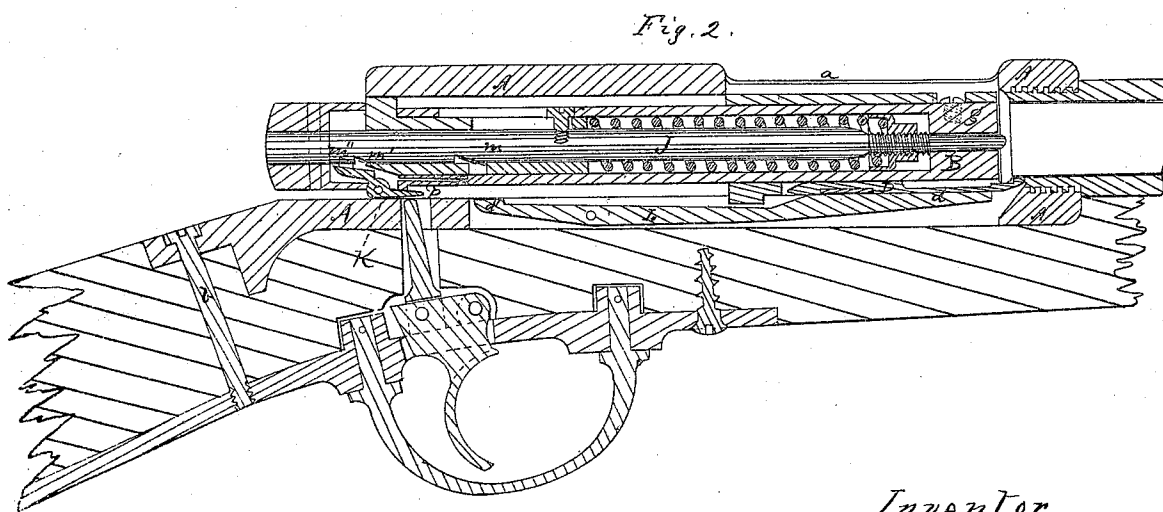
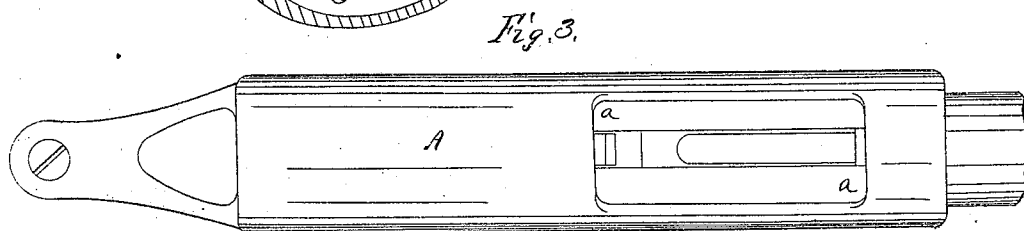
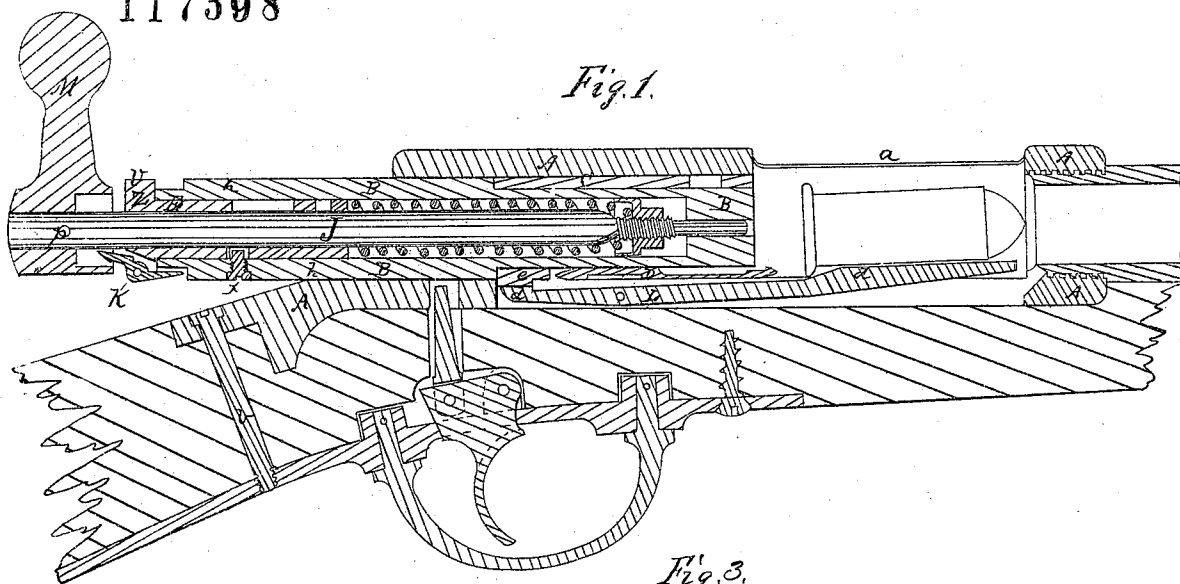


