

J. BROUGHTON.
Breech-Loading Fire-Arms.

No. 158,899.

Patented Jan. 19, 1875.

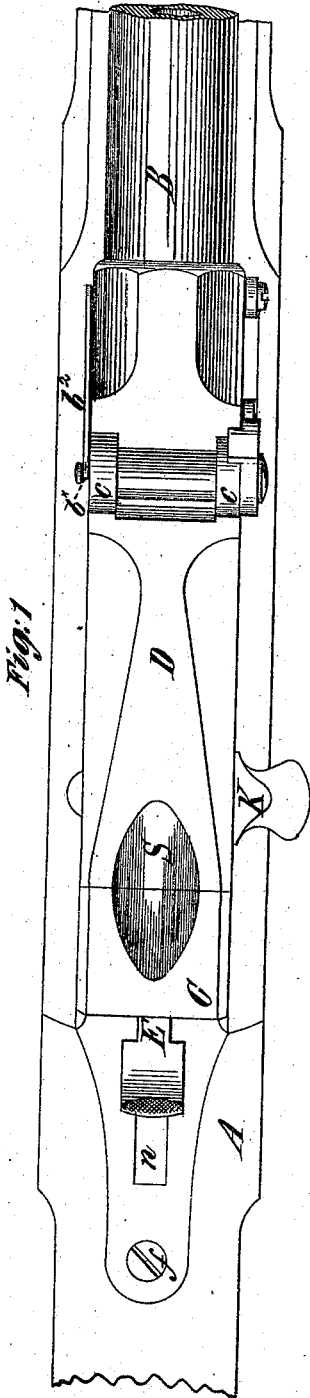


Fig. 1

