

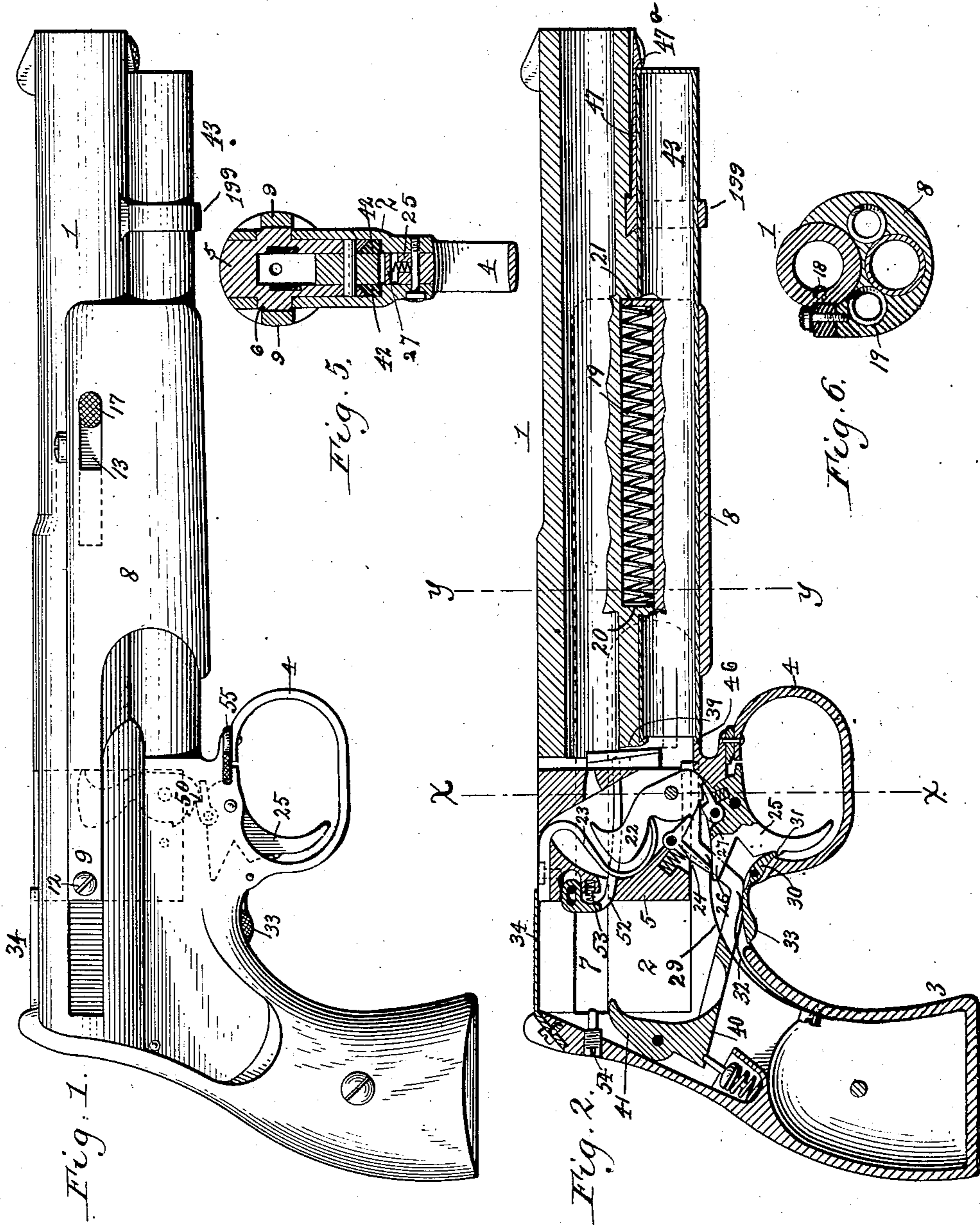
(No Model.)

2 Sheets—Sheet 1.

A. BURGESS.  
GAS OPERATED FIREARM.

No. 589,119.

Patented Aug. 31, 1897.



