

(Model.)

J. W. CLOUD.

LENS.

No. 325,656.

Fig. 1. Patented Sept. 8, 1885.

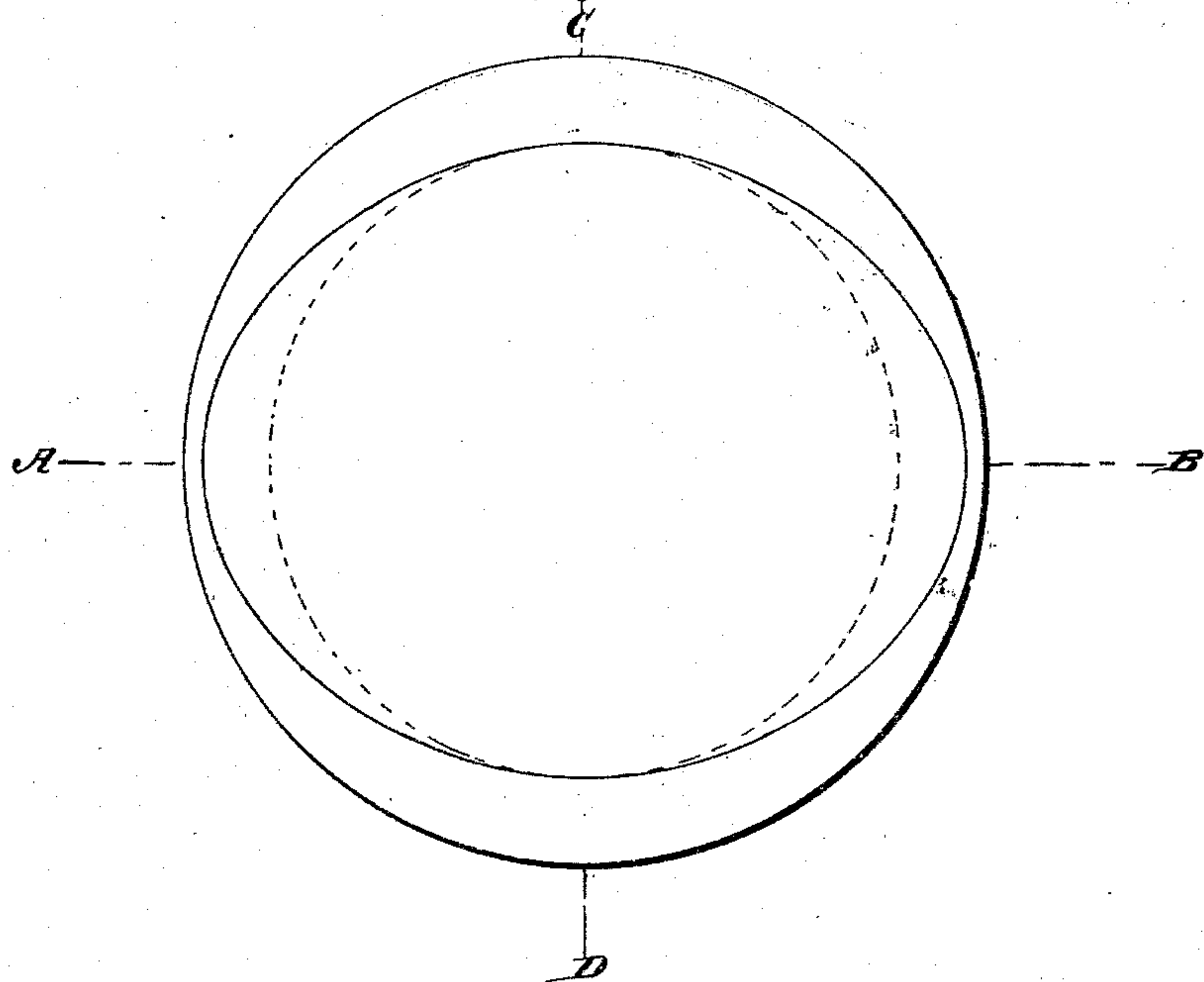


Fig. 2.

