No. 745,177. PATENTED NOV. 24, 1903.

T. GHENEA.

SIGHTING ATTACHMENT FOR ORDNANCE.

APPLICATION FILED DEC. 13, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.

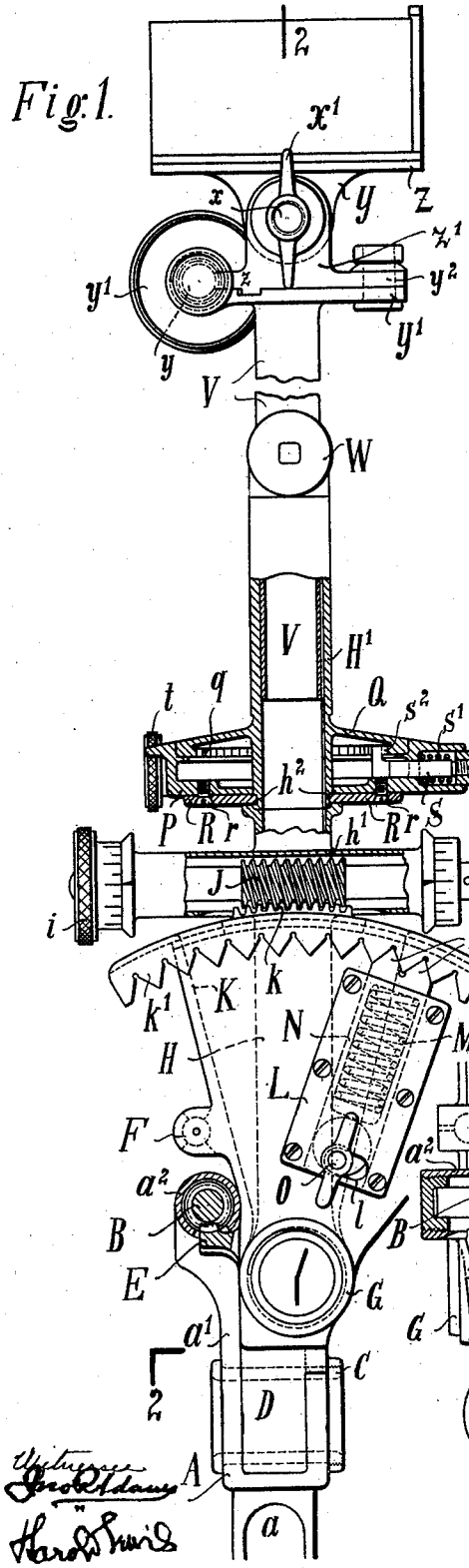


Fig. 2.

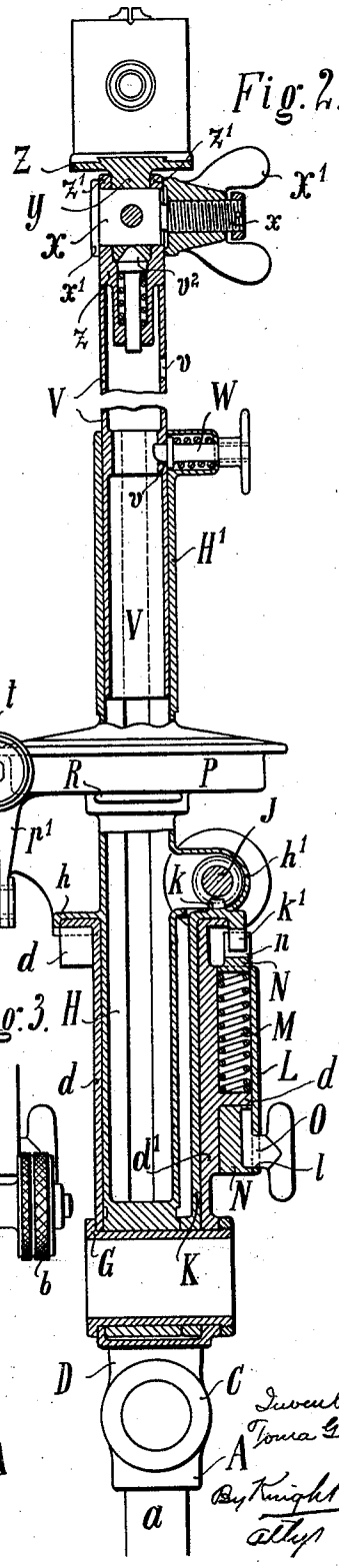
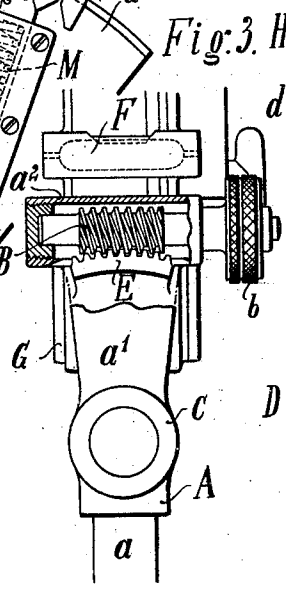


