

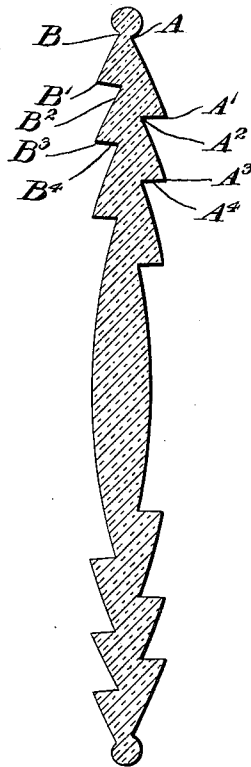
W. CHURCHILL.

LENS.

APPLICATION FILED FEB. 3, 1910. RENEWED MAR. 8, 1912.

1,033,781.

Patented July 30, 1912.



Witnesses

Albert L. Krey

H. Strauss

William Churchill Inventor

By *Vernon M. Dorsey*
Attorney

UNITED STATES PATENT OFFICE.

WILLIAM CHURCHILL, OF CORNING, NEW YORK, ASSIGNOR TO CORNING GLASS WORKS, OF CORNING, NEW YORK, A CORPORATION OF NEW YORK.

LENS.

1,033,781.

Specification of Letters Patent.

Patented July 30, 1912.

Application filed February 3, 1910, Serial No. 541,837. Renewed March 8, 1912. Serial No. 682,515.

To all whom it may concern:

Be it known that I, WILLIAM CHURCHILL, a citizen of the United States of America, and a resident of Corning, county of Steuben, State of New York, have invented certain new and useful Improvements in Lenses, of which the following is a specification.

A type of lens now in common use for projecting light in railway semaphores, consists of a disk having a convex front face, and a corrugated rear face formed by concentric zones, properly formed to obtain the desired refraction, the concentric zones being united by miters. While this reduces the thickness of the glass materially over what it would be were a plano-convex lens employed a considerable loss of light results from the fact that the light falling on the miters is so refracted as to pass out of the lens at too great an angle to be capable of use, the extent of such loss varying directly with the surface presented by the miters but amounting in some case to twenty per cent. With the usual type of such lens, the extent of such surface can only be reduced at the expense of the thickness of the glass, which is of course undesirable.

My invention has for its object to provide a construction of the corrugated lens which avoids the defects pointed out and this I accomplish by corrugating both the rear and front faces thereof, the zones being preferably arranged in alternations on the two faces, whereby with the same refractive power I am enabled to reduce the height of the rear miters without increasing the mass of glass in the lens.

Referring to the accompanying drawings, which represent a lens in diagrammatical section, when constructed in accordance with this invention, the rear face of the lens consists of a series of concentric zones A—A',

A²—A³, etc., the adjacent zones being connected by the miters A'—A², A³—A⁴, while the front face of the lens consists of a similar series of zones B—B', B²—B³, connected by the miters B'—B², B³—B⁴, etc., the zones of one face being placed opposite the miters on the other face, and the general spherical curvature of the overlapping zones being so calculated to conjointly give the desired refraction. By this means the depth of the rear miters may be decreased by more than half what they would be with a smooth face lens of the same general properties, thus effecting a similar decrease in the light losses on the miters. The presence of the miters upon the front face does not occasion a corresponding loss, for the reason that such miters are disposed parallel with the course of the refracting rays adjacent thereto, whereas the rear miters are, due to necessities of manufacture, so disposed as to be at a considerable angle to the divergent rays from the source impinging on those parts of the rear surface of the lens at which they are respectively situated. Moreover the conjoint use of front and rear corrugations results in a reduction in the size of the steps formed by the zones and consequent reduction of the danger of breakage.

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

The herein described lens having both faces formed by a series of substantially spherical zones united by miters, the miters on two faces alternating with each other and the miters on the front face being located substantially parallel with the source of the refracted rays adjacent thereto.

WILLIAM CHURCHILL.

Witnesses:

MARION A. WHITLOCK,
R. H. CURTIS.