Dec. 10, 1935. W. TRAMMELL 2,023,497

DEVICE FOR TRAINING AND INSTRUCTION IN THE FIRING OF SMALL ARMS

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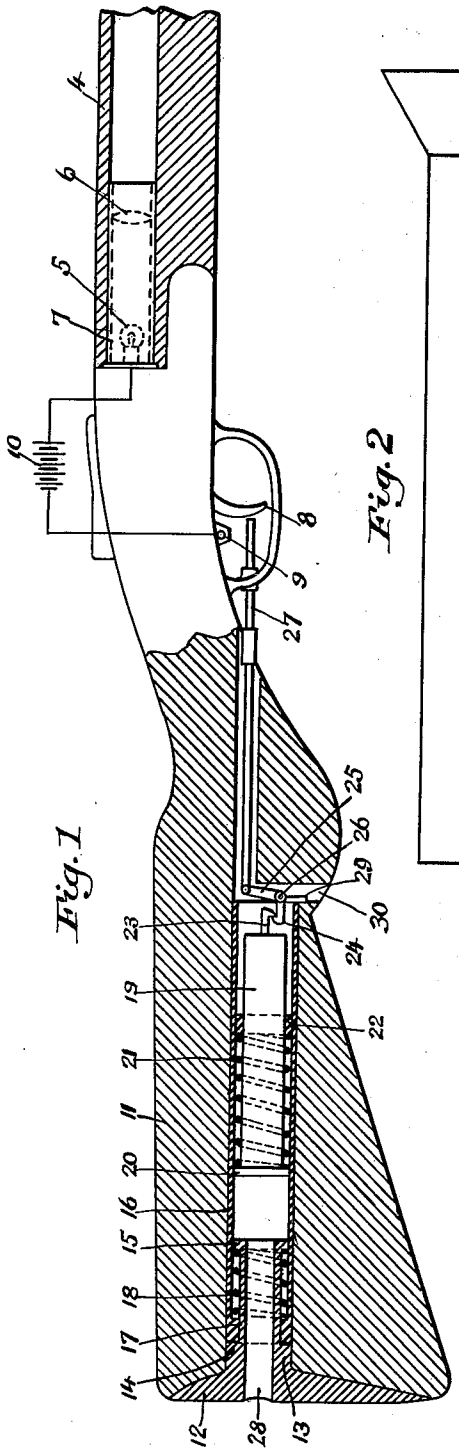

Fig. 1

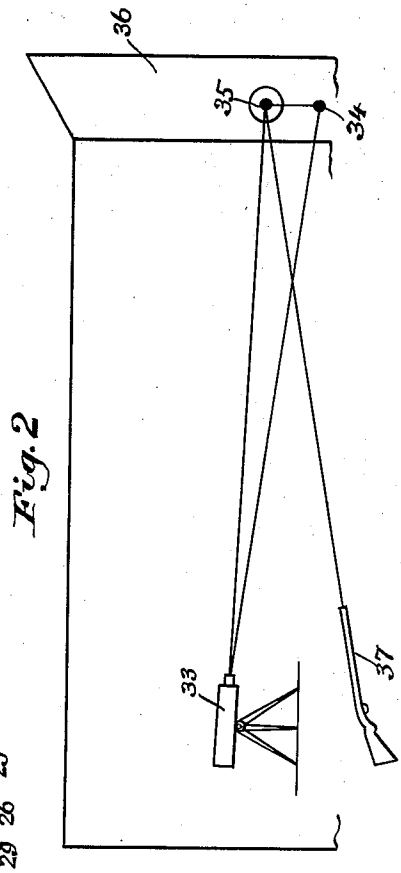

Fig. 2

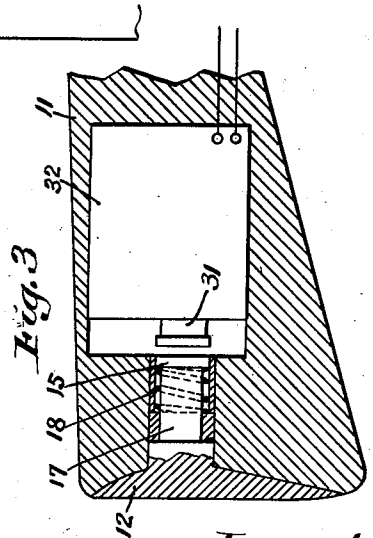

Fig. 3

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DEVICE FOR TRAINING AND INSTRUCTION IN THE FIRING OF SMALL ARMS

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4 Claims. (Cl. 42—1)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

This invention relates to devices for training and instruction in the firing of small arms, and has for its object to provide means to produce a moving target and a gun to be "fired" at the target having means to indicate the point at which the gun was aimed at the time the trigger was pulled and also will simulate the recoil resulting when a gun is actualy fired.

