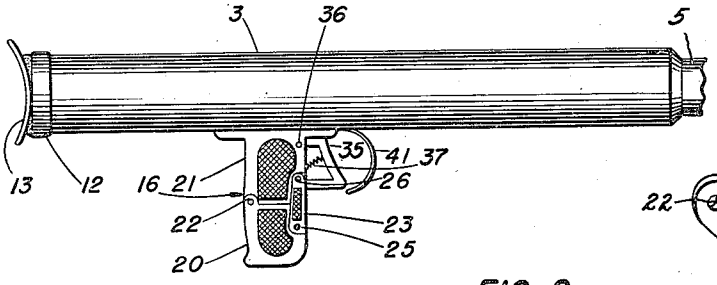
March 7, 1950 E. GARRETT 2,499,379

GRENADE THROWER

Filed Dec. 26, 1944

FIG. 1.



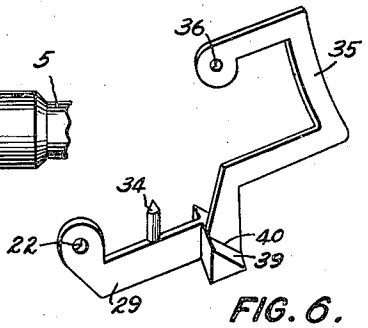


FIG. 6.

FIG. 2.

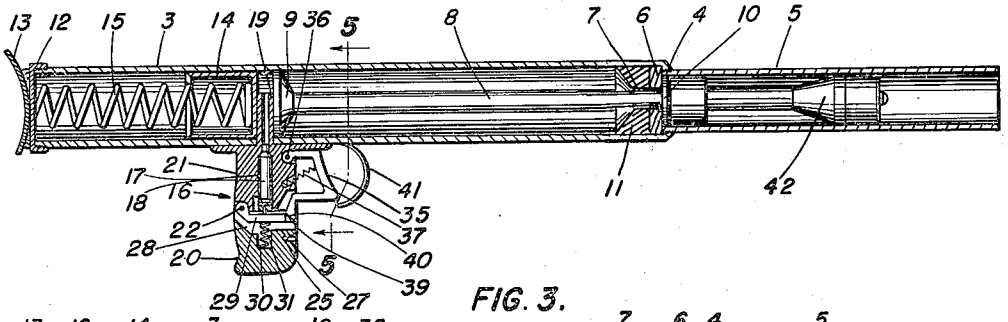


FIG. 3.

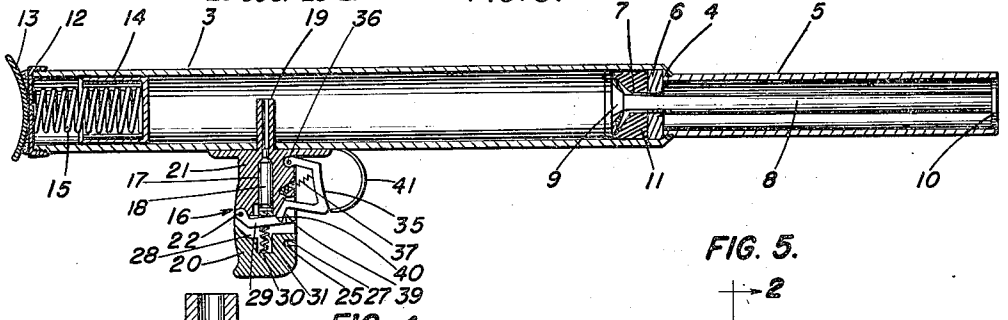


FIG. 4.

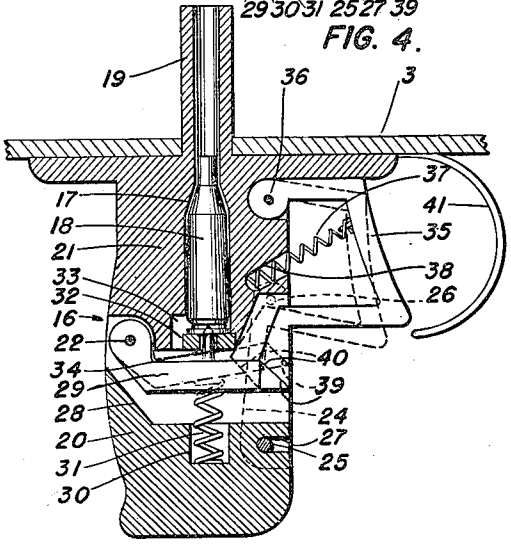
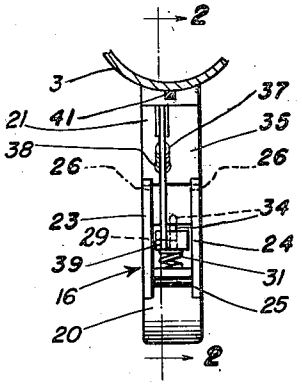


FIG. 5.



