

Nov. 6, 1951

J. M. HOBBS

2,574,147

FIREARM

Filed June 28, 1949

3 Sheets-Sheet 1

Fig 1.

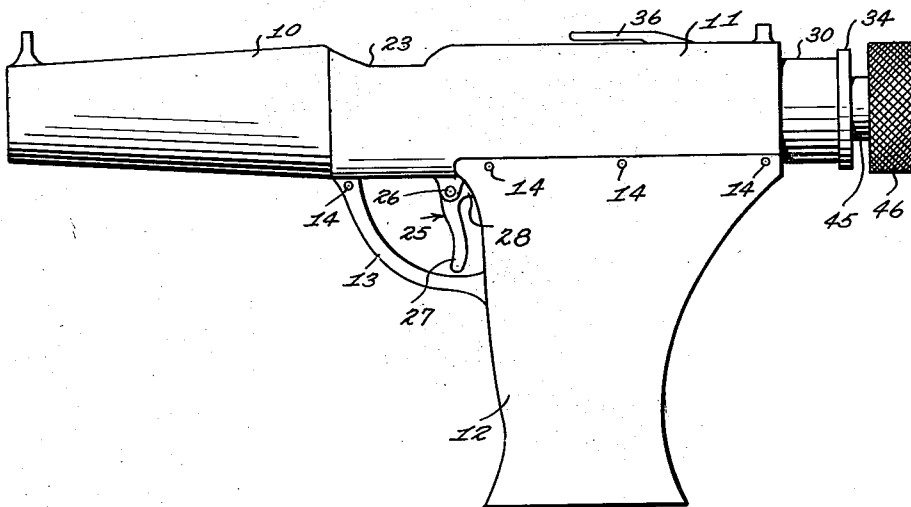
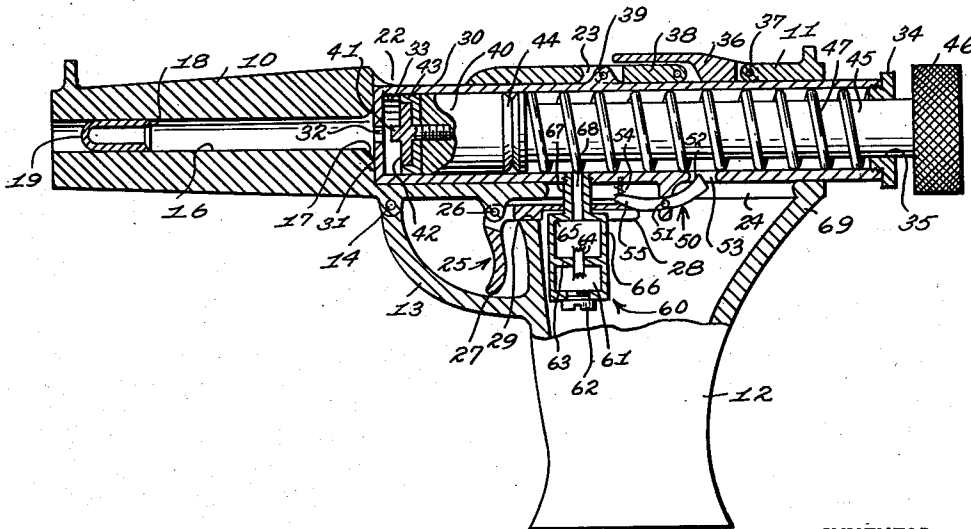


Fig. 2.



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FIG. 3.

