

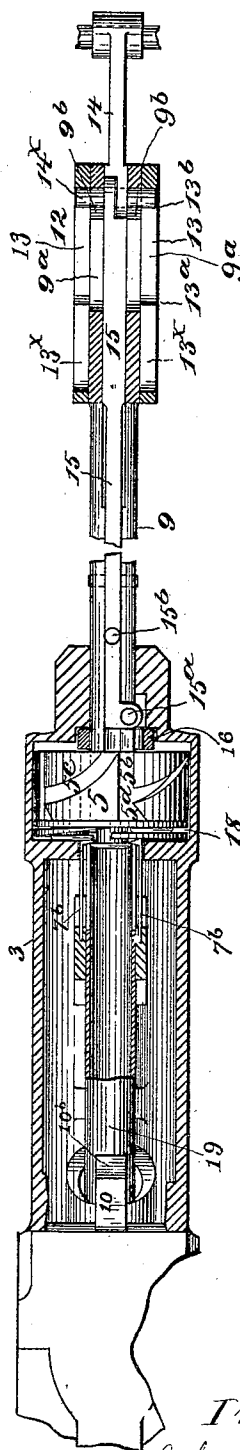
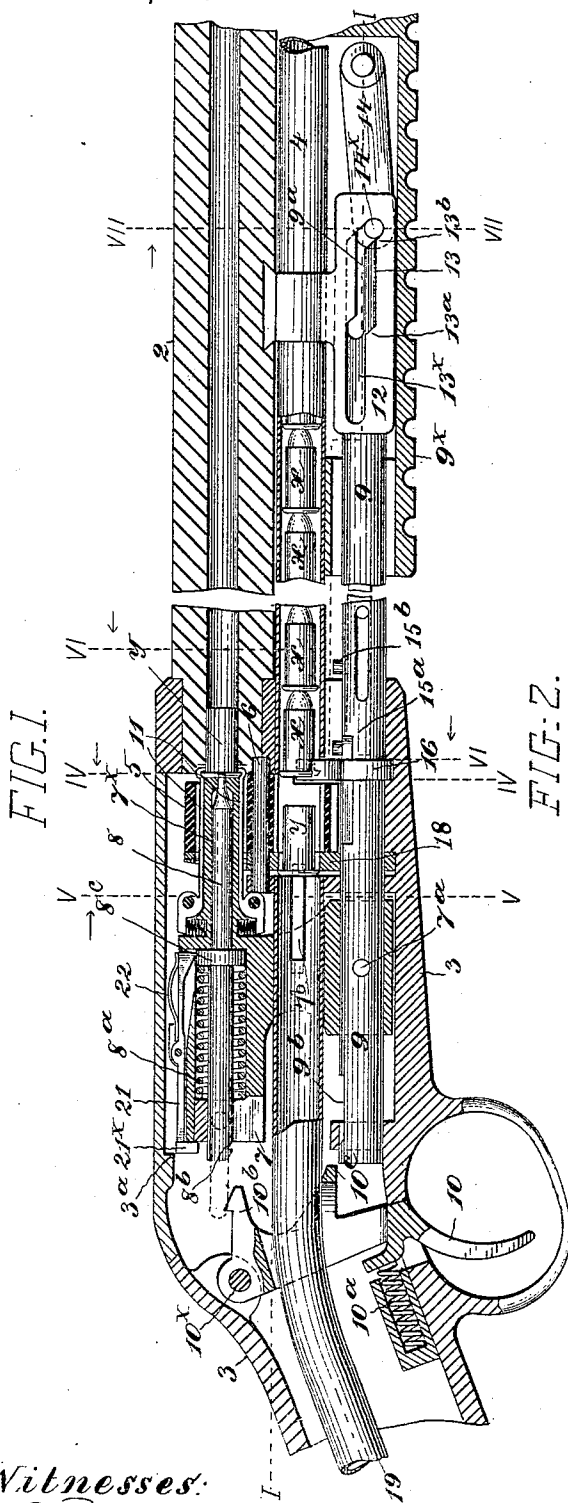
(No Model.)

4 Sheets—Sheet 1.

J. L. McCULLOUGH.
BREECH LOADING FIREARM.

No. 514,490.

Patented Feb. 13, 1894.



Witnesses:
F. M. Whiman
Peter A. Ross

Inventor:
John L. McCullough
by Henry C. Bennett
Attorney

(No Model.)

