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C. A. BLAIS, SR

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LENS COVER DEVICE FOR TELESCOPIC SIGHTS

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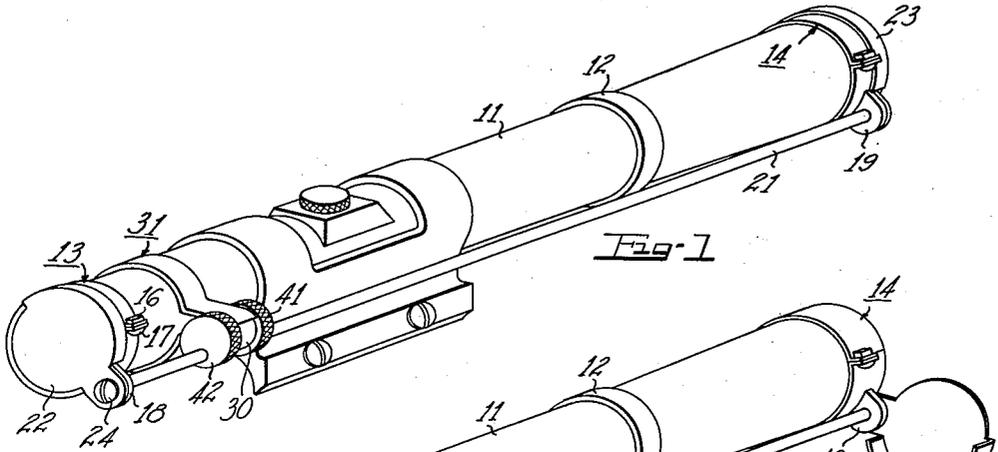


