4 Sheets—Sheet 1.

J. S. EDGE, Jr.

BREECH-LOADING FIRE-ARM.

No. 188,111. Patented March 6, 1377.

FIG I

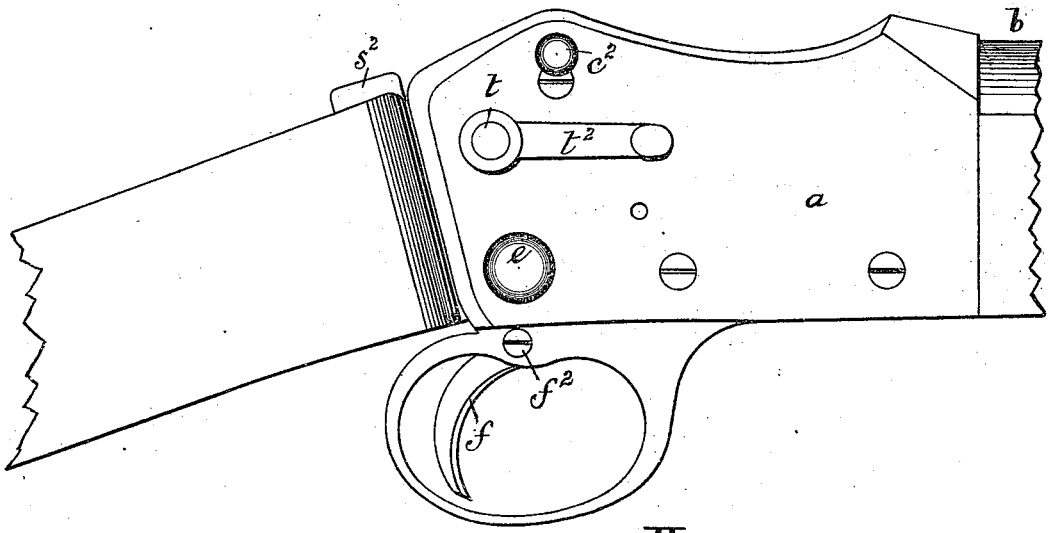
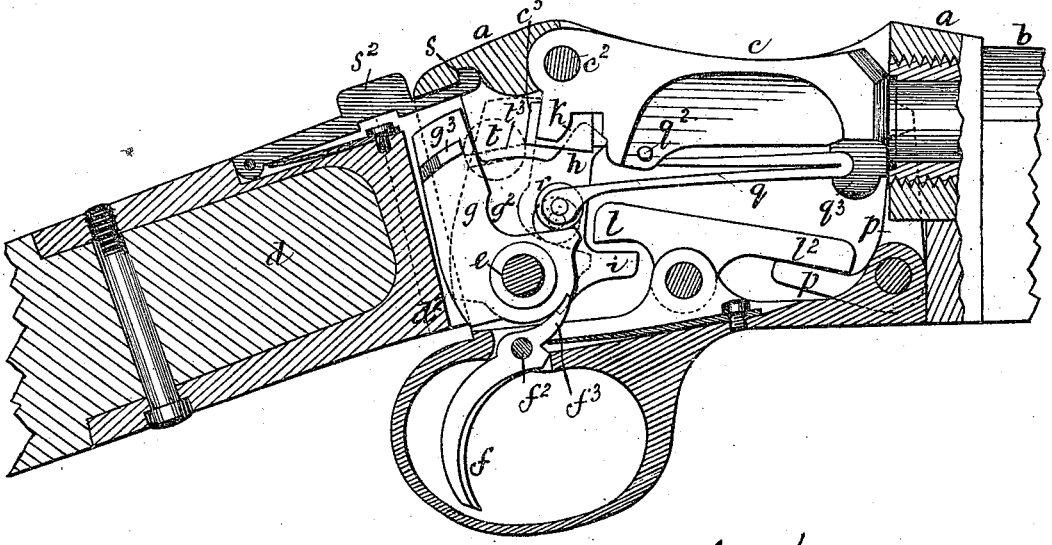


FIG II



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J. S. EDGE, Jr.

BREECH-LOADING FIRE-ARM.