Valentine Fogerty.
Improvement in Breech Loading Fire Arms.

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Witnesses
Chauncey Smith
William W. Swain

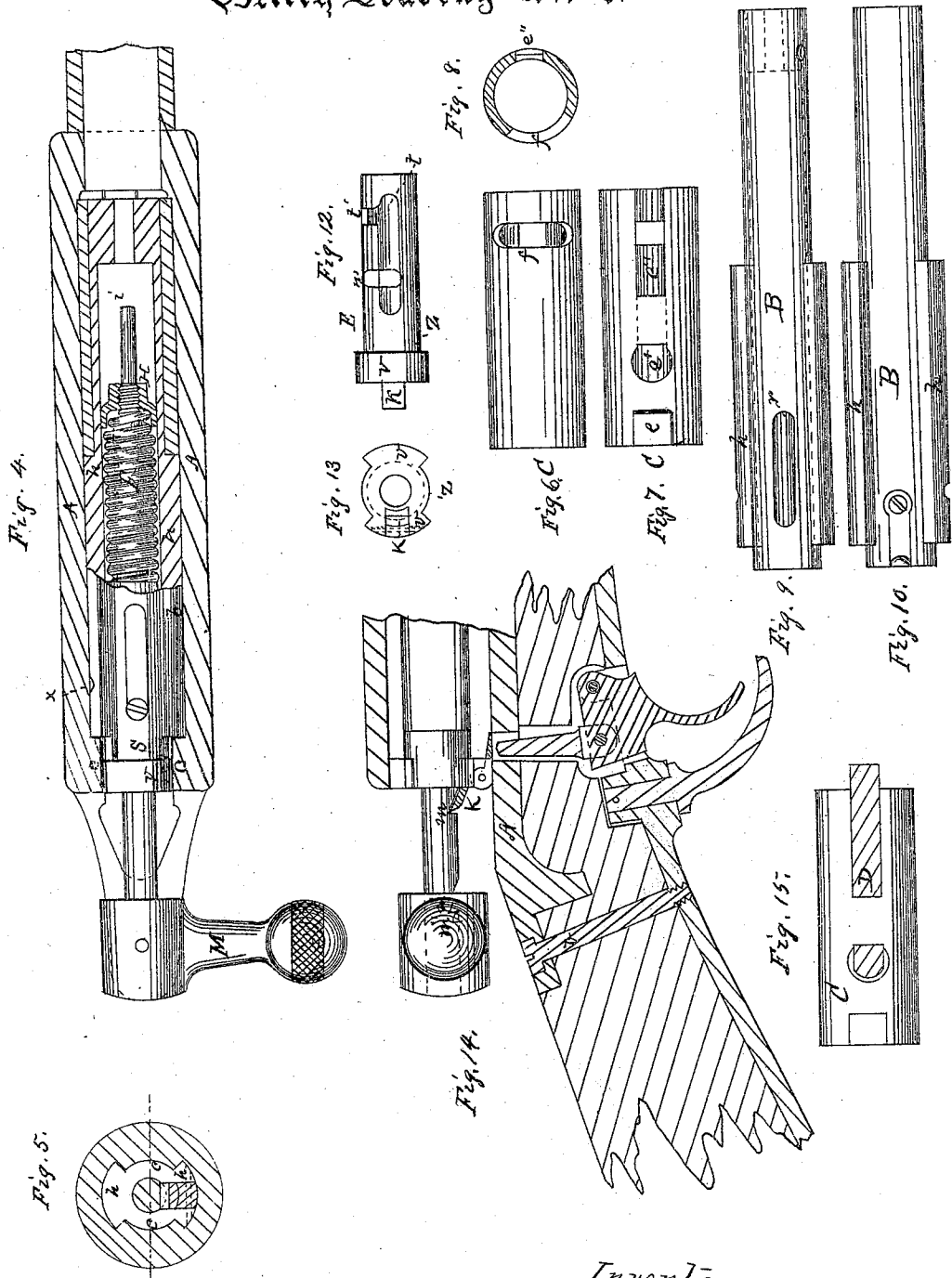
Inventor
Valentine Fogerty

Valentine Fogerty

PATENTED JUL 25 1871

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Improvement in Breech Loading Fire Arms.



Witnesses
Charles Smith
William W. Swan

Inventor
Valentine Fogerty

UNITED STATES PATENT OFFICE.

VALENTINE FOGERTY, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN BREECH-LOADING FIRE-ARMS.

Specification forming part of Letters Patent No. 117,398, dated July 25, 1871; antedated July 13, 1871.

To all whom it may concern:

Be it known that I, VALENTINE FOGERTY, of Boston, in the State of Massachusetts, have invented certain Improvements in Breech-Loading Fire-Arms; and I do hereby declare the following to be a full and correct description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section of a gun embracing my invention, with the breech-bolt drawn back. Fig. 2 is a vertical longitudinal section in the act of firing. Figs. 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, and 15 are detailed views. Fig. 4 is a sectional view, the gun being cocked. Fig. 14 is a vertical section of the rear portion of the lock and gun, the gun being cocked.

The same part is marked by the same letter of reference wherever it occurs.