Fig-1

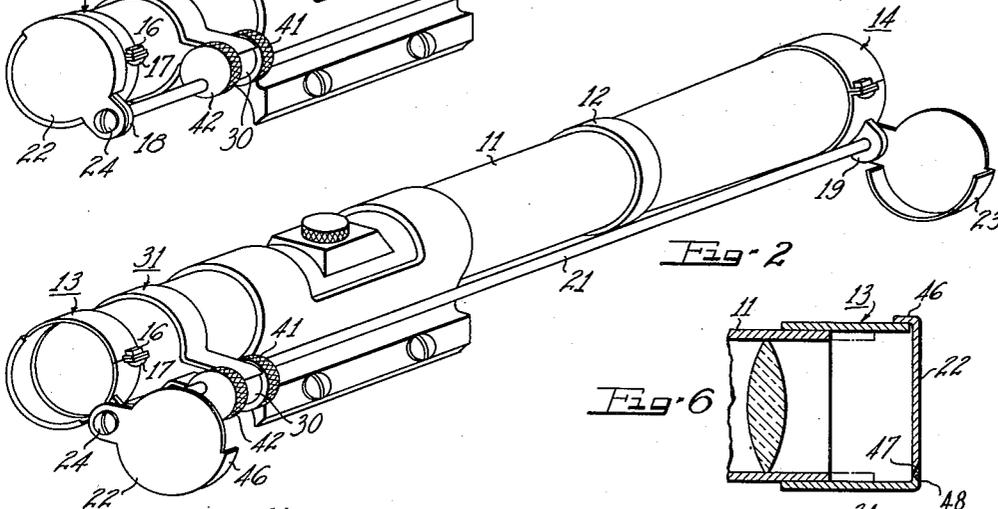


Fig-2

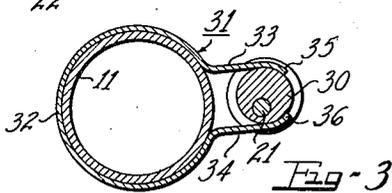


Fig-3

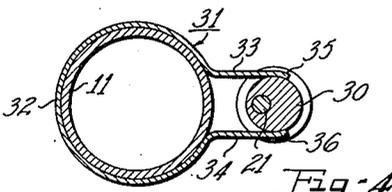


Fig-4

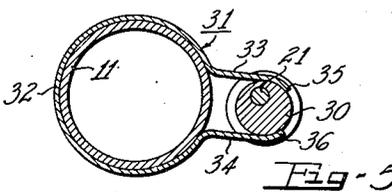


Fig-5

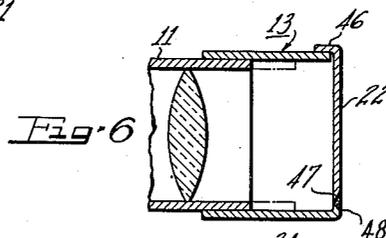


Fig-6

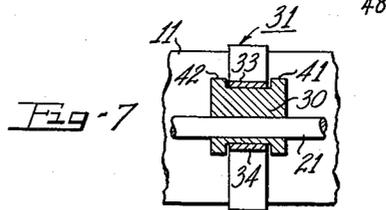


Fig-7

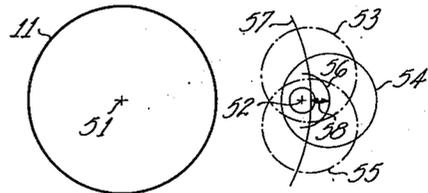


Fig-8

INVENTOR
CLEMENCE A. BLAIS, SR.

by Joseph E. Kerwin
ATTORNEY

UNITED STATES PATENT OFFICE

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LENS COVER DEVICE FOR TELESCOPIC SIGHTS

Clemence A. Blais, Sr., East Moline, Ill.

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10 Claims. (Cl. 33-50)

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This invention relates generally to telescopic gun sights and more particularly to protective covers for the lens of such sights.

While it has been proposed that covers be provided to protect the lens of telescopic gun sights from dirt, dust and moisture, to be satisfactory these protective covers necessarily should be instantaneously operable with the minimum of effort on behalf of the rifleman. It is therefore an object of this invention to provide an improved lens cover device for telescopic gun sights, which device is quickly operable by the rifleman with the minimum of effort during his conventional handling of the rifle.

It is important to the keeping of the telescopic lens clear and clean that the lens be uncovered substantially only as long as the rifleman actually is making use of the sight. Accordingly, another object of this invention is to provide for the front and rear lens covers of a telescopic sight to be quickly and rapidly movable by a simple single thumb or finger operation to both their open positions and their closed positions even while the rifle is shouldered in firing position.

Disadvantages of prior lens protective cover devices not only relate to their operation but to the number and kinds of parts required. Such parts include coil springs and latches that require special handling or operation, and these parts may weaken or break making the device completely inoperative. Hence, it is a further object of this invention to make the front and rear lens cover device with relatively simple, inexpensive parts that may be quickly and easily assembled to be a permanent attachment to the sight with little likelihood that replacement or adjustment of any of the parts will be necessary.

Still another object is to provide for such device a finger tip control which eases or sorts of snaps the covers to either their closed or open positions with the covers, in effect, locked in either of those positions by a relatively large frictional force that must be overcome in effecting rotational movement of the covers from either of those positions.

Still another object of this invention is to provide in an improved and simplified telescopic sight cover device of parts that may be standardized for permanent attachment to telescopic sight tubes which are adjustable by shortening or extending the tube length for focal adjustment.

It is also an object of this invention to permanently attach to a telescopic gun sight a lens cover device which, when in closed position, sub-

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stantially seals the lens from dust and moisture.

These and other objects and advantages of this invention will become apparent to those skilled in the art, from the following description considered in connection with the accompanying drawing in which:

Fig. 1 is a perspective view of a telescopic gun sight having an attached lens cover device embodying this invention, with the covers shown closed;

Fig. 2 is a perspective view of the telescopic gun sight of Fig. 1 with the attached lens covers shown in open position;

Fig. 3 is a sectional view taken transverse the telescopic tube through the tension band designated 31, the lens covers being closed;

Fig. 4 is a sectional view similar to that of Fig. 3, only the lens covers are intermediate their closed and open positions;

Fig. 5 is also a sectional view similar to that of Fig. 3, however taken when the lens covers are in their open positions;

Fig. 6 is an enlarged fragmentary, sectional view of the end portion of the telescopic sight tube and one lens cover;

Fig. 7 is a sectional view taken through the eccentric designated 30 in Fig. 1; and

Fig. 8 is a schematic view illustrating the lens cover thumb operating control in its different positions corresponding to the different positions of the lens covers.

