

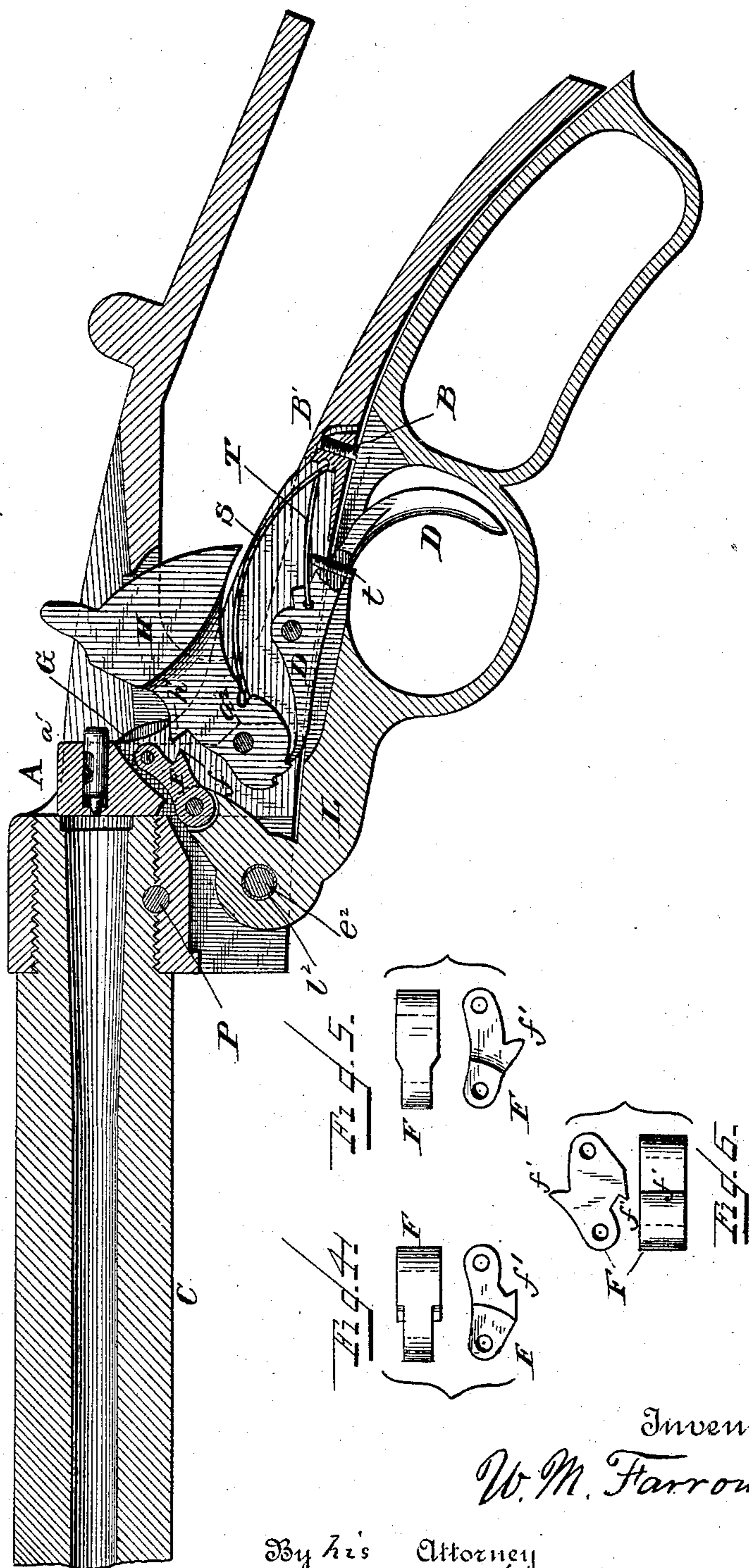
(No Model.)

2 Sheets—Sheet 1.

W. M. FARROW.  
BREECH LOADING FIRE ARM.

No. 372,213.

Patented Oct. 25, 1887.



