

W. Soper,
Breech Loader.

4 Sheets, Sheet 1.

No. 104,223.

Patented June 14, 1870

FIG. 3.

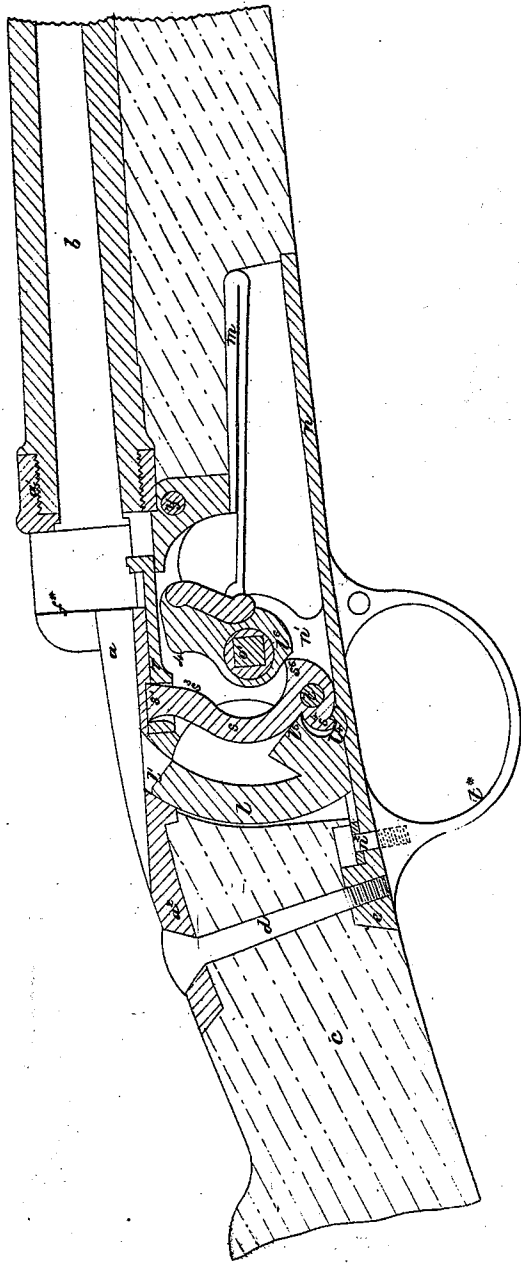
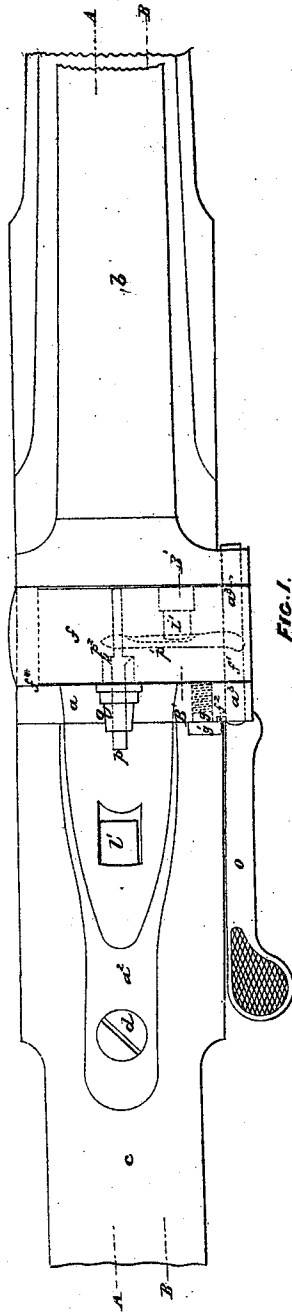


FIG. 1.



