350-452 SR
E297A XR 1,483,636
240
106.1

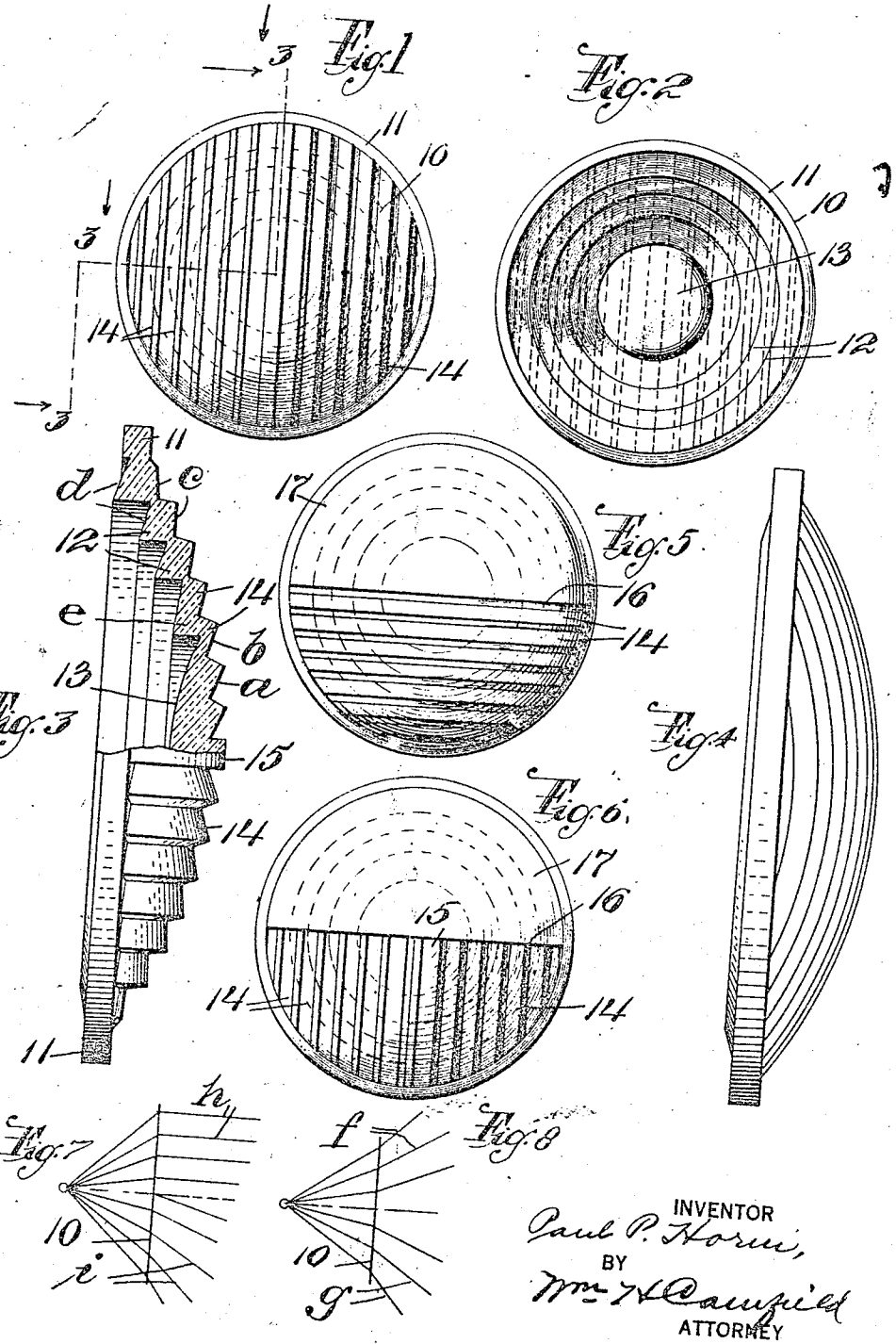
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Feb. 12, 1924.

P. P. HORNI 1,483,636

LENS

Filed Dec. 7, 1922



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UNITED STATES PATENT OFFICE.

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LENS.

Application filed December 7, 1922. Serial No. 605,430.