4 Sheets—Sheet 2.

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Patented Feb. 13, 1894.

Fig: 1^a

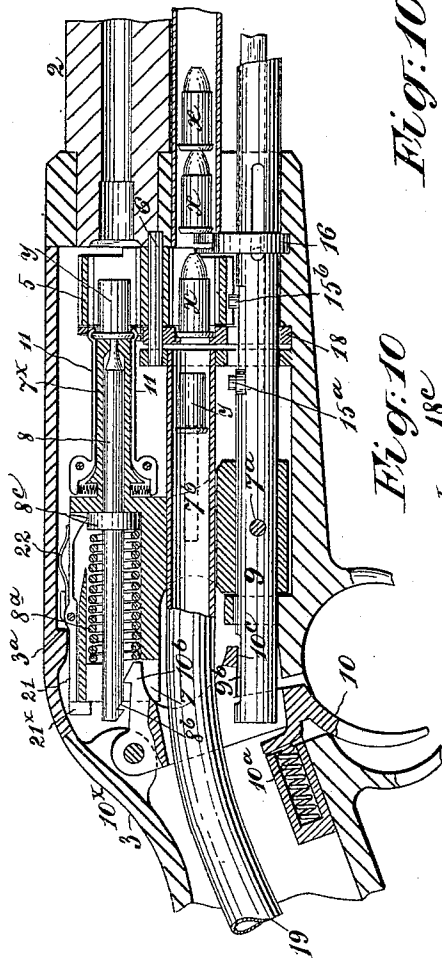


Fig: 10^b

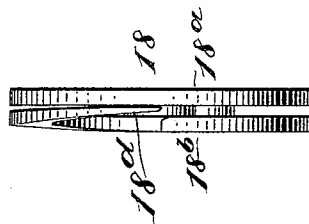


Fig: 10^a

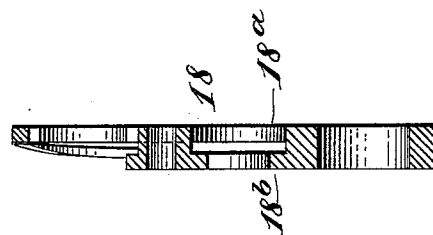
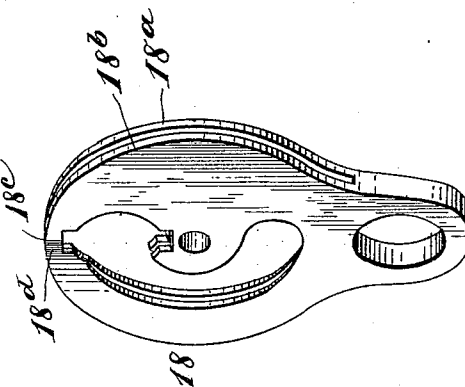


Fig: 10



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(No Model.)

4 Sheets—Sheet 3.

J. L. McCULLOUGH.
BREECH LOADING FIREARM.

No. 514,490.

Patented Feb. 13, 1894.

