

No. 794,649.

PATENTED JULY 11, 1905.

E. TERNSTRÖM.
SIGHTING APPARATUS FOR GUNS.
APPLICATION FILED DEC. 19, 1904.

FIG. 1.

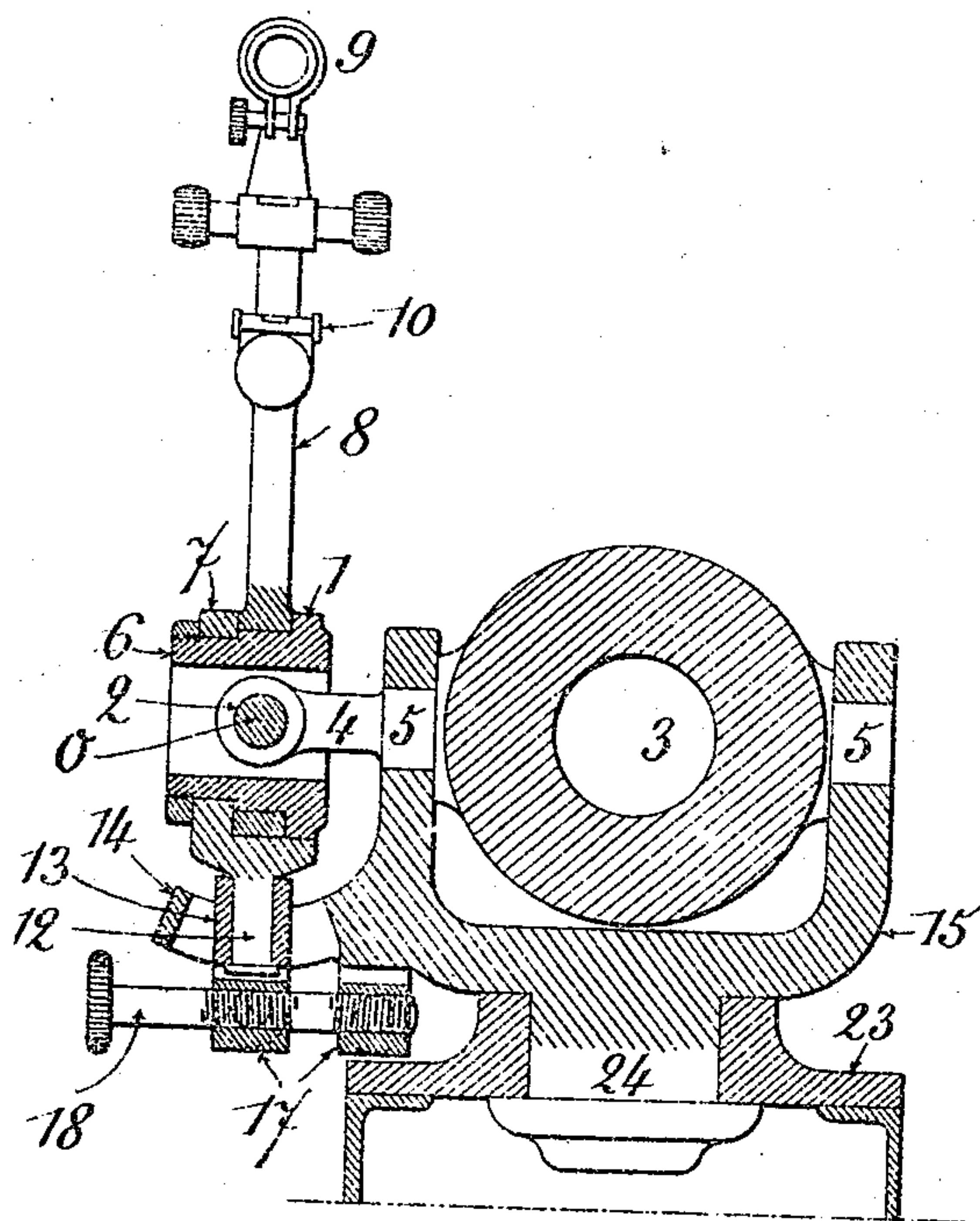


FIG. 2.

