Dec. 10, 1957 J. C. DEAR 2,815,955

APPARATUS FOR RECOVERING PROJECTILES

Filed Aug. 9, 1954

FIG. 1.

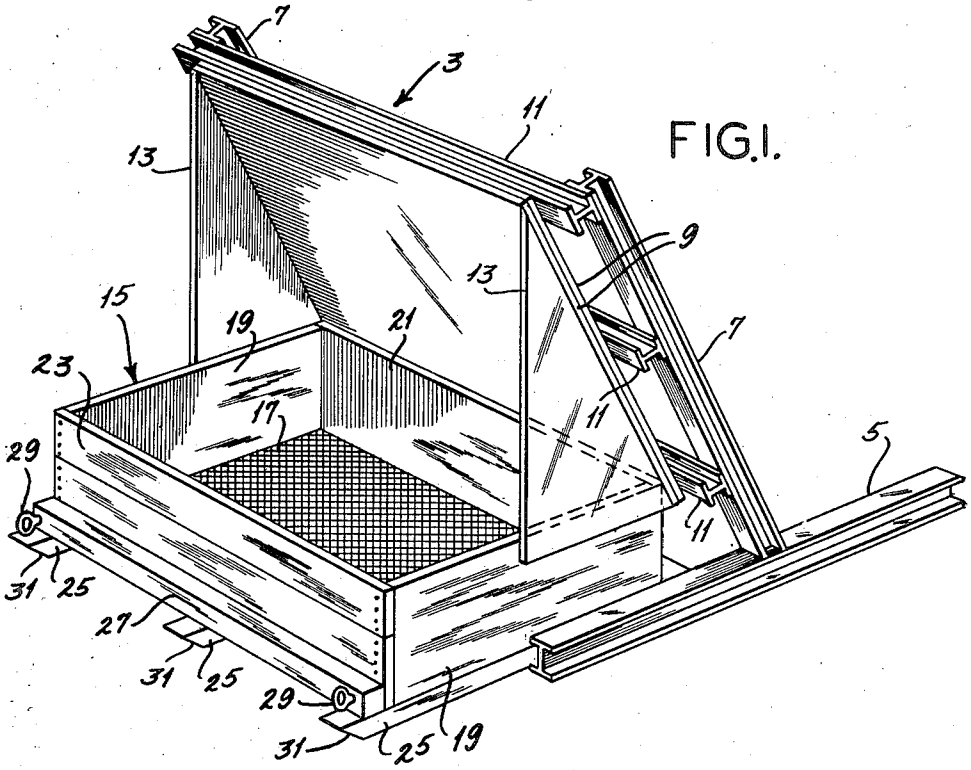
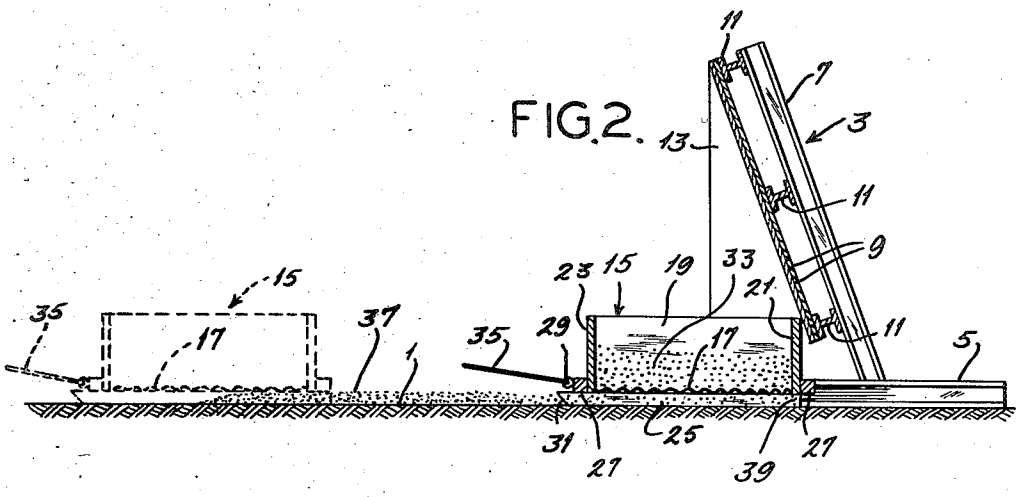


FIG. 2.



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APPARATUS FOR RECOVERING PROJECTILES

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1 Claim. (Cl. 273—102.4)

This invention relates to testing facilities for live ammunition, and more particularly to the recovery of projectiles from a firing range.

In test firing relatively small-caliber ammunition of the non-explosive variety, it is not uncommon to provide an inclined backstop so that the projectiles are deflected downwardly into the ground. On the other hand, explosive projectiles present a problem, inasmuch as some of the projectiles will fail to detonate on the backstop or in passing into the ground. If such unexploded projectiles are permitted to accumulate on the firing range, a hazardous condition necessarily results. Accordingly, the present invention is specifically directed to a convenient method of and apparatus for recovering and destroying live projectiles on a firing range.

