

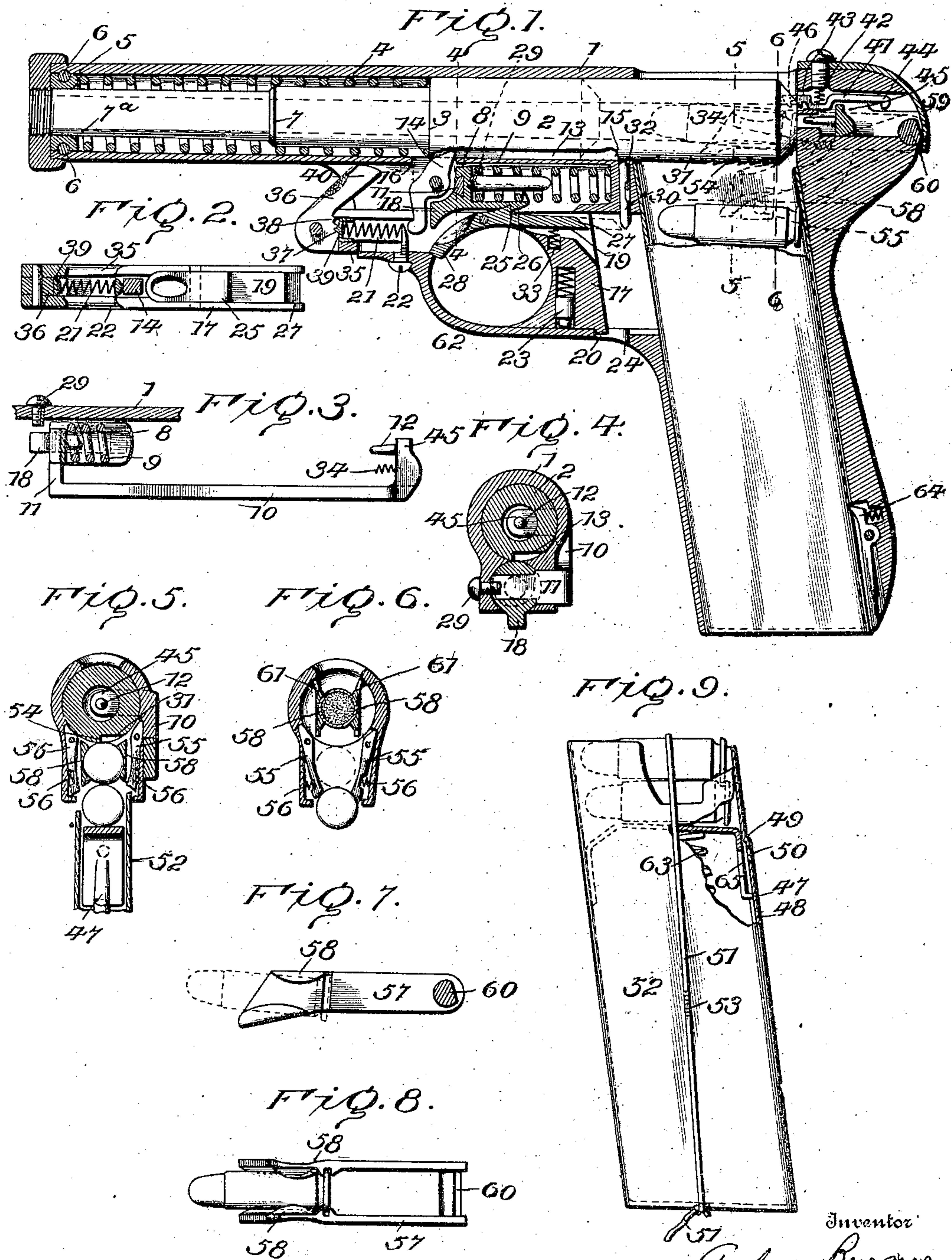
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A. BURGESS.
AUTOMATIC GUN.

