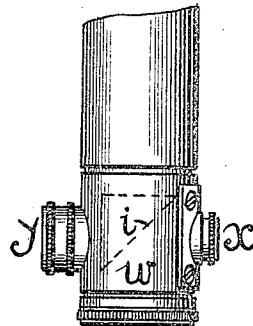
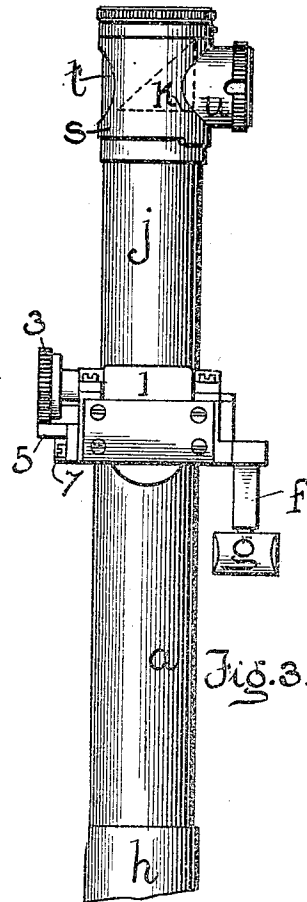
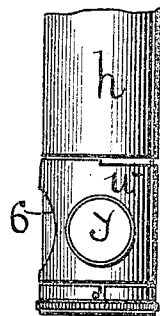
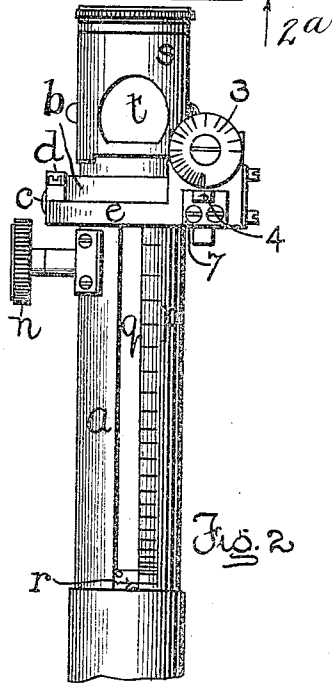
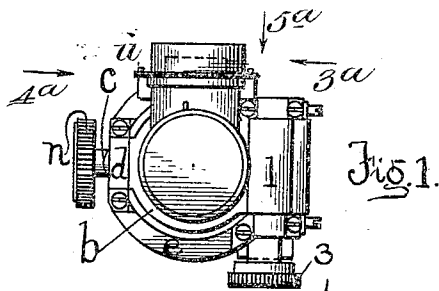


W. YOULTEN.
SIGHTING OF GUNS FROM COVER.

APPLICATION FILED NOV. 21, 1902.

4 SHEETS—SHEET 1.



Witnesses.

