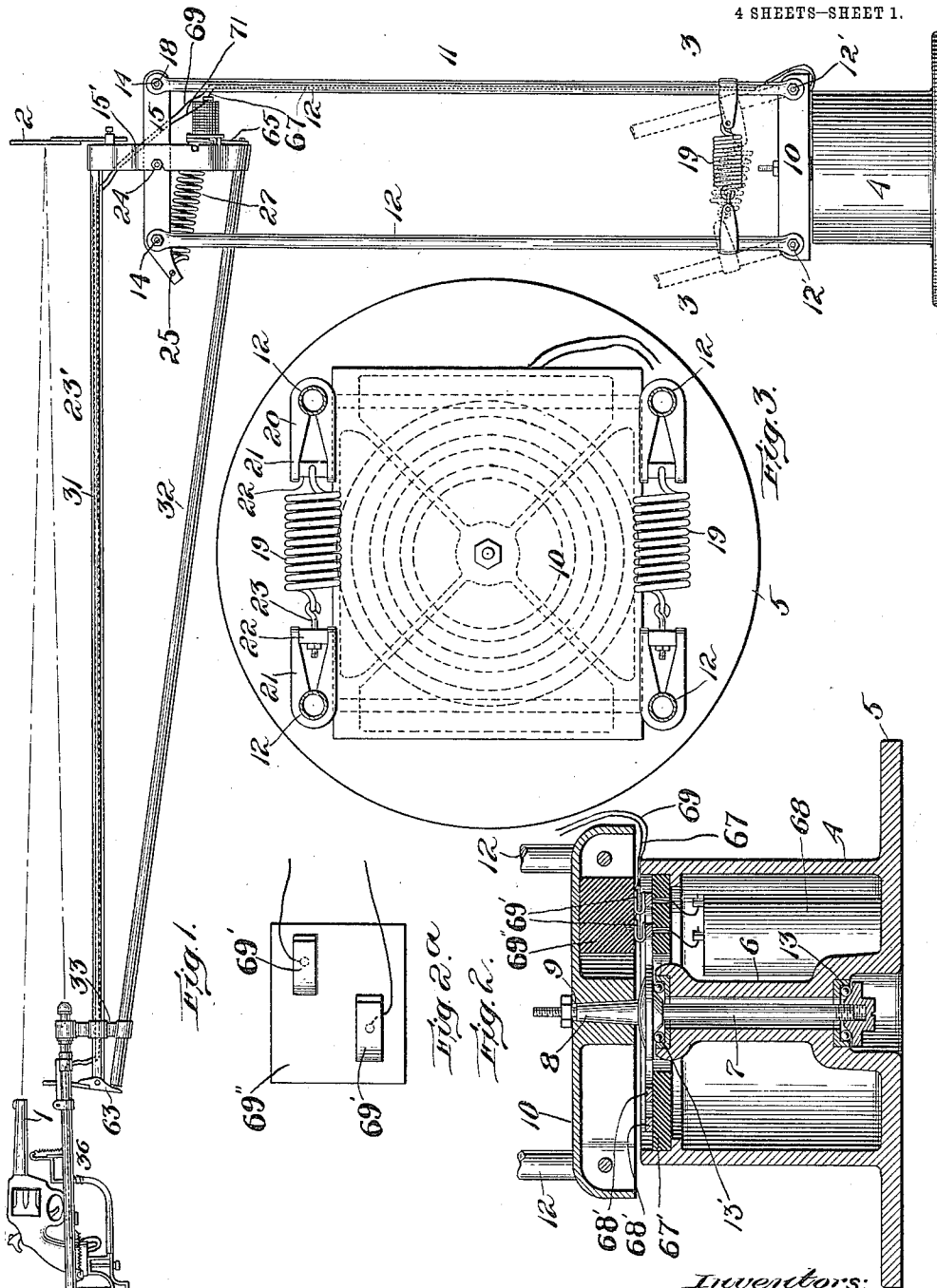


H. A. STEBBINS & A. A. ADAMS.
 TARGET PRACTICE APPARATUS.
 APPLICATION FILED JAN. 26, 1907.

1,041,365.

Patented Oct. 15, 1912.

4 SHEETS—SHEET 1.



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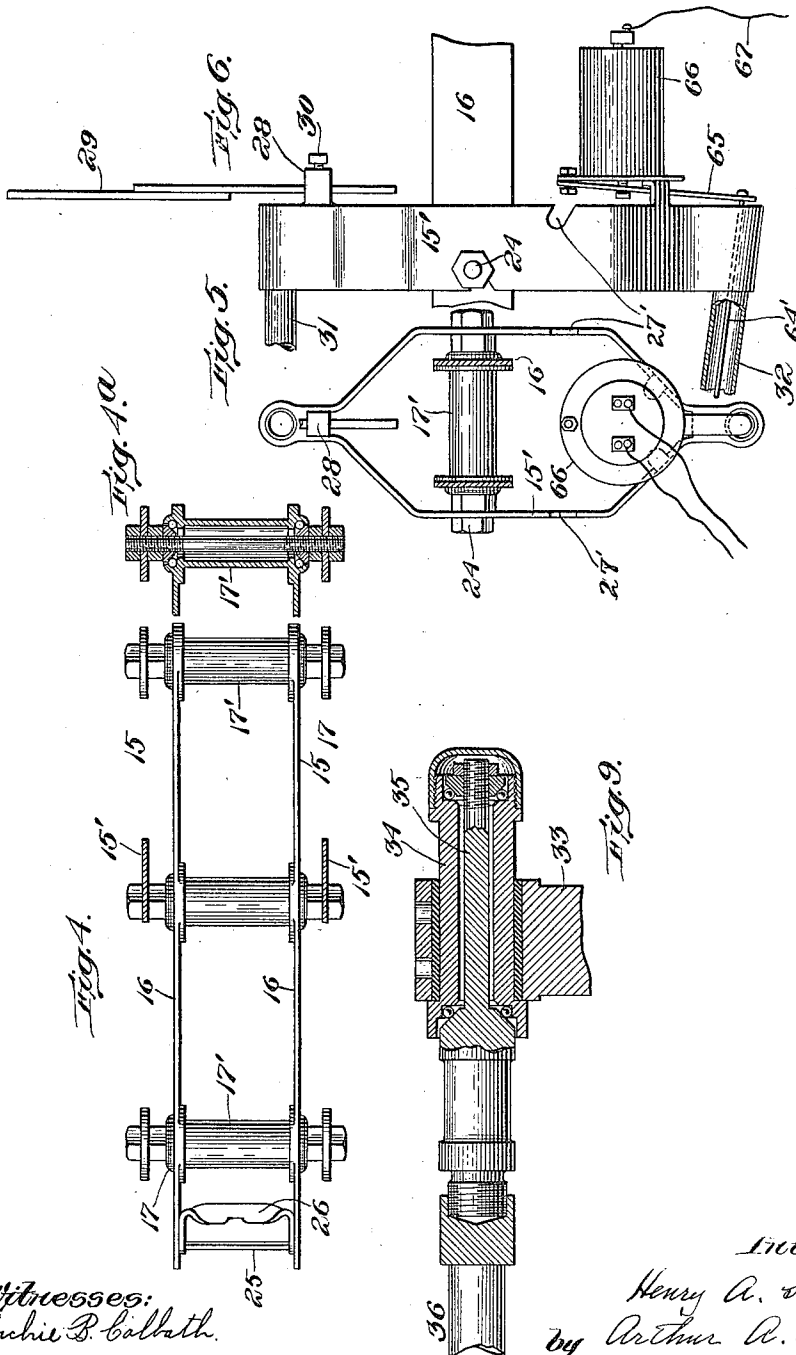
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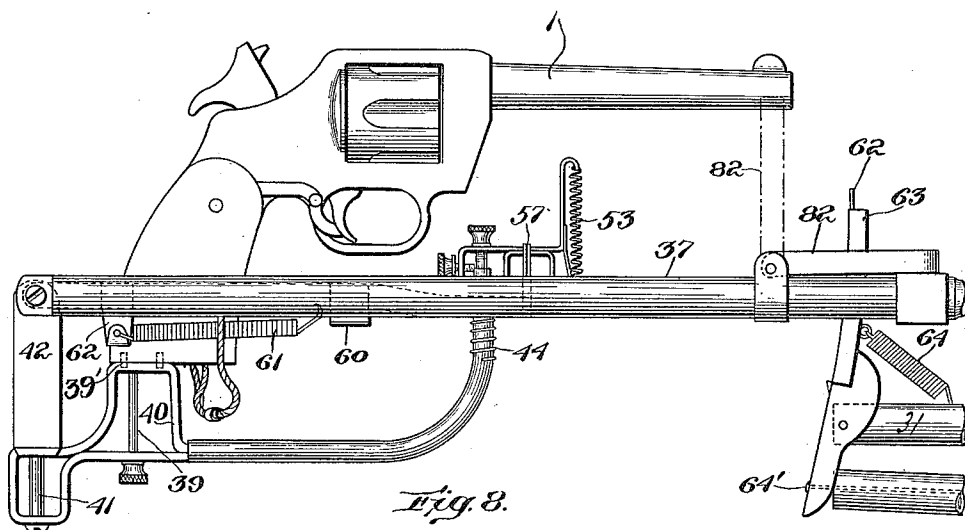
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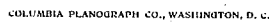
4 SHEETS—SHEET 3.