Fig. 3.



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NO MODEL. 3 SHEETS—SHEET 2.

Fig. 6.

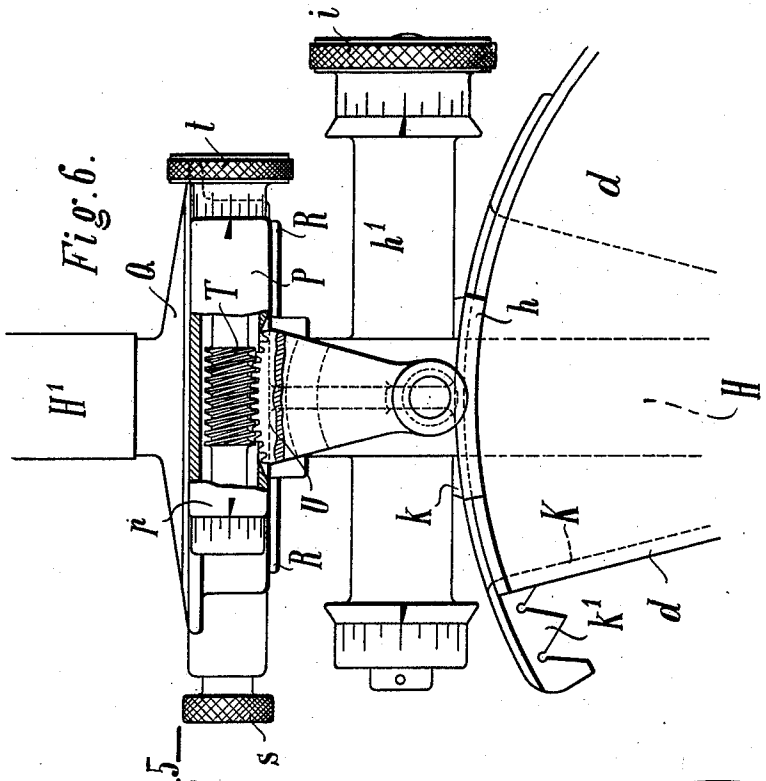


Fig. 4.

