

C. P. E. SCHNEIDER & E. RIMAILHO.
 SIGHTING APPARATUS FOR GUNS.
 APPLICATION FILED AUG. 16, 1906.

946,402.

Patented Jan. 11, 1910.

2 SHEETS—SHEET 1.

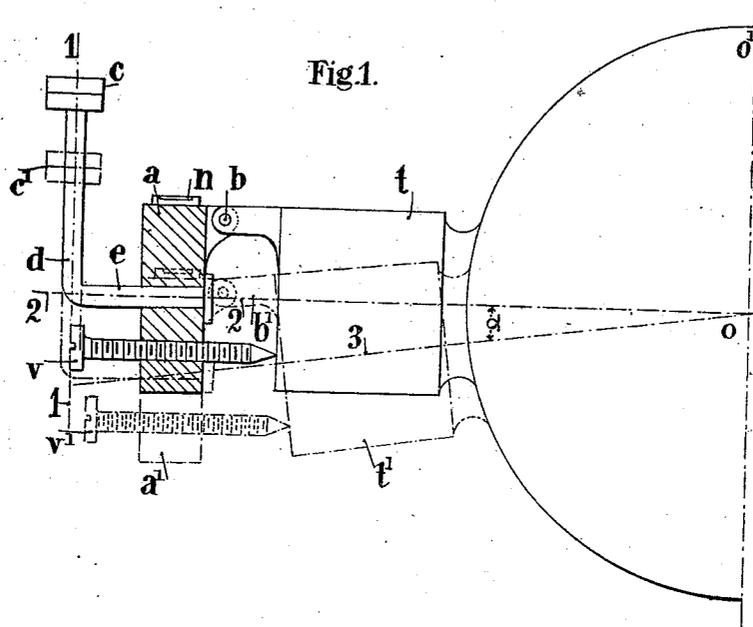


Fig. 1.

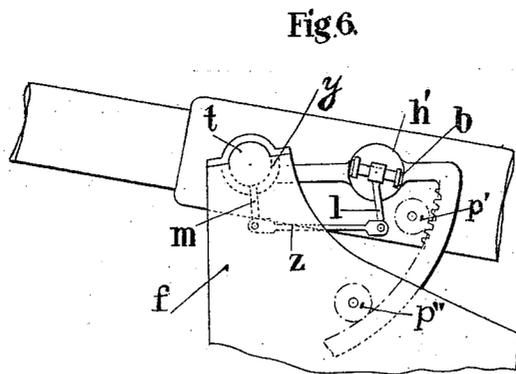


Fig. 6.