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APPLICATION FILED JAN. 26, 1907.

4 SHEETS--SHEET 4.



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.

1,041,365.

Specification of Letters Patent.

Patented Oct. 15, 1912.

Application filed January 26, 1907. Serial No. 354,257.

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 5 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 10 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 to the class 15 of target practice apparatus employing means for recording the aim without the necessary issuance of any projectile from the aiming device, such, by way of example, as is described in the U. S. Patent No. 20 739,778 granted to Henry H. Cummings September 22, 1903. In the patent referred to there is specifically disclosed a target practice apparatus employing an aiming device, therein a gun, adapted to be aimed 25 at a main target but so connected with following means, including a recording needle, that the latter is caused to follow the aiming movements of the aiming device relatively to a secondary or miniature target. At the 30 time of firing, whether actual or simulated, the aim is permanently recorded, upon the secondary target by movement of the latter toward and against the point of the recording needle and without the necessary issuance of any projectile from the gun, the 35 relations between the aiming device, the main target, the needle, and the secondary target being such that the line of sight of the aiming device relatively to the main target is at all times faithfully reproduced 40 by the needle with reference to the secondary target.

Our invention provides a simple but effective target practice apparatus which is 45 particularly desirable where a considerable freedom of movement is required for the aiming device, such, for example, as ordinarily accompanies the use of a revolver, which, when employed either in practice or 50 actual use, is often swept through a considerable range of movement before deliberate and final sight is taken upon the distant ob-

ject. Many of the features of the invention are, however, applicable to a target practice apparatus of other types, as will clearly 55 appear.

Our invention will be best understood as to the features suggested in the foregoing paragraph and other features of novelty involved therein by reference to the following 60 description of one type or embodiment of the invention selected for illustrative purposes, the scope of the invention being pointed out in the appended claims.

Figure 1 is a side elevation of a target 65 practice apparatus embodying one form of our invention and intended in the present instance for use in connection with a revolver; Fig. 2 is a vertical central section of the base and the lower portion of the support 70 mounted thereon; Fig. 2^a is a detail of certain of the electrical connections adjacent the base; Fig. 3 is a section taken upon the line 3—3 of Fig. 1 and looking toward the base; Fig. 4 is a plan view of the 75 upper portion of the support shown at the right in Fig. 1 and showing the horizontal member thereof; Fig. 4^a is a horizontal longitudinal section of one of the bearings for said horizontal member; Fig. 80 5 is an end view looking toward the left in Fig. 1 of the right-hand end of the target and aiming device supporting frame, the upper horizontal portion of the support being shown in vertical 85 section; Fig. 6 is a side elevation of the construction shown in Fig. 5 and showing the main target in position; Fig. 7 is a plan of the aiming device supporting frame proper showing a revolver positioned therein, said 90 frame being shown as broken away at the right-hand end thereof; Fig. 8 is a side elevation of the aiming device supporting frame proper showing a revolver positioned therein and also the secondary or sub-target 95 and a position of the supporting means therefor; Fig. 9 is a vertical sectional view partly in elevation of the right-hand end (viewing Fig. 1) of the aiming device supporting frame proper and showing the 100 swiveled connection between the same and the target and aiming device supporting frame; Fig. 10 is a side elevation of the main parts shown in Fig. 8 but representing

in full lines the revolver and following means as occupying a raised position and in dotted lines as occupying a depressed position; Fig. 11 is a detail showing in side elevation the following means and adjacent supporting and positioning means therefor, the said following means being adapted to cooperate with the secondary or sub-target in the production of the record; Fig. 12 is a horizontal sectional detail upon the section line 12—12 of Fig. 11; Fig. 13 is a vertical section upon the line 13—13 of Fig. 11, looking toward the right in said figure and showing the relation of the following means, its support and the following means positioning device; Fig. 14 is a side elevation partly in vertical section of the secondary or sub-target, and one form of operating means therefor.

Having reference to the one type or embodiment of our invention illustrated in the accompanying drawings, the aiming device 1, which may be of any desired type or construction, but which is herein shown as a revolver of the Colt arm type, is so associated with a relatively distant target 2, preferably at the opposite end of the apparatus, that a free aiming movement of the revolver relatively to the target, is permitted the marksman. Deviations of the line of sight of the revolver from the bull's-eye of the target are by the connections hereinafter described, duplicated by the corresponding deviations of the following means, herein shown as consisting of a recording needle 3, which moves with reference to a secondary or sub-target, so that in the said sub-target, which, in this type of the invention is movable toward the recording needle the resulting impression made by the point of the needle correctly records upon the face of the sub-target the aim taken at that instant by the revolver with reference to the main target 2.

In the present type of the invention the apparatus is preferably mounted (Figs. 1 and 2) upon a base 4, herein shown as a hollow casting having at its lower end a horizontally extended flange 5 and having formed therewith and centrally thereof the vertically disposed bearing 6, adapted to receive a spindle 7, the upper and preferably tapered end 8 thereof being seated in a corresponding vertical centrally disposed recess 9, in the lower horizontal member or casting 10 of the main support 11 and tightly secured therein as by a nut upon the upper threaded end of the spindle. The said spindle 7, is herein shown as provided with ball bearings 13 and 13', provided in the bearing 6 of the base 4, said ball bearings being of any usual or preferred type.