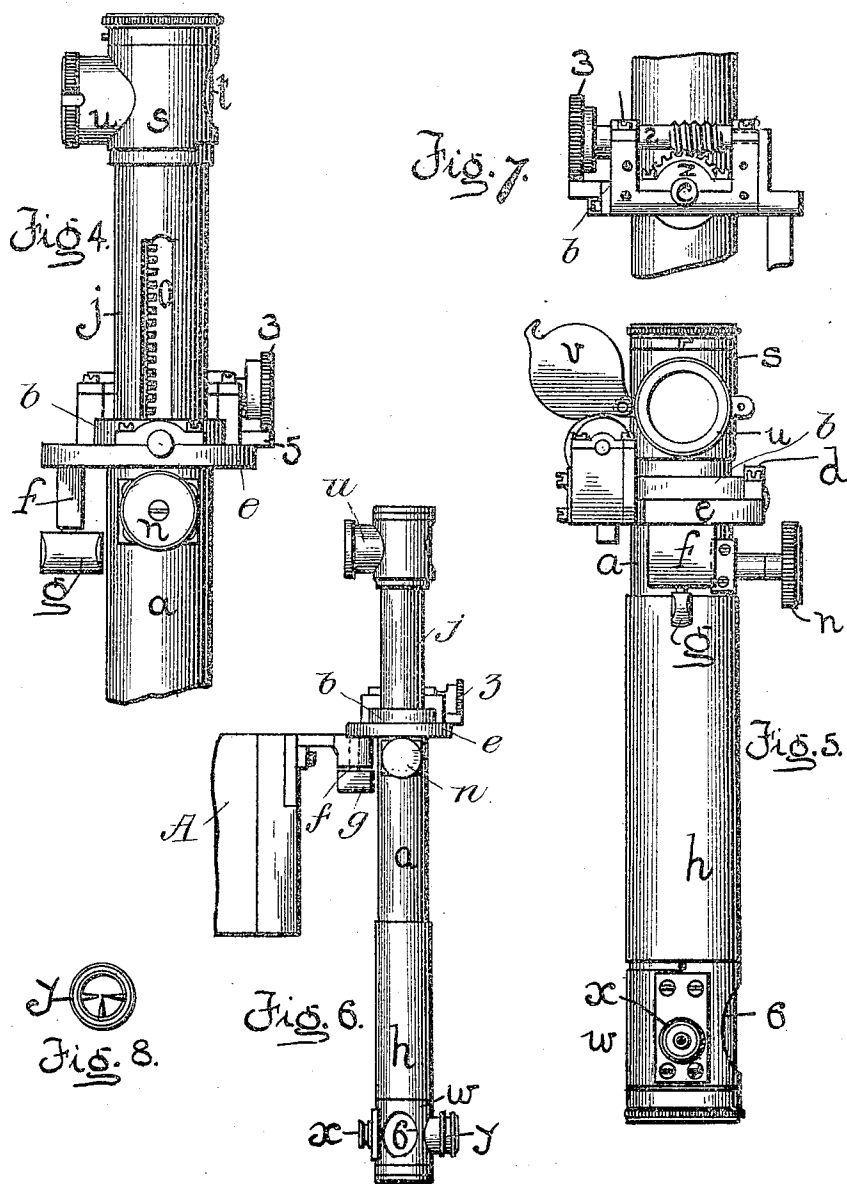
Geo. A. Spue
Geo. A. Spue

Inventor:

W. Youlten
W. Youlten
by Wilkinson & Fisher
Attorneys.

W. YOULTEN.
SIGHTING OF GUNS FROM COVER.
APPLICATION FILED NOV. 21, 1902.

4 SHEETS—SHEET 2.



Witnesses.

Judith Engle
Geo. F. Byrne

Inventor.

W. Youtten,
by Wilkinson & Fisher,
Attorneys.

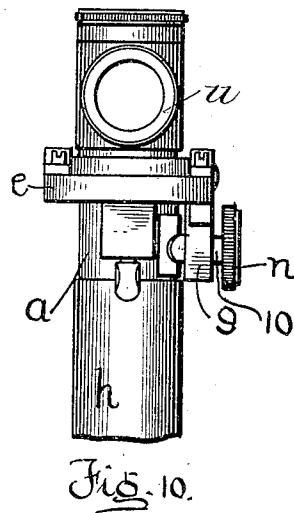
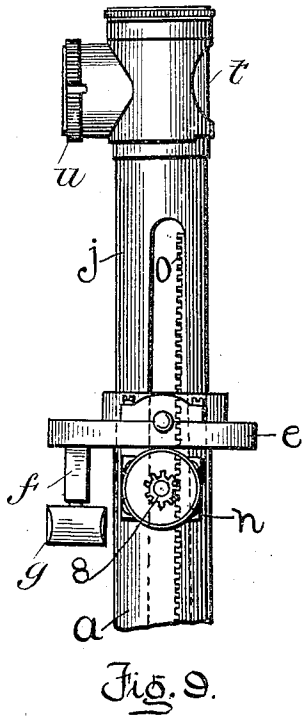
No. 813,932.