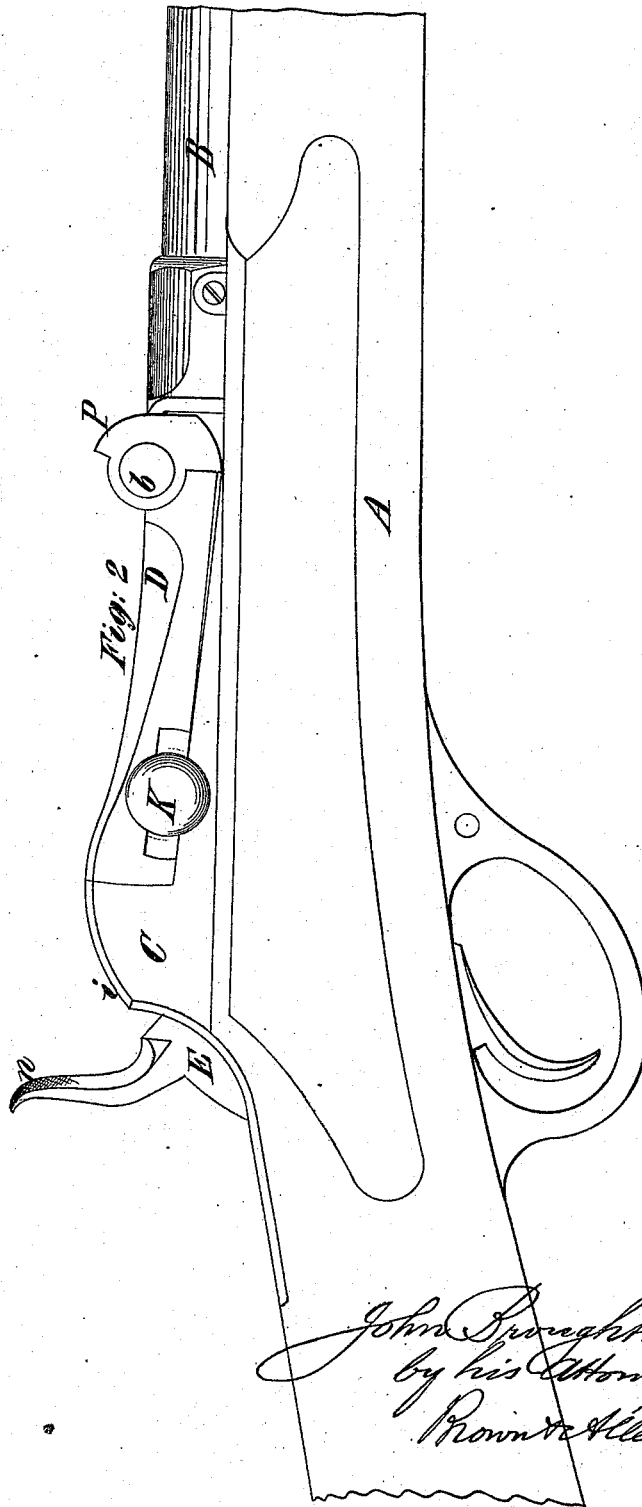


Fig. 2

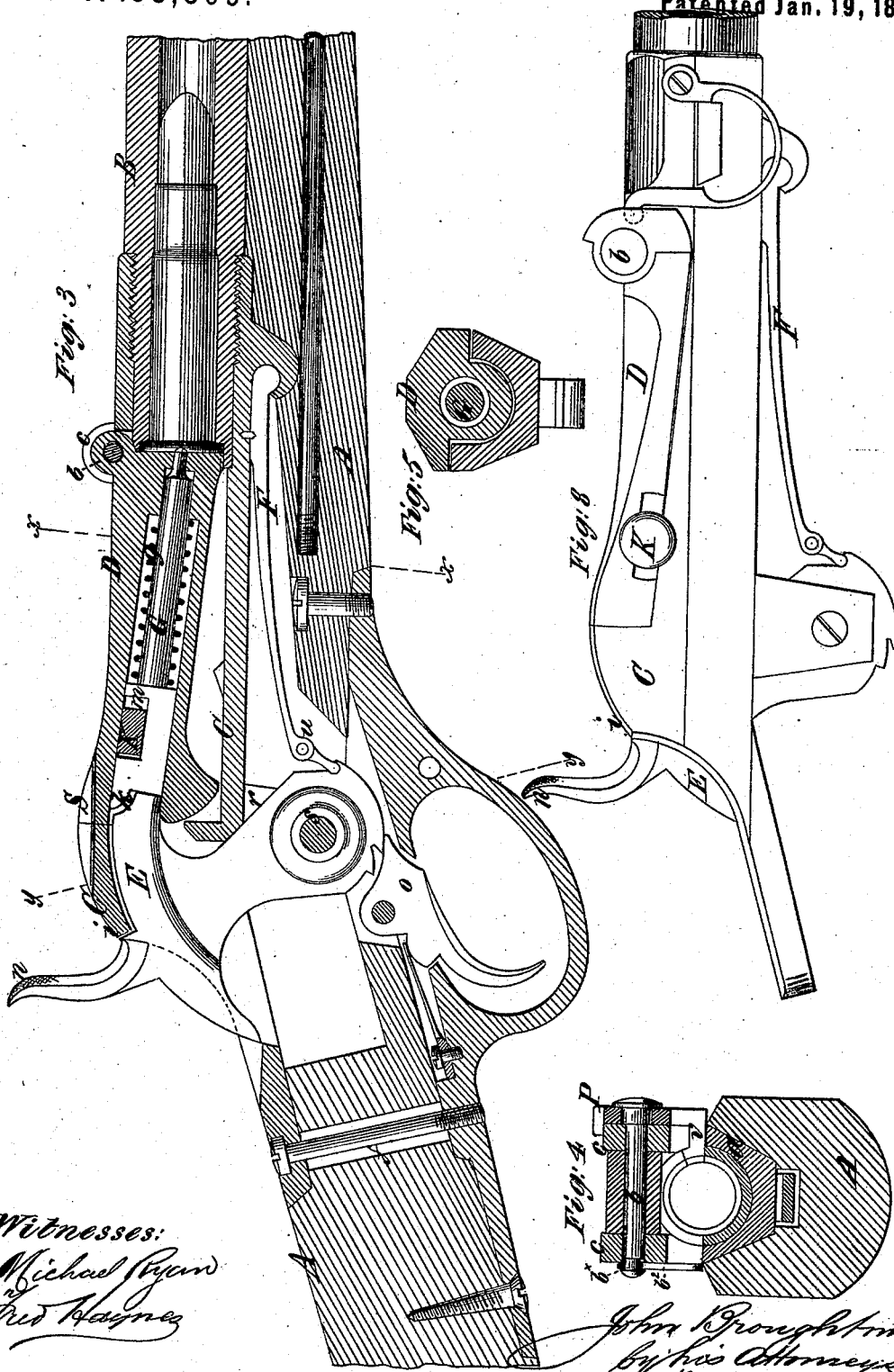
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