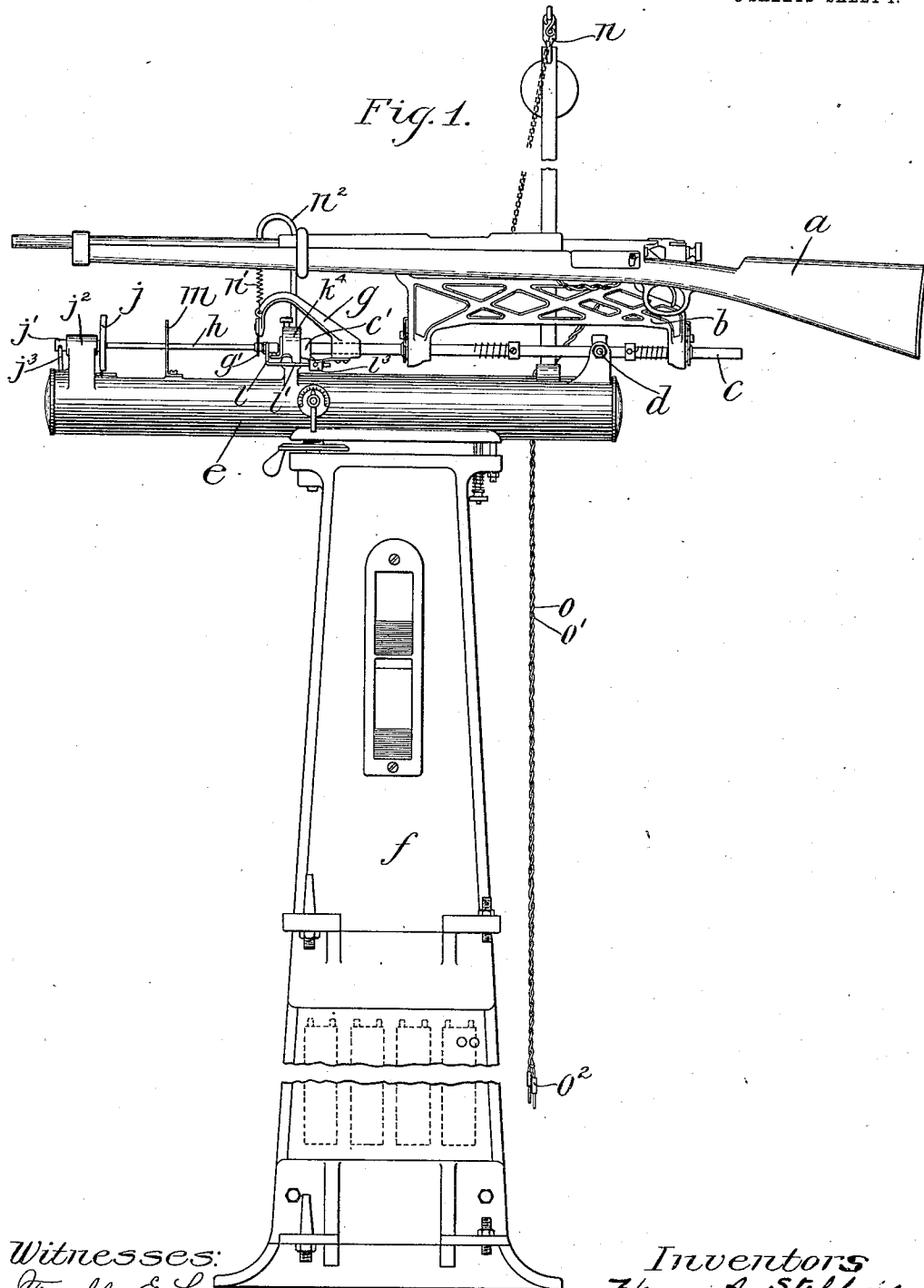


H. A. STEBBINS & A. A. ADAMS.
 TARGET PRACTICE APPARATUS.
 APPLICATION FILED MAY 23, 1906.

1,007,154.

Patented Oct. 31, 1911.

3 SHEETS—SHEET 1.



Witnesses:
 Franklin E. Low
 Robert H. Hammon.