Witnesses  
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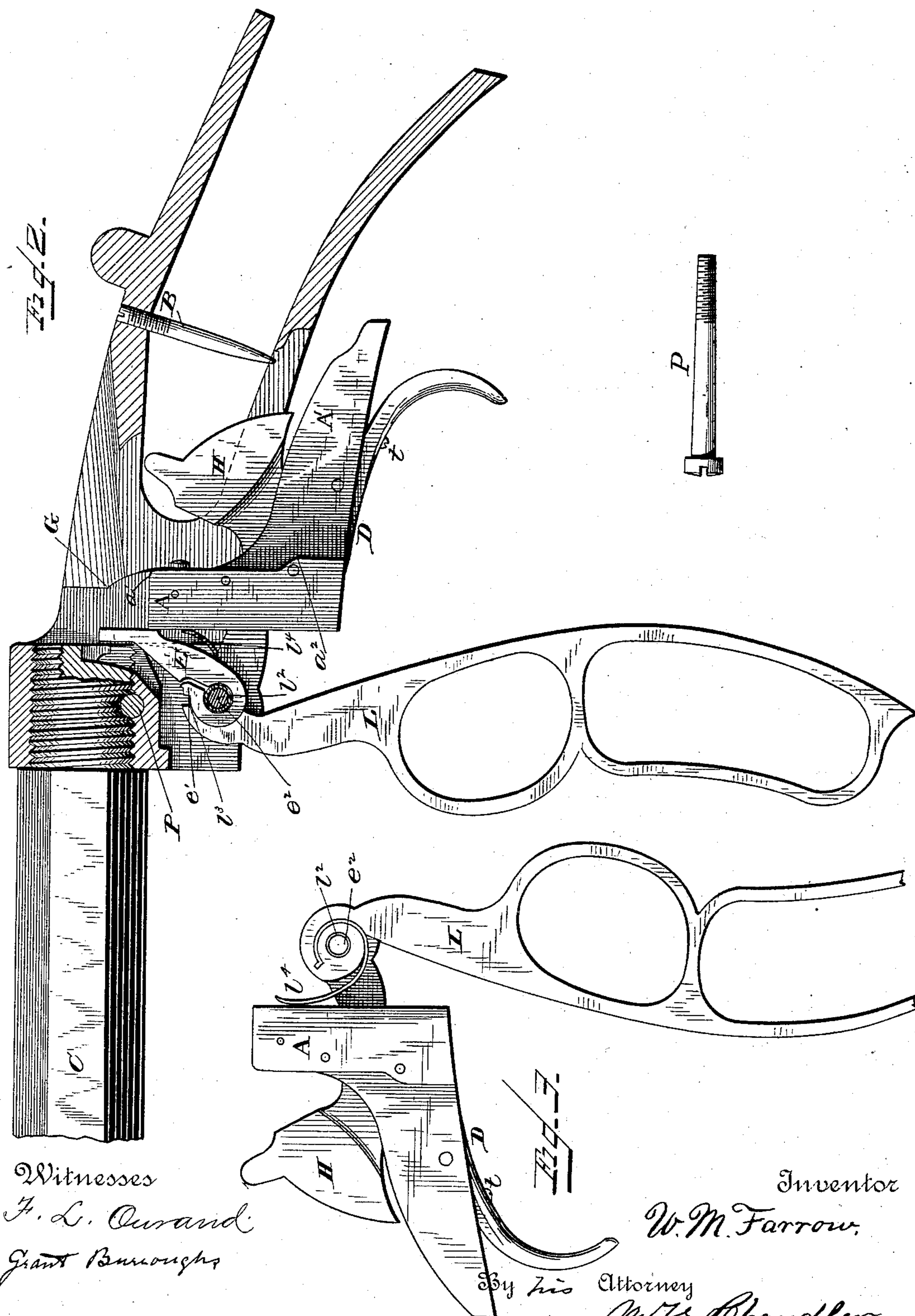
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# UNITED STATES PATENT OFFICE.

W. MILTON FARROW, OF BRATTLEBOROUGH, VERMONT.

## BREECH-LOADING FIRE-ARM.

SPECIFICATION forming part of Letters Patent No. 372,213, dated October 25, 1887.

Application filed January 27, 1887. Serial No. 225,674. (No model.)

