H. S. WILLIAMS.

DIFFUSION LENS FOR ELECTRIC SIGNS AND THE LIKE.

APPLICATION FILED NOV. 15, 1915.

1,190,498.

Patented July 11, 1916.

FIG. 1.

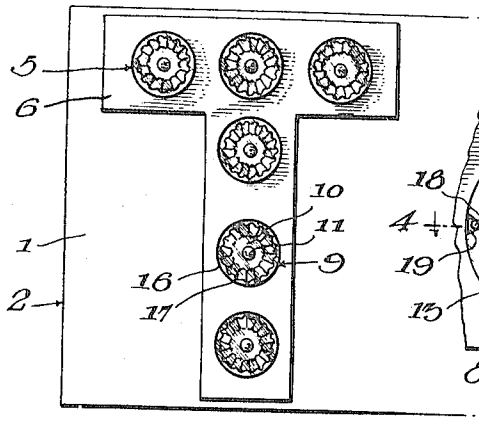


FIG. 3.

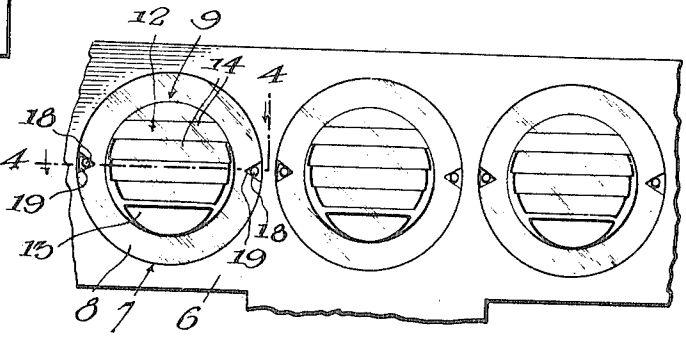


FIG. 2.

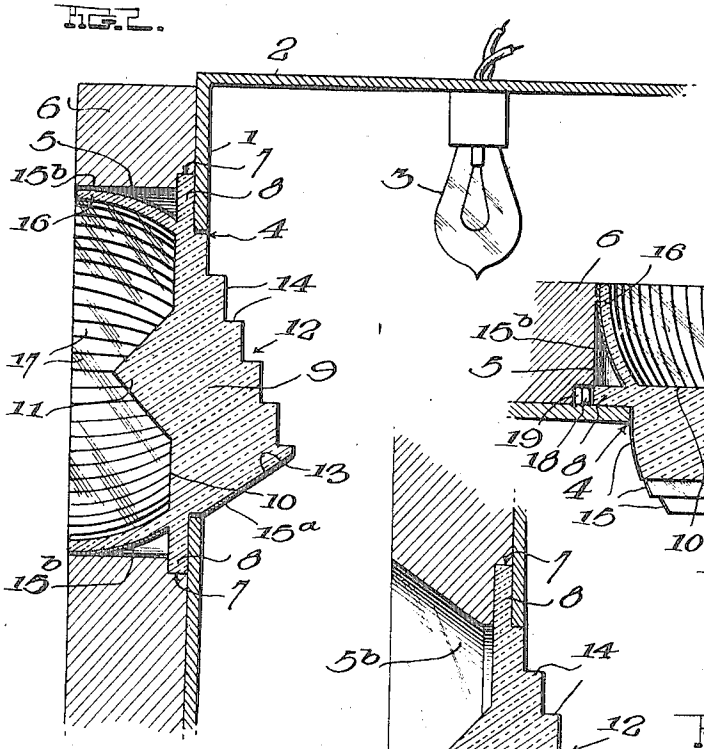


FIG. 4.