Witnesses
W. H. Pinckel
J. H. L. Norris

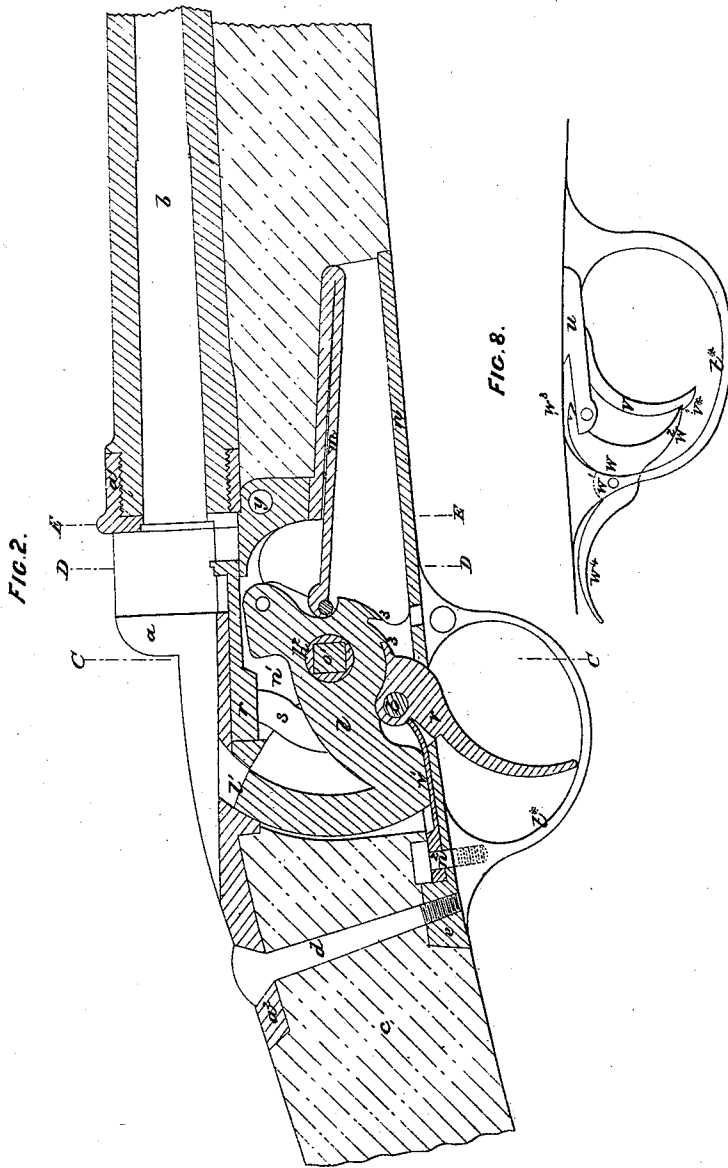
Inventor
W. Soper
Spencer & Morris atty

W. SOPER.

Breech-Loading Fire-Arm.

No. 104,223.