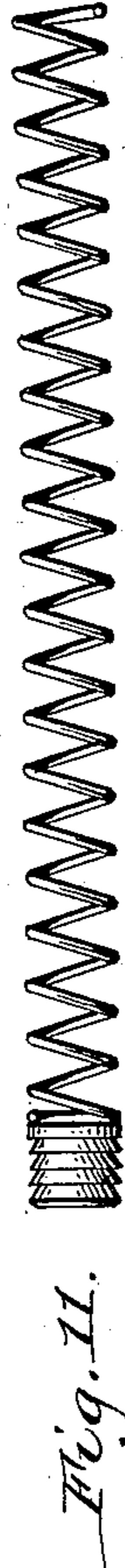
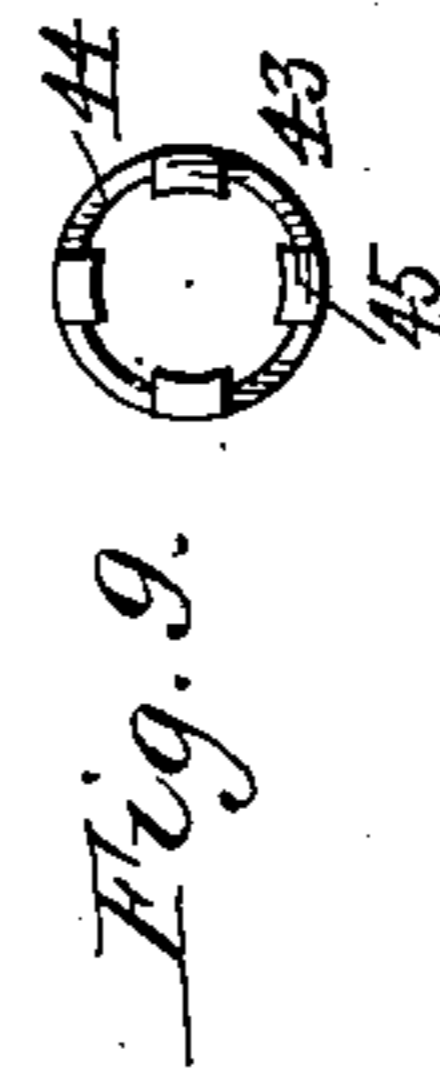
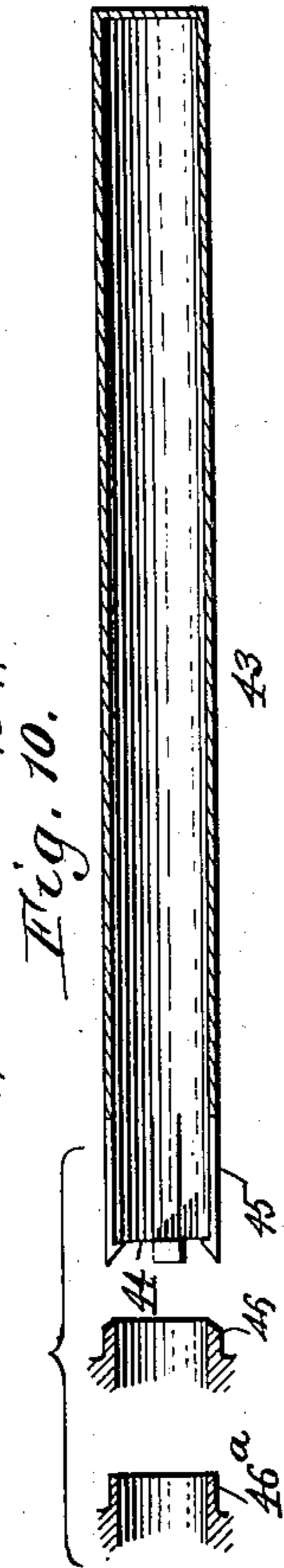
