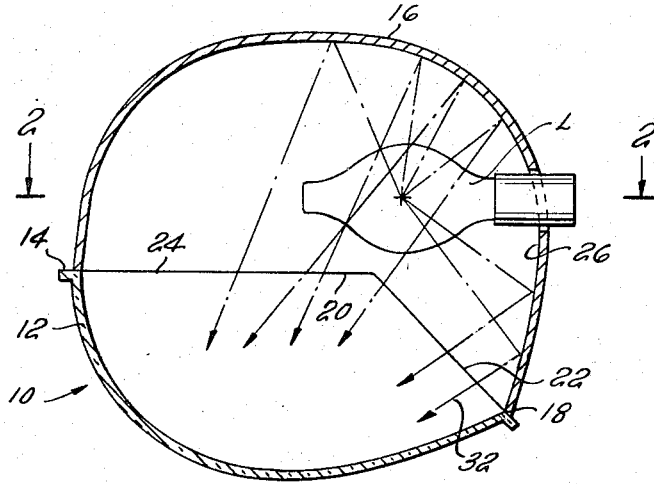
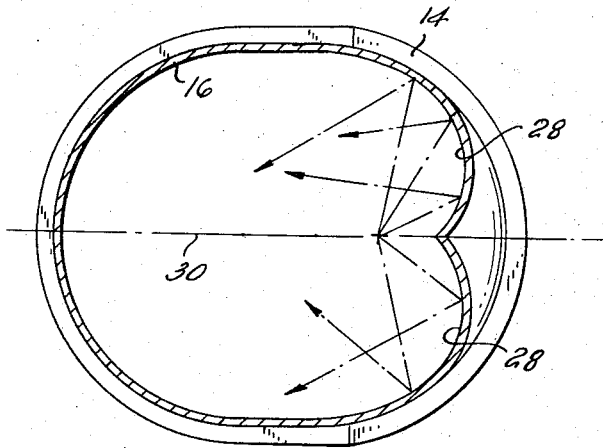


FIG. 2



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STREET LIGHTING LUMINAIRE

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1 Claim. (Cl. 240—25)

ABSTRACT OF THE DISCLOSURE

A luminaire of ovate configuration with a refractor and a reflector having edges engaging each other along substantially horizontally extending front edge portions and downwardly inclined rear edge portions forming an angle of from 40° to 90° with respect to the horizontally extending edge portions, the reflector having an inner reflecting surface directing the light forwardly through the refractor through a vertical range of between approximately 40° and 60° and spreading the light laterally.

The present invention relates to luminaires.

More particularly, the present invention relates to luminaires which are adapted to be used for street lighting purposes and which use mercury lamps, for example.

One of the major problems encountered with mercury street lighting luminaires, particularly the present-day ovate type of street lighting luminaires, is that an excessive amount of light at relatively high angles is undesirably directed behind the curb line of the street which is nearest to the luminaire. Most of this rearwardly directed light is simply wasted, insofar as useful illumination is concerned. In fact, some of this wasted light is harmful inasmuch as it enters into the windows of nearby houses.

It is accordingly a primary object of the present invention to provide a luminaire of the above general type which will avoid the above drawbacks.

In particular, it is an object of the present invention to provide a luminaire which will prevent wasting of light which otherwise would be directed rearwardly at the near-curb side of the street.

In particular, it is an object of the present invention to provide a luminaire which will make full use of the light which is conventionally wasted by being directed rearwardly at the near-curb side of the street.

The practical limit of efficient refraction with a prismatic glass refractor is approximately 40°. In accordance with the present invention it has been found possible to improve the conventional luminaire construction by eliminating that end of the refractor which receives direct light beyond the limits of refraction and instead to replace it with a metal reflector panel. This latter panel is, in a preferred construction of the invention, an extension of the main reflector and directs its light toward the far half of the street with as much lateral spread as possible, in accordance with the present invention.

As a result of this construction there is better shielding with a higher utilization in the street itself of the light derived from the luminaire since light which otherwise would be wasted is now redirected into this street.

Thus, in accordance with the present invention the luminaire will include a lower refractor means which has an upper edge provided with a rear end portion which is downwardly inclined with respect to a portion of this upper edge which immediately adjoins the rear edge portion. An upper reflector means is located over and joined to the lower refractor means, and this upper reflector means has a lower edge provided with a rear end portion which is downwardly inclined with respect to a portion of this lower edge which immediately adjoins its rear

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edge portion. The lower edge of the upper reflector means and the upper edge of the lower refractor means are coextensive with each other, and as a result of this construction the reflector means is provided with a rear end which will direct light forwardly through the refractor means, so that this latter light is not wasted and is instead available for usefully lighting the street.

The invention is illustrated by way of example in the accompanying drawings which form part of this application in which:

FIG. 1 is a longitudinal sectional elevation which includes the longitudinal center line of the luminaire, this center line extending transversely across the street which is illuminated; and

FIG. 2 is a sectional plan view taken horizontally through the reflector along line 2—2 of FIG. 1 in the direction of the arrows and in particular illustrating the lateral spread of the light so as to avoid a bright area in the street.

