J. LEE.

BREECH-LOADING FIRE-ARM.

No. 193,821. Patented Aug. 7, 1877.

Fig. 1.

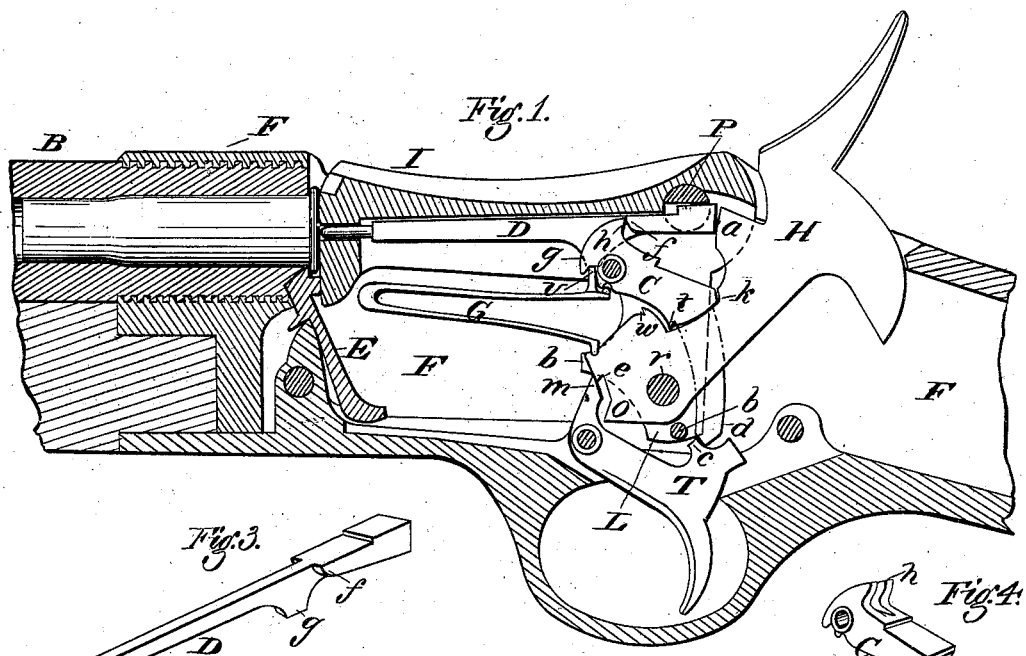



Fig. 3.

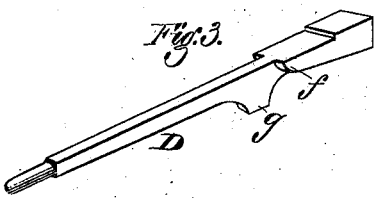



Fig. 4.

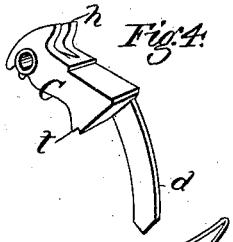
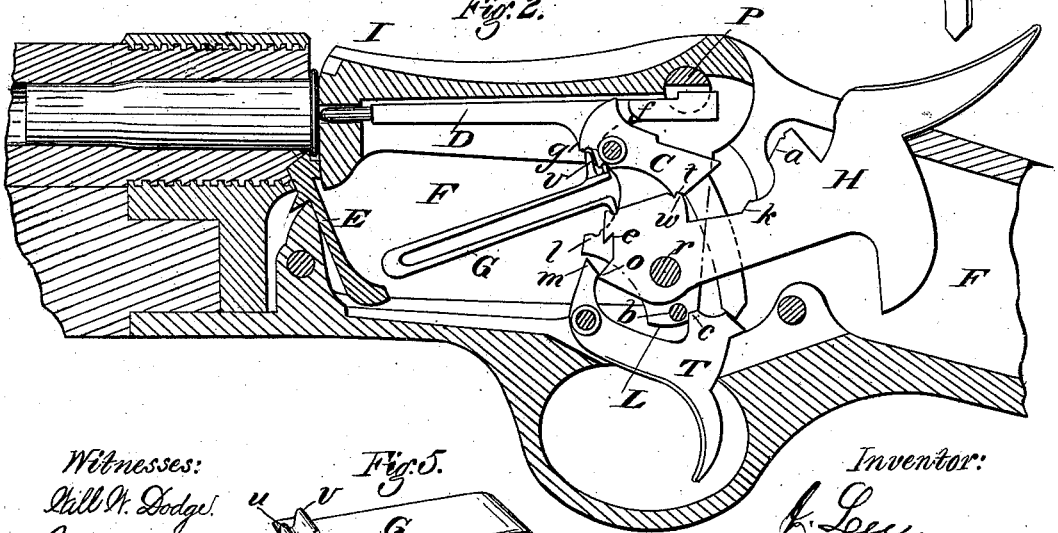



