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3,348,843

AUTOMATIC TARGET STAND

Filed Feb. 18, 1964

3 Sheets-Sheet 1

Fig. 1

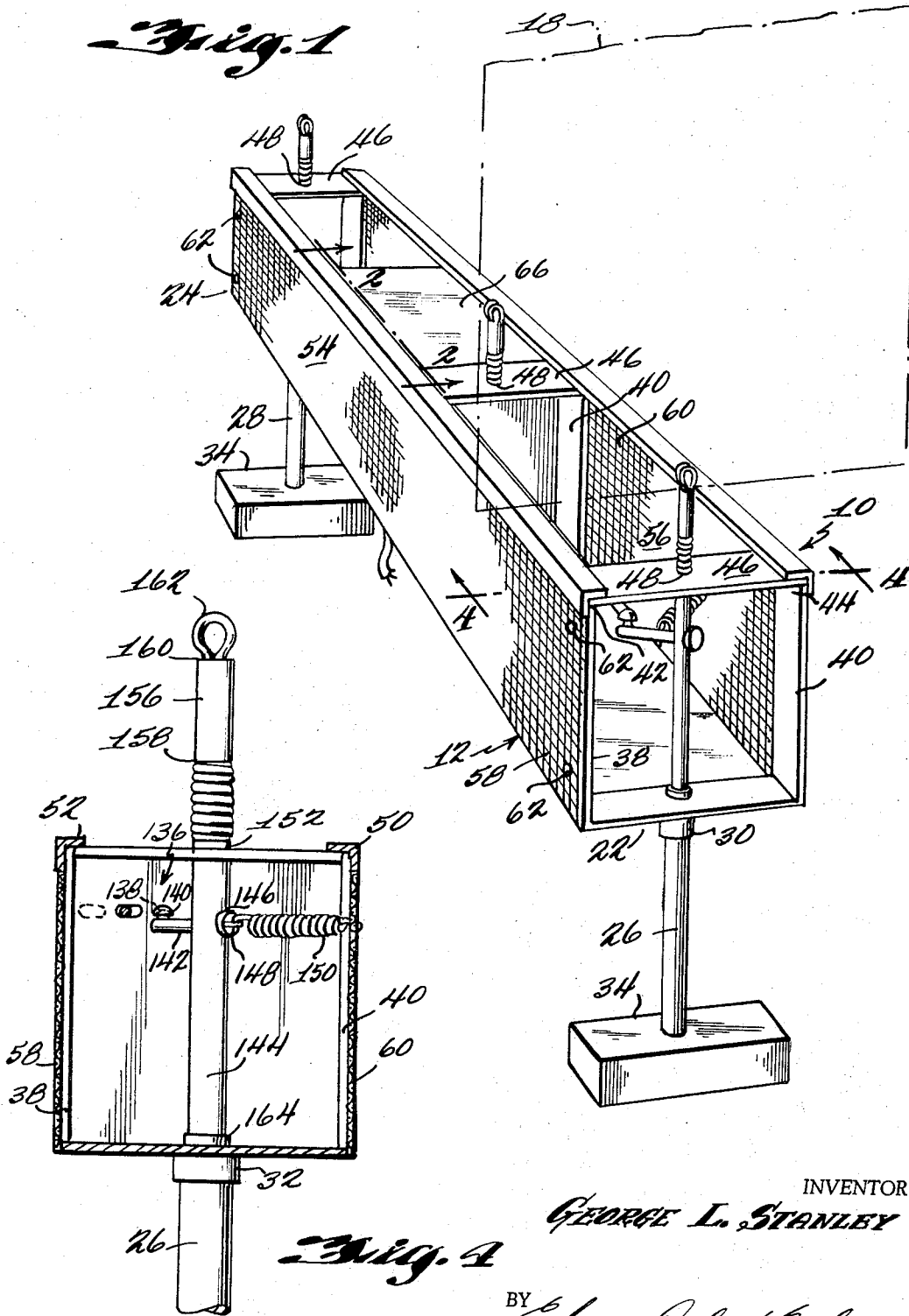