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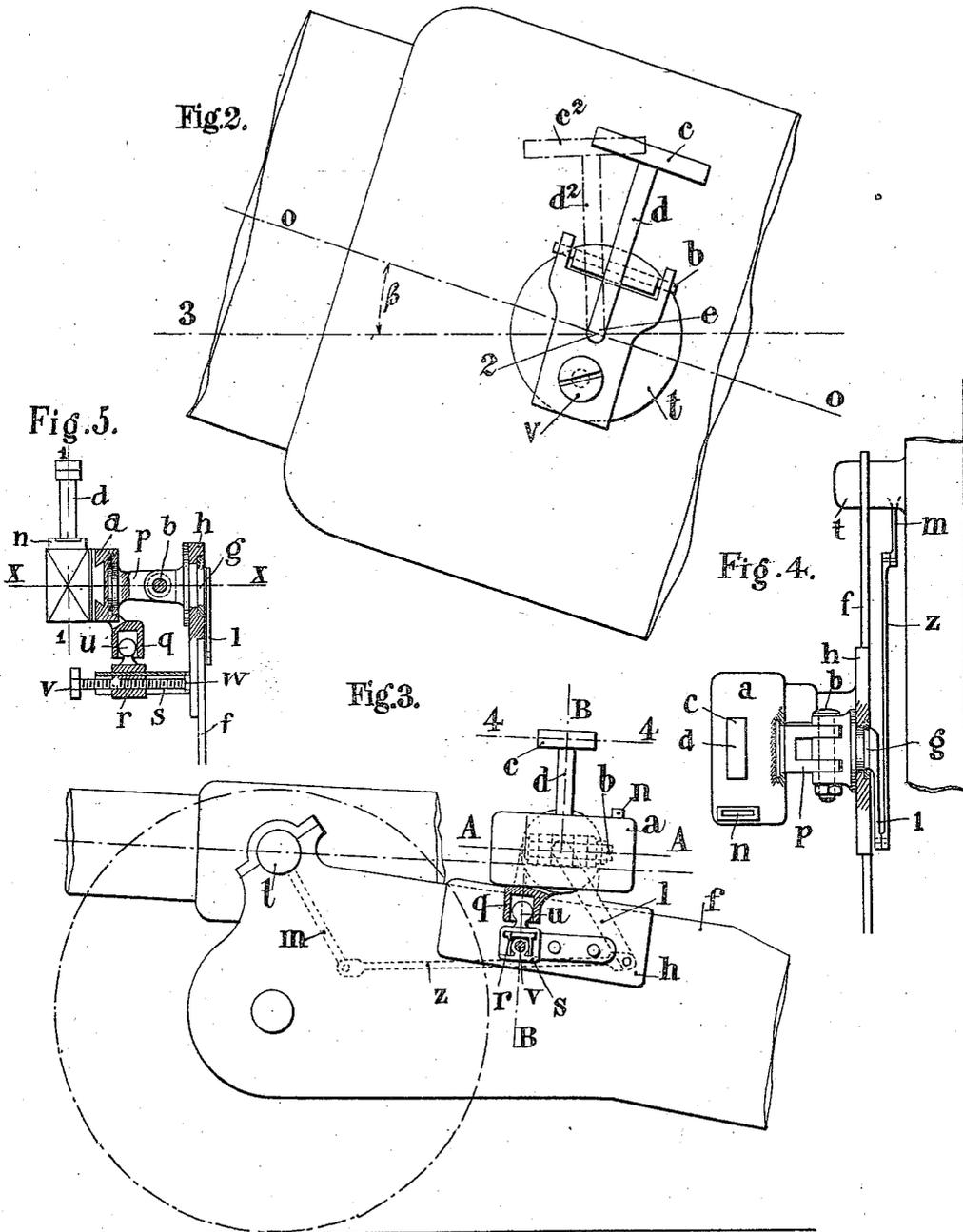
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UNITED STATES PATENT OFFICE.

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SIGHTING APPARATUS FOR GUNS.

946,402.

Specification of Letters Patent. Patented Jan. 11, 1910.

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To all whom it may concern:

Be it known that we, CHARLES PROSPER EUGENE SCHNEIDER and EMILE RIMAILHO, residing, respectively, at Le Creuzot, Saône-et-Loire, France, and at 54 Boulevard Maillot, Neuilly-sur-Seine, Seine, France, have invented a new and useful Improvement in or Relating to Sighting Apparatus for Guns, which is fully set forth in the following specification.

This invention relates to sighting apparatus for guns, and has for its object to correct errors due to the inclination of the axle.

Heretofore, sighting devices have been placed either upon the gun, the trunnion for example, or upon the cradle, or upon the gun carriage, and when the apparatus is carried by the trunnion of the gun, articulated supports have been employed to permit of correcting the influence of the inclination of the axle.

According to the present invention the device is constructed in such a manner that the necessary correction is obtained in a more efficient manner than has heretofore been practicable, in the case in which the sighting device is carried by the cradle or the carriage.

In order that the novel device may be readily understood it is desirable to indicate briefly the means employed for obtaining the correction when the supports of the sighting device are fixed to the trunnion of the gun.

Figures 1 and 2 of the accompanying drawing are diagrams relating to these known means. Figs. 3-6 illustrate the improved device, Fig. 3 being a view in side elevation, showing the connection between the gun mount and the gun and the sighting devices carried thereby; Fig. 4 is a section on line A—A, Fig. 3; Fig. 5 is a sectional view on line B—B of Fig. 3; and Fig. 6 illustrates diagrammatically a connection when the sighting devices are suspended from the aiming sector.