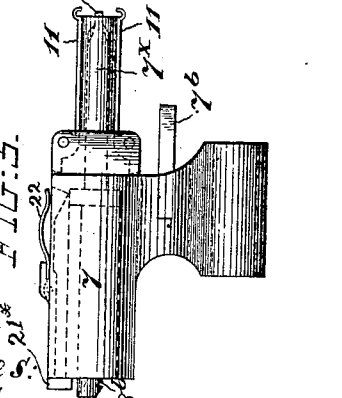
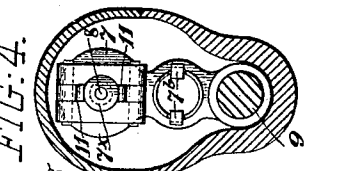
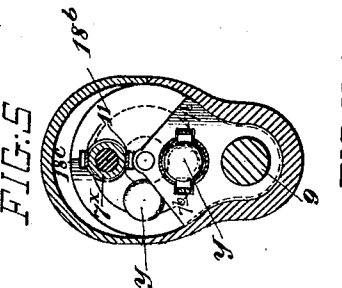
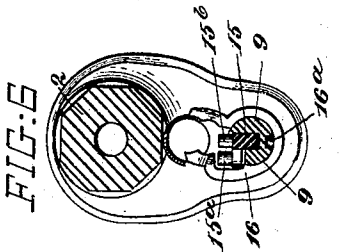
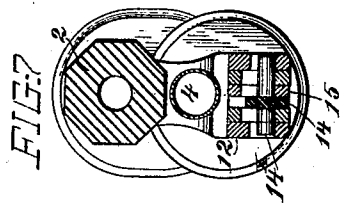
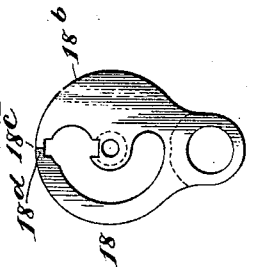
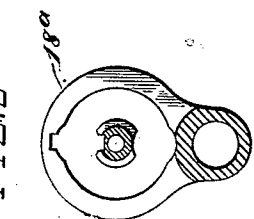
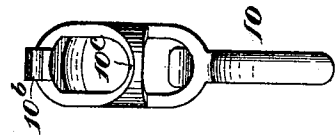
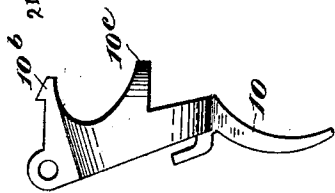
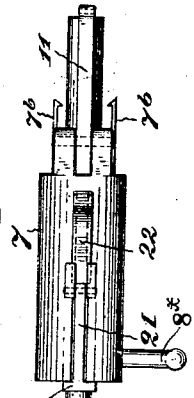


FIG. 3

FIG. 11

FIG. 9

FIG. 8



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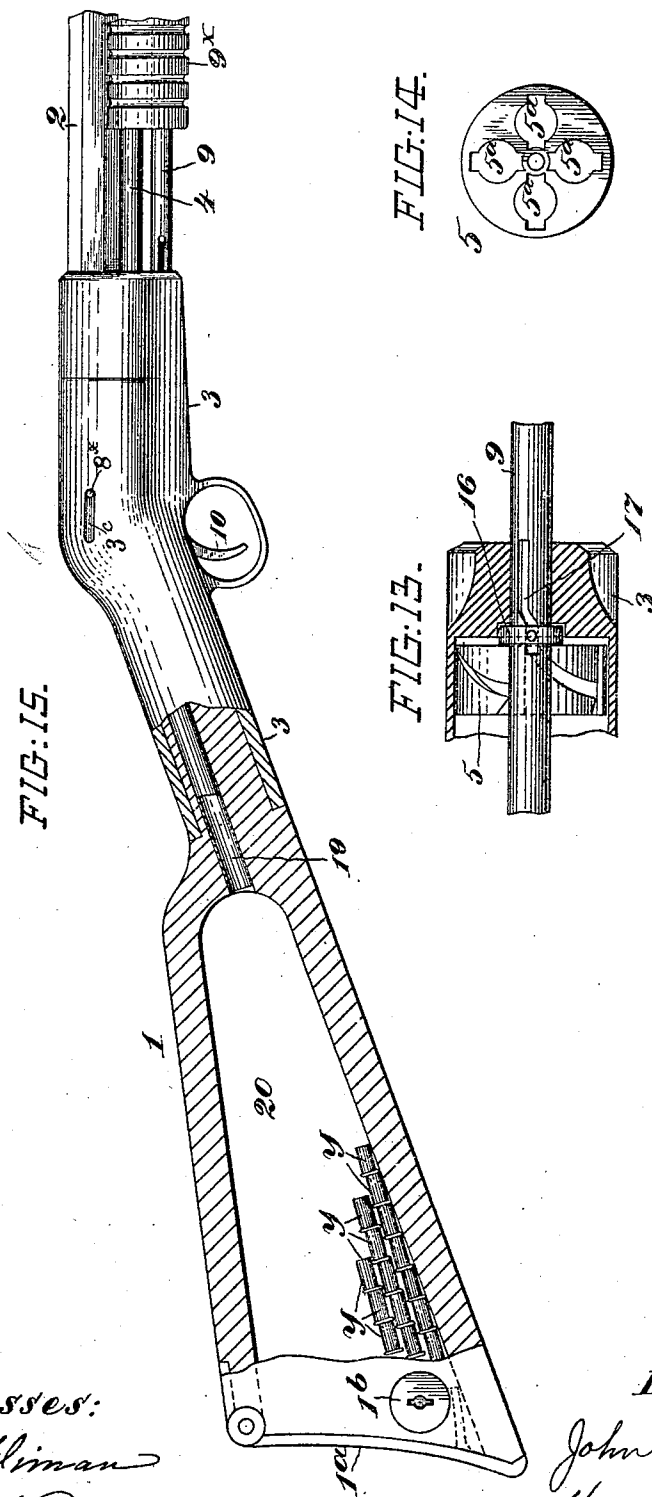
(No Model.)

