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TARGET APPARATUS WITH SIMULATED PROJECTOR

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Fig. 1.

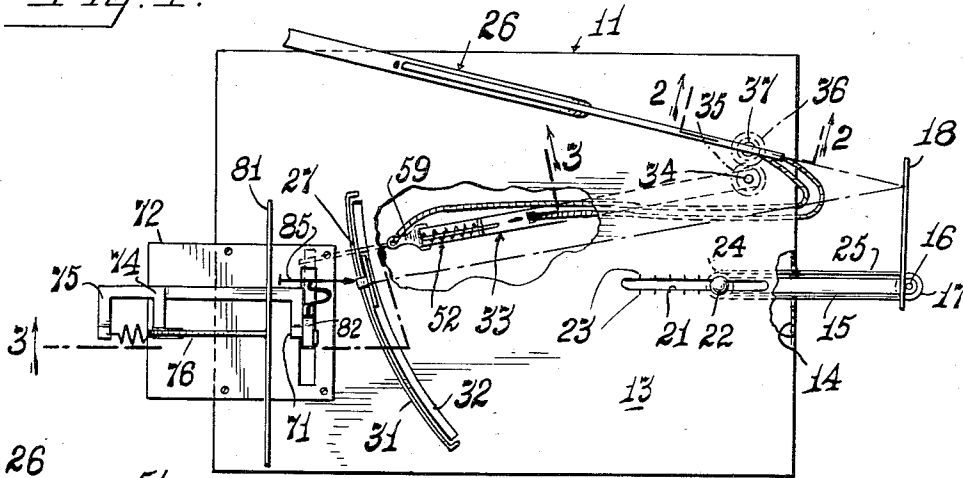


Fig. 2.

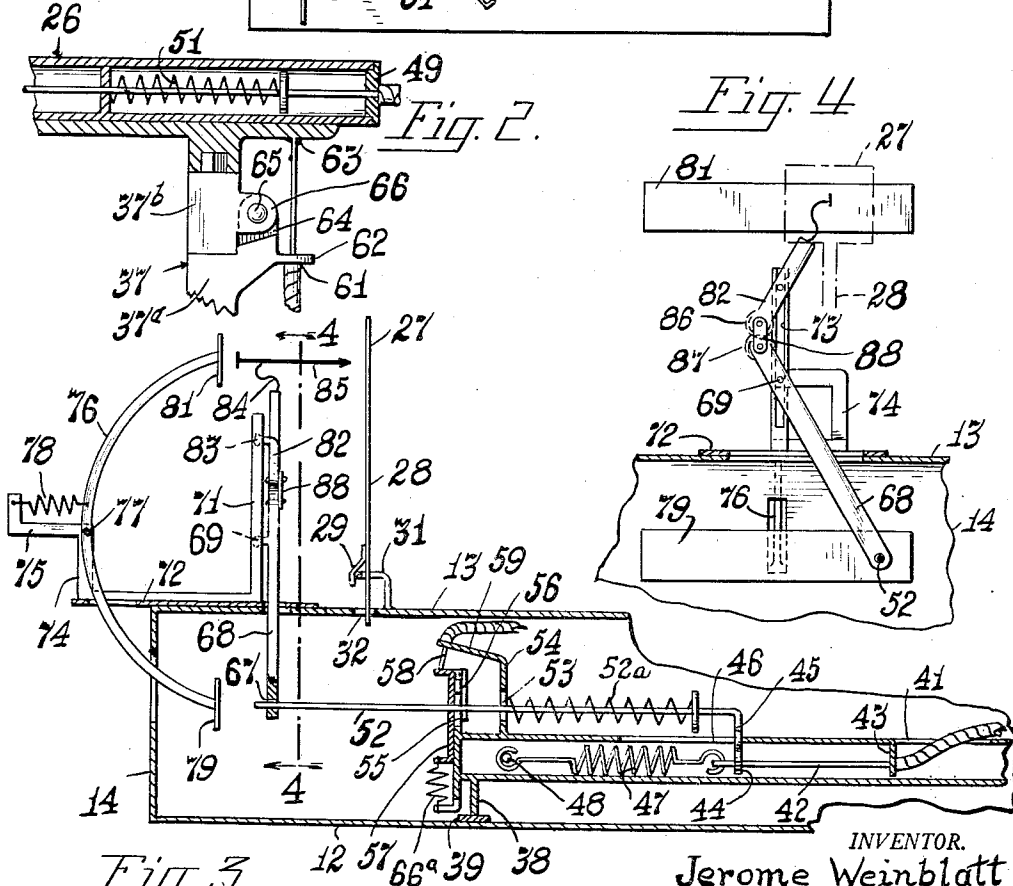
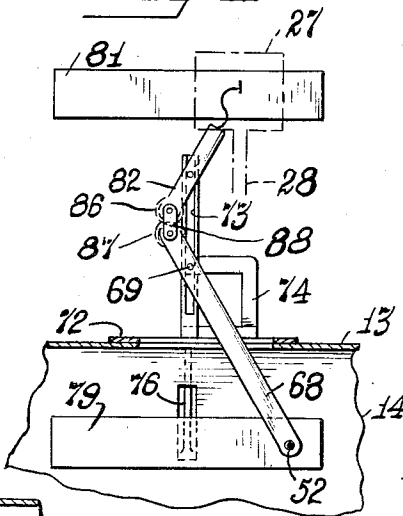