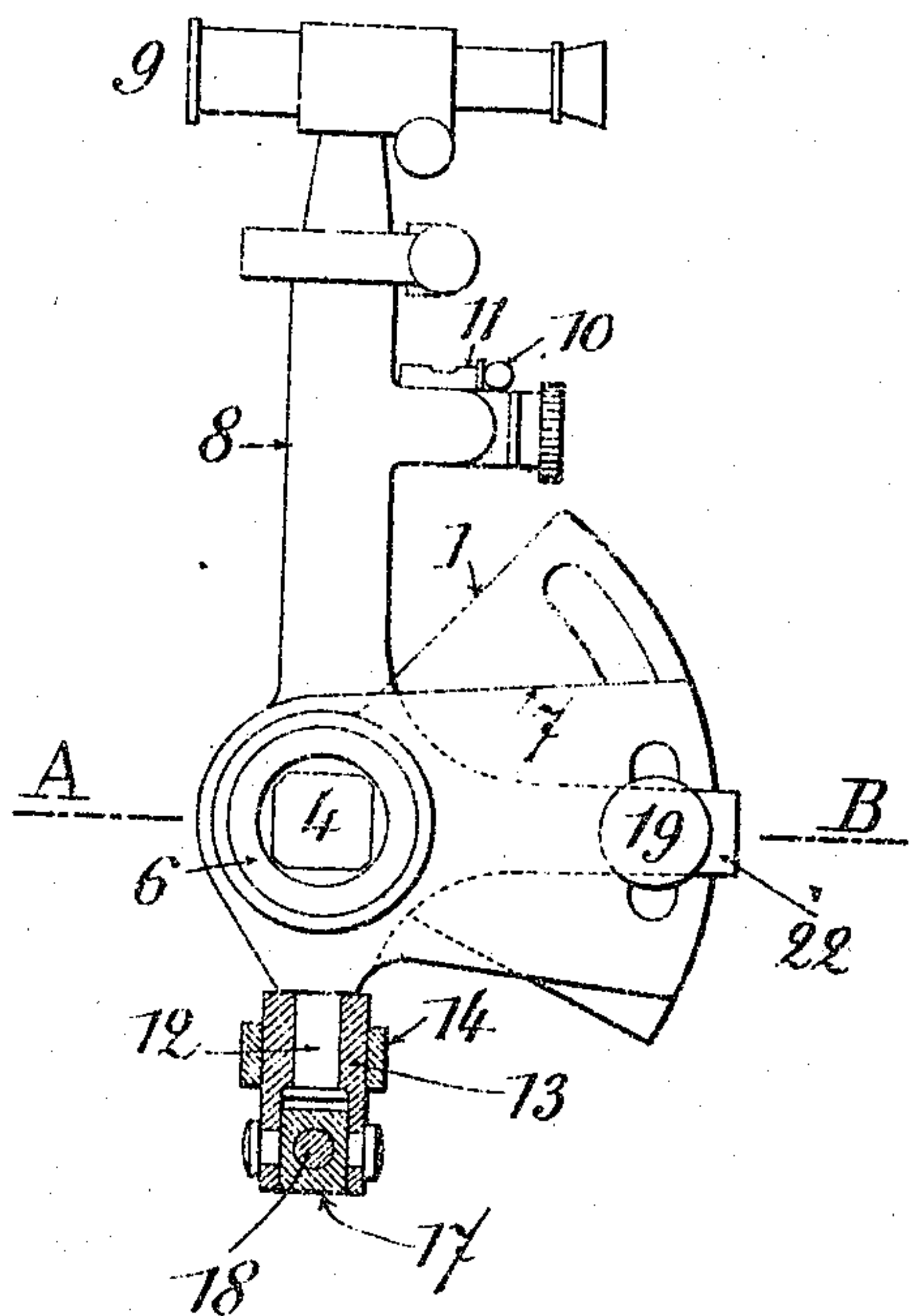
