

HENRY'S
Imp^{ts} in
Breech Loading Fire Arms.

No. 119,145.

Patented Sep. 19, 1871.

FIG. 1.

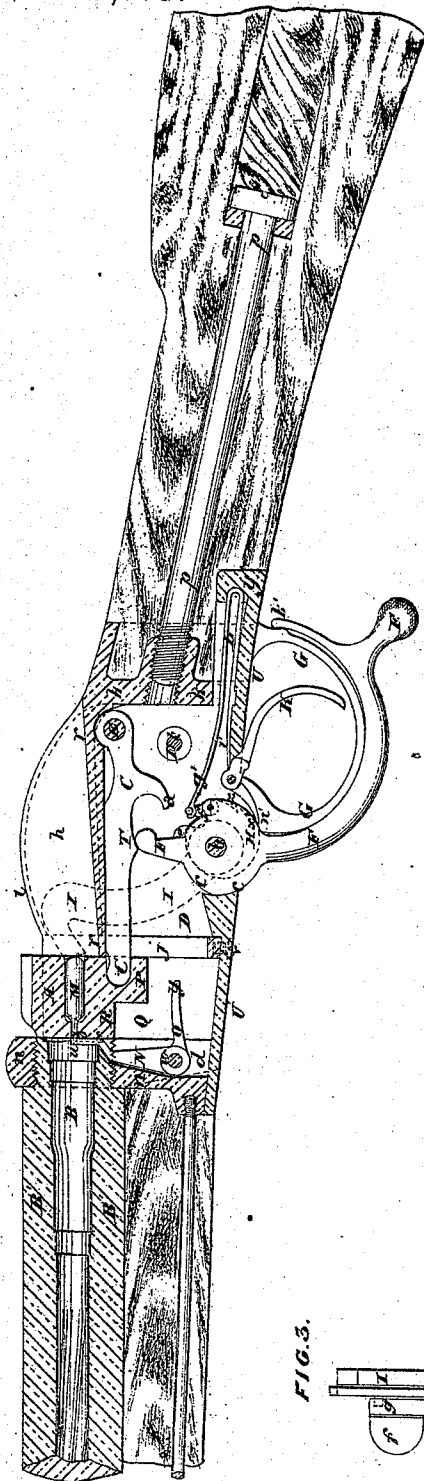


FIG. 2.

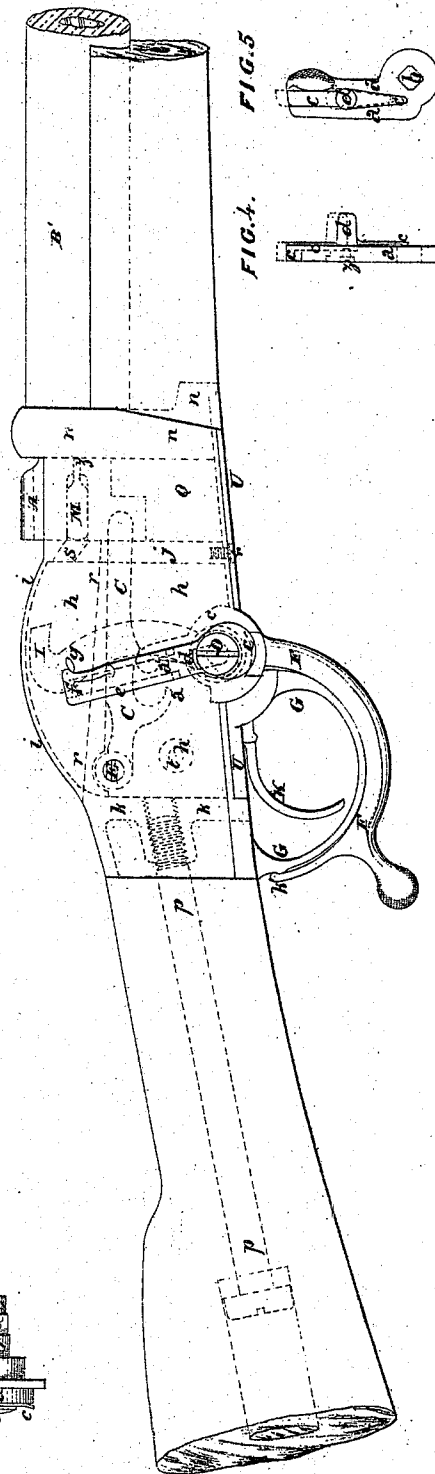


FIG. 3.

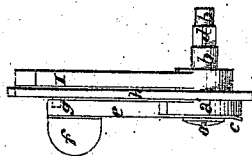
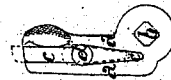


FIG. 4.



FIG. 5.



John Brown Witness
John C. Macandrew Witness

Alfred Henry

HENRY'S
Imptⁿ

Breech Loading Fire Arms.

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FIG. 1.