Fig. 2.




Witnesses:
Still W. Dodge
W. B. Chaffee

Fig. 5.

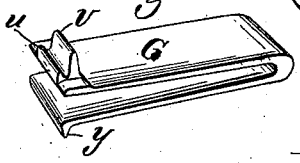
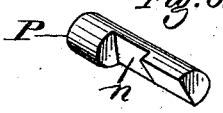



Fig. 6.




Inventor:
J. Lee.
by Dodger & Lee,
Attys.

# UNITED STATES PATENT OFFICE.

JAMES LEE, OF MILWAUKEE, WISCONSIN.

## IMPROVEMENT IN BREECH-LOADING FIRE-ARMS.

Specification forming part of Letters Patent No. **193,821**, dated August 7, 1877; application filed October 9, 1876.

*To all whom it may concern:*

Be it known that I, JAMES LEE, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain Improvements in Breech-Loading Guns, of which the following is a specification:

This invention consists of certain new features or improvements in the construction of the breech mechanism of breech-loading guns, as hereinafter more fully described.

Figure 1 is a longitudinal vertical section, showing the hammer in the position it occupies after the arm has been fired. Fig. 2 is a similar sectional view, showing the hammer at full cock, and Figs. 3, 4, 5, and 6 are perspective views of portions detached.

In the drawing, F represents the metallic frame, technically called the receiver, in which is pivoted the breech-block I on a pin, P, at its rear end, so that its front end may swing down to open the breech, the same as in my Patent No. 160,919, dated March 16, 1875, the extractor E being also the same. In this gun the hammer is also pivoted to and moves with the breech-block, similar to my former gun, but in this case the hammer, as shown in Figs. 1 and 2, is made in a single piece, instead of being jointed as the former one was.

I will now proceed to describe the special features or improvements embodied in the present gun. In my former gun the breech-block was thrown up when released from the extractor by the shoving in of a cartridge by the hammer bearing against one edge of a flattened surface on the pin which held the breech-block in the receiver. In this case, as I desire to use a hammer which, after striking the firing-pin to fire the gun, shall be thrown back free from the firing-pin, it becomes necessary to provide some other means for raising the front end of the breech-block. This I accomplish by making the firing-pin D bear against the under flattened surface of the pivot-pin P, said firing-pin being pressed against the pin P by means of the mainspring at all times except when the hammer is at full cock, or nearly so, as hereinafter more fully explained.

As shown in Fig. 6, the pin P is made flat for about two-thirds of its length, and has a recess, *n*, in its flattened surface midway of its length, in which the upper surface of the firing-pin engages, thereby holding the pin P in place, thus dispensing with any screw or other device for that purpose. The flattened end of pin P fits into a corresponding-shaped hole in one side of the receiver, thereby preventing it from turning, and holding its flat side always in the same position, so that as the front end of the block is thrown down, the firing-pin will bear on the rear edge only of its flat surface, and by the pressure of the mainspring G against the under side of the firing-pin, will tend to force the breech-block up—the upper edge of the firing-pin bearing against the flattened side of pin P, when the breech-block is up, as shown in Fig. 1.

The firing-pin D is constructed as shown in Fig. 3, with a projection, *g*, on its under surface, against which a spur, *v*, on the mainspring G bears to press it up against the pin P at all times, except when the hammer is at full cock, at which time, by a change of position of the spring, as shown in Fig. 2—this change being effected by throwing backward the lower bearing of the spring by the cocking of the hammer, thereby causing its front end to tip down, thus drawing the spur *v* away from the projection *g* on the firing-pin. The firing-pin is also provided with rounded shoulders *f* on its sides, against which the hooked end of the sear C engages to draw back the firing-pin after the gun has been fired, as shown in Fig. 1.