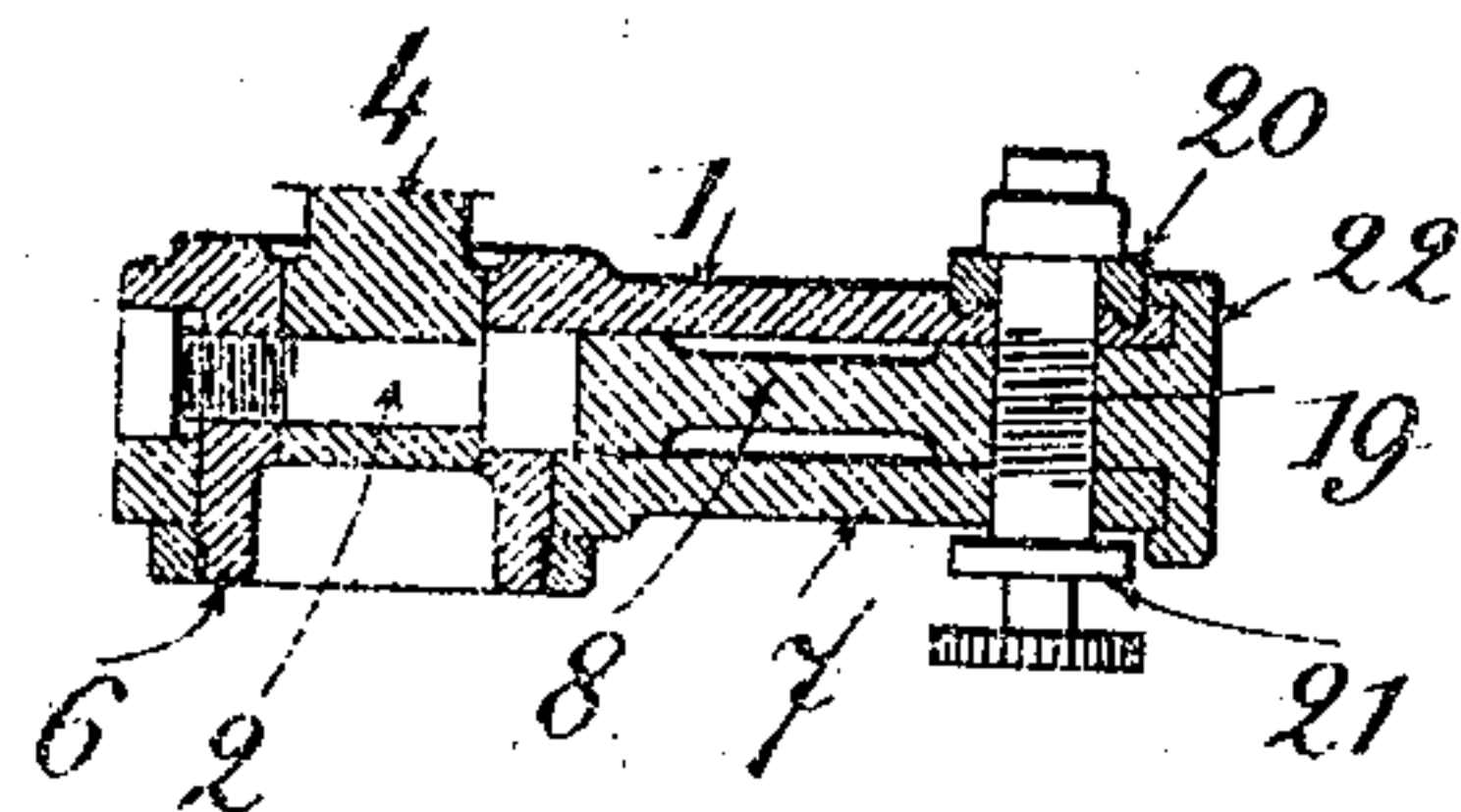