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W. Hinckel
Jas. L. Norris

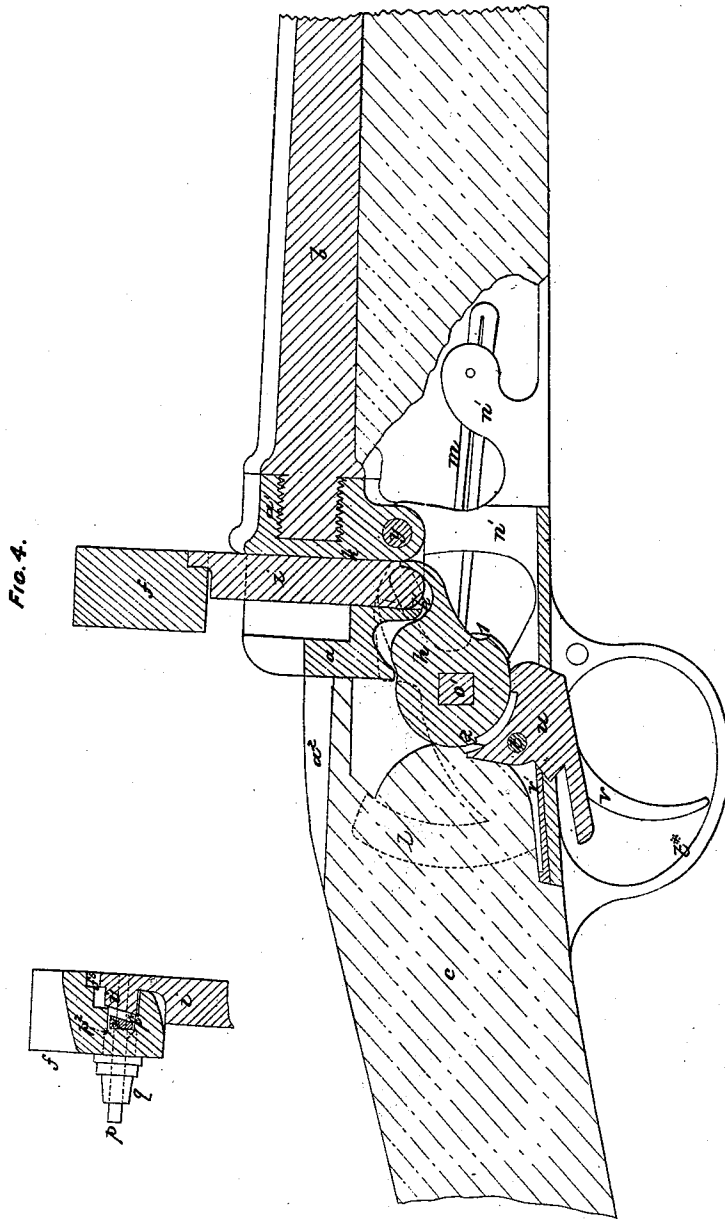
Inventor
Wm Soper
J. Diederichs
Atty

W. SOPER.

Breech-Loading Fire Arm.

No. 104,223.

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Witnesses
N. H. Buckle
Jas. L. Norris.

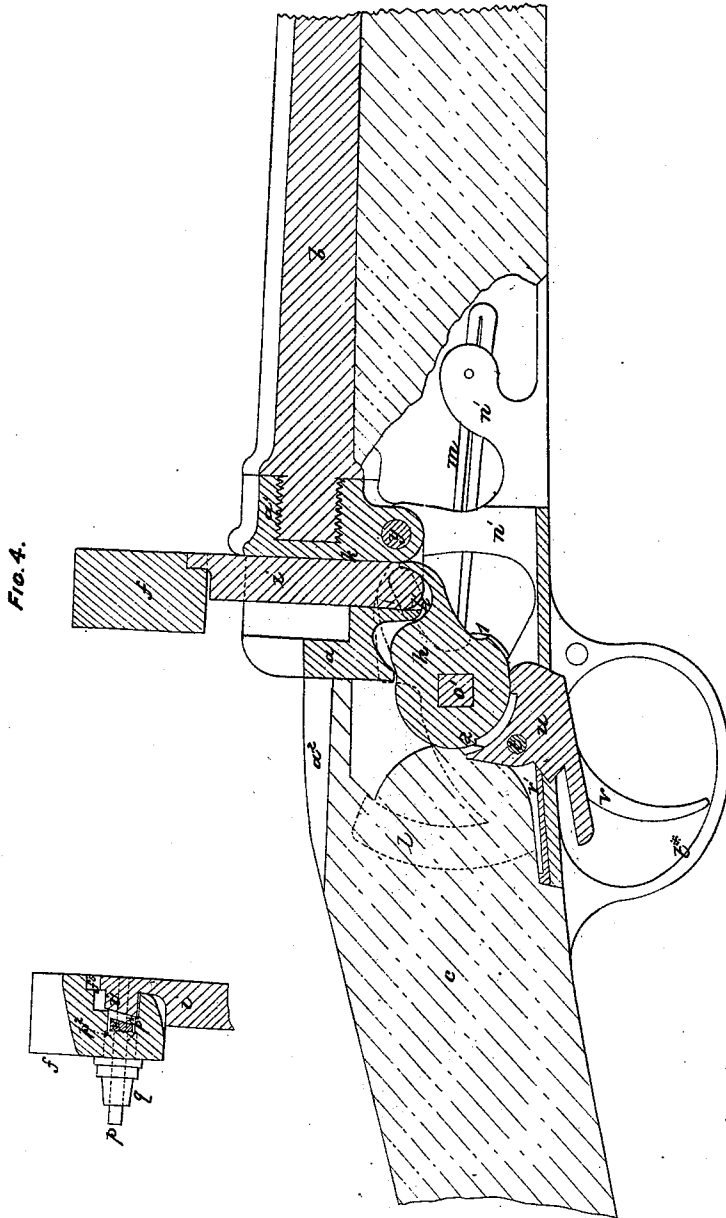
Inventor
Wm. Soper
J. H. Buckle & Co.
Atty.

W. SOPER.

Breech-Loading Fire Arm.

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Witnesses
W. H. Binckel
J. L. Norris.

Inventor
Wm. Soper
J. H. Steiner & Sons
Atty

United States Patent Office.

WILLIAM SOPER, OF READING, ENGLAND.

Letters Patent No. 104,223, dated June 14, 1870.

IMPROVEMENT IN BREECH-LOADING FIRE-ARMS.

