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STREET-LIGHTING LUMINAIRE

This application is a continuation of application Ser. No. 581,579, filed Sept. 23, 1966, now abandoned.

This invention relates to street lighting, and more particularly, to luminaires therefor.

It is an object of the invention to provide a luminaire for use in low mounted rail units providing a light distribution which will assist in three-dimensional delineation of automobiles on the highway; assist in eliminating normally downwardly directed direct light from puddling near the luminaire; and will provide a lateral distribution and a compatible vertical distribution which are consonant with roadway brightness and silhouette viewing.

The invention will best be understood with reference to the following description and accompanying drawings in which:

FIGS. 1 and 2 are diagrammatic views of prior art rail units, viewed transversely of the roadway;

FIG. 3 shows a lateral distribution of light achieved by prior art systems; and

FIG. 4 is a diagrammatic view of a luminaire according to the present invention and schematically showing a refractor for use therein, the view is similar to FIGS. 1 and 2, being transversely of the roadway.

Little has been done so far by way of producing scientific distributions from low-mounted rail units. This invention describes a novel lighting system and a prismatic lens to produce it.

Prior art dictated that all light be kept below the horizontal to insure keeping the light out of the motorists' eyes, as shown in FIGS. 1 and 2.

In effect, the prior art system produced a fan of light across the roadway and a few degrees below the horizontal. This has the definite disadvantage that the bottoms of the cars will be well lighted but the tops will be in darkness, so that three-dimensional delineation is poor. Also in the prior art system too much direct light (ray "B") is "puddled" near the unit. This is eliminated in the new system.

Laterally, as shown on the roadway plan view FIG. 3, some prior art systems limited the light to plus or minus a certain angle by louvers or otherwise because in a lens system the bottom elevating prisms such as "a" of FIG. 2 elevate that light going toward the 90° lateral angles to above the horizon into the drivers' eyes. This is unfortunate since the light going toward 90° lateral is the best light from a roadway brightness producing and silhouette seeing standpoint provided it is held below the horizon.

This new system proposes to provide this good near 90° direction light, hold it below the horizon and at the same time across the road in lateral directions, say to around 60°. It proposes to let some light out above the horizontal to light the tops of the cars. The new lens system is described as follows:

In FIG. 4, area "X" turns the light up to beam direction just under the horizontal but, as mentioned before, this light as it fans out toward around 90° will go above horizontal. To avoid this we must limit the light laterally to say around 60° by outside vertical cutoff prisms P<sub>1</sub>.

Also in FIG. 4, area "Y" contains no lifting prisms and is in essence a nonvertically acting zone on the lens. This light can be let directly out without outside laterally limiting prisms so the fan of light will be almost a complete 90° fan. This, then, provides the very useful "near 90° light" so essential for producing good roadway brightness and silhouette seeing.

Also, in FIG. 4, the area "Z" can be assigned to let light out above the horizontal to light the tops of cars for good three-dimensional recognition. Again, if this light were allowed to spread itself to near 90° lateral it would be in the motorists' eyes. We must, therefore, limit this light to say around 60° lateral by the vertical (or essentially vertical) "cutoff" prisms P<sub>2</sub> on the outer surface.

What is claimed is:

1. A refractor for directing light from a light source onto a road comprising a first area, including means for lifting light toward a beam direction just under the horizontal and including cutoff prism means for limiting the lateral distribution thereof to approximately 60°, said refractor including a second area including means for transmitting light with substantially no effect thereupon, over a lateral distribution spread substantially through a plus or minus 90° fan, said refractor having a third area including means for directing light above the horizontal, said last-mentioned area also including means for limiting the lateral spread of light to within approximately 60°.

2. A refractor for directing light from a light source onto a road comprising a first area, including means for lifting light toward a beam direction just under the horizontal and including means for limiting the lateral distribution thereof to approximately 60°, and including a second area including means for transmitting light with substantially no effect thereupon over a lateral distribution spread substantially through a plus or minus 90° fan, and including a third area including means for directing light above the horizontal and said third area further including means for limiting the lateral spread of light to within approximately 60°.

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