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 by Emory Booth Attys

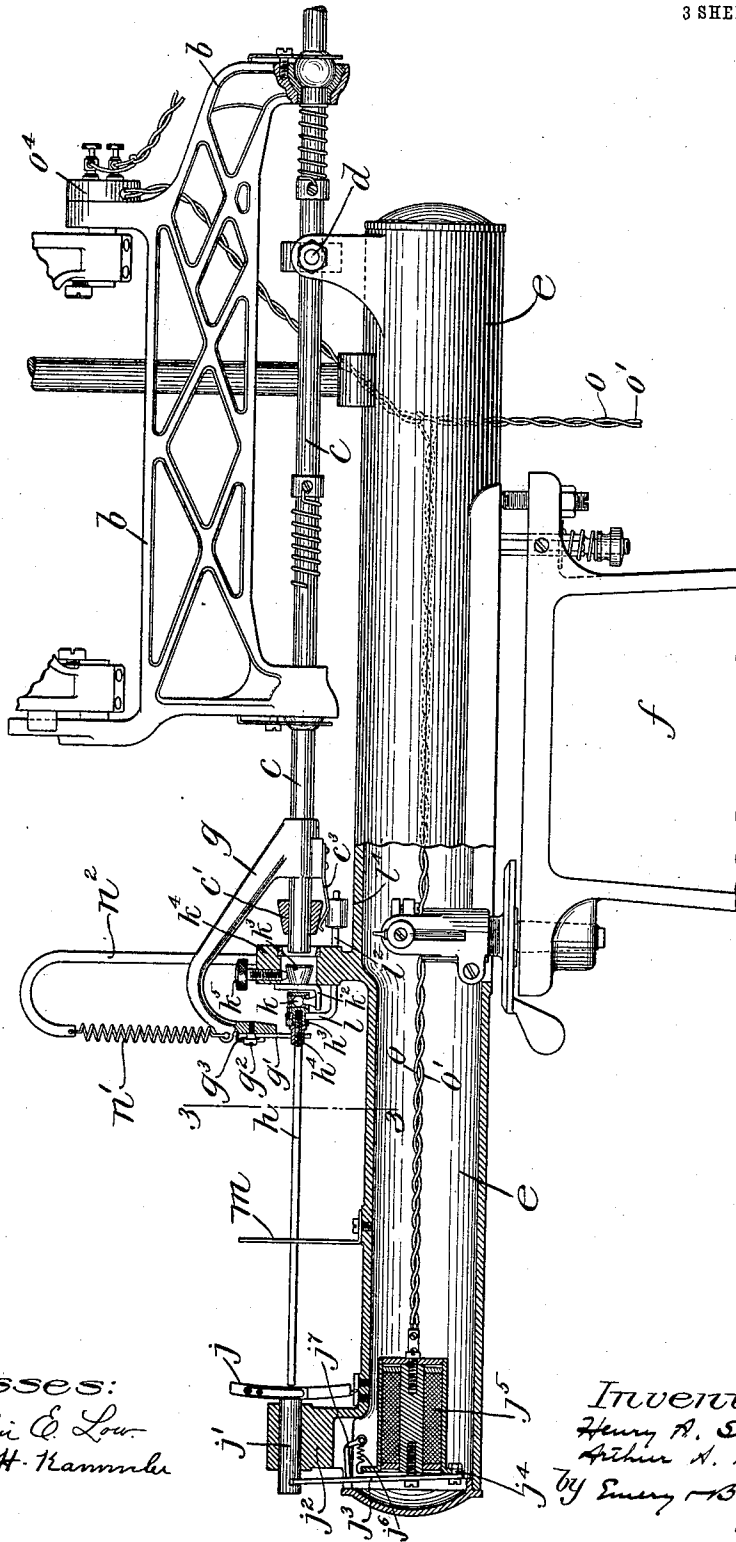
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3 SHEETS—SHEET 2.

Fig. 2.



