3 Sheets--Sheet 1.

F. W. FREUND.

Breech-Loading Fire-Arm.

No. 160,762. Patented March 16, 1875.

Fig. 1

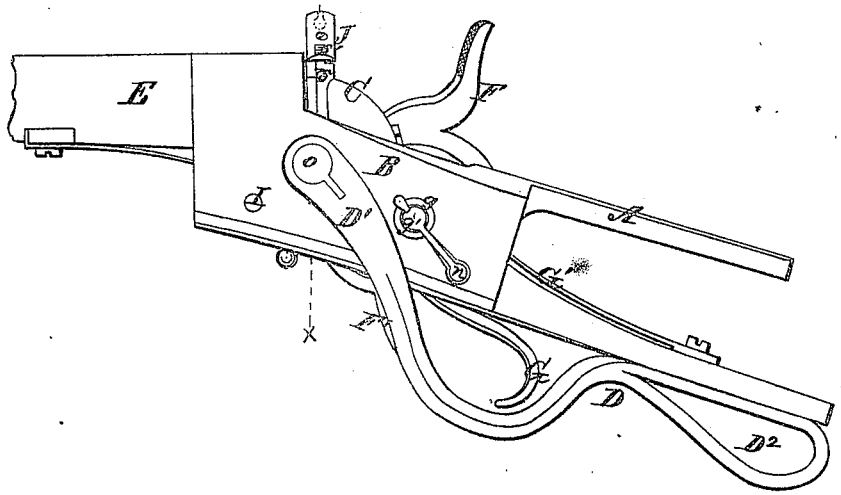
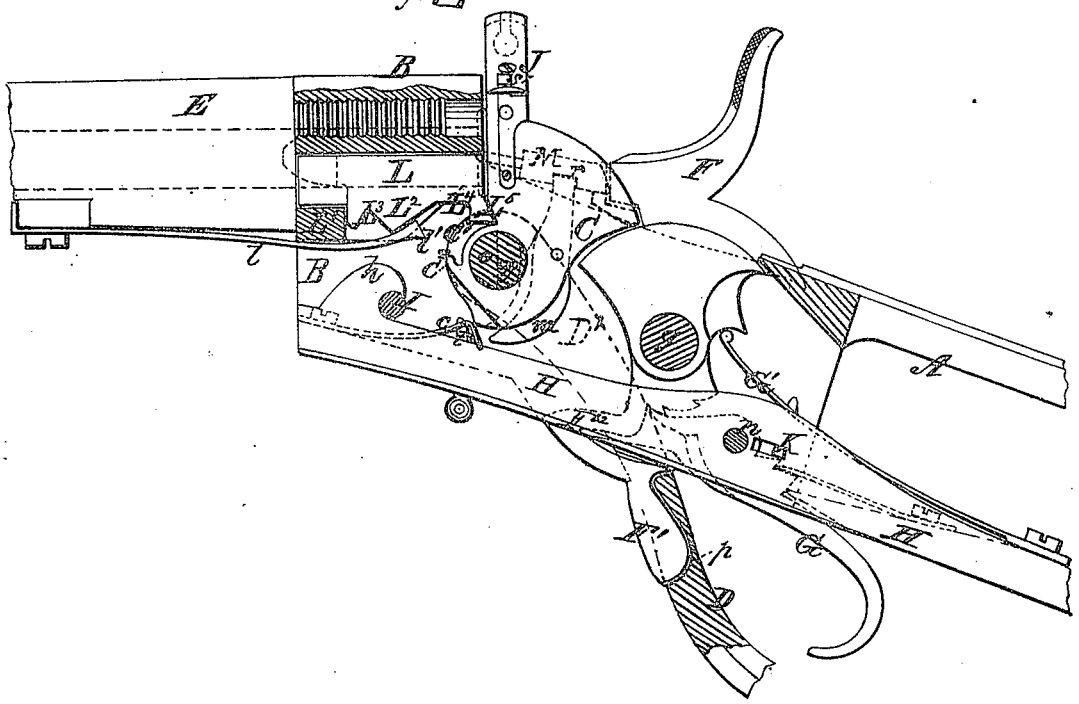