*To all whom it may concern:*

Be it known that I, W. MILTON FARROW, a citizen of the United States of America, residing at Brattleborough, in the county of Windham and State of Vermont, have invented certain new and useful Improvements in Fire-Arms; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention consists in certain novel devices and combination of devices constituting a breech-loading mechanism; and it has for its object to provide a simple, easily understood and operated weapon, adapted for sporting or military purposes; to make all parts of the mechanism readily accessible without removing the parts from the breech-mortise; to make the breech-block and its extension contain the entire firing mechanism in operating position and detachable from the breech by removal of a single assembling screw; to make the barrel readily detachable for convenience in transportation; to make a weapon readily convertible to a self-cocker, or vice versa; to provide for exact adjustment of the breech-block in its closed position and retaining it in such position; to provide an improved trigger-action, whereby the release of the hammer is without jar or disturbance to the aim; to provide an improved and adjustable mainspring and to make both trigger-pull and mainspring adjustable in tension; to cushion the shock of the finger-lever when thrown forcibly to the open position and to automatically return said lever to a partially-closed position position; to provide an extractor that shall act as a rigid lever in starting the shell and as a spring to eject it after starting, and, finally, in combinations of these parts.

In the drawings, Figure 1 is a vertical longitudinal section showing all the parts in position ready for firing; Fig. 2, a like view, partly in section, with the breech-block open in readiness for loading, and a perspective view of the conical bolt for attaching the barrel to the breech, which may be a plain bolt without head or screw; Fig. 3, a view from the opposite side of the foregoing, showing the breech-block, firing mechanism, and lever removed from the gun; Fig. 4, a plan and elevation of the link used when the hammer is to

be retracted by the thumb in the usual way; Fig. 5, similar views of the link that is substituted to make the weapon self-cocking in the act of loading, and Fig. 6 a reversible link which may be used in place of those shown in Figs. 4 and 5.

In the drawings, A is the breech-block, having the lower rear extension, A'. This extension is of less width than the vertical portion, and is approximately at a right angle thereto. Both the horizontal portion of this extension, with the exception of its rear end, and the lower portion of the vertical breech-block are mortised or slotted, and in this slot are pivoted the hammer H, trigger D, and actuating-link F, and this slot also contains the mainspring S and trigger-spring T.

The firing-pin is mounted in the usual manner in the upper portion of the breech-block, which is thus made to contain all parts of the firing mechanism in their operative positions and wholly unattached to the frame of the breech.

The vertical portion of the breech-block has a flat front face. Its upper portion is of solid metal, and has a rear vertical face,  $a'$ , and the lower portion has rear vertical shoulders,  $a^2$ , both the rear face and shoulders being parallel with the front face, though they are in different planes, owing to the lower end of the breech-block being of greater thickness than the upper end, forming an offset,  $a^2$ , on the rear of the sliding block near its lower end.

The breech-block slides in vertical ways in the frame, these ways being narrower at top than at bottom, vertical both front and rear, the latter, however, being vertical from the top downward to the level of the lower part of the bore, where there is an abrupt offset, G, making the mortise of a width to fit the thicker lower part of the breech-block, and the mortise is then continued vertically downward through the frame, so that the breech-block can only be inserted from below.

The guard and operating lever L is slotted for the reception of the fingers and contains an opening for the trigger. This lever conforms to the contour of the frame, and is pivoted at its forward end in front of the breech-block and opposite its lower end by a screw-bolt,  $e^2$ , which is the assembling-pin of the mechan-

ism. By the removal of this pin the firing and extracting mechanism, comprising all movable parts of the system, may be withdrawn from the frame, and while so withdrawn the tension of the various parts may be adjusted, &c. The lever L is of the bell-crank or elbow-lever order, the short arm being turned upward and backward at something more than a right angle. A link, F, pivoted within the slot of the breech-block and to the short arm of the lever, connects and operates the parts. This link F may be made, as shown in Fig. 4, with a short projection,  $f'$ , to merely set the hammer on the safety or half-cock notch, or may be made, as in Fig. 5, to bring the hammer to full-cock in the act of loading. In this case I design to furnish one of each with each weapon, the gun being convertible to a self-cocker by exchanging the links; or I may make the link as shown in Fig. 6, in which case this link is turned end for end when a self-cocker is desired.