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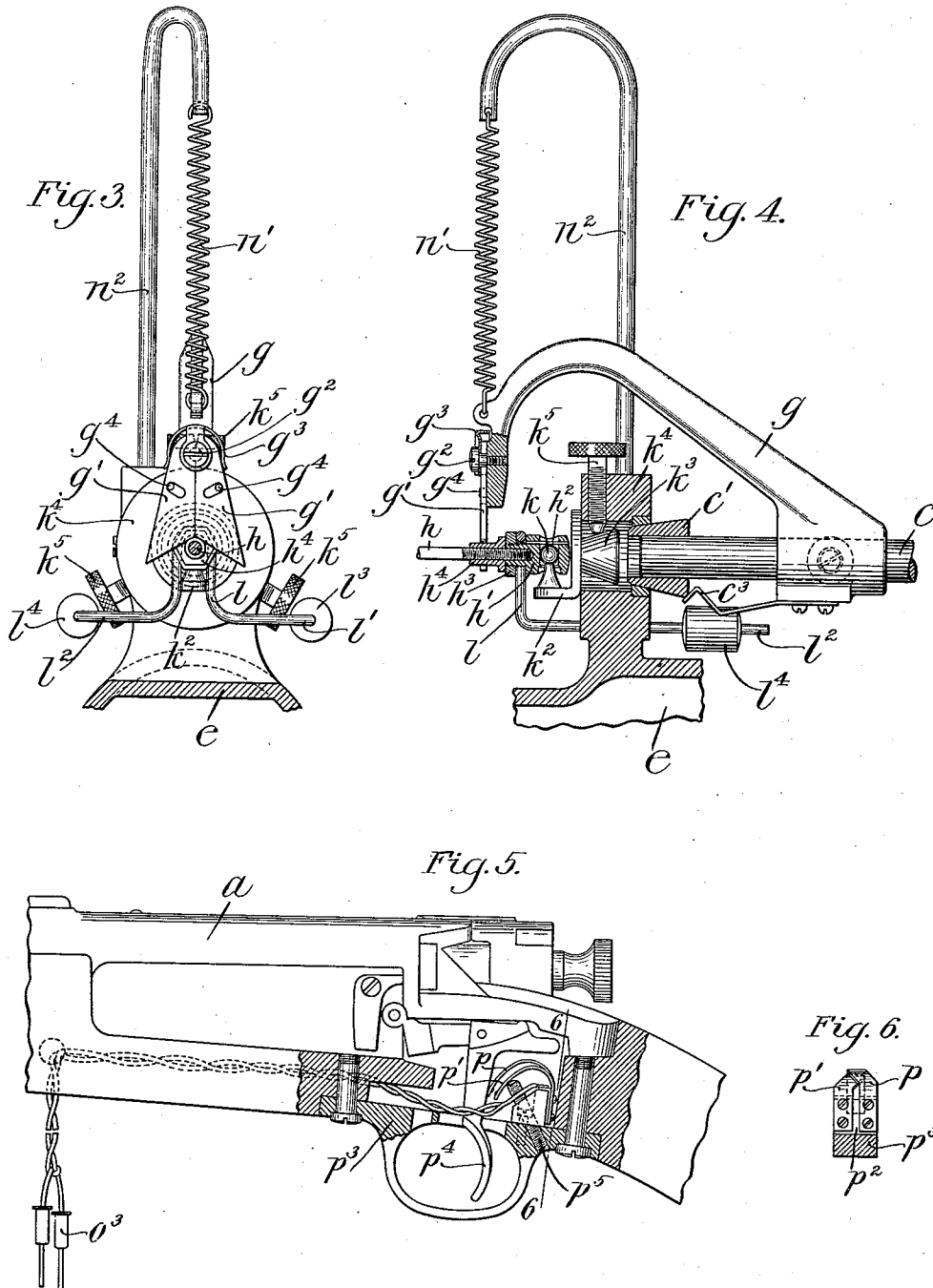
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

HENRY A. STEBBINS, OF MALDEN, AND ARTHUR A. ADAMS, OF BROOKLINE, MASSACHUSETTS, ASSIGNORS, BY MESNE ASSIGNMENTS, TO ATLANTIC NATIONAL BANK, OF PROVIDENCE, RHODE ISLAND, A CORPORATION OF RHODE ISLAND.

TARGET-PRACTICE APPARATUS.

1,007,154.

Specification of Letters Patent.

Patented Oct. 31, 1911.

Application filed May 23, 1906. Serial No. 318,303.