Fig. 2



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Munn, Fennell & Lawrence

3 Sheets--Sheet 2.

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Fig. 3

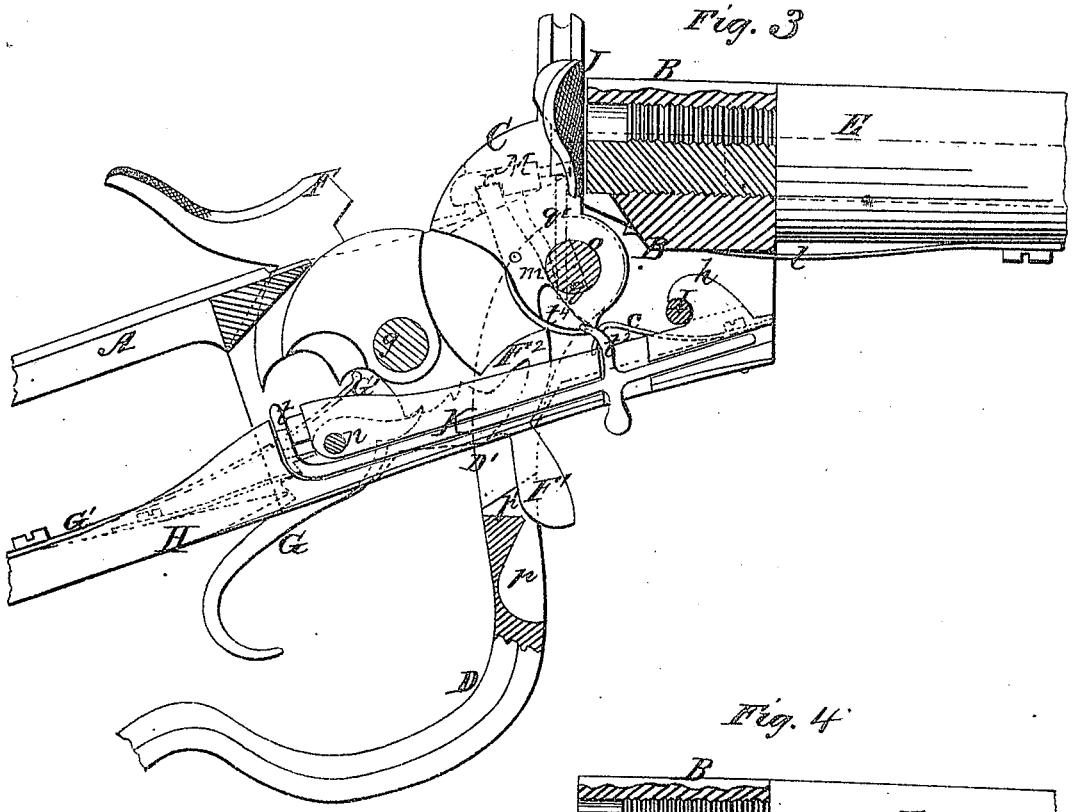

Fig. 4

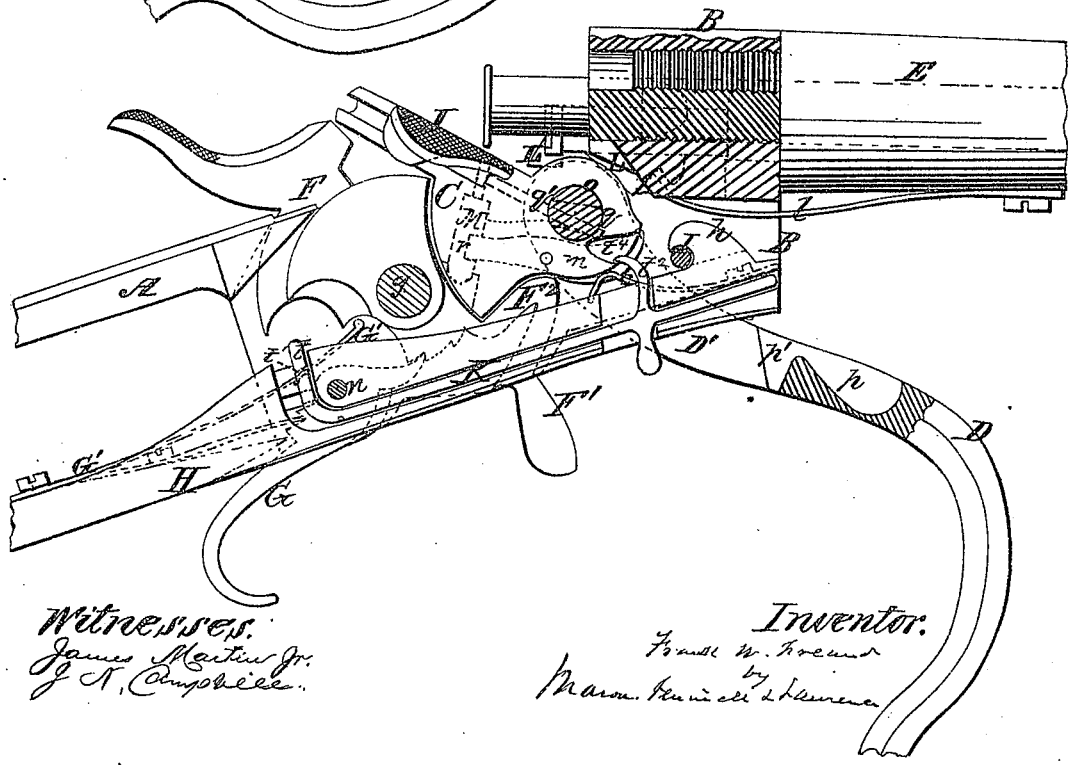

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Fig. 7

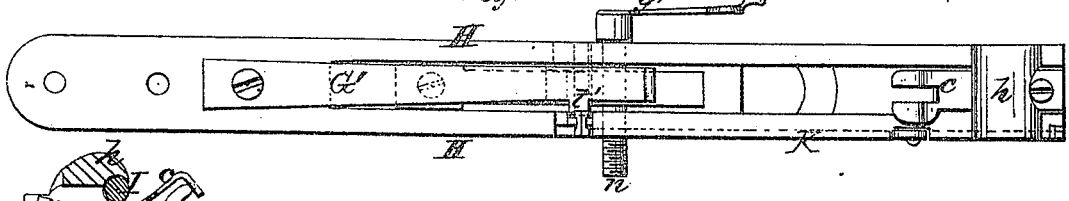


Fig. 8

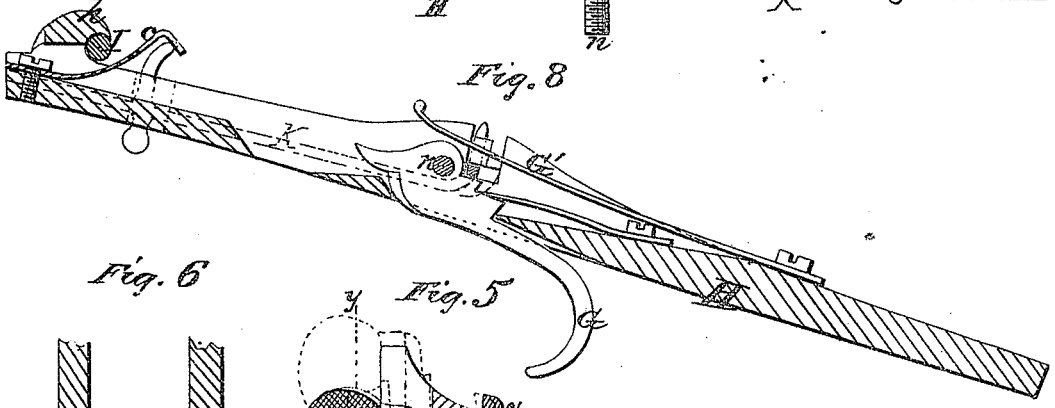


Fig. 6

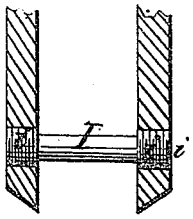


Fig. 5

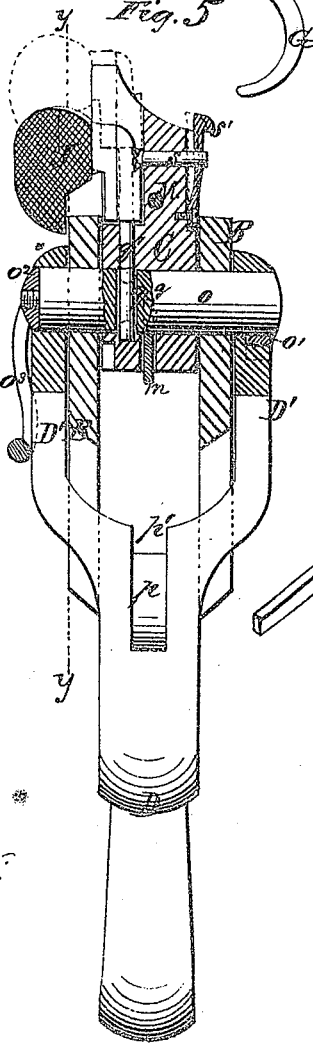
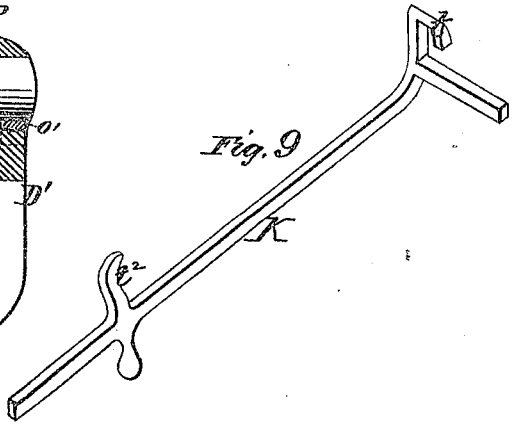


Fig. 9



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UNITED STATES PATENT OFFICE.