The support 11, is mounted, as previously described, upon the base 4 for rotation about a vertical axis and is itself so constructed

and mounted as that it may partake of all necessary or desired movements of the aiming device, the latter being mounted, as hereinafter described, upon a target aiming device supporting frame, which itself is mounted upon the support 11. In the present type of the invention the said support comprises a plurality of upright preferably tubular rods or members 12, here shown as four in number and as arranged in two pairs, said rods being pivoted at their lower ends at 12', to the lower member 10 of the support, and likewise pivoted at their upper ends at 14, to a normally horizontally disposed frame, 15, herein shown (Fig. 4) as comprising parallel side members 16, having bearings 17 and interposed sleeves 17' at opposite ends thereof for horizontally disposed rotatory spindles 18 to which the upper ends of the said rods 12 are connected, said spindles receiving a partial movement of rotation in said members 16 during the swinging movement of said rods 12 upon the casting 10.

While the support 11 normally maintains an upright position as shown in Fig. 1, in order to accommodate the movements of the revolver in the hands of the marksman and particularly the sweeping movements thereof, in a vertical plane about his shoulder or elbow as a center, the said support is in this type of the invention pivotally mounted as previously described so that the rods or members 12 may be drawn or moved into an inclined position, and the support given a free longitudinal swinging movement as indicated in part in dotted lines in Fig. 1, the said support being in equilibrium in any position assumed thereby. In order that the support 11 may be in equilibrium in any position assumed thereby, so that the marksman may be allowed a free positioning movement, and that no weight other than that of the revolver or other aiming device may be found by the marksman, we employ any suitable mechanism, but in the present type of the invention, we preferably employ a spring equilibrium establishing device herein consisting of a coiled spring 19, for each pair of rods 12. In order suitably to connect said springs to the rods, each of the latter is herein shown as provided with a split friction collar 20, between the extended ends 21 of which is swiveled a block 22, one end of each spring 19 being preferably directly connected to the corresponding swiveled block and the other end of each spring being connected to the opposing block by a screw 23. While the support maintains an upright position, the coiled springs 19 assume the horizontal position shown in Fig. 1, but when the said support is inclined in either direction, as for example, into the position indicated in dotted lines in said figure, the friction collars re-

main normal to the respective rods 12, and thereby distend the said springs and carry them into the inclined position shown in the said figure, the contractive force of the said springs, being in any position assumed by the said support equal to and neutralizing the increase leverage or apparent weight of the said support due to the assuming an inclined position. It is apparent that the farther the support 11 is inclined in either direction, the greater becomes the leverage thereof, and that the tension of the springs 19, increases in the same ratio, which is at a minimum when the frame 11 is vertical, the effect being that the increasing leverage is neutralized and that the support 11 is in equilibrium in any position assumed thereby. The disclosed form of spring equilibrium establishing device is employed as it is contained within the limits of the frame 11, but other forms of spring or other equilibrium establishing device may be employed.

Preferably and as herein shown at the upper end of the support 11 and upon the normally horizontal cross member 15 thereof is pivotally mounted a preferably normally vertical end member 15' of the target and aiming device-supporting frame 23', the said end member 15' (Figs. 5 and 6) being herein shown as consisting of an open elongated frame pivoted intermediate its ends upon a shaft 24, suitably mounted in the frame 15, the construction being such that in the rotative or swinging movements of the support 11 the said end member 15' of the target and aiming device-supporting frame 23' partakes of such movements but may itself retain the vertical position shown in Fig. 1, it to this end oscillating about the shaft 24, the frame 23' being thereby susceptible of elevation or depression at will. Preferably the frame 15 near one end thereof as between the downwardly inclined ends of the side members is provided with a cross bar 25, whereon is pivoted a yoke 26 serving as an anchor (Fig. 1) for a coiled spring 27, one end of said spring being attached to said yoke intermediate its ends and the other end thereof being attached in any suitable manner to the end member 15', as by a spindle mounted in notches 27' in the end member 15'.

The frame 23' is maintained in equilibrium in any position assumed thereby, whether elevated, depressed or horizontal, by the spring 27, one end whereof is connected to the end member 15' with such relation to the pivotal point 24 thereof, that if the said frame 23' be tilted, as for example downwardly, any increase in effective moment of the frame 23' due to the increasing leverage thereof is exactly compensated by the increasing tension of the spring 27, all changes in leverage of the said frame 23' in

any position thereof thus being neutralized by said spring.

The frame 11 and the frame 23' are each maintained in equilibrium in any position assumed by either of them. In other words, neither frame can disturb the equilibrium of the other, whatever position it assumes by either, it being understood that when the equilibrium of the frame 23' is referred to, is meant such frame when the revolver or other aiming device is not positioned thereon. The main target is preferably carried upon the target and aiming device supporting-frame and to this end the said end member 15' is provided (Figs. 5 and 6) with an eye 28 adapted to receive a depending leg of the said main target, a set screw 30 being provided to secure the target in any desired position or vertical adjustment. The said target and aiming device-supporting frame 23' is herein shown as comprising the end member 15' having rigidly secured therein, as by brazing, the rods 31 and 32, the former being herein shown as horizontally disposed and the latter as having an inclined position. Any other suitable form of frame may of course be employed. The said rods are at or near their forward or left-hand ends viewing Fig. 1, preferably rigidly secured in an opposite end member 33 (Figs. 1 and 9), the upper end of said opposite end member receiving therein (Fig. 9) a horizontally disposed bearing 34, wherein is secured and preferably by a ball bearing construction of any suitable type, one end 35 of the carrier or aiming device-supporting frame proper 36 (Fig. 7) constituting the so-called sustaining means. The said aiming device-supporting frame proper or sustaining means is in the present type of the invention preferably composed of parallel side members 37, connected and preferably at one end by a cross bar 38, from which extends mid-way the length thereof the end 35 previously referred to. The aiming device which in the present type of the invention is a revolver, is mounted in the said supporting frame and preferably so that normally the line of sight of the revolver intersects at the bull's-eye of the main target the axial line of the aiming device-supporting frame proper as shown by the dotted lines in Fig. 1. By mounting the revolver in this manner it may while held in the hand of the marksman be turned or oscillated as by a twisting movement of the wrist, about the said axis of the supporting frame proper or sustaining means as a center without deflecting the revolver from a position wherein the line of sight thereof intersects at the bull's-eye of the main target the axial line of the said supporting frame member. In other words, so long as the revolver is truly swung about the axis of the said supporting frame and without deflec-

tion the line of sight thereof constitutes an element of a cone, the apex whereof is located at the bull's-eye, said cone being generated by a complete revolution of the revolver about the said axis of the said aiming device-supporting frame proper.

The revolver 1 is so supported as that it may be freely manipulated by the marksman and to this end is mounted so that it may partake of the desired aiming movement such as may be imparted thereto by the wrist movement of the user and also so that it may be swept in an arc about the shoulder or elbow of the marksman as a center, provision being made to this end in view of the fact that many marksmen indulge in a characteristic arm-sweep of the revolver preliminary to the deliberate aiming movement, the arc of such sweep frequently extending below as well as above a horizontal plane.