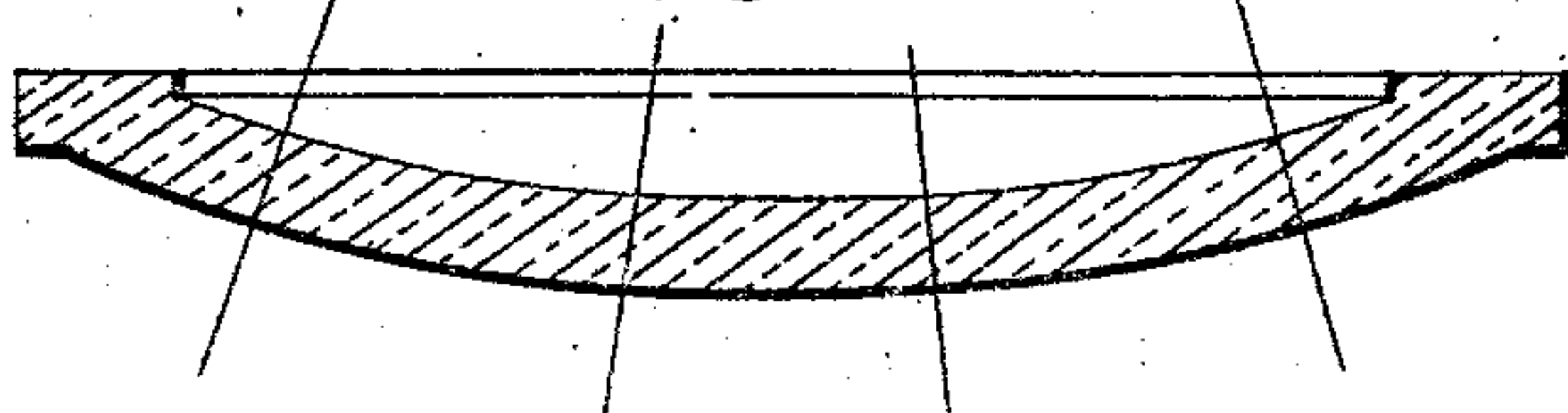


Fig. 3.

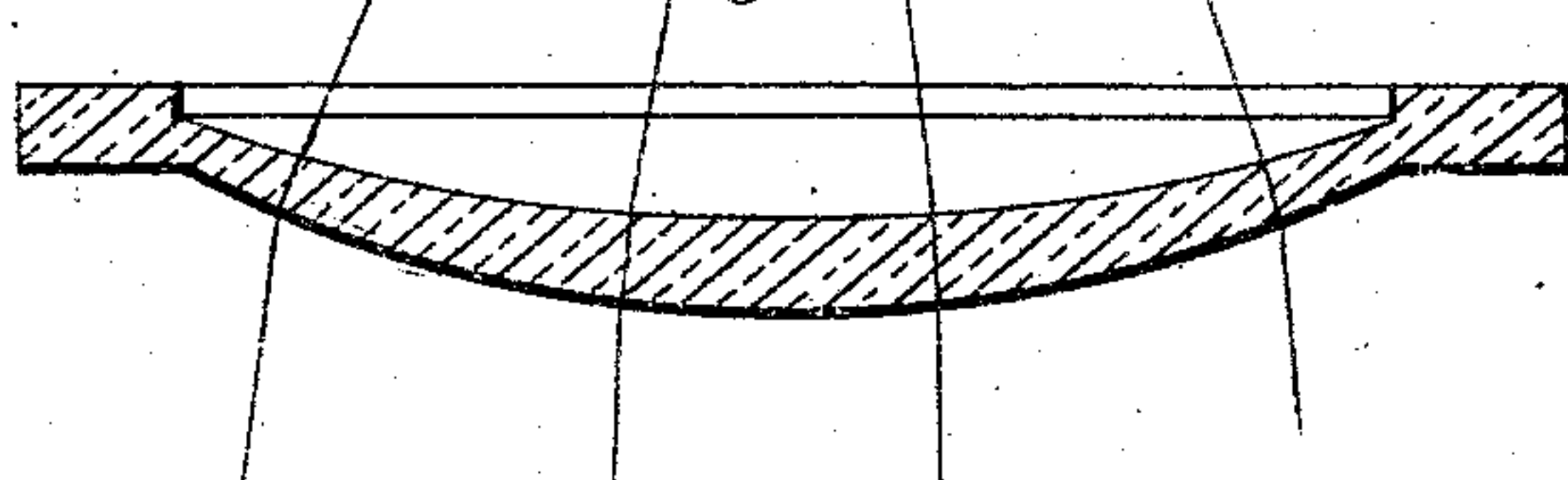
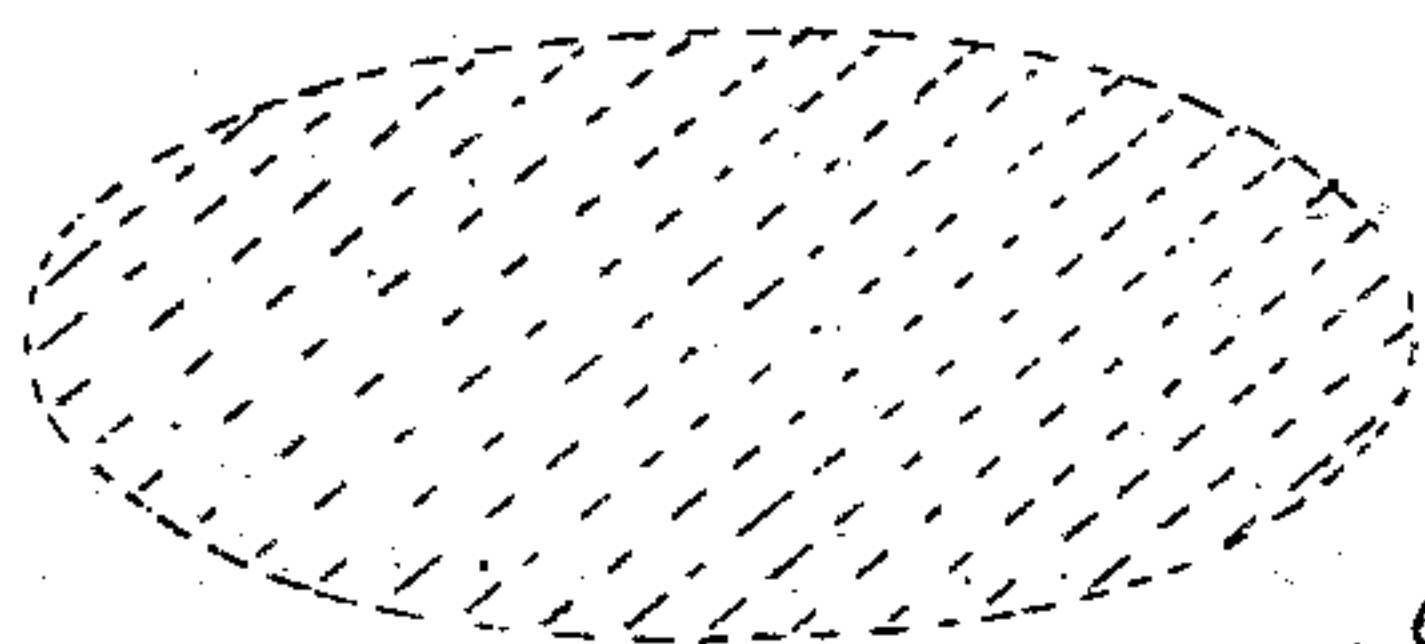