INVENTOR
EMIL GARRETT

BY S. E. Bush

ATTORNEY

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GRENADE THROWER

Emil Garrett, United States Marine Corps

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3 Claims. (Cl. 42—1)

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

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This invention relates to firearms, particularly to those of the type designated generally as grenade throwers or projectors.

Devices for throwing or projecting grenades or the like are well known and have taken numerous forms. Some are adapted to be mounted upon an ordinary firearm such as a rifle, while others are specially designed solely for the purpose of throwing grenades or the like. My invention relates to devices of the latter type.

It is the object of my invention to provide an improved grenade thrower or projector which will throw devices such as grenades and which is so constructed that there is substantially no sound and no flash resulting from the explosion of the charge.

Other objects will be apparent as the description progresses in connection with the attached drawings, wherein:

Fig. 1 is a side elevation of the firearm;

Fig. 2 is a side elevation partly in section along the line 2—2 of Fig. 5, looking in the direction of the arrows, and showing a grenade in the barrel and a cartridge in the cartridge chamber before the firearm is discharged;

Fig. 3 is a view similar to Fig. 2 except that it shows the parts in the position just after the cartridge has been fired and the grenade thrown towards the target;

Fig. 4 is an enlarged view of a portion of the mechanism shown in Fig. 2;

Fig. 5 is a partial sectional view taken along the line 5—5 of Fig. 2 and looking in the direction of the arrows; and

Figure 6 is an isometric projection showing the relation of the hammer, firing pin and trigger.

As shown in Figs. 1 to 3 a pressure cylinder 3 is reduced in diameter at its right end, where it is attached as by a threaded joint 4 to a coaxial grenade barrel 5. A bushing 6 is fixed in the reduced end portion of the cylinder 4 where it joins the barrel 5, and has a central bore 7 for the passage of a piston rod 8 which has a piston 9 at one end, sliding in the cylinder 3, and a round projector plate 10 at the other end, sliding in the barrel 5. On the inside of the cylinder 3 and fixed against the bushing 6 is a sealing member in the form of a resilient shock absorber or bumper 11 of rubber or the like and which has a central opening aligned with the bore 7 in the bushing. On the side towards the piston the bumper 11 has a conical recess which substantially mates with the conical underside of the piston. The diameter of the bore 7 is such as to permit the discharge of air from the cylinder

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3 by passing between the rod 8 and the wall of the bore during the movement of the piston to the right, since there is no other means provided to permit the discharge of this trapped air. The length of the rod 8 is such that when the piston 9 is in its extreme right position as shown in Fig. 3 the plate 10 will still be within the barrel 5. At its rear or left end the cylinder 3 is closed by an end cap 12 which may be threaded thereon. A butt plate 13 is fastened to the end cap, and is normally so shaped as to fit the operator's shoulder.

A recoil piston 14 having a skirt extending towards the end cap 12 is slidably mounted in the left end portion of the cylinder 3. A coiled compression spring 15 within the cylinder 3 may have its left end fastened to the end cap 12. The right end of the spring bears against the underside of the head of the piston 14, and when the piston is in its rightmost position the spring may be slightly compressed.

A handgrip 16 is attached by any suitable means to the bottom of the cylinder 3, and contains among other things a vertical cartridge chamber 17 for the reception of a cartridge 18. A cartridge barrel 19, which is coaxial with the chamber and may be integral with handgrip 16, extends vertically upwards into the cylinder 3, forming a limiting stop for both the piston 9 and the piston 14. The barrel 19 is of such length and diameter that any powder from the cartridge will be completely burned before it is blown out of the barrel and into the cylinder 3.

The lower part 20 of the handgrip 16 forms a breech block and holds the cartridge 18 in the cartridge chamber 17 which is in the upper part 21 of the handgrip, the breech block being pivotally attached to the upper part 21 by a pin 22. The breech block 20 is held closed against the upper part 21 of the handgrip by means of a breech block lock which has a pair of spaced legs 23 and 24 (Figs. 1 and 5) connected at their lower ends by a cross-pin 25, to form a substantially U-shaped unit. The unit is pivotally attached to the upper part 21 by pins 26 which are fastened thereto and which pass through the upper portions of the legs 23 and 24. When the breech block is closed against the upper part of the handgrip the unit is turned downwardly to the position shown in Fig. 1 and in dotted lines in Fig. 4, in which position the cross-pin 25 engages a slot 27 in the breech block to lock it in place.

As shown in Fig. 4 the breech block 20 has a recess or passageway 28 therein which accom-

modates a hammer 29 which is pivoted about the same pin 22 that the breech block is pivoted upon. Another recess 30 within the breech block accommodates the lower end of a coiled compression hammer spring 31 which urges the free end of the hammer upwardly. The upper portion 32 of the breech block, upon which the cartridge 18 rests, protrudes into a recess 33 in the part 21 of the handgrip, and has a central opening through which a firing pin 34, integral with the hammer 29, protrudes to engage the cartridge when the hammer is moved upwardly or counterclockwise about the pivot 22. Thus when the hammer is pushed downwardly and then quickly released the spring 31 will snap it back upwardly and the firing pin will strike and fire the cartridge.