In order that the revolver may partake of the necessary aiming movements it is so mounted in the supporting frame member that it may be swung or deflected either to the right or to the left of the axis of said frame, which, as previously stated, intersects the bull's-eye of the main target. To this end the revolver is rigidly secured by suitable connections, as by a securing pin or screw 39, and dowel pins 39', to a longitudinal frame or member 40 (Figs. 7 and 8), serving as an intermediate support for the revolver and herein shown as pivoted as by the vertically disposed screw 41 to an opposite end member 42 of the said supporting frame proper, said opposite end member preferably having upon its under side, as indicated in dotted lines in Fig. 7, stops 42' to limit the swinging movement of the said longitudinal member 40. The construction described constitutes one form of deflecting movement permitting means.

In order that the revolver may be raised or lowered by the marksman either in the deliberate aiming movement, as by the wrist of the marksman or in the characteristic sweeping arm movement referred to, the opposite end member 42 to which the member 40 is pivoted for a lateral swinging movement, is itself mounted for movement in a vertical plane and relatively to the supporting frame proper to constitute one form of positioning movement support. To this end the said opposite end member 42 is herein shown as formed as a bail, the opposite ends whereof are pivotally supported upon horizontally disposed pins 43, mounted in the ends of the side bars 37 of the supporting frame proper. In Fig. 10 the revolver is shown in full lines as swung about the pivotal pins 43 of the bail 42 into an upward position and in dotted lines as swung into a downward position, it being apparent that the revolver when swung into either posi-

tion here shown either by an arm movement or in the final aiming movement as by a wrist movement, may at the same time be swung to the right or to the left upon the pin 41 as an axis and may also be swung in the manner previously described about the axis of the device-supporting frame proper as a center. Thus, it will be perceived that the revolver has essentially a universal connection, permitting a free aiming movement thereof resulting in deviations in the line of sight of the revolver with reference to the main target such as a revolver undergoes about the wrist, elbow or shoulder of the marksman as a fulcrum, or such as a rifle undergoes about the marksman's shoulder, it being apparent that the invention is not limited in its application to the use of the particular type of firearm herein illustrated. A revolver or other aiming device supported in accordance with our invention is accorded free positioning and aiming movements, and any aiming movement resulting in a deflection of the line of sight from the bull's eye of the target is accorded its full value and is not neutralized or absorbed by the inertia of the support or supports, for since they are in equilibrium in any position, they may be moved with absolute freedom and respond to any and all movements of the aiming device, whether voluntary or involuntary.

During the aiming movement of the revolver or other aiming device, the following means 3, which in the present type of the invention is a recording needle, is caused to undergo a corresponding movement, although in the present embodiment of the invention, when the revolver is swept in an arc, so that the line of revolver sight extends above or below the main target and no longer intersects the same, the recording needle does not at such times indicate with respect to the sub-target the line of revolver sight, such indication at such time being unnecessary, but as soon as the line of revolver sight again intersects the main target, the said recording needle is brought under the control of devices whereby its movements faithfully record relatively to the sub-target the movements of the revolver relatively to the main target.

In the present type of the invention the recording needle is herein shown as mounted upon the pivoted frame 40, that carries the revolver. To this end, in the present type of the invention the forward end of said pivoted member 40, (Figs. 8 and 10) is upwardly inclined, a spiral spring 44, encircling the same. Upon the extreme portion of said upwardly turned end is mounted the recording needle supporting device 45, of any suitable construction but herein shown as comprising a preferably metallic strip bent intermediate its end to present

an open rectangular frame 46, parallel horizontally disposed contacting members 47, and upwardly and downwardly extending members 48 and 49, respectively, the said upwardly extending member 48, having secured thereto a downwardly extending member 50, parallel to and slightly spaced from the member 49, said members having circular holes therein, wherein is received the sphere 51, with which the recording needle 3, is preferably provided near its rear end, the construction being such that when the needle impinges against a positioning device hereinafter described, the sphere is partially rotated in its support afforded by said members 49 and 50, which are herein shown as connected at their lower ends by a bolt 52. The extremity of the member 48, is preferably downwardly turned, and between the same and the recording needle 3 is mounted a distended coiled spring 53, the tendency whereof is to elevate the outer or recording end of said needle, the said spring being suitably connected to the said needle in any preferred manner. The said frame 46 is herein shown as received upon the end of the pivoted member 40, above the coiled spring 44, the said frame 46 being upwardly pressed by the said spring and adjusted to the desired vertical position by the nut 54, disposed upon the extreme end of the said member 40. By the described adjustment the recording needle 3 may be raised or lowered in a vertical plane, for a purpose to be hereinafter more fully described. In order to adjust the said needle in a horizontal plane the upper and preferably reduced extremity of the arm 40, is provided with a laterally extending lug 55, against which is adapted to impinge the extremity of an adjustable stop screw 56, mounted in an upright member of the frame 46. The spiral spring 44, being connected at its upper end to said frame 46, the tendency thereof is to rotate the same about the upturned end of the member 40, and the degree of rotation may be adjusted by the said adjusting screw 56, the lateral adjustment of the recording needle 3 being thus accomplished. While the recording needle 3, may be at all times under the control of a positioning device, so that it may faithfully record the direction of revolver sight, yet as previously stated, in the present type of the invention, the said recording needle is preferably under the control of the positioning device or mechanism only during such times as the line of revolver sight intersects the main target. Since in the present type of the invention the recording needle is so mounted as to move with the revolver, the recording needle positioning device 57 (Figs. 10 and 11) is herein shown as so mounted that it normally maintains a horizontal position as shown,

and when the revolver is swept in an upward arc from the horizontal, the said needle positioning device maintains its horizontal location, the recording needle moving therefrom and being thus withdrawn from the control thereof as the line of revolver sight extends above the main target. When, however, the main target is swept in a downward arc below the horizontal, said needle positioning device is in the present type of the invention preferably so mounted that it partakes of the said movement, although we wish it to be understood that our invention comprehends the movement of the aiming device in a downward as well as an upward arc, irrespective of the connections between the recording needle and its positioning device. The said recording needle positioning device preferably employed in the present type or embodiment of the invention comprises a member 57 having a flared or substantially angular opening 58 therein, the apex of the opening being adapted to engage and direct the movement of the recording device 3. The said positioning device 57 is in the present type of the invention, mounted (Fig. 7) upon a generally U-shaped frame 59, the legs whereof are pivoted at their outer ends upon the pins 43, of the side bars 37 of the frame 36, the said legs of the frame 59, preferably having laterally extending ears 60, adapted to engage the under side of the side members 37, whereby said frame 59 is restrained from a movement upon its pivot above the horizontal, a coiled spring 61 (Figs. 10 and 8) being connected at one end to the supporting frame proper, and at its opposite end to a lug 62, depending from the frame 59, thereby to maintain the same normally in a horizontal position but permitting the described downward movement of the frame 59 and the needle positioning device 57 carried thereby when the revolver is swept in a downward arc below the horizontal.