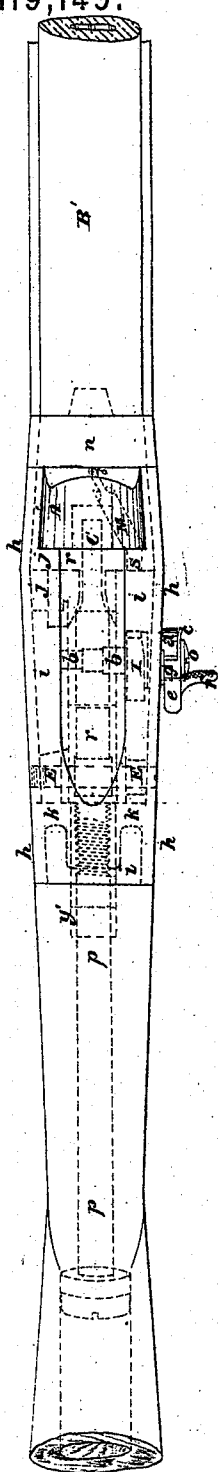


FIG. 2.

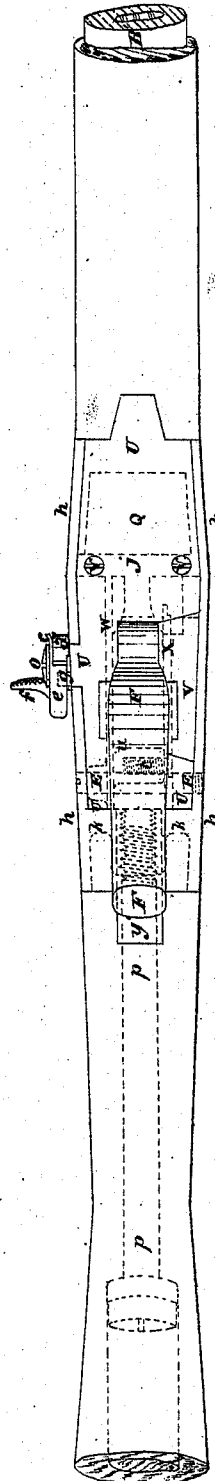


FIG. 4.

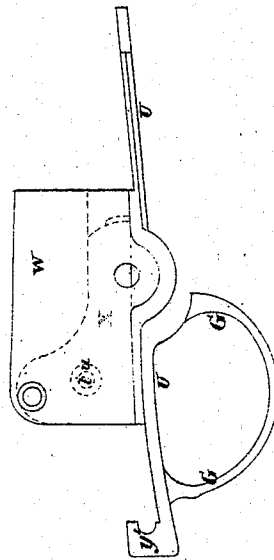
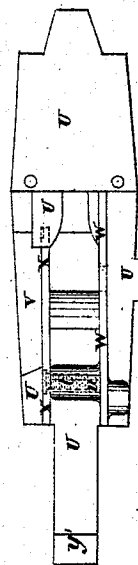


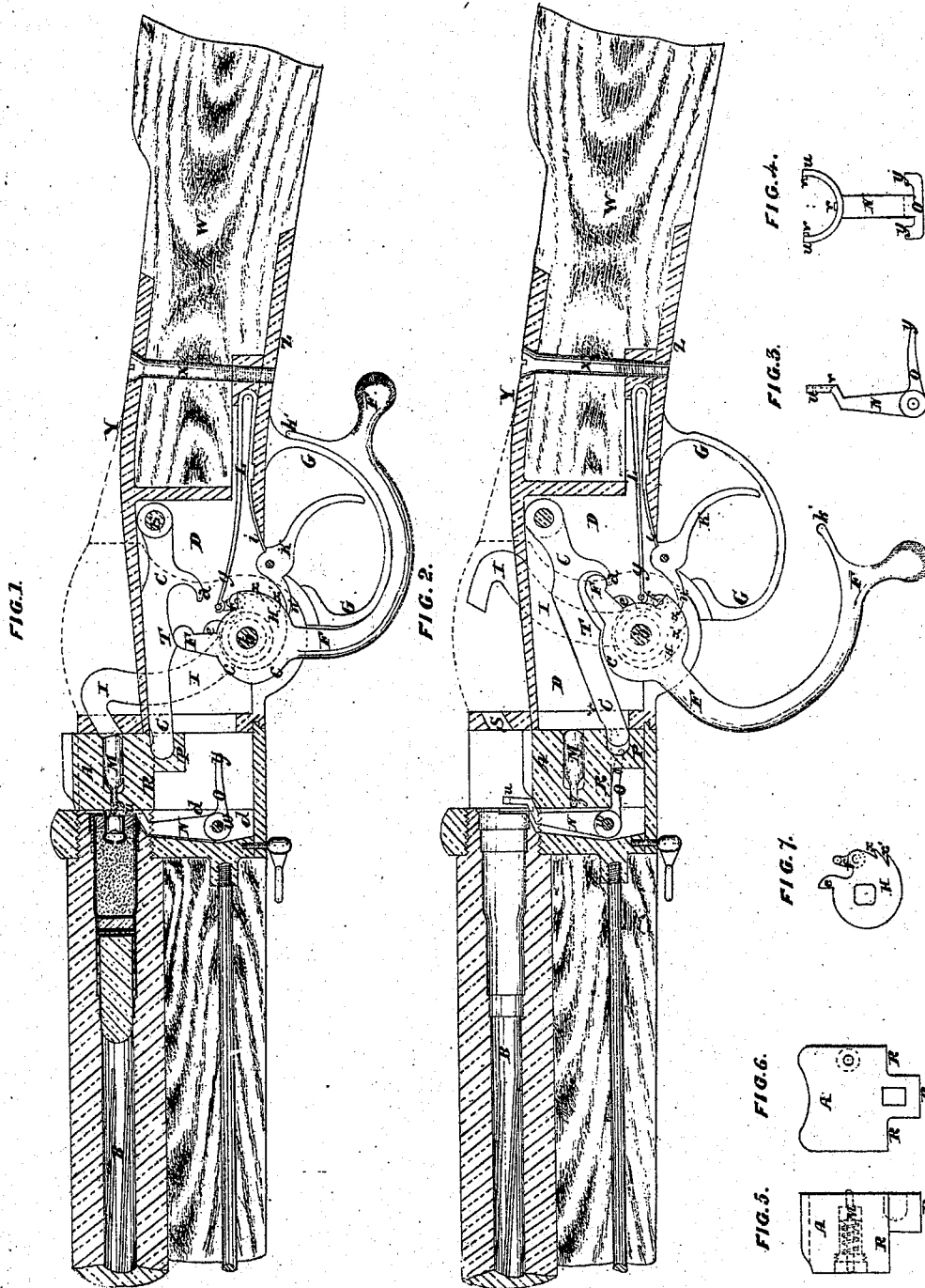
FIG. 3.