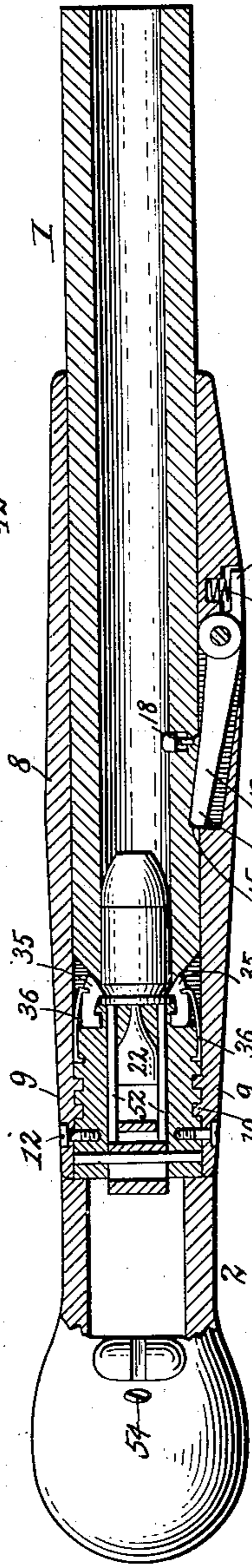
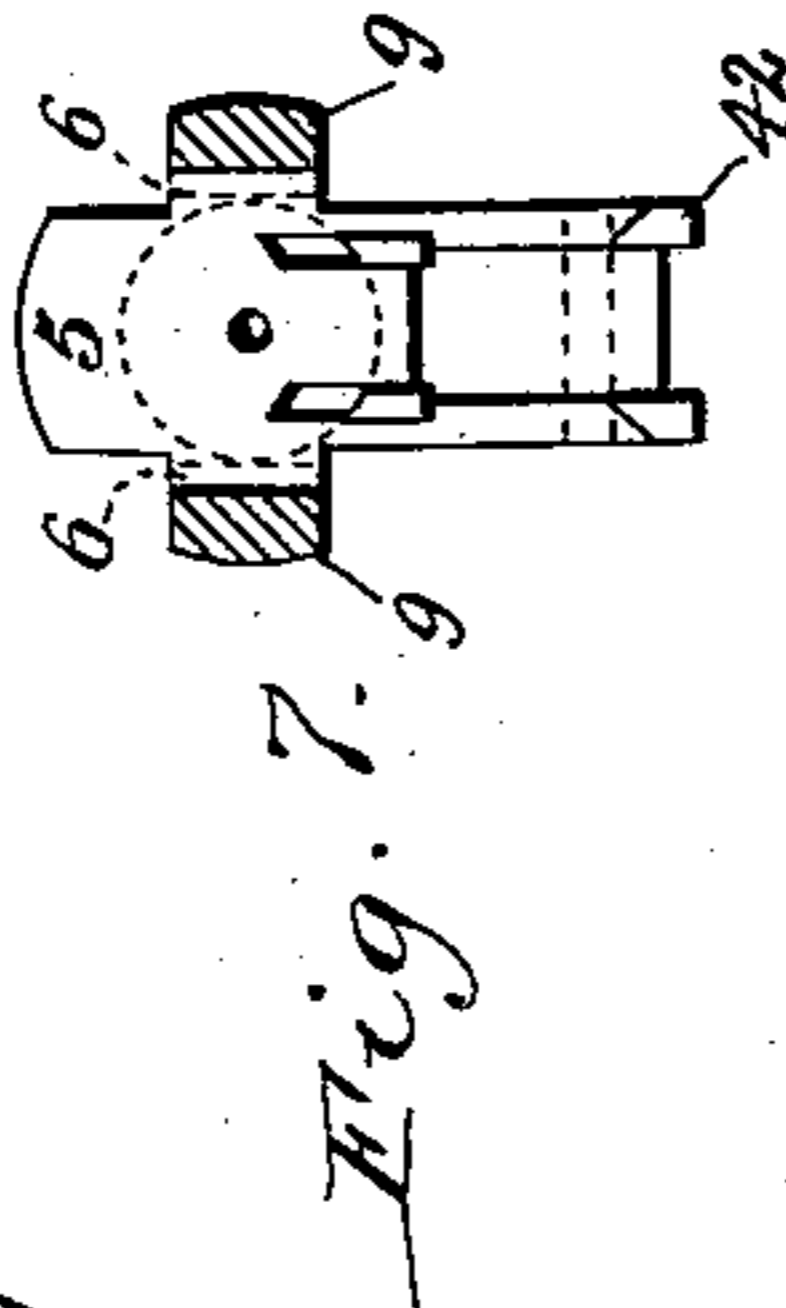
