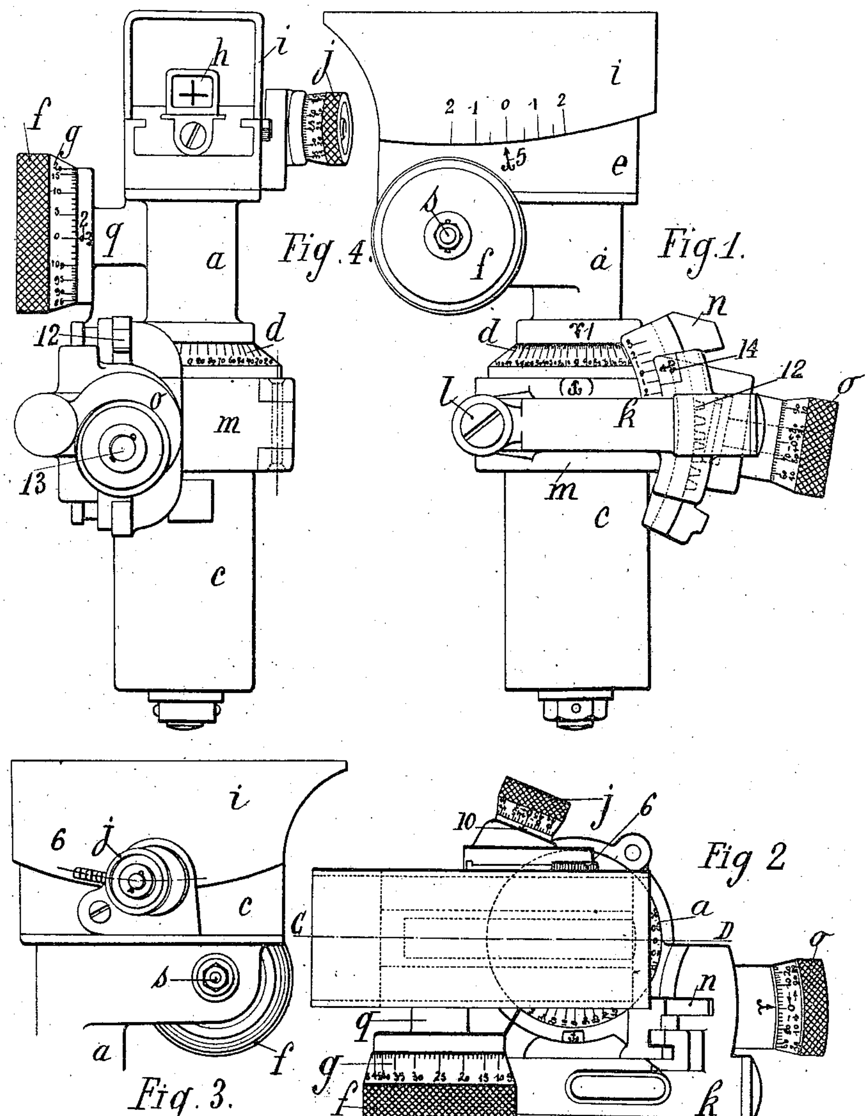
No. 716,114. Patented Dec. 16, 1902.

C. P. E. SCHNEIDER & J. B. G. A. CANET.

APPARATUS FOR SIGHTING GUNS.

(Application filed Aug. 6, 1901.)

(No Model.) 2 Sheets—Sheet 1.



Witnesses:—

Geo W. Lewis

Wm. D. Kerkam.

Inventors:—

Charles Prosper Eugene Schneider

and Jean Baptiste Gustave Adolphe Canet

by Philip Mauro

Atty

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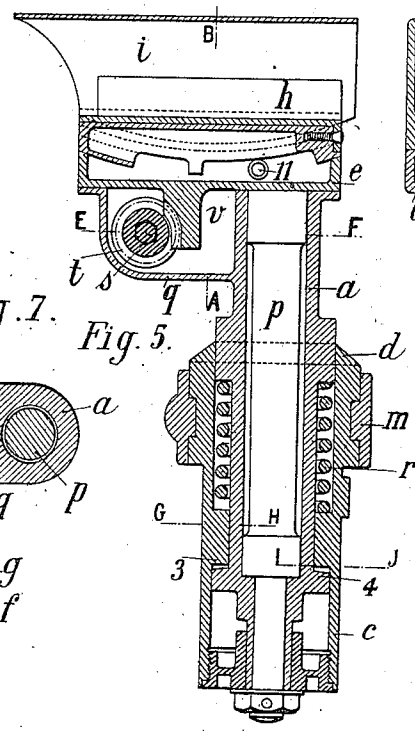

Fig. 5.

