

W. H. GOLDSON.
PRISMATIC LENS.

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989,244.

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Fig. 1.

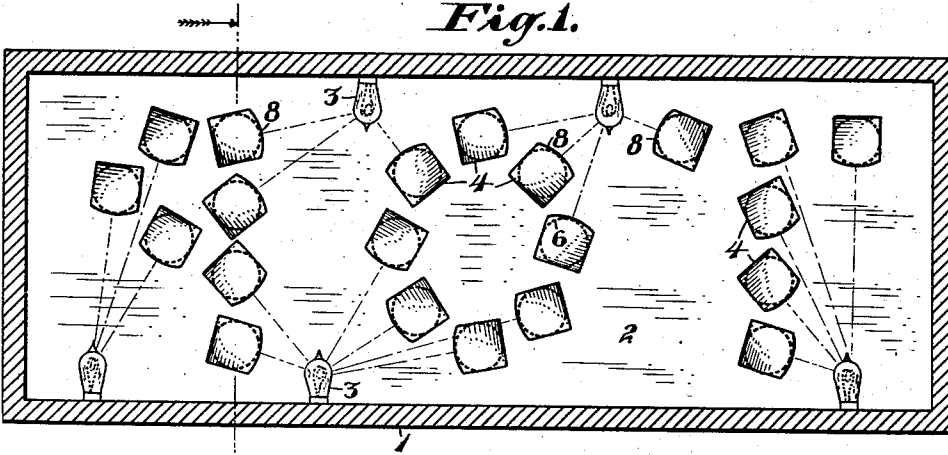


Fig. 2.

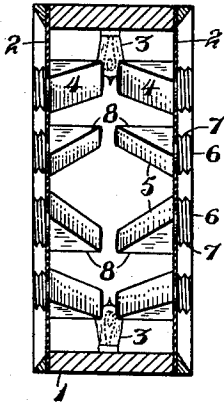


Fig. 3.

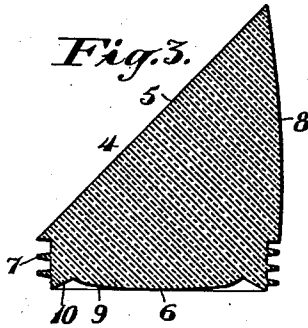


Fig. 4.

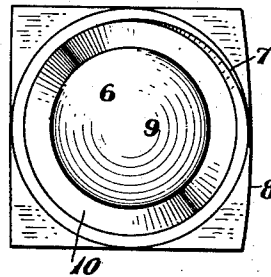


Fig. 5.

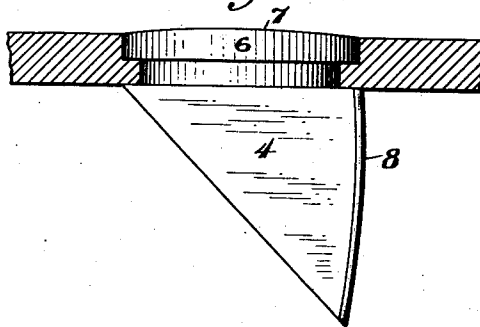
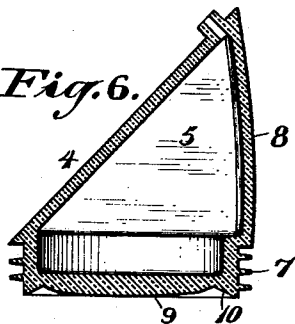


Fig. 6.



WITNESSES:

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PRISMATIC LENS.

989,244.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM HENRY GOLDSON, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented new and useful Improvements in Prismatic Lenses, of which the following is a specification.

The object of my invention is to provide a prismatic lens adapted both to reflect and to concentrate rays of light.

My improved device may be used very advantageously for illuminated signs of that class in which lenses, forming the outline of the sign, are placed in the sides of a closed box, the interior of which is illuminated, as by electric lamps. They may also be used advantageously as sidewalk lenses, and in any case in which it is desired to reflect in a substantially horizontal direction rays of light coming from above.

In the accompanying drawing, Figure 1 is a vertical longitudinal section of an illuminated sign in which my improved lenses are used; Fig. 2 is a vertical cross section thereof; Fig. 3 is an enlarged cross section of the device taken through the center of the lens portion thereof; Fig. 4 is a front view of the device; Fig. 5 is a side view of a modified form of the device suitable for sidewalk lenses; Fig. 6 is a sectional view showing a modified construction of the device.

Referring to the drawing, 1 indicates a closed box having its longitudinal sides 2 formed of sheet metal. At suitable position in the interior of the box are arranged incandescent lamps 3.