My invention relates to that class of breech-loading fire-arms in which the breech is opened and closed by means of a sliding bolt and in which a central-fire metallic cartridge is used. They embrace improvements: First, in the breech-piece—or receiver, so called—which is attached to the breech of the barrel, and which receives the sliding bolt and other devices by which the gun is operated, and also receives the cartridge to be discharged. Second, in the sliding bolt, called the breech-bolt, by which the breech of the barrel is opened and closed, including the means for throwing out the cartridge-shell after the cartridge is exploded. Third, in the lock by which the gun is discharged, and in the combination of the lock and breech-bolt.

The receiver is represented in the drawings by A, and is shown in Figs. 1, 2, 3, and 4. It consists of a cylinder bored out to form a chamber to receive the sliding bolt and cartridge. It is screwed to the barrel in the manner shown in the drawings, and has, at the opposite end from the barrel, a prolongation on the lower side through which a screw is passed to fasten it to the stock. This prolongation is seen in Figs. 1 and 2. In the upper side of the receiver a rectangular orifice or slot is cut to admit the cartridge into the chamber. This feature is seen in Figs. 1, 2, and 3, and is marked *a*. The chamber extends entirely through the receiver, but at the end opposite the barrel it is partially obstructed by two lands or projections extending inwardly from the walls of the chamber, each occupying one-fourth