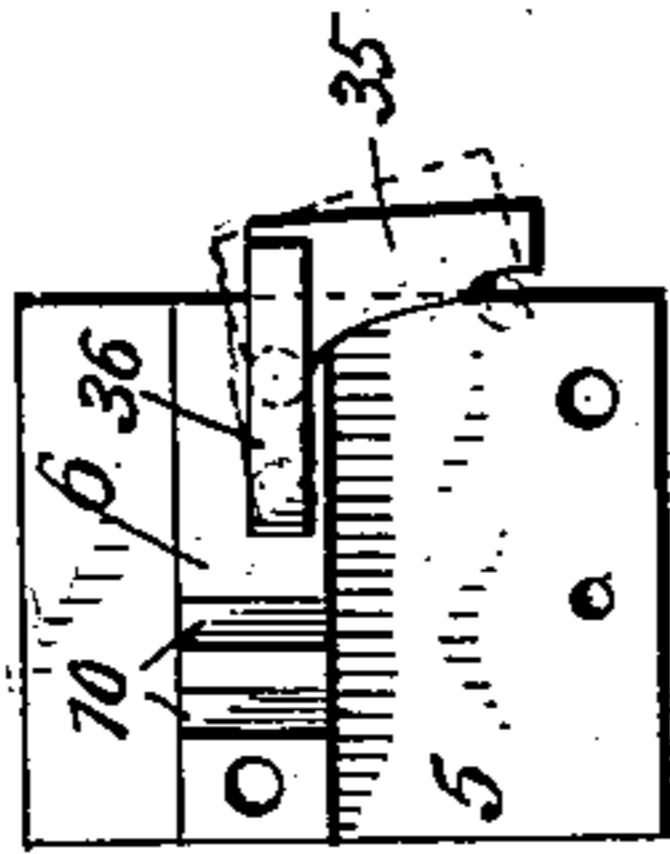
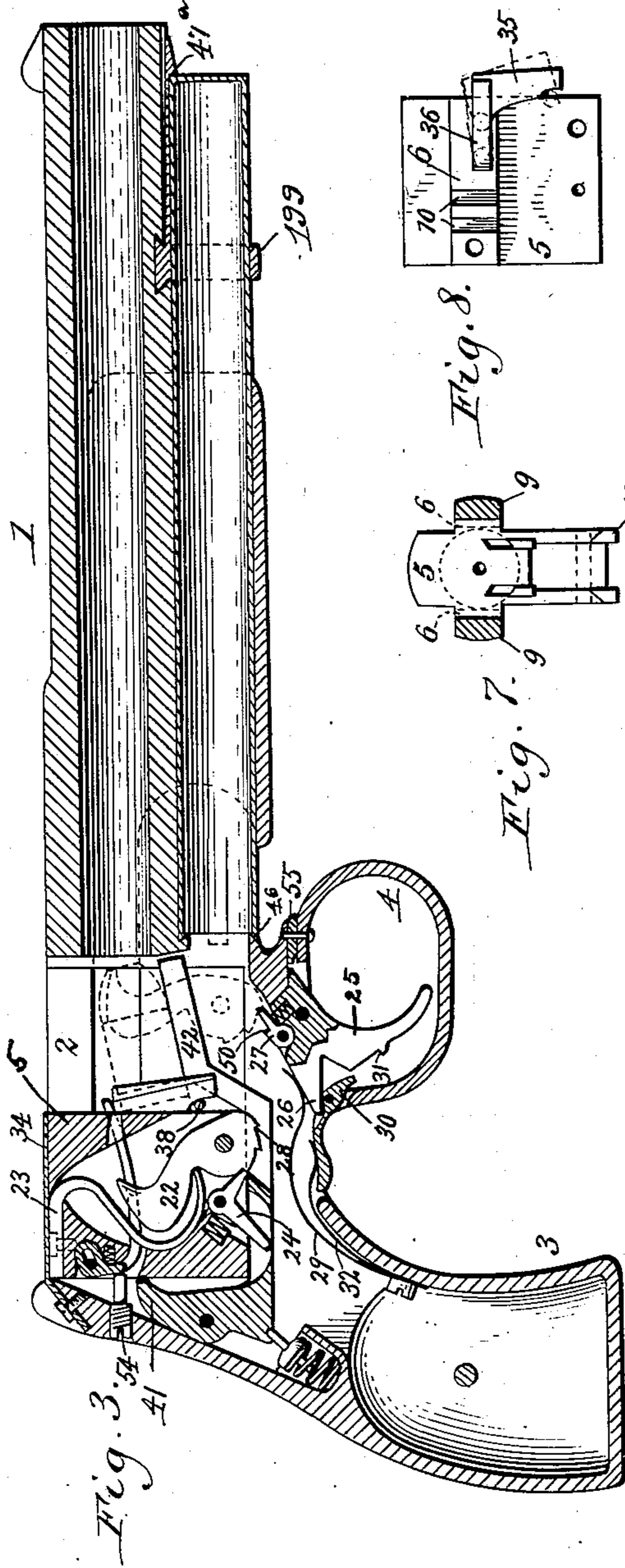
Witnesses:  
 Theo. L. Popp.  
 Frank. W. Smith