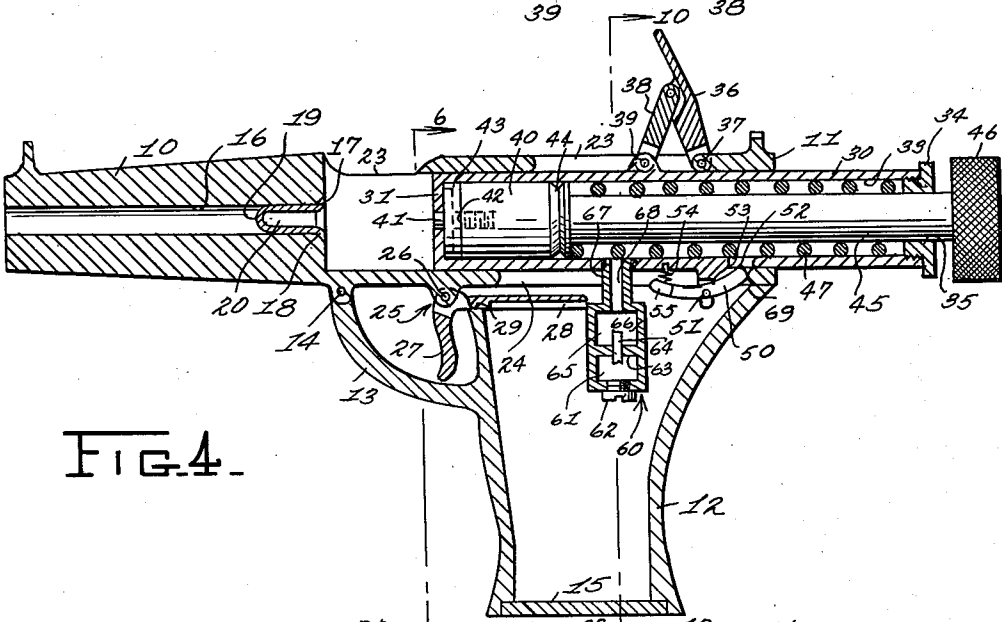
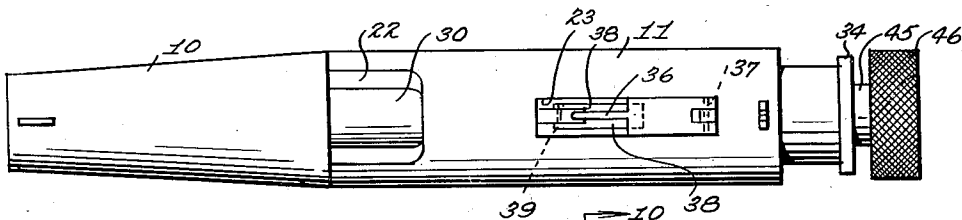


FIG. 4.

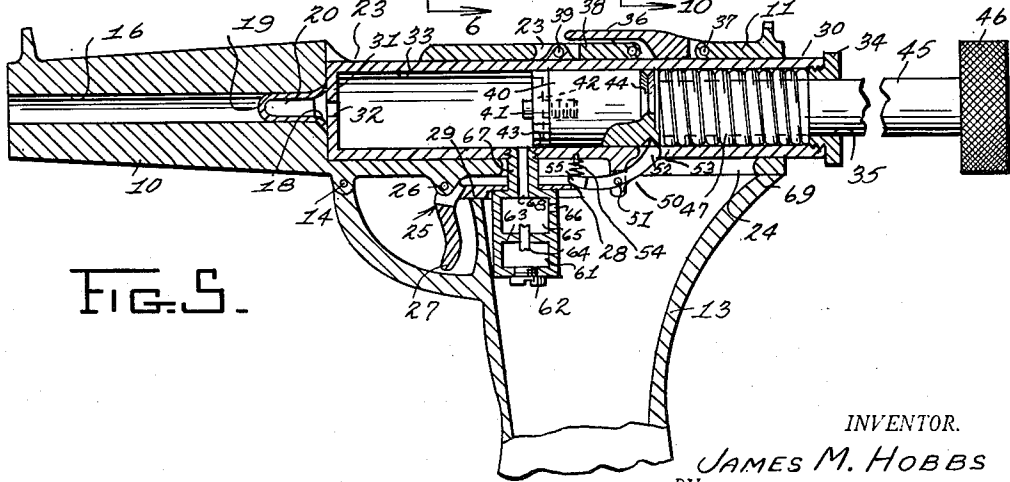


FIG. 5.

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FIG. 6.