John Brown Witness
John C Macandrew Witness

Alex Henry

HENRY'S
Imp^{te} in
Breech Loading Fire Arms.
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John Brown Witness
John C. Macandie Witness

Alex. Henry

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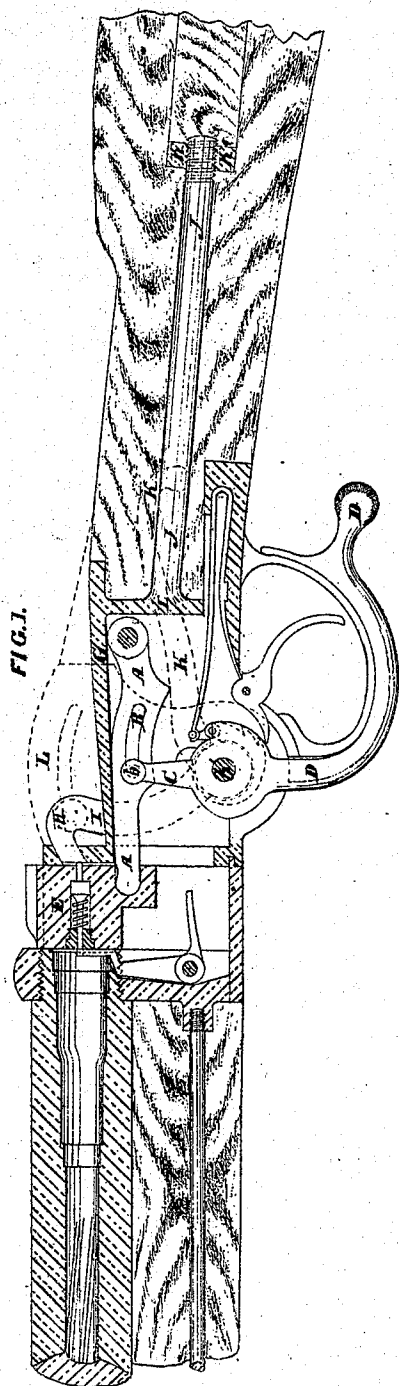


FIG. 2.

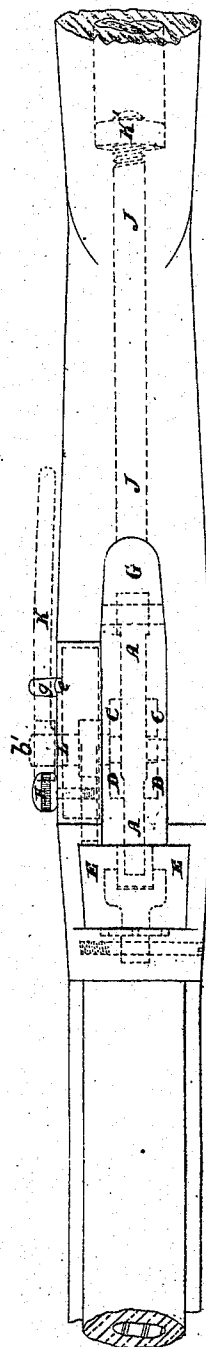
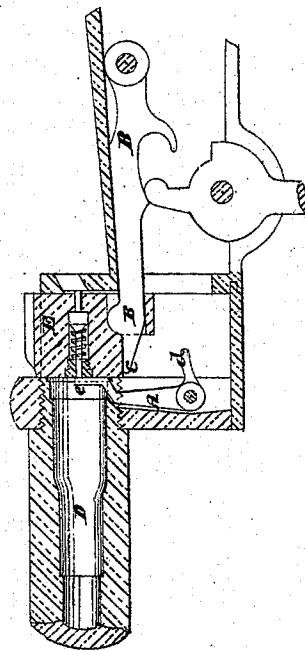


FIG. 3.