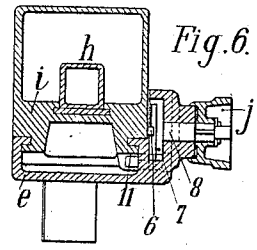

Fig. 6.

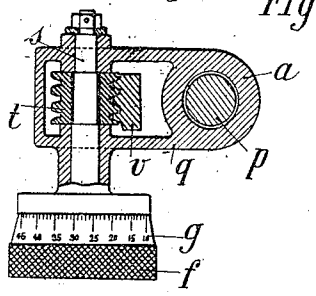

Fig. 7.

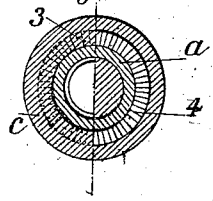

Fig. 8.

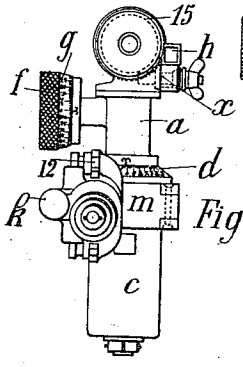

Fig. 10.

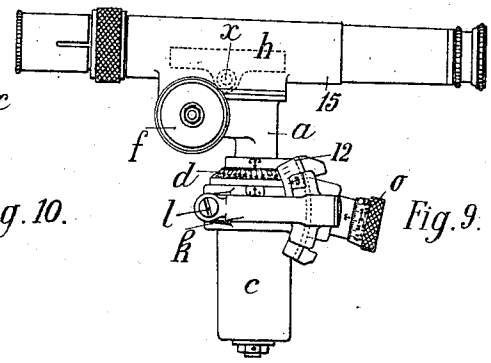

Fig. 9.

Witnesses:

Inventors:

Charles Prosper Eugene Schneider
and Jean Baptiste Gustave Adolphe Canet
by Philip Mauro
Atty.

UNITED STATES PATENT OFFICE.

CHARLES PROSPER EUGÈNE SCHNEIDER AND JEAN BAPTISTE GUSTAVE ADOLPHE CANET, OF LE CREUSOT, FRANCE.

APPARATUS FOR SIGHTING GUNS.

SPECIFICATION forming part of Letters Patent No. 716,114, dated December 16, 1902.

Application filed August 6, 1901. Serial No. 71,053. (No model.)

To all whom it may concern:

Be it known that we, CHARLES PROSPER EUGÈNE SCHNEIDER, ironmaster, and JEAN BAPTISTE GUSTAVE ADOLPHE CANET, engineer, residing at Le Creusot, Saône-et-Loire, in the Republic of France, have invented certain new and useful Improvements Relating to Apparatus for Sighting Guns, of which the following is a full, clear, and exact specification.

This invention relates to apparatus for sighting guns.

Hitherto sighting apparatus, properly speaking, has comprised a fore sight and a rear sight. The fore sight requires to be placed at a somewhat great distance from the rear sight to allow of a sufficient length of sight-line, and in order to render the sight-line independent of the movements of the gun an independent support of considerable length is required for carrying the sighting apparatus. On the other hand, if the rear sight is carried by a short support it provides a limited field within which corrections for drift and the laying of the gun can be effected.

The improved sighting apparatus constructed according to this invention obviates these objections. It enables the fore sight to be dispensed with and yet retains the advantages of a line of sight of convenient length. Furthermore, while forming a small compact apparatus mounted in a socket on a support permanently connected with the pointing mechanism of the gun it permits of both the laying of the gun and the making of corrections for drift in a plane of movement of three hundred and sixty degrees. It also has other advantages which will be hereinafter explained.

In order that our invention may be clearly understood and readily carried into effect, we will describe the same fully with reference to the accompanying drawings, in which—

Figure 1 is a side elevation of the complete apparatus as seen from the left. Fig. 2 is a plan of the same. Fig. 3 is a side elevation of a portion of the apparatus as seen from the right. Fig. 4 is a rear elevation. Fig. 5 is a vertical longitudinal section taken on the line C D of Fig. 2. Fig. 6 is a vertical transverse section taken on the line A B of Fig. 5. Fig. 7 is a horizontal section taken on the line E F of Fig. 5. Fig. 8 is a horizontal section taken on the line G H I J of Fig. 5. Figs. 9 and 10 are elevations showing another embodiment of the invention.