FRANK W. FREUND, OF DENVER, COLORADO TERRITORY.

IMPROVEMENT IN BREECH-LOADING FIRE-ARMS.

Specification forming part of Letters Patent No. **160,762**, dated March 16, 1875; application filed June 10, 1874.

To all whom it may concern:

Be it known that I, FRANK W. FREUND, of Denver, county of Arapahoe, Territory of Colorado, have invented a new and useful Improvement in Breech-Loading Fire-Arms; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a side elevation of the arm as it appears after it has been fired. Fig. 2 is a longitudinal section of the arm, in the same position as in Fig. 1. Fig. 3 is a similar section in the line *y y*, Fig. 5, of the arm, cocked, and just previous to having the empty cartridge-shell extracted. Fig. 4 is a similar section of the arm in the line *y y*, Fig. 5, cocked, and with its breech-block thrown back to open the breech, and the empty shell partly withdrawn from the chamber of the barrel. Fig. 5 is a vertical transverse section in the line *x x* of Fig. 1. Fig. 6 is a sectional view of the lugs of the breech, and pin which holds the front end of the trigger-plate. Fig. 7 is a plan of the trigger-plate and its attachments. Fig. 8 is a longitudinal section of the same. Fig. 9 is a perspective view of the slide which latches the hammer spring and hammer-trigger after the hammer is cocked.

