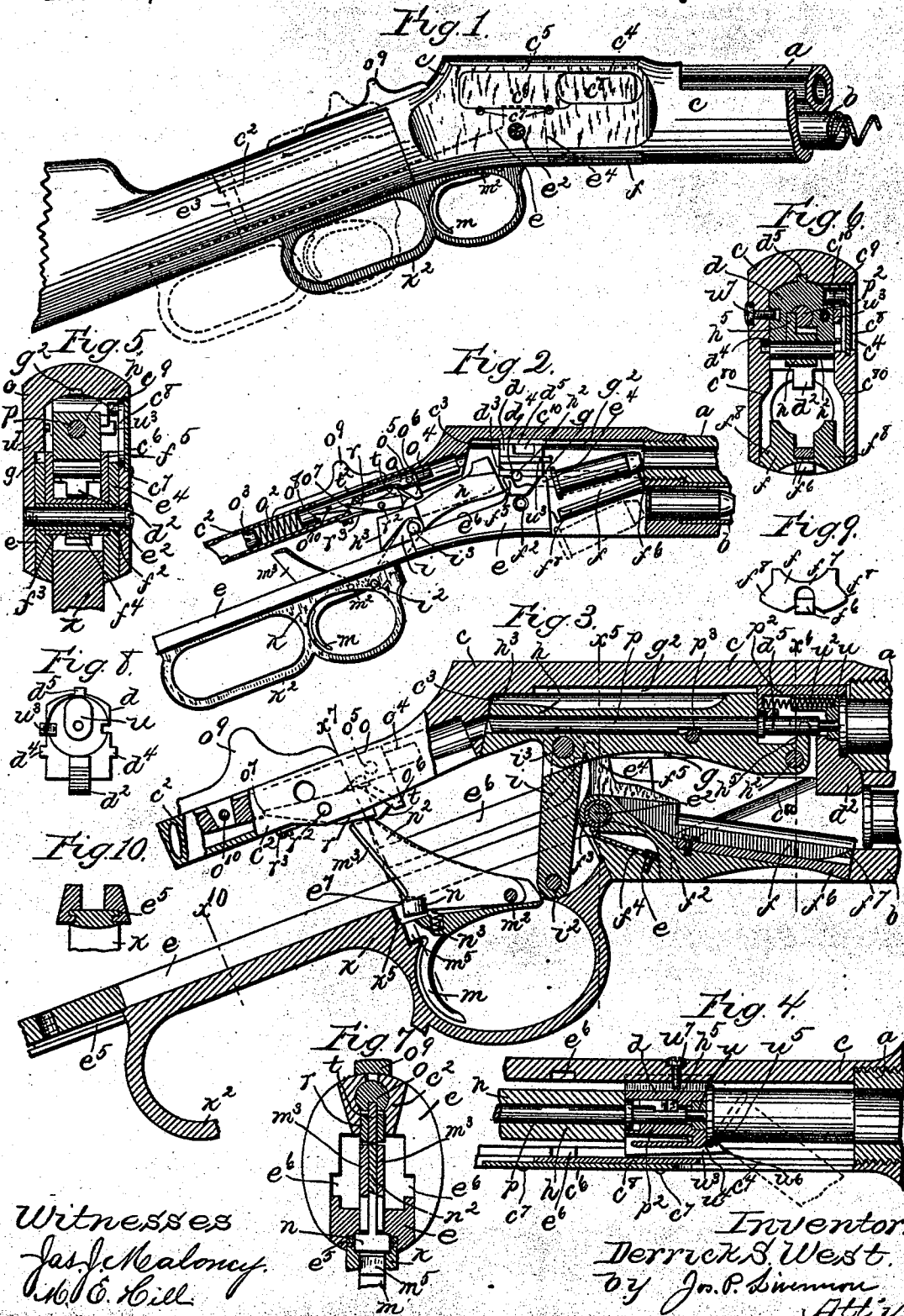


D. S. WEST.
MAGAZINE FIREARM.

No. 478,729.

Patented July 12, 1892.