In the aiming movement proper of the revolver, which, for the purposes of description may be segregated from the preliminary or sweeping arm movement thereof, the line of revolver sight will, excepting in the case of a poor marksman, intersect the main target and therefore during such aiming movement the recording needle 3 will be under the control of the needle positioning device 57. The revolver may, however, be swung in an upward arc, as indicated in full lines in Fig. 10, at which time the recording needle 3 is in the present type of the invention separated from its positioning device. If, however, it be desired to swing the revolver in a downward arc below the horizontal either after the upward arc swing or preliminary thereto, the recording needle and its positioning device are preferably in the present type of the invention, during

such movement in the downward arc, maintained in such relative position that the position of the needle is determined by the said positioning device 57. Assuming the revolver to be in the upwardly inclined position shown in Fig. 10, if it be desired to depress the same below the horizontal, then in the downward movement thereof the shorter end of the recording needle 3 is brought into engagement with the positioning device 57, and by the engagement of the said two members the position of the recording needle is changed to faithfully reproduce the line of sight relative to the main target, which did not in the present type of the invention occur during the swing of the revolver in the upward arc above the horizontal. The recording needle 3 having been thus returned and brought under the control of the needle positioning device 57, the needle follows the line of revolver sight so long as the same intersects the main target, but if it be desired to swing the revolver in a downward arc below the horizontal, during which movement the line of revolver sight would extend below the main target, it is unnecessary that the recording needle 3 should correspond in position to the line of revolver sight. Inasmuch as in the present type of the invention, during the sweep of the revolver in a downward arc below the horizontal, the needle positioning device 57 is itself moved downward, it is not considered desirable that the said positioning device should be moved downward by the impact thereon of the needle 3. Therefore, after the needle has been positioned, as by engagement thereof with the apex of the opening 58 of the positioning device, as shown in Fig. 13, the downward movement of the revolver below the horizontal brings the horizontal members 47, of the needle positioning device 45, previously described, into engagement with the flaring sides of said opening 58, this engagement occurring after a brief period of lost motion following the engagement of the needle with the apex of the opening 58, during which period of lost motion the needle is positioned to indicate the line of revolver sight so long as the latter intersects the main target. Preferably and substantially as the line of revolver sight passes below the main target, the member 47, of the needle positioning device 45, engages the flaring sides of the opening 58, and in the further downward sweep of the revolver depresses the said needle positioning device 57, which is returned by the spring 61, as the revolver is again lifted toward the horizontal.

The secondary or sub-target whereon the record of the aim of the revolver is made, (Figs. 8 and 14) is indicated at 62, it being removably held in a preferably vertically curved target holder, 63, preferably piv-

otally mounted (Fig. 1) upon the forward end of the horizontal member 31, of the target and aiming device supporting frame 23', the coil spring 64 being employed to normally maintain the same in a position out of contact with the recording needle 3. When it is desired to record the aim of the revolver or other aiming device, a relative movement is imparted to the said secondary or sub-target and the recording needle. In the present type of the invention we preferably move the secondary or sub-target toward the needle, so that the target is brought into contact with the point of the needle. This movement of the secondary or sub-target may be accomplished in any suitable manner. In the present instance, however, we preferably connect one portion and herein the lower portion of the pivoted target holder 63 (Figs. 1 and 8) by a wire 64', herein shown as passing through the tubular member 32 and connected at the opposite end (Figs. 1 and 6), to an armature 65, mounted in suitable relation to a magnet 66, herein shown as carried upon the end member 15, one terminal of the magnet being connected by a suitable conductor 67, preferably sheathed within one of the rods 12, with a battery 68, herein shown as disposed within the base 4 (Fig. 2). Connected with the opposite pole of the battery 68 is a conductor 69, likewise sheathed within said rods 12, and thence passing through the tubular member 31 to the butt end of the revolver. To permit the free rotation of the support 11 upon the base 4 without interfering with electrical conductors 67 and 69, any suitable means may be provided, but herein is shown an annular non-conducting disk 67' suitably supported at or near the upper end of the base and having openings therein for the wires directly connected with the battery 68, two metallic conducting rings 68' being mounted upon the upper face of the disk, with which contact throughout the rotation of the support 11, two conducting springs 69' mounted upon the lower face of a non-conducting block 69'' secured to the under face of the casting 10, and to which are secured the wires 67 and 69. The remaining terminal of the magnet is connected by a conductor 71, preferably passing through the tubular member 31 and thence to the revolver butt. The magnet 66 is energized and the recording takes place when the trigger of the aiming device is pressed in simulation of the act of firing by means of the electric circuit described. The circuit may be closed in any suitable manner by the pulling of the trigger. We have herein shown one type of mechanism which is well adapted for the purpose.

The conductors 69 and 71 pass into the butt of the revolver and are connected to the

contact pieces 75 and 76. The revolver butt is shown in Fig. 10 with one face removed to illustrate the construction of the circuit closing mechanism. The contacts 75 and 76 remain normally in separation, but are brought together when the trigger is pressed by the sliding presser block 77, of insulating material, pivoted to the lever 78, the latter having a depending extension 79, directly back of the revolver trigger 80. The ends of the contact pieces enter the opening 81 in the lower end of the sliding block 77, so that when the trigger is pulled and the contact block is raised in response to the movement of the lever 78, the walls of the contracted opening 81 draw the diverging ends of the contact pieces together and complete the electric circuit. This form of circuit closing mechanism is satisfactory, since it may be placed in the waste space of the receiver butt and is sensitive in operation, but any other desired type of circuit closing mechanism may be employed.

When the apparatus is out of use, the revolver may be held in a fixed position in any suitable manner, and in the present type of the invention (Figs. 7 and 8) by means of a hinged rest 82, pivoted upon the side members 37, and adapted when in use, to be swung into the vertical position shown in dotted lines in Fig. 8. When the said rest is in use the barrel of the revolver is received in the V-shaped depression 83, formed mid-length thereof, the opposing walls of said depression being preferably provided with set screws 84, by the adjustment of which the revolver when resting thereon may be so adjusted upon the supporting frame proper that the line of revolver sight intersects the bull's-eye of the target. Such adjustment, however, usually occurs only periodically, and will ordinarily be necessary only when there has been injury to or displacement of some of the parts. At the time of such adjustment or while the revolver barrel is received upon the said pivoted rest 82, the recording needle 3, may be adjusted in the manner previously described, either vertically or laterally about the point of contact thereof with the positioning device 57 as a center. This adjustment of the needle may be to conform the line of the needle to the line of revolver sight.

From the foregoing description it will be apparent that during gyrations or movements of the revolver already described, such movements thereof as result in deviation of the line of revolver sight from the bull's-eye of the main target, are faithfully reproduced by corresponding deviations of the needle from the bull's-eye of the sub-target, it being, however, understood that in the present type of the invention it is regarded as unnecessary to reproduce by the recording needle the line of revolver

sight when the same does not intersect the main target; all of which has been fully set forth.

Aim having been taken at the main target and the trigger pulled, the circuit is thereby closed, the magnet energized, and the secondary or sub-target is in the present type of the invention thrown forward against the needle point to receive the record of the aim. After one record has been made, other records may be made upon the same secondary or sub-target, or the latter may be withdrawn from its holder and a fresh target substituted for a continuation of the practice. It will, of course be understood that blank cartridges may be fired with the revolver, if desired. The secondary or sub-target will be so proportioned to the main target as to correctly record thereon the aim taken at the former. The dimensions, as well as the entire construction of the apparatus, may be varied as desired. The effect of any desired length of range may be secured by making the main target of any appropriate size, reducing the same for any increased range that may be desired.