(Application filed Oct. 23, 1900.)

(No Model.)



Witnesses

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AUTOMATIC GUN.

SPECIFICATION forming part of Letters Patent No. 693,105, dated February 11, 1902.

Application filed October 23, 1900. Serial No. 34,059. (No model.)

To all whom it may concern:

Be it known that I, ANDREW BURGESS, residing at Owego, in the county of Tioga and State of New York, have invented certain new and useful Improvements in Automatic Guns, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to magazine-fire-arms of the automatic class.

The object of this invention is to produce a magazine gun or pistol which shall be loaded and the shell ejected by the barrel movement and being under control of the operator by special trigger mechanism; also, to control the barrel movement in reference to the cartridge feeding; also, to hold and feed the cartridges from a magazine, and also to produce a firing-lock adapted to this class of guns, together with other improvements and combinations of parts of automatic gun mechanism.

Figure 1 is a vertical longitudinal section of a pistol embodying my present invention. Fig. 2 shows the trigger-piece and its contained parts from its top partly in section. Fig. 3 is a detail plan from the top of the striker and with piston-head partly in section with a cut-away section of frame. Fig. 4 is a broken cross-section on line 4 4 of barrel and frame looking backward and showing the rear of the piston-head and the striker. Fig. 5 is a broken cross-section on line 5 5 looking backward. Fig. 6 is another broken cross-section on line 6 6 looking forward and with the barrel in advanced position. Fig. 7 is an inner arm of carrier in elevation. Fig. 8 is a top plan view of carrier. Fig. 9 is a view of the magazine, partly in section and partly in elevation.

The frame 1 is of any suitable construction to support the working parts and is a hollow cylinder at the top to confine the barrel to a longitudinal reciprocating movement. The barrel 2 has a shoulder 3, against which a coiled spring 4 bears to press the barrel back. The front end of spring 4 rests against a ring 5, which is held in place in the frame, as by pins 6 6. The barrel 2 slides in the ring 5 as it reciprocates, and a beveled shoulder 7 around the barrel is stopped when said barrel reaches the limit of its forward path of

movement by its striking the undercut or inclined shoulder 7^a of the ring 5. The inclined or wedging blow of the beveled shoulder 7 on the concaved, inclined, or undercut bearing 7^a prevents a violent rebound and tends to a slight delay of the barrel before its return by the spring 4. This gives more time for the feeding-cartridge to be raised from the magazine. The barrel is driven forward by force of the discharge in firing the gun, as is common, there being no stop to hold the barrel back, save spring 4. A plunger-piston or piston-head 8 is housed in a bore in the frame beneath the barrel and is pressed forward by the coiled mainspring 9, whose rear end rests against a shoulder in the frame and front end against the piston-head. The piston is stopped in its forward movement by pin 29. A striker 10 is entered from the rear of the frame, and its forward end 11, being turned to a right angle, enters a cut in the piston-head to form a dovetail connection therewith, and the rear end of said striker, carrying the firing-pin 12, is turned up and inward to obtain for said firing-pin alinement with the bore of the barrel. A light spring 34, bearing against the frame, tends to press the striker rearward. A cocking-lever 14 is pivoted in the frame, with its upper arm entering a groove 13 in the bottom of the barrel. At the rear termination of said groove is the shoulder 15, which will turn the top of lever 14 forward (to dotted line 16) when the barrel moves well forward, and the lower arm of the lever, turning backward and engaging the downward projection 18 of the piston-head, will drive said piston-head backward, and thereby compress the mainspring 9. To cock this lock or hold it cocked and to release it, special sear and trigger parts are provided.

