

Feb. 28, 1939.

J. K. CRAIN ET AL

2,148,438

TARGET

Filed Oct. 23, 1936

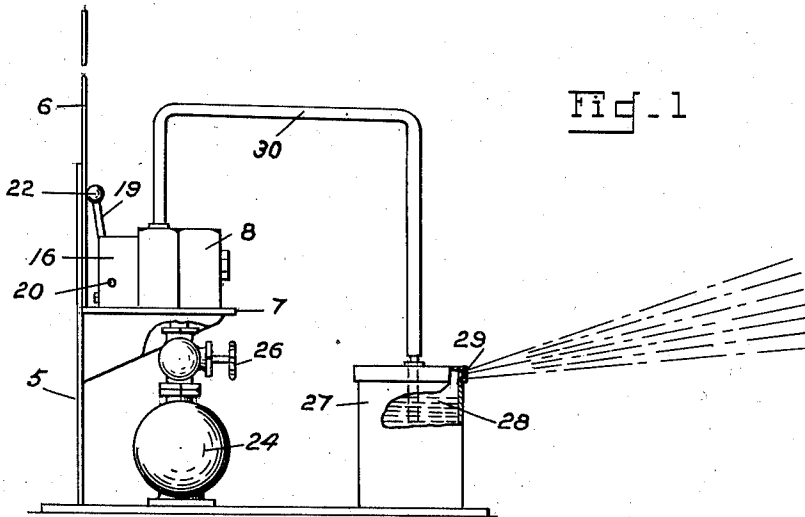


Fig. 1

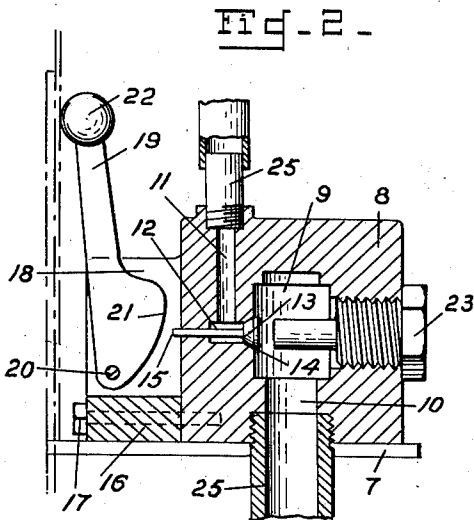


Fig. 2

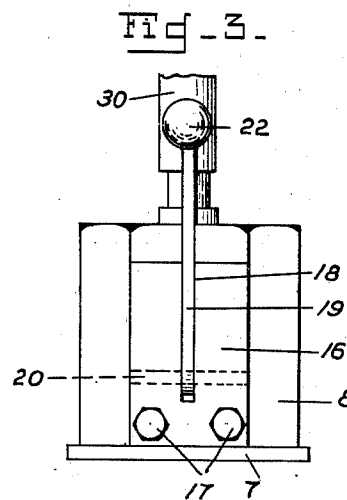


Fig. 3

Fig. 4

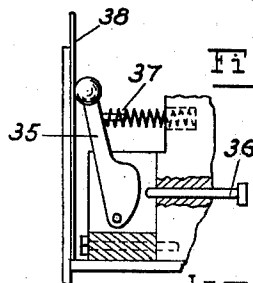
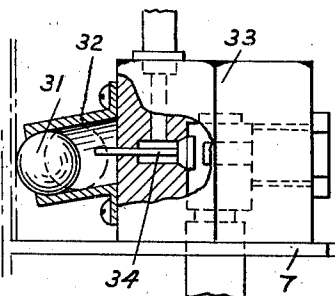


Fig. 5

Inventors
James K. Crain
Frank Kowalski, Jr.

By *W. N. Roach*

Attorney

UNITED STATES PATENT OFFICE

2,148,438

TARGET

James K. Crain, United States Army, Cuero, Tex.,
and Frank Kowalski, Jr., United States Army,
Belmont, Mass.

Application October 23, 1936, Serial No. 107,230

5 Claims. (Cl. 273—102.1)

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

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

5 This invention relates to a target and more particularly it has reference to a target of the annunciating type.

Under actual conditions of warfare troops experience no difficulty in ascertaining the effectiveness of their fire and in determining the attainment of fire superiority. The training of troops under simulated war conditions is conducted by executing combat firing problems. In such a problem a large number of targets are distributed over an extended portion of the terrain to represent opposing troops and a group of troops undergoing training fire their various weapons at the area containing the targets. With inanimate targets it is impossible for the troops to immediately know the effect and distribution of their fire and as a consequence the exercise is unreal and its training value is insignificant.

25 In order to increase the value of this character of training as well as to provide reality, interest and novelty in all kinds of target practice, it is the purpose of this invention to provide a target that will automatically and immediately give an observable indication of the effect of fire. 30 The impact of a missile or projectile on the target will set up vibrations in the target to actuate signaling apparatus adapted to produce various types of visual or audible signals.

35 More specifically, further objects of the invention are to provide novel trigger mechanisms for transmitting the impact energy to signalling apparatus and to employ a fluid pressure medium for controlling the production of a smoke signal.

40 With the foregoing and other objects in view, the invention resides in the novel arrangement and combination of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed 45 may be made within the scope of what is claimed without departing from the spirit of the invention.

50 A practical embodiment of the invention is illustrated in the accompanying drawing, wherein:

Fig. 1 is a view in side elevation showing one form of the improved signalling target.