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FIG. III

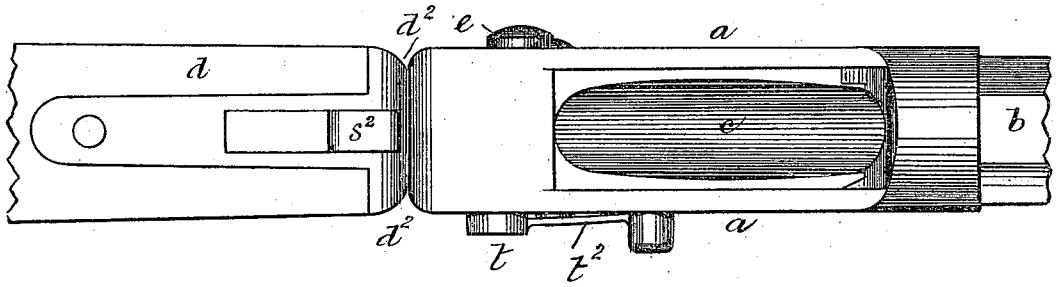
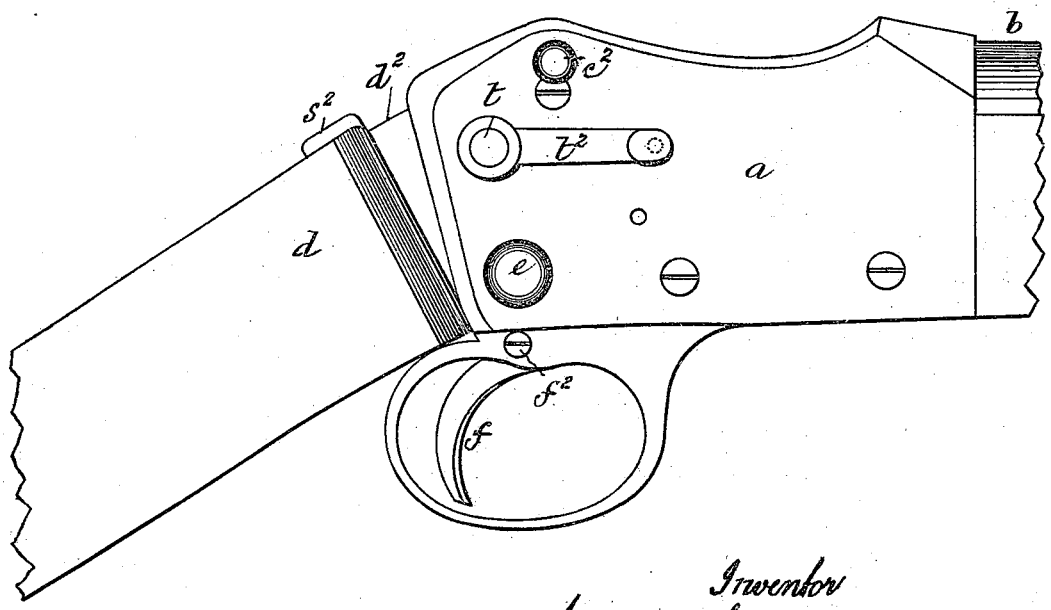


FIG. IV



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J. S. EDGE, Jr.

BREECH-LOADING FIRE-ARM.