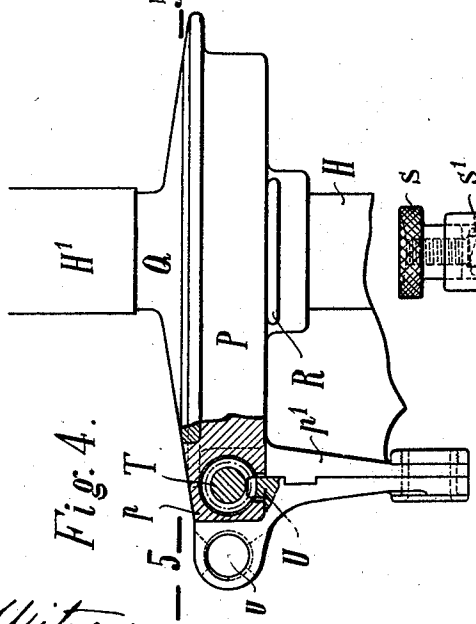
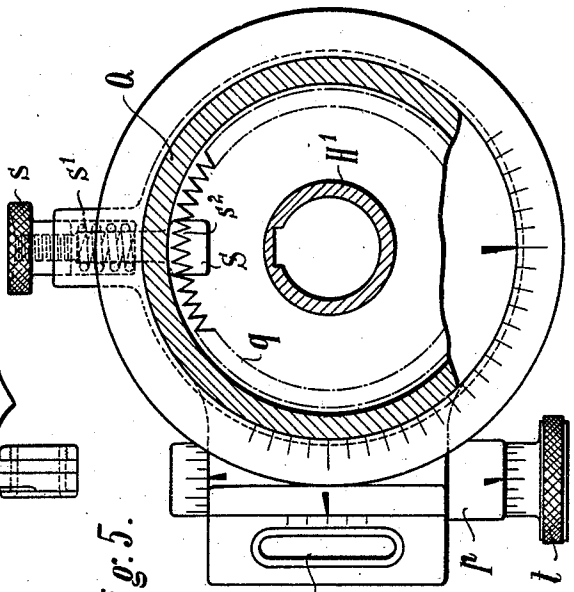


Fig. 5.



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NO MODEL 3 SHEETS—SHEET 3.

Fig. 7.

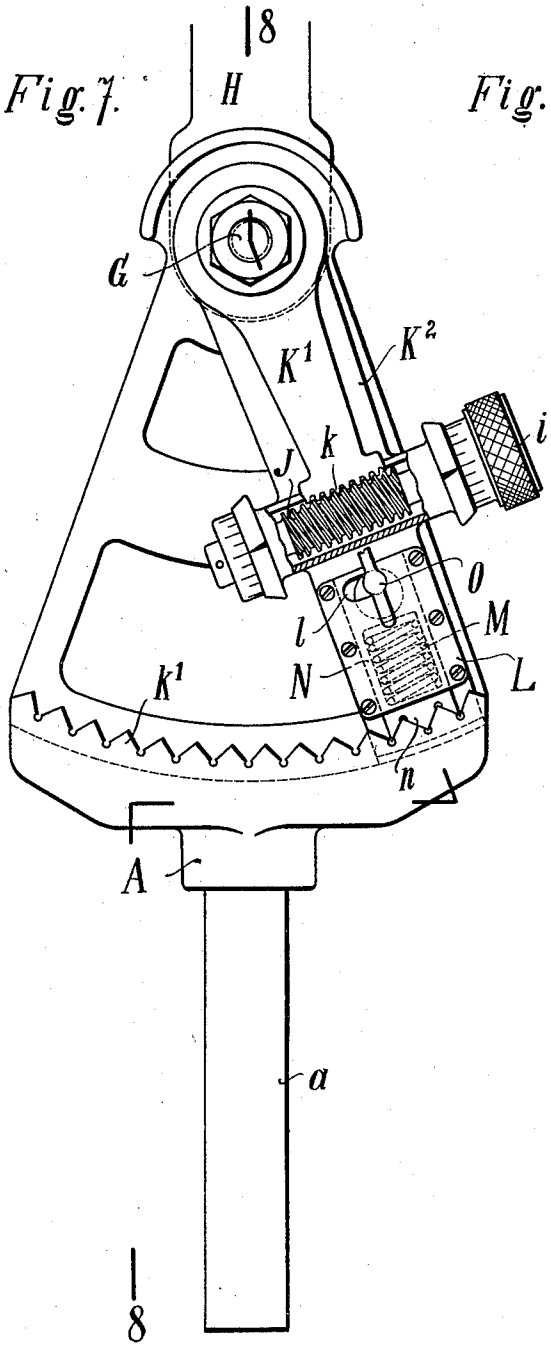
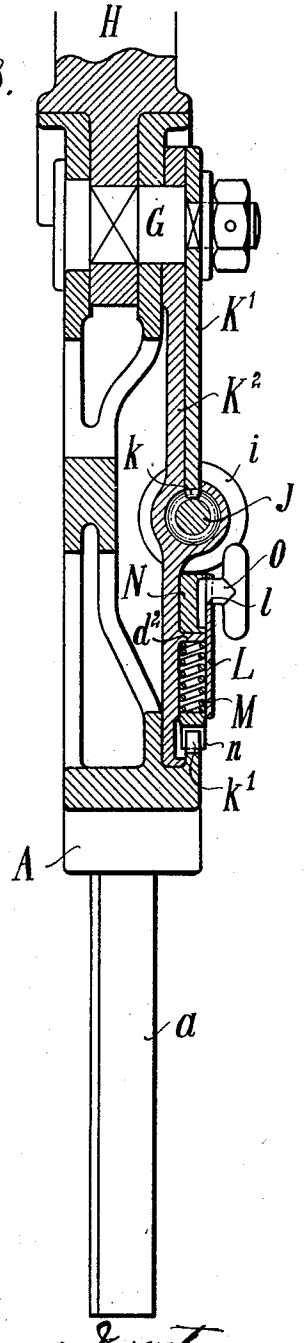