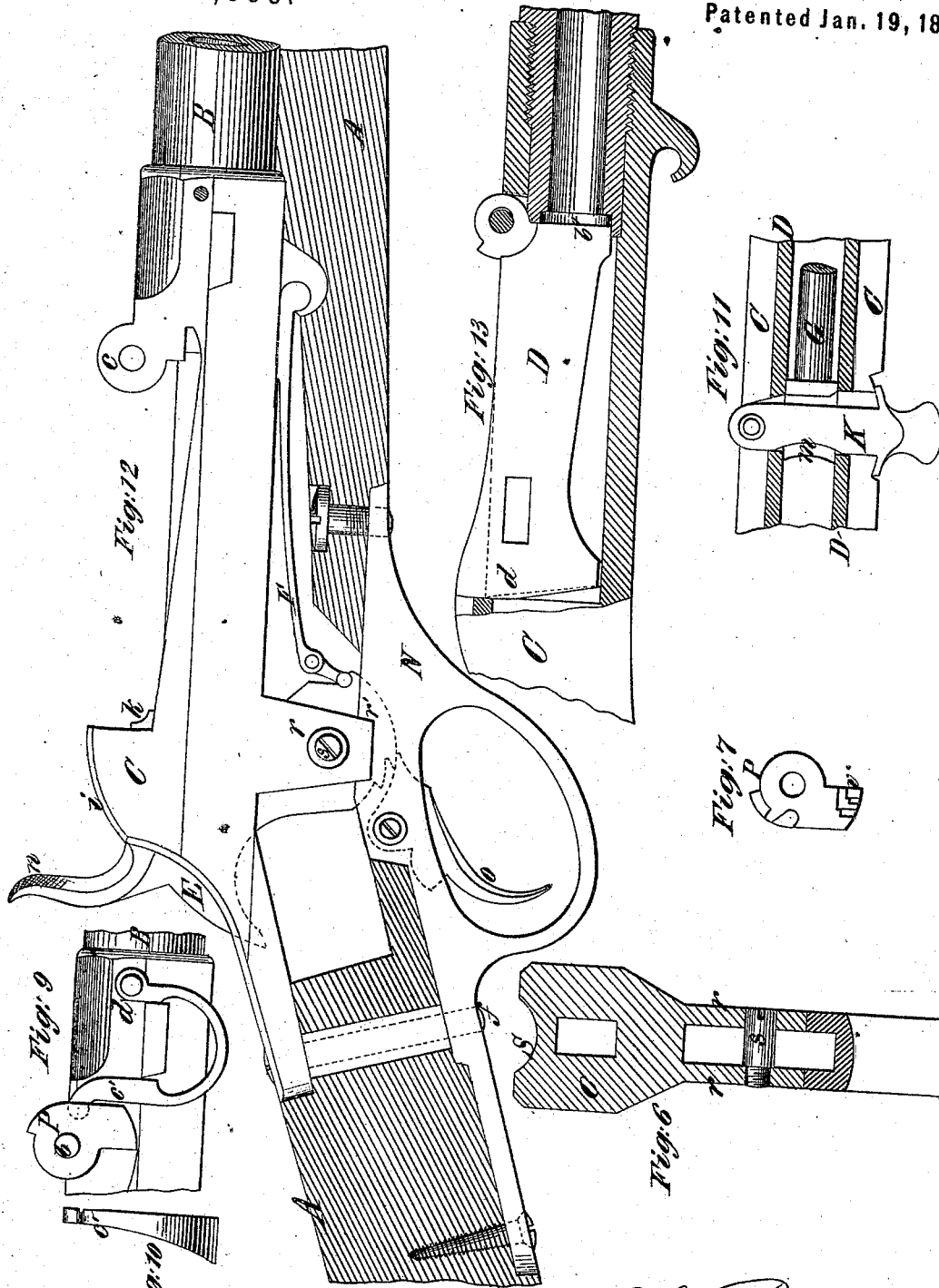
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UNITED STATES PATENT OFFICE.

