United States Patent [19]

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[54] **REFLECTOR FOR LIGHT FIXTURES**

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Related U.S. Application Data

[63] Continuation of Ser. No. 233,620, March 10, 1972, abandoned.

[52] **U.S. Cl.** ..... **240/103 B,** 240/25, 240/41.36

[51] **Int. Cl.** **F21v 7/12**

[58] **Field of Search** ..... 240/103 R, 103 B, 41.35, 240/41.35 C, 51.11 R, 25, 41.36, 41.37

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[57] **ABSTRACT**

Reflector for light fixture, characterized in that it is constituted by juxtaposition of ruled surfaces with a view to permitting the use of a light source of elongate form, which can have small or large dimensions.

1 Claim, 4 Drawing Figures

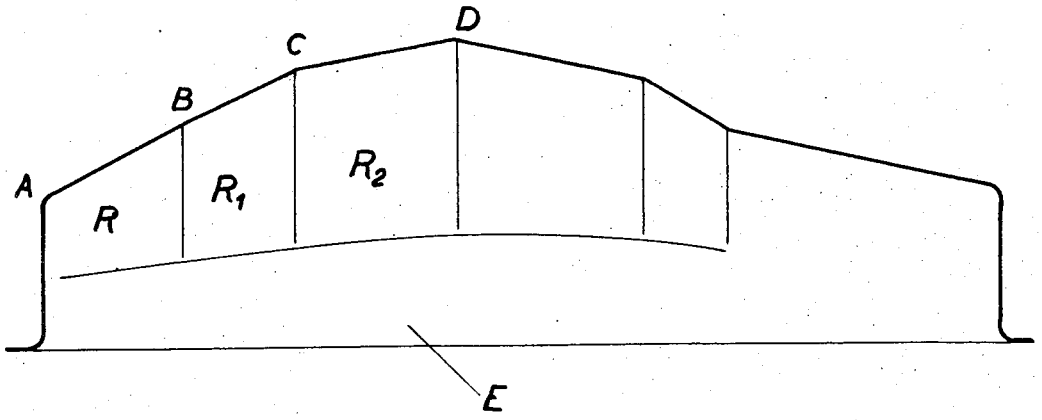
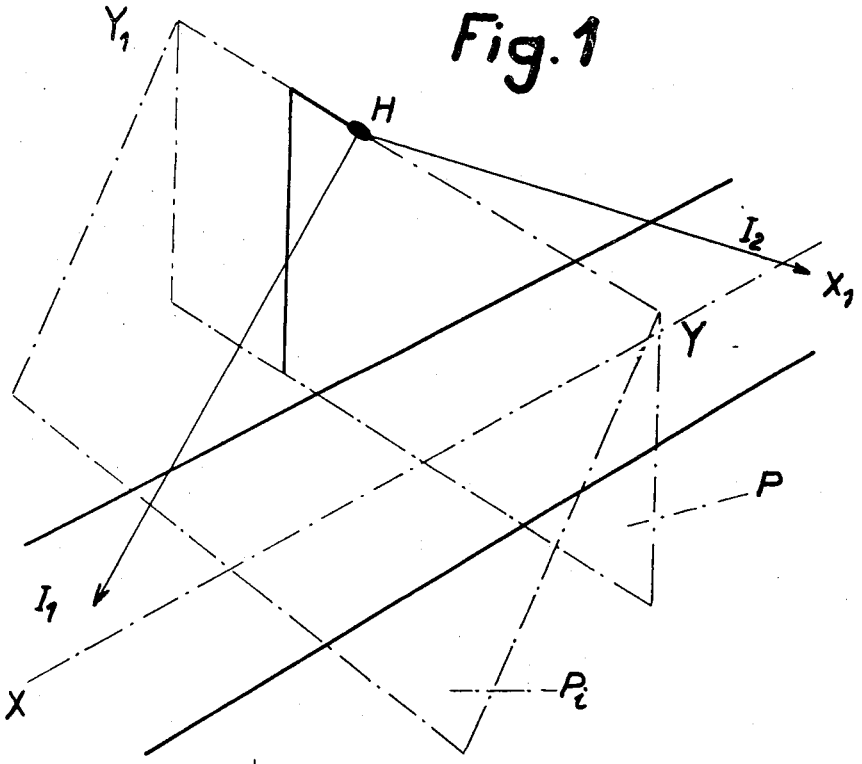