4 Sheets—Sheet 4.

J. L. McCULLOUGH.
BREECH LOADING FIREARM.

No. 514,490.

Patented Feb. 13, 1894.



Witnesses:
S. W. Wiman
Peter H. Ross.

Inventor:
John L. McCullough
by Henry C. Cunniff
his attorney

UNITED STATES PATENT OFFICE.

JOHN L. McCULLOUGH, OF BROOKLYN, NEW YORK.

BREECH-LOADING FIREARM.

SPECIFICATION forming part of Letters Patent No. 514,490, dated February 13, 1894.

Application filed March 15, 1893. Serial No. 466,055. (No model.)

To all whom it may concern:

Be it known that I, JOHN L. McCULLOUGH, a citizen of the United States, and a resident of the city of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Fire-arms, of which the following is a specification.

My invention relates to fire-arms, and is especially applicable to the class of magazine fire-arms. In the embodiment illustrated and described in this application, the magazine lies parallel with the barrel and the loading and cocking are effected by the drawing back of an operating slide also arranged parallel to the barrel. The cartridges are fed from the magazine into a revolving, multiple-chambered cylinder which carries them to the index point; that is, into axial alignment with the bore of the barrel.

The invention will be fully described hereinafter and its novel features carefully defined in the claims.

In the accompanying drawings which serve to illustrate my invention—Figure 1 is a longitudinal, vertical section, on a comparatively large scale, of the main, operative part of the piece; this view shows the breech closed. Fig. 1^a is a similar view to Fig. 1 but showing the breech open. Fig. 2 is a horizontal section taken substantially in the plane indicated by the line I—I in Fig. 1. Fig. 3 is a side elevation of the breech block which carries the firing pin, detached; and Fig. 3^a is a plan of the same. Figs. 4, 5, 6 and 7 are transverse sections in the respective planes indicated by the lines IV—IV, V—V, VI—VI, and VII—VII, in Fig. 1. Fig. 8 is a face or rear view of the separator, and Fig. 9, is a sectional view of the same, detached, showing the front plate thereof. These views are on the same scale as the principal views. Fig. 10 is a perspective view of the separator, detached, on a larger scale. Fig. 10^a is a vertical mid-section thereof, and Fig. 10^b is a plan thereof. Figs. 11 and 12 are, respectively, a front and side elevation of the trigger, detached. Fig. 13 is a fragmentary detail view of the mechanism for operating the magazine escapement, and Fig. 14 is an end view of the chambered cylinder. Fig. 15 is a general view, of the piece on a smaller scale. This view is partly broken

away to show the lock-up shell-magazine in the stock.

Throughout the drawings 1 represents the stock of the gun or piece, 2 the barrel and 3 the receiver connecting the stock and barrel, and in which that part of the mechanism usually called the "lock," is mounted. Beneath and parallel with the barrel is placed the usual tubular magazine, 4, common to magazine guns. This magazine will have the ordinary spring for feeding the cartridges to the chambered cylinder or carrier, but I have not deemed it necessary to show this spring and the muzzle portion of the gun, as these may be of the known, or any suitable construction or kind.

The cartridges, *x*, are fed from the magazine into the lower chamber of a chambered cylinder or carrier, 5, mounted rotatively on a pin, 6, in the frame. As here shown (see Fig. 14) the carrier 5 has four chambers, 5^a, and when the lowermost of these chambers is axially aligned with the magazine 4, the uppermost chamber will be at the index point and aligned with the bore in the barrel 2.

Mounted in the receiver 3, back of the carrier 5, is a breech block, 7, in which is mounted a sliding firing pin, 8, backed by a spring, 8^a. The block 7 also carries the device for withdrawing the cartridge shell after firing, but this device will be described hereinafter. The breech block 7, is actuated by an operating slide, 9, mounted in the lower part of the frame 3 and coupled to the block by a pin or screw, 7^a. On the operating slide 9 is a grip, 9^x, whereby the slide is moved to and fro longitudinally.