Fig. 4



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TARGET APPARATUS WITH SIMULATED PROJECTOR

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9 Claims. (Cl. 273—101.2)

The invention relates to target apparatus and more particularly to improvements in a rugged target apparatus that is compactly arranged and structurally designed to provide accurate visual indicating means for scoring the aim of the operator.

The apparatus herein disclosed embodies novel improvements over the apparatus shown and described in my copending application Serial No. 594,957, filed June 29, 1956. It may be described generally as including a shallow hollow base structure, or at least a horizontally arranged wall, mounting thereon a universally adjustable target rifle or like aiming device. Such aiming device is mechanically connected, in a novel manner, with novel mechanism located within the base or beneath the wall, that is actuated upon "firing" of the aiming device and is aimed in accordance with aiming of said aiming device so as to cause a target supported above the base or wall to be impinged, pierced or struck when the aim is true.

The apparatus includes an adjustable target image reflector located in front of the aiming device and said device is so mounted that its position may be varied horizontally and vertically while aiming. Any change in the position of the aiming device is transmitted to the target-striking mechanism through novel mechanical interconnecting means. The target-striking mechanism is "cocked" or set automatically in conjunction with the "cocking" of the target rifle or aiming device and said mechanism is released upon actuation of the aiming device. The target disclosed herein is adjustable on the base or wall very easily and simply so as to permit it to be repositioned manually, quickly and with a minimum of effort.

It is an object of the present invention to provide novel mechanism operably connected with an aiming device, and responsive to "firing" of said device, for causing visual impact against or physical displacement of a target, only if the aim is true.

Another object is to provide novel mechanism operably connecting the aiming device with a target striker.

Another object is to provide a novel mounting for a target striker which is characterized by the inclusion of novel means responsive to movement of an aiming device for causing corresponding movement of a striker.

Another object is to provide a novel apparatus of the character described which is not expensive to construct and assemble, is positive and automatic in its operation and simple to use.

With these and other objects in view, the invention resides in certain novel features of construction, combination and arrangement of parts as will be hereinafter described in detail in the specification, particularly pointed out in the appended claims, and illustrated in the accompanying drawings, which form a part of this application and in which:

Fig. 1 is a plan view of a target apparatus embodying features of the present invention and showing a portion of its top wall broken away.

Fig. 2 is an enlarged sectional detail view of the

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mounted end of the aiming device, showing parts in elevation and taken substantially on line 2—2 of Fig. 1.

Fig. 3 is an enlarged longitudinal vertical sectional view of the front end portion of the target displacement mechanism, taken substantially on line 3—3 of Fig. 1.

Fig. 4 is a fragmentary vertical sectional view taken substantially on line 4—4 of Fig. 3.

Referring now to the structure as disclosed in the accompanying drawings, the target apparatus preferably includes a shallow substantially rectangular mounting base 11 having a bottom wall 12, a top wall 13 and connecting marginal walls 14. A bracket 15 extending outwardly through one of the walls 14 is suitably formed at its outermost end to provide a vertical bearing for an upstanding post 16 having a pulley 17 secured firmly to its lower end. The post 16 constitutes a support for target image mirror means 18.