Fig. 1



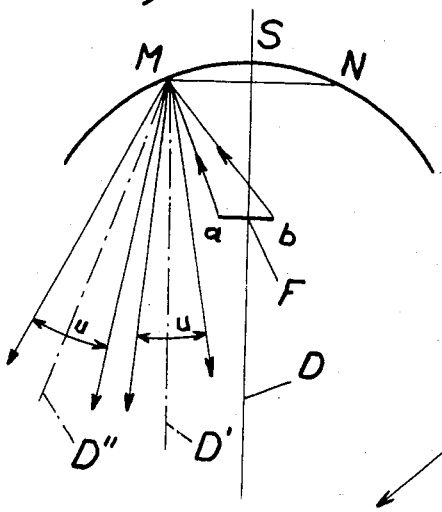


Fig. 2
PRIOR ART

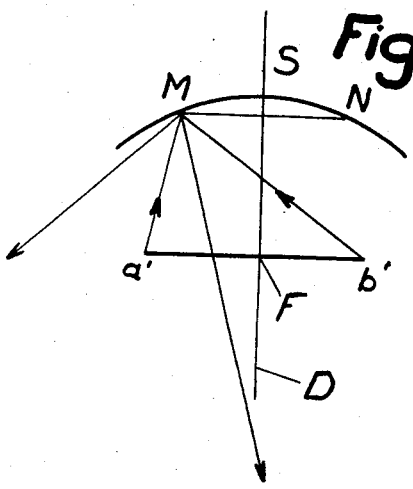
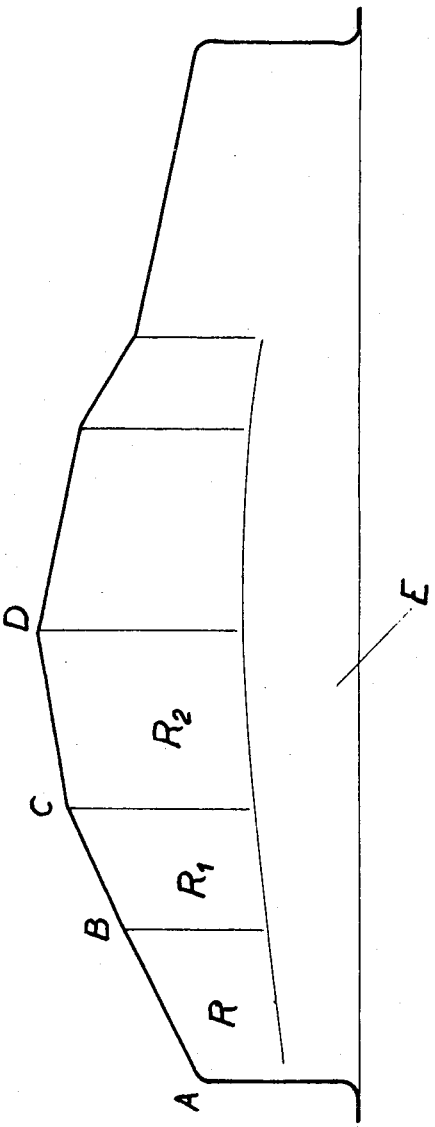


Fig. 3
PRIOR ART

Fig. 4



REFLECTOR FOR LIGHT FIXTURES

The present application is a continuation of my copending prior application Ser. No. 233,620 filed Mar. 10, 1972 now abandoned.

The present invention is concerned with a reflector for light fixtures.

Light fixtures designed for the lighting of elongate surfaces such as public roads, have a light distribution based on a vertical plane of symmetry normal to the longitudinal axis of the road, when the apparatus is disposed on the edge of the latter, and comprises two maximum light intensities extending on either side of said plane toward the longitudinal axis of the road.

It is indispensable that the light distribution give on the ground an appearance of uniformity that is as good as possible for the observer looking in the longitudinal direction of the road.

The means permitting the determination of the reflecting surfaces with a view to obtaining a good light distribution of the light in the longitudinal direction of the road are known; they make use of geometry or analysis.

The light distribution in the transverse direction of the road is, however, linked to the nature of the lamp used, to the position of the latter in the optical system and to the geometric parameters of the latter.