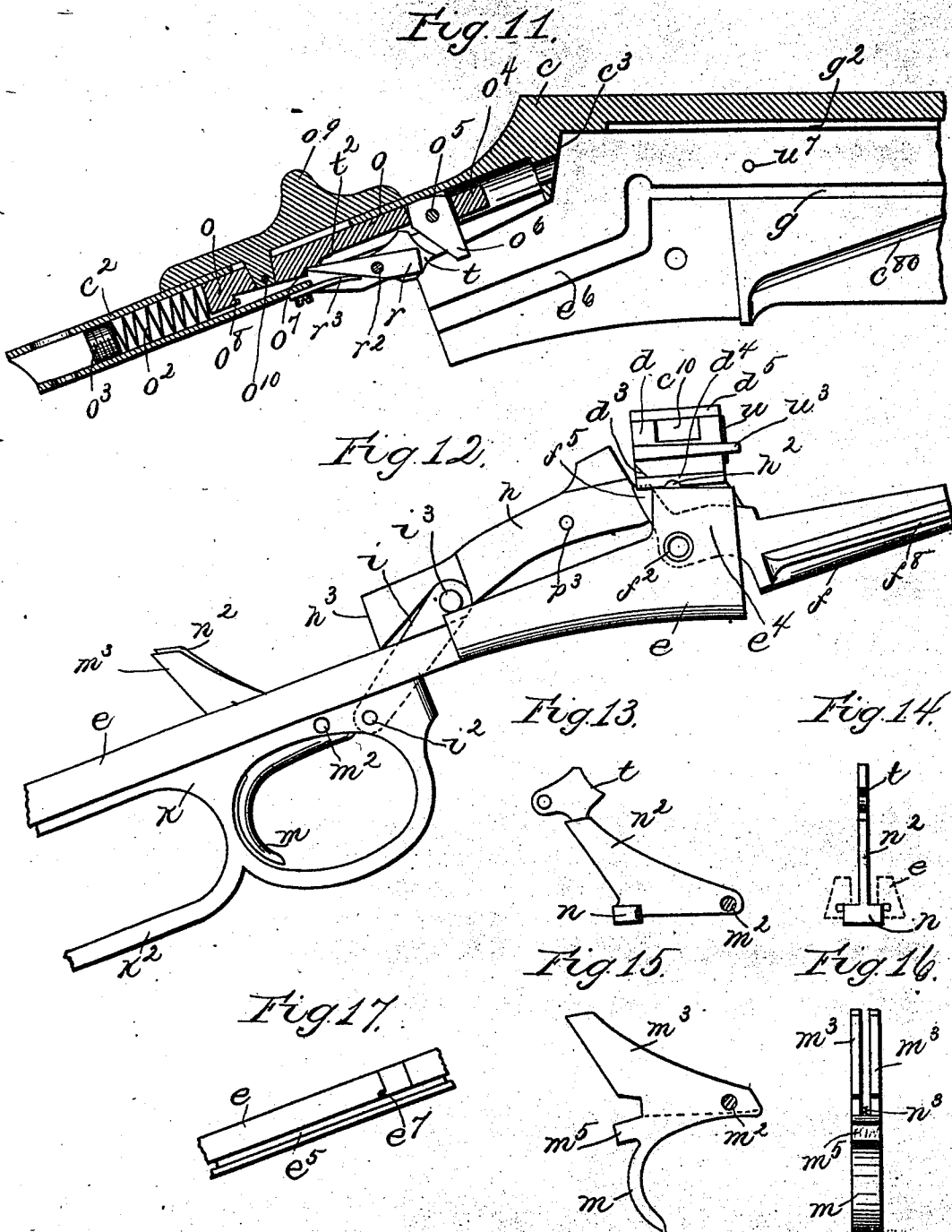
Witnesses
Jas. J. McAloney
W. E. Hill

Inventor.
Derrick S. West.
by J. P. Simon
Att'y.

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Witnesses
Jas. J. Maloney.
H. C. S. B.

Inventor.
Herrick S. West,
by Jos. P. Linnane,
Att'y.

UNITED STATES PATENT OFFICE.

DERRICK S. WEST, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF THREE-
FOURTHS TO CHARLES H. FISH, OF MANCHESTER, NEW HAMPSHIRE, AND
JOHN W. DREW, OF BOSTON, MASSACHUSETTS.

MAGAZINE-FIREARM.

SPECIFICATION forming part of Letters Patent No. 478,729, dated July 12, 1892.

Application filed May 20, 1892. Serial No. 433,670. (No model.)

To all whom it may concern:

Be it known that I, DERRICK S. WEST, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Breech-
5 Loading Firearms, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention relates to a breech-loading
10 magazine-gun, the object of the invention being to provide a simple, safe, and rapidly-operating breech mechanism.

The invention is embodied in a gun having a magazine located beneath the barrel, as is
15 usual in magazine-guns, said barrel and magazine connecting with a breech frame-piece having a chamber, hereinafter called the "receiver," which communicates with both the barrel and magazine and into which the car-
20 tridges are delivered one at a time from the magazine preparatory to being introduced into the barrel for firing. The said receiving-chamber contains the breech-block, which closes the breech at the rear of the cartridge,
25 and is operated to open the breech for the removal of the cartridge-shell and introduction of the next cartridge, and the receiver also contains a transferer for carrying the cartridge that enters the receiver from the magazine
30 into position to enter the barrel, said cartridge then being pressed into the barrel by the action of the breech-block in coming up to close the breech.

In prior applications, Serial No. 396,965,
35 filed June 20, 1891, and Serial No. 405,425, filed September 11, 1891, I have shown and described a breech-loading gun having a two-part breech-block, which when in position to close the breech is interposed with the two
40 parts in line with one another between the rear end of the barrel and an abutment formed in the breech frame-piece at the rear end of the receiver and in line with the barrel. The said two parts of the breech-block are
45 hinged together and the rear part is inclined out of line with the fore part when the breech of the gun is to be opened.

