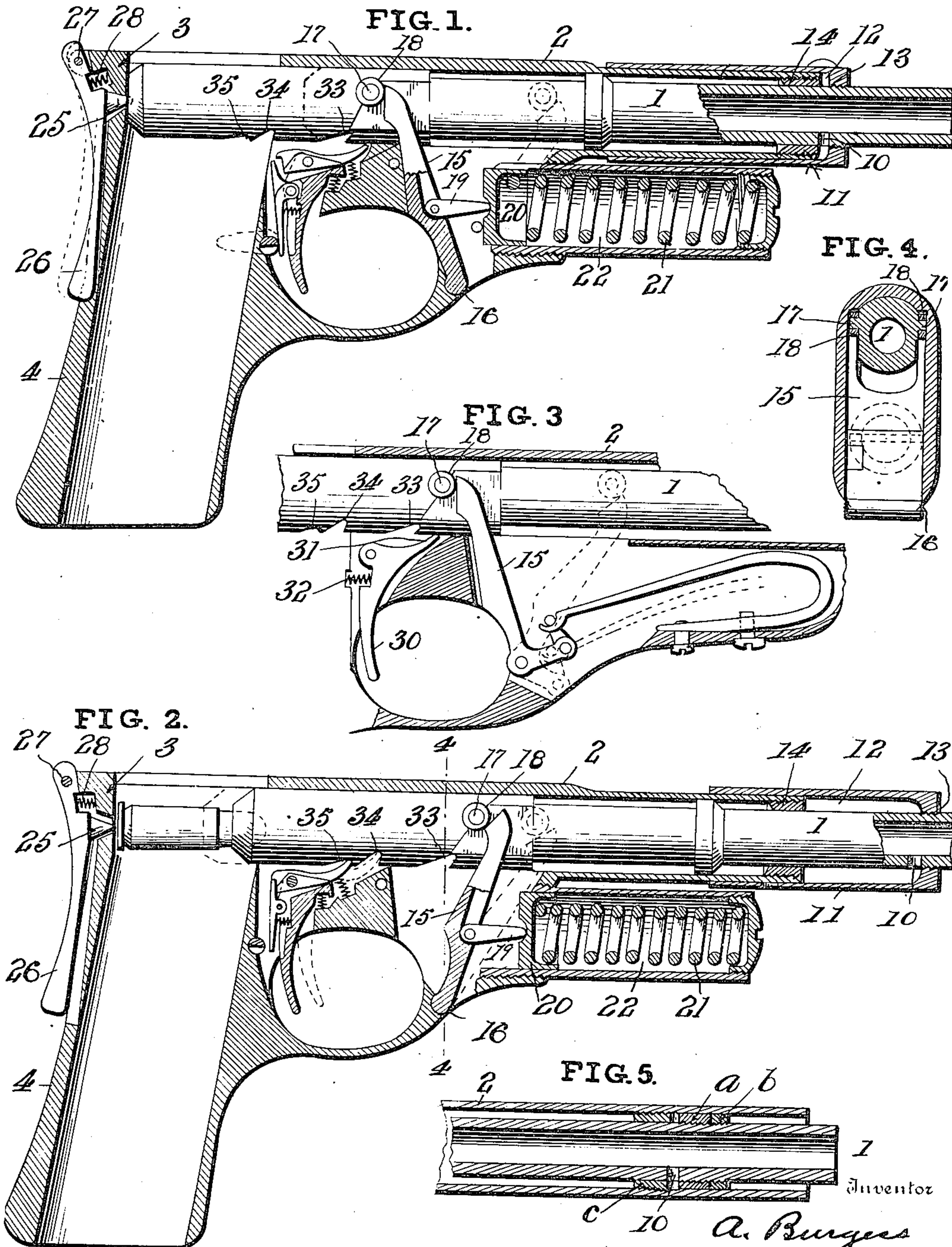


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PATENTED APR. 28, 1903.

A. BURGESS.
GAS OPERATED FIREARM.
APPLICATION FILED NOV. 3, 1902.

NO MODEL.



Witnesses.
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UNITED STATES PATENT OFFICE.

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GAS-OPERATED FIREARM.

SPECIFICATION forming part of Letters Patent No. 728,399, dated April 28, 1903.

Application filed November 3, 1902. Serial No. 129,912. (No model.)

To all whom it may concern:

Be it known that I, ANDREW BURGESS, a citizen of the United States, residing at Owego, in the county of Tioga and State of New York, have invented certain new and useful Improvements in Automatic Firearms, of which the following is a specification.

This invention relates to automatic firearms.