In said plane of symmetry, the curvature of the reflectors commonly used can be compared to a parabola which is to be adapted to the size of the light source used to satisfy the distribution selected, because the angular opening of the beam reflected by a given element of surface of the reflector, and coming from the source, varies as a function of the dimensions of the latter.

The object of the present invention is to provide a reflector whereof the light distribution, for a given position of the source, varies very little as a function of the dimensions of the latter, both in said plane of symmetry and in the half-plane beam limited by the horizontal, passing through the axis of said source.

The following description, made in reference to the drawings attached by way of indicative example only, will clarify the characteristics of the reflector according to the invention.

FIG. **1** shows the mounting of a light fixture at the edge of a road.

FIGS. **2** and **3** are theoretical and diagrammatic views showing a longitudinal section of an ordinary reflector, taken through its plane of symmetry, and,

FIG. **4** is a sectional view analogous to FIGS. **2** and **3** of a reflector according to the invention.

Referring to FIG. **1**, XX_1 is the longitudinal axis of the roadway and that radii H I_1 and H I_2 represent the directions of maximum light intensity with the latter extending on either side of the vertical plane of symmetry P, perpendicular to XX_1.

The reflector must make it possible to obtain good distribution, both in plane P and in half-plane beam P_i, limited by the horizontal line Y Y_1 of plane P passing through the source, and do so, whatever the dimensions of the latter.

Referring to FIGS. **2** and **3**, the curvature of the reflector in one of the planes of beam P P_i is a parabola with apex S, focus F and axis D.

To simplify the problem, it is to be assumed that the source delimited by segment *a b* passes through F and is disposed symmetrically to D.

On the parabola two selected points M and N are disposed, for example, symmetrically to D, and it can be imagined that the segment MN is a linear and rectilinear mirror.

In FIG. **2** it was assumed that the length of the segment M N was greater than that of source *a b*.

The light beam reflected at M by the parabolic element has, as axis, a straight line D′ parallel to D, and as angular opening, an angle *u*, under which, from point M, is seen the source *a b*.

The light beam reflected at M by the rectilinear element has for example a straight line D″ not parallel to D, and for opening, said angle.

In FIG. **3** it was assumed that the length of the segment MN was less than that of the source *a′b′*.It can be demonstrated that the light rays issuing from source *a′b′*,and reflected by M, form beams having the same opening as point M whether point M is considered on the parabola or on the segment of straight line MN, and that the reflected beam contains the directions D′ and D″ defined above.

Referring to FIG. **4**, it can be seen that the observations have led to the embodiment of a reflector whose section through one of the planes of bean P P_i is a polygonal line, whereof each rectilinear element A B, B C, C D etc., is one of the chords of an arc of a parabola determined to insure, in this plane, an adequate photometric distribution for source *a′b′*,the length of each of the said elements A B, B C, C D etc., being formed between that of the smallest source (*ab*) and that of the largest source (*a′b′*), which makes it possible to obtain a good photometric distribution of the flux reflected, whatever the dimensions of the sources.

This reflector, constituted by a juxtaposition of adjusted surfaces R - R_1 - R_2 etc., can therefore be used both with a source of small dimensions of the nature of the type one in which the discharge takes place in a quartz chamber surrounded by a bulb of clear glass, and with a source of larger size of the nature of that in which the quartz chamber is surrounded by a bulb of ground glass or glass coated on the inside with fluorescent substances.

In the half-planes P_i which are most inclined with respect to P, it is necessary, in order that the transverse photometric distribution will correspond to the maximum use coefficient of the focus of the light, that the angular opening of the beams reflected by a given surface element of the reflector, and for a given position of the course, be as small as possible.

With this in mind, and according to another characteristic of the invention, the adjusted surfaces R, R_1, R_2 etc., do not extend to the lower edge of the reflector, but are replaced on each side by a paraboloid element E.

I claim:

1. A luminaire capable of receiving different light sources whose length along an axis may vary between two known values comprising in combination a reflector having a plurality of juxtaposed reflecting surfaces arranged so that the section of said reflector through a set of planes passing through the axis of the light source is a broken line formed by segments of straight lines, each segment forming with the adjacent segment an obtuse angle, said segments being, in each of said sets of planes chords of the arc of a parabola assuring in each plane of the set a good photometric distribution for the light source of a large dimension, the length of each of said chords being greater than the length of the smaller of the two known values and less than the length of the greater of the two known values.

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