With the above and other objects in view, the invention consists in the construction, combination and arrangement of parts as will be described more fully hereinafter.

In the drawing:

Fig. 1 shows the construction of my gun;

Fig. 2 represents diagrammatically the relative positions of gun, target, and means for producing an image representing the point of aim;

Fig. 3 shows a modified form of gun construction according to my invention.

In the early stages of training in the firing of small arms inaccuracy of shooting at a moving target is usually due to failure to "lead" the target, i. e., to aim a sufficient distance ahead of the target to allow for the movement thereof during the time of flight of the projectile to the path followed by the target. Another source of inaccuracy is the tendency of a person inexperienced in firing to flinch at the recoil or aniticipating the recoil and thus throw the gun out of the line of sight before the bullet has left the barrel. My invention is designed to give experience in firing that will obviate both of the above-mentioned difficulties without the expenditure of large quantities of expensive ammunition.

The gun comprises a barrel 4 having in it a lamp 5 and a lens 6 to concentrate the rays from lamp 5 into a beam of restricted cross section and project that beam along the path that would be followed by a bullet fired from the barrel. The lamp and lens may be mounted in a cartridge 7 that is adapted to be inserted into the barrel, or they may be otherwise fixed in the barrel, if desired. When trigger 8 is pulled, it actuates a switch 9 that closes a circuit through battery 10 or other source of electric current and the lamp 5 is lighted, the beam being projected toward the point at which the gun is aimed.

In the end of the gun stock 11 is a movable butt-plate 12 having connected to it a cylindrical portion 13 that is reduced to form a shoulder 14 and is provided with a flange 15 at its forward end. The reduced portion is disposed in a cylindrical sleeve 16 in the butt, the sleeve having an inturned flange 17 at its rear end. A spring 18 under suitable compression is mounted on portion 13 between flanges 15 and 17 to keep the butt-plate normally housed in the recess in the stock provided therefor.

A plunger 19 having a flange 20 at its rear end is mounted in sleeve 16 forwardly of member 13. A coiled spring 21 disposed around plunger 19 is confined between flange 20 and an annular spring abutment 22 fixed inside sleeve 16. At the forward end of the plunger is a hook 23 adapted to engage hook 24 on one limb of bell crank lever 25 pivotally mounted on sleeve 16 at 26, the other end of the lever being pivotally connected to a longitudinally slidable push rod 27 whereof the free end is disposed to be contacted by trigger 8 when the trigger is pulled. Pulling the trigger not only causes lamp 5 to flash but moves push rod 27 back and disengages hooks 23 and 24 which permits spring 21 to drive plunger 19 back against the forward end of portion 13 and impact the movable butt-plate 12 against the shoulder of the person "firing" the gun. The strength of spring 21 is so regulated that the blow delivered by the butt-plate is approximately equal to that due to the recoil of a high-power rifle or shot gun. Plunger 19 is moved forward to re-engage hooks 23 and 24 by means of a rod pushed against the plunger through the passage 28 formed in butt-plate 12. The small lever 29 connected to bell crank lever 25 may be moved by a suitable tool inserted through aperture 30 to cause hook 24 to engage hook 23 or a spring may be provided to move the push rod 27 forward immediately after "firing".

Fig. 3 shows a form of gun in which the recoil-simulating blow is imparted to butt-plate 12 by a plunger 31 actuated by a mechanism similar to that of mechanically operated percussive tools. Electrically driven means 32 are shown in Fig. 3 for actuating plunger 31, but compressed air may be used therefor when available, if desired.

A mechanically driven projector 33 throws upon screen 36 a spot of light 34 that is used as the target. The driving mechanism may be set to cause the target to move at different uniform speeds. A second spot of light 35 is thrown by projector 33 ahead of target 34 in the direction of its movement a distance equal to the lead required for the speed at which the target is moving.