A telescopic gun sight to which an embodiment of the subject lens cover device is attached is illustrated in Fig. 1 and comprises tube 11 which has lens (not shown) disposed in the front and rear ends thereof. Tube length adjustable means 12 provides for focusing the sight. At the front and rear ends of the tube there are split bands, 13 and 14, each of which is clamped about an end of the tube by suitable fastening means such as nut 16 and bolt 17. Each of those bands has an extending tab, 18 and 19 respectively, in which the opposite end portions of pivot rod 21 are journaled. The pivot rod 21 is disposed alongside of tube 11 with the axes of the rod and the tube having fixed positions parallel to each other. The end portions of the operating rod extend through the tabs, and covers 22 and 23 are fixedly attached to the respective ends of the rod by any suitable means such as a machine screw 24.

An operating cylinder 30 is attached to the pivot rod between the journaled ends thereof. The exact position of this operating cylinder along the rod depends on the desire of the rifle-

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man, and in all instances may be within easy reach of the thumb of the rifleman while he holds the rifle in a conventional manner. The axis of the cylinder is offset laterally from the pivot rod axis so that the cylinder is an eccentric on the rod.

Frictional clamping means is associated with this operating cylinder to prevent inadvertent or accidental movement of the lens covers; in other words the frictional clamping means retains the covers in any selected position. For this purpose, in this instance there is provided a tension band 31 made of resilient material such as spring steel. This band has a middle, C-shaped portion 32 which is generally circular in cross section and which loosely encircles tube 11 and is free to turn about the tube while yet being self held thereon except for movement longitudinally of the tube. The tension band has laterally extending end portions, 33 and 34, which are substantially parallel to each other and which are spaced apart a distance equal to the diameter of the operating cylinder. End tips, 35 and 36, of these end portions are curved on the arc of the cylinder surface so as to be turned inwardly toward each other bringing those tips closer together than are the substantially parallel portions. The operating cylinder is snugly disposed between the end portions of the tension band with the axis of that cylinder more remote from the tube axis than is the pivot rod.

Suitable means is incorporated in the operating cylinder and tension band to prevent the tension band from moving longitudinally of the tube and away from the cylinder. Yet this means does not interfere with the tension band coacting with the operating cylinder. In this instance, this means comprises collars 41, 42 disposed at the opposite ends of the operating cylinder. The operating cylinder therefore has an H-shaped longitudinal cross section (Fig. 7), and these collars are axially spaced so the middle cylindrical portion of the cylinder has sufficient length to accommodate the width of the end portions 33, 34 of the tension band, thereby holding or retaining the tension band in contact with the operating cylinder. The collars 41, 42 have knurled peripheries to facilitate turning the cylinder by the thumb.

So that the parts may be standardized for telescopic sights which are shortened or extended to different lengths, at least one clamping band 13 has sufficient axial length (Fig. 6) that it may extend beyond the end of tube 11 a distance at least equal to the tube length adjustment.

As is also best shown in Fig. 6, the covers and clamping bands cooperate to substantially seal the ends of the tube to protect the lens. The upper half of the periphery of each cover is bent at a right angle to its face to comprise a flange 45 that overlays the end part of the upper half of the associated clamping band, and the lower half 47 of the periphery of each cover is tapered and closely fits the lower half 43 of the periphery of the associated clamping band, as this lower half 43 of the clamping band extends longitudinally beyond its upper half periphery.

The described lens cover device embodying the teaching of this invention not only is an improvement in the art in being inexpensive, easily made and easily assembled, but its operation also is a considerable improvement.