The trigger-piece 17, carrying sear 19, is entered to position from the magazine-well and is confined to a reciprocating movement by the guard 62 and bottom part of the frame, as shown in section in Fig. 1. Stop 20 limits the forward movement of the trigger-piece. Spring 21, bearing back against pin 22 in the frame, presses the trigger-piece forward, but allows it to be pulled back until its rear shall abut against the magazine, when its spring-stop 23 will spring into slot 24 in the guard to confine the trigger-piece to near its back-

ward position, which thus becomes the full-cocked position of the firing mechanism. The sear 19 has the usual spring 33 and a point 25 to engage in notch 26 of the piston-head.

5 Said sear has also an incline 27 at its rear. It can be turned out of engagement by its finger-piece 28. A vertical foil-pin 30 is set loosely in the frame, so it may be freely moved upward when the barrel is forward, and when

10 the barrel returns backward the groove 31 still allows pin 30 to move upward; but when the shoulder 32 of the barrel reaches said pin it confines it to a fixed position downward, as shown in Fig. 1, when it becomes an abut-

15 ment against which the sear may be tripped. The trigger-piece 17 when pressed to its forward limit by spring 21, as in Fig. 1, has carried its sear-point so far forward that the rebound of the piston-head 8 (which is caused

20 by pin 29, which stops the mainspring, and the spring 34, which pressed back the striker) will carry the notch 26 of the piston into position to be engaged by the sear, which then holds the lock in the half-cocked or "safety"

25 position, as shown in Fig. 1. To fire the gun from this position, the trigger (trigger-piece) is pulled back until it carries the rear incline 27 of the sear against foil-pin 30, as shown in dotted lines, and also the piston-head and

30 striker, when a further backward movement causes said foil-pin to press or cam down the sear until its hook disengages from notch 26 of the piston-head, and thus releases it to spring forward by force of mainspring and

35 propel the striker to drive firing-pin 12. When the firing occurs, the barrel being forced forward thereby, its notch 15, reaching top of cocking-lever 14, turns it to throw back the piston-head by its lower arm. The trigger-

40 piece, with the sear, will in meantime be held back, as described, by its stop-pin 23, so that when the piston-head notch 26 obtains position over the sear-point 25 it will be engaged thereby, and only a short back pull on the

45 trigger will then suffice to pull off the sear by carrying it into engagement with the foil-pin 30, as before. Thus it will be seen that the sliding trigger-piece is in the forward position. (Shown in Fig. 1.) It must be drawn back some

50 little distance to bring the end 27 of the sear against the end of foil-piece 30 to release the sear; but when this has been done the spring-stop 23 will hold the sliding trigger in this rearward position, so that a very slight further retraction of the trigger releases the sear and causes the firing. In substance this

55 amounts very nearly to pulling the trigger for the first shot and then holding the trigger for continuous automatic shooting, although, in fact, the trigger may be released to prevent the continuous automatic shooting, as will be explained. As the time interval is exceedingly small, being a minute fraction of a second, (since automatic guns perform the en-

60 tire loading and firing under some circumstances in less than one-tenth of a second—that is, ten shots per second or six hundred

per minute,) it is impossible for the operator to make any very extended muscular movement between shots, yet it is desirable that

70 the first shot shall require so much of a muscular movement as will insure reasonable immunity from accidents. It will be observed that the slot 24 is carried rearward to permit the short movement, as above, without retir-

75 ing the stop-pin 23; but when it is desired to allow the trigger-piece to move farther forward the pin 23 can be pressed up from slot 24 from the outside of the guard.

The trigger-piece has a forward cylindrical

80 portion 35, which serves as a guide to said piece and to carry the dog 36. Said dog is stopped in its up movement to its operative position by the point of cap 39, which is pressed into its notch by trigger-return spring

85 21 and in its down inoperative position by notch 38, into either of which positions it may easily be turned by hand. When said dog 36 is turned up, as in Fig. 1, and the trigger-piece is pulled to its back position, the point

90 40 reaches to nearly or quite in contact with the front of cocking-lever 14. If the gun is then fired, the barrel will move forward and turn the lever 14, as before described, until its forward part shall reach to dotted line 16,