of the circumference of the chamber. These projections are best seen in a horizontal longitudinal section at Fig. 4, where they are marked *c*. The lands *cc* form the means by which the sliding bolt is locked when the cartridge is forced into the barrel and the breech is closed, and serve as the points of resistance to the force of the powder when the gun is discharged. Through the lower side of the receiver, at the end next the barrel, a longitudinal slot is cut, as shown in Figs. 1 and 2, to receive a lever marked L. This lever is pivoted to the receiver, as shown in the drawings, and serves to throw the cartridge-shell out of the receiver when the lock-bolt is drawn back, as will hereafter be described. It will also be observed, upon reference to Fig. 1, that the cartridge, when placed in the receiver, does not rest upon the bottom of the chamber, but upon the lever at its forward end. The lever has a projection, *d*, formed upon its upper side at the end, so that when the cartridge is placed in the chamber its axis will be in a line, or nearly in a line, with the axis of the barrel. By making this projection upon the lever larger or smaller the same receiver and working parts can be used in constructing guns of different calibers. This is a matter of great importance, as it saves the necessity of providing many special tools for the manufacture of arms of different calibers. A corresponding change, however, will be required in the other end *d*, or in the cam *e* which operates the lever. In the longitudinal slot just mentioned a cam, *e*, travels back and forth over the lever, as will be hereafter explained. The cam is seen in Figs. 1, 2, and 7. The width of the slot and of the lever may be determined by the width of the cam.

The breech-bolt and lock are combined together in a peculiar manner. The latter consists of several parts, nearly all contained within the breech-bolt, and so combined together and connected with the breech-bolt that the gun is cocked and the breech opened and closed by a common handle or hand-piece. The means by which the breech-bolt and lock are combined will be explained in connection with the mechanism of the lock. The breech of the barrel is opened and closed by the breech-bolt sliding backward and forward in the receiver. The breech-bolt is locked within the receiver by means of two long lands, *h h*, which, when the breech-bolt is in its place, and the breech of the barrel is closed, rest against the lands *c c*

at the back end of the receiver. The lands *h h* each take up a quarter of the circumference of the breech-bolt, and are shaped to fit into and slide through the recesses between the lands *c c* in the receiver, the latter lands, in turn, being in the same manner made to fit the recesses between the lands in the bolt. The breech-bolt is operated by the hand-piece, with which it is connected, as will be hereafter shown. For the purpose of locking the breech-bolt it has a rotary motion for a quarter of a turn within the chamber of the receiver, which it fills. When the breech of the barrel is closed the lands of the receiver and the lands of the bolt lie in the same lines, and the hand-piece lies turned down to the right. To open the breech the hand-piece is turned to the left a quarter of a turn, when the lands of the bolt are in line with the recesses between the lands of the receiver, and the bolt may be drawn back to the position shown in Fig. 1, thus opening the slot *a*. The means taken to prevent the breech-bolt from slipping entirely out of the receiver will be presently described. To close the breech the breech-bolt is pushed back and turned to the right by the hand-piece. The breech-bolt proper, by which the breech of the barrel is opened and closed, is a hollow cylinder or tube, represented by B in Figs. 1, 2, and 4, provided with a sleeve, C, which is secured to it by a screw, *g*, through a transverse slot, *f*. It fills the receiver. The breech-bolt sleeve can slide freely back and forth in the chamber, but is prevented from coming out of the back end by the lands *c c*. When the screw *g* is in its place, securing the sleeve to the breech-bolt, and the breech-bolt is drawn back, the sleeve, striking against the lands *c c*, prevents the breech-bolt from being drawn wholly out. The breech-bolt, however, when the sleeve is thus fastened to it, can be drawn back far enough to open the slot *a* for inserting a cartridge. When, by taking out the screw *g*, the breech-bolt is allowed to slip out of the sleeve, it can be drawn entirely out of the receiver. Views of the breech-bolt drawn out of the receiver and free from the sleeve are shown in Figs. 9 and 10. Views of the sleeve by itself are shown in Figs. 6 and 7. The breech-bolt sleeve is of the same length as the part of the bolt in front of the lands *h h*. Its shell has the same thickness as the lands *h h*. A vertical section of the breech-bolt through the lands *h h* is shown in Fig. 11. From their great length the lands *h h* assist the breech-bolt sleeve in keeping the breech-bolt steady within the receiver. Another office, besides locking the breech-bolt within the receiver, is to guide the breech-bolt as it is drawn out or pushed in through the back end of the receiver. The lands serve to keep the breech-bolt in line with the barrel in whatever position the breech-bolt may be placed. The diameter of the breech-bolt, not including the lands nor the sleeve, is uniform and equal to the distance between the lands *c c* of the receiver, shown by the red line in Fig. 13. The part of the breech-bolt back of the lands *h h* extends back between the lands *c c* when the bolt is locked in its place, as shown in Fig. 4. The extreme front end of the breech-bolt is nearly

