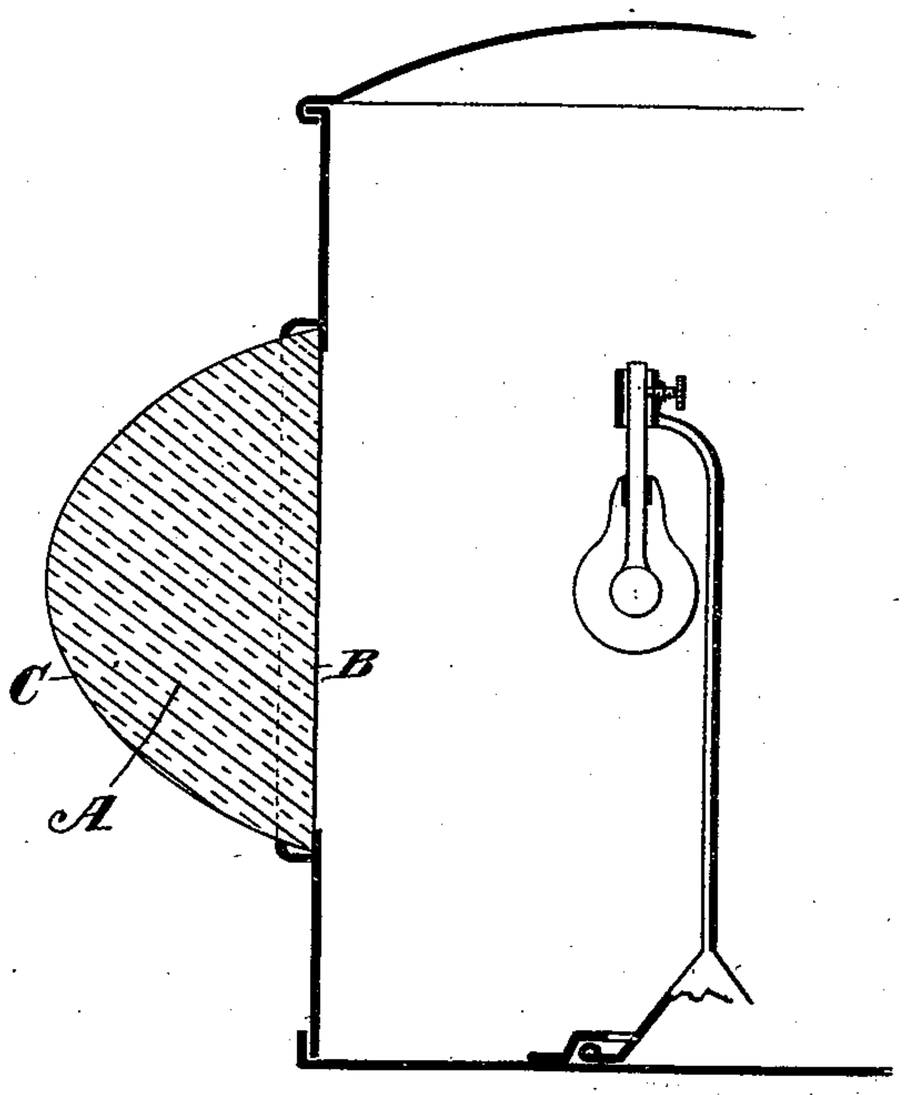
(Model.)

J. THORNE & E. B. BURR.

LENS FOR SIGNAL OR OTHER LAMPS.

No. 446,304. Patented Feb. 10, 1891.



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UNITED STATES PATENT OFFICE.

JAMES THORNE AND EBENEZER BANTON BURR, OF LONDON, ENGLAND;
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LENS FOR SIGNAL OR OTHER LAMPS.

SPECIFICATION forming part of Letters Patent No. 446,304, dated February 10, 1891.