The horizontally disposed top wall 13 of the base 11 has a slot 21 therein coinciding with the longitudinal axis of the bracket 15 and a knob 22, carried on the innermost end of said bracket, operates in said slot to facilitate sliding of the bracket longitudinally inwardly and outwardly relative to the base for positioning the mirror means 18. Calibration markings 23 may be placed adjacent either or both longitudinal edges of the slot 21 to facilitate accurate positioning of the mirror means. The knob carries, within the base 11, a pulley 24 having a belt 25 trained therearound, which belt is trained also over the pulley 17. Rotation of the knob 22 will impart rotation to the standard or post 16 so as to position the mirror means at a required angle for purposes to become apparent presently. The mirror means 18 is located in front of a target rifle 26, or other aiming device, and its purpose is to reflect an image of a target, such as the target 27 shown in Fig. 1. The target is mounted on the top wall of the base adjacent the end opposed to the end mounting the mirror means 18. Preferably the target includes a standard 28 (Fig. 3) having an offset flange 29 on its back face adapted to be engaged over a rail 31 mounted on the base so as to hold the target in a vertical position with its lower extremity depending through an arcuate guide slot 32.

When the target apparatus is in use, the aiming device 26 is aimed at an image of the target 27 in the mirror means 18. When the operator believes that his aim is true, and that the image has been properly sighted, he "fires" the aiming device. Such "firing" sets in motion novel striker-actuating mechanism mounted on and within the base and to be described presently, which, if the aim is true, operates to impinge or displace the target 27.

The striker-actuating mechanism is partly contained in and partly mounted on or otherwise operably associated with a tubular body 33 pivotally mounted at one of its ends on a vertical axis 34 within the base 11. Referring particularly to Fig. 1 there is a pinion 35 mounted on the mechanism axis 34, which pinion is meshed at all times with a similar pinion 36 carried firmly on the lower end of a post 37 that extends upwardly through and is journaled in the top wall 13 of the base. Referring to Fig. 2, the post carries on its upper end, the forward end of the aiming device 26. When the aiming device 26 is swung in a horizontal arc while aiming at an image in the mirror means 18, the striker-actuating mechanism is likewise swung through a horizontal arc but in an opposite direction about its axis 34 through meshed pinions 35—36. The free forward end of said actuating mechanism may be supported, as at 38 (Fig. 3) on an arcuate track 39.

The striker-actuating mechanism is operably connected with any suitable operating means such as for example a conventional type trigger in the aiming device 26. Also, the striker-actuating mechanism, or at least a portion

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thereof, is adjustable in a vertical plane to compensate for vertical variations in the aim of the aiming device.

Referring now particularly to Fig. 3, the tubular body 33 is provided with a top wall opening 41 to receive a sheathed cable 42, the sheath of which is connected firmly to a tongue 43. The cable 42 extends through the tongue 43 and carries adjacent its end a collar 44 having a radial arm 45 extending upwardly through a wall slot 46. A spring 47, connected at one end to the cable 42 and at its other end to an anchor pin 48, normally tends to pull the cable forwardly in the body 33. The other end of the cable 42 is threaded into the barrel of the aiming device 26 (Fig. 2) and its sheath is anchored to an end plug 49. The cable 42 extends into the barrel and is connected to the aiming device actuating trigger or other mechanism in such manner that when the rifle is "cocked," the cable 42 is drawn into the barrel against the tension of a spring 51 therein. At the same time the other cable end (Fig. 3) including the collar 44 is pulled into the position substantially as shown in Fig. 3.

As illustrated in Fig. 3, the radial arm 45 terminates in a plunger 52, integral therewith, which extends freely through a large opening 53 in an upstanding wall 54 on the top face of the tubular body 33 and through a vertical slot 55 in an upstanding front wall extension 56. Vertically slidable relative to the extension 56 is a plate 57 which has a hole therein to receive and guide the free end of the plunger 52. The upper end of the slide-plate 57 is connected to a cable 58 which has its sheath anchored to a forwardly directed overhang 59 integral with the vertical wall 54. The other end of said sheath is anchored, at 61 (Fig. 2) to a flange 62 on the post 37, whereas the corresponding end of the cable 58 is anchored firmly to the aiming device 26 as at 63.

The post 37 is sectional and it includes a section 37a having a hinge element 64 connected by a pin 65 to a complementary hinge element 66 on a post section 37b mounting the aiming device. Rocking of the device through a vertical arc about the horizontal axis 65 pulls or slacks the cable 58 thus raising or lowering the slide plate 57 with or against assistance of a spring 66 and correspondingly raise or lower the elevation of the guided free end of the plunger 52.

It should be quite apparent at this time that moving said aiming device through a vertical and/or a horizontal arc about its support post 37, results in corresponding movement of the striker-actuating mechanism and particularly of the plunger 52. Also obvious is the fact that when the aiming device is actuated, as when "firing," the plunger 52 is released and is pulled forwardly by its spring 47. Recoil mechanism for the plunger 52 is provided by means of a spring 52a fitted thereover.