John Brown Witness
John C. Macandie Witness

Alex. Henry

UNITED STATES PATENT OFFICE.

ALEXANDER HENRY, OF EDINBURGH, NORTH BRITAIN.

IMPROVEMENT IN BREECH-LOADING FIRE-ARMS.

Specification forming part of Letters Patent No. 119,145, dated September 19, 1871.

To all whom it may concern:

Be it known that I, ALEXANDER HENRY, of Edinburgh, in the county of Mid Lothian, North Britain, have invented Improvements in Breech-Loading Fire-Arms, of which the following is a specification:

This invention, which relates to certain improvements in the arrangement or construction of that class of fire-arms wherein a vertically-sliding breech-piece is employed for opening and closing the breech or cartridge-chamber, consists in operating the said breech-piece by means of a lever or beam having a radial movement in a vertical plane.

The lever or beam is jointed at its rearward end, by a pin or hinge-joint, to the metallic casing of the lock, and its forward end enters a cavity of suitable shape to receive it, formed in the breech-piece. A lever carried loosely on a shaft, having its axis transverse to the linear axis of the fire-arm, is so placed that its inner end enters a recess, opening, or curved slot in the lever first referred to, while the outer portion of this lever last referred to is so situated that it to a greater or less extent surrounds the trigger-guard and is in a position to be with facility raised or depressed by the hand. As it is depressed it also depresses the lever first referred to at the interior of the lock, and with it the breech-piece, thereby opening the breech or cartridge-chamber, while, on being raised, the said lever and breech-piece are elevated and the breech or cartridge-chamber closed. The lever first referred to, as well as that referred to secondly, may be constructed of various forms, but in each and every form the manner in which they operate upon each other is the same. On the transverse shaft hereinbefore referred to a tumbler is carried provided with "bents" or notches for the "full-cock" or "half-cock", or the full-cock position only, of the hammer or striker. This, as the lower lever is depressed, is thrown back so as to be caught by the sear or trigger. One end of the shaft whereon the tumbler is carried has the hammer or striker attached to it, which is, therefore, by the depression of the lever, raised into the half or full-cock position, so that, by means of the arrangement set forth, both the breech is opened and the hammer or striker half or full-cocked by one motion of the lever; and the arrangement is so compact that all the working parts of the lock are confined within a plain

casing. One end of the transverse shaft may or may not be provided with an indicating and bolt-lifting-finger. The reactions of the lock are produced by means of an ordinary flat main spring, which acts also as the sear-spring; but a separate sear-spring may be employed.

On Sheet 1 of the drawing, Figure 1 is a longitudinal section of part of a breech-loading rifle constructed in accordance with my said invention, and having a vertically-sliding breech-piece, A, for opening and closing the cartridge-chamber B. Fig. 2, Sheet 1, is an elevation of the same in a position the reverse of that shown at Fig. 1. Figs. 1 and 2, Sheet 2, are corresponding plans, respectively, of the upper and under sides of the same, while Fig. 3, Sheet 1, and Figs. 3 and 4, Sheet 2, are detailed views of certain portions thereof, and hereinafter particularly described.

Under the modification illustrated by the figures hereinbefore referred to the sides *h*, upper part *i*, front and rear walls *j* and *k* of the outer shell of the lock-casing D, and the sides and front wall *n* of the breech-chamber or cavity Q, are formed in one piece, as shown in longitudinal section at Fig. 1, Sheet 1. The barrel B' of the fire-arm is screwed into a hole formed in the front wall *n* of the breech-chamber Q, and it, together with the lock-casing D, is secured to the stock of the fire-arm by a bolt, *p*, passed from the rearward end through a hole in the stock, and the forward end of the bolt *p* is formed with a screw-thread which is entered into a tapped hole in the rear wall *k* of the lock-casing D. The hole in the stock in the rear of the head of the bolt *p* may or may not be plugged up with a piece of wood or other suitable material. On the sheets of drawing now under reference it is shown so plugged up. On the upper side of the lock-casing D a groove, *r*, is formed, as shown in longitudinal section at Fig. 1, Sheet 1; in dotted lines at Fig. 2 of the same sheet; and in plan at Fig. 1, Sheet 2, in order that the cartridge may be pushed into the cartridge-chamber B of the barrel B' after the breech-piece A has been depressed. The bottom or under side of the lock-casing D is formed of two pieces or plates of metal, U and V, as shown on the plan of the under side of the rifle, at Fig. 2, Sheet 2, and more particularly by the detached plan of the under and inner parts of the lock-casing, at Fig. 3, Sheet 2. The forward end of the plate U forms the bottom of the breech-chamber