The extractor E constitutes an important part of my invention. It is pivoted upon the guard-lever by means of an annular groove countersunk around the pin-hole  $e^2$  in such a manner as to leave a ring of metal,  $l^2$ , surrounding the pin, and which forms a bearing or pivot for the extractor when the pin is withdrawn. This extractor has normally a loose bearing upon the ring of metal  $l^2$ , but fits closely the outer circumference of the groove in the guard-lever in which it rests, and it has a curved slot,  $e'$ , cut entirely through it from a point,  $e$ , on its surface to the pivot-hole. The surface  $e$  forms a shoulder, against which abuts a corresponding shoulder,  $l^3$ , on the guard-lever. Upon the opposite side of the guard-lever is a curved spring,  $l^4$ , permanently attached to the lever in a groove surrounding the assembling pin  $e^2$  and pressing at all times against the front face of the breech-block A.

The hammer has upon its front face, about midway between its pivot-pin and the firing-pin, a projection,  $h'$ , for engaging the projection  $f$  of the link F, and upon its lower extension has the usual safety and firing notches.

The mainspring S may be of uniform thickness throughout, and its rear end bears in a slot in the rear end of the rear extension of the breech-block and its front end in a groove in rear of and above the pivot of the hammer.

The trigger D contains in a slot in rear of its pivot a spring, T, adjustable in tension by a set-screw,  $t$ , the rear end of this spring bearing upon the mainspring S, as shown in Fig. 1. This is of especial importance in military weapons, as the action of the springs at the instant of discharge obviates that jar always found in rifles having the military pull of six pounds, which is so disastrous to the correct aim and poise of the weapon, especially in off-hand shooting. The set-screw B in the extreme extension A' of the breech-block bears against a recess in the frame.

P, Fig. 1, is a conical bolt, screw-threaded on its end and passing through a conical hole

in the threaded portion of both frame and barrel, and serving to wedge and lock the barrel rigidly yet detachably to the breech-frame; but as this pin P forms a part of and is claimed in another application for patent filed by me on the 9th day of September, 1887, bearing Serial No. 249,276, it is not claimed in this.

The operation of this mechanism is as follows, supposing the weapon to have been fired: The lever L is thrown downward in the usual manner, thus turning the short arm of the lever around the pin  $e^2$ . This brings the projection  $f$  of the link F against the projection  $h'$  of the hammer, and places the hammer upon the safety or half-cock position while holding the breech-block stationary. This releases the firing-pin and dispenses with a retracting-spring for the same. Continuing the movement of the lever, the breech-block is now drawn downward by a vertical pull upon the breech-block through link F, the block sliding vertically until its top  $a'$  passes below the shoulder G of the frame, and the offset  $a^2$  of the breech-block passes below the frame. The breech-block is then carried bodily backward and downward, though maintaining its vertical position under the pressure of the spring  $l^4$ , and thence vertically downward to the end of its movement. Just before the shoulders  $a'$  and  $a^2$  pass below the offset G and the lower edge of the mortise in the frame the shoulder  $l^3$  of the lever strikes the shoulder  $e'$  of the extractor E and coils it closely around the ring of metal forming its pivot. This ring of metal is a part of the lever L, and as the long arm of the extractor is rigidly held by the shell the slot in E is closed and the extractor becomes practically a part of the lever L and acts as a rigid bar of metal. At this instant the shoulders  $a'$  and  $a^2$  pass below the point G and lower edge of mortise, and the breech-block in its downward movement clears the lower edge of the head of the shell, so that the breech-block is suddenly thrown backward by the spring  $l^4$ . The extractor now acts as a spring by the sudden opening of the compressed circular portion and ejects the shell from the weapon. The spring  $l^4$  arrests the lever in its lowest movement without the shock that would follow the contact of metallic shoulders and returns the lever partially to its closed position and within easy reach of the fingers of the operator. This movement also removes the shoulder  $l^3$  of the lever from the shoulder  $e'$  of the extractor, so that the latter may move freely back to place. Another cartridge being placed in the barrel moves the extractor easily before it without disturbing other parts of the mechanism, and ordinarily can be easily pressed home with the thumb; but if, as sometimes happens, the shell sticks, with the head projecting, or is carelessly left some distance from place, it is forced in in the act of closing the breech. This is accomplished as follows: The breech-block rises vertically with its rear face held against the rear lower portion of the mortise by the backward and upward thrust of the link F and