95 which will cause it to engage point 40 of dog 36 and throw forward said dog, and thereby the trigger, so it will be pressed quickly out of firing position, and the firer by this break in the back pressure of the trigger-pull will

100 be enabled to let up sufficiently to allow the firing of single shots. By turning the dog downward against or into the slot of the extension-piece 35, so that it will be thus retained by its notch 38, said dog is made en-

105 tirely inoperative, and a continued pull on the trigger will pull off the sear as often as the foil-pin is wedged down by shoulder 32 of the barrel. It is obvious that the forward impulse of dog 36 may be given by any part

110 of the mechanism moved by the barrel or by a shoulder thereon in an equivalent manner.

The ejecting-extractor 41 has hook 43 to engage the flange of the cartridge-shell. Its rear end 44 is supported in a horizontal groove

115 in the frame, and a spring 42 presses the hook part into engagement with the cartridge-shell or flange. A projection 45 on the rear of the striker engages a downward shoulder of extractor to press it forward to engaging position, (indicated in dotted lines, Fig. 1,) and

120 when said striker moves back to near its rear-most limit its said projection strikes its rear shoulder against downward-projecting end 44 of the extractor to then move it backward.

125 A segment of the top of the recoil-shield in the frame is cut away at 46 to form an abutment below the engaging-line of the extractor-hook, so that the quick back impulse of the extractor, as described, trips the cartridge,

130 the abutment just mentioned then serving as a fulcrum against which the cartridge-shell bears, and the backward movement of the extractor-hook then acts as the power to eject

the shell to throw it upward and out of the frame.

The box-magazine 52 that I adapt to this arm has the usual spring 63 and is held in the gun in the usual manner, as by catch 64. The follower 65 is a platform and has an arm extending about parallel with the side of the box and then turned outward. This makes a slightly elastic piece, which extends into an offset or recess in the side of the box. When this follower is lifted by its spring, its arm encounters shoulder 49 and is stopped thereby. A hole 50 is made in the wall of the magazine to allow the stop to be pressed back at will to remove the follower from the magazine. To retain the cartridges in the detached magazine, which has no detents, a thread or thin narrow ribbon 51 is tied around them, as shown in Fig. 9, and will be so thin as not to obstruct the entrance of the magazine into the gun in the usual manner. This ligament may be partly cut or weakened at some point, as 53, so that on a strong pull at its projecting ends will break it there, or said ends can be tied in a bow or slip knot, that it may be instantly loosened and pulled out from the gun after having been entered therein; but this will not generally be necessary in this form of gun, as the barrel moves over and in contact with the top cartridge, and I form corrugated or serrated edge 54 on the bottom of the barrel, so that its first forward movement will rasp or cut the thread to release the cartridges, and the thread will not materially obstruct them thereafter.

The detents 55 55 are pivoted in the frame below the barrel to be closed in by their springs 56 56 to engage and hold down the second cartridge from the top. The detents 55 are levers pivoted near their upper ends and having their lower ends normally pressed in by their springs, these lower ends being below the top cartridge when said cartridge is in the carrier. The carrier operates in most respects like several well-known cartridge-carriers to clasp the sides of the top cartridge and lift the same into line with the barrel when the barrel moves forward, but to be pressed down by the barrel on its return or backward movement. The barrel receives the end of the bullet in its bore and then by its wedging action in entering between the cartridge and the beveled front ends of the carrier-arms spreads the arms of the carrier apart and forces them down at the same time. The spreading of the carrier-arms also spreads the detents 55, and the cartridge theretofore held by their lower ends rises between the detents and also between the jaws of the carrier, as shown in Fig. 5, the barrel having meanwhile swallowed the cartridge before held by the carrier and interposed itself to prevent the rise of the cartridge now in the carrier from between the arms, although the arms cannot clasp tightly on such cartridge. When the barrel moves forward, the spring-

arms of the carrier close in on the cartridge between them, and the detents 55 also close to obstruct the cartridge below their lower ends, and as soon as the barrel permits the carrier rises and brings its cartridge in line with the barrel, and so on repeatedly.