The sear C is made as represented more clearly in Fig. 4, and is pivoted to the breech-block, as shown in Figs. 1 and 2, its upper end being slotted, so as to straddle the firing-pin, and thus bring its upper hook-shaped end in proper position to engage against the shoulders *f* of the latter. It is also provided with a point, *t*, arranged to engage in the full-cock notch *w* of the hammer, as represented in Fig. 2. It is also provided with a tail-piece or prolongation, *d*, the end of which is beveled, and arranged to bear on a beveled or inclined surface on the upper rear part of the trigger T, for the purpose of disengaging the point *t* of the sear from the notch *w* of the hammer, in order to fire the gun, as shown in Fig. 2.

The trigger T is made as shown in Figs. 1

and 2, and is pivoted near its front end, which latter is bent upward, and terminates in a point, *m*, which engages in the half-cock notch *e* in the lower end of the hammer, as shown in Figs. 1 and 2. At its rear end the trigger is provided on its upper side with a hook-shaped projection, *c*, arranged to engage with a pin, *b*, which extends across and connects the two arms L, which project downward from the under side of the breech-block at its rear end, so as to lock the breech-block up in position at the time of firing, or when the gun is at full cock. In Fig. 2 this projection *c* is shown as partially engaged with the pin *b*, and as the trigger is pulled to release the hammer the projection *c* is forced still farther up, and made to engage fully with the pin *b*, whereby the breech-block is locked fast. As soon as the finger is removed from the trigger after firing the latter drops down, as represented in Fig. 1, thereby unlocking the breech-piece, and leaving it free to be moved by pressing forward on the horn or thumb-piece of the hammer.

The hammer H is made of the form shown in Figs. 1 and 2, and is pivoted on a pin, *r*, between the arms L of the breech-block, near their lower end, as clearly shown in the drawings. It is provided with a nose, *a*, for striking the firing-pin, and on its front edge, below said nose, it is also provided with a shoulder or notch, *k*, in or against which the rear end of the sear C engages after the arm is fired, and by which the hammer is forced and held back away from the firing-pin, these parts being so arranged and proportioned as to hold the hammer in a position just short of half-cock, as shown in Fig. 1.

It is obvious that the firing-pin D may be made to shove the hammer back, in which case the beveled end of the sear, and the shoulder *k* on the hammer may be dispensed with.

When it is desired to half-cock the hammer it is only necessary to draw it back slightly, when the point *m* of the trigger will engage in the half-cock notch *e*. The hammer is also provided at its lower end with a projecting point, *o*, which, as the hammer is drawn back to cock it, presses against the rear side of vertically-projecting arm on the front end of the trigger, thereby throwing its rear end upward, and bringing the hook or projection *c* of the trigger behind the pin *b*, as shown in Fig. 2.

The mainspring G, which is the only spring used in the gun, is fully represented in Fig. 5. It is a flat bent spring, having on its lower leaf a projection, *y*, which bears in a notch in the front lower part of the hammer, as shown in Fig. 2, while its upper leaf is provided with two projections or spurs, *u* and *v*, the latter of which is considerably longer than the other, there being two notches in the under side of the sear near its front end, as represented in Fig. 2, for these spurs on the upper leaf of the spring to engage in, as shown in Fig. 1, when the parts are in place.

The proportions and arrangement of these notches and spurs are such that as the arm is manipulated the upper leaf of the spring changes its bearing from one to the other of the spurs and notches, thus exerting much more force on the sear C at one time than at another.