Andrew Burgess  
 Inventor.

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# UNITED STATES PATENT OFFICE.

ANDREW BURGESS, OF BUFFALO, NEW YORK.

## GAS-OPERATED FIREARM.

SPECIFICATION forming part of Letters Patent No. 589,119, dated August 31, 1897.

Application filed November 25, 1892. Serial No. 452,991. (No model.)

*To all whom it may concern:*

Be it known that I, ANDREW BURGESS, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Magazine-Firearms; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to magazine and automatic firearms, and has for its object simplicity, safety, and rapid firing, and is adaptable to pistols, rifles, shotguns, machine-guns, and cannon; and it consists in mechanisms and combinations of parts for automatically unlocking and moving back the breech-piece by the discharge and various other arrangements and combination of parts hereinafter more fully set forth and described.

Figure 1 is a longitudinal elevation of this arm, showing some details in dotted lines. Fig. 2 is a longitudinal vertical section of this arm with breech closed. Fig. 3 is a similar view with the breech open. Fig. 4 is a longitudinal horizontal section showing the breech closed and locked. Fig. 5 is a cross-section on line *xx* of Fig. 2. Fig. 6 is a cross-section on line *yy*. Fig. 7 shows face of breech-piece with handle-straps in cross-section. Fig. 8 is a side view of breech-piece; Fig. 9, a rear end view of magazine; Fig. 10, a sectional side view of magazine with annular projection of frame. Fig. 11 shows part of the magazine-spring and follower.

Similar figures of reference in accompanying drawings indicate corresponding parts.

A barrel 1, frame 2, butt-strap 3, and guard 4 are arranged together in the usual manner.

The breech-piece 5 has lateral longitudinal projections 6 6 (which may be either integral therewith or attached) to enter the grooves 7 in the frame and confine the breech-piece and guide it to a reciprocating movement in the frame.

A sliding handle 8 clasps the barrel and is guided thereon in the usual manner. This handle has side straps 9 9 extending rearward. These straps may be elastic to spread outward

a little to pass back outside of the breech-piece. The outer sides of said breech-piece has vertical grooves or projections 10 10, and the inner rear of the straps have corresponding projections or grooves to connect the said straps and breech-piece together, where they may be further held by screws 12 12, as shown in Fig. 4. I thus form a strong connection of the handle with the breech-piece, with the object of locking the breech by means of the handle. This connection may be made by other obvious means. A locking-dog 13 is fulcrumed in the handle 8. Its end 14 may be projected by spring 16 into the notch 15 in the barrel. Said dog has also a thumb-piece 17, by which it may be turned to release it from its engagement with the barrel. This manner of locking and releasing the handle is well known, but I also here show another device for unlocking the handle by means of the discharge of the gun.