Fig. 4

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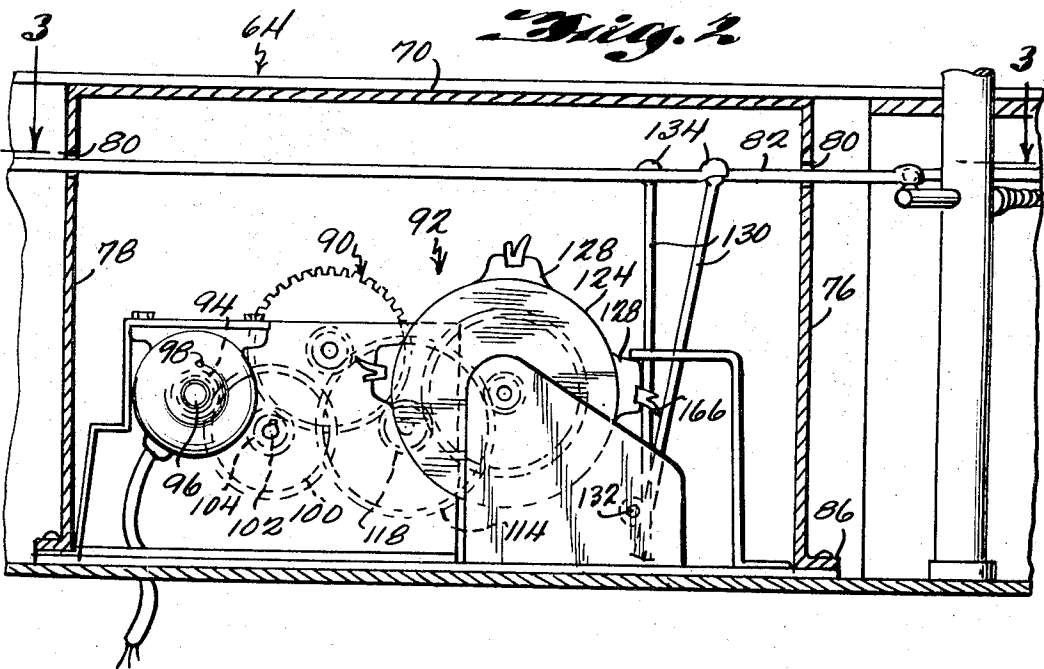
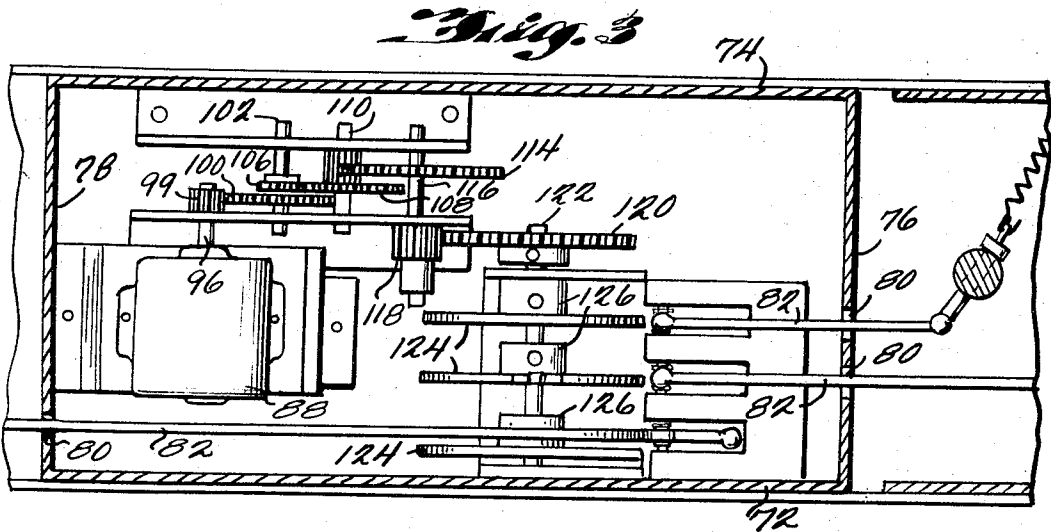
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