or cavity Q, as shown, and it is fixed to the front wall *j* of the lock-casing (which also forms the rear wall of the breech-chamber or cavity Q) by screws *v*, as shown at Fig. 2, Sheet 2. The forward end of the plate U is also fixed to the front wall *n* of the breech-cavity by dovetailing its edges into grooves in the under part of the said wall; or it may be fixed to the wall *n* by means of a screw passed into the wall *n* from the under side of the plate U. The rear end of the plate U is elongated so as to extend behind the rear wall *k* of the lock-casing, and on the said elongated portion a heel, *y'*, is formed, in a curved recess in which the rearward portion of the lock-spring L is situated, as shown at Fig. 1, Sheet 1. From each of the plates U and V, and at right angles thereto, pieces W and X, respectively, project upward, as shown in plan at Fig. 3 and in side elevation at Fig. 4, Sheet 2, and these are held together by a screw, *t*, tapped through the piece X into a projection, *u*, on the plate W, as more particularly seen in plan at Fig. 3, Sheet 2. Between the pieces W and X the upper end of the lever F, the tumbler H, lever or beam C, and the lock-spring L (details of mechanism hereinafter more particularly described) are situated as shown, and on the opposite side of the plate W, and between it and the outside plate *h* of the lock-casing, the hammer or striker I is placed, as shown at Figs. 1 and 2, Sheet 1, and at Fig. 1, Sheet 2. The vertically-sliding breech-piece A is actuated by means of the lever or beam C, the forward end of which enters a cavity or recess formed to receive it in the lower part of the breech-piece A, as shown. The lever or beam C at its rearward end is hinged or jointed to the metallic casing D of the lock by a pin or stud, E, and toward its rearward end a curved toe or projection, *a*, is formed, and which is acted upon, as hereinafter more particularly set forth, by the inner or upper end of the lever F, carried loosely on a shaft or pin, *b*, whose axis is situated transversely to the linear axis of the fire-arm. The outer and lower portion of the lever F is so constructed that when the breech-chamber or cavity Q is closed by the breech-piece A the said lower portion of the lever F surrounds the trigger-guard G and is therefore in a position to be with facility depressed by the hand; and the said lever, when not in use, is retained in position against the under side of the trigger-guard G by means of a catch-spring, *k'*, formed in one piece with the lever F, on its rearward end. That portion of the lever F marked *c* is formed duplex, and between the two sides or cheeks so constructed the tumbler H, seen in dotted lines at Fig. 1, Sheet 1, is situated. The said tumbler H is fixed on the same shaft or pin *b* as that upon which the lever F is carried loosely, and it is provided with a projecting toe, *e*, against which the solid upper portion of the lever F bears, as shown at Fig. 1, Sheet 1. The tumbler H is also provided with bents or notches *x* and *x'* for the full-cock or half-cock positions, respectively, of the hammer or striker I, which is rigidly secured to one end of, or is made in one piece with, the shaft or pin *b*. The portion of the shaft or pin *b* whereon the tumbler H is carried is, by preference, square, and the result

of this arrangement is that when the lever F is depressed the tumbler H and hammer or striker I are moved through an angle rearward, and the point *n'* of the sear or trigger K enters one of the bents or notches *x* in the tumbler H, and the hammer or striker I is thereby held at half or full-cock, as desired. The hammer or striker I may, when necessary, be secured at the full-cock position by one or other of the arrangements now about to be described, or it may be placed in the half-cock position by depressing the lever F, thereby drawing back the hammer or striker I until the point *n'* of the sear or trigger K enters the half-cock notch *x'*. With reference to the full-cock position of the hammer or striker I, it may be retained or bolted therein by the arrangement of mechanism shown in side elevation and in position on the fire-arm at Fig. 2, Sheet 1; in detailed end elevation at Fig. 3, Sheet 1; and in plan at Figs. 1 and 2, Sheet 2, of the drawing. This arrangement consists in attaching a lever, *a'*, to the outer end of the shaft *b*, whereon the hammer or striker I is fixed, the said lever *a'* being on the outside of the lock-casing D, as shown. On the lever *a'* a spring-catch, *e*, is placed, the lower or spring end *c* of which is formed with a slot, *d*, as shown at Fig. 2, Sheet 1, through which a screw, *o*, is passed into the end of the shaft *b* in such a manner that while the catch *e* is held in its position on the lever *a'* by the head of the screw *o* it is still free to slide longitudinally on the lever *a'*. To facilitate the sliding of the catch *e* its upper part is provided with a thumb-piece, *f*. A stud, *g*, of the shape shown at Fig. 2, Sheet 1, is fixed on the side *h* of the lock-casing D, and when the hammer or striker I has been raised to the full-cock position, as hereinbefore described, and if it is desired to retain it in that position—that is to say, to bolt it therein—the spring-catch *e* is drawn up, as shown at Fig. 2, Sheet 1, so that the front part of the catch *e* rests against the back or rearward side of the stud *g*, thereby preventing the hammer or striker I from being impelled forward until after the catch *e* is lowered. For the sake of greater security, it is preferred to form a slight cavity or groove on that portion of the catch *e* which comes in contact with the back of the projection *g*; but this may be dispensed with. Should the catch *e* by any accident be pushed up on the side of the projection *g*, opposite to that side at which it is shown on Fig. 2, Sheet 1, such a position of the catch does not prevent the full cocking of the hammer I, as, from the angular position of the stud *g* when the catch *e* is drawn back, the rear part thereof comes in contact with the front of the projection *g* and the catch is thereby depressed to its normal position so that it can pass below the stud *g*, and from which position it can be raised so as to hold or bolt the hammer or striker I, as hereinbefore described, when it has been drawn beyond the stud *g*; or, in lieu of the arrangement now last described, the hammer or striker I may be locked at the full-cock position by the bolting and indicating-lever shown in end elevation at Fig. 4, and in side elevation at Fig. 5, Sheet 1. This arrangement consists of a lever, *a*, fixed to the shaft *b* of the