A pin 18 has a head projecting inside the bore of the gun. Said pin is riveted or headed slightly outside the barrel in a manner to allow it a little movement in and out. The locking of the dog 13 will force it in, as shown in Fig. 4, but in firing the pin will be forced outward by the passing projectile or gases of discharge to violently throw the dog 13 out from its locking position, thereby allowing the pressure of gases still in the barrel to throw back the breech-pin and handle by direct pressure on the cartridge-shell and breech-piece.

It is obvious that the release-pin 18 may be arranged at any distance from the breech and that a heavy charge, when used, may operate much stronger and more remote from the breech than a light one, and in some conditions an unusually strong cartridge-shell may be required.

The pin 18 may be removed or omitted, when the gas will act directly on the dog 13 to blow it back, and the breech will be opened by the discharge, as before. This arm is also provided with one or a pair of spiral springs 19 19, (shown alongside of the barrel and magazine, Fig. 6,) and in Fig. 2 the barrel and magazine are broken away to show one of said springs and its abutment 21 of the handle to thereby bear forward on the handle by a constant pressure, so that when the breech



and handle shall be forced back, as before described, the abutment 21 carries the front end of said spring back, and its rear being supported by the abutment 20 in the body of the gun said spring becomes compressed and will throw the breech and handle to locking position, and the dog 13 will spring into its locking-notch 15 to hold the breech closed.

The vibrating hammer 22 is hung in the breech-piece and is provided with a main-spring 23 and a spring-sear 24, and a trigger 25 has a point 26 to engage said sear and release it from the hammer in the usual manner. A cocking-dog 27 is also hung in the trigger and has a spring to throw it into position to engage a supplementary notch 28 of the hammer when the breech is closed. A pull on the trigger will then cock the hammer, as shown in Fig. 2. The hammer is also cocked by said dog 27 by the automatic opening of the breech, when the trigger is thrown forward by its spring 29, as shown in Fig. 3, when the breech is closed and the hammer down. Said hammer obtains the position shown in dotted lines in that figure and engages the notch 27 of hammer to resist below the hammer-pivot, and thereby turn the top of hammer back to cock it when the breech-piece is forced back by the handle. Then the sear retains the hammer in its cocked position and holds it thus until the breech closes, when the parts attain the relative positions shown in Fig. 2, and the arm may then be fired in the usual manner. The hammer and cocking-dog at the instant of the discharge take the position shown in dotted lines in Fig. 1. Then to continue firing automatically the trigger is held back by a stop or a continued pull, the gas or release pin throws out the locking-piece, and the breech is then free to be moved back by the impulse of the pressure yet remaining in the barrel.

A spur 50 is shown on the cocking-dog, whose position is shown in Fig. 1. At the instant of firing and as the breech begins to travel backward said spur engages the notch 28 of the hammer to turn and cock it, and when the breech-piece reaches the position shown in Fig. 3 it has struck the short arm 41 of the carrier to vibrate it and raise its long bifurcated arm and on that the cartridge. The springs 19 then snap the breech-piece forward and force the cartridge into the barrel, when (if the catch 30 has been disengaged) the sear 24 reaches engagement with the trigger, to be turned thereby and release the hammer, when the return of the breech will take place as before and the operation be repeated so long as there are cartridges to feed and the trigger shall be held back.

I show a safety-catch 30 in Figs. 1 and 3. It is pressed into engagement with a notch 31 in the rear of the trigger by its spring 32 to hold the trigger a little forward of its rear-most position, so it may not then "pull off" the sear 24 or release its dog 27 from its hold in notch 28 of the hammer, but when the arm

is grasped by the hand in position for firing that clasping of the finger against the rear end 33 of the catch 30 turns said catch out of engagement with the rear of the trigger and so frees it, and a light pull on the trigger then suffices to fire the arm.

It will be seen in Figs. 1 and 4 that the frame has an opening at the top for the top of the breech-piece to travel in, and I attach a cover 34 to the rear of the opening that the breech-piece can pass under, as in Fig. 3, but when the breech is closed, as in Fig. 1, said cover closes the opening not then occupied by the breech-piece.