10 The object of the invention is to produce a firearm of the class stated in which the opening movement of the barrel is effected in greater or less degree by the escape of gas from the barrel when the charge is fired; also, to effect the closing of the barrel toward the breech by a combined spring-and-lever action, so that the power which closes the breech may act most efficiently during the last part of the closing movement; also, to place the firing mechanism under the control of the hand when grasping the firearm in firing position and leaving the gun without capacity for firing a cartridge save when the weapon is so held; also, to improve the mechanism by which the weapon may be kept loaded and in safety position.

Figure 1 is a central longitudinal section of a magazine-pistol according to the present invention with breech closed. The cartridge-feeding mechanism is not illustrated. Fig. 2 is a similar section of the same firearm with breech open. Fig. 3 is a broken section of a modification of the barrel-returning spring, showing enough of the mechanism to illustrate the points claimed. Fig. 4 is a cross-section on line 4 4, Fig. 2. Fig. 5 is a longitudinal section of modified construction of barrel.

I have found in practice that with some arms of this class, with some cartridges and under some conditions, the direct action of the cartridge does not give a sufficient forward movement to the barrel to operate advantageously. To secure a sufficient movement, I make a hole 10 in the barrel 1 at some distance forward from the breech and I surround the barrel with a sleeve 11 at a little distance from the barrel, thus producing an annular chamber 12 around the barrel, said chamber being closed by a shoulder 13 at its front end and by an abutment 14 at the rear end. The abutment 14 may be a

part of the frame 2 or be screwed therein, as shown in Figs. 1 and 2.

When the weapon is fired, after the projectile has passed the hole in the barrel the gas in the barrel escapes through the hole 10 into the chamber 12 and acts as does steam on a piston to drive the barrel forward, the gas entering the chamber 12 and there pressing on the abutment 14 and on the ring 13.

In the modification Fig. 5 the barrel 1 has a sleeve or ring *a* screwed thereon and held by a lock-nut *b*. The gas passing through the hole 10 in the barrel presses the ring *a* forward, the ring *c* screwed in the frame serving as a resistance-piece. When the projectile leaves the gun, the gas in the chamber around the barrel is driven back into the barrel by the means which closes the barrel and escapes from the muzzle, or if the barrel be pressed forward far enough the gas can escape around the sleeve. The size of the hole 10 and the distance of said hole from the muzzle are factors in determining the pressure which can be exerted to move the barrel forward.

In the modification Fig. 5 the ring *a* can be screwed to position to partly close hole 10, thus making the device adjustable to admit of the use of more or less pressure.

When the barrel has been thrown forward in firing, it is desirable that it close backward toward the breech-plate or recoil-abutment 3 with a slow initial movement, so that the magazine-feed may operate effectively. To effect this closing movement, I employ a lever 15, having its fulcrum in the frame below the barrel, as at 16, and bearing so as to press back an ear or ears 17 on the sides of the barrel. The ears 17 are preferably provided with antifriction-sleeves 18. The lever 15 is preferably forked at its upper end, so as to bear against ears on both sides of the barrel.

I do not in the present application make any improvement in the mechanism for raising cartridges in the magazine. Such mechanism being old and well-known in this art it is considered unnecessary and possibly confusing to illustrate the same. The mechanism of my Patent No. 687,448, of November 26, 1901, is well adapted for use in the present invention.

To the lever 15 a push-piece 19 is pivoted,

and the piston 20 bears against the outer end of said push-piece. Said piston-head is pressed back by the coiled spring 21, which is stored in a chamber 22 in the lower part of the frame, so as to press back the piston 20. The piston 20 is merely a convenient inert element to convey the pressure of the spring 21 to the lever 15. The lever 15 is so arranged that it stands at a right angle to the axis of the coiled spring 21 when the barrel is closed or nearly closed. When the barrel is in its open or forward position, the spring acts less directly and at a disadvantage and does not start the barrel back with excessive speed. Of course the proportions of parts might be greatly varied from the illustration.

Fig. 3 shows how a flat spring may be applied to a lever to press the barrel back, such arrangement being a well-known arrangement for operating the hammer of a gun. The particular advantage of the lever connection is that the spring exerts its power to best advantage when the barrel is nearly closed. The lever 15 has a rounded bearing at 16 resting in a corresponding notch in the frame. By taking hold of the projecting ends of the bearing 16 the lever 15 may be taken out of the opening in the bottom of the frame, leaving the barrel free to reciprocate in the frame without resistance from the spring 21.

The barrel is thrown forward by the explosion to open the breech and pressed back by the spring to close the breech, the cartridge being fed in by usual means when the breech is open. The firing is effected by carrying the cartridge forcibly back against a firing-point, the barrel itself serving as a hammer.