10 is the trigger, which is pivotally attached, at 10^x, in the upper part of the receiver 3 and 10^a is its spring. On the trigger is a latch-arm, 10^b, which is so situated that when the block 7 is moved backward a shoulder or notch, 8^b, in the rear end of the firing pin will wipe over and engage the hook or shoulder on said latch-arm, 10^b, whereby, when the block 7 is moved forward again, the firing pin will be held against returning by its engagement with the trigger, and the spring, 8^a, of said pin will be put under tension. When the block 7, is moved forward, a plunger, 7^x, thereof, enters the indexed chamber of the carrier 5, and

forces the cartridge in said chamber forward into the cartridge-chamber of the barrel 2. On opposite sides of the plunger 7^x are mounted spring fingers, 11, provided with hooks at their front ends (see Fig. 3) which take over the flanged rim of the cartridge. The chambers in the carrier 5 (see Fig. 14) are grooved to make room for these retracting fingers. When the block 7 is moved backward, in cocking, the hooks on the fingers 11, withdraw the cartridge shell from the barrel and leave it in the chamber in the carrier 5. The fingers being arranged respectively, above and below the shell, the rotation of the carrier will move the flange on the shell laterally out from engagement with the hooks on the fingers and bring the flange of the next cartridge to be fired into engagement with said hooks. When the block 7 and operating slide 9, are moved forward in loading, tension is put upon the spring 8^a of the firing pin 8, and if no means were provided to hold the slide when thus moved forward, the said spring would return it. To avoid this difficulty I provide a lock or detent at the grip 9^x, as will now be described. Fixed to the under side of the barrel, is a slotted guide-piece, 12, through which the cartridge magazine, 4, passes. This guide-piece has two cheek-pieces which depend into the hollow of the grip 9^x, (see especially, Figs. 1, 2 and 7) and are slotted as seen in Fig. 1. The slot has two horizontal, longitudinal portions, 13, and 13^x, in different planes or levels, connected by an intermediate inclined portion, 13^a; and at its outer end it has a depressed, pocket-like portion, 13^b. Pivotaly mounted at its front end in the grip 9^x, is a link 14, which has a pin, 14^x, in its rear, free end, and this pin engages the slots in the cheek-pieces of the guide-piece 12. The operating bar 9, is longitudinally grooved and in this groove is situated an auxiliary slide, 15, to which the link 14 is coupled at its rear end,—that is, the end presented to the breech of the piece. The cheek-pieces of the front end of the slide 9 are embraced respectively between the slide 15 and the cheek-pieces of the guide-piece 12; and in each cheek-piece of the slide 9, is a short slot, 9^a, and a pocket, 9^b, which may be brought to coincide with the pocket 13^b. When the grip, 9^x, is pushed forward in loading the gun, the pin 14^x drops into the coinciding pockets 9^b and 13^b, as seen in Figs. 1 and 2, and locks the slide 9 and the breech block 7, against the recoil. When the grip is drawn back, in cocking the gun, the pin 14^x is driven up out of the pockets and into line with the slot 13 in the guide-piece 12, the auxiliary slide 15 springing or lifting up to permit of the movement; but as the slot 9^a in the operating slide is above the level of the slot 13, the pin cannot, at the first part of the movement, enter the slot 9^a, and the two slides, 9 and 15, will be moved back together. However, when the pin 14^x reaches the incline 13^a, it rides up the same

into the slot 13^x, and this slot, being on the same level and then co-incident with the slot 9^a, the slide 9 will cease to move farther with the grip, the pin 14^x playing along the slot 9^a; but the auxiliary slide, 15, will still continue to move with the grip to the full extent of the stroke. In other words, on the backward movement of the grip in cocking, both slides, 9 and 15 are moved together for about half the movement of the grip, when the main slide 9 is disengaged and ceases to move; the auxiliary operating slide, being coupled to the link 14, necessarily moves at all times with the grip. If found desirable or necessary the pin 14^x may engage a cross slot in the auxiliary slide so as to obviate the springing up or lifting of the latter. When the trigger is pulled, the latch-arm, 10^b, thereon frees the firing pin and the spring thereof drives the pin forward with force sufficient to explode the fulminate in the cartridge, as will be readily understood. In Fig. 1 an empty shell is shown in the cartridge chamber of the barrel.