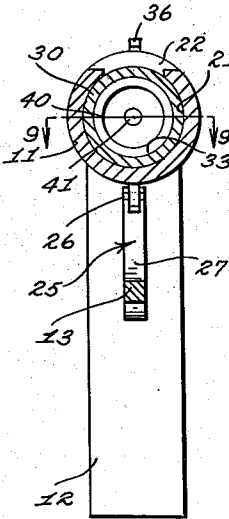


FIG. 7.

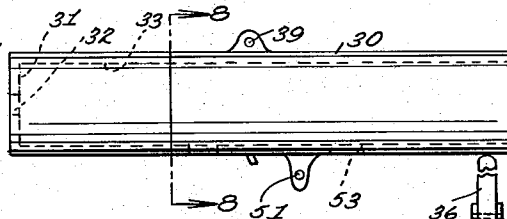


FIG. 8.

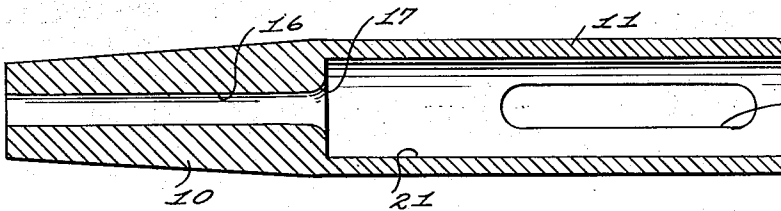
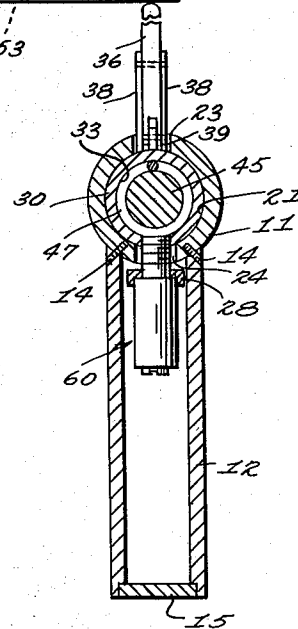
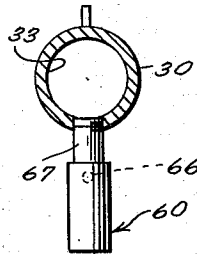


FIG. 10.

FIG. 9.

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FIREARM

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Application June 28, 1949, Serial No. 101,791

3 Claims. (Cl. 89-7)

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My invention relates to firearms of the type wherein a projectile or bullet is propelled from a gun barrel by the detonation of an explosive in a firing chamber without the use of a cartridge case for the explosive. Such guns are well known, but have the objectionable feature that they require a percussion cap, an electric battery and a spark plug or the like for igniting the explosive mixture in the firing chamber.

With the foregoing in view, it is an object of my invention to provide a firearm of the type described, but which gun includes means for igniting the explosive propellant charge by compressing a charge of air so as to raise the temperature thereof to at least the ignition point of the explosive.

A further object is to provide an improved firearm of the class described which includes novel charge-forming means for supplying an explosive charge to the firing chamber.

A further object is to provide in a firearm a novel firing chamber comprising a cylinder, a spring-loaded piston in said cylinder, means for supplying a charge of air to said cylinder when the piston is in a retracted position, and said piston being operative upon forward movement to compress said air to raise the temperature thereof to at least the ignition point of a propellant explosive.

A further object is to provide in a firearm such as that last described a novel combination of firearm and projectile wherein a breech is formed with a chamfer, the projectile is formed with a deformable flange seating in said chamfer to seal said breech and maintain the projectile against forward movement prior to the detonation of the explosive.

Other objects and advantages reside in the particular structure of the invention, the structure of the several parts thereof, and will be readily understood by those skilled in the art upon reference to the attached drawings in connection with the following specification, wherein the invention is shown, described and claimed.