In the gun forming the subject of the present invention substantially the same two-
50 part breech-block is employed; and the pres-

ent invention consists, mainly, in details of construction whereby the means for operating the breech-block are simplified and in details of construction of the means for extracting and ejecting the empty shell, for locking the breech mechanism in closed position, and for unlocking the same preparatory to reloading the gun after it has been fired.

In the present invention the locking device for holding the breech mechanism in closed position in the act of firing is combined with the firing mechanism in such manner that it is released by the action of the hammer coming forward to explode the cartridge, the release thus being effected substantially at the instant that the discharge takes place, and inasmuch as the pull on the trigger by which the hammer is released is in line with the movement of the handpiece by which the breech mechanism is operated the automatic release permits the breech mechanism to start instantly on its movement to reload the gun the result being that the reloading action is to a large extent automatic and may be performed with extreme rapidity.

In the organization of the parts the hammer and sear work in a portion of the breech frame-piece which extends down the upper side of the grip portion of the stock, while the remainder of the breech mechanism is all connected with an under frame-piece that mortises into the breech frame-piece of the gun and also extends along the under side of the grip portion of the stock, such arrangement affording great facility in the assembling of the gun and taking it apart for cleaning, &c. The fore part of the breech-block travels backward and forward in a suitable guide in the receiver in line with the barrel, moving back far enough to receive a loaded cartridge between it and the rear end of the barrel. The rear part of the breech-block is pivotally connected at its forward end with the sliding fore part and is connected at its rear end by a link with a handpiece that carries the trigger-guard and trigger and has a sliding movement in a guide in the frame in the under portion of the grip of the stock, said handpiece being the actuating part by which the operator manipulates the gun. Backward

movement of the handpiece causes the rear end of the rear portion of the breech-block to drop from in front of the abutment, thus permitting the entire breech-block to move to the rear, the rear portion being drawn by the handpiece and itself drawing the front portion backward in its straight guideway. In this backward movement the rear portion of the breech-block engages the hammer and moves it to full-cock position, at which it is held by the sear. Near the end of its rearward movement the fore part of the breech-block engages the cartridge-carrier, upon which a cartridge has been introduced from the magazine during the act of sliding the breech-block to the rear, and by said engagement the carrier is moved so as to carry the fore end of the cartridge up into line with the breech of the gun, so that at the forward movement of the breech-block the cartridge is inserted in the barrel. The handpiece carries a locking device, which is a pivoted bolt that is drawn into engagement with a shoulder in the under frame as the handpiece reaches its extreme forward position in which the breech of the gun is closed, and the trigger which travels with the handpiece is brought into engagement with the sear, so that the hammer can be released by pulling the trigger, and the hammer at the end of its forward movement disengages the said lock, as before stated.

Figure 1 is a side elevation of the breech portion of the gun embodying this invention; Fig. 2, a sectional elevation showing the breech frame-piece in central longitudinal section and the remainder of the breech mechanism and frame in side elevation with the parts in the position occupied when the breech is open preparatory to the introduction of the cartridge; Fig. 3, a central longitudinal section of the breech mechanism, on a larger scale, with the said mechanism in the position occupied when the breech is closed and the gun ready to fire; Fig. 4, a longitudinal horizontal section of the receiver-chamber and fore part of the breech-block, illustrating the shell-ejector mechanism. Figs. 5, 6, and 7, transverse sections at the lines x^5 , x^6 , x^7 of Fig. 3; Fig. 8, a front end elevation of the breech-block; Fig. 9, a front elevation of the end of the cartridge-carrier; Fig. 10, a sectional detail on line x^{10} , Fig. 3; Fig. 11, a longitudinal sectional detail of the main breech frame-piece with the under frame-piece and connected breech mechanism removed; Fig. 12, a side elevation of the under breech frame-piece and working parts connected therewith detached from the remainder of the gun; Fig. 13, a side elevation of the locking device and releasing device co-operating therewith; Fig. 14, an end view thereof; Fig. 15, a side elevation of the trigger detached; Fig. 16, an end elevation thereof; Fig. 17, a detail of the guideway for the handpiece, showing its locking-shoulder.