solid, as shown in Figs. 1, 2, and 4, a small opening being left for the play of the percussion-pin, as will hereafter be explained. This gives sufficient thickness to bore a hole for the screw *g*. The breech-bolt sleeve is placed within the receiver through the slot *a*. Upon the bottom it has a projection or cam, *e*, seen in Figs. 1, 2, and 7, which fits into and travels in the slot *y* above the lever L, previously described. When the sleeve is drawn back in the chamber the cam *e*, on its backward passage, strikes the projection *d'* upon the lever L and operates the lever to throw out a cartridge-shell. Remaining upon the projection *d'*, it holds the other end *d* in position to receive a new cartridge. The cam *e*, working in the slot *y*, prevents the sleeve from turning in the receiver, and allows it to have only a longitudinal motion back and forth. After the sleeve has been placed in the receiver through the slot *a* the breech-bolt is pushed in through the back end of the receiver, and the part in front of the lands *h h* enters and fills the sleeve. The screw *g* is then screwed into the breech-bolt through the slot *f*, to secure the sleeve to its bolt. The slot *f* is made long enough to allow the bolt, when the screw is inserted, to make a quarter of a rotation within the sleeve; but when the screw is inserted the sleeve and bolt have necessarily the same longitudinal motion. The head of the screw *g* is buried in the slot. This slot is cut in the top of the sleeve, as shown in Fig. 6, so that the screw can always be reached by the screw-driver through the slot *a* of the receiver. The slot for the screw *g* may be cut in the thick end of the breech-bolt and the hole be placed in the sleeve. In the lower side of the breech-bolt sleeve there is a hole, *e'*, and a slot, *e''*, shown in Figs. 1, 2, and 7, for securing and allowing the play of the cartridge-shell retractor, which is marked D in the drawings. The office of the retractor is to draw the shells of discharged cartridges from the barrel into the chamber, whence they are thrown out by the lever L. A vertical section of the retractor may be seen in Figs. 1 and 2. It has a wedge-shaped head, which will pass under the flange of a cartridge in the barrel. The head has a catch, as shown. Back of the catch, for a considerable distance, the retractor is hollowed out on the top. This gives it the force of a spring to retain its place and its grasp upon the flange of a cartridge, the bolt within the sleeve pressing hard upon the rear part of the retractor. The retractor and breech-bolt sleeve are mortised into each other, as shown in Figs. 1 and 2. (See also Fig. 15, further illustrating the manner in which the sleeve and retractor are connected.) The retractor is put into its place, through the slot *a* of the receiver, after the sleeve is in the receiver and before the breech-bolt is pushed in from the back end.

The peculiar combination of the retractor with the breech-bolt and sleeve is an important feature in my invention. The sleeve remaining fixed while the bolt is turned, the retractor also remains fixed, and is not required to move around the flange of a cartridge; but the sleeve partaking of the longitudinal movements of the breech-bolt,

the retractor is carried back and forth as the bolt is moved, and in its backward movement draws back the cartridge-shell. The combination allows the retractor to be operated by the common hand-piece which is used to operate the breech-bolt and the lock, and thus it allows without requiring any separate movement of the hand-piece.