In the drawings:

Figure 1 is an elevation of a gun according to the invention;

Figure 2 is a longitudinal vertical sectional view through the same, the parts being shown in the position occupied just after the firing of the gun;

Figure 3 is a plan view of the gun;

Figure 4 is a view like Figure 2, but showing the parts in the position assumed while the gun is being loaded;

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Figure 5 is a view like Figure 4, but showing the position of the parts when the gun is in the cocked position;

Figure 6 is a transverse vertical sectional view taken substantially on the plane of the line 6-6 of Figure 4;

Figure 7 is an elevational view of a bolt for the gun apart from the rest of the structure;

Figure 8 is a transverse vertical sectional view through the bolt showing a charge-forming device attached thereto and taken substantially on the plane of the line 8-8 of Figure 7;

Figure 9 is a horizontal sectional view through the barrel and receiver apart from the rest of the structure and taken substantially on the plane of the line 9-9 of Figure 6;

Figure 10 is a transverse vertical sectional view taken substantially on the plane of the line 10-10 of Figure 4.

Referring specifically to the drawings, wherein like reference characters have been used throughout the several views to designate like parts, 10 designates a barrel of a gun which has an integral receiver 11 secured thereto rearwardly thereof, and which is mounted on any suitable stock 12. In the embodiment illustrated, the gun comprises a pistol whereby the stock comprises a pistol grip 12 having a trigger guard 13 secured thereto. The stock 12 and trigger guard 13 are secured to the receiver by any suitable means, such as the screws 14. Moreover, the pistol grip 12 is hollow and closed at the bottom by a base plate 15, Figure 4, which may be secured in place for ready removal by any suitable means, not shown. Thus, access to the interior of the hollow grip 12 may be readily had for a purpose which will be apparent later.

The barrel 10 is formed with a bore 16 axially thereof which is preferably provided with the usual rifling, not shown. The rear end of the barrel 10 comprises a breech, and preferably, the bore 16 at that point is chamfered, as at 17, to provide a seat for complementary deformable flange 18 formed on a hollow bullet 19. The bullet 19 is preferably filled with any suitable powder or other propellant 20 to assist in the propulsion of the bullet, as will appear later. It will suffice to say at this time that when sufficient explosive force has been exerted on the bullet 19, the deformable flanges 18 thereof are compressed radially inwardly to permit passage of the bullet through the bore 16, as shown in Figure 2.

The receiver 11 is substantially cylindrical in form to provide a cylindrical bore 21 for a purpose to be apparent later. An upper portion of

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the receiver 11 is cut away, as at 22, adjacent the barrel 10 to provide an opening for the insertion of bullets 19 into the bore 16 of the barrel. Likewise, the top of the receiver rearwardly of the opening 22 is formed with a longitudinally-extending slot 23. Also, the under side of the receiver is formed with a somewhat larger slot 24 opening into the interior of the pistol grip 12. A trigger 25 is pivoted to the under side of the receiver 11 by any suitable means 26, and includes a finger piece 27 located inwardly of the trigger guard 13. The trigger 25 likewise includes a trigger lever 28 which is bifurcated and extends rearwardly into the interior of the pistol grip 12. The trigger lever 28 extends through a hole in the forward wall of the grip 12 and downward movement of the trigger lever is limited by a shoulder 29 defining the bottom edge of such hole.

A hollow cylindrical bolt 30 provides a firing chamber for the gun and is axially slidable in the bore 21 of the receiver 11. The bolt 30 includes a front wall 31 which is adapted to bear against the flat breech of the barrel 10 in one position of the bolt. Thus, as best seen in Figure 5, when the bolt 30 is in the firing position there illustrated, the front wall 31 of the bolt bears against the flange 18 of the bullet 19 to assist the chamber 17 in retaining the bullet against forward motion in the barrel bore 16. Also, it should be noted that the front wall 31 of the bolt is formed with an axial opening or port 32 opening onto the rear end of the bullet 19. The interior of the bolt 30 is formed with a cylindrical bore 33, the rear end of which is closed by any suitable plug 34 which is threaded therein, and which plug may be provided with an axial bore or journal 35 for a purpose to be apparent hereinafter. To move the bolt 30 from the firing position of Figure 5 to the loading position of Figure 4, there has been provided a toggle lever 36 which is pivoted to the receiver by any suitable means 37 at the rear of the receiver slot 23. A toggle link 38 pivoted to the toggle lever 36 connects the latter to the bolt 30 by any suitable pivotal means, such as the pin 39. As is clearly shown in Figures 4 and 5, when the toggle lever 36 is pivoted in a clockwise direction on its pivot 37, the bolt 31 is retracted to the loading position of Figure 4. On the other hand, if the toggle lever 36 is thereafter pivoted in a counterclockwise direction, the bolt will be projected forwardly to the firing position of Figure 5 and locked by the alignment of the dead centers of the toggle lever and linkage. Thus, the bolt may be readily locked in the firing position.