JOHN BROUGHTON, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN BREECH-LOADING FIRE-ARMS.

Specification forming part of Letters Patent No. 158,899, dated January 19, 1875; application filed February 14, 1874.

To all whom it may concern:

Be it known that I, JOHN BROUGHTON, of Brooklyn, in the county of Kings and State of New York, have invented certain Improvements in Breech-Loading Fire-Arms, of which the following is a specification:

This invention mainly relates to that description of breech-loading fire-arms in which a breech-block arranged to swing upward and forward in opening is used.

The invention consists in, first, a firing-pin, constructed and arranged with relation to the breech-block and receiver, in combination with a retracting-spring, whereby said firing-pin, in addition to its ordinary function, is made to operate as a latch to the rear end of the breech-block when the latter is closed and the hammer is raised; second, a vibrating knob lever or handle in combination with the firing-pin and the swinging breech-block, whereby said knob lever or handle constitutes a means of lifting and lowering the breech-block, and also serves to withdraw the firing-pin from its hold within the abutting surface of the receiver when acting as a latch to the rear end of the breech-block; third, the construction and arrangement of the rear end of the firing-pin and the nose of the hammer relatively with each other, whereby the hammer in its forward motion is made to enter and lock the breech-block before the firing-pin is released from its hold within the receiver, and said firing-pin in its backward movement is caused to enter the receiver and lock the breech-block before the hammer in moving backward has released it; fourth, a novel mode of attaching to the hinge of the breech-block an extractor arranged outside of said hinge, whereby, while the hinge may be tightly set up, the extractor is enabled to work freely independently of the said hinge; fifth, the combination with the extractor and the hinge of the breech-block of the working point or nose of the extractor, arranged to pass through a lateral slot in the receiver, whereby, when in a closed position, it is firmly supported by a shoulder resting against the inner cylindrical surface of the receiver.

Having thus specified the several objects and nature of the invention, its description

will be proceeded with in reference to the accompanying drawings.

Figure 1 represents a plan of a gun, in part, constructed in accordance with the invention. Fig. 2 is a side view of the same; Fig. 3, a longitudinal vertical section thereof; Fig. 4, a transverse section through the hinge of the breech-block; Fig. 5, a transverse section on the line xx ; and Fig. 6, a transverse section on the line yy . Fig. 7 is a side view of the cartridge-shell extractor detached. Fig. 8 is a side view, in part, with the stock removed; Fig. 9, a side view in illustration of the spring applied to the extractor; Fig. 10, an edge view thereof; Fig. 11, a horizontal section in illustration of the vibrating bar and knob or handle for lifting or lowering the breech-block and operating the firing-pin. Fig. 12 is a longitudinal vertical section, in part, with the breech-block removed; and Fig. 13, a longitudinal section in illustration of the abutment surface of the breech-receiver, with the breech-block in position therein.

A is the stock, and B the barrel, of the gun. C is the breech-block receiver, into which the rear end of the barrel fits and screws. D is what may be termed a solid breech-block, hinged to swing upward and forward (when being opened) on an axis or hinge pin, b , that passes through suitable ears or bearings cc formed on the receiver. The hole in the breech-block, through which the pin b passes, is elongated or slightly elliptical, so that when the breech-block is forced back by the recoil there is no strain on the hinge-joint. The forward face of the breech-block is a plane or flat surface coinciding with a line drawn perpendicularly to the axis of the barrel through the axis of the hinge-pin, while its rear end or recoil surface d , and the back end of the interior of the receiver, form the arc of a circle, extending both above and below the center, from which it is struck, and which is here shown (see Fig. 13) as that of the hinge, but need not necessarily be such. This gives an abutting surface, which is virtually at right angles to the axis of the barrel, without requiring the breech-block to move longitudinally when opening or closing. If preferred, the rear end of the breech-block may be cut away below

the central line of the arc, as represented by dotted line in Fig. 13. In either case—that is, whether the abutting surface be equally above and below said line or center, or wholly above it—the effect is equivalent to that of a dead-square abutment with an undercut surface, against which the rear end of the breech-block is pressed, and by which it is prevented from rising by the recoil consequent on explosion.