To all whom it may concern:

Be it known that we, HENRY A. STEBBINS and ARTHUR A. ADAMS, citizens of the United States, residing, respectively, at Malden, in the county of Middlesex, and Brookline, in the county of Norfolk, both in the State of Massachusetts, have invented an Improvement in Target-Practice Apparatus, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

Our invention relates to target practice apparatus and more particularly though not exclusively to the general type shown in Patent No. 739,778 to Henry H. Cummings.

Among other objects of our invention is an increased efficiency of the recording apparatus and an increased sensitiveness and delicateness in the movement of those parts which are connected to follow the movement of the aiming device.

Our invention will be best understood by reference to the following description taken in connection with the accompanying illustration of one specific embodiment thereof, while its scope will be more particularly pointed out in the appended claims.

In the drawings,—Figure 1 is a side elevation, partially broken away, showing the selected embodiment of our invention; Fig. 2 is an enlarged sectional elevation, partially broken away, showing the details of the recording mechanism and the following devices; Fig. 3 is a transverse section, partially broken away, on an enlarged scale along the lines 3—3 in Fig. 2 looking toward the pivot support of the needle; Fig. 4 is a partial longitudinal section showing on an enlarged scale the support of the needle and its connection to the follower rod; Fig. 5 shows a portion of the aiming device, partially broken away, to illustrate the contact recording mechanism contained therein, and Fig. 6 is a partial section on the line 6—6 in Fig. 5 to show the relation of the two contact pieces.

Referring to the drawings and more particularly to Figs. 1 and 2, the aiming device *a*, herein a gun of standard pattern, is mounted for aiming movement by means of the jointed holder *b* upon a gyratory rod *c*, the latter having a universal or gimbal support at *d* upon the beam or carrier *e*, the

latter being adjustably mounted upon the supporting pedestal *f*. Near the free end of the rod *c* is adjustably secured by means of a set screw the yoke *g*, the opposite end of which engages with the universally mounted recording needle *h* and acts to move the latter in correspondence with the movements of the gun when the latter is held by the marksman.

The connection of the gun to the rod through the jointed holder being substantially the same as in the aforesaid prior patent, when the gun is held by the marksman and aimed at a suitably positioned distant target the rod and the needle are caused to follow the aiming movements of the aiming device, the latter indicating the aim relatively to a stationary reference object, such as a secondary or miniature target *j* mounted in front of the needle point near the end of the beam *e*. At the time of firing, whether actual or simulated, the aim is permanently recorded upon a secondary target through movement of the latter toward and against the point of the recording needle. As in the aforesaid patent, the axes of the joints between the gun and the rod all converge at the distant target so that the gun may undergo a positioning movement forward and back upon the follower rod, or up and down, or in or out, relatively thereto without causing movement of the needle so long as the line of sight of the gun upon the distant target remains unaltered. When, however, the aim of the gun is altered in the least, the alteration is correctly indicated or reproduced by the needle.

One important feature in an apparatus of this kind is to provide a needle or pointer which, with its connections, shall be of such delicate construction as to be sensitively responsive to all aiming movements of the gun, yet such that no injury will result thereto or to the target if the gun be moved while the needle is still held, as by having its point pressed against the face of the target. This and other advantages are provided in the present instance specifically by the following construction: The needle is mounted for its gyratory movement upon a pivot post having a spherical head or bearing *k* carried by the bracket *k*². The latter has a beveled or button-shaped head *k*³ maintained within a horizontal aperture of an

upright bracket k^4 formed upon the beam or carrier e , the said head being engaged by a plurality,—herein three,—of adjusting screws k^5 threaded into the walls of the said bracket.

5 These adjusting screws permit the centering adjustment of the spherical needle support and at the same time grip the beveled head k^3 and draw the disk-shaped flange of the bracket k^2 against the front walls of the upright supporting bracket k^4 , acting thereby

10 firmly to clamp the needle support in its adjusted and correct position.

The butt end of the needle is threaded into the needle head h' and the latter is provided

15 with a vertical bore of substantially the same diameter as the spherical head h , the lower end of the bore being flared or enlarged to permit a suitable range of needle movement about the support. The upper

20 end of the bore is closed by the pin h^2 which rests upon the spherical head and acts to sustain the needle thereon. This provides a delicate pivot post suspension for the needle similar to that of a compass needle, per-

25 mitting its free gyration about the post and at the same time the ready elevation and detachment of the needle from its support upon which it rests wholly by gravity.