The carrier 57 is entered from the rear of the gun and has forward-extending spring-arms provided with inwardly-grasping hands or jaws 58 58. The carrier-arms are held together at the rear by pivot 60, which is so cut away as to allow spring 59 to engage its edge below its center to rotate it, and thereby bear upward the arms of the carrier. The forward beveled ends of the carrier when in raised position, being in line of movement of the barrel from its forward position, as shown in Fig. 6, will be engaged, partly opened, and turned down by its returning beveled rear end, which incloses the cartridge. The same barrel movement serves to retire the detents 55 55 by entering the carrier-arms between and pressing them apart, so that the cartridge they had just held down can be raised by the magazine-spring to between the jaws of the carrier, as in Fig. 5. When the barrel then moves forward, it will allow the carrier and the cartridge grasped between its jaws to rise by force of the spring 59 to the loading position, (shown in Fig. 6,) and the detents 55 55 meantime spring in to hold down the next cartridge. The inner grasping-surface of hands or jaws 58 58 are provided with longitudinal projections to grasp the body and vertical ones to grasp the flange of a cartridge to the more firmly hold and guide it. While the grip of both the vertical and longitudinal teeth of the spring-jaws, as described, may by mere force of the springing together of the arms be sufficient to raise and hold the cartridges, extensions 61 61 of said jaws are shown in Fig. 6 to rise against the inward-curved top of the frame in a well-known manner to the more firmly bind the jaws to the cartridge.

The longitudinally-movable piston, connected to the striker and firing-pin and moving in a line parallel with the barrel, permits a most compact arrangement of the firing mechanism and also the introduction of a very strong mainspring. The lever, acting directly on the piston as the barrel moves forward, insures the retiring of the striker and the ejection of the shell at the proper instant of time. The forward blow of the barrel, communicated to the trigger, insures the ability of the operator to release the trigger quickly enough to avoid two successive shots—a difficult thing to do by mere muscular exertion. The cord or other detaining mechanism by which the follower is held depressed renders it easy to enter the magazine into its receptacle without a special cartridge-detent on the magazine proper. The carrier, gripping the flange as well as extending over the body of the cartridge, holds the top cartridge with

such firmness that it is not likely to be displaced by the quick and violent actions of a gun of this class.

It is of course understood that my invention is not limited to precise constructions and terms save as the same are pointed out in the claims.

What I claim is—

1. In an automatic gun, a reciprocating barrel having an inclined shoulder, a spring tending to press said barrel back to firing position, and a removable ring in the frame and surrounding the barrel and provided with a beveled rear surface against which the inclined shoulder of the barrel engages to cause a wedging contact and slight detention of the barrel, all combined substantially as described.

2. In a gun of the character described, a reciprocating barrel, a piston-head having longitudinal movement substantially parallel with the barrel, the striker and firing-pin connected to said piston, a spring acting to press the piston forward, and a lever hung in the frame, operatively engaged by the barrel in its forward movement, and engaging the piston to move the same and the striker rearward, and means for holding the striker back, all combined substantially as described.

3. In a gun of the character described, a reciprocating barrel, a piston-head having longitudinal movement substantially parallel with the barrel, the striker and firing-pin connected to said piston, a spring pressing the piston forward, a lever hung in the frame, engaged by the barrel in its forward movement and engaging the piston to press the same back, means for holding the striker back, and means for releasing the same for firing the gun, all combined substantially as described.

4. In an automatic gun, a reciprocating barrel, the piston pressed by a spring and moving in a line substantially parallel with the barrel and means for pressing it back by the barrel movement, a sliding trigger-piece in proximity to the said piston, a sear carried by the trigger-piece and engaging the piston to hold the same retracted, and a stop acting on the trigger to thereby hold the lock and its connected parts in cocked position, all combined substantially as described.