A trigger 35 is pivoted at its upper end on a pivot 36 in the upper portion 21 of the handgrip and can be rotated clockwise about the pivot against a trigger spring 37 which is seated in a recess 38 in the upper portion 21 of the handgrip. The outer end of the hammer 29 is wider than the rest of the hammer, and this wide portion has an inclined cam follower face 39 as shown in Figs. 4 and 5. The lower or free end of the trigger 35 terminates in a cam face 40 which engages the cam follower face 39. Thus as the trigger is pulled its cam face 40 presses down on the cam follower face 39 causing the hammer 29 to rotate in a clockwise direction. When the trigger has been moved sufficiently far for the cam face 40 to clear the cam follower face 39 on the hammer, the hammer snaps upwardly due to the force of the compressed spring 31, and the firing pin 34 strikes the cartridge to explode it. In Fig. 4 the trigger 35 and hammer 29 are shown in solid lines in the respective positions that they have before the trigger is pulled. They are also shown in dotted lines in the positions that they have after the hammer has been pressed down by the trigger and then released to fire the cartridge. The trigger and its cam clear the hammer to allow it to snap upwards due to the fact that the trigger is offset to the left of the hammer as viewed in Fig. 5 whereby the cam face of the trigger engages only the wider outer end of the hammer. A trigger guard 41 is suitably fastened to the underside of the cylinder 3 so that it is located substantially in front of the trigger as shown in Fig. 5.

In operation the cartridge is loaded into its chamber by opening the breech block lock so that the breech block can be swung to its open position, inserting the cartridge, and then closing and locking the breech block. When the breech block 20 is swung open as stated, gas remaining in the pressure cylinder 3 from a previous firing escapes by ejecting the empty cartridge case from the chamber 17. The piston 14 will be resting against the stop provided by the cartridge barrel 19 due to the force exerted by the spring 15. The piston 9 may be pushed to the position shown in Fig. 2 by pressing against the plate 10 with a rod or the like inserted into the barrel 5, but generally this is done by the act of inserting the grenade 42 which is to be thrown to the position shown in Fig. 2. When the trigger is pressed and the cartridge fired the expanding gases from the resulting explosion blow the piston 9 outwardly to eject the grenade, and the piston 9 strikes the shock absorber or bumper 11, sealing the central bore 7 so that no sound or flash from the explosion of the cartridge

can pass through and out of the barrel 5. At the same time the recoil piston 14 moves to the left under the pressure of the expanding gases from the explosion, and compresses the spring 15 and the air trapped under the piston. The impact resulting when the piston 9 with its connected elements strikes the shock absorber or bumper 11 acts as a counter recoil.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is, therefore, to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are, therefore, intended to be embraced therein.

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

I claim:

1. A firearm particularly for the throwing of grenades or the like, comprising; an elongated cylinder; a bushing in one portion thereof and having a bore coaxial with said cylinder, dividing said cylinder into a pressure cylinder and a grenade barrel, a first piston reciprocable within said pressure cylinder and having a piston rod extending through the bore in said bushing and into the grenade barrel; a second piston reciprocable within said pressure cylinder and located in a portion thereof remote from said bushing and barrel; resilient means so located within said cylinder as to oppose the movement of said second piston away from said first piston; and means for holding and firing a cartridge between said two pistons so that the expanding gases resulting from the explosion thereof move the said two pistons away from each other.

2. A firearm particularly for the throwing of grenades or the like, comprising; an elongated cylinder; a bushing in one portion thereof and having a bore coaxial with said cylinder, dividing said cylinder into a pressure cylinder and a grenade barrel; a first piston reciprocable within said pressure cylinder and having a piston rod extending through the bore in said bushing and into the grenade barrel; a second piston reciprocable within said pressure cylinder and having its piston head facing the head of said first piston; handgrip means attached to said elongated cylinder and having a cartridge chamber therein; a cartridge barrel connected to said cartridge chamber and extending up into said pressure chamber between the heads of said first and second pistons; means within said pressure chamber resiliently opposing the movement of said second piston away from said cartridge barrel; and means for holding a cartridge in said chamber and firing it so that the expanding gases resulting from the explosion thereof pass into the pressure cylinder to drive said two pistons apart.

3. In a firearm, a pressure cylinder closed at one end, cartridge exploding means attached to the pressure cylinder adjacent the closed end, said means including a cartridge barrel penetrating the cylinder and being of such length and diameter as to insure complete powder burning before the resulting pressure gas enters said cylinder, a piston in said cylinder having a con-

necting rod and an attached projector plate, a missile barrel joined coaxially to the pressure cylinder in which barrel the projector plate is displaceable by an inserted missile until the piston is stopped by the cartridge barrel, and a bushing structure at the junction of the pressure cylinder and missile barrel, forming a closure for the other end of the cylinder excepting for a bore in which the connecting rod is movable and which is oversized to permit the discharge of entrapped air ahead of the piston.

EMIL GARRETT.

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