FIG. 3.



WITNESSES:

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SIGHTING APPARATUS FOR GUNS.

SPECIFICATION forming part of Letters Patent No. 794,649, dated July 11, 1905.

Application filed December 19, 1904. Serial No. 237,534.

To all whom it may concern:

Be it known that I, ERNST TERNSTRÖM, engineer, a subject of the King of Sweden and Norway, residing at 50 Quai des Carmes, Jemeppe sur Meuse, Belgium, have invented certain new and useful Improvements in Sighting Apparatus for Guns, of which the following is a specification.

This invention relates to a sighting mechanism for guns so fitted that the line of sight may be rendered fixed at will or independent with respect to the piece of ordnance and also that the corrections required on account of the inclination of the axle—that is to say, of the trunnions—of the gun may be made.

The said sighting mechanism comprises an adjusting-segment, the plane of which is parallel to the axis of the gun and which is mounted on a hinge parallel to the said axis, so that the said segment can be set up straight or more or less inclined, but is forced to follow the movements of the gun when inclining one way or the other around its trunnions on taking a higher or lower sight. The said adjusting-segment carries on a stud or hub perpendicular to its plane a guiding-segment, which is thus held in a plane parallel to its own and which is connected to the gun-carriage by a guideway extending in a plane passing through the axial line of the trunnions of the gun, so that the said segment can swing with the adjusting-segment around the same hinge parallel to the axis of the gun, but cannot follow, like the last-named segment, the inclining movements of the piece of ordnance around its trunnions. The sighting mechanism also comprises an adjusting device, which allows of the segments being swung around their common hinge parallel to the axis of the gun and of locking the same in any desired position. On the same stud or hub perpendicular to the plane of the segments a bracket is capable of turning and which carries a sighting device having a sight-hole or other sighting device, the line of sight of which lies normally in a plane parallel to that of the segments and can be more or less inclined with respect to the axis of the gun. The same bracket is provided with two levels which allow of measuring the

inclination of the line of sight and that of the common stud carrying the guiding-segment and the said bracket. A suitable fixing device allows of causing the line-of-sight bracket to coöperate with either of the two segments at will. By the combination of these arrangements the segments can be maintained in a plane which is always vertical and parallel to the axis of the piece of ordnance, and it becomes possible to point or train the gun on the butt and to modify its inclination according to the range to be reached without the line of sight leaving the butt.

The sighting mechanism may also be provided with a goniometer to show the errors of direction.

In the accompanying drawings, showing, by way of example, one form in which this invention can be carried out, Figure 1 is a vertical section on the axial line of the trunnions of a gun. Fig. 2 is a side elevation of the training mechanism. Fig. 3 is a horizontal section on the line A B of Fig. 2.

In the form shown in the drawings the sight-supporting mechanism comprises an adjusting-segment 1, mounted on a hinge 2, the axis of which is placed parallel to the axis of the piece of ordnance 3 on an extension 4 of one of the trunnions 5 of the latter. The segment 1 is provided with a hub 6, around which is loosely mounted a guiding-segment 7 and a bracket 8, bent in shape and which carries a glass 9, determining the line of sight, as well as two levels 10 and 11, placed the one parallel to the axis of the hub 6 and the other perpendicular to the same. The segment 7 is provided with an extension 12, which is guided, by means of a slide 13, in a slideway 14, extending in a plane passing through the axial line of the trunnions 5, the said slideway being fixed to the cradle or frame 15. On the slide 13 and the slideway 14 are pivotally mounted two nuts 17, in which passes a screw 18, having threads arranged in contrary directions. When the said screw is turned one way or the other, the nuts are caused to move nearer to or farther away the one from the other, and the segments 1 7, as well as the bracket 8, are caused to swing around their common hinge 2.

A screw 19, passing loosely through slots or slideways of the segments 1 7, is screwed in the bracket 8 and carries two washers 20 and 21, by the aid of which either the segment 5 1 or the segment 7 can be clamped against the said bracket, according to whether the screw is turned one way or the other.