the pressure of the spring  $t^1$ , and with its front face at some distance from the front of the mortise, so that it passes upward behind the shell, then upward and forward, forcing the shell to its proper position, and then vertically upward to bring the firing-pin opposite the primer and complete the closing of the breech. Just as it reaches its fully-closed position the end of the extension, with its adjustable set-screw B, comes in contact with the frame and causes the breech-block to jam or bind in its mortise, thus holding the breech frictionally closed. The parts really give or spring sufficiently for this purpose, and at the same time secure, in connection with the spring  $t^1$ , another important advantage in having the breech-block held firmly back against the rear wall of the mortise instead of being forced back by the shock of firing, as any yielding of the breech-block, though apparently infinitesimal, stretches or elongates the shell to that extent each time it is fired.

It will be noticed that the assembling-pin, the pivot connecting the link F to the lever, and the pivot connecting the link to the breech-block are contiguous to or in a direct line when the breech is fully closed and hold it securely in place.

The mainspring S may, if desired, be rigidly attached to the rear of the extension and act in the usual manner upon the hammer; but I prefer the construction shown in Fig. 1, in which the ends merely have a bearing in the extension and hammer and act upon the latter by an end-thrust above the pivotal point. The spring in this way is simply bowed or bent in the act of cocking the hammer, and straightens out when the hammer is released, giving a quicker and sharper blow than when the spring moves bodily upward in the usual way. I have, however, in this instance another object that is subserved by this sudden straightening of the mainspring. It will be noticed that the trigger-spring T bears upon the curved under side of the mainspring at some distance from its end and is adjustably pressed against such surface. Now, when the backward and upward pressure of the finger releases the trigger from the detent, the further recoil of the trigger is arrested by the reaction of the mainspring, which, straightening at this instant, presses sharply upon the trigger-spring in opposition to the finger-pressure and holds it stationary, so that the shock or jar hitherto inseparable from the sudden release of the trigger and gripping of the fingers about the stock that accompanied such release is avoided, and the poise of the weapon and aim are not disturbed at the instant of firing. This adjustable pressure of the trigger-spring also brings an adjustable addition to the tension or force of the mainspring.

I am aware that it is not new to employ a sliding breech-block having a wedging or tilting action, as in the Sharp and Spencer fire-arms used in the late war, or such as shown in the patents to Freund, No. 180,567,

August 1, 1876, and No. 211,728, January 28, 1879. In the Spencer and Freund devices the block in closing is rotated or tilted forward, driving the cartridge to its seat, and then slides vertically to secure it. In my device the breech-block is in all positions vertical or parallel with the ways in which it slides, and is pressed firmly backward against the rear face of its mortise, and this, together with its forward and backward movement, constitutes a distinctive feature of my invention.

I do not limit myself to the exact construction shown.

Having now described my invention, I claim—

1. In a breech-loading fire-arm and in combination with the actuating-lever and firing mechanism, the reversible link connecting the breech-block and operating-lever for converting the weapon to or from a self cocker, as set forth and described.

2. In a breech-loading fire arm and in combination with the sliding breech block and its mortise, the set-screw in or bearing against the lower rear extension of the breech-block, whereby the latter is adjusted in closed position and frictionally held against accidental opening, as set forth.

3. In a breech-loading fire-arm, the adjustable bearing for the rear end of the breech-block extension, in combination with the vertically-sliding breech-block, its actuating mechanism, and vertical mortise, whereby the block is cramped into frictional engagement with its mortise at the instant the breech is fully closed.

4. In a breech-loading fire arm, the extractor having a curved slot extending through it to the pivot-hole and the shoulders on either side of the slot, whereby when subjected to force the shoulders are brought together, constituting a rigid lever, though under a spring-tension, as described.

5. In a breech-loading fire-arm, the combination of the lever for engaging the extractor, the extractor having a corresponding shoulder, and the prolongation for engaging the rim of the cartridge, and having the metal between these points cut through to the pivotal point, whereby the metal surrounding the pivot may be compressed to form an ejecting-spring, as shown and described.