In Fig. 1, t is the trunnion of a gun the axis of which is projected at o . Ordinarily the support a of the sighting device is suspended from the trunnion t by a hinge b parallel with the longitudinal axis $o—o$ of the gun. This support may be displaced around its hinge by means of a screw v ; it carries a level n and a sighting device c situated upon a rod d forming part of a shaft

e capable of rotating with slight friction in the support a around the geometrical axis 2—2 (Fig. 1). In the position represented in firm lines in Fig. 1, the plane of sight is the plane parallel with the axis of the gun, passing through the line 1—1. When the screw v is rotated this plane remains parallel with the hinge b which is parallel with the axis of the gun and this plane is vertical when the bubble of the level n is between its marks. If the axle, and consequently the axis of the trunnions t are inclined by an angle α along 3—3, the plane of fire of the gun is still the vertical plane $o—o^1$ passing through the axis of the gun; in order that the plane of sight may be parallel with the plane of fire, it is necessary to act upon the screw v , in order to bring the bubble back between its marks, and, as stated above, in this manner the plane of sight is rendered vertical and parallel with the axis of the gun, and therefore parallel with the plane of fire, by bringing the parts into the position indicated in broken lines in Fig. 1. When however the angle of elevation β is given, as indicated in firm lines in the diagram Fig. 2, the line of sight is inclined and directed skyward. In order to bring it back on to the target which is on the ground it is necessary to turn by hand the rod $d—e$ around the geometrical axis 2—2 (Fig. 1), in such manner as to bring the line of sight downward, the parts $c—d$ then assuming the position $c^2 d^2$ indicated in broken lines in Fig. 2. The novel device permits, in short, of obtaining the following results:—1. The plane of sight is kept parallel with the plane of fire, assuming the gun trunnions are horizontal, and is kept approximately horizontal when they are inclined, although the support a of the sighting device is not carried by the gun itself. 2. The connection of the support a with the part from which this support is suspended, and the gun, is such that the line of sight remains stationary when the elevation of the gun alters; this dispenses with the maneuver for returning the whole $c—d—e$ to $c^2—d^2—e$, (Fig. 2).

In Fig. 6 the sighting device is shown suspended from the aiming sector h' which is provided with a hollow trunnion y having a bearing in the gun carriage f and which receives the trunnion t of the gun. The sector h' engages on the gun a pinion p' and

on the gun carriage a similar pinion p'' whereby the sector may be caused to rotate with respect to the gun carriage, or the gun may rotate with respect to the sector. In either case the hinge b remains parallel with the axis of the gun.

Referring to Figs. 3-6, the device comprises a trunnion g , parallel with the trunnions of the gun, and rocking in the carriage f_2 , or in a bracket h forming part of the carriage, or in a similar bracket forming part of the sector h' (Fig. 6). This trunnion g carries a hinge b parallel with the axis of the gun, and maintained parallel with this axis owing to a connection between g and one of the trunnions t of the gun, causing g to follow all the movements of t . In the constructional form represented, the two trunnions g and t carry two parallel projecting arms of the same length l and m to the extremities of which there are jointed the two heads of a connecting rod z , in such a manner that t and g are the apexes of an articulated parallelogram. A part p , which in its turn serves as pivot for the support a of the sighting devices $c-n$, is capable of turning around the hinge b . It is obvious that the whole $g-b-p$ is able to rotate without necessarily entailing the rotation of the support a . An adjusting screw v supported upon the bracket h permits of rocking the whole $a-p$ around the hinge b in order to return the support a to the vertical position. The nut of this screw instead of being formed, as in the known devices, in the support a itself, is constituted by an independent part r , a kind of carriage guided normally to the median plane of the gun upon an arm s forming part of the carriage or of the cradle, or fixed upon the bracket h . The head w of the screw is prevented from longitudinal displacement in such manner that the rotation of the screw causes the longitudinal displacement of the nut upon the arm s . Now, the nut carries a spherical stud u engaged in a cylindrical socket q , formed in the support a , or in an appendix projecting from this latter. The diameters of the socket and of the spherical stud are such that the sphere always has a great circle in contact with the inner surface of the socket. When, by maneuvering the screw v longitudinal displacement of the nut r is produced, a rotation of the whole $p-a$ around the hinge b is produced, the socket q inclining upon the spherical nut u according to requirements; and if by means of the level, the support a has been made vertical, it is maintained in that position whatever may be the vertical inclination given to the gun, because the whole $g-b-p$ rotates in the said support. The plane of sight may accordingly be rendered parallel with the plane of fire by manipulating the screw v whatever the inclination of the trunnions t of the gun may