To the head of the needle is clamped the

30 yoke l , having the two rearwardly extending horizontal arms l' , l^2 , carrying the counter-balancing weights l^3 , l^4 . The weights are of such a size and so located as normally to swing the needle upward about its sup-

35 port and also to give to it an appreciable mass and inertia for a purpose to be referred to. The weights are preferably adjustable along the arms l' , l^2 and provided with clamping screws, as indicated, to effectually

40 retain them in their positions, change in which will seldom be required.

The location of the weights below the center of needle suspension adds considerably to its stability and also prevents the needle

45 from turning on its axis, which, if it be bent or out of true, might result in an erroneous record.

The yoke is clamped to the needle head by the check nut h^3 and the locking nut h^4 , the latter having an elongated neck or sleeve.

50 This sleeve is engaged by a guiding or directing member carried by and depending from the front end of the yoke g , which is thereby given a connecting or directing

55 guidance over the needle movement. This guiding member comprises a pair of adjacent separate plates g' , which are beveled or inclined at the bottom toward each other to form a cleft or pocket, into which the

60 sleeve or neck of the needle lock nut h^4 is normally pressed through the medium of the counter-balancing weights l^3 and l^4 .

When the aiming device is elevated in the deliberate act of aiming, the counter-balanc-

65 ing weights cause the needle to swing up-

ward and follow the corresponding elevating movement of the guiding plates g' . When the aiming device is moved laterally or downwardly the needle is swung about its pivot support in a corresponding direction,

70 being directed by the guiding member through its position in the pocket or cleft thereof. This maintains a very delicate yet complete control over the needle movement, rendering the same accurately responsive

75 to the movement of the aiming device. It will be seen, however, that the rod is disengageably guided by the needle, for the latter follows the upward movement of the rod only when forced to do so by the counter-balancing weights l^3 and l^4 . This con-

80 nection exercises an important influence upon the accuracy of the record where it is attempted to use blank or other ammunition in the aiming device during target practice,

85 this being frequently done to accustom the marksman to the gun recoil and to conduct the practice under actual service or range conditions. In actual range practice the

90 bullet leaves the gun before the recoil can affect its trajectory, but in an apparatus of the character described the recording mechanism however quick and sensitive is practically incapable of completing the rec-

95 ord before recoil if the movement of the needle is instantly responsive to that of the gun. In other words, it tends to record the position of the gun after recoil, instead of at the instant of firing and before recoil. In the described construction the inertia of the

100 needle which is afforded by the counter-weights l^3 and l^4 permits a slight interval to elapse before the needle moves in response to the sharp upward recoil of the gun. This

105 interval, while slight, is sufficient to complete the record of the aim, showing the position of the needle at the instant of firing and before recoil. This connection, therefore, while causing the needle to follow all the intended and deliberate movements of

110 aiming, retards slightly the needle movement which follows the recoil or kick of the gun and substantially eliminates the effect of that recoil from the indicated or recorded aim.

If the marksman after firing and before releasing the trigger moves the gun involuntarily or otherwise, as he is apt to do, the needle target still remaining advanced with the needle point embedded in its face, al-

120 though upward movement of the gun act merely to withdraw the guiding member from the needle, cannot affect or injure the needle and its delicate suspension, down-

125 ward, or downward and lateral, gun movement occurring at that time if not provided for might seriously injure the needle. To permit continued free movement of the gun without injury to the needle while the latter is held fixed, the two guiding plates g' are

130

adapted under sufficient and suitable pressure to separate about their supporting stud g^2 , being normally forced to a closed position by a spring clip g^3 , also secured to the said stud, the two fingers of said clip embracing the edges of the said plates at their upper ends. Pins g^4 secured to the end of the yoke g and passing through slots formed respectively in the plates g' , g'' limit the outward movement of the latter and serve also to hold said plates in position. It will be clear that if the gun is moved downwardly or downwardly and laterally while the needle point engages the target, the resistance of the needle will merely cause the two guiding plates to separate against the action of the springs g^3 without injury to the needle or its parts. When the gun is again raised the plates move back to their normal position, as shown in Fig. 3.