I will now explain the operation of the escapement between the rear end of the magazine 4, and the chamber in the carrier 5, whereby a cartridge is allowed to enter said chamber and drive out the empty shell therein at the back. Reference may be had to Figs. 1, 2, 6 and 13. 16 is the escapement, mounted to rock on the operating slide 9, in a keeper-recess in the receiver 3, the arms or pallets of the escapement being situated just in front of the chambered carrier 5, and in line with the magazine 4. The pallets of the escapement are in different planes, so that one will interpose between the butt of the cartridge and the chamber, when this pallet is advanced, and the other pallet is forward of this plane, so that, when it is advanced, it will take in front of the flange on the cartridge about to enter the chamber and thus allow it to pass, but will interpose behind the flange of the next cartridge in front. In the under side of the operating slide 9 (see Fig. 13) is an angular cam-groove, 17, in which plays a stud or projection, 16^a, on the escapement, as seen in Fig. 6. When the slide 9 is drawn back, in cocking, the groove 17 rocks the escapement in a manner to free the rear cartridge in the magazine and allow it to enter the chamber in the carrier, but so as to prevent the next cartridge from following; and when the slide is again moved forward, the escapement is rocked in such a manner as to permit the flange of the next cartridge to pass the forward pallet of the escapement and move back against the pallet farthest to the rear. Thus one vibratory movement of the escapement permits a cartridge to pass into the chamber of the carrier, but stops the next succeeding cartridge.

I will now describe the device for rotating the chambered carrier, premising that this is in the main effected on the last half of the backward movement of the grip, being com-

pleted during the first part of the forward movement of the grip. As herein arranged the carrier 5 rotates in a direction opposite to that in which the hands of a watch rotates, when seen from the rear, and in Fig. 2 the carrier is seen in plan. On the auxiliary slide 15, are two studs, 15^a and 15^b, which rotate the carrier 5 by engagement with grooves in the convex face of the same. There are four straight grooves, 5^b, in the carrier, parallel with the axis of the cylinder, four oblique grooves, 5^c, connecting the adjacent straight grooves, and four beveled corners, 5^d. As these grooves are seen in plan in Fig. 2, the obliquity of the grooves 5^c appear the reverse of the grooves on the under side which will be engaged by the studs 15^a and 15^b. As the slide 15 moves back, the stud 15^a, which is out of line with the stud 15^b to the extent of its diameter, passes along a straight groove 5^b, with which it is aligned, and when it has passed through and cleared the groove, the other stud, 15^b, enters the oblique groove 5^c, in moving through which it rotates the carrier 5 through nearly a fourth of a revolution. When the movement of the slide shall have terminated, the stud 15^b will have passed from the oblique groove into the straight groove. On the return movement forward of the slide 15, the stud 15^b moves back along the straight groove into which it had passed, and after it shall have passed out of this groove the stud 15^a, following, will strike the beveled face or corner 5^d, and rotate the carrier 5 the remainder of the quarter revolution. When the stud 15^a enters the straight groove through which the other stud has just passed, it will move along said groove to its first position, seen in Figs. 1 and 2. It is while the stud 15^a is passing back along the straight groove that the plunger on the breech block drives the cartridge from the carrier into the barrel.

I will now describe the manner of getting rid of the empty shells and how they are discharged into a lock-up magazine in the stock. Just back of the chambered carrier is situated a separator, 18, which allows the empty shells to pass from the lower chamber of the carrier back into a receiving tube 19, but will not allow the loaded shells, or cartridges to pass. This separator is seen detached in Figs. 8, 9, 10, 10^a, and 10^b. 18^a is the front plate of the separator, or the one next the carrier 5, and 18^b is the rear plate. These plates are connected together, as indicated in Fig. 10^a, but they are distanced to an extent sufficient to take in between them the flange at the butt or base of the cartridge. In the front plate (Figs. 9 and 10) is a circular slot or ring-like aperture wide enough to allow the body of a cartridge shell to pass, and at top and bottom, opposite the upper and lower chambers of the carrier, it is enlarged sufficiently to allow the flanged end of the shell to pass. In the rear or back plate 18^b, as clearly seen in Fig. 8, is a similar slot to that in the front plate except that it is confined to the left

side or half of the plate, and it is not enlarged at its lower end opposite to the lower chamber in the carrier. In this plate, 18^b, the metal is cut through at the top,—at 18^c,—and the part 18^d, at the left, is chamfered or thinned down and bent forward until it rests on the rear face of the front plate. This construction is clearly shown in Figs. 10^a and 10^b.