PATENTED FEB. 27, 1906.

W. YOULTEN.
SIGHTING OF GUNS FROM COVER.

APPLICATION FILED NOV. 21, 1902.

4 SHEETS—SHEET 3



Witnesses

Geo. W. Conklin
Geo. H. Byrne.

Inventor.

W. Youlten,
by Wilkinson & Fisher,
Attorneys.

No. 813,932.

PATENTED FEB. 27, 1906.

W. YOULTEN.
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APPLICATION FILED NOV. 21, 1902.

4 SHEETS—SHEET 4.

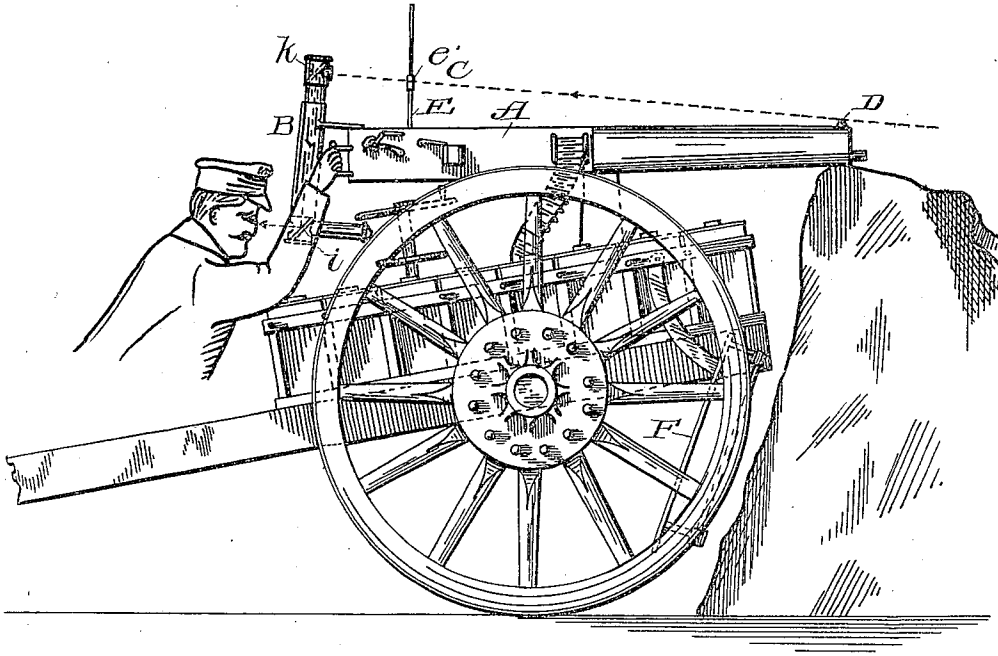


Fig. 11.

Fig. 13.

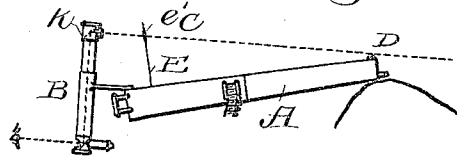
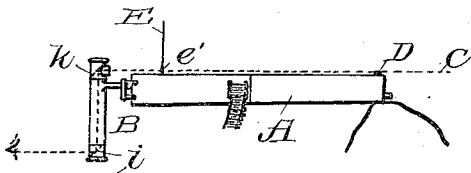


Fig. 12.



Witnesses.

Mr. (Maurice) Dwall.
Geo. H. Byrne.

Inventor.

W. Youtten.
By Wilkinson & Fisher
his Attorneys.

UNITED STATES PATENT OFFICE.

WILLIAM YOULTEN, OF WESTMINSTER, ENGLAND.

SIGHTING OF GUNS FROM COVER.

No. 813,932.

Specification of Letters Patent.

Patented Feb. 27, 1906.

Application filed November 21, 1902. Serial No. 132,333.