At the back end of the breech-bolt, upon the lower side, there is attached a sear-spring, P, seen in Fig. 10, the operation of which will be described hereafter. The breech-bolt has a slot, *r*, through which a screw, *s*, is fastened into the lock-bolt J. This screw also passes through a slot, *t*, in the lock-sleeve, which lies between the hollow cylinder which constitutes the breech-bolt and the lock-bolt, as is presently to be described. The head of the screw *s* is buried in the slot *r*. Through one of the lands of the breech-bolt there is a hole for a screw, *x*, connecting the breech-bolt with the lock-sleeve.

My lock consists of five pieces, viz., the lock-sleeve, the lock-bolt, the spiral spring, the sear, and the sear-spring. As before stated, these parts are mostly contained within the breech-bolt. The lock-sleeve is shown in whole or in part in Figs. 1, 2, 4, 5, 12, 13, 14, and 15. It may be considered the principal piece of the lock mechanism, having an office to perform in every motion in loading and firing the gun. The lock-sleeve, for the greater part of its length, fits closely within the breech-bolt, but has a shoulder, *z*, which presses against the back end of the breech-bolt, as shown. The shoulder *z* of the lock-sleeve closes the back end of the receiver, as shown in Figs. 4 and 14, having lands *v v*, shaped like the lands *h h*, to fit the grooves between the lands *c c* of the receiver. These lands deprive the lock-sleeve of rotary motion. The lock-sleeve is placed within the breech-bolt before the latter is pushed forward into the receiver. It is secured to the breech-bolt by a screw, *x*, seen in Fig. 1, receiving this screw in a transverse slot, *w*, which is of such length as to allow the breech-bolt a quarter of a rotation independently of the lock-sleeve. When the breech-bolt and lock are to be put into the receiver the breech-bolt is turned upon the lock-sleeve until the lands *h h* and *v v* are in the same line. The breech-bolt is afterward turned to the right, and secured as before directed. The longitudinal slot *t* of the lock-sleeve, which has been before referred to, is always along the top of the sleeve when the sleeve is in the gun. It has the same length and breadth as the slot *r* of the breech-bolt; but it has a branch, *t'*, by means of which the breech-bolt and lock-bolt, connected, as before shown, by the screw *s*, are allowed a quarter of a rotation independently of the lock-sleeve. In one of the lands of the lock-sleeve is pivoted the sear K, as shown in Fig. 14. The forward end of the lock-sleeve serves as a shoulder, against which rests the base of the spiral spring F, the use of which will be hereafter explained. The lock-sleeve surrounds the lock-bolt J, as shown, to which it is secured by the screw *s*. After the screw *s* is turned into the branch

slot *t'* the lock-sleeve and lock-bolt have the same longitudinal motion. The lock-bolt J is shown in Figs. 1, 2, 4, and 14. It fits closely within the lock-sleeve for a part of its length, but extends both back and in front of the sleeve. The lock-bolt tapers at the forward end into a pin, *i*, called the percussion-pin. Owing to the peculiar shape and position of the branch slot *t'* in the lock-sleeve, which are accurately shown in the drawings, the act of turning the screw *s* into the branch slot draws the lock-bolt a little way back independently of the lock-sleeve. This has the effect to draw the percussion-pin wholly within the breech-bolt. The slots *r* and *t* in the breech-bolt and the lock-sleeve, respectively, when they coincide, allow the lock-bolt to have a longitudinal motion independently of the breech-bolt and lock-sleeve. The lock-bolt has three notches to catch the sear, viz., the notch *m* for full-cock, the notch *m'* for half-cock, and the notch *m''* for an additional safety-catch. There is coiled around the lock-bolt a spiral spring, F, furnishing the power by which the lock operates. The spring is confined between the lock-sleeve and the screw-head H attached to the lock-bolt, as shown. It is wholly within the breech-bolt in front of the lock-sleeve, as shown in Figs. 1, 2, and 4. It is the mainspring of the lock. When the spiral spring is free to exert its force upon the lock-bolt it carries the lock-bolt forward so that the pin *i* projects through the hole in the thick part of the breech-bolt, before referred to. The tension of the mainspring is regulated by the screw-head H, as shown.