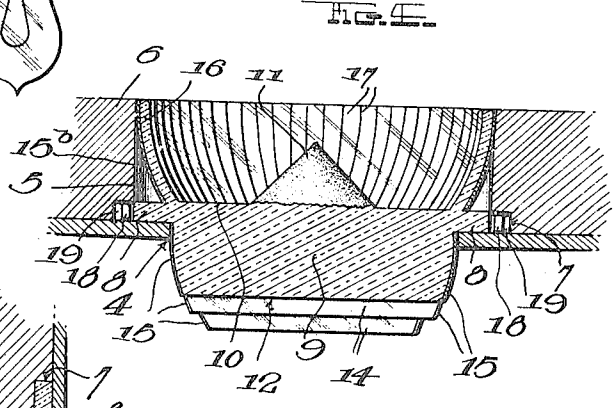
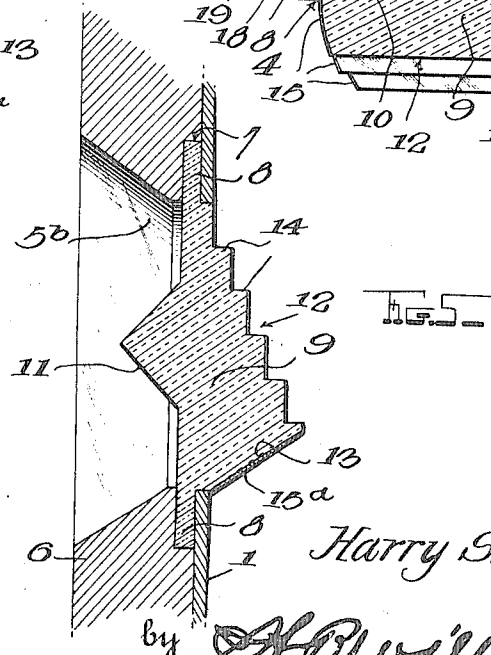


FIG. 5.



Witnesses

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UNITED STATES PATENT OFFICE.

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DIFFUSION-LENS FOR ELECTRIC SIGNS AND THE LIKE.

1,190,498. Specification of Letters Patent. Patented July 11, 1916.

Application filed November 15, 1915. Serial No. 61,658.

To all whom it may concern:

Be it known that I, HARRY STANFORD WILLIAMS, a citizen of the United States, residing at Ithaca, in the county of Tompkins and State of New York, have invented certain new and useful Improvements in Diffusion-Lenses for Electric Signs and the like; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in lenses for use upon electric signs and analogous illuminating devices, and the object of the invention is to provide a simply constructed and inexpensive device of this class which will effectively diffuse the light rays from the interior of a box or casing to give not only an attractive but efficient illumination on the face of the sign.

With this general object in view, the invention resides in certain novel features of construction to be hereinafter fully described and claimed, the descriptive matter being supplemented by the accompanying drawing which constitutes a part of this application and in which:

Figure 1 is a front elevation of a portion of an electric sign equipped with one type of the improved lens; Fig. 2 is a vertical transverse section through a part of the sign box and one of the letters on the face thereof, showing a vertical section of one of the lenses; Fig. 3 is a rear elevation of a part of one of the letters and the lens applied thereto; Fig. 4 is a horizontal section as seen on the plane of the line 4—4 of Fig. 3; and Fig. 5 is a sectional view similar to Fig. 2, illustrating the application of a different type of lens.

In specifically describing the invention shown in the drawings above briefly described, similar reference characters will be placed on corresponding parts throughout the several views in such drawings, and reference will be herein made to the numerous parts by their respective indices.

To this end the numeral 1 represents the front plate of a sign box 2, the latter having therein one or more sources of light 3 usually in the form of electric lamps, while the plate 1 has formed therein a plurality of circular openings 4 which register with other circular openings 5 formed through raised letters or the like 6 on the front of said plate, the diameters of the openings 5 being increased at their rear ends as shown at 7 to provide annular grooves for the reception of retaining flanges yet to be described.

Inserted through the openings 4 and having outstanding annular flanges 8 adjacent their front ends which project into the grooves 7, is a plurality of lens bodies 9 formed of transparent glass, such bodies being of substantially cylindrical formation and having flat front ends 10 equipped at their centers with outstanding cones or the like 11 which are rendered translucent by grinding or frosting. The rear end of the body 9, however, consists of two surfaces 12 and 13 which recede rearwardly in respect to the front face 10 and converge in a rearward direction from diametrically opposite points on the curved side of the body 9, the surface 12 being of considerably greater length than that indicated at 13 and being formed with a number of parallel steps 14 designed to bend the rays of light from the sources 3 and to project such rays through the lens.

For intensifying the strength of the rays of light and at the same time diffuse such rays as they are projected through the lens, a reflecting medium 15 is applied to the curved side of the body with its active surface facing the center of said body, while an additional reflecting area 15^a is applied to the surface 13, said area also having its active surface disposed inwardly.