To all whom it may concern:

Be it known that I, WILLIAM YOULTEN, a subject of the King of England, residing at 159 Victoria street, Westminster, in the county of London, England, have invented certain new and useful Improvements in the Sighting of Guns from Cover; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to the sighting of guns from cover, and refers to an instrument of a class for which I have already obtained Letters Patent in the United States of America, No. 694,904, dated March 4, 1902, which instrument is now known by the name of the "hyposcope."

At the time of my application for the aforesaid Letters Patent in the United States of America I had already discovered in the course of my experiments that it was necessary to keep the main axis of the instrument at right angles to the line of aim in all positions, and the necessity of this is obvious from the following considerations.

It is common knowledge in aiming a gun at marks or objects on the same horizontal plane, but at different distances, that as the range of the gun increases to its maximum the muzzle must be slowly tilted up to increase the trajectory. Thus if we are aiming at a mark at a distance of five thousand yards and then at a mark at a distance of ten thousand yards on the same horizontal plane the muzzle of the gun must be tilted up to a greater extent in the latter case than in the former. With ordinary sighting devices it is simply necessary in such a case to provide an arrangement by which the rear sight may be raised as the range increases and the eye looking along the sights accommodates itself to the proper line of aim. When aiming with an instrument, this is impossible, and the instrument must be kept automatically or otherwise in the proper position or the front sight would not remain in the field of view of the instrument when the gun was properly aimed. It will be seen that some provision had already been made to meet this requirement in the specification of Letters Patent No. 694,904, and on page 2, line 3, *et seq.*, an arrangement is described with reference to Figure 9, in which the instrument as it is raised or lowered is made to cant

over by means of a curved rod sliding through an eye.

In practice, especially in the case of instruments intended for machine-guns where the hyposcope is of somewhat large size, this arrangement was found capable of improvement and development, and the present invention relates to improvements on the former instrument designed to effect the necessary vertical and horizontal adjustments with great accuracy either separately or in combination.

In order that my said invention may be clearly understood, I will describe the same with reference to the drawings accompanying this specification, in which—

Fig. 1 shows plan of the instrument. Figs. 2, 3, 4, and 5 show elevations looking in the direction of the arrows 2^a, 3^a, 4^a, and 5^a, Fig. 1, respectively, but with the tube carrying the upper prism raised in Figs. 3 and 4 and lowered in Figs. 2 and 5. Fig. 6, which is drawn to a smaller scale than the other figures, shows the instrument fitted to the butt of a machine-gun. Figs. 7 and 8 show details hereinafter referred to. Figs. 9 and 10 show a modified form of instrument in which the vertical adjustment and the canting over of the tubes are effected simultaneously by one operation. Fig. 11 shows a Maxim gun with the instrument fitted thereto. Figs. 12 and 13 are diagrammatic views showing the line of sight at point-blank range and at a long range, respectively.

The same characters of reference are employed to denote the same parts in all the views.

Referring to Figs. 11 to 13, A shows the gun; B, the hyposcope attached thereto. C shows the line of sight. D indicates the front sight, E the rear sight, which may or may not be used, and *e'* the sliding leaf on the rear sight.

Referring now to Figs. 1 to 8, *a* shows a tube provided at its upper end with a collar *b*, Fig. 1, from which extend two pivots *c*, carried in bearings *d* on a ring *e*. This ring is formed with an extension *f* on its under side for the purpose of attachment to the machine-gun A, for example. *g* is a button for locking the instrument in position. On the tube *a* slides another tube *h*, which is fitted at its lower end with a prism *i* or with an ordinary reflector. Within the tube *a* another tube *j* slides, carrying at its upper end a prism *k* or other reflector. The tube *j* is telescoped into

or out of the tube *a* by means of a pinion actuated by a milled head *n*, which pinion engages with a rack *o*, Fig. 4, fitted in a slot in the tube *j*. As will be explained later, the tube *a* is attached to the gun and has no vertical motion relative to the gun, but only a slight tilting motion. The tube *j* forms, in effect, a sliding rear-sight bar, and the tube *h* is the focusing-tube for the telescope forming a part of the implement.

