(No Model.)

# G. H. EATON.

## OPERA, FIELD, OR MARINE GLASS.

No. 381,347. Patented Apr. 17, 1888.

Fig: 1.

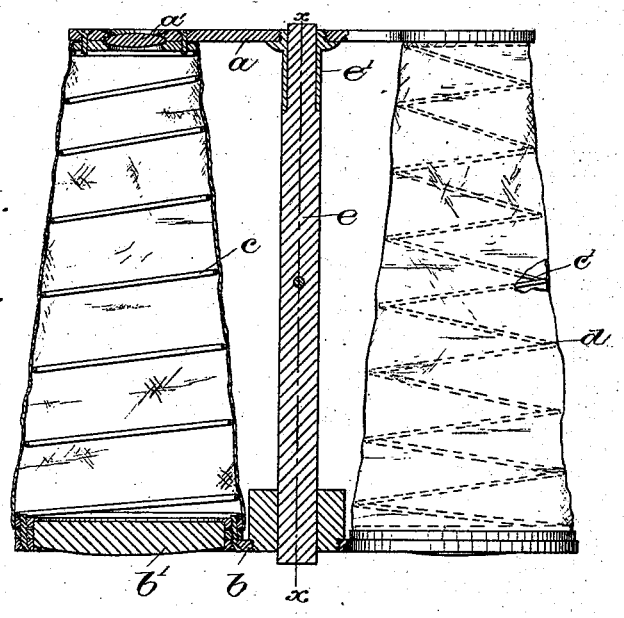


Fig: 2.

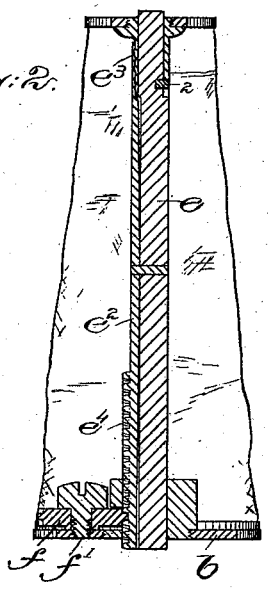


Fig: 3.

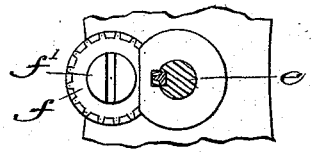


Fig: 4.


Fig: 5.


Witnesses.
Howard F. Eaton.
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# UNITED STATES PATENT OFFICE.

GEORGE H. EATON, OF BOSTON, MASSACHUSETTS.

## OPERA, FIELD, OR MARINE GLASS.

SPECIFICATION forming part of Letters Patent No. 381,347, dated April 17, 1888.

Application filed November 21, 1887. Serial No. 255,776. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE H. EATON, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Opera, Field, or Marine Glasses, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to construct an opera glass which may be collapsed to occupy very small space.

In accordance with this invention the two lens-holding plates are joined one to the other by spiral springs, the normal tendency of which is to move the two lens-holding plates from each other. The spiral springs are enveloped or inclosed by a suitable textile or flexible covering. The glass is provided with an adjusting device, preferably detachable, by which the two lens holding plates may be adjusted with relation to each other and be held in adjusted position. The adjusting device referred to is herein shown as a rod or bar adapted to pass through an opening in one of the lens-holding plates and to engage the other of the said plates, the said rod or bar having a key or spline to prevent its rotation, and also having a series of diagonal teeth which are engaged by a spirally-toothed wheel, the rotation of which actuates the rod or bar to move the two lens-holding plates toward or from each other.

Figure 1 shows in elevation and partial section an opera-glass embodying this invention; Fig. 2, a vertical section of the opera-glass taken on the dotted lines *x x*, Fig. 1; and Figs. 3, 4, and 5, details of the adjusting device to be referred to.

The plate *a*, of suitable shape and having openings to receive the eye-lenses *a'*, and the plate *b*, of suitable shape and having openings to receive the lenses *b'*, are joined one to the other by spiral springs *c c'*, the normal tendency of which is to move the two lens-holding plates *a b* from each other. Each spiral spring *c c'* is enveloped or inclosed in a suitable textile or flexible covering or casing, *d*, which may be attached to the successive convolutions of the spring.

The lens-holding plate *b* is provided with an opening through which passes an adjusting device, herein shown as a rod or bar, *e*, and the lens-holding plate *a* is provided with a socket, *e'*, which receives the end of the rod *e*. The rod *e* is provided with a key or spline, $e^2$, which enters an opening or passage communicating with the rod-receiving opening in the lens-holding plate *b*, to thereby prevent rotation of the rod, but permit of a vertical movement only. The key $e^2$ is extended at its upper end outside of the socket *e'*, and such extension is provided at its inner side with a series of teeth, as at $e^3$, (see Fig. 2,) which engage a serrated or toothed portion of the said socket, thereby serving as an attaching or engaging device for the rod *e* to connect it with the lens-holding plate *a*. The rod *e* is also provided with a stud, 2, which enters an opening in the lower end of the socket *e'*, for the purpose of preventing rotation of the said rod. The rod *e*, or, as herein shown, the key $e^2$ of said rod, is provided at its lower end with a series of diagonal teeth, $e^4$, (see Figs. 2 and 5,) which are engaged by a spirally-toothed wheel, *f*, pivotally connected with the lens-holding plate *b* by a screw or stud, *f'*, rotation of the said spirally-toothed wheel *f'* effecting a vertical movement of the rod *e*, to thereby move the lens-holding plates *a b* toward and from each other.

It will be seen that by rotating the wheel *f* the rod *e* may be moved to adjust and hold the lens-holding plates at any desired distance with relation to each other, and, furthermore, the rod *e* may be readily detached or withdrawn from the lens-holding plates, permitting them to be pressed toward each other, and when placed in a case will thereafter lie contiguous to each other, occupying very small space, so that the glass may be carried in the pocket much easier than ordinary opera-glasses known to me.

I do not desire to limit my invention to the particular form or construction of adjusting device, as it is obvious the same may be modified somewhat and yet contain the principal features of this invention.

The invention is also applicable to field and marine glasses, so that I do not desire to limit myself to opera-glasses.

I claim—

1. In an opera, field, or marine glass, the

two lens-holding plates *a b*, combined with two spiral springs, as *c c'*, one end of each spring being connected with one of the lens-holding plates, and the opposite end of each spring connected with the other lens-holding plate, and a covering for said springs, substantially as described.

2. In an opera, field, or marine glass, the two lens-holding plates *a b* and two spiral springs, *c c'*, attached at each end to the lens-holding plates, combined with the rod *e*, adapted to engage one of the lens-holding plates, and made movable through the other, and means, substantially as described, for moving the said rod *e* in the direction of its length only, as and for the purpose set forth.

3. In an opera, field, or marine glass, the two lens-holding plates, the flexible connections by which they are joined one to the other, combined with the rod *e*, passing through one of the lens-holding plates, and having at one end an attaching or engaging device to engage the other lens-holding plate, a series of teeth, $e^4$, and a toothed wheel, *f*, substantially as and for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE H. EATON.

Witnesses:

BERNICE J. NOYES,

B. DEWAR.