Extending forwardly from the front end of the body 9 at the outer edge thereof, and gradually increasing in diameter from its rear to its front end, is a circular glass reflector 16 to whose outer surface a reflecting medium 15^b is applied with its active surface positioned inwardly to reflect the rays projected through the lens, the inner side of the reflector 16 being preferably corrugated as shown at 17.

By constructing the lenses in the manner above described, the numerous letters or the like will be effectively illuminated and

the appearance of such letters will be greatly enhanced to such an extent as to render the entire sign extremely conspicuous and attractive.

It will be obvious that in order to remove or replace any of the lenses, it is simply necessary to detach the letters upon which the alterations must be made, this being allowed by suitable connections between such letters and the face plate 1. When the lenses are applied, they are held against rotation by pins 18 projecting from the numerous letters 6 into notches 19 formed in the edge of the outstanding annular flanges 8.

In Fig. 5, a slightly different type of lens is shown. In this view, all features of construction are the same as those previously described with the exception that rather than form the reflector 16 directly on the lenses, the wall of the opening 5^b in the letter is gradually increased in diameter toward its front end, and the wall of such opening is painted with white enamel or covered with other suitable material which will serve to intensify the light rays.

From the foregoing description, taken in connection with the accompanying drawings, it will be obvious that the object of the invention has been attained and that further description and exposition is therefore unnecessary. In the drawings, certain specific features have been shown for the attainment of probably the best results, and I have herein described such features, but obviously a number of changes might well be made within the scope of the invention as claimed without sacrificing any of the advantages thereof.

I claim as my invention:

1. A lens comprising a substantially cylindrical transparent body whose rear end is positioned obliquely of its axis and stepped, and a reflecting medium surrounding the curved side of the body and having its active surface facing the center of said body.

2. A lens comprising a substantially cylindrical transparent body whose rear end is formed by a pair of joined surfaces converging rearwardly from diametrically opposite points on the curved side of the body, one of said surfaces being stepped, and a reflecting medium covering the other surface and the curved side of the body, said medium having its active surface facing the center of said body.

3. A lens formed of strictly transparent material and having a flat circular front end through which light rays may pass freely, said front end being provided at its axis with an outstanding frosted cone formed integrally therewith.

4. A lens formed of strictly transparent material having a flat front end through which light rays may pass freely, said end being provided at its edge with a circular reflector extending forwardly therefrom and increasing in diameter from its rear to its front end, and an outstanding frosted cone formed integrally with said front end of the lens at the axis thereof.

5. A lens comprising a substantially cylindrical transparent body whose rear end is positioned obliquely of its axis and stepped, a reflecting medium applied to the curved side of the body and having its active surface facing the center of said body, and a circular reflector extending forwardly from the front edge of the lens and increasing in diameter from its rear to its front end.

6. A lens comprising a substantially cylindrical transparent body whose rear end is positioned obliquely of its axis and stepped, a reflecting medium applied to the curved side of the body and having its active surface facing the center of said body, the front end of the lens being flat and being provided with a central outstanding translucent cone, and a circular reflector extending forwardly from the front edge of the body and increasing in diameter from its rear to its front end.

7. A lens comprising a substantially cylindrical transparent body whose rear end is formed of a pair of joined surfaces converging rearwardly from diametrically opposite points on the curved side of the body, one of said surfaces being stepped, a reflecting medium applied to the other surface and to the curved side of the body, said medium having its active surface facing the center of said body, and a circular reflector extending forwardly from the front edge of the body and increasing in size from its rear to its front end.

8. A lens comprising a substantially cylindrical transparent body whose rear end is formed of a pair of joined surfaces disposed in a plane converging rearwardly from diametrically opposite points on the curved side of the body, one of said surfaces being stepped, a reflecting medium applied to the other surface and to the curved side of the body, said medium having its active surface facing the center of said body, a circular reflector extending forwardly from the front edge of the body and increasing in diameter from its rear to its front end, and a translucent cone projecting forwardly from the center of the aforesaid front end of the body.

9. A lens comprising a substantially cylindrical transparent body whose rear end is formed by a pair of joined surfaces disposed in planes converging rearwardly from diametrically opposite points on the curved

side of the body, one of said surfaces being stepped, and a reflecting medium applied to the other surface, said medium having its active surface facing the center of said body.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HARRY STANFORD WILLIAMS.

Witnesses:

HAZEL M. DODGE,

HELEN E. LINDSLEY.