The nature of my invention consists, first, in a tail on the lower part of the hammer, in combination with a notch of the guard-lever, the tail and the notch being peculiarly constructed, and enabling me to cock the arm before moving the breech-block by the movement of the lever to open the breech, and after the breech has been opened and the arm loaded, I am enabled to close the breech by the lever without striking the hammer with the lever, so as to interfere on its back movement.

It consists, second, in a nose or cam formed on the tail of the hammer, in combination with a lever and the firing-pin, whereby I am enabled to move the firing-pin back with a positive action, and hold it so after the arm is cocked and during the act of closing the block, and at a time when the block is nearly and quite closed, and then I am enabled to release the pin on the instant that the hammer is set free from its trigger-pawl. Thus, while the greatest safety is insured by a hold upon the firing-pin until the aim is taken and the hammer set free, a percussive blow with the hammer is produced, from the fact that the hold upon the pin is withdrawn the instant the hammer-trigger is drawn.

It consists, third, in a slide for latching the spring of the hammer and hammer-trigger during the act of loading the arm, in combination with the breech-block, whereby the slide is automatically made to latch and unlatch the said spring and hammer-trigger as the breech-block is opened and closed.

It consists, fourth, in a forked guard-lever, which receives the breech between its prongs and fastens rigidly upon a movable pin of the breech-block, in combination with a breech-block which is fitted loosely upon the said pin, and with a sliding thumb-piece having a coupling-pin attached to it, which pin is arranged to enter an oblong passage cut through the pin or pivot whenever it is desired to operate the breech-block by the guard-lever, and occupies a position outside of said passage when it is desired to operate the breech-block by the thumb-piece, whereby a fire-arm is provided in which the hammer can be cocked before the breech-block is opened. The breech-block can be opened and closed by the guard-lever, or by the thumb-piece, and thus, when the huntsman is in a position which necessitates the depression of his gun near the ground, and there is no room for the sweep of the lever, he can, by simply withdrawing the coupling-pin, release the breech-block from its rigid connection with the pin, and then, by taking hold of the thumb-piece, he can open and close the breech-block while the gun is depressed close to the ground. Further, this combination is such that the arm is rendered capable of being operated either by the thumb-piece or guard-lever interchangeably for rapid or slow firing, and in case the guard-lever is broken the arm is not disabled so as to be useless until repaired, as the thumb-piece is interchangeable with the guard-lever. This is a matter of some importance in localities where repair-shops and gunsmiths are not readily reached. This combination is also such that the hammer can be

cocked by the guard-lever first, and then the breech-block opened by a continuation of the movement of the lever.

It consists, fifth, in a transverse spring-pin having a holding-catch, in combination with the thumb-piece and coupling-pin, whereby the thumb-piece, with attached coupling-pin, is held in an elevated position while the breech-block is to be operated by the thumb.

It consists, sixth, in a pin for receiving the hook of the trigger-plate, screw-threaded on both of its ends and screwed into the cheek-plates of the breech, whereby a firm brace between the cheeks and a support for the trigger-plate is provided by the use of a single pin.

It consists, seventh, in the forked guard-lever clasping the two sides of the breech-piece, in combination with the pivot of the breech, extended beyond the cheeks of the breech, and having the prongs of the guard-lever rigidly connected to the extended end, whereby the lever is applied without cutting into the breech or through the trigger-plate, and, while this is the case, can be operated in a more steady and perfect manner than heretofore.

It consists, eighth, in a peculiar construction of a cartridge-shell extractor, in combination with a peculiar spring combined therewith, and with a breech which admits of the arrangement of the extractor directly above the pivot of the breech-block, and in a recess formed on one side of the chamber of the arm. This feature of my invention is such that the extractor is applied and held in position without the aid of a pin or other fastening. Further, but three parts additional to the stock and barrel are necessary in its construction and application—viz., the breech-block, the spring, and the extractor itself. These parts are of such a construction that they are strong and not liable to get out of repair and become deranged; and the effect of the spring as applied is to hold the extractor firmly in place when the breech is closed, and at the proper moment, after the shell has been started out of the chamber by the breech-block, to suddenly act upon the extractor with a straight thrust, and thereby accelerate the discharge of the shell from the chamber of the arm.