The barrel a and magazine b may be of substantially the usual construction, being con-

nected with the breech frame-piece c , which has a rearward extension or tang c^1 , that extends down, the upper part of the grip of the stock being mortised or sunk into the stock, as indicated in dotted lines, Fig. 1. The said breech frame-piece is hollow and affords a cartridge-receiving chamber at the rear of the barrel and magazine, in which receiver the cartridge is transferred from the magazine to the barrel. The said receiver also contains a portion of the breech mechanism and has at its rear end an abutment c^2 , between which and the breech of the gun-barrel the breech-block is introduced when the gun is ready for firing, as shown in Fig. 3. The top and side walls of the said breech frame-piece are completely closed and continuous, as shown, except that one of the said side walls, preferably the right-hand one, is provided with an opening c^4 , as best shown in Fig. 1, the portion c^5 of which is closed by a removable plate c^6 , secured in position by screws c^7 , while the portion c^4 contains a sliding cover c^8 , that works in longitudinal guides at the rear of the fixed plate c^6 , the said cover c^8 being provided with an inwardly-projecting stud c^9 entering a slot or notch c^{10} in the fore part d of the breech-block, so that the said cover c^8 is moved forward and backward with the breech-block, leaving the receiver accessible through the opening c^4 when the breech-block is retracted, so that the cartridge-shell, which is extracted from the barrel, may be ejected through said opening upon the withdrawal of the breech-block by the ejecting mechanism, which will be hereinafter described. A single cartridge may be introduced in the said opening c^4 to load the gun, if desired, instead of taking a cartridge from the magazine. The under portion of the breech frame-piece c is itself open, but receives tightly within it a portion of the under frame-piece e , upon which the greater part of the breech mechanism is assembled. (See Fig. 12.) The fore end of the said frame-piece e (the outline of which is indicated by dotted lines, Fig. 1) is fastened in said frame-piece c by a screw e^1 , while the rear end of said frame e is mortised into the under part of the grip of the stock, as shown in Fig. 1, and is connected with the tang portion c^1 of the breech frame-piece by a screw e^2 (see dotted lines, Fig. 1) passing through the wood of the stock. The fore end of the frame-piece e is provided with wings e^4 , that enter a suitable mortise in the frame-piece c and between which is pivoted the rear end of the carrier f , the pivotal connection being by a tube or bushing f^1 , through which the fastening-screw e^2 passes. Thus when the screw e^2 is withdrawn for the purpose of separating the frame-piece e from the frame-piece c the carrier remains pivotally connected with the said frame-piece e , as will be understood from Figs. 2, 5, and 12. The hub or pivotal portion f^3 of said carrier is provided with notches acted upon by a spring f^4 , as shown in Fig. 3, tending to hold it in one of the two positions

shown in Figs. 2 and 3, it being in the position shown in Fig. 3 when the gun is closed, so that a cartridge will be pressed out of the magazine by the usual magazine-spring upon the said carrier as soon as the breech-block is withdrawn, said breech-block having a downward projection d^2 , which retains the cartridges in the magazine while the breech is closed, as shown in Fig. 3. The said carrier has above its pivot f^2 wings f^5 , between which the breech-block works, the said wings being engaged by shoulders d^3 on the breech-block d as the latter arrives at its rearward position, (see Fig. 2,) and thus causing the carrier to be thrown up into the position shown in Fig. 2, thus lifting the fore end of the cartridge (that has entered above it from the magazine, as before stated) into line with the breech of the gun, so as to be inserted therein by the breech-block d at its next forward movement, as will be readily understood from Fig. 2.

The carrier is provided with a retaining projection f^6 , which is the end of a spring that projects from the under side of the forward end of the carrier, as shown in Figs. 2 and 9, and thus prevents the cartridges from coming out from the magazine when the ejector is in elevated position, as shown in Fig. 2. The said spring, however, yields when the cartridges are pressed forward beneath it from the position shown in dotted lines, Fig. 2, in the operation of loading the magazine. The said spring is seated in a longitudinal bore, which opens into the upper face of the carrier, constituting for the most part a groove to receive the shank of the spring, and also opens at the lower part at the front end to permit the spring to act, but leaving a bridge f^7 above the yielding end of the spring, as shown in Figs. 3 and 9, which prevents overstraining of the spring.

The lower forward part of the receiver-chamber near the magazine is made wider than necessary to receive the cartridge within it, as best shown in Fig. 6, and the carrier is provided with lateral projecting ribs f^8 , (see Fig. 6,) which fill the said space and which engage with inclined shoulders c^{80} (best shown in Figs. 3 and 6) when the carrier is in its elevated position, said shoulders thus positively limiting the upward movement of the carrier. Such widening of the lower part of the receiver adjacent to the rear end of the magazine greatly facilitates the introduction of the cartridges into the magazine, as it affords ample room for the thumb of the operator to follow the cartridge from the position shown in dotted lines, Fig. 2, until its rear end passes the retaining projection f^8 , and is thus retained in the magazine until removed therefrom in the operation of loading.

The side walls of the receiver are provided with guide-grooves g , the lower edges of which are just in line with the upper edges of the wings e^4 at the fore end of the frame-piece e when in working position, as shown in Figs.

3 and 5, and the breech-block d is provided with longitudinal ribs d^4 , which work in said guide-grooves g , so that the said block moves in a rectilinear path in the receiver, the top wall of which may be provided with a longitudinal groove g^2 to receive a corresponding longitudinal rib d^5 on the block d .