The sighting apparatus comprises three main parts—viz., a goniometer, an eyepiece or telescope, and a level—which parts are connected together in and upon a socket *c*, serving as a support for the entire apparatus and having at its upper edge a graduated scale *d*. For preparing the gun ready for action the apparatus is secured by means of its socket to a solid support integral with the pointing mechanism, from which it may be removed when desired. In the interior of the fixed socket *c* is a hollow rod or movable socket *a*, which is adapted to turn about its axis and forms a sleeve supporting the eyepiece-carrier *e*.

m is a ring supporting the level *k* and capable of being turned around the said socket *c* by reason of its being loosely connected therewith by an annular rib engaging with a corresponding annular recess, Fig. 5.

The goniometer comprises the fixed graduated socket *c* and the movable socket *a*. The latter is furnished with a sign or index 1, Fig. 1, which is capable of being adjusted and fixed adjacent to any of the larger divisions of the graduated scale *d*.

3 is a toothed crown formed integral with the socket *c* and with a passage for the movable socket *a*. It is provided with teeth equal in number to the larger divisions of the graduated scale *d*. (See Figs. 5 and 8.) These teeth are kept normally in engagement with the teeth of a similar toothed crown 4 on the movable socket *a*, Fig. 8, by a spring *r*, provided in the interior of the socket *c* and surrounding the movable socket *a*. By depressing the socket *a* so as to compress this spring the movable toothed crown 4 is separated from the fixed toothed crown 3, and if then the socket *a* be turned the index 1 can be moved over the graduated scale *d*. As the number of teeth of each crown corresponds to the number of larger divisions of the scale *d* it will be possible to so turn the socket *a* as to place the index opposite any desired larger division of the scale. We find it advanta-

geous to divide the scale *d* into four parts of a circle, each part or quarter being divided into ten large divisions, making forty large divisions all the way around scale *d*, each of said divisions corresponding to one of the teeth of crown 3, as already stated.

The eyepiece-carrier *e* is formed integral with a stem *p*, that fits loosely and concentrically in the movable socket *a*, so as to be capable of rotating around the same axis as the latter. Angular displacement of the carrier *e* relatively to the socket *a* can be effected as follows: A box *q*, forming part of the socket *a* and projecting laterally therefrom, supports a spindle *s*, on which is mounted a worm *t* and a graduated milled head *f*. With the worm *t* engages a toothed helicoidal segment *v*, projecting from the lower end of the eyepiece-carrier *e*. (See Figs. 5 and 7.) Upon the support *q* and integral with the socket *a* is formed an index 2 adjacent to the graduated milled head *f*. The graduated scale, in connection with the milled head *f*, is formed on a drum *g* and has a hundred equal divisions. The segment *v* is so adjusted that the line of sight is exactly parallel to the axis of the gun when the milled head is set at zero. The hundred divisions of the graduated scale of the milled head *f* correspond to one division of the scale *d*. The total amplitude of the movement of the milled head *f* therefore corresponds to one-fortieth of the circle of movement on the scale *d*. It will thus be understood that by turning the milled head *f* a distance of one division of its graduations the eyepiece is displaced a distance of one four-thousandths of the said circle of movement.

The carrier *e* comprises a carriage forming a guide for the eyepiece proper or collimator *h*, or rather for the casing *i*, which protects it and in which it is fixed. The guide and the corresponding surface of the casing form an arc of a circle, the said casing being provided on one of its sides with divisions in hundredths of the circumference and the carrier *e* with an index 5. The divisions of the casing *i* are marked from a zero-point in two directions for measuring angles in positive and negative directions. The angular movement of the casing *i*, with its collimator *h* in the vertical plane passing through the longitudinal axis of the carrier *e*, is obtained by means of a rack 6, Figs. 3, 4, and 6, connected with the casing *i*, and a spiral-toothed wheel 7, fast on the spindle 8 of the carrier *e*. On the same spindle is a milled head *j*, which is provided with a drum graduated into fifty divisions and with the numbers running in two opposite directions. Adjacent to this graduated drum is an index 10 on the carrier *e*, Fig. 2. When the zero of the graduations of the casing *i* is opposite the index 5, the zero of the milled head *j* is opposite the index 10. The axis of the collimator *h* is then at right angles to the axis of the apparatus—*i. e.*, to the axis of the socket *c*. A complete turn of the milled head *j* corresponds to a half-division of a graduation on the casing *i*, so that by means of the said milled head *j* it is possible to estimate elevations or depressions of the eyepiece in one ten-thousandths of the circumference. A stud 11, provided on the carrier *e*, serves as a stop for limiting the movement of the casing *i*.