A piston 40 is axially slidable in the bore 33 of the bolt 30 toward and away from the front wall 31 of the bolt. The front end of the piston 40 detachably mounts a disc 42 which is formed with a forwardly-extending projection 41 which is sized to have a close sliding fit in the port 32 formed in the front wall 31 of the bolt. At times, the projection 41 is adapted to be seated in the port 32 whereby to substantially seal the same. However, just prior to such seating, the port 32 is filled with a compressed charge which, upon detonation, is concentrated in the port. Disc 42 clamps any suitable packing 43 against the front end of the piston, whereby to provide a right sliding fit of the piston 40 in the bore 33 of the bolt. The packing 43 is formed in a well known manner so that the fit is tighter on the forward stroke of the piston than on the rearward stroke. The rear end of the piston 40 is

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also preferably formed with a sear groove 44. A stem or piston rod 45 is fixed to the rear end of the piston 40 and extends rearwardly through the bore 35 formed in the plug 34 for the bolt.

The rear end of the rod or stem extends outwardly of the plug 34 and is provided with a finger grip or knob 46, the outer periphery of which is preferably roughened or knurled. A relatively powerful driving spring 47 surrounds the stem 45 between the plug 34 and the rear end of the piston 40, whereby to load the piston for forward movement toward the front wall 31 of the bolt through a firing stroke. Thus, when the piston is not cocked, the spring 47 causes the same to bear against the front wall 31 of the bolt with the projection 41 seated in the port 32 to seal the latter, Figure 4.

A sear 50 is pivoted to the under side of the bolt 30 inwardly of the grip 12. Any suitable means 51 pivots the sear to the bolt and the rear upwardly-directed lug 52 of the sear is adapted to be extended upwardly through a slot 53 formed in the under side of the bolt rearwardly of the pivot 51. The forward arm of the sear is engaged by an expansive spring 54 interposed between the forward arm and the under side of the bolt 30. Likewise, the forward end of the sear is provided with a pair of laterally-directed lugs 55 which engage the bifurcations of the bifurcated trigger lever 28. As is apparent from Figure 5, the spring 54 loads the sear into engagement with the sear notch 44 of the piston 40 when the latter is retracted sufficiently in the bore 33 of the bolt. Thus, the bolt 40 is locked in a retracted position, but may be released by pulling movement on the finger piece 27 of the trigger, whereby the trigger lever 28 is elevated into engagement with the projections 55 on the front end of the sear so that the latter is pivoted in a clockwise direction to depress the lug 52 out of engagement with the sear notch 44, whereby the spring 47 drives the piston 40 forwardly with substantially great force.

The forward part of the interior of the bolt 30 comprises a firing chamber and a charge is supplied thereto by means now to be described. Thus, a charge-forming device or carburetor 60 is threadedly secured to the under side of the bolt 30 intermediate the ends thereof and forwardly of the sear 50. The carburetor 60 preferably comprises a lower fuel chamber 61 access to which may be had by means of a filler plug 62 formed in the bottom thereof. Likewise, it should be noted that access to the filler plug 62 may be had upon removal of the base plate 15 for the grip 12. A horizontal partition 63 separates the fuel chamber 61 from a mixing chamber 65. However, gas from the fluid such as high test gasoline in chamber 61 passes to the mixing chamber 65 through a wick 64 extending through the partition 63. Air is admitted to the mixing chamber 65 through any suitable port 66 formed in the upper portion of the carburetor 60. Likewise, air may be admitted to the interior of the grip 12 in any suitable manner, as through a port 69 formed therein and so positioned as to be not normally covered by the hand of a person gripping the grip 12. The mixing chamber 65 has an upwardly-directed port 68 formed in a stem 67. The stem 67 is threadedly connected to the under side of the cylinder 30 so that the port 68 is in open communication at times with the bore 33 of the bolt. Thus, with the parts in the Figure 5 position, it is noted that the front end of the piston 40 is