Fig. 8.



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No. 745,177. Patented November 24, 1903.

UNITED STATES PATENT OFFICE.

TOMA GHENEA, OF BUKHAREST, RUMANIA.

SIGHTING ATTACHMENT FOR ORDNANCE.

SPECIFICATION forming part of Letters Patent No. 745,177, dated November 24, 1903.

Application filed December 13, 1902. Serial No. 135,120. (No model.)

To all whom it may concern:

Be it known that I, TOMA GHENEA, major, residing at Royal Arsenal, Bukharest, Rumania, have invented certain new and useful Improvements in Sighting Attachments for Ordnance, of which the following is a specification.

This invention is designed to produce a sighting attachment which can be adjusted very rapidly for the greatest distances and in which the line of sight lies comparatively high. This object is attained according to the present invention by having the particular sighting device (telescope or the like) arranged upon the free end of a post, the other end of which post, in the present case a specially-formed shank, is coupled with the gun-barrel or the cradle, on one side by a joint and on the other side through the medium of an adjusting device, in such a manner that the post during the sighting operation remains vertical or nearly vertical.

In the accompanying drawings, forming part of this specification, the invention is illustrated by way of example in two embodiments, Figure 1 being a side elevation, partly in section, showing the subject-matter of the invention, Fig. 2 being a vertical longitudinal section on the line 2 2, Fig. 1, looking from the left with several parts shown in elevation, Figs. 3 to 6 being detail views, of which Figs. 4, 5, and 6 are on an enlarged scale, and Figs. 7 and 8 showing a second embodiment of the subject-matter of the invention in side elevation and in section, respectively, the section being taken on line 8 8, Fig. 7, looking from the left.

Referring to the form of the invention illustrated in Figs. 1 to 6, the sighting attachment consists, essentially, of the post H H′ V, carrying upon its upper end the special sighting device—for example, a telescope—and connected at its lower end through the medium of a hinging-bolt G with the shank A. The shank A is provided with a foot *a*, which can be inserted in a channel formed on the gun or cradle. The shank A can also be rigidly connected with these parts or be constructed in one piece therewith if the sighting attachment is to remain in place upon the gun or its cradle during transportation as well as in use. This shank terminates at its upper end in a fork whose inner arm a' carries the housing a^2 on its free end, in which housing is mounted a worm B, provided with a turning head *b*, Fig. 3. In the fork is likewise mounted to oscillate through the medium of the bolt C a part D, which is also fork-shaped, the fork-arms d d' of this part D being of segmental form and carrying a toothed segment E, which extends in engagement with the worm B, as also a level F. Through the medium of the worm-gear E B the part D can be swung upon the bolt C, and thus by the assistance of the level F the effect of the uneven condition of the carriage-wheels can be eliminated. The arms d d' of the part D are provided with two eyes which are concentric with the circumference of the segmental faces which define the toothed segment and in which eyes the bolt G is journaled. Upon the bolt G is mounted to swing loosely the hollow cylindrical rod H, which on the one side carries a guide for the fork-arm d and on the other end a housing h', in which is journaled a worm J, provided with a turning head *i*. Extending in engagement with the worm J are the external teeth k of the toothed segment K, which is likewise capable of oscillating about the bolt G. In addition to the external teeth k the segment K is likewise provided with internal teeth k' of greater dimensions than the teeth k. The fork-arm d' of the part D will usually be coupled with the tooth-segment K and for this purpose carries a bolt N, inclosed in a housing L, which bolt carries on its end lying toward the teeth k' and engaging therewith two correspondingly-formed teeth n. The bolt N is held in engagement with the teeth k' through the medium of a spring M, bearing against a cross-rod d^2 on the fork-arm d', and said bolt can be brought out of engagement with the teeth k' by turning an eccentric cam O, which engages in a circular recess of the bolt N and is mounted in a slot-opening l on the housing L. By this means the turning axis of the eccentric cam O moves sidewise in the slot l of the housing. The coarse toothing k' of the toothed segments K is provided with a scale (not shown in the drawings) corresponding to the divisions of the toothing, which,