The rotation of the lens covers and pivot rod as a unit about the axis of that rod is self evi-

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dent. In moving the covers from their closed positions to their open positions, the rod is rotated through an angle sufficiently large that, in the open position, the covers are completely away from the telescopic sight and do not interfere with the proper use of the sight. Preferably, this angle of rotation is approximately 135 degrees. The function and operation of the eccentric cylinder and tension band may be most easily explained in connection with schematic view of Fig. 8.

Numeral 51 designates the axis of tube 11, and 52 is the axis of the pivot rod. The circles or construction lines 53, 54 and 55 represent the closed, intermediate and open positions, respectively, of the eccentric operating cylinder which pivots about axis 52. This eccentric, operating cylinder is placed so that its center moves in an arc 56 about the pivot rod axis remote from the tube 11.

Arc 56 is generated by motion of the center of the operating cylinder in its movement from closed to open positions; this arc is drawn with axis 52 as a fixed center since the tube axis and pivot rod axis have no relative movement. In Fig. 3 another arc 57 is drawn which has tube axis 51 as a center and which has a radius equal to the distance from axis 51 to the center of the operating cylinder when it is in either the open or closed positions. This arc therefore cuts through points on arc 56 corresponding to the center of the operating cylinder in the open and closed positions.

The distance 58 between arcs 56 and 57 corresponds to the lateral movement of the center of the operating cylinder away from the tube axis 51 as the operating cylinder moves from one position to the other.

Since the tension band is loosely disposed about tube 11 and is free to move thereon under the influence of the operating cylinder, the ends of the tension band are always a constant distance from the tube axis 51 although they do have movement circumferentially which is caused by the eccentric operating cylinder as shown by Figs. 3 to 5.

As above mentioned the end tips of the tension band are curved inwardly toward each other and contact the outer surface of the operating cylinder. And with the center or axis of the operating cylinder being spaced farthest from the tube axis intermediate the closed and open positions, it necessarily results that there is movement of the cylinder relative to the end tips of the tension band. As mentioned those tips stay a fixed distance from the tube axis, and the cylinder moves with respect to that axis. Because of this relative movement the cylinder forces the end tips apart flexing the tension band, appreciably increasing the friction, binding or clamping of the tension band on the cylinder. This flexing of the tension band to increase the friction or binding of the cylinder is quite noticeable even immediately adjacent the closed or open positions. This is illustrated by the appreciable increase in distance between arcs 56 and 57 even near the closed and open positions.

In the closed and open positions, however, the tension band is in a relatively unflexed state. Thus, the intermediate position flexing and frictional binding effects a substantial locking means for the covers to keep them in their selected closed or open positions thereby preventing inadvertent or accidental movement of

the covers when the rifle is jerked or jarred in handling.

Also this flexing and unflexing of the tension band results in an easing or sort of snap of the covers into both their closed and open positions, but this snap or easing into position does not occur until those positions are nearly reached while turning the operating cylinder.

Although but one embodiment of this invention is shown and described, it will be realized that variations and modifications thereof may be made by skilled persons without departing from the scope of the invention defined by the appended claims.

It is claimed and desired to secure as Letters Patent:

1. A lens protector for a telescopic gun sight tube, comprising an operating rod having its axis fixedly disposed parallel to the gun sight tube, means connecting said rod to said tube with said rod rotatable about its axis, a front lens cover fixedly attached to a first end of said rod, a rear lens cover fixedly attached to the opposite end of said rod, rotation of said rod through a predetermined angle about its axis moving said covers from closed positions to open positions with respect to said tube, eccentric means fixedly attached to said rod, resilient means secured to said tube and contacting said eccentric means, said resilient means being substantially unflexed when said covers are in said closed and open positions and being flexed by said eccentric means when said covers are intermediate said closed or open positions to frictionally bind said eccentric means, whereby said covers are substantially locked in any selected position by the coaction of said eccentric means with said resilient means.