Surrounding the needle between its point and support (Figs. 1 and 2) is a limiting frame m which has a rectangular or other suitable frame to limit and confine the needle movement to substantially the face of the sub-target. If the movement of the aiming device exceeds this range the needle is brought to rest by the walls of the limiting frame. If this excessive movement is upward, the guiding plates g' simply withdraw from the needle. If it is downward or lateral, the guiding plates yield and separate when the pressure on the obstructed needle exceeds the pressure of the springs g^3 . It sometimes happens that an expert marksman is in the habit of sweeping his gun through the arc of a circle or causing it to undergo some similar evolution prior to deliberate sight and a needle connection acting in constraint of this tends to produce annoyance. This free or disengageable connection, if the end of the follower rod is fore-shortened to allow it free movement beyond the limits of the aperture in the bracket k^4 , permits the marksman to swing his rifle through any desired range without reference to the needle, the guiding plates re-assuming control of the latter when the line of gun sight approaches the range of the main target.

When the apparatus is out of use or undergoing adjustment, or errors in eyesight are being tested through the appliances described in the aforesaid patent, or in showing the pupil how sights should look when properly sighted, the normally free end of the following rod c may be and preferably is held locked in a fixed position, this being herein accomplished by means of the sliding and tapered sleeve or collar c' , carried upon the end of the rod and having a correspondingly tapered seat in a bushing within the aperture of the upright bracket k^4 . When the gun is in use this sleeve is withdrawn or retracted from the bracket, as shown in Fig.

2, leaving the rod free for gyration. The sleeve is held in its withdrawn or retracted position by means of the leaf spring c^3 secured to and extending forwardly from the sleeve of the yoke-connecting piece g , which spring also acts to hold seated the sleeve when in its locking position. When the rod is locked the line of sight of the gun should be directed at the bull's eye of the distant target and the needle at the bull's eye of the sub-target, otherwise adjustment is required. This permits the rod to be repeatedly locked in the same central position, and the gun being initially adjusted with reference to the distant target by adjustment of the beam or carrier, adjustment of the needle can be readily ascertained and quickly corrected when required.

The connections of the gun are suitably counterbalanced by a flexible connection to the weighted lever n , the weight of the follower rod and the yoke connection g being sustained by the spring n' secured to the standard n^2 , the latter supported in the bracket k^4 , thus leaving the weight of the gun only in the hands of the marksman.

The secondary target j upon which record is made is removably secured in a holder secured to the target pin j' , slidable in a bracket j^2 upon the gun carrier e . The target pin is secured to the armature lever j^3 , loosely fulcrumed upon the screw j^4 , secured to the frame of the magnet j^5 . The latter when energized attracts the armature lever j^3 and forces the target holder with its contained target from its normal position shown in Fig. 2 against the needle point to effect record of the aim. The target is turned to its normal position on deenergization of the magnet by means of the tension spring j^6 , secured to the finger j^7 upon the armature lever.

For the energization of the recording magnet the latter is in circuit with a battery or other source of current and also with suitable contact devices at the trigger of the aiming device. For this purpose flexible conductors o and o' connect the battery, which herein is located near the base of the pedestal f (Fig. 1) with the magnet j^5 and a circuit-closing device in the gun. Plug and socket connections o^2 are used between the conductors where they emerge from the pedestal, and similar plug and socket connections o^3 (Fig. 5) between the conductors where they emerge from the gun stock, the intermediate connections passing through a connecting box o^4 (Fig. 2) upon a joint of the frame b .

Considerable difficulty has been experienced in this class of apparatus in securing a quick responsive movement of the recording mechanism following the initial pull upon the gun trigger. For best results the interval between the initial pull upon the

trigger and the recording movement of the target holder must be reduced to a minimum. In the described apparatus effective and successful contact means is supplied by providing (Figs. 5 and 6) a pair of resilient contact pieces p and p' , one overlying the other and provided near their ends with adjacent contact areas formed of any suitable material. These contact pieces are mounted side by side upon a block p^2 of insulating material, secured to the trigger plate p^3 of the gun. One contact p abuts against a part of the trigger p^4 when the latter is in its normal position, being held thereat in close but separated relation to the contact p' , which latter is positioned by means of the adjusting fine-threaded screw p^5 . The resiliency of the two contact pieces tends to separate them but the adjusting screw and the trigger part hold them normally in a very close relation. Their separation is so slight that following a trigger movement sufficient to release the firing pin of the gun, the two contacts close upon each other and complete the electrical circuit causing the energization of the target magnet p^6 and the forward movement of the target holder. The rapidity of record which is practically instantaneous is sufficient to record the aim at the moment of firing before the needle can move from the position which it then occupies.

