Aug. 18, 1925.

1,550,645

C. E. GODLEY

REFLECTOR

Filed Aug. 3, 1922

Fig. 4.

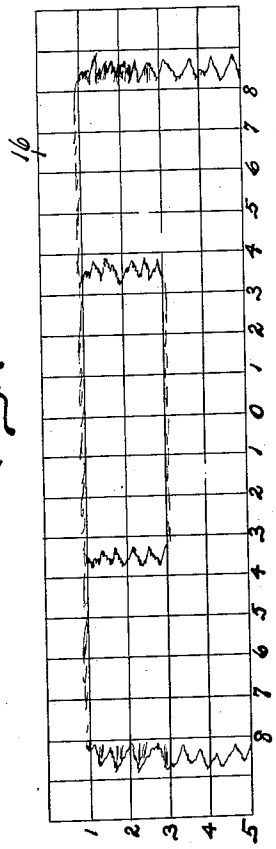


Fig. 1.

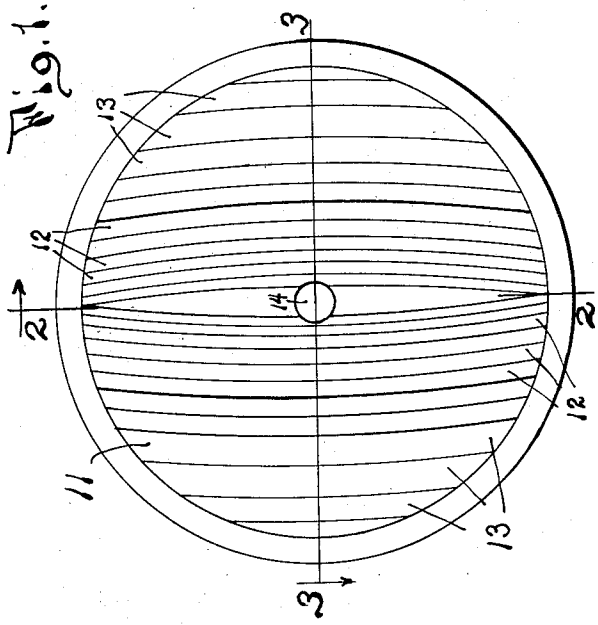


Fig. 3.

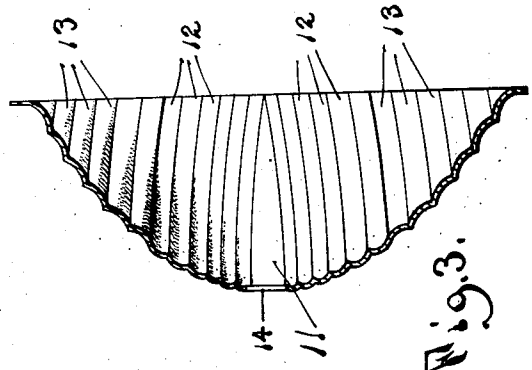
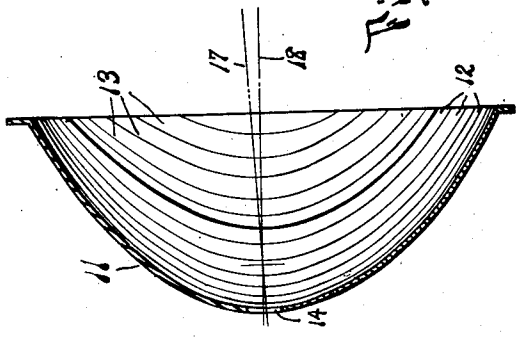


Fig. 2.



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UNITED STATES PATENT OFFICE.

CHARLES E. GODLEY, OF DETROIT, MICHIGAN, ASSIGNOR TO EDMUNDS & JONES CORPORATION, OF DETROIT, MICHIGAN, A CORPORATION OF NEW YORK.

REFLECTOR.

Application filed August 3, 1922. Serial No. 579,358.

To all whom it may concern:

Be it known that I, CHARLES E. GODLEY, a citizen of the United States, and residing at Detroit, in the county of Wayne and State of Michigan, have invented a new and Improved Reflector, of which the following is a specification.