Inasmuch, however, as an arc-shaped abutment, which shall be equivalent to a straight one at right angles to a line parallel with the axis of the barrel, requires an upward extension or deepening of the metal of the receiver and the breech-block at its rear end sufficient to give the required abutting surface, and as such upward extension interferes with the line of sight, a central and longitudinal groove, *S*, in line or parallel with the axis of the barrel, is made in the upper surface of the receiver and breech-block, over and back and front of the abutment. This obviates all interference or obstruction by said upward extension with the sights of the gun. The receiver *C* is let into the upper surface of the stock, so as to form an unbroken continuity, as it were, therewith, and receives, through an opening in its top, the swinging breech-block. In connection with such a receiver and swinging breech-block, the hammer *E* of the gun is arranged to occupy a central position, and has a central action. Also, the main spring *F*, which controls it, has a similar central arrangement, and both are connected with and carried by the receiver, that, including the entire breech mechanism, is detachable as a whole from the stock *A* by simply slipping off the usual bands, and taking out the rear tang-screw *f* of the receiver. The upper arc and nose of the hammer *E* is arranged to work under cover of the receiver *C*, as clearly shown in Fig. 3, thus avoiding the presentation of any open slot during any part of its stroke for fouling, and said hammer is so constructed and arranged as, when fully down and in the act of firing, it projects through the rear abutting surface of the receiver, and enters the firing-pin cavity *g* of the breech-block, thereby forming a positive lock to the latter, and preventing it from rising when exposed to a backward leakage of gas acting on its under surface. The firing-pin *G*, which passes longitudinally through the breech-block, is made heavy and substantial, and is so arranged that, in connection or by the aid of its retracting-spring *H*, it not only acts as a firing-pin to a center-fire cartridge, *I*, but also, by passing under a back upper portion, *i*, of the receiver, as an auxiliary catch, latch, or lock to the rear end of the breech-block, when the latter is closed, and the hammer is in any other than its down position. Said firing-pin *G* is set inclining upwardly in a backward direction, such inclination being tangential to the curved or arc-formed nose of the

hammer, when down, and approximately a continuation of the same in a forward direction.

This arrangement gives safety against the breech-block rising when firing the gun, by reason of the nose of the hammer being caused to enter the bore of the breech-block with a downward-inclined action, and act as a hook, in such manner that, while the hammer prevents the breech-block from rising, the latter restrains the hammer from moving backward when exposed to an excessive lifting action, the rear end of the firing-pin being made with an under beveled or rounded nose, *k*, which overlaps the striking portion of the hammer when down.

The inclination of the firing-pin also provides for an additional length and throw of the hammer, without affecting the depth and symmetry of the stock, which necessarily restricts the size of the hammer below the receiver *C*; nor does such arrangement materially interfere with the blow of the hammer on the cartridge, but admits of as effective an action as if it were a direct longitudinal one in line with the axis of the barrel.

K is a laterally-projecting knob or handle-lever, pivoted at *l* to the rear portion of the breech-block, and operating as a handle to the latter. Said lever passes through a slot, *m*, in the firing-pin, and, in addition to its ordinary function as a handle whereby to swing the breech-block, serves, when moved forward, to operate the firing-pin by withdrawing the latter from its hold within the abutting portion of the receiver, when said pin acts as a latch to the rear end of the breech-block. This forward swing of the knob-lever *K* prior to lifting the breech-block is limited to what is sufficient to withdraw the rear end of the firing-pin clear of the receiver only, and such movement of the firing-pin in a forward direction is about one-half of that which is required to force it against the base of the cartridge, or put it in an exploding position within the breech-block. This insures safety against premature explosion, inasmuch as the full forward movement of the firing-pin can only be imparted to it by the entrance of the nose of the hammer into the rear end of the breech-block.

The rear end of the firing-pin is so formed, as hereinbefore described, and the general construction and arrangement relatively to each other of said pin and hammer is such, that either one or the other of such devices forms a constant latch to the rear end of the breech-block, when the latter is closed, the hammer in its forward motion entering and locking the breech-block before the firing-pin is moved forward and released from its hold within the receiver *C*, and the firing-pin in its back motion entering the receiver and locking the breech-block before the hammer in its backward movement has released it; hence when the breech-block is closed there is no point or

moment at which there can be an open and unlocked joint at the abutting junction of the breech-block with the receiver.

Furthermore, the construction and arrangement of the hammer are such that while its nose works under cover, and no open slot is presented for fouling, it can be introduced to its place by inserting it from above through the central longitudinal slot in the receiver, thus admitting of a broader comb, *n*, than that which would correspond to the thickness of the body of the hammer if passed into position from below through the slot in the receiver.

The receiver C has its side lugs *r r*, which carry the fulcrum-pin *s* of the hammer, constructed to interlock with a notch, *r'*, in the upper edge of the trigger-guard plate N, carrying the sear O. This determines and preserves the relative positions of the hammer and sear axes when the receiver and trigger-guard plate are fitted to their places and let into the stock as separate pieces, the one from above and the other from below. The mainspring F of the hammer has a toggle-joint connection, *u*, and pressure on the latter, which is obtained or provided for by the relative arrangement of the hammer, the mainspring, and the receiver. Such toggle-joint connection and pressure cause an increased pressure of the spring as the hammer moves forward, and a diminishing pressure as the hammer moves back to the position of full-cock.