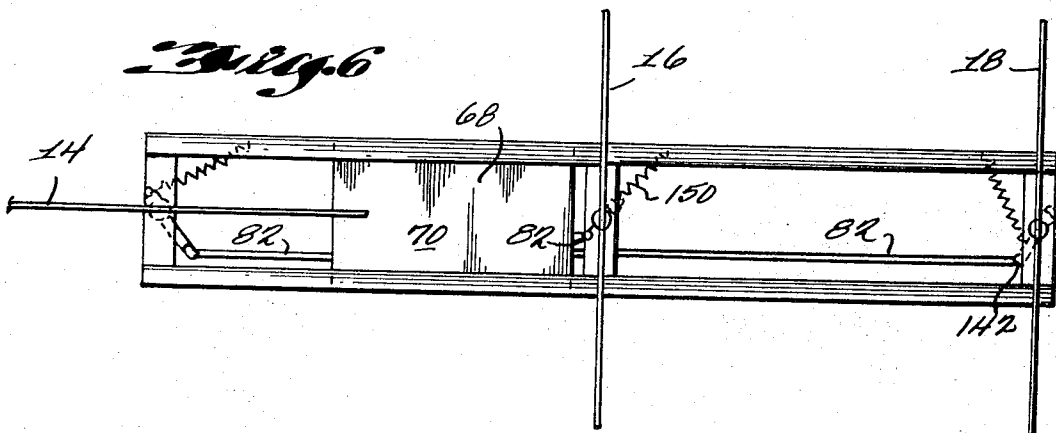
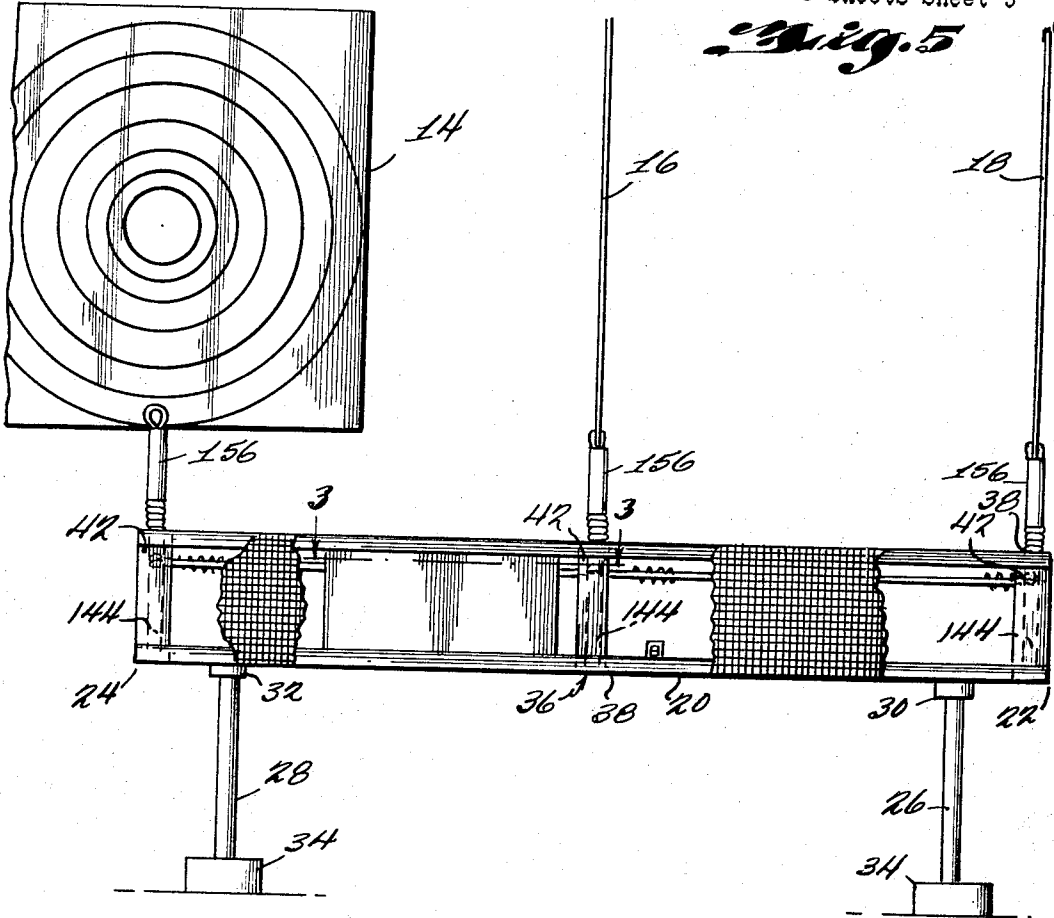
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3 Sheets-Sheet 3