This invention relates to the construction of reflectors for projecting headlamps for vehicles of the general type shown in my prior applications, Serial No. 559204, filed May 8, 1922, and Serial No. 562065 filed May 19, 1922, and this invention has the same object, that is, to so divide the reflector into sections and panels that the rays of light will be projected upon a clearly defined limited area and in part be concentrated upon a restricted portion of said area.

This present invention again employs a simple substantially parabolic reflector which is so deformed that an upper and lower half will project beams of light whose cross sections are similar in shape but different in size, so that a considerable portion of the road in advance of the vehicle will be illuminated to a limited degree while another portion of the roadway which is at a greater distance ahead of the vehicle will be illuminated by a more concentrated beam.

An ordinary paraboloidal reflector is divided into a series of panels which extend transversely to the direction in which the beam is to be expanded, that is, extend substantially vertically and at right angles to the roadway.

These panels are in a series of groups and the panels of several of the groups have their longitudinal medial portions disposed out of and preferably back of the general paraboloidal surface of the reflector, the lateral edges of the panels of said groups remaining in this original paraboloidal surface. The panels of the other groups have their longitudinal medial portions in this original paraboloidal surface but the edges of these panels are disposed out of and back of this surface. The widths of these panels may vary and I prefer those nearer the center of the reflector to be narrower than those farther away, although the depths and widths of these panels and the directions of their curvatures may be varied according to the desired spread of the projected beam, and the relation of the central lines of the panels to the vertical plane passing through the axes of the reflector may be varied according to the direction in which the beam is to be expanded.

If the central lines of the panels of a reflector having a horizontal axis were all in vertical planes, the beams of light would be expanded from circular to elliptical cross-sections with the major axis horizontal, as fully explained in my two prior applications. These panels in the present case are arranged in two groups on each side of the central vertical plane of the reflector and the sides of all the panels on each side of this vertical plane are parallel.

The upper and lower portions of the panels are curved slightly relative to the central vertical plane, so that the projected beam will be changed in cross-section to substantially a horizontal rectangle. I prefer to curve these ends toward said plane.

In the accompanying drawing, Fig. 1, is a front elevation of a reflector embodying the present invention. Figs. 2 and 3 are sections on the lines 2—2 and 3—3 of Fig. 1 respectively. Fig. 4 is a diagram illustrating the effect of the light rays projected by the reflector shown in Figs. 1, 2 and 3.

Similar reference characters refer to like parts throughout the several views.

After the reflector 11 has been formed and polished in the usual manner, it is placed between proper dies and its surface is deformed so as to be divided into panels 12 and 13. Those on each side of the central aperture 14 of the reflector are parallel to each other and the panels 12 on each side of and next to this aperture being narrower than the panels 13 which are farther away, although these widths may be reversed. The upper and lower ends of all the panels curve toward the central vertical plane of the reflector in order to effect the projection of diffused light toward the corners of the main projected field.

The panels 12 are concave and the panels 13 convex relative to the plane of the open end of the reflector. The edges of the panels 12 and the medial lines of the panels 13 are preferably in the general paraboloidal surface of the original reflector. The expansion of the beam of light along the horizontal line 3—3 of Fig. 1 or parallel thereto, will depend upon the comparative depth of the panels and the panels 12 therefore dif-

fuse the light to a much greater extent than do the panels 13. They also serve to expand the beam at right angles to the line 3—3 of Fig. 1, but to a much less extent.

When the light from a reflector 11 is received upon a screen 16 as shown in Fig. 4, it is found that where the rays projected by a parabolic reflector, of the same general size as the reflector 11, are concentrated in a circle whose diameter equals the distance between horizontal lines 2 and 4, the rays projected by the panels 12 are diffused over an area extending between vertical lines 8 and horizontal lines 1 and 5. The rays reflected by the panels 13 are concentrated upon an area of about one half this height and less than one half of this width but these proportions depend upon the depth of the scorings which produce these panels.