Original application filed July 2, 1888, Serial No. 278,744. Divided and this application filed January 26, 1889. Serial No. 297,642. (Model.) Patented in England February 12, 1887, No. 2,262; in Belgium April 30, 1888, No. 81,377, and in France June 8, 1888, No. 189,824.

To all whom it may concern:

Be it known that we, JAMES THORNE, merchant, and EBENEZER BANTON BURR, engineer, subjects of the Queen of Great Britain, and both residents of London, England, have invented a new and useful Improvement in Lenses for Signal and other Lamps, (for which we have obtained patents in Great Britain, No. 2,262, dated February 12, 1887; in France, No. 189,824, dated June 8, 1888, and in Belgium, No. 81,377, dated April 30, 1888,) of which the following is a specification.

The objects of our invention are to provide a lamp that will project in one approximately parallel beam the available rays emanating from the source of the light, and to provide for intensifying the light in the lamp designed to project a divergent beam. These objects we accomplish by means of the peculiar construction of lens, as hereinafter described and claimed, reference being made to the accompanying drawing, in which the figure is a central vertical sectional view showing the lens mounted in the frame of a lamp, which may or may not be such as is described in our application filed July 2, 1888, Serial No. 278,744, of which the present application is a division.

Heretofore spherical lenses have usually been employed with reflectors for the purpose of concentrating the rays from a source of light—for example, in the signal-lamps for railway and other purposes. In some instances parabolic reflectors have been used, generally without a lens, as in the well-known projectors or search-lights, though sometimes with a lens of spherical form. Moreover, it has heretofore always been considered necessary that in order to increase the illuminating power of a lamp a lens should be used in combination with a reflector. Now we have discovered that by employing a solid lens A, of which the interior surface B is plane and the exterior surface C is so curved in one sweep as to give an approximately parallel beam from a point we can without a reflector attain results in respect of the concentration of the rays and the intensity of the projected beam which exceed the results heretofore attained in these respects with the ordinary spherical lenses and reflectors. The curvature of the exterior surface C of the lens should for this purpose be parabolic or in the form of a paraboloid.

In carrying out our invention, therefore, we dispense with a reflector and use a single lens, of which the interior surface B is plane, and the exterior surface C of which has the form of a paraboloid, as above described, so that the said lens will utilize all or nearly all the available rays emanating from the source of light—that is to say, will convert these rays into an approximately parallel beam. The said lens is placed at a greater or less distance from the light, according to the dimensions of the lens. Moreover, in a lamp provided with an improved lens, as above described, instead of the shape of light or flame of the lamp being visible through the lens, as in lamps heretofore constructed, the lens presents the appearance of an illumined disk, the light having substantially the same brilliancy over the entire area of the lens, and the lamp throws out a beam of intense light, which can be seen at a great distance from the lamp. We thus obtain much better results than heretofore with respect to the intensity of the beam projected from the lamp.

Our improvements are applicable to all kinds of lamps which require lenses or reflectors, whether oil, gas, electricity, or other illuminating agent be used therein. It will thus be seen that we are enabled to replace the parabolic reflector used in the well-known "search-light" by a parabolic lens that is much more easily kept clean and performs precisely the same function. Moreover, a lamp provided with the parabolic lens instead of a reflector is capable of having a lens placed on each side, and may in this way be used as a railway signal-lamp in both directions.

It will be understood that with the source of light placed at a fixed distance from the lens the concentration of the rays is regulated by the curvature of the parabolic surface. Thus the more nearly it is desired to bring the rays to a parallel beam the greater must

be the curvature of the parabolic surface. From this it will also be understood that any variation in the distance between the source of light and the lens can also be compensated for by varying the curvature of the lens.

What we claim is—

1. A lamp provided with a solid lens, one surface of which is flat or plane and the other surface of which is a paraboloid, substantially as described.

2. A lamp having no reflector and provided with a solid lens of plano-parabolic form which will project the light in one approximately parallel beam, substantially as described.

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