The level *k* is pivotally mounted on a pin *l*, disposed in a plane at right angles to the axis of the goniometer and carried by the ring *m*, which latter, as already explained, embraces the socket *c* and is capable of turning around the latter. The said ring *m* carries a sector *n*, which serves as a guide for the level in its movement around the pivotal axis *l*. The said sector is graduated in hundredths of the circumference of the circle of which it forms part, and the level which moves over and in front of the said graduated sector is furnished with an index 14. When the zero of the graduations of the sector lies opposite the index 14, the axis of the level is in a plane at right angles to the axis of the socket *c*. The sector is fitted with a toothed rack 12, gearing with a spiral pinion that is fast on the spindle 13, carried by the level, and such spindle is fitted with a milled head *o*. This head is provided with a drum circumferentially divided into one hundred equal parts marked with two sets of numbers running in opposite directions. It is thus possible to estimate or adjust the angular displacement in one ten-thousandths of the circumference of the circle the level describes around its pivot *l*. This particular arrangement of the level on the support of the goniometer permits of the rapid adjustment of the angle of sight with great precision, of laying the gun, of imparting or measuring the angle of drift, and of ascertaining and correcting the inclination of the trunnions.

As shown in Figs. 9 and 10, the sighting instrumentalities may comprise a telescope 15, provided with a collimator *h*, pivoted thereto on an axis *x*, so as to be capable of adjustment parallel to the axis of the telescope. In this arrangement the outer sleeve of the telescope forms the carrier for the collimator, taking the place of carrier *e* of Figs. 1 to 8, the construction shown in Figs. 9 and 10 being the same as that of the other figures, except as to the differences just explained.

The telescope furnished with a cross-wire and a micrometer enables indistinct objects to be sighted with great precision, distances and heights to be measured, and lateral angles to be ascertained.

What we claim, and desire to secure by Letters Patent of the United States, is—

1. In sighting apparatus for guns, a tubular socket adapted to be fixed to a gun or its mounting and subject to movement imparted to the gun in pointing the same, a level-support mounted on and rotatable about the

socket, a level pivoted to the support, a second support rotatable within the socket, and a sighting instrument having connection with said second support.

2. In sighting apparatus for guns, a tubular socket adapted to be fixed to a gun or its mounting and subject to movements imparted to the gun in pointing the same, a level-support mounted on and rotatable about the socket, a level pivoted to the support, a second support rotatable within the socket, a carrier rotatable on the second support, and a sighting instrument pivoted to the carrier.

3. In sighting apparatus for guns, a tubular socket adapted to be fixed to a gun or its mounting and subject to movements imparted to the gun in pointing the same, a level-support mounted on and rotatable about the socket, a level pivoted to the support, a second support rotatably adjustable within the socket, means for locking the second support in its adjusted position, a carrier adjustably pivoted to the second support, and a sighting instrument adjustable to different inclinations on the carrier.

4. In sighting apparatus for guns, a tubular socket adapted to be fixed to a gun or its mounting and subject to movements imparted to the gun in pointing the same, a ring surrounding and rotatably mounted on the socket, a level pivoted to the ring, means for adjusting the level on the pivot, a support rotatably adjustable within the socket, locking means for holding the support in its adjusted position, a carrier pivoted on said support, means for laterally adjusting the carrier on its pivot and for locking it in its adjusted position, and a sighting instrumentality adjustable to different inclinations on the carrier.

5. In sighting apparatus for guns, a tubular socket adapted to be fixed to a gun or its mounting and subject to movements imparted to the gun in pointing the same, a ring surrounding and rotatably mounted on the socket, a level pivoted to the ring, means for adjusting the level on its pivot, a tubular support rotatably adjustable within the socket, locking means for holding the support in its adjusted position, a carrier having a pivot-stem rotatably engaging within the tubular support, means for laterally adjusting the carrier on its pivot and for holding it in its adjusted position, and a sighting instrument adjustable to different inclinations on the carrier.

6. Sighting apparatus for guns substantially as described, characterized by a fixed graduated socket *c* provided externally with a horizontal rotary collar or ring *m* to which is articulated a level *k*, and provided internally with a movable socket *a* adapted to be turned horizontally and locked in any desired angular position about the axis of said socket *c*; the said socket *a* serving as a support for a transversely-movable carrier *e* carrying the sighting device *i h* proper, which latter is capable of vertical angular movement for the purpose specified.

In witness whereof we have hereunto set our hands in presence of two witnesses.

CHARLES PROSPER EUGÈNE SCHNEIDER.
JEAN BAPTISTE GUSTAVE ADOLPHE CANET.

Witnesses:
JEAN GRUND,
EDMOND BLAISE.