The free extremity of the plunger 52 is slidably engaged in a guide opening 67 in the lower extremity of a bar 68 which is pivotally mounted, on a horizontal axis 69, to a vertical standard 71. The standard 71 is carried on a base plate 72 secured to the top face of the wall 13 rearwardly of the target 27. The standard 71 has a slot 73 in one of its faces in which the axis of the bar 68 is mounted for sliding. The base plate 72 also carries rearwardly of the standard 71, an upstanding post 74 formed with a horizontal portion 75 at its upper extremity. The post 74 mounts a cradle 76 for rotation in a vertical plane about a horizontal axis 77 and said cradle normally is urged in a clockwise direction to maintain the position substantially as illustrated in Fig. 3, by a spring 78 connected at one end to the cradle and at its other end to the horizontal portion 75. The lower extremity of the cradle extends freely into the base 11 and it carries on its lower end, a plate 79 that is of sufficient width and length as to lie in the path of the plunger 52 irrespective of its position of vertical or arcuate adjustment. The upper extremity of the cradle carries a similar plate 81 for a purpose to become apparent presently.

Also mounted on the standard 71 for vertical sliding

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and pivotal movement is a striker-carrier 82. This carrier comprises a length of material journaled at 83 between its ends and which carries a spring steel wire extension 84 on its upper end. A target striker 85 is secured to the free upper end of the wire extension.

The lower extremity of the striker-carrier 82 and the upper end of the bar 68 are each formed with meshing gear segments 86 and 87 respectively, which are bridged by a link connection 88. This toothed and linked connection permits coordinated adjustment of the striker 83 when the plunger 52 is adjusted. In other words, movement vertically of the plunger 52 will slide both the bar and the striker-carrier 68 and 82 in the vertical mounting slot 73. Similarly when the plunger 52 is moved through a horizontal arc, the bar 68 is moved about its pivot 69 and, because of the meshed gear segments 86 and 87, the striker-carrier 82 is also adjusted about its pivot, thus moving the striker in response to adjustment of the aiming device. As best illustrated in Fig. 4, the striker will remain in the path of the upper cradle plate 81 so that when the cradle is rocked about its pivot 77 by impingement of the plunger 52 with the lower plate 79, the upper plate 81 will strike the striker and thrust it in the direction of the target so as to pierce or otherwise mark the same.

As many possible embodiments may be made in the invention, and as many changes might be made in the embodiment above set forth, it is to be understood that all matters hereinbefore set forth or shown in the accompanying drawings are to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, what I claim as new and desire to be secured by Letters Patent is:

1. In an apparatus of the character described, a horizontal wall having a guideway therein, a target mounted for manual positioning along said guideway, a striker arranged adjacent to the target, striker-actuating mechanism pivotally mounted at one end within the base, a plunger carried by said mechanism, a vertically adjustable guide on the plunger-carrying end of said mechanism, said plunger projecting through said guide, an aiming device pivotally mounted on said base, mirror means to reflect an image of said target toward said aiming device, means operably connecting the aiming device and the pivoted end of the striker-actuating mechanism for swinging said mechanism in a horizontal arc in one direction when the aiming device is swung in a horizontal arc in an opposite direction while aiming it at the image to point the plunger in the general direction of but below the plane of the target, means operable to raise and lower the adjustable guide to vary the effective elevation of the plunger independently of the mechanism when the aiming device is tilted in a vertical plane, actuating means in the aiming device operably connected with the plunger to actuate the plunger, means connecting the striker with the plunger for raising and lowering the striker and for moving it in a vertical arc in response to adjustment of the plunger, and means engageable by the plunger when actuated to impinge the striker and thrust it against the target.

2. In an apparatus of the character described, a hollow base including a top wall having a guideway, a target mounted for manual positioning along said guideway, striker means arranged rearwardly of said target, elongated striker-actuating mechanism pivotally mounted at one end within the base, a plunger at the other end of said mechanism, mirror means on the base to reflect an image of said target, said mirror means being rotatably and slidably adjustable, a pivotally and tiltably mounted aiming device, gear means operably connecting the aiming device and the striker-actuating mechanism for swinging said mechanism in a horizontal arc about its pivot in one direction when the aiming device is swung in a horizontal arc in an opposite direction to point the plunger in a predetermined direction, means operable to

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raise and lower the effective elevation of the plunger relative to the striker-actuating mechanism when the aiming device is tilted in a vertical plane, actuating means including a cable connecting said actuating means with the striker-actuating mechanism operable to actuate the plunger, and articulated means operably connecting the striker means and plunger for causing the striker means to move vertically and in a horizontal arc in response to corresponding movement of the plunger.