The correct adjustment of the tube *j* for various ranges is indicated by a scale *p*, Fig. 2, on the tube *a* at the side of a slot *q*, in which a pointer *r*, fixed to the tube *j*, slides.

s is a collar embracing the top of the tube *j* and capable of being turned through two right angles. This collar is formed with an aperture *t*, corresponding in size to an aperture in the tube *j* opposite to the prism *k*. Opposite to the aperture *t* the collar *s* is provided with a short tube *u*, carrying an object-glass.

v, Fig. 5, is a cap to protect the object-glass when not in use. *w* is another collar at the lower end of the tube *h*, also capable of rotation through two right angles. This collar is made with an aperture 6 corresponding in size to that in the tube *h* opposite the prism *i* and has two extending tubes, one, *x*, provided with a small aperture or peep-hole and the other, *y*, being a connecting-piece for the attachment of a telescopic eyepiece. This connecting-piece *y* is furnished inside with needle-points indicating the center, as shown at Fig. 8.

The collar *b* is formed with or has fixed to it a toothed quadrant *z*, (see Fig. 7,) which shows this part of the instrument with the plate 1 removed.

2 shows a worm engaging with the quadrant *z* and actuated by a milled head 3. This head has marked on its face a scale, as shown in Fig. 2.

4 is a pointer marked on the extension 5 of the plate 7, which is screwed to the ring *e*.

The instrument is used in the following manner: It is attached to the gun, preferably as shown in Figs. 6 and 11, with the upper prism *k* coming behind the sight and the lower prism *i* in front of the gunner's eye. For obtaining a general view of the objects to be aimed at the collars *s* and *w* are turned so that the apertures *t* and 6 coincide with the apertures in the tubes *j* and *h* opposite the prisms *k* and *i*. The lower tube *h* is drawn down, exposing the scale *p*, and the upper tube *j* is racked up according to the range required, which is indicated by the scale *p*, Fig. 2, or by the leaf *e'* of the rear sight E. At Fig. 2 the tube is shown with the scale at zero for "point-blank" aiming; but for one thousand yards it would be racked up until the pointer *r* came opposite the graduation for one thousand yards on the scale *p*. The next operation is to cant over the instrument, which

is done by turning the milled head 3 until the graduation thereon corresponding to one thousand yards is opposite the pointer 4.

It must be carefully observed that so far the telescope has not been brought into requisition.

In using the telescopic sight the collar *s* is rotated so that the object-glass comes in front of the prism *k*, and the lower collar *w* is rotated so that the eyepiece comes in front of the prism *i*. Then the object already seen in the field of view without the telescope will be in the field and greatly enlarged. It must be observed that the focusing of the telescope depends upon the tube *h* being drawn out or pushed in and has no reference to the raising and lowering of the tube *j*. It is necessary to clearly grasp this point in considering the instrument used as a telescopic hyposcope or the action becomes difficult to understand.

It is clear on consideration that the instrument may be used either with or without the ordinary rear sight. In using it with ordinary sights the gun is aimed in the ordinary way, but through the instrument, by bringing the rear-sight leaf *e'* and front sight D in a line with the object, the range being approximately known; but the use of the rear sight is quite unnecessary, as the instrument automatically forms a rear sight, since when the tube *j* is set to, say, one thousand yards and canted over by means of the milled head 3 to the proper extent, as shown on the milled head, and the center of the upper prism is brought in line with the front sight the gun is correctly aimed for one thousand yards. This is a matter of great importance in actual warfare when the rear sight may be shot away or destroyed. In order to facilitate aiming in this way, I mark a central line on the prism *k*. The instrument is operated as before. A general view of the object is taken, and it is brought approximately into the middle of the field of view. The collar *w* is rotated so that the peep-hole, which forms a very small field, is in front of the eye. When the object to be aimed at is seen in the middle of the field of view, with the line of the prism directly across it, the gun is correctly aimed for that object at the determined range. As before, the telescope may be brought into requisition, it being always remembered that in that case the telescope must be focused by drawing the tube *h* in or out; but this of course will not affect the general aiming of the gun and is only useful for obtaining close accuracy at a long range.