Although in the present type of the invention the apparatus is mounted upon the base 4, yet many features of the invention are equally adapted to use with the provision of overhead supporting members or in any suitable type of apparatus wherein the effect of a floating suspension is secured, or in any apparatus wherein a freely movable support is obtained by any desired mechanism.

In devices of this class it is of great importance that there should be permitted the aiming device while in the hands of the marksman a free positioning movement, that is to say, one which serves to alter the position of the aiming device without necessarily changing its line of sight with reference to the bull's-eye. This is necessary in order that the marksman may raise or lower the firearm or move it to one side or the other for positioning purposes prior to executing an aiming movement. In the described construction such positioning of the revolver may be had not only by reason of the fore and aft rocking movement of the support 11, as well as its rotative movement on the base 4, but also by reason of the vertical swinging movement of the supporting frame 23' and the oscillatory or rocking movement of the carrier 36 about its horizontal bearing to accommodate the wrist movement of the marksman. Such free positioning or non-deflecting movements of the aiming device provide against any conscious aiming point of rest and in no wise interfere with the aiming or deflecting movements which take place in a horizontal plane about the pivot 41, or the vertical deflecting

aiming movements about the pivot 43, including the upward and downward deflecting sweeps which, as above described, the marksman may perform as in the usual practice.

Having thus described one type or embodiment of the invention, we wish it to be understood that although the same has been set forth in detail and described specifically, yet such terms of description are employed merely in a descriptive and not in a limiting sense and that the scope of the invention is set forth in the following claims.

We claim.

1. A target practice apparatus having an aiming device, aim indicating means for indicating the aim thereof without the necessary issuance of a projectile, supporting means whereon said aiming device has free aiming movement and a base whereon said supporting means is mounted for free positioning movement relative thereto.

2. A target practice apparatus having an aiming device, aim indicating means for indicating the aim thereof without the necessary issuance of a projectile, supporting means whereon said aiming device has free aiming movement and a base whereon said supporting means is mounted for free rotative positioning movement relative thereto.

3. A target practice apparatus having an aiming device, aim indicating means for indicating the aim thereof without the necessary issuance of a projectile, supporting means whereon said aiming device has free aiming movement and a stationary base whereon said supporting means is mounted for free positioning movement relative thereto.

4. A target practice apparatus having an aiming device, aim indicating means for indicating the aim thereof without the necessary issuance of a projectile, supporting means whereon said aiming device has free aiming movement and a stationary base whereon said supporting means is mounted for free rotative positioning movement relative thereto.

5. A target practice apparatus having an aiming device for aiming at a target or like object, a carrier upon which said aiming device is fulcrumed for horizontal and vertical aiming movement, a base, and means connecting said base and carrier to permit of lateral and longitudinal swinging movement of the latter relative to said base, and independently of or simultaneously with the aiming movement of said aiming device.

6. A target practice apparatus having an aiming device for aiming at a target or like object, a carrier upon which said aiming device is mounted to permit of free aiming movement thereof, supporting means whereon said carrier is mounted and comprising mechanism to permit rocking movement of

the carrier thereon, and a base for supporting said carrier having provision for independent movement of the latter to said base.

7. A target practice apparatus having an aiming device for aiming at a target or like object, a support upon which said aiming device is fulcrumed for aiming movement, a base whereon said support is mounted for free positioning movement relative thereto and following means also sustained by said support to follow the aim of said aiming device with relation to a reference object.

8. A target practice apparatus having an aiming device for aiming at a target or like object, a movable support for said target or like object and upon which said aiming device is fulcrumed for aiming movement, a base whereon said support is mounted for free positioning movement relative thereto, and following means to follow the aim of said aiming device with relation to said target or object.

9. A target practice apparatus having an aiming device for aiming at a target or like object, following means to follow the aim thereof, supporting means for said aiming device and following means, said aiming device having free aiming movement on and relative to said supporting means, a base whereon the latter is mounted for free relative positioning movement, and connected mechanism to permit of such movement simultaneously with or independently of the aim of said aiming device.

10. A target practice apparatus having an aiming device for aiming at a target or like object, following means to follow the aim thereof with relation to a reference object, a longitudinal and lateral movable and common support for said aiming device, following means and reference object, and a base whereon said support is mounted for free positioning movement relative thereto during the aiming movement.

11. A target practice apparatus comprising a main target, an aiming device for aiming thereat, a secondary target, following means to follow the aim of said aiming device with relation to said main target, a common support for said main target, secondary target, following means and aiming device, and a base whereon said support is mounted for movement relative thereto.

12. A target practice apparatus comprising a main target, an aiming device for aiming thereat, a secondary target, following means to follow the aim of said aiming device with relation to the main target, a common support for said main and secondary targets, aiming device and following means, and a base whereon said support is mounted for rotation relative thereto.

13. A target practice apparatus having a main target, a secondary target, an aiming device and following means, a common sup-

port for said main target, secondary target, aiming device and following means and a stationary base whereon said common support is mounted for rotative movement relative thereto.

14. A target practice apparatus having an aiming device, means for indicating the aim thereof without the necessary issuance of a projectile, a swinging support whereon said aiming device is mounted for aiming movement, and a base whereon said swinging support is mounted for movement relative thereto, said support having connections with said base to permit rocking and rotative movements of said support.

15. A target practice apparatus comprising an aiming device, aim indicating means for indicating the aim thereof without the issuance of a projectile, a swinging carrier therefor having a rocking movement about one end and whereon and relative to which said aiming device has free aiming movement and a base for said carrier and to which said end is connected and whereon the same is mounted for movement relative thereto.

16. A target practice apparatus having an aiming device, aim indicating means for indicating the aim thereof without the necessary issuance of a projectile, following means to follow the aim thereof, a swinging support provided with a plurality of pivotally connected or hinged members and whereon said aiming device and following means are mounted for free aiming movement and a base whereon said support is mounted for movement relative thereto.

17. A target practice apparatus having an aiming device for aiming at a target or like object, following means to follow the aim thereof with relation to a reference object, connecting means for the main target and aiming device to maintain the desired relation between the same, a common support for said aiming device, following means, and connecting means, and a base whereon said support is mounted for rotative movement relative thereto.

18. A target practice apparatus comprising an aiming device, a main target, a secondary target, a tubular support common to said main target, secondary target and aiming device, and a base whereon said common support is mounted for movement relative thereto.

19. A target practice apparatus comprising an aiming device, a main target, a secondary target, a tubular support common to said main target, secondary target and aiming device, and a base whereon said common support is mounted for rotation relative thereto.

20. A target practice apparatus comprising an aiming device, following means, a main target, a secondary target, a tubular

support common to said aiming device, following means, main target and secondary target, and a base whereon the support is mounted for movement relative thereto.

21. A target practice apparatus comprising an aiming device, a support upon which said aiming device is fulcrumed, a main target also upon said support, connections permitting the movement of said support for positioning the same prior to or during the aiming movement of said aiming device and a base whereon said support is mounted for movement relative thereto.

22. An apparatus of the class described comprising an aiming device, a support upon which said aiming device is fulcrumed, a main target and following means also upon said support, connections permitting movement of the main target during movement of said aiming device, and a base whereon said support is mounted for movement relative thereto.