6. In a breech-loading fire-arm, the guard or operating lever pivoted upon the assembling-pin and having an annular groove in its side and a ring of metal between this groove and the pin, in combination with the extractor having a bearing upon said ring, whereby the extractor is retained in position when the pin is withdrawn and the mechanism is removed from the mortise, as set forth.

7. In a breech-loading fire-arm, the combination of the trigger-spring with the mainspring, the former adjustably bearing against the latter, whereby the tension of the trigger-spring and finger-pull is added to that of the mainspring, while the reaction of the

mainspring subjects the trigger-spring to further compression at the instant of firing, as set forth.

8. In a breech-loading fire-arm, the trigger-spring having its bearing upon the mainspring and having constant pressure against the same, the mainspring throwing toward the trigger-spring when in action, in combination with the hammer and detent, whereby when the trigger is released the sudden movement of the mainspring arrests the further movement of the trigger.

9. In a breech-loading fire-arm, the combination of the trigger-spring having adjustable and constant bearing against the mainspring, which in action throws toward or in opposition to the trigger-spring, whereby the reaction of the latter at the instant of firing may be adjusted to hold the trigger stationary after it slips from the detent of the hammer, as set forth.

10. In a breech-loading fire-arm, the flat mainspring having end-thrust bearings upon the hammer and extension of the breech-block, whereby the spring is bowed or bent in the act of drawing back the hammer, in combination with the trigger-spring bearing upon the mainspring at a point between its ends and adjustable in tension thereon, whereby the mainspring in becoming extended forcibly arrests the recoil of the trigger and holds it stationary in resistance to the pull of the finger.

11. In a breech-loading fire-arm having a slotted or mortised frame and vertically-sliding breech-block, the combination of the guard-lever and the curved or helical spring bearing against the front face of breech-block, whereby the latter is held in firm engagement with the rear face of the mortise and maintained in a vertical position while being opened and closed.

12. In a breech-loading fire-arm, the combination of the lever having a shoulder to engage the extractor and the spring-extractor having like shoulder, with the spring  $\ell^t$ , which presses against the breech-block and which partially returns the lever to its closed position, whereby the shoulders of the lever and extractor are automatically separated after ejection of the shell and the extractor left free to be pressed back to place without moving the lever, as set forth.

13. In a breech-loading fire-arm, the breech-block having the lower rear extension of less width than the vertical portion and the upper and lower rear bearing-shoulders connected by the inclined offset with the correspondingly-mortised frame, the inclined actuating link and lever, and the coiled spring  $\ell^t$ , carried by the

lever and pressing against the breech-block, whereby the breech-block is at all times maintained in a vertical position and held in firm contact with the rear face of the mortise in all positions when opening and closing, as set forth.

14. In a breech-loading fire-arm, the combination of the sliding breech-block, the vertically-mortised ways, the actuating-lever having elbow or bell-crank extension, the link pivoted to said extension and to the breech-block and having a projection between its ends, with the hammer pivoted within the breech-block and having a projection upon its surface to engage the projection of the link, whereby the first motion in opening the breech places the hammer at safety-cock.

15. In a breech-loading fire-arm, the combination of the sliding breech-block, the hammer pivoted in a mortise therein and having a projection upon its front surface, with the reversible actuating-link connecting the breech-block and its operating-lever and having upon opposite sides projections to engage that upon the hammer, these projections being of such length that when one side is used the hammer is placed upon safety or half cock and when the other side is used is placed at full-cock in the act of opening the breech, as set forth and described.

16. In a breech-loading fire arm, the combination of a vertically-sliding breech-block having offsets or shoulders, the front face of which is always maintained in a vertical plane, and the mortised breech-frame having corresponding shoulders, with the actuating-lever pivoted in front of the breech-block and connected thereto by the upwardly and backwardly inclined link, whereby the breech-block is made to rise vertically to a point opposite the lower edge of the cartridge-chamber, then bodily upward and forward, still maintaining its vertical position, and then vertically to its closed position.

17. In a breech-loading fire-arm, the mortised breech-block and its lower rear extension, in combination with the actuating-lever and connecting-link, the breech-block and lever containing, when removed from the frame, all parts of the firing, self-cocking, and extracting mechanism in operative position, whereby the tension of the springs may be adjusted to each other and the parts cleaned, examined, and tested while separate from the weapon, as set forth.

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Witnesses:

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