2. A lens protector for a telescopic gun sight tube, comprising an operating rod having its axis fixedly disposed parallel to the gun sight tube, a first tube band clamped to one end of said tube and having a lateral tab in which a first end of said rod is journaled, a second tube band clamped to the opposite end of said tube and having a lateral tab in which the opposite end of said rod is journaled, a first lens cover fixedly attached to said first end of said rod, a second lens cover fixedly attached to said opposite end of said rod, whereby rotation of said rod through a predetermined angle moves said covers from their respective closed positions to their respective open positions, a control cylinder fixedly attached to said rod intermediate its said ends with the axis of said cylinder parallel to and spaced from the axis of said rod whereby the axis of said cylinder in turning about said axis of said rod defines the arc of a circle and has lateral movement with respect to said axis of said tube, a generally C-shaped tension band of resilient material having a middle portion loosely encircling said tube with substantially parallel end portions extending laterally of said tube and contacting opposite sides of said cylinder whereby said tension band is slidable about said tube responsive to turning of said cylinder, said cylinder disposed between said parallel lateral portions at positions corresponding to said closed and said open positions of said covers, the ends of said portions being curved inwardly toward each other contacting the surface of said cylinder, said cylinder being laterally more distant from said axis of said tube at positions corresponding to positions intermediate said closed and open positions whereby said inwardly

curved ends are forced apart by said cylinder flexing said tension band and causing frictional binding of said cylinder to prevent accidental turning of said cylinder and displacement of said covers from their said open or closed position.

3. A lens protector as claimed in claim 2 wherein said cylinder has two axially spaced collars with said lateral end portions being disposed between said collars to restrain said tension band from moving axially of said tube.

4. A lens protector as claimed in claim 2 wherein retaining means cooperates between said cylinder and said tension band restraining said tension band from moving axially along said tube.

5. A lens protector as claimed in claim 2 wherein one said tube has a cylindrical portion extending beyond the end of said tube to which said one tube band is clamped to accommodate for adjustment of the length of said tube.

6. A lens protector for a telescopic gun sight tube, comprising an operating rod having its axis fixedly disposed parallel to the gun sight tube, a front tube band clamped to one end of said tube and having a tab in which a first end portion of said rod is journaled, a rear tube band clamped to the opposite end of said tube and having a tab in which the second end portion of said rod is journaled, a front lens cover fixedly attached to the first end of said rod, a rear lens cover fixedly attached to the opposite end of said rod, whereby rotation of said rod through a predetermined angle moves said covers from their respective closed positions to their respective open positions, a control cylinder eccentrically fixed to said rod whereby said axis of said cylinder in turning about said axis of said rod has lateral movement with respect to said axis of said tube, a tension band being disposed loosely about said tube with a portion thereof extending laterally of said tube and frictionally contacting said cylinder whereby said tension band holds said covers in any selected position, said cylinder having retaining means cooperating with said portions of said tension band restraining said tension band from moving axially of said tube.

7. A lens protector as claimed in claim 6 wherein the upper half peripheral edge of each of said covers is flanged and overlaps the upper edge of the corresponding said tube band, and the lower half peripheral edge of each of said tube bands extends axially beyond the upper edge thereof and is formed to interfit closely with the bottom half edge of the corresponding said cover, whereby said covers cooperate with said tube bands to seal the ends of said tube.

8. A lens protector as claimed in claim 6 wherein one said tube band has a cylindrical portion extending beyond the end of said tube to which said one tube band is clamped to accommodate for adjustment of the length of said tube.

9. A lens protector as claimed in claim 6 wherein said retaining means comprises two axially spaced collars on said cylinder between which said portion of said tension band are disposed.

10. A lens protector as claimed in claim 6 wherein one said tube band has a portion extending beyond the end of said tube to which said one tube band is clamped to accommodate for adjustment of the length of said tube, and said retaining means comprises two axially spaced collars on said cylinder between which said portions of said tension band are disposed.

CLEMENCE A. BLAIS, Sr.

No references cited.