23. A target practice apparatus comprising a base, a rocking support mounted upon said base, an aiming device and main target mounted upon said support and connections permitting free aiming movement of said device with relation to said target.

24. A target practice apparatus comprising a base, a rocking support mounted upon said base, an aiming device, following means, a main target and secondary target mounted upon said support, said aiming device having free aiming movement thereon with relation to said main target.

25. A target practice apparatus comprising an aiming device for aiming at a target or like object, following means to follow the aim thereof with relation to a reference object, a support upon which said aiming device is fulcrumed for aiming movement thereof, and a base whereon said support is mounted for movement to permit of positioning said aiming device when in the hands of the marksman.

26. A target practice apparatus comprising an aiming device for aiming at a target or like object, following means for following the aim thereof with relation to a secondary target, electromagnetic means relatively remote from said secondary target for effecting record of the aim thereupon, a rocking support whereon said aiming device, following means and electro-magnetic means are mounted, and a base for said rocking support.

27. A target practice apparatus having an aiming device, aim indicating means for indicating the aim thereof without the necessary issuance of a projectile, a pivoted rest to retain said aiming device in its normal position when out of use and aim adjusting means upon said pivoted rest.

28. A target practice apparatus comprising, in combination, an aiming device, a tar-

get at which aim is to be directed, sustaining means, said aiming devices having provision to permit, while in the hands of the marksman, a positioning movement thereof with and upon said target, connections intermediate the latter and said aiming device to permit free aiming movement of said aiming device relative to said sustaining means, a follower for said aiming device to follow and indicate the aim thereof by movement relative to a reference object and a base whereon said support is mounted for movement relative thereto.

29. A target practice apparatus comprising a base, a rocking support mounted thereon, an aiming device mounted upon said support and spring equilibrium establishing means for said rocking support.

30. A target practice apparatus comprising a pivoted support, an aiming device mounted thereon and spring equilibrium establishing means for said support.

31. A target practice apparatus comprising a rocking support, an aiming device mounted thereon, and spring equilibrium establishing means for said support.

32. A target practice apparatus comprising a base, an upright rocking support mounted thereon and comprising a plurality of pivoted members, an aiming device mounted upon said support and spring equilibrium establishing means connecting corresponding pivoted members.

33. A target practice apparatus comprising a rocking support having a plurality of normally upright pivoted rods, an aiming device mounted on said support and spring equilibrium establishing means for said support.

34. A target practice apparatus comprising a base, a rocking support mounted thereon and comprising a plurality of normally upright pivoted members, a coiled spring uniting a pair of said members and adapted upon the rocking movement thereof to be distended and an aiming device mounted upon said support.

35. A target practice apparatus comprising, in combination, a base, a movable support mounted thereon, a frame carried by said support provided with target means, and an aiming device movably mounted on said support to permit of free aiming movement of said aiming device relative thereto.

36. A target practice apparatus comprising a base, a rocking support mounted thereon, a frame carried by said support and movable relative thereto, and a target and aiming device carried by said frame.

37. A target practice apparatus comprising a base, a rocking support mounted thereon, a frame pivoted upon said support, a target carried by said frame and an aiming device carried upon said frame having free

aiming movement with relation to said target.

38. A target practice apparatus comprising a movable support, a frame mounted thereon for movement relative thereto, a target carried by said frame and an aiming device also carried by said frame and having free aiming movement thereon relative to said target.

39. A target practice apparatus comprising a base, a support mounted thereon for movement relative thereto, a target and aiming device supporting frame, relative movement permitting connections between said frame and said support, and an aiming device mounted upon said frame and having free aiming movement thereon.

40. A target practice apparatus comprising a support, a target and aiming device supporting frame thereon and movable relatively thereto, an aiming device supporting frame proper mounted in said frame for relative movement and carrying an aiming device.

41. A target practice apparatus comprising a support, a target and aiming device supporting frame mounted thereon and movable relatively thereto and an axially disposed aiming device supporting frame proper axially mounted therein and carrying an aiming device, whereby said aiming device may be oscillated about an axis coincident with the bull's-eye of the target.

42. A target practice apparatus comprising a support, a target and aiming device supporting frame mounted thereon and movable relatively thereto, an axially disposed aiming device supporting frame proper axially mounted in said supporting frame, said axial line intersecting the bull's-eye of the target and an aiming device mounted upon said supporting frame proper, so that the line of sight thereof normally forms an element of a cone whose axis intersects the bull's eye of the target.

43. A target practice apparatus comprising a base, a rocking support mounted thereon, a target and aiming device supporting frame mounted on said support for movement relative thereto, an axially disposed aiming device supporting frame proper pivoted in the latter and having the axial line of its pivot intersecting the bull's-eye target and an aiming device upon said supporting frame proper and having free aiming movement relative thereto.

44. A target practice apparatus comprising a movable support, a frame mounted thereon for movement relative thereto, an aiming device supported by said frame, positioning movement connections for said device between the same and said frame, and free aiming movement connections between said aiming device and said frame.

45. A target practice apparatus comprising sustaining means, a support mounted thereon and movable relatively thereto, a carrier mounted on said support, an aiming device mounted for deflecting or aiming movement with said carrier, connections permitting a horizontal deflecting movement between said aiming device and said carrier, connections between said aiming device and said first frame permitting oscillatory non-deflecting movement, and connections between said aiming device and said frame permitting sweeping deflecting movement of the said device.

46. A target practice apparatus comprising a support, an aiming device for aiming at a target, sustaining means mounted on said support and carrying said aiming device, a follower for following the aiming movement of the aiming device and adapted to be deflected when the aim of the aiming device is deflected with reference to the target aimed at and connections between said aiming device and said sustaining means permitting an oscillatory movement of the aiming device without deflection.

47. A target practice apparatus comprising, in combination, a support, an aiming device, sustaining means intermediate the latter and said support for sustaining said aiming device, and including connections to permit of horizontal deflecting movement and vertical sweeping deflecting movements of the latter relatively to a target and also to permit oscillatory vertical and horizontal non-deflecting movements for positioning the same.

48. A target practice apparatus comprising a supporting frame, an aiming device mounted therein for movement relatively thereto, following means mounted to partake of the movement of said aiming device and a movable following means positioning device mounted in said frame and having capacity for movement therein below the horizontal.

49. A target practice apparatus comprising an aiming device, a swinging support therefor, a member wherein said support is mounted for swinging movement in an arc extending below the horizontal, following means carried by said swinging support and partaking of the movement of said aiming device and a following means positioning device mounted in said member to partake of the said downward swinging movement of said following means.

50. A target practice apparatus comprising an aiming device, a swinging support therefor, a pivoted frame wherein said swinging support is mounted for movement in an arc below the horizontal, aiming device following means carried by said swinging support, a following means positioning

device carried by said pivoted frame and sustaining means for said pivoted frame.

51. A target practice apparatus comprising an aiming device, a swinging support therefor, a pivoted frame wherein said swinging support is mounted for movement in an arc below the horizontal, aiming device following means carried by said swinging support, a following means positioning device carried by said pivoted frame and having movement relative thereto, and sustaining means for said pivoted frame.

52. A target practice apparatus comprising an aiming device, a swinging support therefor, a frame wherein said swinging support is pivoted for positioning movement below the horizontal, aiming device following means carried by said swinging support, and a following means positioning device carried by said frame.