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just rearwardly of the port 68 so that it will close the same almost immediately upon forward movement of the piston under the influence of the spring 47. Thereafter, it is obvious that a charge in the front end of the bolt 30 will be substantially compressed by continued forward movement of the piston. I contemplate using a gaseous fuel which has a relatively low ignition point, and in view of the presence of oxygen in the charge, the compression of the charge will be such as to cause the same to ignite upon continued forward movement of the piston 40. A portion of the force of the exploding charge is communicated to the bullet 20 through the port 32 whereby to propel the same forwardly out of the barrel 10 and at the same time ignite the propellant charge 20 of the bullet, whereby the same is accelerated in flight. The piston 40, together with the stem 45 thereof, is relatively heavy as compared to the bullet, whereby the reaction of the explosion will be operative mainly on the bullet to cause a projection of the same. Moreover, the weight of the piston and its forward motion at the time of the explosion overcomes any tendency of the explosion to move the piston 40 rearwardly. After a discharge, the operator elevates the toggle lever 36 so that the bolt 30 and the piston 40 are moved rearwardly to the Figure 4 position to permit the insertion of a fresh bullet in the breech of the barrel 10. Thereafter, the toggle lever 36 is lowered to permit the bolt 30 and the piston 40 to ride forwardly until the bolt seats firmly against the breech of the barrel. As aforesaid, the action of the toggle arrangement locks the bolt in the firing position. Thereafter, the finger piece 46 for the piston 40 is grasped and the piston is manually pulled rearwardly until the sear lug 52 engages in the sear groove 44 of the piston. While this is occurring, a partial vacuum is created in the firing chamber portion of the bolt 30 by the rearward action of the piston 40. However, before the interior of the firing chamber can reach atmospheric pressure, the front end of the piston 40 uncovers the port 68 of the carburetor, whereby a gas-air mixture rushes into the firing chamber portion of the bolt 30. The gun is now ready for firing once more, which may be accomplished in the usual manner by pulling the trigger 25.

While the foregoing embodiment utilizes a gas-air mixture, I have found that the heat of the compressed air is sufficient to detonate various other explosives and combustibles, for example, phosphorous compounds such as those forming the heads of safety matches, powdered coal, various gunpowders, and fuel oil. Obviously, when using non-gaseous explosives, means other than the carburetor are utilized to introduce the explosive to the cylinder. Hence, the mixture 20 in the bullet may be ignited without the use of the carburetor. Of course, in such instances, only a charge of air is admitted through the port formed by the removal of the stem 67 of the carburetor.

Thus, while I have shown and described an operative embodiment of the invention, it is to be understood that the same is susceptible of other forms and expressions. Consequently, I do not limit myself to the precise structure shown and described hereinabove except as hereinafter claimed.

I claim:

1. A firearm comprising a barrel having means on one end for seating a powder containing bullet, a receiver positioned in aligned end to end