The twin extractors 35 35 are hung in the breech-piece, Figs. 4 and 8, by horizontal trunnions entering loosely into holes in the sides of the breech-piece. Springs 36 36 press the hooked ends of the extractors inward to grasp the cartridges, and a cut-out in the face of the breech-piece allows the extractor to swing slightly in a vertical plane to position, as shown in dotted lines, Fig. 8. This swinging is effected at the rearmost position by a stud 38 in the inside of the frame to stop the bottom of the extractor and causes the top of the extractor-hook to cramp and tighten on the inside of the flange of the rising cartridge, as shown in Fig. 3, and firmly hold it against any possibility of flying out of the top of the frame. As soon as the breech-piece starts forward it moves the extractor out of contact with the stud 38 and the extractor is then free to turn, so it will not bind the cartridge when the closing breech moves it into the chamber, and the abutment 39 of the barrel will turn the lower point of the extractor back, as in Fig. 2, when the breech is closed.

The carrier 40 is hung in the frame to the rear of the breech-piece and has a short arm 41, which the rear wall of the breech-piece engages at the last of its backward movement to turn the carrier and thereby raise its long split arm 42, which carries up the cartridge. The removable magazine-tube 43, Figs. 9 and 10, is split into a series of staves or blanks 44 and spring-hooks 45 at its rear end.

The hooks project inward and slightly behind the blanks to hold the cartridges or follower in the tube when it is not attached to the gun. To attach it, the tube is pressed rearward through the ring 99, which ring is here shown connected to the barrel and having a hook and snap-spring integral therewith. When so inserted, the hook of the snap-spring 47 then engages the extreme front end of the tube to hold it in, as shown in Fig. 2. When the tube is forced home, the inner beveled surfaces of the hooks 45 of the magazine-tube strike the outer surface of the annular projection 46 of the frame to spread the hooks so far that they no longer hold the cartridges, and the blanks 44, abutting against the mouth of the opening in the frame, serve to guide the cartridges into it.

The inner part of the opening is slightly smaller than the magazine-tube, so the fol-



lower may not pass, and when the tube is removed its springs hold the follower by engaging in its corrugated sides.

The snap-spring 47 has the hook 47<sup>a</sup> to hold the magazine in and is dovetailed to the barrel by its rear end, which is continued in a ring below to receive and hold the magazine. I show the rear end of magazine divided into eight parts—four hooks and four blanks—but it is obvious that any different spacing, even to using one hook, might be made to serve the purpose of holding the cartridges in the tube and the blank part of the tube to guide them into the frame.

The ejector 52 has a slot through which it is hung in the breech-piece by a pin. The ejector has also a spring 53 below its pivot to press it back and its forward end downward. The forward end of the ejector is split vertically, so its arms may swing at the side of the hammer.

A set-screw 54 through the rear of the frame is arranged to stop the rear of the ejector as the breech reaches its rearmost position, to first bear the ejector forward relatively to the breech-piece, so its points shall project from the face of the breech-piece and reach below the flange of the cartridge-shell, as shown in dotted lines in Fig. 2, and then raise its forward end, as shown in Fig. 3, to throw the shell out at the top of the frame.

It is obvious that the hanging of the cocking-spur 50 on the trigger is only a matter of construction and that any way of fixing it in the body of the gun to resist the hammer below its pivot will cock it.

A stop 55 forward of trigger is shown in Fig. 1 in position to prevent the trigger from turning forward in the shock of resisting the hammer to cock it. In this condition the opening of the breech and cocking are effected by the discharge, and only a short pull on the trigger is required to continue firing.

I claim—

1. In an automatic gun, the barrel and breech-piece constructed to permit a longitudinal opening and closing movement, a locking-dog by which said barrel and breech-piece are locked together when the breech is closed, an opening in the barrel, and a gas-check pin in this opening, said pin operating directly on the locking-dog to unlock the parts by means of pressure in the barrel acting on said pin, whereby the parts may be unlocked and the breech opened by direct pressure from within the bore, all combined substantially as described.

2. In an automatic gun, a frame supporting the breech and barrel, and means for opening said breech by the longitudinal movement of one of the parts relatively to the other, a breech-locking dog engaging an abutment at the side of the barrel and extending into proximity to a hole in the barrel, whereby pressure in the bore of the gun, acting through the hole in the barrel will directly unlock the lock-

ing-dog, whereby when unlocked the breech will be opened by residual pressure in the bore acting backward on the cartridge-shell, and a spring acting to close the breech-opening, substantially as described.