hammer or striker I, on the outside of the lock-casing, and by which the hammer or striker I may be raised to full cock independently of the lever F. On the lever *a*, a spring-bolt, *c*, is fixed, the upper part of which slides in a groove formed to receive it in the lever *a*, and the lower portion of the bolt *c* is so formed as to constitute a spring, which, by bearing on the face of the lever *a*, affords sufficient resistance to movement as to retain the bolt *c* in the position desired. The bolt *c* is retained on the lever *a* by means of a screw-pin, *z*, passed through a slot in the said lever and tapped into the under surface of the bolt, as shown at Fig. 4, Sheet 1. On the outside of the lock-casing a projection is formed similar to that shown at *g*, Fig. 2, Sheet 1, and when the hammer or striker I has been raised or moved rearward beyond the said projection, and if it is desired to retain it there, the spring-bolt *c* is pushed or drawn up by means of the thumb-piece *d*, so that the front of the bolt *c* bears against the back of the projection *g*, thereby locking or bolting the hammer or striker at full cock. The reactions of the lock—that is to say, of the hammer or striker I, the tumbler H, and the sear or trigger K—are produced by means of a flat double spring, L, shown at Fig. 1, Sheet 1. One extremity, *g'*, of the spring L is attached to the tumbler H by means of a link, *f*, as shown, and the other extremity, *i'*, presses against the back of the sear or trigger K; or the reaction of the sear or trigger K may be effected by means of a separate spring. In a hole or chamber formed in the breech-piece A, a piston, M, of the shape shown at Figs. 1 and 2, Sheet 1, and at Fig. 1, Sheet 2, is placed, by which the cartridge contained in the cartridge-chamber B is ignited or fired when the said piston M is struck by the percussive action of the hammer or striker I; or, the cartridge may be fired by any other suitable arrangement of piston, the said piston forming no part of my present invention. The fire-arm shown in part on Sheets 1 and 2 is provided with an extractor, N, as shown in Fig. 1, Sheet 1, for removing the cases of exploded or fired cartridges from the cartridge-chamber B, as is hereinafter made more particularly apparent in reference to Sheet 3 of the drawing. The said extractor N is situated in a recess, *d*, formed in the front of the chamber in which the breech-piece A is situated, and it is carried loosely on a pin, *w*. The lower part *o* of the extractor is formed duplex, or with two arms or toes, *y*, the space between which is sufficient to allow the projection P on the lower part of the breech-piece A to pass between them.

Having thus described the various details of mechanism which constitute this modification of my said invention, I now proceed to set forth the combined action of the said details, and the mode of using the fire-arm. When it is desired to load the fire-arm, the lever F is depressed. This has the effect, by the action of the upper end of the lever F on the toe or projection *a* of the lever or beam C, of depressing the said lever or beam C through an angle, and the forward end thereof being situated in a cavity or recess in the breech-

