

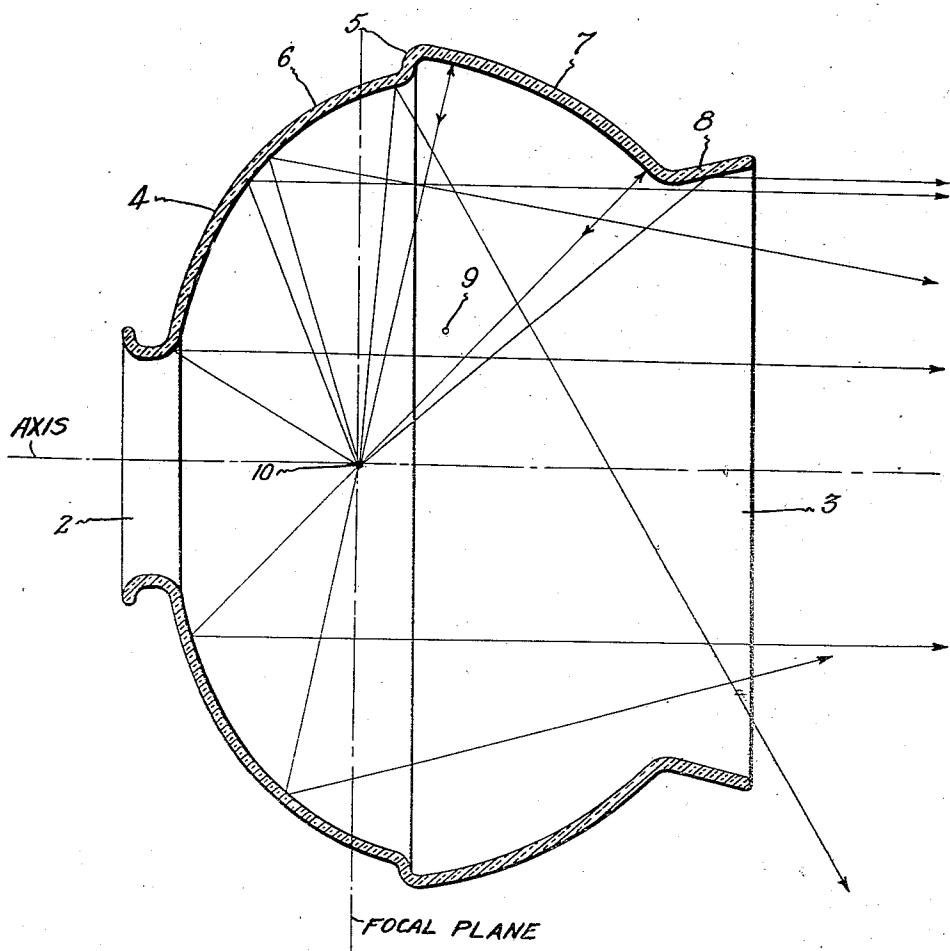
April 30, 1929.

C. A. B. HALVORSON, JR.

1,711,478

LIGHT REFLECTOR

Filed March 18, 1925



Inventor:
Cromwell A. B. Halvorson, Jr.
by
Myron S. Lunt.
His Attorney.

Patented Apr. 30, 1929.

1,711,478

UNITED STATES PATENT OFFICE.

CROMWELL A. B. HALVORSON, JR., OF LYNN, MASSACHUSETTS, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

LIGHT REFLECTOR.

Application filed March 18, 1925. Serial No. 16,552.

My invention relates to a light reflector of a type which is especially adapted for use in traffic signal devices. The invention will be readily understood from the accompanying specification, reference being had to the accompanying drawing in which the figure is a side view of a section of the reflector taken along an axial plane.

Referring more in detail to the drawings, it will be seen that the reflector is provided with a rear opening 2 through which a socket for a light bulb may be inserted. The reflector is also provided with a front opening 3 through which the rays that go to make up the beam from the projector pass forward. The rear portion 4 of the reflector immediately around the opening 2 and extending for some distance therefrom is paraboloidal in form. Beyond the paraboloidal region and extending as far as the ridge 5 the section 6 is spherical. The portion 7 of the reflector to the right of the ridge 5 is also spherical but has a different curvature than the region 6. Beyond the spherical region 7 the flaring portion 8 of the reflector is paraboloidal or it may be a surface of revolution generated by any one of the conics.