As the fore part of the piece e constitutes a part of the under wall of the guide-groove g , as shown, the said ribs d^4 of the breech-block d are practically disengaged from the grooves g of the receiver when the said block is in its rearmost position, as shown in Fig. 2, so that it can be withdrawn with the frame-piece e through the mortise or opening in the under part of the frame-piece c . In other words, with the parts in the position shown in Fig. 2 the frame-piece e , together with the carrier f , breech-block d , and the handpiece, and devices to be hereinafter described, connecting it with the breech-block, may all be removed together from the frame-piece c by merely withdrawing the screws e^2 and e^3 .

The fore part d of the breech-block that operates in the guides g , as before stated, is held rigidly against the breech of the barrel by the rear part h of said breech-block, which is pivotally connected at h^2 with the fore part d , and is provided with a seat h^3 at its rear end to engage the abutment c^3 at the rear end of the receiver, the said fore and rear parts of the block d h in this position being in rigid contact with one another, and with the said abutment constituting a rigid metal support to close the rear end of the barrel and receive the recoil-pressure of the cartridge.

The rear end of the rear portion h of the breech-block is pivotally connected with a link i , which is itself pivotally connected at i^2 with the operating-handle for the breech mechanism, shown as a handpiece k , which works in a longitudinal guide e^5 in the under frame-piece e of the breech mechanism. The said handpiece k is provided with a suitably-shaped loop k^2 to receive the fingers of the hand of the operator, who can thus easily move the said handpiece forward and back in its guide e^5 , the said forward movement pushing the link i and breech-block d h before it, and finally bringing the two portions of the breech-block in line with one another and in rigid contact from the breech of the barrel to the abutment c^3 , as shown in Fig. 3, in which position the link i stands nearly vertically from the handpiece k to the breech-block h , thus holding the latter securely up against the abutment c^3 , which, with the adjacent end of the breech-block, is slightly inclined to the line of the axis of the barrel, to facilitate the dropping of the rear end of the breech-block h when the breech is to be opened, the inclination, however, being insufficient to permit the breech-block to yield under direct rearward pressure applied at the forward end of the portion d of the said breech-block. The pivot i^2 that joins the link i and the breech-block h projects slightly from the sides of the

said breech-block, so as to engage with a guide-groove e^5 , (see Figs. 3 and 7,) formed partially in the breech-frame piece c and partially in the under frame-piece e , and serving to properly guide the rear end of the breech-block h in its movement toward and from the abutment c^2 , the said guide first causing the rear end of the breech-block to drop substantially vertically from the position at the front of the seat c^3 to a point below the seat, (when the handpiece k is moved to the rearward to open the breech,) and then guiding the rear end of the breech-block substantially in line with and below the rearward extension c^2 of the frame-piece to the position shown in Fig. 2. The said handpiece k also carries the trigger m by which the gun is fired, the said trigger being pivoted at m^2 in the handpiece and having an upwardly-extending portion m^3 that engages the sear that controls the hammer, as will be hereinafter described.

In order to insure the firm holding of the breech-block during the discharge, the handpiece k is locked in its forward position, Fig. 3, by a locking device n (shown as a lock or bolt) that works in a recess k^5 in the handpiece and bears against the upper wall of the guide e^5 for the handpiece as the latter travels in said guide. The lock n is carried by a thin plate n^2 , which works in the upper part m^3 of the trigger, which is forked to receive the said plate, as shown in Fig. 7. (See also Figs. 13 to 16.)

Near the forward end of the guide e^5 is a shoulder e^7 , (see Fig. 17,) over which the locking-bolt passes as the handpiece arrives at its forward position with the breech completely closed, the said bolt engaging with the said shoulder, as shown in Fig. 3, and thus preventing rearward movement of the handpiece and opening of the breech until the said bolt n is pressed down into line with the groove e^5 .

The lock-carrying plate n^2 is pivoted at m^3 on the same pivot as the trigger, said trigger and lock being capable of independent movement on the said pivot and having a spring n^3 interposed between them, so as to tend to throw the upper part m^3 of the trigger downward—that is, to throw the trigger itself forward—and tending to throw the lock n upward, so that the said lock bears against the upper wall of the guide e^5 as it travels therein and is thrown up past the shoulder as soon as it arrives in line therewith, its upward movement being arrested by the shoulder e^7 , and thus leaving the spring n^3 acting to hold the trigger forward and downward. A portion m^5 of the trigger stands under the bolt n , and thus prevents the trigger from being pulled as long as the bolt n remains in the guide-groove e^5 ; but when the said bolt is thrown up over the shoulder e^7 to lock the handpiece and breech mechanism it permits a sufficient movement of the trigger to operate the sear and release the hammer. Thus the locking device n locks the trigger, so that

it cannot be pulled and the gun fired until the breech mechanism is completely closed, and said locking device then locks the breech mechanism, but unlocks or releases the trigger. A downward pressure on the upper end of the plate n^2 (which is within the forked upper end of the trigger, as before stated) will, however, disengage the lock and release the handpiece, so that the breech may be opened and the gun reloaded.