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AUTOMATIC TARGET STAND
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 1 Claim. (Cl. 273—105.6)

The present invention relates to apparatus for moving one or more targets from a non-firing position to a firing position and particularly to target-presenting apparatus adapted to position a target at predetermined intervals for a predetermined time interval.

An object of the present invention is to provide apparatus which presents a target in a firing position at predetermined intervals.

Another object of the present invention is to provide a target-presenting apparatus which actuates a target, in a retracted or non-firing position, to a firing position at predetermined intervals for a predetermined time interval.

A further object of the present invention is to provide a target-presenting apparatus which actuates a target at predetermined intervals from a non-firing position to a firing position for a predetermined interval of time, said actuation to the firing position and said predetermined time interval at the firing position being adjustable.

A still further object of the present invention is to provide a target-presenting apparatus adapted to be used indoors or outdoors such as in a shooting gallery, pistol or rifle range or the like where small arms are used for firing at targets.

Yet another object of the present invention is to provide a target-presenting apparatus which can be adjusted to present a plurality of targets intermittently each for a predetermined time interval or simultaneously for a predetermined time interval, the time interval of the target presented in the firing position being adjustable as desired.

Other objects and the entire scope of the present invention will become apparent from the detailed description, which while indicating the preferred embodiments of the invention, is given by way of illustration only since various changes and modifications within the spirit and scope of the invention will become readily apparent from the description and the accompanying drawings, wherein like numerals refer to like parts throughout and in which:

FIGURE 1 is a perspective view of one embodiment of the target-presenting apparatus of the present invention;

FIGURE 2 is a front elevational view taken along the line 2—2 of FIGURE 1;

FIGURE 3 is a top plan view of the apparatus taken along line 3—3 of FIGURE 2;

FIGURE 4 is a side elevational view of the apparatus taken along the line 4—4 of FIGURE 1;

FIGURE 5 is an end elevational view of the apparatus of FIGURE 1; and

FIGURE 6 is a fragmentary top plan view of the apparatus shown in FIGURE 5.

One embodiment of the target-presenting apparatus of the present invention includes a frame 10 with the major dimension 12 of the frame 10 generally parallel to the line-of-fire so that the target 14 in the position shown in FIGURE 5 is presented broadside or in full view of the marksman while targets 16 and 18 present only a single edge facing the marksman. However, the

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target-presenting apparatus of the present invention provides for pivoting the targets 16 and 18 through an angle of 90° so as to present them also to full view of the marksman and thereafter, return the targets to the non-firing position.

The frame comprises a bottom member 20 made preferably of a flat, narrow, rectangular sheet or bar of metal, preferably aluminum, having its major dimension 12 parallel to the firing position. Depending from the underside of the bottom member 20 and fixedly and spacedly attached adjacent either extremity 22 and 24 of the major dimension of the frame 10 is a pair of support means 26 and 28 secured in sockets 30 and 32 respectively, each support means provided at its lower end with a ground or floor engaging foot 34 fabricated generally of wood such as hard pine.

Adjacent the extremities 22 and 24 and the midpoint 36 of the bottom member 20 there are fixedly attached thereto, as by welding, a pair of upwardly vertically extending aligned strips 38 and 40 at the front and rear of said bottom member 20. The upper ends 42 and 44 of the vertically extending aligned strips are connectingly attached to each other by horizontally disposed strip 46 fixedly attached thereto, as by welding. Each strip 46 is provided adjacent its mid point with an aperture 48 having a vertically disposed axis.