5. In a gun as described, a reciprocating barrel, piston, and firing-pin, connected and coacting substantially as described, a sliding trigger-piece and a spring to press the same forward, a sear carried by the trigger-piece and engaging the piston as described, and a movable foil which serves when in proper position as an operating-abutment against which the sear may bear when the foil is held, all combined substantially as described.

6. In a gun as described, the reciprocating barrel, piston-head, and firing-pin, coacting as described, a sliding trigger-piece and a spring to press it forward, a sear pivoted to the trigger and extending toward the foil, and a foil movable in the frame, but fixed by the bar-

rel when in firing position, whereby the foil acts to trip the sear only when the barrel is closed and trigger pulled, all combined substantially as described.

7. In an automatic gun, the reciprocating barrel, the piston and connected firing-pin pressed forward by a spring and moving in a line substantially parallel with the reciprocating barrel, a lever acted on by the barrel and engaging the piston to move the same back, a sliding trigger in proximity to the piston and carrying a sear by which connection is made to the piston, and a stop acting to limit the forward movement of the mainspring, and a spring to rebound the parts to half-cock position, all combined.

8. In a gun as described, the combination of a reciprocating barrel, a piston pressed forward by the mainspring and means for moving the piston back by the barrel movement, a longitudinally-sliding trigger and a sear pivoted thereto in position to interlock with said piston, a foil operatively engaged by the barrel as described to serve as an abutment for the sear, and stops acting on the trigger to stop it in its half-cock or full-cock position, all substantially as described.

9. In a gun as described a reciprocating barrel, and firing-pin, piston and trigger, each supported in the frame to have longitudinal movement therein, a dog connected to the trigger and extending into proximity with the barrel, and means operated on by the barrel, by which the forward movement of the barrel actuates the dog to throw the trigger forward, all substantially as described.

10. In a gun as described, a reciprocating barrel, piston, and firing-pin, a trigger sliding in the frame, and a dog connected to the trigger and in one position actuated by the barrel to throw the trigger forward, and means for holding the dog out of operative position.

11. In a breech-loading gun, the recoil-shield cut away to leave an abutment near the edge of the cartridge-shell, the reciprocating barrel, the reciprocating striker, and a longitudinally-movable cartridge-extractor actuated by said striker, whereby the rearward movement of the extractor rocks the cartridge-shell on said abutment as a fulcrum, and thereby ejects the shell, substantially as described.

12. The combination of a gun having a magazine-receptacle, a box-magazine adapted to such receptacle, a follower in the magazine and a detaining-cord or equivalent by which the follower is held in depressed position, and means on the gun for severing the cord by the breech-opening movement, substantially as described.

13. The combination with the magazine having a retaining-cord to hold the follower depressed, of the longitudinally-movable barrel having a cutting-surface which engages and severs said cord as the barrel moves.

14. In a breech-loading gun as described, a box-magazine and a follower therein, a detent which engages the second cartridge below the

top, and a carrier acting to lift the top cartridge while succeeding cartridges are held down by the said detent, all combined substantially as described.

5 15. In a gun as described, a reciprocating barrel, a box-magazine and a follower therein, a detent engaging the second cartridge below the top, a carrier which lifts the top cartridge as described and has incline engagement with
10 the barrel at the backward movement of the barrel, said carrier engaging the detent to release the cartridge therefrom as the carrier falls, in combination substantially as described.

15 16. In a gun as described, the carrier piv-

oted in the frame and having elastic side arms provided with projections to extend over the body of the cartridge, notches to inclose the head or flange of the cartridge, and inclines at the front, combined with the reciprocating
20 barrel inclined at its rear, to engage, depress, and open the carrier-arms as the barrel moves back, substantially as described.

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

ANDREW BURGESS.

Witnesses:

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