4 indicates my improved prismatic lens, and it consists of a prismatic portion 5 and a lens portion 6 formed in one piece. The periphery of the lens portion is threaded as shown at 7 so that it can be screwed from the inside into a round hole in the side of the box with the lens on the outside of the box and can be turned about the axis of the lens to any position. The prismatic portion of the device is contained within the box. The angles of the prism are respectively 86° , 47° , and 47° . The prism therefore differs slightly from the ordinary 45° or total reflection prism, the receiving face 8 of the prism being inclined slightly backward from perpendicularity to the side of the prism connected with the lens. By reason of this slight inclination prisms may be used in both sides of the box and receive and re-

flect the light effectively from incandescent lamps placed in the middle of the box, as shown in Fig. 2. If the face 8 were exactly perpendicular to the lens, then in order for the prism to act effectively it would be necessary that the electric lamp be placed close to the side of the box to which the prism is attached, and it would therefore be necessary to have two sets of lamps, one for each side of the box. By the above form of prismatic lens I am enabled to use only one set of lamps.

By making the prismatic angle 86° , substantially the whole of the light received by the prism is transmitted through the lens. However, inferior results may be obtained with a prismatic angle differing not more than 5° on either side of 86° , but, beyond this limit, the prismatic lens would be worthless for the purposes described, since substantially no light would then be transmitted through the lens portion.

A great advantage of my improved form of prismatic lens is that, whatever be the position of the lens in the box with reference to the incandescent lamp, it can be turned as shown in Fig. 1 so that the receiving face of said prism shall be substantially at right angles to the rays of light proceeding from the lamp, which rays of light are thereby reflected by the oblique face of the prism outward through the box in a direction parallel to the axis of the lens portion thereof. I am thus enabled to use a comparatively small number of lamps in the box. A further improvement in my prismatic lens resides in the form of the receiving side of the prism, which is not flat, as is usual but convex and therefore concentrates the rays of light transmitted through said prismatic lens.

The lens portion of the device is formed with a central convexly curved surface 9, and an annular conical surface 10 flaring outward. The lens portion is therefore in the nature of a Fresnel lens such as are used in light-houses, and is therefore well adapted to concentrate the rays of light passing through the prism.

An important feature of the construction is that the side of the prismatic portion of the prismatic lens, by which it is joined to the lens portion thereof is in form and size substantially a square having a side not less than the diameter of said lens portion. It results from this that substantially no part

of the light received through the prismatic portion is cut off, but the whole of it is transmitted through the lens portion.

The radius of curvature of the convexly curved face 8 of the prismatic portion is the same as that of the central portion 9 of the lens portion and depends upon the size of the hole in the box. For a hole having a diameter of $1\frac{1}{8}$ inches the radius of curvature of these convexly curved surfaces should be 11 inches. In this case the whole of the light received through the prismatic portion of the lens is transmitted through the lens portion and the whole of the lens portion is illuminated. If the opening in the box were larger, or the radius of curvature were smaller so that the rays of light transmitted would be too much concentrated, then they would not illuminate the whole of the lens portion of the device. On the other hand if the opening in the box were smaller or the radius of curvature were larger then some of the rays of light would be cut off, not being able to pass through said opening.

Fig. 5 shows a modified form of the prismatic lens for use in sidewalk lights. In this case the neck of the lens is not threaded.

Fig. 6 indicates a modification of my invention in which the prismatic lens is made hollow for reasons of economy. In use it is filled with distilled water or some other transparent liquid.

I claim:

1. In combination with a box and a source of illumination in said box, means for transmitting the light from said source to the outside of said box, comprising prismatic lenses, each consisting of a lens portion and a prismatic portion made in a single piece, the prismatic angle being slightly less than a right angle, substantially as described.

2. In combination with a box and a source of illumination in said box, means for transmitting the light from said source to the outside of said box, comprising prismatic

lenses, each consisting of a lens portion and a prismatic portion made in a single piece, said prismatic lenses being arranged at different locations in the side of the box and with the receiving faces of the prisms directed toward the source of illumination, substantially as described.

3. In combination with a box and a source of illumination in said box, means for transmitting the light from said source to the outside of said box, comprising prismatic lenses, each consisting of a lens portion and a prismatic portion made in a single piece, the receiving faces of the prismatic portions being convexly curved, substantially as described.

4. In combination with a box and a source of illumination in said box, means for transmitting the light from said source to the outside of said box, comprising prismatic lenses, each consisting of a lens portion and a prismatic portion made in a single piece, the side of the prismatic portion by which it is connected to the lens portion having a width not less than the diameter of said lens portion, substantially as described.

5. A prismatic lens comprising a prismatic portion and a lens portion having its periphery threaded, substantially as described.

6. A prismatic lens comprising a prismatic portion and a lens portion made in a single piece and hollow, substantially as described.

7. A prismatic lens comprising a prismatic portion and a lens portion, the face of the lens portion being formed with a central circular convex portion and an annular conical portion flaring outward, substantially as described.

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

WILLIAM HENRY GOLDSON.

Witnesses:

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