

(No Model.)

G. H. EATON & J. L. PATCH.
COLLAPSIBLE OPERA GLASS.

No. 463,660.

Patented Nov. 24, 1891.

Fig: 1.

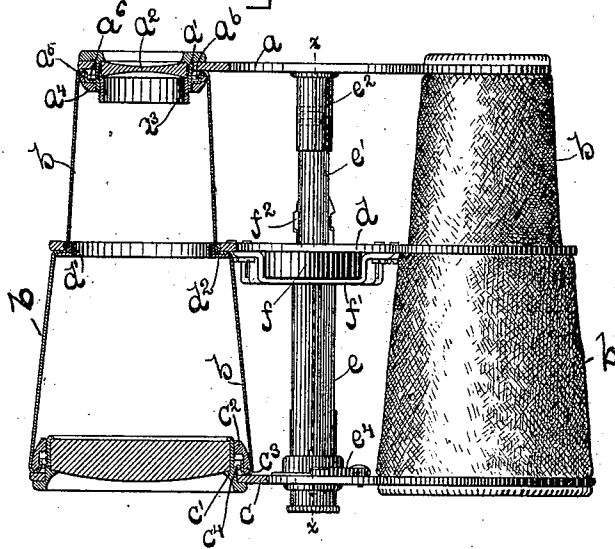


Fig: 2.

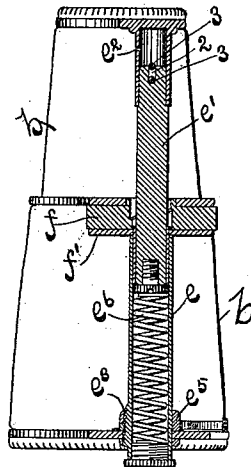


Fig: 4.

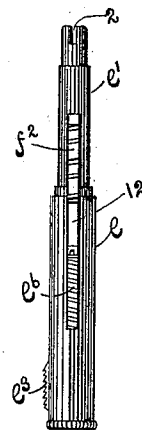
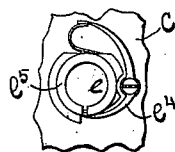


Fig: 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

GEORGE H. EATON AND JOHN L. PATCH, OF BOSTON, MASSACHUSETTS;
SAID PATCH ASSIGNOR TO SAID EATON.

COLLAPSIBLE OPERA-GLASS.

SPECIFICATION forming part of Letters Patent No. 463,660, dated November 24, 1891.

Application filed June 13, 1891. Serial No. 396,103. (No model.)

To all whom it may concern.

Be it known that we, GEORGE H. EATON and JOHN L. PATCH, both of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Collapsible Opera-Glasses, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.
This invention has for its object to improve the construction of collapsible opera-glasses.

Our invention comprehends the employment of two lens-holding plates and an intermediate plate and flexible tapering tubes, as cloth or equivalent material, attached to and held by said plates, and a detachable extensible post or support adapted to be interposed between the lens-holding plates, and an adjusting device for adjusting the length of said post or support, whereby the lens-holding plates may be held at any desired distance apart to thereby change the focus.

Figure 1 shows in side elevation and vertical section a collapsible opera-glass embodying this invention; Fig. 2, a vertical section of the device shown in Fig. 1, taken on the dotted line $x x$; Figs. 3 and 4, details to be referred to.

The plate a , made of metal and of suitable shape, has two holes through it, which, as herein shown, are adapted to receive thimbles a' , which contain lenses a^2 , held therein by bushings a^3 . Rings a^4 are screwed or otherwise secured to the thimbles a' , each of which rings has an upwardly-extended flange a^5 , over which one end of the tapering flexible tube b , of cloth or other suitable material, is drawn. A spring-acting ring a^5 is placed within each flange a^5 of the rings a^4 , acting to hold the flexible material in place. The rings a^4 are turned on the thimbles until the flanges a^5 thereof press the material firmly against the under side of the lens-holding plate a . The other lens-holding plate c has two holes through it similar to the lens-holding plate a , and in said holes thimbles c' are placed which receive and hold the lenses. Rings c^2 are screwed or otherwise secured to said thimbles, having flanges c^3 , over which are drawn the opposite ends of the flexible

tubes b , the material being held in place by the spring-acting rings c^4 , and said rings c^2 being turned on the thimbles until the flanges c^3 press the material firmly against the plate c .

A plate d , placed midway between the lens-holding plates a and c , has two holes through it like said lens-holding plates a and c , which receive the tubular flexible material b , said material at such point being firmly and securely attached to the plate d by the wire-like rings d' and the flanged clamping-rings d^2 .