together with a mark arranged upon the spring-bolt N, (not shown,) serves roughly to establish the elevation. The accurate fixing of the elevation is accomplished by a scale made upon the drum of the turning head i of the worm J through the medium of a mark upon the housing h' of the worm J.

Above the worm J the rod H is extended to a housing P, the cover of which rests upon the lower end of the rod H′, which sets the rod H upward and can be turned, together with the same, relatively to the rod H and the housing P. The connection of the rod H′ with the rod H is effected by two plate-formed projections R, which enter beneath the housing P through corresponding recesses in the rod H, engaged in an annular groove h^2 upon the lower end of the rod H′ and held upon the housing P through the medium of screws r. This connection permits the rods H′ to be turned relatively to the rod H, which is secured against axial movement. On the inner rim of the cover Q is arranged a toothed crown q, with which the upwardly-presented teeth s^2 of a spring-bolt S, guided in the housing P, stand in engagement, (see also Fig. 5,) so that the rod H′ is secured against turning with respect to the housing P. By pressure upon the head s in opposition to spring s' this coupling can be released. After releasing the coupling s^2, q, which carries the sighting device, can be turned three hundred and sixty degrees relatively to the fixed housing P. The reading of the angle of revolution is obtained by assistance of a scale mounted upon the upper side of the housing P and a mark located upon the cover Q, Fig. 5. Upon the housing P is another housing p, Figs. 2, and 4 to 6, which receives a worm T, provided with a turning head t. Extending in engagement with this worm T are the teeth of a sector U, which carries the level u and is jointed to an arm p' of the housing P, projecting vertically downward. By rotating the head t the sector U, carrying the level, can be swung in a vertical plane. The angle of this movement can be read upon a scale arranged upon the housing of the worm T, together with a mark located upon the housing of the level u. The above-described arrangement serves for determining the angle of terrain.

A rod V is arranged to slide in the rods H H′ through the medium of a right-line groove and feather. The rod V can be locked through the medium of a spring-bolt engaging in the recesses v, either in its drawn-out or shove-in position. It terminates above in an arm Y′ transverse to its direction, which carries upon its rear end a worm y. This worm engages in the toothed edge of a segment z, which is connected with a hinge-bolt y^2 in a manner to be horizontally rotatable. By the turning of the head y' of the worm y the toothed segment z, and through it the line of sight, can be swung in a horizontal plane about the bolt y^2 of the arm y'. The turning angle of this movement can be read off from a scale mounted upon the drum of the turning head through the medium of a mark placed upon the housing of the worm Y.

The above-described arrangement for horizontally swinging the sighting device serves, on the one hand, for fixing by direct training, and, on the other hand, together with the already-described swinging device mounted in the housing P, it serves by indirect training through the medium of the auxiliary aim for roughly and accurately establishing the swinging angle, ascertained through the point of aim, auxiliary point of aim, and the gun, by observation or the like, and to which also the angle of deviation approaches.