To enable others skilled in the art to make and use my invention, I will proceed to describe it.

A represents the stock; B, the breech; C, the breech-block; *c*, its easing and steadying spring; *o*, its pivot or pin; D D^1 D^1 D^2, the guard-lever; E, the barrel, and *q'* the pin by which the guard-lever is coupled to the breech-block; F F^1 F^2, the hammer and its extensions; G, the hammer-trigger, and G' the hammer-spring; H, the trigger-plate; *h*, its hook; I, the hinge-pin of trigger-plate; *i i*, its screw-threaded ends. J is the thumb-piece for operating the breech-block when the lever is not used. K is the slide for latching the hammer-spring and hammer-trigger when the arm is being loaded. L is the cartridge-extractor, and *l* the spring for controlling and suddenly operating it. M is the firing-pin passed loosely through the breech-block, and *m* is the lever by which it is forced back after firing the arm. The hammer is hung and operated in the usual manner upon a pin, *g*, which is confined by means of a spring-catch, *g'*, attached to a screw-pin, *n*, which holds the rear end of the trigger-plate between the cheek-pieces of the breech B. This catch springs into a notched socket in the end of the hammer-pivot, and prevents the said pivot from turning and moving endwise; but by moving the catch aside the pin can be withdrawn. The tail or extension F^1 of the hammer passes outside of the arm through a slot in the trigger-plate, while the extension F^2 projects obliquely toward the breech-block, and is long enough to impinge forcibly upon the lever *m* of the firing-pin when the hammer is cocked and the breech-block about half closed. The guard-lever is constructed with a finger-loop, D^2, at its rear, and forked at its front end, its prongs D^1 D^1 passing up on each side of the breech, and receiving through their perforated ends the projecting ends of the pin *o* of the breech-block C.

The connection between the pin and this lever is made rigid by means of a key, o^1, and a nut, o^2, which screws upon a threaded end of the pin, said nut having a spring-arm, o^3, formed on it to hold the nut from turning by falling into a groove in one of the prongs of the lever. At the junction of the prongs of the lever an oblique socket, *p*, is cut on the front of the lever, and just above this socket a notch, *p'*, is cut in the lever from front to rear.

By this construction, and the extension F^1 of the hammer, the hammer can be cocked when the guard-lever is moved downward and forward for the purpose of opening the breech, and the lever can be drawn back without striking the tail or extension so as to interfere; but in order to cock the hammer before the breech is moved, an oblong slot, *q*, is cut through the pin *o*, on which the breech-block is hung, and the coupling-pin *q'* is made of smaller size than this slot, so that the pin *o*, with the lever, may be moved far enough to cock the hammer before the breech-block begins to move. The breech-block is formed with a slot in its rear, in which the lever *m*, for moving back the firing-pin M, is set, and confined by a pivot. This lever *m*, below its axial pin, projects out from the back and bottom edge of the breech-block, and has its projecting edge of a cam form, so as to ride up against and past the extension F^2 with a wedging action. The upper end of this lever is coupled to the firing-pin by entering a notch, *r*, in the bottom of said pin. The coupling-pin *q'* has a flat extension on its top, and this extension unites with the thumb-piece J. Said pin with flat extension is fitted in a transversely-grooved top piece or extension of the breech-block, and at right angles to this pin a latch-bolt, *s*, is passed through the extension, and

fits under the shoulder formed by the junction of the coupling-pin and the flat extension thereof. This bolt has a shoulder or head, and in front thereof a spring-lever catch, s', is arranged, for the purpose of pulling the bolt from under the shoulder of the coupling-pin when it is desired to lower the coupling-pin into the oblong slot of the pin or pivot of the breech-block.