The forward or fulcrum end of the mainspring fits within a hook-shaped projection on the receiver, and the connection between the hammer, the receiver, and the mainspring is such that the mainspring may be connected with or disconnected from the other parts without the use of tools.

P is the cartridge-shell extractor, which rests on a shoulder, *p*, of the hinge-pin *b*, outside of or beyond the one end of the breech-block hinge, whereby said hinge may be a solid or plain and simple one extending the whole width of the receiver—that is, between the ears or journal-bearings *c c*, and operating without lateral friction on the extractor—that is, free to move on the hinge-pin *b*. This provides for a strong breech-block hinge, and insures a freedom of action to the extractor against any straining or twisting of the breech-block in opening or closing.

The working part or nose *v* of this outside and independent extractor P is arranged to extend inwardly through a lateral slot, *a'*, in the receiver, and the usual vertical and weakening slot in the rear end of the barrel, incidental to an extractor arranged to work on the hinge-pin *b* within the ears *c c* is avoided, while, when said extractor is in a closed position, it is firmly supported by a shoulder, *q*, resting against the inner cylindrical surface of the receiver.

Thus, while the extractor can neither be

blown out, expanded, nor jammed by escaping gas or expansion of the cartridge-shell, it may be kept clean without detaching or dismounting any of the parts.

The flip action of the extractor to throw out the cartridge-shell is imparted to the extractor by a spring, *c'*, which is arranged to operate with but little friction by its free suspension on a pivot, *d'*, at its one end, and the liberty given to it to vibrate and expand at its working end.

The strength of this spring may be largely in excess of what is necessary to give the flip action to the extractor, and its arrangement, relatively to other parts is such that it is impossible, under ordinary usage, to damage or break it.

The rear end of the barrel is formed with a counter-bore, *b⁴*, (see Figs. 3 and 13,) for the reception of the flange of the cartridge and the front end of the breech-block. The lower half of the counter-bore extends farther back into the receiver than the upper half, which reaches only to and forms a joint with the front end of the breech-block.

In consequence of this construction the lower half of the counter-bore furnishes a support for the front end of the breech-block, and forms with it a perfectly gas-tight joint, and prevents the downward and backward escape of gas into the receiver.

The portion of the hinge-joint which lies in the receiver between the ears *c c*, instead of being rounded is cut out so as to form an angular chamber or recess in front of said joint. Any gas which may escape backward from the cartridge on the explosion thereof will enter this chamber or recess and pass upward through the hinge-joint in front of the breech-block, instead of passing downward and backward to clog the parts, or laterally outward, to inconvenience the person using the gun.

The hinge-pin *b* is formed with a groove, *b^x*, on its smaller or protruding end, for engagement with a notch or fork on a spring-lever, *b²*, pivoted on the side of the receiver, as shown in Figs. 1 and 4, by which means it is prevented from slipping out of the hinge-joint.

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

1. The firing-pin G, constructed and arranged in relation with the breech-block and its receiver, substantially as described, in combination with the retracting-spring H, whereby said firing-pin in addition to its ordinary function, is made to operate as a latch to the rear end of the breech-block when the latter is closed and the hammer is raised, essentially as specified.

2. The vibrating knob lever or handle K, in combination with the slotted firing-pin G, and the swinging breech-block D, substantially as and for the purpose shown and described.

3. The construction and arrangement of

the rear end of the firing-pin and the nose of the hammer relatively with each other, essentially as described, whereby the hammer in its forward motion is made to enter and lock the breech-block before the firing-pin is released from its hold within the receiver, and said firing-pin in its back movement caused to enter the receiver and lock the breech-block before the hammer in moving backward has released it, substantially as specified.

4. In combination with the extractor P, working on the pin *b* of the breech-block hinge, the shoulder *p* on the said pin, for maintaining a proper distance between the

exterior of the hinge and the head of the pin, for the free working of the extractor, substantially as herein described.

5. In combination with the extractor P, arranged in relation with the hinge of the breech-block, as described, the working point or nose *v* of the extractor, arranged to pass through a lateral slot in the receiver, and supported by means of a shoulder on its extremity, essentially as specified.

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Witnesses:

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