The toothed segment z carries a fork z' z', in whose arms a hinge-bolt is rotatably mounted. This bolt X is non-rotatably connected with a head Y, mounted between the two eyes, which head is shaped above into a base-plate Z, which carries the sighting device. The head Y will ordinarily be fixed in one position by a spring-bolt v^2, arranged in a seat on the head Y, in which position the optical axis of the sighting device stands perpendicular to the axis of the rod V H′ H. The bolt X extends into a screw-bolt x, carrying a thumb-nut X′, and carries on its other end a disk x', which serves to oppose the thumb-nut X′. After loosening the thumb-nut X′ the head Y, carrying the sighting device, can swing in a vertical plane in the fork z' z'. By this means the spring-bolt v^2 slides from its seat into an annular groove surrounding the head Y. The new position of the head Y, and consequently of the sighting device, can be fixed by again screwing up the thumb-nut X′. The sighting device, which may be of any desired kind, is secured upon the base-plate Z by dovetail grooves.

The description of the manipulation and mode of operation of the sighting device will proceed upon the assumption that the sighting device is connected with the gun-barrel or with the cradle and that the several marks upon the attachment stand at the zero-points with reference to their scales. The procedure of direct training will now be described. For the purpose of eliminating the influence of uneven conditions of the wheels the worm B is turned through the medium of the head b until the level F registers. The desired elevation is next established. In order to establish the elevation roughly, the spring-bolt N is withdrawn from the teeth k' by turning the concentric disk O, and the rod H H′ V, together with toothed segment K, coupled therewith, through the worm-gear J k, is swung forward or backward until the mark upon the spring-bolt points to the number of thousands or hundreds of the scale arranged upon the toothing k' corresponding with the desired elevation. By turning back the eccentric disk the coupling N k' is again engaged. The elevation is then accurately established by

turning the post H H′ V to further swing relatively to the toothed crown K, rigidly secured to the shank A, until the mark upon the housing h' of the worm J points to the number of tens and units upon the drum of the turning head i corresponding to the desired elevation. Then by turning the head y' through the medium of the scale thereon the necessary horizontal training is imparted to the sighting device and finally by the crank on the elevating mechanism, and on the lateral training mechanism of the gun the point of aim is disclosed through the medium of the sighting device in a well-known manner. If the line of vision points to the aim, the gun is accurately pointed. After the gun is once pointed further aim can be simplified by determining the angle of terrain through the medium of the level u on the scale arranged upon the housing on the worm T, and obviously in further pointing the level u may be permitted to coöperate. If the target is not visible and the aim is to be determined by means of auxiliary sights, the rough and accurate pointing of the sighting device is effected exactly the same as in direct pointing. Then the post H′ V, connected with the sighting device, is turned in a horizontal plane through the determined angle of direction, which is made up of the exact angle found between the direct and auxiliary aims, and the angle of deviation. For this purpose the sighting post H H′ V, which during the establishing of the elevation occupied a position depressed from the horizontal plane, is given a vertical position by the crank on the elevating mechanism with the assistance of the level u. By this means the gun-barrel is simultaneously given the necessary elevation. Then by pressure upon the head s of the toothed coupling s^2 is released, and post H′ V is turned by hand relatively to post H until the mark on the cover Q registers with the number to be read upon the housing P, which has thousands and hundreds corresponding to the established angle of pointing. The accurate fixing of this angle follows by turning the head y'. Finally, the auxiliary aiming-point is adjusted by turning the crank on the horizontal turning mechanism or by the swinging of the carriage-trail and when necessary after loosening the thumb-nut X′ by swinging the sighting device in a vertical plane. If the line of vision points to the auxiliary aim, the gun has been swung through the determined angle of direction, which consists of the established angle plus the angle corresponding to the horizontal movement—that is to say, the gun is pointed in the direction of the aim. In case the angle of terrain is known this is established through the medium of the level u, mounted to swing upon the sector U, and transmitted by the elevating mechanism to the gun-barrel. The elimination of disturbing influences resulting from uneven position of the wheels is effected in the same manner as described with reference to direct pointing. If in pointing by auxiliary aim the point of auxiliary aim is so placed that the wheel-fellies come between it and the sighting device, the rod V, which is usually shoved into the post H H′, is withdrawn from the latter until the spring-bolt W snaps into the lower slot v. The line of vision will thus lie above the fellies of the wheel.

