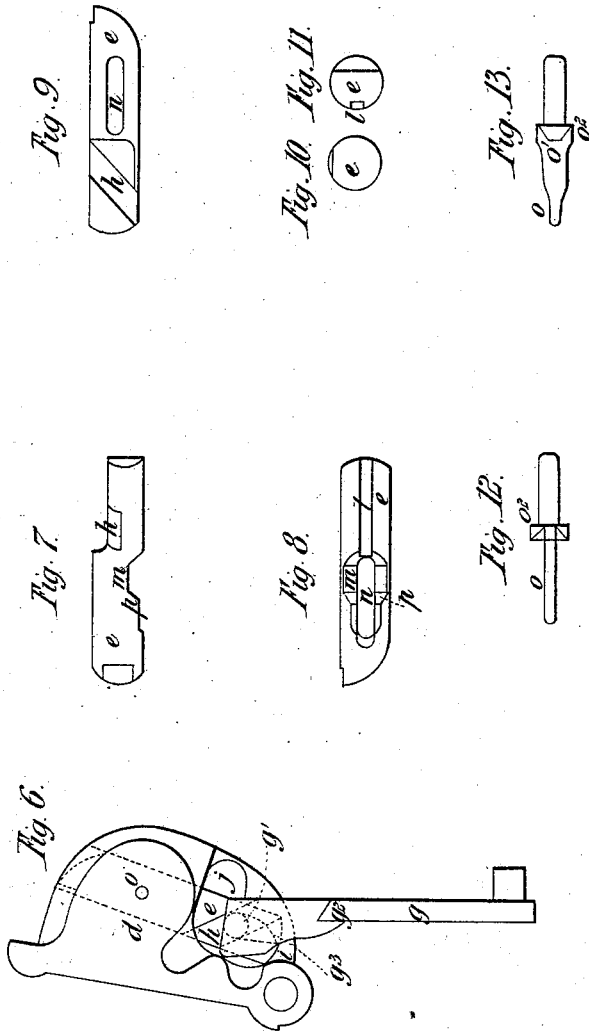


W. SOPER.
Breech-Loading Fire-Arm.

No. 207,689.

Patented Sept. 3, 1878.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN BREECH-LOADING FIRE-ARMS.

Specification forming part of Letters Patent No. 207,689, dated September 3, 1878; application filed December 19, 1877.

To all whom it may concern:

Be it known that I, WILLIAM SOPER, of Reading, England, have invented new and useful Improvements in Breech-Loading Fire-Arms, which improvements are fully set forth in the following specification, reference being had to the accompanying drawings.

This invention is designed to further improve the particular class of breech-loading fire-arms known as "Soper's breech-loading rifles;" and consists in various details of construction and arrangement of the parts of the breech and lock mechanism, as hereinafter specified.

The said invention is illustrated in the accompanying drawings, in which Figure 1 is a side view of a rifle embodying my improvements. Fig. 2 is a transverse section on the line $x x$, Fig. 1, with parts in a different position. Fig. 3 is a longitudinal section on the line $y y$, Fig. 2. Fig. 4 is a longitudinal section on the line $z z$, Fig. 2, looking in the opposite direction. Fig. 5 is a rear-side elevation of the breech-block of the said rifle. Fig. 6 is a front-side elevation of the said block and its lifting-lever. Fig. 7 is a plan of the locking-bolt. Fig. 8 is a view of one side, and Fig. 9 a view of the other side, of the same. Fig. 10 is a front-end view, and Fig. 11 a rear-end view, of the said bolt. Figs. 12 and 13 are two views of the firing-pin.

Like letters indicate the same parts throughout the drawings.

In the fire-arms a guard or protector has heretofore been employed to prevent the entrance of sand or other matter into the lock through the opening formed in the breech-shoe for the striking arm or end of the cock or hammer. But according to my present invention I dispense with this guard or protector, and as a more efficient means for accomplishing the same object I form the end a^1 of the lock-box a to fit the under side of the arm b^1 of the cock b , and I form the tail c^1 of the breech-shoe c to fit around the other three sides of the said cock—that is to say, this tail c^1 is formed with a recess or groove, c^2 , deep enough to receive the upper part of the cock and to form the three protecting sides. The said shoe c is also formed with a recess, c^3 , to receive the end of the breech-block d when the

same is closed, and in which the said block is secured, and I now provide the said breech-block with a safety or locking bolt, e , which is arranged to shoot into a hole or socket, f , in the recess c^3 . This bolt e works through the said breech-block, and is operated by a connecting-rod, g . This connecting-rod g has at its upper end a stud, g^1 , which engages with the breech-block d . It also has a projection, g^2 , for opening, and a projection, g^3 , for closing, the said block. The said stud g^1 projects into a diagonal slot, h , in the said bolt e . The part g^3 of the connecting-rod g , which acts on the breech-block to close the same, is so arranged in combination with the shoulder i of the breech-block, on which it acts, and with the aforesaid stud g^1 and projection g^2 , that in closing the breech the rod g will not force out the said bolt until the breech-block d is properly closed; but when the block d is closed, as shown in Fig. 4, the projection g^3 on the connecting-rod g will drop into a recess, j , suitably formed for its reception in the breech-block d , and the said stud g^1 of the connecting-rod, working in the diagonal slot h of the bolt, will force the said bolt into its hole or socket f in the recess c^3 of the breech-shoe. On the other hand, in the act of opening the breech the aforesaid parts operate relatively in such a manner that the lock-bolt e is withdrawn from its socket f before the breech-block d begins to move up out of its recess.