The center of curvature 6 of the spherical region along an axial plane I have indicated at the point 9. The point 10, on the other hand, is the focal point for the paraboloidal regions 4 and 8 and the central point of the spherical region 7. The reflector, therefore, as shown in the drawing consists of a surface of revolution formed by revolving a curve about the axis of the reflector, which axis passes through the focal point 10. The curve as shown consists of four conics 4, 6, 7, and 8, three of which, to wit: curves 4, 6 and 8, are so positioned with respect to the focal point that rays originating in the focal point are reflected to the right of the focal plane, while the fourth curve, namely, curve 7, is so positioned with respect to the focal point that the rays originating in the focal point are reflected to the left of the focal plane. The arrows in the figure indicate how the rays that go to make up a beam from a light source located at the point 10 pass out of the reflector. It will be seen that with a reflector of this type a very wide angle of projection is obtained.

It will be understood that whereas I have described my invention in connection with specific construction illustrated I do not wish

to be limited to such specific construction inasmuch as various modifications may be made within the scope of my invention and of the claims herein contained.

What I claim as new and desire to secure by Letters Patent of the United States, is:—

1. A reflector having a reflecting surface in the form of a surface of revolution, said surface being produced by rotating a curve about the axis of the reflector, said curve consisting of four conics, three of said conics facing in one direction with respect to the focal plane of the reflector and the fourth conic facing in the opposite direction with respect to said focal plane, said conics being arranged in the following order from the origin of the surface of revolution, two facing in one direction followed by one facing in the opposite direction and the latter followed by the last facing in the same direction as the first two, the first curve in order being a parabola, the second and third, each the section of a circle, and the fourth a parabola, both parabolas having a common focal point, said circle sections having radii of different lengths.

2. A reflector having a reflecting surface in the form of a surface of revolution, said surface being produced by rotating a curve about the axis of the reflector, said curve consisting of four conics, three of said conics facing in one direction with respect to the focal plane of the reflector and the fourth conic facing in the opposite direction with respect to said focal plane, said conics being arranged in the following order from the origin of the surface of revolution, two facing in one direction followed by one facing in the opposite direction and the latter followed by the last facing in the same direction as the first two, the first curve in order being a parabola, the second and the third, each the section of a circle, and the fourth a parabola, both parabolas having a common focal point, said circle sections having radii of different lengths, the center of curvature of one of said circular sections being located on said axis and the center of curvature of the other section of a circle falling outside of the said axis.

3. A reflector comprising focalizing surfaces of revolution generated about an axis, said reflector being provided with a rear opening and with a front opening, said axis passing through the center of said openings, the rear portion of the reflector formed about

said rear opening with its focalizing surface facing toward the front opening and a front portion of the reflector being formed about the front opening and located with its focalizing surface facing toward the rear opening, said front portion of the reflector flaring toward the rear portion of the reflector and terminating at a plane transverse the axis of the reflector, said rear surface also terminating at the same plane, the diameter of the front portion of the reflector at said plane being greater than the diameter of the rear portion of the reflector at the same plane, the front and rear portions of the reflector bending abruptly to meet each other along said plane and form a ridge about said reflector along said plane, said reflector having a flaring surface about the front opening joining the forward portion of the said front section of the reflector, and the flaring portion of the reflector facing in the same direction as the rear portion of the reflector, the rear surface being part paraboloidal and

part spherical, the front flaring portion being paraboloidal and the front portion next to 25 said plane being spherical.

4. A focalizing reflector having a reflecting surface in the form of a surface of revolution produced by rotating a curve about an axis, said curve consisting of four conics 30 arranged in the following order from rear to front, a parabola, a circle, a second circle and a parabola, said surface having a rear parabolic portion, two spherical portions, one being concentric and the other being eccentric, 35 and a front parabolic portion, said parabola sections and one of said circle sections having a common focal point and the radii of said circle sections crossing each other, the focal point of said other circle section being located 40 outside of the focal point of said parabola sections.

In witness whereof, I have hereunto set my hand this 16th day of March, 1925.

CROMWELL A. B. HALVORSON, JR.