The parts thus far described co-operate with the hammer o , which is substantially a round bolt (best shown in Fig. 2) working in a longitudinal bore in the tang c^2 of the breech frame-piece, the mainspring o^2 being interposed between the rear end of said bolt and a rear support, shown as a screw e^3 , turning into the rear end of the bore in the piece c^2 far enough to permit the fastening-screw e^3 to pass through the said frame-piece c^2 at the rear of the said screw o^3 . The forward end of the hammer is of reduced diameter, as shown at o^4 , to pass through an opening in the rear abutment c^2 of the receiver to act upon the firing-pin composed of two sections p p^2 , working in suitable bores in the two sections d h of the breech-block, so that when the breech-block is closed the sections of the firing-pin are in line and in contact from the point at the front of the hammer opening in the rear abutment to the primer of the cartridge, so that the blow of the forward end o^4 of the hammer will explode the cartridge in the usual manner.

The portion p of the firing-pin has its longitudinal movement limited, as usual, by a transverse pin p^3 (see Fig. 3) crossing a notch in the side of the firing-pin, and the portion p^2 of the firing-pin has a vertical notch cut in its side, as shown in Figs. 4 and 6 and in dotted lines Fig. 3, which is engaged by a finger h^5 , formed on the rear portion h of the breech-block, so that the dropping of said rear portion of the breech-block on its pivot in the act of opening the gun positively retracts the fore part p^2 of the firing-pin and prevents the possibility of premature explosion of the cartridge in the act of closing the breech, as might occur if the firing-pin were not positively retracted and happened to stick in the forward position in which it was left after firing the last cartridge.

The fore-end of the hammer has pivotally connected with it at o^5 a projecting finger o^6 , that extends through a longitudinal slot in the under part of the rear-extension c^2 of the breech frame-piece in position to be engaged by the upper rear corner of the rear portion h^3 of the breech-block as it is drawn back from the closed to open position; the line of movement of the corner of the breech-block being very slightly divergent from that of the hammer, so that after a rearward movement sufficient to cock the hammer the corner of the breech-block slips off from the projection o^6 and may then move farther to the rear without producing further effect on the ham-

mer. The said hammer is provided with a full-cock notch o^7 , which is engaged by the sear r , pivoted at r^2 , and acted upon by a spring r^3 , that tends to throw its end into engagement with the notch of the hammer, which may also be provided, as shown, with an underent half-cock notch o^8 if it is desired to leave the hammer at half-cock, and the said hammer is also provided with a handle o^9 , working on top of the frame-piece c^2 and having a tongue which passes through the longitudinal slot in the said frame-piece and is mortised into the hammer and fastened by a pin o^{10} , so that the hammer can be controlled by hand, if desired, for cocking or letting it down in the usual manner. The said finger-piece extends along the frame-piece far enough to cover the slot in the frame-piece in all positions of the hammer.

The tang c^2 of the breech frame-piece is provided with a transverse bore, (best shown in Fig. 3,) through which the pivot-pin o^5 of the cocking-finger o^6 and the fastening-pin o^{10} for the mortise of the cocking-handle o^9 may be driven into place or driven out in the operation of assembling or taking apart the gun, it being necessary in assembling to first introduce the hammer in its bore and then to introduce the cocking-finger and tongue of the cocking-handle through their proper slots in the frame-piece and fasten them to the hammer by driving in the pins.

In the act of opening the breech the hammer is moved to full-cock by the engagement of the breech-block and finger o^6 , as before described, and is caught and held there by the sear engaged with the notch o^7 , and the finger o^6 is loosely connected with the hammer by the pivot o^5 , so that it can turn forward slightly, so as not to bear on the breech-block when it is moved forward to close the gun, the said breech-block in the cocking operation carrying the hammer a little farther back than necessary to bring the notch o^7 over the sear in order to insure certainty of engagement by the sear.

When the breech mechanism is locked by the locking device n in closed position ready for firing the gun, the rear end m^3 of the trigger is immediately under the sear, as shown in Fig. 3, so that pulling the trigger disengages the hammer and causes the gun to be fired in the usual manner. The trigger-engaging end of the sear is forked like the trigger and has mounted within it upon the same pivot and capable of independent movement thereon a lock-releasing device t , the lower end of which lies directly over the upper end of the lock-plate n^2 (see Figs. 3 and 7) when the breech is closed, while the upper end of said releasing device t enters a groove in the under part of the hammer, the rear end of which groove is curved down, forming a cam, as shown at t^2 , Figs. 2 and 11, so that just as the hammer arrives at the extreme forward position in the act of firing the gun the said cam t^2 presses the releasing device t down-