53. A target practice apparatus comprising an aiming device, sustaining means therefor, a frame wherein said sustaining means is mounted and positioning movement permitting connection between said frame and said sustaining means, permitting movement of the latter below the horizontal.

54. A target practice apparatus comprising an aiming device, a swinging support therefor, a frame wherein the same is mounted for sweeping positioning movement above and below the horizontal and relatively movable following means and following means positioning device mounted in said frame.

55. A target practice apparatus comprising, in combination, an aiming device for aiming at a target, a vertically swinging carrier on which said aiming device is fulcrumed for aiming movement, a frame wherein said carrier is mounted to permit of vertical swinging movement to bring the aiming device either above or below the line of sight to be taken at the target, and a base on which said frame is mounted for independent movement relative thereto.

56. A target practice apparatus comprising an aiming device, a support therefor, a follower to follow the aiming movement thereof, a recording means, connections between said aiming device and said support for permitting movement of said aiming device in a vertical arc below the horizontal and connections between said aiming device and said support for permitting free aiming movement thereof relative to said support.

57. A target practice apparatus comprising an aiming device, a support wherein said aiming device is mounted, sustaining means for said support, connections between said support and said sustaining means, whereby said support may receive a movement of the aiming device below the horizontal and separate connections between said

aiming device and said support to permit of free aiming movement of the former.

58. A target practice apparatus comprising an aiming device target means at which aim is to be directed, a support wherein said aiming device is mounted, connections between said aiming device and said support to permit of deflections of said aiming device from the line of sight, and a rotatable sustaining means for said support to permit of independent deflecting movement thereof and of said aiming device in aiming or positioning the latter.

59. A target practice apparatus comprising an aiming device, supporting means wherein said aiming device is mounted, connections between said aiming device and said supporting means for permitting universal aiming movement of the former, sustaining means for said supporting means, and connections between said sustaining and supporting means for permitting oscillatory movement between them for positioning said aiming device prior to or simultaneously with the aiming movement thereof.

60. A target practice apparatus comprising an aiming device, a support wherein said aiming device is mounted, connections therebetween permitting a movement of deflection of said aiming device relative to said support, sustaining means for said support, connections between said sustaining means and said support for permitting oscillatory movement of said aiming device, and relatively movable following means and a following means positioning device.

61. A target practice apparatus comprising an aiming device, a support wherein said aiming device is mounted, sustaining means for said support having connection therewith whereby said aiming device may receive movement in an arc extending below the horizontal, following means for following the aim of the aiming device and arranged to partake of the movement of said support and a positioning device for the following means mounted upon and sustaining means.

62. A target practice apparatus comprising an aiming device, a support wherein said aiming device is mounted, sustaining means for said support, connections therebetween whereby said aiming device may receive movement in an arc extending below the horizontal, following means partaking of the movement of said support and a device yieldingly mounted upon said sustaining means to partake of the downward movement of said support for positioning said following means.

63. A target practice apparatus comprising an aiming device, supporting means therefor, sustaining means for said support, connections therebetween permitting movement of said supporting means in a vertical

plane, following means carried by said supporting means, universal adjustment means for said following means, and a following means positioning device carried by said sustaining means.

64. A target practice apparatus comprising an aiming device, supporting means therefor, sustaining means for said support, connections therebetween permitting movement of said supporting means in a vertical plane, following means carried by said supporting means, universal adjustment means for said following means, and a following means positioning device carried by said sustaining means and movable relatively thereto whereby it may be depressed in the movement of said supporting means.

65. A target practice apparatus comprising an aiming device, a positioning movement support wherein the same is mounted, deflecting movement permitting connections between said aiming device and said support, pivoted sustaining means for said positioning movement support, said sustaining means being pivoted upon an axis whose line intersects the bull's-eye of the target, and a common supporting means for said aiming device and target.

66. A target practice apparatus comprising an aiming device, a positioning movement support wherein the same is mounted, deflecting movement permitting connections between said aiming device and said support, pivoted sustaining means for said positioning movement support, said sustaining means being pivoted upon an axis whose line intersects the bull's-eye of the target, a common supporting means for said aiming device and target, and means permitting rocking movement of said supporting means.

67. A target practice apparatus comprising an aiming device, a movable support therefor and provisions maintaining said support in equilibrium in any position assumed thereby, whereby free movements of the aiming device are permitted without absorption or neutralization of said movements by inertia of said support.

68. A target practice apparatus comprising an aiming device, a movable support therefor and equilibrium establishing devices operatively connected with said support, whereby said support is maintained in equilibrium in any position assumed thereby and movements of the aiming device are not neutralized in any position of the support.

69. A target practice apparatus comprising an aiming device, a pivoted support therefor, and equilibrium establishing connections for said support permitting free movements of the aiming device.

70. A target practice apparatus comprising a movable support, equilibrium establishing devices operatively connected there-

with to maintain the same in equilibrium in any position assumed thereby, a second support mounted upon the first support with capacity for movement relatively thereto, 5 equilibrium establishing devices operatively connected with said second support to maintain it in equilibrium in any position assumed thereby without respect to any position assumed by the first support, and an 10 aiming device operatively connected to said second support and accorded free movement by said supports.

71. A target practice apparatus comprising a pivoted support, equilibrium establishing devices operatively connected therewith to maintain the same in equilibrium in any position assumed thereby, a second support pivoted upon the first support, equilibrium establishing devices operatively connected with said second support to maintain it in equilibrium in any position assumed thereby without respect to any position assumed by the first support, and an aiming device operatively connected to said 25 second support and accorded free movement by said supports.

72. A target practice apparatus comprising a pivoted support, spring equilibrium establishing devices therefor to maintain it in equilibrium in any position assumed thereby, a second support pivoted upon the first support, spring equilibrium establishing devices to maintain it in equilibrium in any position assumed thereby without respect to any position assumed by the first support, and an aiming device operatively connected to said second support and accorded free movements by said supports.

73. A target practice apparatus comprising in combination a support, an aiming device adapted to be aimed at, a main target, a follower for following the movements of the aiming device, and connections be-

tween the support and the aiming device to permit of a downward sweeping movement 45 of the aiming device and follower relatively to the field of the main target.

74. A target practice apparatus comprising in combination an aiming device, a main target support, and established connections 50 between said aiming device and main target support to permit of a downward sweeping movement thereof relatively to the field of said main target.

75. A target practice apparatus comprising in combination a revolver, a main target support and established connections between said revolver and main target support to permit of a downward sweeping movement of the revolver relatively to the 60 field of the main target.

76. A target practice apparatus comprising a revolver, a follower to follow the aiming movement thereof, a main target support and established connections between the 65 revolver, follower and main target support to permit of a downward sweeping movement of the revolver relatively to the field of the target.

77. A target practice apparatus comprising in combination a revolver, a follower to follow the aiming movement thereof, a main target support and established connections between the revolver, follower and target support to permit of a combined downward 75 and upward sweeping movement of the revolver relatively to the field of the main target.

In testimony whereof, we have signed our names to this specification, in the presence 80 of two subscribing witnesses.

HENRY A. STEBBINS.
ARTHUR A. ADAMS.

Witnesses:

IRVING U. TOWNSEND,
ARTHUR E. CARSON.

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