The operation of this device is as follows: Suppose there is an empty shell in the upper chamber of the carrier and the latter is rotated to the left. The thinned or chamfered portion, 18^d, of the back plate will take under the flange of the shell and drive it back or cam it out to the rear, as seen in Fig. 5, wherein *y* represents a shell thus driven back, its body being carried around in the coinciding slots in the plates of the separator. When this shell reaches the lower side of the carrier and the chamber it occupies is in the line with the magazine 4, a cartridge *x*, entering the front end of the chamber from the magazine, forces the shell out at the back into the tube 19. But the flange on the cartridge will prevent it from passing through the slot in the rear plate 18^b, and it cannot pass this plate until it has been carried up to the index point and fired. The shells *y*, entering the receiving tube one after the other, push each other back and they are finally discharged from said tube or channel into a shell-magazine, 20, in the stock, seen in Fig. 15. This magazine will have a hinged cover-plate, 1^a, provided with a lock, 1^b, of any kind. There are several important advantages in disposing of the empty shells in this manner. It preserves the shells and prevents them from being scattered around; it enables the person using the gun to prove the number of shots fired, and, what is still more important where the gun is used in a shooting gallery, it enables the proprietor to ascertain exactly how many shots have been fired with a gun. This is an important check on the attendant of a gallery when the proprietor is absent, and it is more accurate than the indicators sometimes employed as it only records the actual number of shots fired and not the number of times the grip has been operated. So far as described the incoming cartridge is relied on to expel the empty shell from the cylinder; but in some cases it is desirable that means shall be provided for drawing the shell out of the chamber and into the tube 19. To meet this requirement, I prefer to provide the sliding block 7, at the point where it plays over the tube 19, with spring hooks, 7^b, the hooked front ends of which play in slots in the sides of the tube 19. These hooks take over the flange on the shell and when the block is drawn back they draw back the shell in a manner that will be well understood.

As a precautionary device to prevent the user from drawing back the grip a second time before firing, I prefer to employ a device illustrated clearly in Figs. 1, 3 and 3^a. On the top of the sliding block 7, and adjacent to

the closing plate of the frame 3, is pivotally mounted a detent bar, 21, backed by a light spring 22, which tends to depress its front end. The front end of the bar is upheld normally by a collar, 8°, on the firing pin 8. After the gun has been cocked and the block is driven forward, the spring 22 is free to depress the forward end of the bar, and this forces its rear end, 21^x, upward in front of a shoulder, 3°, on the frame. Thus the bar acts as a detent to prevent the drawing back of the block 7; but when the trigger is pulled, the firing pin is driven forcibly forward and the collar 8° thereon wipes under and lifts the forward end of the bar again, thus depressing its rear end and freeing it from the shoulder 3°.

It is necessary that, after cocking, the grip 9^x shall be pushed forward to its fullest extent before firing, and to compel this I prefer to provide the construction I will now describe. The trigger 10, is made open or ring-like at its middle part to allow the tube 19 and the operating slide 9, to pass it (see Fig. 11), and on the trigger is a bar or bail, 10°, which projects out to the front at the level of the upper face of the slide 9. When the latter is moved forward to its full extent as in Fig. 1, its rear end is situated just in front of the bar 10°, so that when the trigger is pulled and this bar descends, it will have only just room enough to pass the slide; consequently, the trigger cannot be drawn and the gun discharged when the end of the slide 9 is still under the bar 10°. In order, however, to permit the trigger to move sufficiently to allow the firing pin to engage the latch-hook 10^b, the slide 9 has a slight recess, 9^b, formed in its top at the proper point to receive the bar 10°. The retracting hooks 11, on the sliding block 7 must expand slightly in order that their hooked extremity may pass over the flange on the shell, and this may be effected in several ways. For example, they may be leaf springs and be secured rigidly at their rear ends to the block, or they may be pivoted to the block near their rear ends and have springs arranged under their rear ends back of the pivots. I have shown this latter construction herein.

As seen in Fig. 1 coil springs are employed, but a block of rubber might be employed as an equivalent of the coil spring.