Along the front and rear upper edges of the frame 10 and superimposed over the juncture of the vertically disposed members 38 and 40 with the horizontally disposed members 46, there is provided a pair of angle rods 50 and 52 fixedly attached as by welding or fastened thereto with set screws.

Removably attached to the front and rear 54 and 56 respectively, of the frame 10 is a missile protective means 58 and 60, preferably a close mesh screen, which can be attached to the frame 10 at the vertically extending strips 38 and 40 with, for instance, machine screws 62. Missile protective means 58 and 60 insure against damage of the operating mechanism 64 disposed within the frame 10 and permits easy access to the interior thereof, to, for instance, regulate and service the operating mechanism as well as remove any missile deflected to the frame's interior. A light cover or screen (not shown) may also be removably attached to the top 66 of the frame 10 if desired.

Within the frame 10 is disposed operating mechanism 64 encased in housing 68 comprising cover plate 70, front and rear plates 72 and 74 respectively, and end walls 76 and 78. Front and rear plates 72 and 74 are positioned with their longitudinal axes parallel to the major dimension of the frame 12. End walls 76 and 78 are each provided with one or more apertures 80 to slidably receive push rods 82 extending therethrough. The housing 68 can be removably attached to the bottom member 20 of the frame 10 by machine screws 84 joining the bottom member 20 and a horizontally extending flange member 86 provided along the lower peripheral edge of the housing 68. Alternatively, the flange member 86 may be provided only at the lower edge of the end walls 76 and 78.

Within the housing 68 there is supported a motor 88 which actuates gear reducing means 90 which in turn operates cam means 92 to urge a target from a non-firing to a firing position. The motor 88 can be any commercially available, for instance a 6 or 12 volt DC motor. Additionally, a 110 volt AC motor can advantageously be used.

The choice of an AC or DC motor will depend generally on the availability to the device of an electric outlet. Further, a spring powered hand wound motor can also be used or even a pair of 2 volt DC motors with a pair of flash-light batteries is suitable to operate the mechanism 64.

The gear reducing means 90 can include, for instance, a gear 94 operatively connected to the motor 88 by shaft 96 being secured to the former by pin 98. A plurality of other reduction gears are actuated by gear 94. Thus gear 100 secured to shaft 102 by pin 104 is rotated by gear 94. Shaft 102 also carries and rotates gear 106 attached thereto which in turn rotates gear 108 carried by shaft 110, the latter also in frictional engagement with gear 112. Gear 112 engages and rotates gear 114 carried on shaft 116 which also carries gear 118 to engage and cause to rotate gear 120 secured to shaft 122. Spacedly affixed on shaft 122 or a shaft driven by other known gear reducing means are one or more adjustable, rotatable cams 124 each provided with bearings 126. The outside peripheral edge of the cam is provided with a means 128 of any predetermined size and shape to intermittently engage lever arm 130 pivotally attached at its lower end through shaft 132 whose longitudinal axis is disposed substantially parallel to the end walls 76 and 78 of the housing 68. The upper end of lever arm 130 is operatively connected as by, for instance, a universal joint 134 to push rod 82 slidably and horizontally projecting out aperture 80 provided in an end wall of the housing 68. At the end of the push rod 82, outside the housing 68, there is provided a pivot means 136, such as a ball 138, which pivotally engages ball 140 integral with one end of arm 142. The other end of arm 142 is fixedly attached to target post 144 by any conventional means such as a collar secured to the target post by set screw or the arm 142 can be passed through an aperture 146 provided in the target post and fixedly connected thereto by, for instance a stud 148 or the like.

Fixedly attached to the arm 142 at the end opposite the arm's push rod engaging and pivot means 136 is resilient means 150. The non-arm attaching end of the resilient means 150 is fixedly secured to missile protective means 60 of the frame 10. The resilient means 150 in the non-firing position of the target can be in a state of compression and on actuation of the gear reducing means and cam which coact to urge the push rod 82 to pivot the target post 144 the resilient means is tensioned so that on disengagement of the cam from the lever 130 the contraction of the resilient means will return the target post to a non-firing position and urge the push rod to return the lever 130 to its original, non-pivoted position.