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FIG V

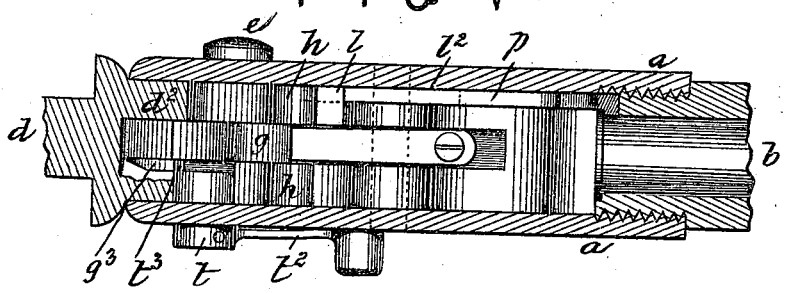


FIG VI

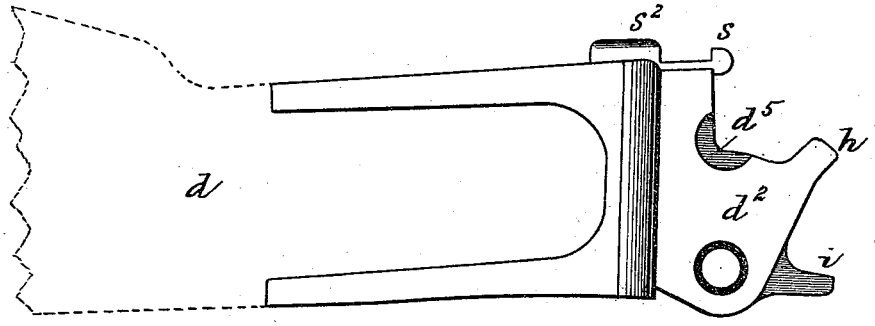
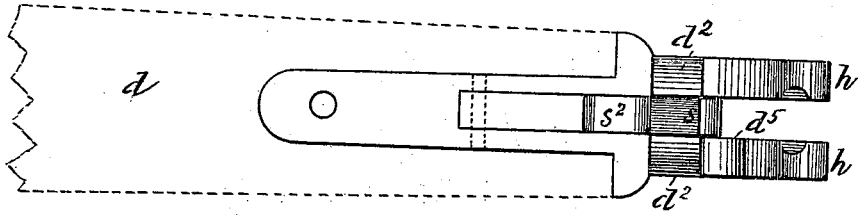


FIG VII



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BREECH-LOADING FIRE-ARM.

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FIG VIII

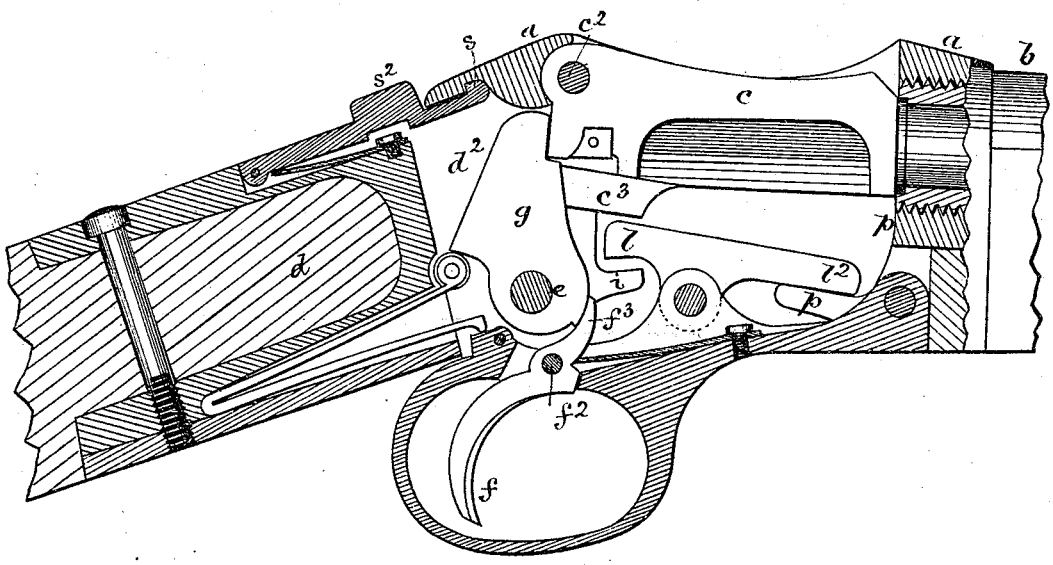


FIG IX

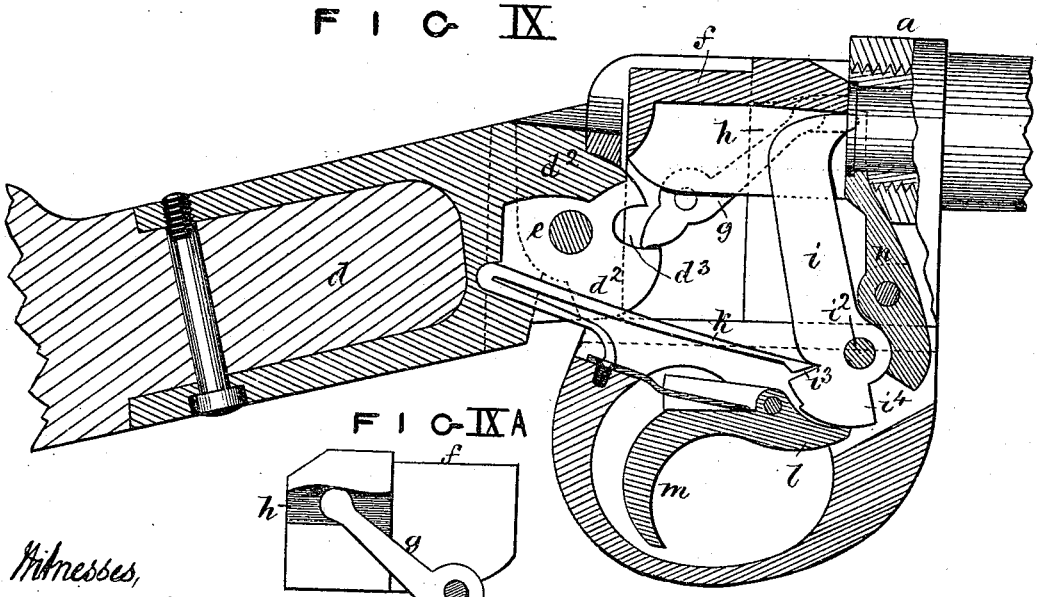
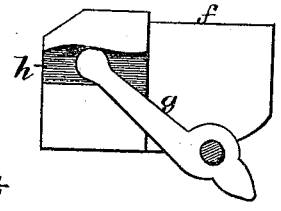