When this reflector is used in a headlight of an automobile it is very desirable that that portion of the roadway farthest from the vehicle which should be illuminated shall receive as much light as possible while the roadway between this brightly illuminated portion and the vehicle shall be lighted up sufficiently to permit the driver to watch the roadway. The outer groups of panels 13 are therefore tilted up relative to the two central groups of panels 12 so that the focal axis 17 will form a slight angle to the focal axis 18 of the relatively more deeply corrugated panels 12. The result is that the rays of light from the panels 13 are concentrated on that portion of the screen 16 bounded by vertical lines 3 and horizontal lines 1 and 3.

It is obvious that the various features of this invention may be embodied in a variety of lamps and that reflectors may be constructed according to this invention to produce widely differing degrees of illumination of different portions of the projected field and that the widths of the panels, the depths and directions of the scorings and the relative areas of the reflecting surfaces which have convex and concave panels may be varied by those skilled in the art without departing from the spirit of my invention as set forth in the following claims.

I claim:

1. A paraboloidal reflector whose reflecting surface is scored to produce groups of panels, the panels of the central groups being transversely concave away from the open end of the reflector and the panels of the outer groups being transversely convex toward the open end of the reflector, the portions of the reflector embodying the central groups of panels having a focal axis at an angle to the focal axis of those portions embodying the panels of the other groups.

2. A paraboloidal reflector whose reflecting surface is scored to produce two groups of panels on each side of the central vertical plane of the reflector, the panels of the central groups being transversely concave away from the open end of the reflector and the panels of the outer groups being transversely convex toward the open end of the reflector, the panels on each side of the central vertical plane being parallel to each other and having their ends curved toward said plane, the panels of the inner groups being narrower than those of the outer groups, the portion of the reflector embodying the inner groups having its focal axis at an angle to the focal axis of those portions of the reflector embodying the outer groups, both axes being in the same vertical plane.

3. A paraboloidal reflector whose reflecting surface is scored to produce groups of panels, the panels of the inner groups being transversely concave away from the open end of the reflector and the panels of the outer group being transversely convex toward the open end of the reflector, the edges of the panels of the inner groups and the medial lines of the panels of the outer group being in a paraboloid, the ends of the panels on one side of the center of the reflector being curved toward the ends of the panels on the other side.

4. A parabolic reflector whose reflecting surface is scored to produce groups of panels on each side of a central plane, the panels of one of the groups on each side of the central plane being transversely concave away from the open end of the reflector and the panels of the other groups being transversely convex toward the open end of the reflector, the portions of the reflector embodying the panels which are concave having a focal axis at an angle to the focal axis of those portions embodying the panels which are convex, both axes being in said central plane.

5. A parabolic reflector whose reflecting surface is scored to produce a plurality of groups of panels on each side of a central plane, the panels of one group on each side of the central plane being transversely concave away from the open end of the reflector and the panels of the other groups being transversely convex toward the open end of the reflector, the parts of the reflector on each side of said plane being symmetrical to each other, the ends of said panels being curved toward said plane.

6. A substantially paraboloidal reflector having its surface formed to afford panels extending in the general direction of one meridional plane of the reflector, certain of the said panels being forwardly concaved in transverse section and other panels being forwardly convexed in transverse section, the said convexed panels having a focal axis at an angle to that of the said concave panels.

7. A substantially paraboloidal reflector having its surface formed to afford panels extending in the general direction of one

meridional plane of the reflector, panels near the said plane being forwardly concaved in transverse section, and panels more distant from the said plane being forwardly convexed in transverse section.

8. A substantially paraboloidal reflector having its surface formed to afford panels extending in the general direction of one meridional plane of the reflector, panels near the said plane being forwardly concaved in transverse section, and panels more distant from the said plane being forwardly convexed in transverse section and wider than the said forwardly concaved panels.

9. A substantially paraboloidal reflector having its surface formed to afford panels extending in the general direction of one meridional plane of the reflector, certain of the said panels being forwardly concaved in transverse section and other panels being forwardly convexed in transverse section, all of the said panels presenting bowed edges toward the said plane.

10. A substantially paraboloidal reflector having two sets of formations, one set comprising substantially parallel grooves and the other set comprising substantially parallel ribs, all of the said formations extending in the general direction of a meridional plane of the reflector and the formations comprising one set having their middle portions at different distances from the said plane than their ends.

CHARLES E. GODLEY.