In order to allow the gun to be cocked and snapped without actuating the operating slides, as may be necessary in case a cartridge misses fire, I prefer to provide the firing pin 8 with a stud, 8^x, (seen best in Fig. 15) which projects out laterally into or through a slot, 2°, in the frame. This stud also prevents the rotation of the firing pin.

The tube 19 forms practically a part of the shell-magazine and its open end, adjacent to the separator, is the entrance to said magazine. The front plate, 18^a, of the separator, performs no absolutely necessary function; it merely provides a stationary bearing for the

cam-point 18^d, which would otherwise bear on the face of the rotating carrier.

I do not herein broadly claim a magazine in the stock of the gun to receive the extracted shells, as this is not new with me.

Having thus described my invention, I claim—

1. In a gun having a shell-magazine to receive the empty shells, and a cartridge magazine aligned with the entrance to the shell-magazine, of a cylindrical, chambered carrier rotatively mounted between said magazines as specified, a rotator for said carrier to bring its chambers in succession, one to the index point and another in line with the cartridge magazine, means for withdrawing the empty shell from the cartridge chamber into the carrier, and an automatic separator substantially as described, arranged between the carrier and the entrance of the shell-magazine, whereby the shells are allowed to pass from the carrier to the magazine when driven therefrom by the incoming cartridge.

2. In a gun having a shell-magazine and a cartridge magazine aligned as shown, the combination with a rotating, chambered carrier arranged between said magazines, whereby a cartridge entering a chamber of the carrier drives the empty shell therefrom into the magazine, of the separator 18 arranged adjacent to the carrier and between it and the shell-magazine, said separator having a slotted plate, 18^b, having a thinned, inclined point 18^d, adapted to take under the flange of the shell and partially withdraw it, substantially as set forth.

3. In a gun having a cartridge chamber arranged parallel with its barrel, and a rotatively mounted carrier, the chambers in which are adapted to be brought successively into alignment with said magazine, the combination of an operating slide, means whereby the reciprocating movements of the slide operate the carrier, an escapement device, arranged between the carrier and the magazine whereby the cartridges are admitted to the carrier singly and means intermediate the slide and escapement whereby the latter is vibrated, substantially as set forth.

4. In a gun, the combination with the chambered carrier the operating slide, the breech block, 7, connected therewith, the firing pin, 8, mounted in the sliding block and provided with a shoulder 8^b, the spring of the pin, the trigger, 10, provided with a latch-arm to engage the shoulder on the pin when the latter is drawn back, the trigger-spring, and means substantially as described for holding the operating slide in its advanced position when the spring of the firing pin is under tension, all arranged to operate, substantially as set forth.

5. In a gun having a cartridge magazine and a rotatively mounted chambered carrier adapted to receive cartridges from said magazine, the combination with the separator, ar-

ranged adjacent to and back of the carrier, and the tube 19, of the sliding block 7, provided with hooks adapted to grasp the flange of the shell and draw it from the chamber of the carrier into the tube 19, substantially as set forth.

6. In a gun, the combination with the rotatively mounted, chambered carrier 5, provided with longitudinally arranged straight grooves 5^b, oblique connecting grooves 5^c, and beveled shoulders 5^d, of the slide 15, provided with the non-aligned studs 15^a and 15^b, adapted to engage the grooves in the carrier, when the slide is reciprocated, and intermittently rotate the cylinder, substantially as set forth.

7. In a gun, the combination with the slotted guide-piece 12, fixed to the barrel of the gun and pendent in the grip, 9^x, the said grip, the auxiliary slide 15, the link, 14, connecting the grip with said slide, the operating slide 9, embracing the slide 12, said slide having slots

9^a, in its cheek pieces, and pockets 9^b, at the ends of said slots, said slots and those in the guide-piece, engaged by the pin 14^x in the link, as set forth.

8. In a gun, the combination with the slide block 7, the firing pin 8, mounted therein and provided with a collar 8^c, and the spring of said pin, of the detent bar, 21, pivotally mounted on the sliding block and backed by a light spring, the front end of the bar resting on the collar on the firing pin, normally, and a shoulder, 3^a, on the frame of the gun, adapted to be engaged by the rear extremity of the bar when the firing pin is drawn back, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOHN L. McCULLOUGH.

Witnesses:

HERBERT BLOSSOM,
JAS. KING DUFFY.