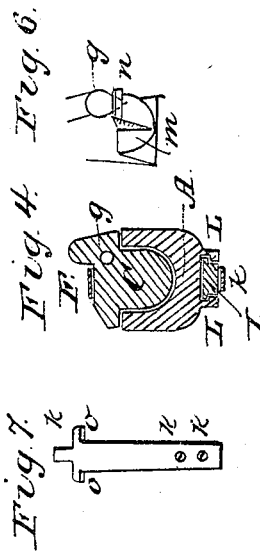
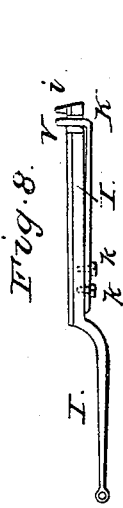
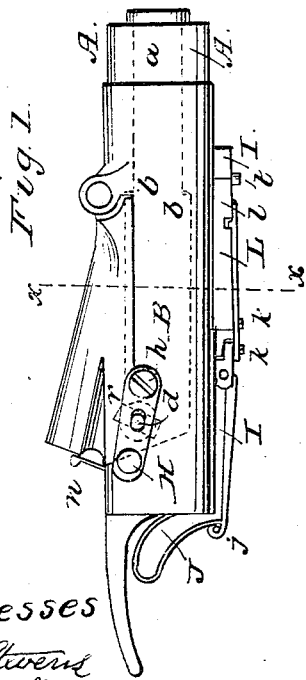
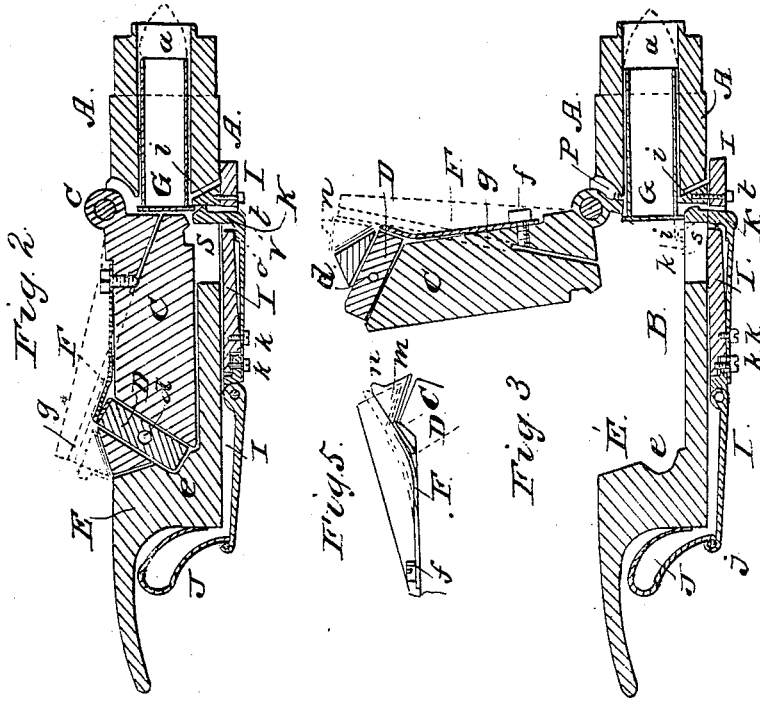


A. L. VARNEY,  
Breech-Loading Fire-Arm.

No. 88,531.

Patented March 30, 1869.



Witnesses  
E. L. Stevens  
Wm Parker

Inventor  
A. L. Varney

# United States Patent Office.

A. L. VARNEY, OF WATERTOWN, ASSIGNOR TO ALFRED B. ELY, OF  
NEWTON, MASSACHUSETTS.

Letters Patent No. 88,531, dated March 30, 1869.

## IMPROVEMENT IN BREECH-LOADING FIRE-ARMS.

The Schedule referred to in these Letters Patent and making part of the same

Be it known that I, A. L. VARNEY, of Watertown, Massachusetts, have invented certain Improvements in Breech-Loading Fire-Arms, of which the following, with the accompanying drawings, is a full description.

My inventions have reference more especially to locking, ejecting, and guarding-devices, in connection with the solid swinging breech-plug, for which patent was granted to A. B. Ely, assignee of J. W. Preston, February 5, 1867, although some of them may be otherwise used.

Figure 1 is a side view, with the block closed down.

Figures 2 and 3 are longitudinal sections, with breech-plug, shell, and sere, in different positions.

Figure 4 is a transverse section through line  $x x$  of fig. 1.

Figure 5 is a side view of bolt-spring and guard of firing-pin.

Figure 6 is front view of guard.

Figure 7 is a view of under side of sere-spring.

Figure 8 is modification of ejecting-rod and sere.

In the drawings—

A represents the barrel, of which  $a$  is the bore.

B is the receiver, or enlarged cavity of the barrel, in rear of the shoulder  $b b$ , against which is placed the flange of the cartridge-case G.

C is the solid plug, or breech-block, swinging up and over on the hinge  $c$ , which has on its rear a small lug, or hook,  $p$ . When the block is down, its front end presses against the rear of the shell.

In the front of the rear end, or recoil-plate of the receiver E, is a notch, or cavity,  $e$ , for the reception of the locking-bolt D of the plug.

Through the centre of the rear part of the plug, and at an angle of about forty-five degrees, (which, however, may be varied, as found expedient,) is a round hole, through which is passed a round bolt, D, the end of which, when down, enters the notch  $e$ , and locks the plug in place.

This bolt is pressed upon and held down by a flat spring, F, upon the top of the block, one end being fastened to the block by a screw,  $f$ , the other, resting and pressing upon the bolt.