Adjacent the upper end 152 of the target post 144 and attached thereto is shock spring 154 which engages and operatively connects target rod 156 adjacent the lower end 158 thereof to said upper end 152 of the target post in an abutting relationship. The upper end 160 of the target rod 156 is provided with target engaging means 162, for instance, a spring clip or other conventional means to removably receive a target.

The target can be of any size and shape and can be made from any material such as paper, plastic, metal, cloth, glass, wood, screening or clay. The size of the target is limited only by the horizontal distance between target posts 144 when a plurality of such target posts are incorporated into the device of the instant invention. Advantageously, when the action target is employed for use on an indoor range, the target can be provided with similar indicia on the front and back faces thereof.

In another embodiment of the instant invention the support means 26 can be lengthened to a height sufficient to accommodate an additional target post 144 and target rod 156 with an attached target, depending below the bottom member 20 of the frame 10. Thus in the embodiment shown in FIGURE 5, which shows three targets operated by three cams, three additional targets can be provided in the manner described above by pivotally connecting addi-

tional push rods 82 and lever arms 130 to shaft 132 for pivot engagement with cams 124. This second embodiment will provide a marksman with a choice of two targets at each shot.

The operation of the embodiment shown in FIGURES 2 and 5 is as follows. The gear reducing means 90 and the cam means 92 are adjusted so that, for instance, the target post 144 which is rotatably supported in the frame 10 at 164 is rotated to give a predetermined time interval during which the target will be presented to the line-of-fire. Further, the cam means 92 is adjusted to provide for a predetermined sequence of target rotation. The predeterminations are accomplished by selecting the shape of the land 128 on a cam and the position of one such land 128 on a given cam with that of another cam for engagement with the contacting means 166 to pivot the lever 130 provided for each cam. Thereafter, the motor 88 is set in operation and the gear reducing means 90 caused to rotate. As the gears move, they in turn cause shaft 122 which carries the cam means 92, to rotate, thus rotating the cams. As the cams 124 revolve the land 128 provided on each, will sequentially engage lever arm pivoting means 166 and urge the lever 130 to the right as shown in FIGURE 2. The engagement of the land 128 with the pivoting means 166 will be for a predetermined time, dependent on the particular shape of the land 128 chosen.

The pivot of the lever 130 to the right will urge the push rod 82 to pivot the target post 144 through a 90° angle, thus rotating the target from a non-firing position or edgewise view when looking directly down the firing line, to a firing view or frontal view of the target.

As the cam continues to rotate, the land 128 will disengage the lever 130 and the lever will be urged back into its non-engagement position by the release of tensioned spring means 150 attached to the target post 144 and the frame 10. Thus after the predetermined time of exposure of the target to the marksman, the cam no longer being in interfering engagement with the lever, the spring means 150, which originally biased the target in a non-firing position, will cause the target post to rotate the target to the original non-firing position on this disengagement of the cam from the lever. This spring action in turn urges the arm 142 to pivot the push rod 82 at 136 causing the latter, through its operative connection with the lever 130 to urge the lever 130 to the non-firing or cam-disengagement position. The operation of other cams is substantially the same as described above. A single revolution of all the cams employed constitutes one cycle and any number of cycles can be performed in operating the device of the instant invention.

The present invention can be embodied in other specific forms without departing from the spirit or essential attributes thereof and it is therefore desired that the present embodiments be considered in all respects as illustrative and not restrictive. It is also to be understood that since such changes and variations may be made without departing from the invention, the spirit and scope of the invention are defined by the appended claim.

What is claimed is:

Apparatus for moving a plurality of targets from a non-firing to a firing position including a frame, target receiving means for each of said targets, each of said target receiving means being shock absorbingly attached to a pivotable target post, an operating mechanism adjustable to present each of said targets at a predetermined interval for a predetermined time interval and resilient means connected to said frame and each of said target posts to move said targets from a firing to a non-firing position, said operating mechanism including gear reducing means, means commonly driven by said gear reduction means carrying adjustable camming means for controlling the pivoting sequence of each target post, and the duration of time in which the target post is pivoted to a firing position, lever means, said camming means op-

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eratively engaging said lever means, and means operatively connecting said lever means and said target posts to pivot said posts to a firing position.

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