Fig. 4.



Witnesses.
Robert Orvatt,
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Atty.

UNITED STATES PATENT OFFICE.

JOHN W. CLOUD, OF ALTOONA, PENNSYLVANIA, ASSIGNOR OF ONE-THIRD
TO CHARLES F. HOUGHTON, OF CORNING, NEW YORK.

LENS.

SPECIFICATION forming part of Letters Patent No. 325,656, dated September 8, 1885.

Application filed July 8, 1885. (Model.)

To all whom it may concern:

Be it known that I, JOHN W. CLOUD, of Altoona, in the county of Blair and State of Pennsylvania, have invented certain new and useful Improvements in Lenses; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to lenses adapted to service on railways, or for any purpose where signal-lights are required, where it is desirable to cast the rays of light in a widened form in a horizontal direction; and the novelty consists in the construction, form, arrangement, and adaptation of parts, as will be hereinafter more fully set forth, and particularly pointed out in the claims.

The object of my invention is to produce a lens of such shape that when a source of light is placed behind it the beam of light will be widened out into a band whose cross-section will be greater in one direction than in the direction at right angles thereto. I form the lens of two curved surfaces, the inner being concave and a section of the surface of a sphere, and the outer being convex and a section of the surface of a flattened spheroid.

The invention is illustrated in the accompanying drawings, which form a part of this specification, and in which—

Figure 1 represents a front view showing the outline of the convex surface in full line and of the concave in dotted line. Fig. 2 is a section taken on the line A B of Fig. 1. Fig. 3 is a section taken on the line C D of the same figure, and Fig. 4 represents the cross-section of the beam of light produced.

Upon the section A B the surfaces are ap-

proximately concentric with each other, and transmit the rays without refraction, as seen in Fig. 2; but the surfaces upon the section C D differ from each other sufficiently to refract the rays on leaving the lens, so that they become nearly parallel on leaving the lens, as seen in Fig. 3.

The combination of the spherical concave and spheroidal convex surfaces will cause the refracting substance to be of uniform thickness in the cross-section A B, but of varying thickness, being thicker at the center in the cross-section C D, the first not causing refraction, but the second causing the rays to be refracted toward each other, thereby producing the result desired. The beam of light so produced is of an elliptical cross-section, and is represented by Fig. 4. The inner surface may be perfectly flat and same effect produced.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A lens having a concave spherical surface and a convex spheroidal surface, arranged and adapted to serve substantially as shown and described, and for the purposes set forth.

2. A lens having a concave surface in form of a section of a sphere, and a convex spheroidal surface, whereby two cross-sections of the lens at right angles are made different from each other, in one the thickness being uniform and in the other being thickest at the center, thereby causing the beam of light, after passing through the lens, to be of elliptical cross-section, as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

JNO. W. CLOUD.

Witnesses:

SAMUEL PORCHER,
PAUL KREUZPOINTNER.