be, and may be maintained so whatever inclination may be given to the longitudinal axis of the gun.

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

1. In a device for automatically correcting for the inclination of the gun trunnions, the combination of a revoluble shaft parallel to the gun trunnions, means connecting said shaft with one of said trunnions to cause the shaft to follow the rotation of the trunnion, a sighting device support, a member having one end in revoluble engagement with said support and having the other end hinged to said shaft, a displacing screw having a traveling nut provided with a ball bearing, a socket in said support for receiving said ball bearing and adapted to maintain the plane of sight vertical while permitting said plane to remain parallel to the axis of the gun.

2. In combination, a gun, trunnions therefor and a gun mount, a sighting device and a support for the same, a hinge carried by the gun mount and around which said support is adapted to be rotated, and connections between one of said trunnions and said hinge whereby the latter is maintained parallel with the longitudinal axis of the gun.

3. In combination, a gun, trunnions therefor and a gun mount, a second trunnion parallel to the first-mentioned trunnions and carried by the gun mount, a hinge carried by said trunnion, an arm connected to said hinge, a sighting device and a support for the same carried by said arm, means for rotating said support around said hinge, and connections between one of said gun trunnions and said second trunnion whereby said hinge is maintained parallel with the longitudinal axis of the gun.

4. In combination, a gun, trunnions therefor and a gun mount, a second trunnion parallel to the first-mentioned trunnion and carried by the gun mount, a hinge carried by said trunnion, a sighting device and a support for the same, an arm connected to said hinge and adapted to rotate freely in said support, means for rotating said support around said hinge, and connections between one of said gun trunnions and said second trunnion whereby said hinge is maintained parallel with the longitudinal axis of the gun.

5. In combination, a gun, trunnions therefor and a gun mount, a sighting device and a support for the same, a hinge carried by the gun mount and adapted to be maintained parallel with the longitudinal axis of the gun, a screw secured to said gun mount, a nut longitudinally movable thereon and provided with a spherical portion engaging in a socket on said support, whereby actuation of said screw rotates the support about said hinge.

6. In combination, a gun, trunnions

therefor and a gun mount, a trunnion mounted on the gun mount, a hinge carried by said trunnion, connections between said trunnion and one of the gun trunnions
 5 whereby said hinge is maintained parallel with the longitudinal axis of the gun, a sighting device and a support therefor, an arm secured to said hinge and adapted to freely rotate in said support, a screw secured to said gun mount, and a nut longitudinally movable thereon and provided with a spherical portion engaging in a socket on said support, whereby actuation of said screw rotates the support about said
 10 hinge.

7. In combination, a gun, trunnions therefor and a gun mount, a trunnion mounted on the gun mount, a hinge carried by said trunnion, an arm connected to said trun-

nion, a similar arm connected to one of the gun trunnions, a rod connecting said arms, a sighting device and a support therefor, an arm secured to said hinge and adapted to freely rotate in said support, a screw secured to said gun mount, and a nut longitudinally movable thereon and provided with a spherical portion engaging in a socket on said support, whereby actuation of said screw rotates the support about said
 20 hinge.

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

CHARLES PROSPER EUGENE SCHNEIDER.
 EMILE RIMAILHO.

Witnesses:

EUGÈNE ETTEMCE,
 PIERRE GALON.