It is to be understood that while we have shown in detail one form or embodiment of our invention, the same is not limited either to the details or form or arrangement of parts here shown or to the precise application of the invention as here illustrated, but that extensive modifications may be made in the same without departing from the spirit thereof.

Claims:

1. A target practice apparatus having an aiming device for aiming at a distant target, a follower rod connected to follow the aiming movements of said aiming device, a support therefor, and means for holding said follower rod in a fixed position, said means comprising a sliding sleeve upon the end of said rod engaging with a stationary part upon said support, and a spring for holding said sleeve.

2. A target practice apparatus having an aiming device, a stationary support, following means to follow the aim thereof including a fulcrumed pointer, a fulcruming support therefor provided with a bracket and a head, a bracket on said stationary support, and adjusting screws for said bracket to engage and adjustably clamp said head and said fulcruming support in position.

3. A target practice apparatus comprising an aiming device, a follower member, a stationary support, a jointed holder between said aiming device and following member,

a fulcrumed pointer arranged to follow the movements of said following member, and counter-balancing means connected to said pointer at the rear of and below the fulcrumed support thereof.

4. A target practice apparatus comprising an aiming device, a following member, a stationary support, a jointed holder between said aiming device and following member, a fulcrumed pointer arranged to follow the movements of said following member, the latter at times being withdrawable from operative connection with the pointer, and counterbalancing means connected with the pointer at the rear of the fulcruming support thereof.

5. A target practice apparatus having an aiming device for aiming at a target or other like object, following means to follow the aim thereof with reference to a reference object, a jointed holder between the aiming device and following means, said following means including a gyratable pointer, a directing member withdrawable from directing relation thereto, and a counterbalancing weight by which said pointer is pressed toward said directing member.

6. A target practice apparatus for aiming at a distant target or like object, following means to follow the aim thereof with relation to a reference object, a jointed holder between said aiming device and following means, said following means including a fulcrumed pointer, and a guiding member engaging said pointer between the point thereof and its fulcrum and adapted to be withdrawn therefrom on excessive upward deflection of said aiming device.

7. A target practice apparatus having an aiming device, a jointed connection between said aiming device and follower permitting positioning movement of the aiming device without necessary deflection of the follower, an indicating member, guiding means carried by said follower adapted for engagement with said indicating member, said indicating member being weighted to normally press the same toward said guiding member to permit withdrawal of said guiding member therefrom.

8. An apparatus of the class described having an aiming device, a gyratory indicating needle, guiding means for transmitting the aiming movements of said aiming device to said needle, said guiding means comprising adjacent guiding members having depending edges beveled toward each other and overlying the said needle, a counter-weight for normally pressing said needle into the seat thus formed between the said separable members, and yieldable means for pressing said members together.

9. In an apparatus of the class described, the combination with a gyratory indicating needle, of guiding means therefor comprising

ing a pair of beveled separable guiding plates adapted to overlie the needle, and yieldable means normally pressing said plates together.

5 10. An apparatus of the class described having an aiming device, a follower, a gyratory needle, a connection fixedly secured to said aiming device and overlying said needle and means attached to said connection for
10 engaging said needle to transmit the aiming movements thereto, said means being relatively movable to said connection, but automatically returnable to its usual position to provide a yielding connection between the
15 aiming device and the needle.

11. In an apparatus of the class described, the combination with the needle *h*, of the follower *c*, having guiding plates *g'*, *g'*,

spring *g*³, and weights *l*⁴, *l*⁴, connected with said needle.

12. In an apparatus of the class described, the combination with the needle *h*, of the follower *c* provided with needle guiding plates *g'*, *g'*. 20

13. In an apparatus of the class described, the combination with the needle *h*, of the follower *c*, and the movable guiding plates *g'* and *g'*. 25

In testimony whereof, we have signed our names to this specification, in the presence of two subscribing witnesses. 30

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Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."