piece A, the said breech-piece A is also depressed or drawn down, and in descending its under side R comes in contact with and depresses the projections or toes *y* of the extractor N, and by so depressing them throws the upper part of the extractor N rearward. This has the effect of withdrawing from the chamber B the case of the cartridge which had previously been discharged or fired. The depression of the lever F also turns back the tumblers H, and with it the hammer or striker I, to the full-cock position, wherein they are retained to the point *n'* of the sear or trigger K, entering the full-cock bent or notch *x*, so that in elevating the lever F the tumbler H and hammer or striker I remain in that position. By means of this arrangement the cartridge-chamber B is opened, the case of the exploded or fired cartridge withdrawn, and the hammer or striker I full cocked by one motion of the lever F. When the lower end of the lever F is elevated, the head or upper end thereof acting against that part of the under surface of the lever or beam C, marked T, Fig. 1, Sheet 1, causes the said lever or beam C, and with it the breech-piece A, to be returned into the position shown at Fig. 1, Sheet 1, and when this is effected the fire-arm is ready for being discharged. The cartridge contained in the cartridge-chamber B is fired by pressing with the finger upon the sear or trigger K so as to clear the full-cock notch or bent *x* of the tumbler H, which, being effected, the reaction of the spring L throws the tumbler H, and with it the hammer or striker I, forward. The front part of the said hammer or striker I passes through a hole or slot, S, formed in the rear wall *j* of the breech-chamber, as shown in dotted lines at Fig. 2, Sheet 1, and at Fig. 1, Sheet 2 of the drawing, and striking percussively on the end of the piston M also forces it forward, so that the point *z* of the piston M strikes the cap or percussion-ignition in the base of the cartridge, by which means the cartridge is exploded, the case being thereafter withdrawn and a fresh cartridge inserted into the cartridge-chamber B in the manner hereinbefore described. The piston M, on being freed from contact with the hammer or striker I, is pushed back to its normal position—that is, the position shown at Fig. 1, Sheet 1, (when the breech-piece A is lowered,)—by the action of a central beveled toe or claw, *v*, of the extractor N, as shown in detail at Fig. 4, Sheet 3, on the point *z* of the piston. The compound lever *a'*, shown in position at Fig. 2, Sheet 1, and at Figs. 1 and 2, Sheet 2, and in detail at Fig. 3, Sheet 1, or the arrangement of lever shown separately at Figs. 4 and 5, Sheet 1, in addition to the purpose of full or half cocking the hammer or striker I, serves as indicator, to denote the position which the hammer or striker I at any time occupies.

On Sheet 3 of the drawing, Figs. 1 and 2 are longitudinal sections of the same portion of a breech-loading rifle as that shown at Figs. 1 and 2, Sheets 1 and 2, but illustrating another arrangement of lock-casing, D. On Fig. 1, Sheet 3, the breech-piece A, together with the various details of mechanism employed for operating it, are shown in the position which they occupy at

the instant when the hammer I is in the act of striking the piston M. Fig. 2, Sheet 3, illustrates the position which the vertically-sliding breech-piece A and the entire mechanism occupies when a cartridge has been extracted from the cartridge-chamber B, it being here explained that before inserting another cartridge the extractor N is returned to its recess *d* by the partial upward movement of the breech-piece A. The extractor N is more particularly shown in side elevation by the detached view, Fig. 3, and in front elevation at Fig. 4, Sheet 3. As shown at Figs. 3 and 4, the upper end of the extractor N is formed with two segmental arms, *u*, which, when the extractor is in its normal position, rest in a corresponding recess formed in the barrel B, as shown at Figs. 1, Sheets 1 and 3. The arms *u* are provided with projecting claws *v*, the distance between the inner extremities of which corresponds with the internal radius of the cartridge-chamber B, and against these claws the flanch on the base of the cartridge-case bears when the cartridge is situated in the chamber in the position for firing, as seen at Fig. 1, Sheet 3. The piston M (after being acted upon by the hammer I, and striking percussively on the cap or percussion-ignition in the base of the cartridge contained in the chamber B, and as the breech-piece A is lowered, in order that the case of the said cartridge may be withdrawn as hereinbefore described in reference to Sheets 1 and 2 of the drawing) is pushed back to its normal position by the action of the central beveled toe *v* of the extractor, more particularly seen at Fig. 4, Sheet 3, on the point *z* of the piston M; or the cartridge may be fired by the arrangement of piston shown in dotted lines on the detached views of the breech-piece at Figs. 5 and 6, Sheet 3, in which instance the piston M is withdrawn by the reaction of a compressed spiral spring surrounding it. In the arrangement of lock-casing D, illustrated at Figs. 1 and 2, Sheet 3, the casing is secured to the stock of the fire-arm by passing a screw, X, through the upper bracing-plate Y and stock W, into the lower bracing-plate Z in the ordinary manner, as shown. Fig. 7, Sheet 3, is a detailed view of the tumbler.

On Sheet 4 of the drawing, Fig. 1 represents, in longitudinal section, that portion of a fire-arm including the breech E and breech-action, and Fig. 2, a plan of the same arranged in accordance with another modification of my invention. Under this arrangement the lever or beam A is formed with a curved slot, B, as shown at Fig. 1, Sheet 4, and the upper end C of the lever D is duplex, so as to embrace both sides of the lever or beam A, as shown in dotted lines in plan at Fig. 2, and it is attached to the said lever or beam A by means of a pin, *b*, passed through the slot B. On depressing the lever D the pin *b* moves through the curved slot B, thereby depressing the lever or beam A and the breech-piece E in the manner hereinbefore set forth in reference to the modifications shown on Sheets 1, 2, and 3 of the drawing; and as the actions of all the other parts of mechanism, in conjunction with