ward against the locking-plate n^2 , depressing the latter and the locking-bolt n off from the locking-shoulder e^1 , so that the handpiece k may be moved to the rear. As the hammer is permitted to strike by the operation of pulling the trigger and the explosion is almost instantaneous after the pull of the trigger, the unlocking of the handpiece k takes place almost simultaneously with the explosion, and as the operator is pulling to the rearward on the trigger the handpiece will immediately move back, so that the operator by a slight additional exertion will quickly draw it wholly to the rear and open the breech of the gun preparatory to reloading by the return forward movement of the handpiece. Such release, however, although following the discharge at an almost inappreciable interval of time, is never quick enough to permit the removal of the breech-block to make it ineffective to withstand the shock of the explosion, although there appears to be some gas-pressure exerted on the cartridge-shell after the unlocking takes place, which contributes to the rearward movement of the breech-block produced by the operator, and thus makes the act of opening the breech and ejecting the shell of the fired cartridge preparatory to reloading to a large extent automatic and far more rapid than with breech mechanism that is operated by a swinging lever, in which the movement for opening the gun is in the opposite direction to the pull of the trigger, and thus requires a distinctly different muscular action of the operator instead of what is merely a prolongation of the action by which the gun is discharged, as is the case with the present gun.

The shell extracting and ejecting mechanism is best shown in Figs. 3 and 4. It consists of a bolt u , working in the forward end of the fore part d of the breech-block and pressed forward by a stout spring u^3 , Fig. 3. The fore part p^2 of the firing-pin works through the lower part of this bolt, the front end of which is thus of sufficient size to engage with a considerable portion of the rear end of the cartridge, (see Fig. 8,) and is pressed back flush with the front end of the breech-block by the reaction of the cartridge when the breech-block is forced up to closed position, the front end of the breech-block being recessed slightly, as shown, to receive the rim of the cartridge within it. (See Fig. 3.)

At the side of the breech-block adjacent to the opening c^4 in the side of the frame is placed the extractor u^3 , (shown as a fork-shaped spring,) one branch of which passes into a longitudinal opening from the rear of the block d , while the other branch extends along the side of the block, which may be slightly grooved to receive it, and is provided with a shoulder u^4 , that engages the forward end of the block to hold the ejector in place therein, and with a second shoulder u^5 at the rear of the beveled end u^6 , which second shoulder engages with the rim of the cartridge

When the breech-block is closed, the inclined and springing the ejector outward to cause its shoulder u^5 to pass over the rim of the cartridge as the breech-block comes to closed position. When the breech-block is drawn back, the shoulder u^6 hooking over the rim of the cartridge-shell extracts it from the barrel in the usual manner, and it also constitutes a fulcrum about which the shell may turn under the action of the spring-bolt ejector u , the spring-pressure of which tends to turn the cartridge-shell from the full to the dotted line position, Fig. 4, and it is so turned the instant the fore end of the cartridge-shell in its movement of extraction clears the rear end of the barrel, the spring thus giving the shell a sudden movement from the full toward the dotted line position by which it is thrown out from the opening a^4 , which is then uncovered by the slide c^8 .

In order to assist the ejector action in case the cartridge should stick, the side of the receiver opposite to the opening c^4 is provided with a projection w^7 , which in the rearward movement of the block d would (if the spring-bolt failed to act) engage with the head of the cartridge-shell at the side opposite to the part engaged by the extractor, and thus tend to turn the cartridge in the same direction that the ejector-spring tends to turn it, as before described, and as the opening movement of the breech is usually a quick one the shell will be thrown out with absolute certainty.

The operation of the gun may be briefly described as follows, assuming the magazine to be full and a shot to have been already fired: The hammer is in the forward position and the lock n is therefore depressed by the device t and the handpiece unlocked. The operator then pulls the handpiece to the rear to its full extent, bringing the parts to the position shown in Fig. 2, (dotted lines, Fig. 1,) in which movement the extractor and ejector removes and throws out the shell of the cartridge last fired and the magazine-spring presses a new cartridge out from the magazine, the head of said cartridge bearing against and following the projection d^2 at the front ends of the breech-block until just as the latter arrives at the rear position its shoulders d^3 engage the wings f^5 of the carrier, lifting its forward end, and thus bringing the cartridge which has been pressed from the magazine out upon it into position with its forward end in line with the barrel. In this movement the rear end of the rear part of the breech-bolt has brought the hammer to full-cock by acting on the finger o^6 . Then the operator moves the handpiece forward, the projection d^2 and front end of the breech-block forcing the cartridge ahead of it into the gun-barrel, and both parts of the breech-block being finally brought into line with one another and against the abutment c^3 and the handpiece being locked in this position by the lock n . In this closing movement the link i , acting on the wings f^5 , turns

the carrier back to its lowermost or normal position, and the projection d^2 then holds the column of cartridges in the magazine until the next operation. In the final part of the forward movement of the breech-block the spring-ejector bolt u is pressed back flush with the breech-block and the extractor-shoulder u^5 carried over the edge of the rim of the cartridge. The gun is then fired by pulling the trigger and the series of operations just described repeated when desired to fire the gun again, said operations requiring only a single backward and forward movement of the hand of the operator, which can be made in an extremely-short interval of time.