A small pin or screw, k , is passed through the rear side of the breech-block. The point of this screw projects into a longitudinal groove, l , in the said locking-bolt e , and prevents its turning, while permitting it to slide freely endwise in the breech-block d when operated by the connecting-rod g , although the hole in the breech-block d through which the said bolt works is circular. The said bolt is also formed with a cavity, m , cut across the rear surface, one side of which is beveled to an angle of about forty-five degrees. It also has a longitudinal aperture or slot, n , through which the firing-pin or striker o passes and works freely without obstructing the action of the said bolt; but this cavity will not be in a position to allow the striker o to be driven forward through the breech-block d unless the latter is properly closed, as in Fig. 4, and the bolt e has

entered its socket *f*. The part *o*¹ of the said striker that passes through the slot of the bolt *e* has a flat shape, to prevent the turning of the striker in the slot, while allowing the said bolt to work freely without obstruction by the striker. It is also provided with a flange or shoulder, *o*², properly shaped to fit and work against the beveled side *p* of the cavity in the said bolt. The part *p* of the bolt being formed with a beveled or inclined surface, suitably arranged to act on the said flange or shoulder, forces the striker *o* back as the bolt *e* is drawn out of its socket *f* to release the breech-block *d*, and does not require the aid of a spiral spring.

I form on the rear side of the breech-block *d* a shoulder, boss, or projection, *r*, for the reception of the nipple *r'*, through which the firing-pin *o* works. This shoulder permits the use of a stronger screw than has heretofore been used on the nipple, and allows the shoulder *o*² on the firing-pin *o* to be made of adequate strength.

The rear of the said lock-box *a* is constructed with a recess or cavity, *a*⁵, wherein the rear or trigger spring *s* may be firmly fixed in its proper position without the aid of a screw. I now form the trigger-guard *t* solidly upon or in one piece with the bottom plate *a*⁶ of the lock-box, whereby I am enabled to dispense with the screws heretofore employed for securing the said trigger-guard.

I give the fire-arm a neater appearance and render the same more convenient for handling by reducing the depth of the front part of the lock, and I form through the side of the lock a hole, through which a side screw or pin, *t*, may be passed under the mainspring *u* to hold the same compressed. To keep the afore-said connecting-rod *g* in place while being actuated by the tumbler *v*, I form on the lock-plate, in front of the said connecting-rod *g*, a small lug or projection, *a*⁷, between which and the tumbler *v* the lower end of the said connecting-rod *g* works.

According to my present invention I form the said cock or hammer *b* with a comb or projection, *b*², on the upper part of its striking-arm *b*¹, to enable the person using the rifle to operate or adjust the cock freely without interfering with the parts of the breech mechanism.

I also improve the said cock by strengthening its claw or projection *b*³, which acts upon the extracting-lever *w* to bring it back to its place after the cartridge has been extracted.

I also improve the construction of the side lever *v*¹ used in the said fire-arms by forming the same with a round pin or axle, *v*², to pass through the tumbler *v*, the said pin having formed on it a wing, lug, or projection, *v*³, which fits a slot, *v*⁴, extending from the hole in the

tumbler on one side of the same. The use of this round pin instead of the square pin hitherto used permits a considerable reduction in the cost of manufacture of these parts; and I still further reduce the cost of manufacture by making the projection *v*⁵ of the tumbler, with which the short arm *b*⁴ of the said cock engages, circular, so that the same may be shaped with an ordinary cutter. I form the breech-block pin *d*⁶—that is to say, the pin on which the said block turns—with a split spring end at *d*⁷, so that only a plain round hole is needed in the breech-shoe for the reception and holding in place of this pin, instead of the screwed hole heretofore used. The breech-block may therefore be more readily taken out and replaced than heretofore.

I construct the extractor-slide *w*^{*} of these fire-arms with two claws, *w'*, which take hold of different parts of the rim or flange of the cartridges, and thereby insure a more reliable extraction of the cartridges, especially those provided with a metal disk, like the so-called "Boxer" cartridges.

I claim as my invention—

1. The combination, with the breech-block *d*, locking-bolt *e*, capable of adjustment transversely therein, and the hole or socket *f* in the side of the shoe *c* for the reception of said bolt, of the connecting-rod *g*, with its stud *g*¹ and projections *g*² and *g*³, tumbler *v*, side lever *v*¹, and pin or axle *v*², substantially as specified, whereby the said locking-bolt may be operated and the said breech-block opened or closed in one operation.

2. The combination, with the breech-piece *d* and its transversely-adjustable bolt *e*, of the rod *g*, provided with the stud *g*¹, for engaging with the oblique slot in the said bolt *e*, and provided with the projection *g*², for operating on the inclined portions of the breech-piece to raise the latter, and with the projection *g*³, for operating, in connection with the shoulder *i* of the breech-piece, to close the latter, substantially as specified.

3. The combination, with the breech-piece *d*, of the adjustable non-rotating bolt *e*, provided with the slot *n* and cavity *m*, the firing-pin or striker *o*, provided with a flat portion, *o*¹, passing through said slot *n*, and provided with a flange or shoulder, *o*², for projecting against the beveled sides *p* of the said cavity *m*, substantially as specified, whereby the said firing-pin is precluded from turning, is prevented from operating until after the breech-piece is properly fastened, and is forced back on the unfastening of the bolt *e*.

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Witnesses:

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