FIG IX A



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UNITED STATES PATENT OFFICE.

JAMES S. EDGE, JR., OF YARDLEY, ENGLAND.

IMPROVEMENT IN BREECH-LOADING FIRE-ARMS.

Specification forming part of Letters Patent No. 188,111, dated March 6, 1877; application filed January 24, 1877.

To all whom it may concern:

Be it known that I, JAMES SIMEON EDGE, the younger, of Yardley, in the county of Worcester, England, mechanical engineer, have invented new and useful Improvements in Breech-Loading Small-Arms, which improvements are fully set forth in the following specification, reference being had to the accompanying drawings.

My invention consists in constructing and arranging the parts of breech-loading small-arms in the ways hereinafter described, whereby the said arms are rendered more convenient in use than those of the ordinary construction, and the mechanism of the said arms is at the same time simplified.

I construct in the following manner a breech-loading falling-block gun, in which the lever ordinarily employed for opening the breech and cocking the gun is dispensed with, and the opening of the breech, the extraction of the cartridge-case, the closing of the breech, and the cocking of the gun are effected by acting on the stock of the gun. The stock is connected with the body of the gun by means of a metallic prolongation of the stock, in which prolongation is a joint, on which the stock is capable of turning through a small angle. The joint-pin on which the stock turns is situated low in the body of the gun, and very nearly over the pin on which the trigger turns. The hammer turns upon the same pin as the stock. The prolongation of the stock situated within the body of the gun carries an arm, which projects upward, and engages in a recess on the under side of the falling block, and near the joint of the said block. The mainspring is carried on the under side of the falling block, one end of the said spring being connected to the block near the joint end, and the bend of the spring being supported by a shoulder under the free end of the block. The other end of the mainspring acts on the hammer.

When the body of the gun is held still and the stock pressed downward, the latter moves through a small angle, and the internal projecting arm described, acting upon the falling block, depresses it. The motion of the mainspring causes that end of it resting on the hammer to force back the said hammer when the trigger engages in the bent of the tumbler.

A cartridge having been introduced into the open breech end of the barrel, the stock is raised. This motion raises the falling block and closes the breech, the hammer being retained in its cocked position.

By pressing the finger on the trigger the gun is discharged in the usual way. The cartridge-case is extracted by an extractor of the ordinary kind, operated by a lever situated in the lower part of the body. A short horizontal arm on the prolongation of the stock engages under one arm of the said lever.

When the stock is depressed and the falling block lowered, the said horizontal arm lifts the rear end of the said lever. The fore end is depressed, and, striking the extractor, throws out the cartridge-case.

The motion of the stock may be made to operate the sliding blocks of sliding-block guns by the use of a lever, the extractor being operated by the cocking of the hammer.

A safety-bolt, operated by a short arm or lever on the side of the hinged falling-block gun, when turned into one position, locks the stock and hammer, but when turned into another position does not interfere with the motion of either.

I will now proceed to describe, with reference to the accompanying drawings, the manner in which my invention may be performed.

Figure 1 represents in side elevation, Fig. 2 in longitudinal section, and Fig. 3 in plan, the breech end of a hinged falling-block gun constructed according to my invention, the parts of the said gun being in the respective positions which they occupy when the gun is ready for discharge. Fig. 4 represents a side elevation of the gun, showing the jointed stock depressed, for the purpose of opening the breech, cocking the hammer, and extracting the cartridge-case; and Fig. 5 represents a horizontal section of the gun, taken below the hinged block. Fig. 6 represents in side elevation, and Fig. 7 in plan, the jointed stock detached from the gun.