The firing pin or point 25 is carried by a lever 26, which is pivoted at 27 to the frame, and the body of the lever lies near the stock 4, being pressed back therefrom by a spring 28.

When the hand of the operator grasps the stock 4 in position for firing the gun, the lever is pressed against the stock and the point 25 is held forward, so that it projects through an opening in the recoil-shield. Then the sudden backward movement of the barrel and the cartridge brings the cap against point 25 and fires the cartridge; but if the lever 26 be free the point 25 does not project or offer sufficient resistance to fire the cartridge. Thus there is small danger of firing the gun accidentally. To still further provide a safety device, the trigger 30 has its nose 31 extending forward of its pivot, (see Fig. 3,) and this extension of the trigger is pressed by the spring 32 with a tendency to enter into the notches 33 34 35 in the barrel. The notch 35 may be called the "full-cock" notch. When the gun is to be fired the first time, the barrel is drawn forward by hand until the nose of the trigger enters said notch, as shown in Fig. 2. Then if the handle be firmly grasped and the trigger pulled the nose of the trigger will be drawn out of this notch, the barrel and contained cartridge will be forced back by

spring 21, and the cartridge will be fired, carrying the barrel forward, and if the trigger be loosened in time the barrel will be stopped thereby in open position; but if the trigger be held the firing will continue until the magazine is empty.

When it is desired to leave the gun in position to fire with a considerable pull, as in a self-cocking pistol, the barrel is moved by hand until the nose of the trigger enters the notch 34, as shown in dotted lines, Fig. 2. This notch is undercut or has a backward incline at its front edge, so that when the nose of the trigger enters said notch a strong pull on the trigger will press the barrel a little forward by reason of the cam engagement between the front of the notch 34 and the nose of the trigger. When the trigger has been pulled from the notch, the barrel will fly back and fire the cartridge, as before.

The notch 33 is of the usual half-cock form and further from the rear end of the barrel and is still more undercut, so that the trigger cannot be pulled out of the notch except by first moving the barrel forward. When the nose of the trigger is in the notch 33, the weapon is supposed to be in position of safety.

The trigger mechanism illustrated in Figs. 1 and 2 is not herein claimed, being shown and described in my Patent No. 639,106, of February 11, 1902.

It will be observed that when the barrel is held at full cock, as in Fig. 2, the breech is not fully open, and therefore the cartridge remains partly inclosed by the barrel, so that it may not fall out or become displaced.

What I claim is—

1. In automatic firearms, a forwardly-moving barrel, a gas-receiving chamber, an opening from the barrel to said chamber, and means by which the gas-pressure in the chamber acts to press the barrel forward.
2. In automatic guns, the barrel, a sleeve surrounding the same, an opening from the barrel into said sleeve, a fixed abutment in the sleeve, and a movable abutment or piston connected to the barrel, all combined.
3. In automatic guns, the perforated barrel, surrounding sleeve having an abutment, and a ring on the barrel within the sleeve acting as a piston to press the barrel forward.
4. In an automatic gun, the perforated barrel, operating gas-chamber, and a screw-ring on the barrel to regulate the opening therefrom to said gas-chamber.
5. In an automatic gun, the forwardly-moving barrel, a lever engaging therewith and with the frame so as to be in most effective operating position when the barrel is nearly in its rearmost position, and a spring bearing on said lever.
6. In an automatic gun, the forwardly-moving barrel, a lever fulcrumed on the frame, and having a bearing against the barrel, and a spring bearing on said lever, combined as described.

7. In an automatic gun, the frame having a bottom opening, the barrel sliding in said frame, a lever fulcrumed in the frame and bearing against the barrel, and a spring bearing said lever backward, all combined, so the
5 said lever may be grasped and removed through the frame-opening.

8. In an automatic gun, the barrel and means for forcing the same backward to serve
10 as a hammer, the stock, and a lever on the stock in position to be grasped by the hand, and a firing-point carried by said lever.

9. In an automatic gun, the barrel, and means for forcing the same backward to serve
15 as a hammer, a perforated recoil-abutment, and a firing-pin housed therein, and means

to project and confine said firing-pin forward by the grasp of the hand in firing the gun.

10. A reciprocating barrel arranged to serve as a hammer, a full-cock notch by which the
20 sear automatically holds the barrel cocked, a safety-notch into which the sear may be engaged, said safety-notch being undercut relatively to the sear, and whereby the barrel
25 must be moved forward by a hard trigger pull before its backward movement to fire the gun.

In testimony whereof I affix my signature in presence of two witnesses.

ANDREW BURGESS.

Witnesses:

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