The method of using my invention is as follows:

The person "firing" takes position near the projector as in trap shooting. The one operating projector 33 sets the mechanism for the desired speed and angle of flight of the target and the

position of the lead spot **35** relatively to the target, in accordance with the assumed speed and relative direction of a live target that target **34** represents. When the one "firing" gives the word, the projector operator starts the projector moving, immediately after which a contact is made that causes the target to appear in flight across the screen. The person firing aims and pulls the trigger and a spot of light from gun **37** is thrown upon screen **36** at the point at which the gun was aimed. An observer notes whether it was a hit or a miss and the direction and magnitude of deviation of the shot from the target. Since the light reaches the screen practically instantaneously, the "shot" should strike lead spot **35**. Inaccuracies in pointing and flinching can thereby be detected. After sufficient practice, the lead spot **35** is dimmed and the shooter must estimate the lead for himself. The room in which the training is done should be sufficiently darkened to make the spots of light on screen **36** plainly visible.

It will be understood that the above description and accompanying drawing comprehend only the general and preferred embodiment of my invention, and that various changes in construction, proportion and arrangement of parts may be made within the scope of the appended claims without sacrificing any of the advantages of this invention.

The invention herein described may be manufactured and used by or for the Government of the United States for governmental purposes without the payment of any royalty thereon.

I claim:

1. In a device of the class described, in combination, a gun having a stock, a trigger and a barrel, a movable butt-plate seated in a recess in said stock, said butt-plate having a forwardly extending cylindrical portion, said portion being reduced through a part of its length and having a flange at its forward end, a compressed spring around said reduced part, there being a passage through said butt-plate and said cylindrical portion, a cylindrical sleeve in which said cylindrical portion is slidable and having an inwardly turned flange at its rear end abutting the rear end of said spring, a plunger slidably disposed in said sleeve forwardly of said cylindrical portion, a flange on the rear end of said plunger, an annular spring abutment in said sleeve, a spring around said plunger between said abutment and said flange on the plunger, a hook carried by the forward end of said plunger, a bell crank lever pivotally mounted on the forward end of said sleeve, one limb of said lever having a hook engageable by said hook on said plunger, and a slidably mounted push rod pivotally connected to the end of the other limb of said lever and having its free end disposed to be contacted by said trigger when the trigger is pulled whereby the said hooks are disengaged and said plunger is free to be driven by said second mentioned spring back against said cylindrical portion to move said butt-plate outwardly.

2. In a device of the class described, a gun comprising a barrel, a stock, a trigger, a movable butt-plate normally seated in a recess in said stock, said plate having a forwardly extending cylindrical portion reduced for a portion of its length, there being a passage through said plate and said portion, a flange on the forward end of said portion, a sleeve in said stock in which said portion is slidable, an inwardly extending flange at the rear end of said sleeve, a spring under compression disposed between the flange on said cylindrical portion and the flange in said sleeve, a plunger slidably mounted in said sleeve, a flange on the rear end of said plunger, an annular spring abutment in said sleeve, a spring disposed between said abutment and the flange on said plunger, a hook carried by the forward end of said plunger, a bell crank lever pivotally mounted at the forward end of said sleeve, a hook on one limb thereof adapted to engage the hook on said plunger, and a push rod pivotally connected to the other limb of said lever, the free end of said rod being disposed to be contacted by said trigger to disengage said hooks and permit said plunger to be driven back against said cylindrical portion by the second mentioned spring.

3. In a device of the class described, a gun comprising a stock, a trigger, a movable butt-plate normally seated in a recess in said stock and having a forwardly extending portion reduced for a part of its length, a flange at the forward end of said portion, a sleeve in said stock in which said portion is slidable, an inwardly extending flange at the rear end of said sleeve, expansive resilient means between said flange on said portion and the flange in said sleeve, a plunger in said sleeve forwardly of said portion, a flange on the rear end of said plunger, an abutment in said sleeve, expansive resilient means between said abutment and the flange on said plunger, a hook carried by the forward end of said plunger, means to engage said hook to hold said plunger in a forward position, and means actuatable by said trigger to disengage said means from said hook to permit said plunger to be driven back against said portion by said second mentioned expansible resilient means.

4. In a device of the class described, a gun including a stock and a trigger, a movable butt-plate normally seated in a recess in said stock and having a forwardly projecting portion, resilient means to hold said plate seated in said recess, and percussive means actuatable by said trigger to unseat said plate to produce a recoil-simulating shock.

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