As shown in Fig. 2, when the hammer is drawn back or cocked the lower bearing of the spring is thrown backward, thereby causing the front part of the spring to tip downward, whereby the bearing of the upper leaf, which was before on the spur *v*, is transferred to the spur *u*, the notch for the latter being arranged very slightly in front of the pivot of the sear, as shown in Figs. 1 and 2, so that when the bearing is on the spur *u* there is but little pressure upward on the front end of the sear, only just enough to make sure that its arm *d* shall bear on the trigger T, and hold its point *t* securely in the full-cock notch *w*. But when the gun has been fired the change of position of the lower bearing of the spring G causes the spring to resume the horizontal position, as shown in Fig. 1, when, as there shown, the bearing will be transferred back to the spur *v*, which, resting in a notch nearer the front end of the sear C, will exert much more force thereon, in consequence of its increased leverage, thereby forcing down the rear beveled end of the sear, which, pressing against the front edge of the shank or body of the hammer, forces the latter back away from the firing-pin until the end of the sear drops below the shoulder *k* on the hammer, where it remains, thus holding the hammer in the position shown in Fig. 1.

To enable this to be the more easily done, the arms L of the breech-block are provided on their front edge with projections *l*, on which the lower leaf of the spring comes to a rest, just before the hammer in its forward movement hits the firing-pin, thereby leaving the hammer free from the pressure of the spring, so that the sear can easily press it back and lock it there, as above described. At the instant of firing, the rear end of the sear is elevated by the trigger T operating on its arm *d*, whereby the sear is raised so as to be out of the way of the hammer.

At the time when the spring resumes its horizontal position, the longer spur *v*, pressing with force on the sear C, presses its hooks *h* against the shoulders *f* of the firing-pin D, thereby forcing the latter back, and drawing its point within the breech-block away from the cartridge, where it is securely held until the hammer is cocked, when it is left free to move.

It will also be seen by examining Fig. 1 that as the spur *v* presses the front end of the sear C upward, said spur will come in contact with the projection *g* on the under side of the firing-pin, thereby pressing it up against the flat face of pin P, and thus causing the breech-block I to assume a horizontal position, and close the breech of the gun.

It will thus be seen that although the mechanism consists of but very few parts, they are made to do all that is required, and to do it in the most effectual manner, and with the simplest possible manipulation.

A gun constructed on this plan can be loaded and fired at the rate of thirty-seven times per minute, while its construction is such that it can be readily taken apart and put together by the soldier in the field, without the aid of tools, and in the briefest possible time, it only being necessary to remove the pin P, when the breech mechanism can be all removed together, after which, if desired, it can be taken apart with ease.

Having thus described my invention, what I claim is—

1. The pivot-pin P, provided with the notch or recess *n*, in combination with the firing-pin, arranged to engage in said notch, for the purpose of holding said pin in place, substantially as described.

2. The mainspring G, provided with the two spurs or points of bearing *u* and *v*, in combination with the sear C, said parts being constructed and arranged to operate substantially as described.

3. The firing-pin D, provided with the shoulders *f*, in combination with the sear C, provided with the hooks or points *h* for drawing back the firing-pin, as set forth.

4. The sear C, pivoted to the breech-piece I in front of the hammer, constructed and arranged to operate substantially as described, whereby it is made to force the hammer back from the firing-pin after the arm is fired, as set forth.

5. The spring G, provided with the spur *v*, arranged to press against the under side of the firing-pin, and causing the latter to act on the flat side of the pivot-pin P, for the purpose of closing the breech, substantially as described.

6. The combination and arrangement of the sear C, spring G, and hammer H, substantially as described, whereby the spring is made to change its position, and thereby to exert more force on the sear at one time than at another, as set forth.

7. The sear C, provided with the arm *d*, arranged to extend down alongside of or past the hammer, in combination with the trigger T, pivoted below the hammer, substantially as described.

8. The hammer H, provided with the notches *e* and *w*, in combination with the trigger T and sear C, constructed to operate as described, whereby the trigger is made to hold the hammer at half-cock, and the sear to hold it at full-cock, substantially as described.

9. The stop or projection *l*, formed on the depending arms of the breech-block, in relation to the bearing-point of the spring on the hammer, substantially as described, for the purpose of arresting the movement of the spring, and leaving the hammer free to be thrown back, as set forth.

10. The hammer H, provided with the projection *o*, arranged to operate on the front arm of the trigger, for the purpose of causing the rear end of the trigger to ride up behind the arms of the breech-block, and thereby lock the latter in position when the hammer is cocked, as set forth.

11. The combination of the swinging breech-block, with a rebounding hammer, substantially as set forth.

JAMES LEE.

Witnesses:
THOS. RICHARDSON,
GEO. P. CONKLIN.