The same letters of reference indicate the same parts in Figs. 1 to 7, both inclusive.

a is the body or shoe of the gun, connected to the barrel *b* in the ordinary way. *c* is the

hinged falling block, working in the said shoe, the said block *c* turning on the pin or center c^2. *d* is the stock of the gun, and d^2 is the metallic prolongation thereof. The said prolonged metallic part d^2 of the stock *d* is forked, (see Fig. 7,) and projects into the body or shoe, and is jointed to the said body or shoe by the joint-pin *e*, upon which pin *e* the stock is capable of turning through a small angle. The said joint-pin *e* is situated low in the body of the gun, and is over the pin f^2, on which the trigger *f* turns. The hammer *g* turns on the same pin *e* as the jointed stock *d* d^2. The prolonged metallic part d^2 of the stock is provided with two arms, marked, respectively, *h i*. (See Figs. 6 and 7.) The forked arm *h* projects upward and engages in the recess *k* in the falling block *c*, near the joint of the said block, the said forked arm *h* giving the rising and falling motions to the said block. The other arm, *i*, which is nearly horizontal, operates the lever *l* l^2, and the latter the horizontal arm of the cranked extractor-lever *p*, as hereinafter described. The extractor-lever *p* is of the ordinary kind. *q* is the mainspring of the gun, the said spring being carried on the under side of the falling block *c*. The fixed limb of the spring is connected to the block *c* at the joint end q^2, and the bend of the spring is supported by the shoulder q^3 at the fore end of the block. The free end of the mainspring carries a roller, *r*, which works against the concave part g^2 of the hammer *g*. f^3 is the sear of the trigger *f*, which sear engages with the bent in the tumbler of the hammer *g*. The hinged stock *d* d^2 is fastened to the shoe or body of the gun, when the said stock is in its raised or normal position, by the spring-catch fastening *s* on the prolonged end d^2 of the stock engaging with a recess in the upper rear end of the shoe *a*. (See Fig. 2.) By pressure upon the thumb-plate s^2 of the fastening *s*, the latter is released from the shoe, and the stock may be depressed for opening the gun.

The action of the gun is as follows: When the body or shoe *a* of the gun is held still and the stock *d* d^2 is pressed down, after releasing the spring-catch fastening *s*, the said stock turns on the center *e*, and moves through a small angle, passing to the position represented in Fig. 4. By the depression of the stock, the forked arm *h* on the internal projecting part d^2, acting upon the falling block *c*, depresses the said block and opens the breech, and the motion of the mainspring *q*, carried by the said block, causes that end resting on the hammer *g* to force back and cock the said hammer, the sear f^3 of the trigger *f* engaging with the bent of the said hammer and holding it at full-cock, as illustrated in Fig. 2. As soon as the breech has been opened by the depression of the block *c*, the arm *i* of the prolonged end d^2 of the stock acts upon and raises the short arm *l* of the lever *l* l^2, and depresses its opposite arm l^2, and the latter arm, by operating on the nearly horizontal arm of the extractor-lever *p*, causes its vertical arm to move from the barrel and extract the empty cartridge-case from the said barrel.

By an examination of Fig. 2, it will be seen that the arm l^2 of the lever first acts upon the extreme end of the horizontal arm of the extractor-lever *p*, so as to start the cartridge-case, and afterward acts upon the said horizontal arm *p* near the joint, so as to extract the said cartridge-case.

After a fresh cartridge has been introduced into the barrel *b*, the stock *d* d^2 is raised into and fastened in the position represented in Figs. 1, 2, and 3. This motion raises the falling block *c* and closes the breech, the hammer *g* being retained in its cocked position by the sear f^3, and the gun is ready for discharge. By pressure upon the trigger *f*, the hammer *g* is released from the sear f^3, and the said hammer falls by the action of the free end of the mainspring *q*, and discharges the gun. The discharged position of the hammer *g* is indicated in dotted lines in Fig. 2, and the head of the striking-pin in the block *c*, against which the hammer strikes, is marked c^5.