3. In an apparatus of the character described, a base including a top wall having a guideway therein, a target mounted for adjustment along said guideway, a striker, striker-actuating mechanism pivotally mounted at an end within the base, a plunger on said mechanism, an aiming device movably mounted on said base, mirror means to reflect an image of said target toward the aiming device, means operably connecting the aiming device and the striker-actuating mechanism for swinging the striker-actuating mechanism in a horizontal arc about its pivot in one direction when the aiming device is swung in a horizontal arc in an opposite direction while aiming it at the image to point the plunger in a predetermined direction, means operable to raise and lower the effective elevation of the plunger independently of the striker-actuating mechanism when the aiming device is moved in a vertical plane actuating means in the aiming device, operably connected to the plunger and actuable to actuate the plunger when said means is actuated, and means in the path of the plunger operable by said plunger to project the striker in the direction of the target.

4. A target apparatus comprising, an aiming element representing a firearm, a target, a striker, striker actuating mechanism including a trip plunger associated with said aiming element and movable with the same within its aiming range, means movable in response to aiming movement of the trip plunger to move the striker and aim it at the target, a rocker arm having one end disposed for engagement by the trip plunger and its other end with the striker, and means pivotally mounting the arm between its ends for rocking movement in response to trip release of the plunger to actuate the striker and cause it to strike the target in a predetermined area if the aim is true.

5. In a target apparatus, a target, a releasable trip plunger, means to aim the trip plunger in a predetermined direction within the aiming range, a striker spaced from said trip plunger, and means operably connecting the striker and trip plunger for simultaneous aiming adjustment of the striker when the trip plunger is aimed, said means including a pair of arms one connected to the trip plunger and the other to the striker and each pivotally and slidably mounted and operably connected to each other for adjustment in unison.

6. In a target apparatus, a target, a releasable trip plunger, means to aim the trip plunger in a predetermined direction within the aiming range, a striker spaced from said trip plunger, means operably connecting the striker and trip plunger for simultaneous aiming adjustment of the striker when the trip plunger is aimed, said means including a pair of arms each pivotally and slidably mounted, and gear means operably connecting the arms for pivotal movement in opposite directions.

7. In an apparatus of the character described, a base, a target supported above said base, mirror means to

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reflect an image of said target, a horizontally and vertically adjustable aiming device on said base adapted to be aimed at said image, a normally tensioned trip plunger in said base and operably connected to the aiming device for horizontal and vertical adjustment in response to adjustment of the aiming device, a standard on said base, a first arm pivotally and slidably mounted on said standard and operably connected with the trip plunger for adjustment therewith, a second arm pivotally and slidably mounted on said standard, means operably connecting the first arm with the second arm for adjustment of the second arm in response to adjustment of said first arm, a striker carried by and movable relative to said second arm adjacent to the target, means operable to move the trip plunger axially in one direction, and normally disengaged striker lever means engageable by the trip plunger when the latter moves in said one direction and operable thereby to project the striker in the direction of the target.

8. In an apparatus of the character described, a base, a target supported above said base, mirror means to reflect an image of said target, a horizontally and vertically adjustable aiming device on said base adapted to be aimed at said image, a normally tensioned trip plunger in said base and operably connected to the aiming device for horizontal and vertical adjustment in response to adjustment of the aiming device, a standard on said base, a first arm pivotally and slidably mounted on said standard and operably connected with the trip plunger for adjustment therewith, a second arm pivotally and slidably mounted on said standard and operably connected with the first arm for adjustment in response to adjustment of said first arm, a striker carried by said second arm adjacent to the target, means actuable to release the trip plunger, and normally disengaged means engageable by the trip plunger when the latter is released and operable to project the striker in the general direction of the target.

9. In an apparatus of the character described, a base, a target supported above said base, an aiming device, a trip plunger operably connected to the aiming device for adjustment in response to movement of the aiming device, a pivotally and slidably mounted first arm operably connected with the trip plunger for adjustment therewith, a pivotally and slidably mounted second arm, means operably connecting the first arm with the second arm for adjustment of the second arm in response to adjustment of the first arm, a striker carried by and movable relative to said second arm adjacent to the target, means operable to move the trip plunger axially in one direction, and normally disengaged means engageable by the trip plunger when the latter moves in said one direction and operable thereby to project the striker in the general direction of the target.

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