I may use an astronomical eyepiece at *y*, in which case the image of the object to be aimed at is inverted. This inversion causes no difficulty to the gunner after a very small amount of practice; but, if desired, a terrestrial eyepiece may be substituted at *y*, thus giving an erect image.

The canting of the instrument and the rais-

ing of the tube *j* may be performed at the same time and by the same operation by the means shown in Figs. 9 and 10. In these figures, *n* shows the milled head, which turns a toothed wheel 8, which gears with a rack *o*, as before, thus raising and lowering the tube *j* in the tube *a*; but in this case the rack *o* is slanted—*i. e.*, is not parallel to the axis of the tube. This is shown clearly at Fig. 9. Thus when the tube *j* is raised or lowered it is at the same time canted to the required degree, according to the slope of the rack *o*. The whole instrument is canted with the tube *j* as it is swung in the ring *e*. 9, Fig. 10, shows a lug projecting downward from the ring *e*. The spindle 10 of the toothed wheel 8 is carried by this lug. In Fig. 10 the tube *j* is shown shut down into the tube *a*.

Referring to Figs. 11 to 13, Fig. 11 shows a Maxim gun with the hyposcope attached thereto with the instrument set for a somewhat distant range. It will be observed that the shield (marked F) is turned down out of the way, as it is perfectly useless where the hyposcope is employed behind an obstruction and only offers an excellent aim for the enemy. Fig. 13 shows diagrammatically the instrument set for a somewhat remote range. It will be observed that the tube has been racked up and canted over, but is still kept at right angles to the dotted line, showing the line of aim. The rear sight has been left in, although unnecessary, in order to make the theory more obvious. It will be at once seen that if the gunner were aiming his eye would automatically look along the dotted line showing the line of aim, but that with the instrument unless there were some means provided for accurately canting over the instrument so as to keep its main axis at right angles to the line of aim it would have remained parallel to the rear sight, and it would be impossible to sight the gun through it except for a very limited amount of range.

Fig. 12 shows diagrammatically the instrument racked down to its extreme extent for absolutely "point-blank" aiming, and in this case alone it is parallel to the sight.

Although I have described the instrument as applied to heavy and machine guns, it may also be applied to rifles and small-arms.

Having thus described my invention, what

I claim, and desire to secure by Letters Patent, is—

1. An instrument for sighting guns from cover, consisting of a tube secured to the gun or cradle, and two substantially vertical tubes, one telescoping within the other, with a reflector in each tube, and an opening for admitting light to said reflector, mechanism for adjusting the height of the upper reflector, and mechanism for canting the instrument to the required inclination, substantially as described.

2. An instrument for sighting guns from cover, comprising a tube detachably connected to the gun or cradle, and provided with graduations, means for tilting said tube through a small angle, a second tube mounted to slide on the first tube and provided with an opening and a reflecting-surface, and a third tube also mounted to slide on the first tube and provided with a reflecting-surface, substantially as described.

3. An instrument for sighting guns from cover, comprising a tube detachably connected to the gun or cradle, and provided with graduations, means for tilting said tube through a small angle, a second tube mounted to slide on the first tube and provided with an opening and a reflecting-surface, a third tube also mounted to slide on the first tube and provided with a reflecting-surface, and a telescope carried by said third tube, substantially as described.

4. An instrument for sighting guns from cover, comprising a tube attached to the gun and provided with graduations for range, means for tilting said tube through a small angle, a second tube mounted on the first and provided with a prism for refracting light, means for moving said second tube longitudinally on the first, a third tube also mounted to slide on the first tube and provided with a prism therein, and a telescope mounted in rear of said second prism, substantially as and for the purposes described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM YOULTEN.

Witnesses:

GEORGE I. BRIDGES,
ADOLPH E. VIDAL.