Briefly, the invention contemplates the use of a backstop of armor plate which is set at an angle to deflect the projectiles downwardly, and the deflected projectiles are caught in a relatively movable box having an open-mesh bottom. In a specific form, this box is formed as a frame with a screen of hardware cloth extending across the lower surface, the screen and frame being elevated above ground level by means of skids. In use, the box is first positioned beneath the backstop and is filled with sand to a level such that the deflected projectiles will not penetrate the sand to the point of piercing the open-mesh bottom, the interstices of which are smaller than the diameter of the projectiles but sufficient to pass the sand. Upon completion of a firing test, the box is drawn from beneath the backstop and as it travels over the ground, the sand falls therefrom while the projectiles are caught on the open-mesh screen. Unexploded projectiles, if any, may then be safely destroyed by demolition block or by heat, the block being pulled over a gas or oil fire. It may also be noted that the invention can be utilized to recover non-explosive projectiles, when it is desirable to salvage the metal.

Other features of the invention will be in part apparent from and in part pointed out in the following detail description, taken in connection with the accompanying drawings, in which:

Fig. 1 is an oblique view illustrating projectile recovery apparatus embodying the invention; and

Fig. 2 is a vertical section of the apparatus shown in Fig. 1, parts in moved positions being illustrated by dotted lines.

Referring now to the drawings, there is shown a firing range, which is preferably surfaced with rock or other hard material **1**, and a backstop **3** is secured at the target end of the range to intercept the flight of the projectiles. This backstop may be made with steel skids **5**, which are anchored to the ground surface **1**, and with upwardly projecting arms **7**, which carry armor plates **9**. The rails **5** and arms **7** may be conventional I-beams connected together by transverse beams **11**, to which the armor plating **9** is affixed. This plating should be adequate to stop and deflect the projectiles under test, a typical installation

having two layers of seven-eighths inch plate eight feet square set at an angle of seventy degrees. Side plates **13** are provided to catch portions of the projectiles which explode or splatter upon contact with the backstop.

When it is necessary to recover the projectiles, either for purposes of salvaging the metal or to prevent accumulation of projectiles on the range, I contemplate the use of a movable box **15**, which is initially positioned beneath the inclined plates **9** to catch the downwardly deflecting fragments and unexploded projectiles. The box is open at the top but has an open-mesh bottom **17**, which is preferably elevated above the ground surface **1** of the firing range.

More particularly, the box **15** is formed as a wood frame approximately two feet deep with side walls **19**, a front wall **23** and a rear wall **21**. The open-mesh bottom **17** is constituted by hardware cloth stretched across the bottom of the frame, and two or more wood skids **25** extend beneath the cloth so that it is maintained spaced from the ground surface. The box may then be braced with transverse members **27**, the forward one of which carries a ring **29** for attachment of a cord or other means of pulling the box from beneath the backstop, the forward portions of the skids being sloped at **31** for this purpose.

In operation, the box is initially placed beneath the deflecting plates **9** of the backstop and is filled with sand or other similar material for absorbing the energy of the deflected projectiles. The depth of the sand filling **33** should be sufficient to stop the projectiles short of the open-mesh bottom **17**, so that the latter will not be pierced. Upon completion of the firing test, the box is pulled from beneath the backstop, preferably by a relatively long cord **35** attached to the ring **29**. As the box travels over the surface **1** of the firing range, the sand falls through the screen **17** and is deposited at **37** between the skids at the trailing end of the box. Ultimately, all of the sand is eliminated leaving only the projectiles lying upon the screen **17**. Necessarily, the interstices of the open-mesh bottom **17** are sufficiently small to intercept the particular projectiles being fired, although being of a size sufficient to pass the sand or other filling. In order to facilitate emptying of the box, it is desirable to provide for an opening **39** between the skids at the end opposite from that to which the pulling cord is attached.

If the projectiles are of non-explosive type, the box can be readily emptied and returned for reuse. In the case of explosive projectiles, however, it is preferable to provide for their detonation from a safe distance. A detonation block may be used for this purpose; or if desired, the box may be pulled over an oil or gas fire, the heat of which will cause detonation of any unexploded projectiles.

From the foregoing description, it is apparent that those skilled in the art will understand the structure, function and mode of operation of the invention herein disclosed, and appreciate the advantages thereof. Although one embodiment has been disclosed in detail, it is to be understood that the invention is not limited thereto, but the drawings and description thereof are to be understood as being merely illustrative. It is realized that many modifications and variations will present themselves to those skilled in the art without departing from the spirit of this invention or the scope thereof as set forth in the appended claim.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

Apparatus for intercepting explosive projectiles on a firing range having a generally horizontal surface, comprising an inclined back stop, an open-top open-bottom box disposed beneath said back stop to receive projec-

tiles deflected downwardly thereby, said box having its lower portion closed by open-mesh material of a character sufficient to sift sand but block passing of the projectiles, said box being filled with sand to a level substantially above the open-mesh material, means for attaching a card at one end of the box for remotely moving said box from beneath said back stop over the horizontal surface of the firing range, and skids secured to the side of the box for elevating the open-mesh bottom closure above the surface of the firing range and for providing an opening at the other end for the sand to pass therethrough as the box is moved from beneath the back stop.

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