For the purpose of preventing the accidental discharge of the gun, a safety-bolt, *t*, passes across the body of the gun, the said bolt being worked by the arm or lever t^2 on the outside of the body or shoe *a*. (See Figs. 1 and 3.) This bolt is capable of a partial rotation, and its acting end is provided with a cross-piece, t^3, which can either be made to cross the projection g^3 on the side of the hammer *g*, or be removed from the front of the said projection g^3.

When in the position represented in Fig. 2 the cross-piece t^3 of the safety-bolt is below the end of the projection g^3 on the hammer, and the said hammer may be discharged. When the bolt *t* t^2 t^3 is turned through a quadrant its cross-piece t^3 is made to cross the end of the projection g^3, and the discharge of the hammer *g* is prevented. The bolt *t*, besides serving to prevent the discharge of the gun, also fixes the hinged stock in its raised or normal position. The part below the cross-piece t^3 is cut away, so that when the bolt is in the position represented in Fig. 2 it does not impede the motion of the prolonged end of the jointed stock. When, however, the bolt is turned into its fastening position, (see the horizontal section, Fig. 5,) whereby the piece t^3 is made to cross the projection g^3 on the hammer, the cylindrical part of the bolt takes into the circular depression d^5 in the prolonged end of the stock, and thereby fixes the said stock.

Fig. 8 represents a modification of the gun described, in which the mainspring (marked *u*) is situated in the stock, instead of under the falling block. The manner in which the said mainspring *u* is connected with the hammer *g* is seen in the drawing. In this modification the hammer *g* is cocked, on the descent of the block *c*, by the operation of the prolonged part c^3 in the middle of the said block striking against the face of the hammer. The other

parts of this gun are the same as those in the gun herein first described, and corresponding parts are marked with the same letters of reference.

Fig. 9 represents, in longitudinal section, a vertically-sliding-block gun constructed according to my invention, the parts being in the positions which they respectively occupy when the breech is closed, and the gun has been discharged. d d^2 is the hinged stock, turning on the pin or center e. f is the vertically-sliding block, working in the shoe a, for opening and closing the breech. The motion of the said block f is effected by the prolonged end d^2 of the stock acting upon the lever g. The end of the long arm of the lever g engages in a slot, h, in the block f, (best seen in the separate view, Fig. 9ª,) and the short arm of the said lever g engages in the slot d^3 in the prolonged end d^2 of the stock. When the stock d d^2 is pulled down the block f is lowered, and when the stock is returned to its normal position the block f is raised. i is the hammer of the gun, turning on the center i^2, carried by the trigger-plate, and working in the hollow breech-block f. k is the mainspring of the hammer, the bend of the said spring being carried by the hinged stock d d^2. The end of the upper limb of the mainspring bears upon the inclined shoulder i^3 of the hammer, below the center of the said hammer. The end of the short limb of the spring is supported on the trigger-plate. l is the sear, and m is the trigger. When the jointed stock d d^2 of the gun is depressed, it carries the acting part of the spring k with it, and the upper limb of the said spring k, by pressing upon the shoulder i^3 of the said hammer, pulls down and cocks it, the said hammer being retained in its cocked position by the sear l engaging with the bent in the tumbler of the said hammer. The gun is discharged, in the usual way, by pressure on the trigger m. n is the extractor-lever, the upper arm of which acts upon the cartridge-case, and the lower arm is moved toward the barrel by the heel i^4 of the hammer when the latter has nearly reached its cocked position, as will be understood by an examination of the drawing.

Having now described the nature of my invention, and the manner in which the same is to be performed, I wish it to be understood that I do not limit myself to the precise details herein described and illustrated, as the same may be varied without departing from the nature of my invention; but

I claim as my invention of improvements in breech-loading small-arms—

1. In falling-block breech-loading guns, the combination of a jointed stock and a breech-block operated by the movement of said stock, substantially as herein set forth.

2. In falling-block breech-loading guns, the combination, with the breech-block and hammer, of a jointed stock, by whose movement the block is operated and the hammer is cocked, substantially as set forth.

3. In falling-block breech-loading guns, the combination of a jointed stock with a breech-block, hammer, and extractor, which are operated by the movement of the jointed stock, substantially in the manner set forth.

4. The combination, substantially as set forth, of the jointed stock, the falling breech-block, the hammer, and the mainspring, by the action of which the hammer is cocked when the breech-block falls.

5. The combination, substantially as set forth, of the jointed stock, the extracting-lever, and the intermediate lever, through which the stock acts on the extracting-lever.

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