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

I, WILLIAM SOPER, of Reading, in the county of Berks, England, gun manufacturer, have invented certain "Improvements in Breech-loading Fire-Arms," of which the following is a specification.

The said improvements consist, chiefly, in the peculiar combination of parts, whereby the opening of the breech, the cocking of the piece, and the extraction of the empty cartridge-shell are simultaneously effected by one movement of the hand, without changing the position in which the piece is held when being fired.

The breech is closed by a block, which is hinged or pivoted at one side of the rear of the barrel, and which is raised and turned laterally on its pivot to open the breech.

The said block is perforated centrally, to receive the firing-pin, which extends through the block with its ends in the proper position for receiving the-blow of the cock or hammer, and transmitting the same to the cartridge.

The said cock is arranged in combination with a tumbler and lever, in such a manner that the tumbler and lever always move together, while the cock, which is drawn back by the tumbler in cocking the piece, will remain in that position when the tumbler is moved in the opposite direction.

This capability of disengagement from the cock or hammer is necessary to allow the tumbler to be so connected with the breech-block that the breech may be opened and the cock or hammer thrown back to full or half-cock simultaneously, and that the breech may be then closed without moving the cock.

The hammer is acted upon by an ordinary bent or V-shaped mainspring, connected to the hammer by a swivel.

The extractor is provided with a hook or claw, which is formed and arranged to catch under the rim of the cartridge in the charge-chamber.

The said extractor is attached to a bar, which is fitted to slide longitudinally at the bottom of the breech-chamber. This bar, through an intermediate lever, is connected with the hammer, and is operated thereby in the proper direction when the hammer is cocked and released.

The trigger is arranged below the stock in the ordinary manner, and is constructed to take into notches which are preferably formed on the hammer itself instead of upon a separate tumbler.

Description of the Drawing.

Figure 1 is a plan of the breech of a rifle constructed according to my invention, showing the breech closed and the parts adjusted for discharging the arm.

Figure 2 is a longitudinal central section of the same.

Figure 3 is a longitudinal section on the line A A, fig. 1.

Figure 4 is a longitudinal section on the line B B, fig. 1.

Figure 4^a is a transverse section on the line B' B' fig. 1.

Figures 5, 6, and 7, are transverse sections on the lines C C, D D, and E E, fig. 2.

Figs. 2, 3, 4, 5, 6, and 7, show the breech open.

Figures 7^a and 7^b show detached portions of the said rifle.

Figure 8 illustrates a modification of a part of my improvements.

Like letters indicate the same parts throughout the drawing.

The breech-piece or shoe *a* is a strong metal piece, which, by means of the screw-threads *a*¹, or otherwise, is securely united to the barrel *b*, and is attached to the stock *c* by a screw, *d*, passing through the tail *a*² of the shoe, into the lock and trigger-plate *e*.

A recess is formed through this shoe at the rear of the barrel *b*, to receive the breech-block *f*, which is pivoted between two ears *a*³, formed on the side of the shoe.

To secure the joint-pin or pivot *f*¹ of the block in these ears or jaws *a*³, I form the said pin with a small lateral projection, *f*², and in the rear surface of the jaw I fit a screw, *g*, with an eccentric head, *g*¹.

By a half turn of the screw *g* the head *g*¹ is adjusted over or away from the projection *f*² on the pin *f*¹, thereby securing or releasing the same.

The rear shoulder *f*^{*} of the recess, wherein the breech-block *f* slides, forms an abutment or recoil-surface for the said block.

The face *f*³ of the block *f*, which is in contact with the cartridges, is chambered or grooved, as shown in fig. 7^b, in such a manner as to permit the escape, in a vertically-forward direction, of any gas arising from the bursting of a cartridge at the rear.

The edge of the block is also grooved at *f*⁴ for the same purpose.

The block *f* is connected to the loose tumbler *h* by a connecting-rod, *i*.

The upper end of the said rod is inserted in a recess, *f*⁵, in the block, and I form, either in the rod *i* or in the block, an elongated eye or slot, through which, and the sides of the recess *f*⁵, a pin, *i*¹, is passed.

In the drawing I have shown the slot *j* formed in the block *f*, and the pin *i*¹ formed or fixed on the end of the rod *i*.

The lower end of the connecting-rod *i* also carries a pin, *i*², which is fitted to work freely in an elongated hole or slot, *h*¹, in the loose tumbler *h*.