At the periphery of the segment 1 are graduations along which moves an indicator 10 22, fixed to the bracket 8, to indicate the inclination of the cannon with respect to the line of sight.

The way to use the present device is as follows: To begin, by means of the screw 19 the line of sight and the segment 1 are set together. Then the pointing-screw is acted upon so as to move the gun until the line of sight passes through butt. The line of sight is fixed to the segment 7. Then the pointing-screw 20 is so acted upon as to give the gun the required angle for firing in reading off the adjustment on the segment 1. Finally, the influence of the inclination of the axle is corrected by turning the screw until the level 11 25 shows the horizontal position, after which the pointing-screw of the gun is again acted upon to bring the line of sight on the butt. If it be considered that the slideway 14 lies in a vertical plane with the trunnions of the gun, and 30 consequently with the swinging center O of the bracket 1 7 8, it will be understood that in acting on the screw 18 the axial line passing through the pin 12 and the said swinging center O was brought into a vertical direction, the result being that if the direction of 35 the gun is afterward changed the plane of the bracket 8, which is held vertical by the slideway 14, the screw 18, and the nuts 17, must turn around the axial line 12 O to follow 40 the change in direction of the axial line of the hinge 2, which still remains parallel to the gun. Consequently the vertical plane passing through the bracket 8—that is, the line of sight—is then parallel to the vertical plane 45 passing through the axial line of the gun and remains parallel afterward on the direction of the gun being modified.

As herein shown, the intersection O of the axial line of the hub 6 and of the axial line of 50 the hinge 2 lies on the axial line of the trunnions 5; but the said intersection may lie quite as well at any distance from the axial line of the trunnions, provided that the hinge 2 shall still be parallel to the axial line of the 55 gun and that the segment 7 shall still be suitably guided with respect to the gun-carriage. On the other hand, in the form of the invention represented in the drawings the cradle or frame 15 is shown as being pivotally connected 60 to the gun-carriage 23 by means of a

vertical pivot 24. The sighting mechanism described can be applied quite as well to a piece of ordnance in which the trunnions of the gun are mounted directly on the gun-carriage. The slideway 14 is then fixed to the 65 gun-carriage. Likewise it can be applied in the case where the gun is slidably mounted on a cradle which is itself connected to the gun-carriage by the trunnions, in which case the sighting mechanism is connected to one of 70 the trunnions of the cradle or frame and the slideway 14 is connected to the gun-carriage. In every case it is necessary that the plane passing through the axial line of the slideway 14 and the axial line of the hub 6 shall 75 be vertical if it is desired to obtain a strict correction of the inclination of the axle. This result is only reached by a certain position of the gun on inclined ground when the slideway 14 is invariably fixed to the gun- 80 carriage; but a strict compensation may be obtained in all positions by fixing the said slideway adjustable on the gun-carriage, so as to be able to place the said slideway plumb 85 under the hub 6.

I claim—

1. A sighting mechanism for guns comprising a hinge adapted to be connected to a piece of ordnance parallelly to its axial line, a 90 hub pivoted to the said hinge and having its axial line perpendicular to that of the said hinge, a bracket pivoted to the said hub and adapted to carry a line of sight, an adjusting-segment cooperating with the hub, a guiding-segment loosely mounted on the said hub, 95 means to connect alternatively the said bracket to the said segments, means to guide the last-named segment in a determined direction, and means to lock the said guiding-segment along the said direction. 100

2. A sighting mechanism for guns comprising a hinge adapted to be connected to a piece of ordnance parallelly to its axial line, a 105 hub pivoted to the said hinge and having its axial line perpendicular to the latter, a bracket on the said hub and adapted to carry a line of sight, a guiding-segment on the said hub, a slideway or slot adapted to be fixed on the gun-carriage, an extension of the said segment guided in the said slideway or slot, and 110 a device to adjust the said extension in the slideway or slot.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

ERNST TERNSTRÖM.

Witnesses:

H. SAVAGE,
E. TRIESTA.