Fig. 2 shows the pin advanced in the act of discharging a cartridge. The position of the lock-bolt and pin when the spring is compressed is shown in Fig. 4. In Fig. 4 the gun is cocked. The screw-head H is made with a cup, as shown in Fig. 4, into which one end of the spiral spring enters. The lock-bolt has a handle, M, which is also the hand-piece of the lock. The hand-piece is fastened to the lock-bolt by a pin, *p*, as shown. It has a cap around the lock-bolt protecting the sear, as shown. As before stated, the sear K is pivoted to the lock-sleeve. There is a slot cut in one of the lands *v*, as shown in Figs. 1, 2, and 14, to allow it to be so pivoted. When the breech-bolt and lock are in the receiver this slot and the sear are at the bottom, as shown. One arm of the sear plays into the notches in the lock-bolt; the other projects under the back end of the breech-bolt. The breech-bolt can turn freely over this arm, since the arm does not project as far as the lands *h h*. When the breech-bolt is turned so as to be locked within the receiver the sear-spring comes over one arm of the sear and exerts its force to throw the other arm into any notch upon the lock-bolt that may be over it. As the lock-bolt and breech-bolt turn together the sear-spring comes into position to exert its force upon the sear only when the notches upon the lock-bolt are in the line to catch the outer arm of the sear. The trigger and guard of my gun are the same as those of other guns. The trigger operates a trigger-pin, *o*, which strikes

against the sear and releases it from the notches upon the lock-bolt. When, however, the gun is half-cocked, besides pulling the trigger to release the sear, it will be necessary to pull back the lock-bolt by the hand-piece.

To put the parts of the lock together and insert the lock with the breech-bolt into the receiver in working order, it is necessary to first put the lock-sleeve and spiral spring upon the breech-bolt and secure them by the screw-head H. The parts so united are then put into the breech-bolt and the breech-bolt is turned until the hole for the screw *x* is over the transverse slot *v* in the lock-sleeve, when the screw *x* is secured in its place. The three pieces are then so adjusted with reference to each other that the two slots *r* and *t* coincide, and the hole in the lock-bolt for the screw *s* can be seen through the two slots, when the screw *s* is screwed into its place. The same three pieces are now so adjusted that the lands *h h* and *v v* are in line, the sear being underneath and the sear-spring being to the right. To allow this the screw *s* slips aside into the branch slot *t'*, and the two slots *r* and *t* no longer coincide. When the screw *s* turns into the branch slot it draws back the lock-bolt so that the percussion-pin does not project beyond the breech-bolt. The breech-bolt, with the lock-sleeve and parts connected with it, is now pushed into the receiver, where the breech-bolt, sleeve, and retractor have previously been inserted, in the manner before described, and the screw *g* is screwed into its place in the breech-bolt through the slots *a* and *f*. All these parts are then locked within the receiver by turning the hand-piece to the right. Turning the hand-piece to the right turns the breech-bolt and the lock-bolt, the lock-sleeve being firmly held by the lands *v v* fitting into the recesses between the lands *c c* of the receiver. The lands *h h* of the breech-bolt now lock against the lands *c c*. The screw *s* has passed out of the branch slot *t'* into the main slot *t*, and the spiral spring operates to carry forward the lock-bolt and percussion-pin. Lest, however, there might be danger of exploding a cartridge when the lock-bolt and pin slip forward, as the screw *s* passes out of the branch slot *t'* to the main slot *t*, the additional safety-notch *m''* comes into play, the sear-spring operating to throw the sear into the notch as the lock-bolt is turned gradually around. The sear may be instantly released from the safety-notch by touching the trigger.