55 Fig. 2 is a longitudinal sectional view through the valve.

Fig. 3 is a view in elevation of the trigger and valve.

Fig. 4 is a view in side elevation and partly in section and showing a modification of the trigger.

Fig. 5 is a more or less schematic view illustrating the association of the trigger with an electrical switch.

Referring to the drawing by characters of reference, there is shown a support or frame 5 which carries a target 6 mounted in any suitable manner so that it will vibrate as a result of the impact of a projectile or missile. 10

A shelf 7 on the frame supports a valve block 8 which has a chamber 9, an inlet passage 10, and an outlet passage 11 which is in communication with the chamber by a passage 12. A valve 13 slidably mounted in the passage 12 and adapted to engage a valve seat 14 to close the passage 12 has a stem 15 projecting from the block 8. 15

A housing 16 attached to the block 8 by screw bolts 17 is formed with a slot 18 in which a trigger 19 is mounted on a pivot pin 20. A cam surface 21 on the lower end of the trigger is engageable with the stem 15 of the valve in order to move the valve to open position and establish communication between the chamber 9 and the outlet passage 11. The trigger projects above the housing 16 and has a ball 22 on its upper end which is adapted to engage the target. When 20 the valve is in closed position the trigger is normally inclined towards the target against which it is held by the force of gravity.

A stop member 23 is threaded in the block 8 and extends into the chamber 9 to limit movement of the valve 13 in opening. 25

A container 24 for storing a pressure medium is placed in the vicinity of the valve block and is connected to the inlet passage 10 thereof by a line 25 which includes a cut-off valve 26. The pressure medium consists of air or gas or a chemically suitable liquid or solid of a low boiling point such as methyl chloride, sulphur dioxide or similar substances which under atmospheric temperature produce a vapor pressure. 30

A container 27 for storing a smoke-producing agent 28 has a discharge aperture 29 and is connected to the outlet passage 11 of the block by a line 30. The line 30 extends into the container and may be disposed above or within the smoke-producing agent which consists of a chemical substance such as titanium tetrachloride, sulphur trioxide-chlorosulfonic acid mixture, or a mixture having similar chemical characteristics. 35

When the apparatus is prepared for operation the pressure line 25 is open and the pressure medium flows into the chamber 9 and acts on the valve 13 to hold it closed, and through the valve 11 to yieldingly maintain the trigger 19 against the target 6. When the target is struck by a missile the energy of impact is transmitted to the trigger which moves toward the valve block and during this movement the cam surface 21 on the lower part of the trigger acts on the valve 13 to open it and enable a portion of the pressure medium to flow through the outlet passage 11 and through the line 30 to the container 27. On entering the container 27 the pressure medium vaporizes a small portion of the smoke-producing agent 28 and blows a puff of smoke out of the discharge aperture 29.

When the pressure transmitted to the trigger by the target ceases, the fluid pressure in the chamber 9 closes the valve 13 which in turn rocks the trigger to an inclined position from which it falls by gravity until it rests against the target.

In the modification shown in Fig. 4 the trigger consists of a ball 31 contained in an inclined tubular guideway 32 which is attached to a valve block 33 similar to the valve block of Fig. 2. When the ball is driven up the inclined guideway it strikes a valve 34 and moves it to the open position.

In the modification shown in Fig. 5, a pivot trigger 35 is illustrated in association with a movably mounted member 36 representing an element of an electrical switch. In an arrangement of this character a spring 37 is provided for returning the trigger into engagement with the target 38.

We claim:

1. In a target apparatus, a support, a target carried by the support and arranged to vibrate upon impact of a missile, a valve block adjacent the target and having an inlet and an outlet, a valve in the block for closing the outlet, a trigger pivotally mounted on the block and inclined to engage the target, said trigger adapted to be moved when the target is struck by a missile and having a cam surface engaging the valve to move it to open position, a container connected to the

inlet of the valve block, a pressure medium in said container, a container connected to the outlet of the valve block and having a discharge aperture, and an agent in said container adapted to produce a puff of smoke on admission of the pressure medium.

2. In a target apparatus, a target movable on impact of a missile, a valve block adjacent the target and having a passage, a valve for closing the passage, a trigger normally engaging the target under the influence of gravity and movable when the target is struck by a missile to open the valve, means for supplying a pressure medium to the passage of the valve block, an agent vaporizable under pressure to produce smoke, and means for conducting the pressure medium to said agent.

3. In a target apparatus, a target movable on impact of a missile, a valve block adjacent the target and having a passage, a valve for closing the passage, a trigger normally engaging the target and movable when the target is struck by a missile to open the valve, means for supplying a pressure medium to the passage of the valve block, an agent vaporizable under pressure to produce smoke, and means for conducting the pressure medium to said agent.

4. In a target apparatus, a target movable on impact of a missile, a container adjacent the target, a chemical substance in the container which under atmospheric temperature produces vapor pressure, a second container, a chemical substance in the second container vaporizable under pressure to produce smoke, a pressure line between the containers, and means actuated by the target on impact of a missile for controlling the transmission of pressure in the pressure line.

5. In a target apparatus, a target movable on impact of a missile, a container adjacent the target, a pressure medium in the container, a second container, an agent in the second container vaporizable under pressure to produce smoke, a pressure line between the container, and means actuated by the target on impact of a missile for controlling the transmission of pressure in the pressure line.

JAMES K. CRAIN.
FRANK KOWALSKI, JR.