In Fig. 5 the dotted lines show the coupling-pin and thumb-piece raised, and the full black lines show it lowered. When the pin is raised the guard-lever is free from the breech-block, and the thumb-lever can move the block independently of the lever. When the pin is down the lever can move the breech-block as the pin q' couples the block to the lever. The slide K t t^1 t^2 t^3, for latching the hammer-spring and hammer-trigger, is constructed as represented in Fig. 9, and is fitted into grooves and slots cut in the trigger-plate, as shown in Figs. 2, 3, and 4. The part t of this slide which overhangs the lateral projection t^1 of the hammer-spring when the hammer is cocked ceases its connection with the spring, and does not press down upon the spring and interfere with its action upon the hammer, when the hammer is cocked and the breech-block is closed; but when the breech-block is being opened the said part t of the slide is moved in range with the projection t^1, and bears down upon the spring and relieves the hammer from the force thereof, and at the same instant the part t^3 of the slide which extends in laterally behind the shoulder of the hammer-trigger falls in behind the shoulder of the trigger, and latches the trigger in one of the notches of the hammer. Thus both hammer-spring and hammer-trigger are latched while the breech is being opened. This action of the slide is produced by the tooth t^2 gearing with a segment-notch, t^4, in the end of the breech-block, while the button t^5 protrudes through the breech and acts as a stop. The movement of the breech-block backward causes the shoulder of the segment-notch to strike the slide and force the rear end of the slide down upon the spring, thereby locking the hammer-spring and hammer-trigger, and the forward movement of the breech moves the slide out of range with the projection of the hammer-spring, and free from the hammer-trigger, and thereby sets the spring and trigger free.

It is plain that if the breech is being closed the lever m will be forcing the firing-pin back from the position the hammer left it when the arm was last fired, as it is impossible for the cam-surface of the lever m to pass by the extension T^2 until it (the lever) has been forced forward and its upper end forced backward against the firing-pin. It will also be equally plain that the extension moves out of the way on the instant that the hammer begins to fall, and thus the pin is free to act with a percussive force upon the fulminate of the cartridge. The cartridge-extractor L, in general form, is like other extractors so far as taking hold of the rim of the cartridge-shell is concerned, and it occupies a position on one side of the breech of the gun-barrel between the barrel and one of the cheek-pieces or locking plates of the stock—being set to slide in a guide, L^1, and held therein by the spring l. On the bottom edge of this extractor a projection, L^2, in form very nearly of the letter **V**, is provided. At the base of one of the inclined sides of the projection a shoulder, L^3, is formed, and at the base of the other inclined side an angular depression, L^4, is cut, thereby forming a lug, L^5, which is beveled on its rear end and slightly hooking on its front end. This lug fits down behind a shoulder, C^1, formed by cutting the open-sided recess C^2 on the breech-block C in the circumference thereof, as shown in Fig. 2. By means of the shoulder C^1 and the lug L^5 the extractor and breech-block are coupled together. The spring l is bowed slightly toward its rear end, and at the termination of this bowed portion it has its end l' thickened and shaped so as to stand parallel with the respective faces of the inclines of the projection L when in contact with the same. By this means the spring, when in rear of the projection, will hold the extractor from moving back; but the instant the spring escapes forward of the projection it will recoil and produce a sudden accelerated action upon the extractor and cause the shell to fly back out of the chamber, from which it has been started by the breech-hook C^2 taking hold of the lug L^5. The thrust and force of the spring being in nearly a straight line, and the fall of the spring forward of the lug being very quick, the effect upon the extractor is like that of the blow of a hammer, the concussion causing the cartridge to fly suddenly back out of the breech-chamber.

I am aware that cartridge-extractors composed of a greater number of parts have been devised, and that in some instances a spring is used to assist the movement; but I am not aware that any one has devised the plan I have shown, which is very simple, durable, and effective.