Through the side of the block, and in a line with the bolt, is a small slot,  $r$ , through which, and into the bolt, is passed a pin,  $d$ , for raising the bolt from its seat.

H  $h$  is a lever, pivoted to the block, at  $h$ , and with a knob-handle, at H. Through this lever passes the pin  $d$ .

By raising the knob H, the pin  $d$  and bolt D are raised, and the block thrown up and over.

Instead of the lever H  $h$ , the pin  $d$  may be provided with a knob-head, indicated by dotted red lines, fig. 1, for raising the bolt and breech-block.

$g$  is the firing-pin, passing through the block.

I I is an ejecting-rod, placed underneath the barrel, or receiver: It may be made in one piece.

It is made to slide in ways L L, attached to the bottom of the receiver.

To the rear end of the ejecting-rod is attached a spring, J, for retracting or throwing it back, which may be of any form or kind, as found expedient.

To the upper side of the forward end of the ejecting-rod is attached a hook,  $i$ , projecting upward through a slot,  $s$ , in the bottom of the receiver, to the level of the bore  $a$  of the barrel.

When the cartridge-shell is in place, and the block shut down, the point of the hook  $i$  will be on a line with the shoulder  $b b$ , and immediately behind the flange of the shell.

Underneath the ejecting-rod is a flat, cross-shaped spring-sere, K  $k$ , attached to the ejector at its rear end,  $k k$ , by screws, and having a hook at its front end, projecting upward through a slot,  $v$ , in the ejector.

The two arms of the cross are thicker than the body of it, forming a projection, at  $o o$ , above the plane of the spring.

On the lower side of the ways L L, is a notch,  $l$ , on each side, into which the projections  $o o$  catch, and are held when the ejector is strained forward, as in figs. 1 and 2.

When the shell is in place, and the block down, the point of the sere will be in a line with the bore  $a$  of the barrel, and a little in rear of the flange of the shell, the spring-sere holding the ejector in place.

When a cartridge is to be inserted, the block is raised, opening the cavity of the receiver. The hook of the ejector will be thrown back, and the hook of the sere will be down on a line with the bore of the receiver B, as shown in red in fig. 3.

The shell, being placed in the cavity, with its flange against the hook  $i$ , the block is shut down, and, in shutting, the ejector is strained forward, to its position in fig. 2, and the sere-spring, taking into the notches  $l$ , it is there held in place.

After the cartridge is exploded, the block is raised by placing the thumb against the knob H or  $d$ , and pressing upward, relieving the bolt from the notch  $e$ .

On turning the block over, the hook  $p$  will strike against the flange of the shell, and move it backward, as in fig. 3. As it moves back, the flange crowds upon the hook K of the spring-sere, and forces it downward, out of the notches  $l$ , and the ejector being set at liberty, by the action of the spring J, the hook  $i$  will strike against the flange of the shell, and drive it back with force enough to eject it from the cavity of the receiver.

I believe I am the first person who has applied a sere to a spring-ejector, by which the point of the ejector, being locked in place, is held until the release of the sere from its hold, when the ejector is enabled to act with the force of a blow, and so to act more efficiently than where it follows up the shell from its seat continuously.

The position of the ejector may be changed. It may

be placed along the bottom of the barrel, inside the receiver, and the sere-spring may be fastened to the ejector or the barrel, in any convenient position, and the ejector may be so placed as to pull or push. It may also be placed on the top or side, as under the rear strap of the plug-hinge, and the sere be so arranged as to engage with the ejector when the block is down, and to be released by the action of the block when raised up and over.

I do not, therefore, confine myself to any particular form or arrangement of ejector and sere, but only to the combined action of both.

The benefits of my locking-device consist in its simplicity, strength, efficiency, and cheapness, the slanting bolt acting so as to wedge the block still tighter in place on the explosion of the cartridge.

Another of my improvements consists in constructing and applying a movable guard to the firing-pin, which, while it guards the pin from being struck by the hammer at any time when the block is not perfectly shut and in place, and also when the hammer is down, prevents the block from being raised till the hammer is raised.

*m* is a guard of metal, extending from the locking-bolt round in front of the firing-pin, and having in front a projecting lug, or lip, *n*. The position of this guard and lip, when the block is down, may be seen in figs. 1, 2, 5, 6, and its position, when the bolt is raised, may be seen, in red, in fig. 5.

The guard is raised by the raising of the bolt, and the lip *n* will intervene to receive the blow of the ham-

mer in any position, except when the bolt is in its seat, and the block shut in place, and then, when the hammer is down, it will strike over the lip *n*, and thus lock the bolt and block down till the hammer is raised. This guard may be fastened to the top of the bolt, or it may act like a lever, pivoted in rear of the top of the bolt, under the bolt-spring. It may also extend round to the pin *d*, or the pin *d* may extend through the block, and the guard be fastened to it on both sides, the guard, with its lip, being movable, and its movements governed by those of the bolt or plug.

What I claim, is—

1. A spring-sere and ejector, constructed and arranged to operate in combination, substantially as described.
2. The locking-bolt and spring, substantially as described, constructed and arranged, in relation to and in combination with the swinging breech-block, substantially as set forth.
3. The movable guard, with its lip, constructed and arranged, in relation to and in combination with the breech-block and firing-pin, substantially as described.
4. The combination of breech-block, sere, and ejector, when constructed and arranged to operate substantially as described.

In testimony whereof, I have hereunto subscribed my name.

A. L. VARNEY.

Witnesses:

W. M. PARKER,  
ALDEN FRINK.