The embodiment of the invention illustrated in Figs. 7 and 8 is designed for such guns as those in which the influence of the inclined position of the wheels can be eliminated by the adjustment of an attachment-box arranged upon the gun. The lower joint C, described with reference to the first embodiment and which serves for this purpose, is consequently omitted. This embodiment differs otherwise from that already described in that, upon the one hand, the toothing k' for roughly establishing the elevation is mounted upon a segmentally-shaped portion, and, on the other hand, the toothing k for accurately establishing the elevation is mounted upon an arm K′, non-rotatably secured to the post H, while the spring-bolt N, which engages with the toothing k', as well as the worm J, which engages with the toothing k, are arranged upon an arm X^2, loosely rotatable about the hinge-bolt U.

Having thus described my invention, the following is what I claim as new therein:

1. A sighting attachment for guns, in which the sighting device proper is arranged upon the free end of a post, the other end of which is connected with the gun through a joint and adjusting device for giving an inclination to the post, said attachment having means indicating the inclination of the post.

2. A sighting attachment for guns, in which the sighting device proper is arranged upon the free end of a post, the other end of which is connected with the gun through a pivot-bolt by which said post is mounted to swing, a segmental arm and adjusting worm through which the post is adjusted in a vertical plane relatively to the part upon which it is mounted, for the purposes explained.

3. In a sighting attachment for guns, the combination of the sighting device proper, the post on which said sighting device is mounted, divided into two parts connected by a horizontal pivot-bolt, whereby said parts are angularly adjustable relatively to establish the desired elevation, a toothed segmental arm with coöperating toothed bolt for roughly fixing the angle of the post, and an additional segmental toothing with an adjusting worm for accurately fixing the angle of the post.

4. In a sighting attachment for guns, the combination of the sighting device proper, the post upon which the sighting device is mounted, divided into fixed and movable parts, a pivot-bolt connecting said parts, and permitting one to swing upon the other, a segmental arm connected with the fixed part, a segment capable of oscillating about said

bolt, coarse and fine toothing on the movable segmental arm, a toothed spring-bolt connected with the fixed part engaging with the coarse toothing on the movable segment, and a worm carried by the swinging post engaging the fine toothing, for the purposes set forth.

5. In a sighting attachment for guns, the combination of the sighting device proper, the post upon which said sighting device is mounted, divided into fixed and movable parts connected by a pivot-bolt which permits one part to swing in a vertical plane on the other, a segment also mounted to swing upon said pivot-bolt, with fine and coarse toothing, an adjusting-worm carried by the swinging part of the post and engaging the fine toothing on the segment, a spring-pressed toothed bolt mounted on the fixed part of the post, and engaging the coarse toothing on said segment, and a cam-disk for moving said toothed bolt.

6. In a sighting attachment for guns, the combination of a post for supporting the sighting device proper, divided into fixed and movable parts, connected by a pivot-bolt, which permits one to swing upon the other, and means for adjusting the angle between said parts; one of said parts being constructed telescopic and extensible for raising the sighting device proper, as explained.

7. In a sighting attachment for guns, the combination of a post for supporting the sighting device proper, and a foot or support upon which said post is mounted; the post being divided into two parts connected by a pivot-bolt and having means for adjustably fixing the angle between said parts, and a post being connected to its supporting-foot by means of said pivot-bolt at an angle to the bolt which connects the parts to the post, and having means for adjustably fixing the angle of position of the post relatively to its foot, including a level for determining the vertical position of the post, substantially as explained.

8. In a sighting attachment for guns, the combination with the sighting device, of a post on which said sighting device is mounted provided with a hinged joint, an adjusting device for said joint, and means indicating the adjusted inclination of the post.

9. In a sighting attachment for guns, the combination with the sighting device, of an extensible post, on which said sighting device is mounted provided with a hinged joint, an adjusting device for said joint, and means indicating the adjusted inclination of the post.

10. In a sighting attachment for guns, the combination with the sighting device, of a post on which said sighting device is mounted provided with a hinged joint, means for roughly fixing the angle of the parts of the post and means for accurately fixing the angle of the post.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

T. GHENEA.

Witnesses:
MAIOS BOLIVEAU,
R. JANSEN.