3. In an automatic gun, the barrel and breech-piece constructed to permit a longitudinal opening and closing movement, a locking-dog by which said barrel and breech-piece are locked in closed position, and means extending to the bore of the barrel whereby the breech may be unlocked by pressure within the bore, and whereby the breech and barrel may be separated by direct residual pressure within the bore, all combined substantially as described.

4. In a gun, the barrel, frame and breech-piece and reciprocating handle rigidly connected to and reciprocating in the same direction with said breech-piece, means for locking the handle to the barrel, and an opening in the barrel in proximity to said lock, whereby the handle is released by pressure through said opening when the gun is fired, all combined substantially as described.

5. In a gun, the frame and longitudinally-reciprocating breech-piece, the extractors having fulcrum-bearings on the breech-piece, and abutments by which the extractors are rocked and cramped to clamp the flange of the cartridge at about the rearmost position of the breech-piece, all combined substantially as described.

6. In a breech-loading gun, the frame and barrel, the longitudinally-moving breech-closing piece, the spring-pressed extractor-hook hung in said breech-piece on horizontal trunnions entering loosely into a hole in the breech-piece, and the abutment in the frame acting as a stop to cramp the extractor-hook on the cartridge, all combined substantially as described.

7. A reciprocating breech-piece, an ejector hung with reciprocating movement therein and a spring to press the ejector back and downward, in combination with a resisting-piece in the line of movement of the ejector to protrude said ejector's point forward of the breech-face, and then raise it, substantially as described.

8. The combination of barrel and frame, a breech-block free to reciprocate in the frame, means for normally locking the gun in closed position, and means reaching to the bore of the gun for unlocking the locking device, whereby on firing the gun the pressure of gas in the bore of the gun first unlocks the breech-block, and then directly opens the breech, substantially as described.

9. A breech-loading firearm provided with an opening in its frame to receive the cartridges, a projecting ring around said opening, a guideway to receive and hold the magazine beneath the barrel and a spring-snap to confine it against said ring, in combination with a detachable tubular magazine closed at



its front end, and provided with alternate spring stops and guides at its open rear end, substantially as and for the purpose specified.

10. A breech-loading firearm provided with 5 an opening in its frame to receive the cartridges, a projecting ring around said opening, a guideway to receive and hold the magazine beneath the barrel, and a spring-snap to confine the magazine against said projecting 10 ring, all in combination and with a detachable tubular magazine arranged to feed and guide the cartridges, substantially as described.

11. A detachable tubular magazine closed 15 at its front end, provided with alternate spring stops and guides, to form a continuation of its rear end, in combination with a breech-loading firearm provided with means to receive and hold said magazine beneath 20 the barrel and thereby retire the spring-stops from holding engagement with the cartridges, substantially as described.

12. A detachable tubular magazine closed 25 at its front end, slits in its open rear end to form alternate blanks and hooks, connected with the body of the magazine, the hooks being formed to spring inward and hold the cartridges in the magazine against the pressure of its spring, all in combination substan- 30 tially as described.

13. A detachable tubular magazine closed at its front end, slits in its open rear end to

form alternate blanks and hooks, integral with the body of the magazine the hooks being formed to spring inward and hold the cartridges in the magazine against the pressure 35 of its spring, and a follower having annular grooves or corrugations, substantially as described.

14. A gun having a barrel and breech-clos- 40 ing piece constructed to relatively open and close, locking means for retaining these parts in closed position, means reaching to the bore of the gun by which the parts are unlocked by pressure within the bore on the firing of 45 the gun, and the breech and barrel separated by residual pressure within the bore, all combined substantially as described.

15. In an automatic gun, the barrel and breech-piece, constructed to have a longitu- 50 dinal movement of one part relatively to the other, in opening and closing, a locking-piece to retain the breech in closed position, and an elastic gas, developed in the bore of the gun by firing and acting on the locking-dog to un- 55 lock the same, and on the barrel and breech to separate the same by direct pressure, all combined substantially as described.

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

ANDREW BURGESS.

Witnesses:

JNO. McMANUS,  
E. L. MORTIMER.