the lever D in this modification are similar to those hereinbefore described in reference to Figs. 1 and 2, Sheets 1, 2, and 3, they need not now be further specified, excepting in so far as regards the indicating and bolting arrangements, which, in this instance, consist in attaching an indicating-knob, H, to the upper part of the hammer or striker I, by means of a screw passed through a curved slot in the outside plate L of the lock-casing, as shown at Fig. 2, Sheet 4. The knob H also acts as a medium by which the hammer or striker I may be half or full-cocked, independent of the lever D. In order to lock the hammer or striker at full cock a spring bolt, *e*, similar to that shown at *c* on the lever *a*, Fig. 4, Sheet 1, of the drawing, is provided, and the upper portion of which slides in a groove or recess in the slide L of the lock-casing. When the hammer or striker I has been raised to the full-cock position, and if it is desired to retain it there, the spring-bolt *e* is drawn up by means of the finger-knob *g*, so that its rearward side bears against the front of the knob H. In lieu of employing a lever, the lower part of which, when in its normal position, surrounds the under side of the trigger-guard, as hereinbefore described, and particularly shown at Figs. 1 and 2, Sheet 1, and at Fig. 1, Sheet 3, for opening and closing the cartridge-chamber or cavity, and for cocking the hammer or striker, a side lever, similar to that shown in dotted lines at K, Figs. 1 and 2, Sheet 4, may be used for those purposes. Under this arrangement the shaft or pin *b'*, which carries the hammer or striker I and the tumbler H, projects to the outside of the lock-casing, and on this projecting part of the shaft or pin *b'* the said lever K is fixed. When it is desired to open the breech-cavity the lever K is depressed, and it depresses an intermediate lever, similar in construction to the upper portion of the lever D, Fig. 1, Sheet 4, which is also carried on the shaft or pin *b'*. Through the intervention of this intermediate lever the lever or beam A is depressed and consequently lowers the breech-piece E. In lieu of attaching the metallic casing of the lock to the stock or butt of the fire-arm in either of the modes shown on Sheets 1 and 2, or on Sheet 3, the lock-casing may be attached to the stock as shown at Figs. 1 and 2, Sheet 4, and which consists in forming the upper and lower parts G and H, respectively, of the lock-casing in one piece. On the part I a bar or tail, J, is formed, the rear end of which is provided with a screw. The bar J is inserted into a correspondingly-shaped hole formed in the stock to receive it, and held therein by means of a nut, K, which is passed into the stock from the rearward end, and screwed on to the end of the tail or bar J, after which the hole in the rear of the nut K may or may not be plugged up with a piece of wood or other material. In the drawing it is shown so plugged up. Fig. 3, Sheet 4, represents a longitudinal section of part of a breech-loading rifle, on which is illustrated another and slightly-different method of actuating the extractor A. The front part of the lever or beam B, in this instance, is extended and projected through the breech-piece

E, as shown, so that when the lever or beam B and breech-piece E are depressed the beveled extremity *c* of the lever B comes in contact with the toe *d* of the extractor A, and, depressing it, throws the upper part *e* of the extractor rearward, and the said upper part, being provided with claws similar to those shown on the extractor illustrated in detail at Figs. 3 and 4, Sheet 3 of the drawing, these claws catch against the flanch of the cartridge-casing, which is thereby extracted from the cartridge-chamber B in the manner hereinbefore described.

I wish it to be here understood that I lay no claim to the extractor, nor to the vertically-sliding breech-piece with the central fire-piston therein, shown in several of the figures on Sheets 1, 2, 3, and 4, when used separate from the other parts of my breech-loading fire-arm hereinbefore described, and I make no claim to any one of the several modes of attaching the lock-casing to the stock of the fire-arm; but

What I consider to be novel and original, and therefore claim as my invention, is—

1. The general arrangement and combination of parts constituting the breech action shown at Figs. 1 and 2, Sheets 1 and 2; at Figs. 1 and 2, Sheet 3; and at Figs. 1, 2, and 3, Sheet 4 of the drawing, by which the several actions of raising or lowering the breech, extracting the spent cartridge-case, and of “cocking” the hammer or

“striker,” are effected by the actuating of one lever, part of which is situated on the outside of the lock-casing, substantially as hereinbefore described.

2. The actuating a vertically-sliding breech-piece by a lever contained within the lock-casing, and moved radially in a vertical plane by means of another lever centered on the axis of the tumbler-shaft and extending below the body of the fire-arm, as hereinbefore described and shown at Figs. 1 and 2, Sheet 1; at Fig. 2, Sheet 2; at Figs. 1 and 2, Sheet 3; and at Figs. 1, 2, and 3, Sheet 4, or by means of a lever situated at the side of the fire-arm, as shown in dotted lines at K, Figs. 1 and 2, Sheet 4, of the drawing, or any mere modification thereof.

3. The compound levers, constructed and arranged substantially as herein described, for indicating whether the hammer or striker is half or full-cocked, and serving as levers for half or full cocking or bolting the said hammer or striker, as hereinbefore described, or any mere modification thereof.

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

ALEX. HENRY.

Witnesses:

JOHN BROWN,
JOHN C. MACANDIE.

(33.)