No. 801,935.

E. A. TRAPP.

PATENTED OCT. 17, 1905.

LENS.

APPLICATION FILED NOV. 7, 1904.

T2274

Fig. 1.

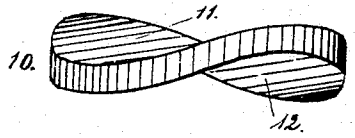


Fig. 2.

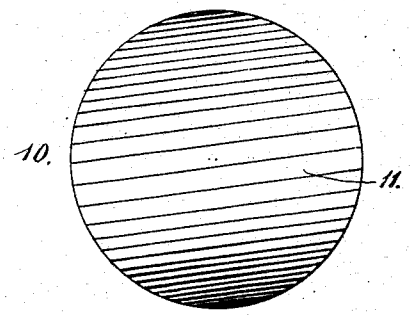


Fig. 3.

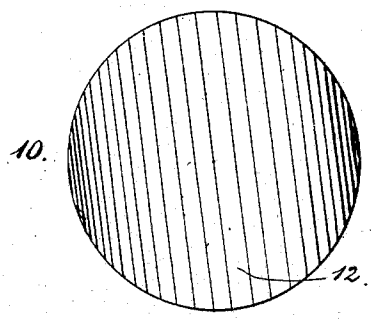


Fig. 4.

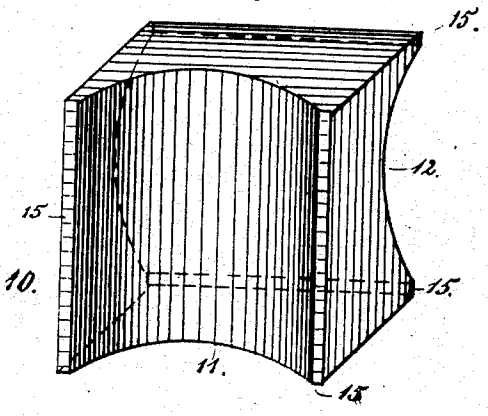
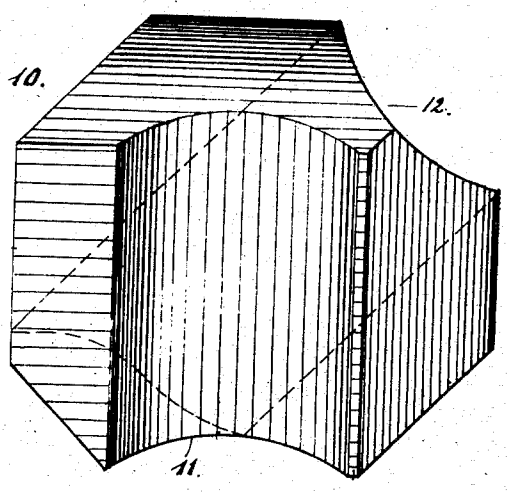


Fig. 5.



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LENS.

No. 801,935. Specification of Letters Patent. Patented Oct. 17, 1905.

Application filed November 7, 1904. Serial No. 231 677.

To all whom it may concern:

Be it known that I, EDWARD A. TRAPP, a citizen of the United States, and a resident of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Lenses, of which the following is a specification.

The invention relates to improvements in lenses for optical instruments—such as telescopes, opera-glasses, cameras, and the like—and pertains to a novel form or construction of objective or collecting lens for use in such instruments.

The purpose of my invention is to provide an efficient objective-lens of novel form and in one integral piece and capable of being manufactured at the minimum trouble and expense; and my invention consists in what I designate a "double cylindrical concave lens," the cylindrical concavities extending entirely across the opposite faces of the lens and preferably at right angles to each other. When the aforesaid cylindrical concavities extend at a right angle to each other, the image will be refracted in proper relative proportions; but if I should desire to produce a distorted image or refraction—such, for instance, as a freak picture—I would run the said concavities across the opposite faces of the lens at an angle other than a right angle to each other.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is an edge view of a lens embodying my invention. Fig. 2 is a top view of same. Fig. 3 is a bottom view of same. Fig. 4 is a perspective view of a lens of rectangular outline and also embodying my invention, and Fig. 5 is a perspective view of a lens for reflecting an image in distorted or freak form.

The preferred form of the lens is shown in Figs. 1, 2, and 3, in which the lens (designated by the numeral 10) is shown as of circular-edge outline and having equal cylindrical concave opposite faces, the concavities (numbered 11 12, respectively) extending entirely across the opposite faces of the lens and at a right angle to each other and the lens being in one integral piece.

I have discovered that a lens of the character just described will efficiently perform the duties of an objective-lens, and aside from its efficiency and other characteristics I regard the lens as important in view of its cheapness of manufacture, the ease with which the lens may be made true with the center lines of the concaves crossing each other at right angles, the fact that the images are refracted in proper relative proportions and without distortion, and the further fact that the rays passing through the lens extend at right angles to the face of the lens.

Fig. 4 is presented to indicate that the lens may be of polygonal instead of circular outline, with the concavities 11 12 extending across the same and at a right angle to each other. The flat edge surfaces 15 (shown on the lens presented in Fig. 4) are left to receive the means by which the lens may be mounted in an instrument, it being intended that the mounting means shall cover said surfaces 15.

In Fig. 5 I illustrate a lens in which the concave surfaces 11 12 do not extend at a right angle to each other and which would only be useful in refracting an image in distorted or freak form.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The lens having cylindrical concave opposite faces, the concavities extending at an angle to each other; substantially as set forth.

2. The lens having cylindrical concave opposite faces, the concavities being equal and extending at a right angle to each other; substantially as set forth.

3. The lens having cylindrical concave opposite faces, the concavities being equal and extending at an angle to each other; substantially as set forth.

4. The lens in one integral piece having cylindrical concave opposite faces, the concavities being equal and extending at a right angle to each other; substantially as set forth.

Signed at New York city, in the county of New York and State of New York, this 5th day of November, A. D. 1904.

EDWARD A. TRAPP.

Witnesses:
CHAS. C. GILL,
ARTHUR MARION.