The herein-described construction of the frame and mechanism contained therein is very safe, as all the moving parts of the breech mechanism are inclosed in a substantially solid walled chamber having only the opening for the ejection of the shells, which opening is on the side away from the person firing the gun, so that if there should be an accidental explosion of a cartridge in the receiver or any failure in the breech mechanism to operate properly such explosion could not injure the user of the gun, as none of the moving parts could get out of the frame except through the side opening.

The arrangement by which all the operating parts of the breech mechanism, except the hammer, may be connected in operative position and assembled on the under frame-piece while out of the gun is very convenient, as by the simple removal of the two fasteningscrews e^2 e^3 the entire mechanism may be withdrawn without separation and rendered accessible for the purpose of cleaning, &c.

I claim—

1. The combination of the main frame-piece constituting a receiver connected with the breech of the barrel and provided with an abutment at its rear end with the under frame-piece and two-part jointed breech-block, and means for operating the same, connected with said under frame-piece, as described, whereby said under frame-piece and the breech-block and its operating mechanism may be removed without separation from the main breech frame-piece, substantially as described.

2. The combination of the main breech frame-piece constituting a receiver communicating with the barrel and magazine and provided with an abutment at the rear of said receiver in line with the barrel with the under frame-piece and carrier pivotally connected therewith and the breech-block and its actuating mechanism connected with the said under frame-piece for removal without separation of its parts from said main breech frame-piece, substantially as and for the purpose described.

3. In a breech-loading firearm, the barrel and receiver connected therewith, having an abutment at its rear end in line with the barrel, and a two-part breech-block having its

front and rear sections hinged together and adapted to be interposed in line with one another between the breech of the barrel and said abutment, combined with operating means 5 for withdrawing the said breech-block from the breech of the gun and for moving it into position between the breech and the abutment, a lock for holding the said operating means, with the breech-block, in closed position, a 10 firing-hammer, and releasing device for said lock, operated by said hammer, substantially as described.

4. The combination of the main breech frame-piece connected with the breech of the 15 barrel and provided with an abutment at the rear thereof with the two-part jointed breech-block and sliding handpiece connected therewith, the trigger pivoted in said sliding handpiece, and a lock co-operating with the said 20 trigger and handpiece, as described, to lock the trigger, except when the breech is closed, and to lock the handpiece and release the trigger when the breech is closed, substantially as described.

5. The combination of the main breech frame-piece connected with the breech of the 25 barrel and provided with an abutment at the rear thereof, the breech-block and actuating handpiece connected therewith, the trigger connected with the said handpiece, and lock 30 co-operating with said handpiece, as described, to lock the breech-block in closed position, and the releasing device for said lock operated by the hammer, substantially as described. 35

6. The combination of the hammer with the sear having a forked trigger-engaging end, the breech-block and mechanism for operating the same, the trigger and lock connected with 40 the said breech-block-operating mechanism, said trigger having a forked sear-engaging end, and the releasing device for said lock, working in the forked engaging end of the sear and operated by the hammer, substantially as described. 45

7. The combination of the breech-block with the extractor, consisting of a forked spring having one branch of the fork in a longitudinal bore in the breech-block and the other 50 branch of the fork extending along the side of the breech-block and projecting beyond the forward end thereof and provided with a shoulder and inclined at its forward end to engage

with the rim of the cartridge-shell, substantially as described. 55

8. The combination of the breech-block *d* with the extractor for engaging the rim of the shell and the spring-pressed ejector-bolt in the forward end of said breech-block, provided with a central passage for the firing-pin, substantially as described. 60

9. The combination of the magazine and barrel and breech frame-piece constituting a receiver in which the cartridges are transferred from the magazine to the barrel, with 65 the carrier *f*, pivoted at its rear end in said receiver, and the spring-retainer *f*⁶, fastened at its rear end to the said carrier and having its forward spring end projecting below the forward end of the carrier to act as a stop to 70 prevent escape of cartridges from the magazine when the carrier is in position to guide the cartridge above it into the gun-barrel, said projecting end being adapted to yield to permit cartridges to be introduced into the magazine below said carrier, substantially as described. 75

10. The breech frame-piece constituting a receiver and the barrel and magazine communicating therewith, said frame-piece being 80 open at its under side, combined with the pivoted carrier *f*, having laterally-projecting ribs *f*⁸ along the lower edges of its side, the said receiver having its lower portion widened to receive said ribs and being provided with 85 shoulders *c*⁸ to engage said ribs and limit the pivotal upward movement of the carrier, substantially as described.

11. The breech frame-piece constituting a receiver closed at the top and provided with 90 an abutment at its rear end and having one of its side walls provided with an opening, combined with a sliding cover for said opening and a breech-block longitudinally movable in said receiver and engaged with said 95 sliding cover, the top side and rear walls of said receiver being otherwise closed and continuous, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of 10 two subscribing witnesses.

DERRICK S. WEST.

Witnesses:

JOS. P. LIVERMORE,
M. E. HILL.