A detachable extensible post or support is interposed between the lens-holding plates a and c , passing through a hole in the plate d , said post or support being composed of the tubular or hollow stem e and the stem e' movable telescopically within the stem e . The upper end of the stem e' is adapted to fit snugly in a socket e^2 , attached to the inner or under side of the lens-holding plate a . The stem e' is slotted at its upper end, as at 2, to receive a cross-bar 3, secured diametrically in the socket e^2 , to thereby keep the stem e' from rotating, and the tubular or hollow stem e has arranged on it exteriorly at or near its extreme end a series of ratchet-teeth e^3 , and a pawl e^4 (see Figs. 1 and 3) is pivoted to the inner side of the plate c , the engaging end of which passes through a hole in a boss e^5 on said plate and engages one or another tooth of the series of ratchet-teeth e^3 . A spring e^6 is contained in the tubular or hollow stem e , which exerts its force against the stem e' .

A milled-edge wheel f , having a hole through it provided with an internal screw-thread, is held in position on the plate d by a bracket or holder f' , secured to the under side of said plate d , the central hole of said wheel registering with a hole in the plate d , through which hole the stem e' of the extensible and detachable post $e e'$ passes. The stem e' has arranged spirally on it projections f^2 , or said stem may be screw-threaded to be engaged by the wheel f' . The stem e is slotted longitudinally, as at 12, (see Fig. 4,) to receive the projections f^2 on the stem e' , as said stem is withdrawn or pressed into the hollow stem e against the tension of the spring e^6 .

The extensible post or support $e e'$, it will be seen, is readily detachable, and when detached the three plates a , d , and c are con-

nected only by the flexible tubes *b*, and may
 therefore be brought together and made to
 occupy but little space. The detachable post
 or support is inserted by passing it with its
 5 stem *e'* foremost through the holes in the
 plates *c d* and into the socket *e²* of the plate
a, and at such time the plate or holder *f'*,
 which supports the wheel *f*, will bear upon
 10 the upper end of the tubular or hollow stem
e and draw the tubular material between the
 plates *c d* substantially taut. Then by rotat-
 ing the wheel *f*, which it will be understood
 serves as the adjusting-wheel, the stem *e'* may
 15 be moved in either direction at will. As the
 stem *e'* is moved outward it acts to separate
 the plate *a* from the plate *d* by bearing against
 the cross-bars 3 3, and as the said stem is
 drawn inward it acts to move the plate *a* to-
 20 ward the plate *d* by its frictional engage-
 ment with the socket *e²*, assisted, as it usually
 will be at such time, by the plate *a* being
 held firmly against the face of the user.

The hollow stem, it will be understood, is
 made of such length that when interposed be-
 25 tween the plates *c d* the flexible material will
 be drawn taut, and although we have shown a
 series of ratchet-teeth adapted to be engaged
 by a pawl, whereby the length may be slightly
 varied to compensate for any shrinkage or
 30 stretching of the material, it is obvious that
 any other suitable locking device may be em-
 ployed.

It is obvious that the means herein shown
 for adjusting the parts may be used in com-
 35 bination with other forms of collapsible opera-
 glasses.

We do not desire to limit ourselves to the
 particular means herein shown for attaching
 the flexible material or tapering tubes *b* to the
 40 plates, as it is obvious that they may be at-
 tached in many different ways.

We claim—

1. In a collapsible opera-glass, two lens-
 holding plates *a c*, an intermediate plate *d*,
 45 and flexible tubes *b b*, rigidly connected to
 said plates *a c d*, combined with an adjust-

ing-wheel *f*, having a central internally-screw-
 threaded bore, the holder *f'* for said wheel se-
 cured to the plate *d*, and the detachable and
 extensible post or support comprising the hol- 50
 low stem *e*, adapted to hold separated the
 plates *c* and *d* and thereby hold the flexible
 material between said plates taut, and also
 comprising the stem *e'*, adapted to engage the
 plate *a* and having spirally-arranged projec- 55
 tions on it, said stem being embraced and
 moved telescopically in the hollow stem *e* by
 the said adjusting-wheel, substantially as de-
 scribed.

2. In a collapsible opera-glass, two lens- 60
 holding plates *a c* and the intermediate plate
d, having two holes through it, flexible tubes
b b, rigidly connected to the plates *a c* and
 passing through the holes in the plate *d*, and
 fastenings contained within the said tubes *b* 65
b for securing them rigidly to the plate *d* at
 the holes, combined with the detachable and
 extensible post or support interposed be-
 tween the two lens-holding plates *a c*, sub-
 stantially as described. 70

3. In a collapsible opera-glass, two lens-
 holding plates *a c* and the intermediate plate
d and flexible tubes *b b*, rigidly secured to
 said plates *a c d*, combined with the adjust-
 ing-wheel, as *f*, a holder for it secured to the 75
 plate *d*, and the detachable and extensible
 post or support comprising the hollow stem
e, slotted as at 12, and interposed between the
 plates *c* and *d*, and the stem *e'*, having pro-
 jections *f²* on it, which enter said slot 12 as 80
 the stem is moved longitudinally with rela-
 tion to the stem *e* by the adjusting-wheel,
 substantially as described.

In testimony whereof we have signed our
 names to this specification in the presence of 85
 two subscribing witnesses.

GEO. H. EATON.
 JOHN L. PATCH.

Witnesses:

BERNICE J. NOYES,
 EDWARD F. ALLEN.