To load a gun embracing my invention—first, turn up the hand-piece from the right to a vertical position; second, draw back the hand-piece; third, put the cartridge into the receiver through the slot *a*; fourth, push back the hand-piece; fifth, turn down the hand-piece to the right. When the hand-piece is turned up vertically the screw *s* passes into the branch slot *t'*, as before described. When the hand-piece, after being drawn back, is again pushed forward, the screw remains in the branch slot, and, consequently, the percussion-pin does not project beyond the advanced end of the breech-bolt to explode the

cartridge as the latter is pushed into the barrel by the breech-bolt. When the hand-piece is turned to the right the sear slips into the safety-notch *m''*, and the percussion-pin is not allowed to press against the cartridge. The gun, therefore, is not liable to go off accidentally when the hand-piece is turned to the right. The gun is handled with safety when the sear is in this notch. A shock occasioned by dropping the gun upon its butt is not communicated to the cartridge with sufficient force to explode it; and even when the trigger is pulled the pin has so little distance to travel that there is not force enough to cause an explosion. The gun is cocked or half-cocked by drawing back the hand-piece until the sear slips into the notch *m* or *m'*, respectively. The sear may be released from the safety-notch before cocking the gun. Although the lock and breech-bolt are operated by a common hand-piece the lock can be operated only when the breech-bolt is locked within the receiver and the hand-piece turned down to the right. The breech-bolt and the lock-bolt having the same rotary motion, the lock-bolt cannot be turned excepting when the breech-bolt is so locked in its place, since the lands *h h* deprive the latter of all rotary motion as it slides into or out of the receiver. The gun cannot be cocked when the hand-piece is turned up vertically, since turning the hand-piece up from the right turns the screw *s* into the branch-slot *t'*, and, the slots *r* and *t* no longer coinciding, the lock-bolt cannot be drawn back independently of the lock-bolt and lock-sleeve. It follows that, having begun to draw the lock-bolt out of the receiver, it is necessary to return it and lock it before the gun can be cocked; and, having cocked the gun, it is necessary to uncock it before the breech-bolt can be unlocked and drawn out of the receiver.

I claim—

1. The projections or shoulders *c c*, extending inward from the walls of the receiver for the purpose of locking the breech-bolt within the receiver, as set forth.

2. The combination, with the slot in the bottom of the receiver, of the lever for throwing out the cartridge and the cam on the sleeve C, as and for the purpose set forth.

3. The combination of parts herein described, whereby the lever L is caused to guide the cartridge into the barrel of the gun and to throw the shell from the receiver, as specified.

4. The combination herein described of the breech-bolt B and sleeve C, the parts being constructed and arranged in relation with each other as shown, and for the purpose specified.

5. The combination of the retractor D and the sleeve C when the same are connected together in the manner shown.

6. The long lands or projections on the breech-bolt for locking the bolt within the receiver, giving it a support against the wall of the chamber through the whole length of the chamber, guiding the breech-bolt as it is drawn back and pushed forward, and for preventing the opera-

tion of the lock to cock the gun when the breech-bolt is not locked in its place.

7. The sear-spring, when combined with the breech-bolt B, as shown, so as to operate on the sear only when the breech-bolt is locked.

8. The combination of the lock-bolt, provided with the angular slot tt' , with the firing-pin and breech-bolt when connected together for operation, in the manner and for the purpose described.

9. The slots r and t in the breech-bolt and lock-sleeve for allowing the lock-bolt to be drawn back independently of the breech-bolt to cock the gun.

10. The shoulder and projections on the lock-sleeve for closing the end of the receiver and preventing the rotation of the lock-sleeve.

11. The combination of the sear and the lock-sleeve.

12. The cap in the hand-piece for protecting the sear.

13. The safety-notch m'' cut in the lock-bolt, when arranged, in the manner described, in relation to the branch slot t' of the lock-sleeve and the screw s , so as to catch the sear when the screw passes out of the branch-slot.

The above specification of my said invention signed and witnessed at Boston this 4th day of June, A. D. 1869.

VALENTINE FOGERTY.

Witnesses:

CHAUNCEY SMITH,
WILLIAM W. SWAN.