Referring now to the drawings, the luminaire 10 of the present invention which is illustrated therein has an optical system which includes a refractor means 12 having a flange 14 which defines an upper edge of the refractor means 12. Situated over and joined to the refractor means 12 is a reflector means 16 which has a lower edge which is coextensive with and joined to the upper edge of the refractor means, and the reflector means and refractor means cooperate to provide an elongated luminaire having a center line 30, as indicated in FIG. 2, extending transversely across the street which is to be illuminated. As is apparent from FIGS. 1 and 2, this luminaire 10 is of an ovate configuration and it accommodates in a conventional manner a mercury lamp L, as shown schematically in FIG. 1.

In accordance with the present invention the upper edge 14 of the lower refractor means 12 has a rear end portion 18 which is downwardly inclined with respect to a portion 20 of the upper edge 14 which immediately adjoins the rear end portion 18. In fact this portion 20 is situated in a plane which makes a predetermined angle with the plane in which the downwardly inclined rear end portion 18 is located. The angle between the planes in which the edge portions 18 and 20 of the upper edge of the refractor means 12 are located is anywhere from approximately 40° to approximately 90°. The particular angle chosen will depend upon the desired angle of end shielding at the right end of the luminaire, as viewed in FIGS. 1 and 2, as well as the particular tilt of the flange 14 in relation to the horizontal. In many luminaire installations, the street end of the luminaire is tilted upwardly approximately 10° so as to direct more light into the street.

The reflector means 16 has a lower edge which is coextensive with and joined to the upper edge of the refractor means, so that the reflector means 16 has at its lower edge a rear end portion 22 which extends along and is joined to the downwardly inclined rear end portion 18 of the edge 14, and in the same way the reflector means 16 has a portion 24 of its lower edge adjoining and extending forwardly from its downwardly inclined rear edge portion 22 and extending along and joined to the forwardly directed upper edge portion 20 of the refractor means 12. Of course, the edge portions 22 and 24 are respectively situated in planes which intersect at the same angle as the planes at which the edge portions 18 and 20 are located, and in fact the planes in which the lower edge of the reflector means 16 is located coincide with those in which the upper edge of the refractor means is situated.

The reflector means 16 has an inner reflecting surface 26 at its rear end provided with a contour, behind the

center of the lamp L, which will spread the light vertically, as shown by the light rays 32 reflected from the rear reflecting surface 26 in FIG. 1, through an angle of approximately 40° to 60° across the street. These angles will depend upon the particular width of the street which is to be lighted. In this way full use is made of light which otherwise would be directed rearwardly at the curb side of the lamp onto the sidewalk into the windows of adjoining houses.

Furthermore, as is particularly apparent from FIG. 2 the inner reflecting surface portions 28 at the rear end of the reflector means 16 behind the center of the lamp L have a curvature which will laterally spread the light so as to avoid a bright area of concentrated illumination in the street.

In an ideal situation none of this latter light should be directed through the beam panels at the sides of the refractor means 12. As a matter of fact substantially all of the light is directed downwardly through portions of the refractor means which are spaced beneath the upper edge portion 20 thereof which extends forwardly from the downwardly inclined rear end portion 22. Thus, practically all of the light goes through the bottom sections of the refractor 12 to permit better control of the light, although in some cases a small amount of light may still pass through the refractor beam panels in the immediate vicinity of the upper edge portion 20 thereof.

Thus, with the luminaire of the present invention, a slant-back construction is provided which greatly increases the efficiency with which the light derived from the lamp L is used.

What is claimed is:

1. In a luminaire, lower refractor means having an upper edge provided with a rear end portion which is downwardly inclined with respect to a portion of said upper edge which immediately adjoins said rear end portion, and upper reflector means located over and joined to said lower refractor means, said upper reflector means having a lower edge coextensive with said upper edge of

said refractor means and also having a rear end portion which is downwardly inclined with respect to a portion of said lower edge which immediately adjoins said rear end portion of said lower edge of said upper reflector means, said downwardly inclined rear edge portion of said reflector means being joined to said downwardly inclined rear edge portion of said refractor means and providing said refractor means with a rear end which blocks illumination rearwardly from said refractor means and instead directs the blocked illumination forwardly through the refractor means, said refractor means and reflector means cooperating to provide a luminaire of ovate configuration, said upper edge of said refractor means and said lower edge of said reflector means being situated forwardly of said rear end portions thereof in a given plane, said rear edge portions being located in a second plane which intersects said given plane at an angle of between approximately 40° and 90°, said reflector means having an inner reflecting surface which at said rear end of said refractor means directs the light forwardly through said refractor means through a vertical range of between approximately 40° and 60°, said reflector means also having at its rear end an inner reflecting surface which spreads the light laterally so as to avoid concentration in the light passing through the refractor means, said reflector means directing substantially all of the light through portions of said refractor means which are adjacent a bottom end thereof spaced from portions of said refractor means which are adjacent the upper edge portion thereof which extends forwardly from said downwardly inclined rear edge portion thereof.

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