To all whom it may concern:

Be it known that I, PAUL P. HORNI, a citizen of the United States, and a resident of Newark, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Lenses, of which the following is a specification.

This invention relates to an improved lens and is of the type that is particularly adapted for use in traffic signals and similar situations where a strong but diffused light is desired, so that it is well adapted for a daylight signal, in that even in sun light it appears sharply outlined as a luminous body rather than as a glaring light.

The invention is also designed to provide a lens which is easily and cheaply manufactured and which, with slight modifications, can show a luminous translucent effect sharply at various distances from the lens.

The invention is illustrated in the accompanying drawing, in which Figure 1 is a front view of a lens made according to my invention, and Figure 2 is a back view of the lens shown in Figure 1. Figure 3 is an enlarged view, one-half of it being shown in section on line 3—3 in Figure 1. Figure 4 is a top view of the lens shown in Figures 1, 2 and 3. Figures 5 and 6 are front views showing modified forms of the front face of the lens, and Figures 7 and 8 are diagrammatic views illustrating the difference in functioning between the structure shown in Figure 1 and those shown in Figures 5 and 6.

The lens 10 is made preferably so that it is of generally concavo-convex form, the lens having a rim portion 11 of the usual form by means of which it is attached to a frame or bezel. The inner face of the lens, that is, the concave face, is formed with a series of concentric annular refractory prisms 12, these prisms extending substantially to the rim of the lens, the center of the face being occupied by a bull's-eye or rounded bulged portion 13.

On the outer or convex face of the lens I arrange a series of straight parallel refractory prisms 14, the center of the lens being preferably formed into a rib 15 which extends across the center of the lens and defines the starting point from which these straight parallel refractory prisms extend to the edge of the lens, and I find that I get the best effect by graduating the straight prisms so that they have a greater angle toward the center of the lens, that is, the angle at *a* is greater than the angle at *b*, and so on to the edge, where the least angle is at the outermost of said faces or prisms, indicated at *c*.

The contrary is carried out on the inside or annular ribs, in that the outer prism *d* has a greater angle than the innermost of the prisms at *e*, these annular prisms being graduated so that they have a greater angle toward the rim of the lens.

This form of lens, shown in Figures 1, 2, 3 and 4, when placed in front of the source of light, as is usual in traffic towers and posts, switch signals and the like, shows a circular luminous body to the eye and has no glare, but is calculated to be easily discerned and call attention when lighted, even as a daylight signal when used in the sun.

In some situations it is necessary to provide such luminous body effect directly in front of the signal and also to one side, as in traffic posts where it is necessary to place such posts a little out of the line of travel of the vehicles in one direction. In this case I extend the straight parallel ribs only to one-half of the lens, as shown in Figure 6, these ribs being at right angles to the line of division shown at 16, the rest of the outer face of the lens being of a generally spherical curvature.

The upper part or smoothly curved part 17 will direct rays straight ahead and in diffused form, and the lower part of the lens will direct rays to the two sides of the lens, as shown in diagram at *f* and *g* in Figure 8, which diverging of rays or diffusing of light is similarly carried out over the entire surface of the lens shown in Figure 1.

Another form of lens is shown in Figure 5, in which, from the line of division 16 on the outer face of the lens, the prisms 14 extend parallel with such line of division, this arrangement being particularly desirable where the rays travel substantially straight ahead from the upper part of the lens, as shown in Figure 7 at *h*, which, in traffic signals, warns the drivers of those vehicles most distant from the signals, which is very advantageous in such places where the lights are being changed constantly, and the lower ribs or prisms 14 direct the rays downward, as shown at *i* in Figure 7, so that those closest to it will be attracted by the signal.

This form of lens is particularly desirable where a distant point is to be notified of a

change of signal so as to make a similar change, as, for instance, in streets where traffic is started and stopped simultaneously at widely separated points in the same street.

I claim:

A lens of generally concavo-convex form, the concave face having a central bull's-eye and a series of concentric annular refractory prisms, the convex face having a series of straight parallel refractory prisms, the annular prisms being graduated so that those nearest the rim have a greater angle than those nearest the centre, the straight prisms being graduated so that those nearest the centre have a greater angle than those nearest the rim.

In testimony that I claim the foregoing, I have hereto set my hand, this 29th day of November, 1922.

PAUL P. HORNI.