The construction of my fire-arm is such that by the removal of four pins—viz., the trigger-pin, the hammer-pin, the lever spring-pin, and the breech-pin—the trigger-plate, with all its attachments—viz., the guard-lever, breech-block, and the hammer—can be separated; and the same parts, together with the breech-piece, are held together and stayed by these three pins and the pin I. Further, the pins of the hammer-trigger, the hammer, and breech-block are held from turning by spring-stops, which enable me to separate the pieces without the aid of any instrument; and by my simple slide, which is held in position without a spring, screw, or pin extra of those used to unite the other parts, I am enabled in one movement to latch or unlatch both the hammer-spring and hammer-trigger, thus rendering the arm doubly safe against accidental discharge.

The provision which the slot *q* makes for an independent movement of the lever in order to cock the hammer before opening the breech-block may be made at the end of the breech-block pin or pivot, in connection with the prongs of the guard-lever, by means of a slide, or by shoulders projecting into the hole of the lever-prong; these shoulders fitting in the pin loosely, so as to permit the necessary play.

What I claim as new, and desire to secure by Letters Patent, is—

1. The tail or extension F^1 of the hammer, extended through the trigger-plate, in combination with the guard-lever D, substantially as and for the purpose described.

2. The nose or cam F^2, formed on the tail of the hammer, in combination with the lever *m* and the firing-pin M, whereby the firing-pin is moved out before the breech-block is moved, the said pin held out when the breech-block is fully closed, and the breech-block can be moved as much and as often as found necessary without releasing the firing-pin at a point where it will come in contact with the percussion, substantially in the manner and for the purpose described.

3. The slide K, having the stops t^3, for latching the hammer-spring and hammer-trigger, as shown and described, in combination with the breech-block C, notched at t^4, and the hammer-spring G′ and hammer-trigger, substantially as and for the purpose set forth.

4. The forked guard-lever D D^1 D^1, fastened rigidly upon the extended ends of the pin *o*, on which the breech-block is hung, in combination with the breech-block C, which is fitted loosely upon the pin *o*, and with a sliding thumb-piece, J, having a coupling-pin, *q′*, attached to it, which pin, at option, is passed into an oblong slot of the pin *o*, substantially in the manner and for the purpose herein set forth.

5. The combination of the guard-lever D, the hammer F, the breech-block C, the oblong slot *q* in pin *o*, and the coupling-pin *q′*, whereby the hammer can be cocked before the breech is opened by the lever which is used to open the breech, and during the one movement of the lever, and the breech can be closed without uncocking the hammer by the back movement of the lever, substantially as described.

6. A guard-lever, forked and connected rigidly by its prongs D^1 D^1 to the outer ends of the pin *o*, substantially in the manner described, and for the purpose set forth.

7. The transverse spring-pin *s*, having a holding-catch, *s′*, in combination with the thumb-piece J and its attached pin *q′*, substantially as and for the purpose described.

8. The rectilinear moving cartridge-extractor L, fitted in the guide L^1, in combination with the spring *l* and the breech-block C, whereby the extractor is operated and held in position without any fastening-pin, as and for the purpose set forth.

9. The extractor having the hook L^5 and the projection L^2, in combination with the breech-block C, whereby the extractor is secured in place and operated by the breech-block, substantially as and for the purpose described.

10. The trigger-plate, constructed with a hook, *h*, on its forward end, in the manner specified, in combination with the permanent pin I, supported in the cheek-pieces of the breech, and, in turn, supporting said cheek-pieces against inward and outward pressure, whereby, while facilities for readily removing the trigger-plate and replacing it, by the removal of a single pin in rear of the pin I, are afforded, the cheek-plates are stayed firmly against any tendency to warp or spring, either outward or inward, during the hardening process and while in use, substantially as described.

11. The combination of the lever spring-stop *g′* with the socketed and notched pin *g* of the hammer, and with the trigger-pin *n*, substantially as and for the purpose described.

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