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abutting relation with respect to said one end of said barrel and fixedly secured to the latter, a hollow cylindrical bolt having one end closed and the other end open positioned within said receiver so that its closed end faces said one end of said barrel and mounted in said receiver for reciprocatory movement of its closed end into and out of abutting engagement with said one end of said barrel, hand actuatable means positioned exteriorly of said receiver and said bolt for effecting the reciprocatory movement of said bolt, there being an aperture in said closed end of said bolt and in communication with the interior of said barrel, a plug closing the open end of said bolt, a carburetor positioned exteriorly of said receiver intermediate its end thereof and in communication with the interior of said hollow bolt for introducing an air-gas mixture into said hollow bolt, a piston positioned within said hollow bolt and mounted for sliding movement into and out of engagement with the closed end of said hollow bolt, a projection on said piston and seatable in the aperture in the closed end of said bolt when the piston has executed its sliding movement into engagement with the closed end of said bolt, a piston rod slidably supported in said plug and having one end secured to said piston and having the other end projecting beyond said plug, spring means operatively connected to said plug and said piston for urging the latter into engagement with the closed end of said hollow bolt, hand actuatable means on the projecting end of said piston rod for moving said piston out of engagement with the closed end of said hollow bolt, a sear positioned exteriorly of said bolt and mounted on said bolt for movement into and out of engagement with said piston, and trigger means operatively connected to said sear for moving the latter out of engagement with said piston.

2. A firearm comprising a barrel having means on one end for seating a powder containing bullet, a receiver positioned in aligned end to end abutting relation with respect to said one end of said barrel and fixedly secured to the latter, a hollow cylindrical bolt having one end closed and the other end open positioned within said receiver so that its closed end faces said one end of said barrel and mounted in said receiver for reciprocatory movement of its closed end into and out of abutting engagement with said one end of said barrel, toggle means positioned exteriorly of said receiver and said bolt for effecting the reciprocatory movement of said bolt, therebeing an aperture in said closed end of said bolt and in communication with the interior of said barrel, a plug closing the open end of said bolt, a carburetor positioned exteriorly of said receiver intermediate its ends thereof and in communication with the interior of said hollow bolt for introducing an air-gas mixture into said hollow bolt, a piston positioned within said hollow bolt and mounted for sliding movement into and out of engagement with the closed end of said hollow bolt, a piston rod slidably supported in said plug and having one end secured to said piston and having the other end projecting beyond said plug, spring means operatively connected to said plug and said piston for urging the latter into engagement with the closed end of said hollow bolt, hand actuatable means on the projecting end of said piston rod for moving said piston out of engagement with the closed end of said hollow bolt, a sear positioned exteriorly of said bolt and mounted on said bolt for movement

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into and out of engagement with said piston, and trigger means operatively connected to said sear for moving the latter out of engagement with said piston.

3. A firearm comprising a barrel having means on one end for seating a powder containing bullet, a receiver positioned in aligned end to end abutting relation with respect to said one end of said barrel and fixedly secured to the latter, a hollow cylindrical bolt having one end closed and the other end open positioned within said receiver so that its closed end faces said one end of said barrel and mounted in said receiver for reciprocatory movement of its closed end into and out of abutting engagement with said one end of said barrel, hand actuatable means positioned exteriorly of said receiver and said bolt for effecting the reciprocatory movement of said bolt, there being an aperture in said closed end of said bolt and in communication with the interior of said barrel, a plug closing the open end of said bolt, a carburetor positioned exteriorly of said receiver intermediate its ends thereof and in communication with the interior of said hollow bolt for introducing an air-gas mixture into said hollow bolt, a piston positioned within said hollow bolt and mounted for sliding movement into and out of engagement with the closed end of said hollow bolt, a piston rod slidably supported in said plug and having one end secured to said

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piston and having the other end projecting beyond said plug, a coiled spring circumposed about said piston rod and operatively connected to said plug and said piston for urging the latter into engagement with the closed end of said hollow bolt, hand actuatable means on the projecting end of said piston rod for moving said piston out of engagement with the closed end of said hollow bolt, a sear positioned exteriorly of said bolt and mounted intermediate its ends on said bolt for movement of one of its ends into and out of engagement with the rear end of said piston, and trigger means engageable with the other end of said sear for moving the latter out of engagement with said piston.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,291,674	Brannon	Jan. 14, 1919
1,320,233	Jamerson	Oct. 28, 1919
2,129,875	Rost	Sept. 13, 1938

FOREIGN PATENTS

Number	Country	Date
124,523	Great Britain	Apr. 3, 1919