By means of these elongated holes or slots *j* and *h*¹, the rod *i* (though connected to the tumbler and breech-

block, which move in arcs of circles in planes at right angles to each other) is not diverted from a straight line when these parts are moved. I therefore arrange the said rod to work in a guide-way, *k*, in the shoe, in which guide-way the rod *i* is so closely fitted as to prevent the entrance of sand or dust to the lock.

When it is desired to remove the hammer *l* and other parts from the lock-box, it is necessary to restrain or hold back the mainspring *m*, and for this purpose the pins *i*¹ or *i*² may be advantageously used.

The said lock-box is constructed with two side plates, *n*¹, projecting from a plate, *n*, which is secured to the under side of the stock *c*.

These side plates are bored or perforated to receive the trunnion *h*² of the tumbler *h*, which is fitted to turn freely therein.

A square hole is formed through the said trunnion to receive the axis or spindle *o*' of the side lever *o*, which spindle is preferably formed in one piece with or solidly upon the said lever, the latter being arranged outside the stock at the right-hand side of the breech, as shown in fig. 1.

The cock or hammer *l* is fitted to turn freely upon the trunnion *h*² of the tumbler *h*, at one side of the same, and is so formed and arranged that, when it is released from the trigger, its nose or extremity *l*¹ will strike fairly the rear end of the firing-pin *p*, if the parts have been properly adjusted.

The connection between the cock or hammer *l* and the tumbler *h* is effected by means of shoulders or projections *h*³ on the said hammer and tumbler, which projections are so formed and arranged that the cock or hammer *l* is raised or forced back when the tumbler is turned back, but cannot be moved in the opposite direction by the tumbler, which may thus be turned down, with the block *f*, to close the breech, while the hammer *l* is left at either full or half cock, as desired, (see fig. 7^a.)

The firing-pin *p* is arranged either longitudinally or obliquely in the block. I prefer to arrange the same longitudinally or in a line with the bore of the barrel.

It is very important that the firing-pin should be drawn back within the block before the latter rises. For this purpose I place inside the block a small lever, *p*¹, through one end of which the pin *p* passes.

The pin *i*¹ on the end of the connecting-rod is beveled, and the side of the lever is also beveled or inclined, and the said lever is so fitted in a recess, *p*^{*}, that, as the connecting-rod begins to rise, and before it raises the block, its pin *i*¹ forces back the lever in its recess, and thus withdraws the pin *p* within the block. I thus dispense with the use of a spring for throwing back the firing-pin, and substitute therefor a device which can never fail to act at a critical moment.

The pin *p* is passed through a nipple, *q*, screwed in the rear of the block *f*, and is formed with a conical shoulder or valve, *p*², which, in case of an escape of gas at the breech, is forced into contact with a correspondingly-formed seat on the nipple *q*, and prevents the exit of the gas at the rear of the block.

The extractor-bar *r* slides, at the top of the lock, between the two side plates *n*¹.

The said bar is formed with a recess or aperture to receive the nose or extremity *s*¹ of the lever *s*, which connects the said bar with the cock or hammer *l*.

This lever *s*, which is pivoted between the side plates *n*¹ at the bottom of the lock, is constructed and arranged to act in combination with peculiarly-formed portions of the cock or hammer, so that the extractor *r*, as it is drawn back, starts with a slow motion, which is accelerated, and finishes with a jerk.

By this peculiar motion of the extractor, great force may be exerted upon the cartridge-shell in starting it from the barrel, which force is necessary when the

shell is caused, by the explosion of the cartridge or otherwise, to stick tightly in the barrel.

The shell being thus started and freed, is, by the accelerated movement of the extractor, jerked or thrown out of the breech. To effect this varying motion of the extractor, I form the extractor-lever *s* with a projection, *s*³, which is arranged in such a position as to be caught by a projection, *4*, on the cock or hammer *l*, when the same has been partially turned back in cocking the piece.

The lever *s* is formed with a short arm, *s*⁴, which projects laterally from the lower part of the lever, as shown in fig. 3, in such a position that another projection, *t*², on the cock *l*, as the same is drawn back nearly to the full extent, strikes the said short arm *s*⁴; this arm being so much nearer its fulcrum or pivot than the projection *s*³ on the other arm, *s*¹, of the lever, the motion of the latter is necessarily accelerated.

The projection *t*² of the cock and this short arm *s*⁴ are so formed and arranged together that the said projection acts upon the said arm with an increasing proximity to its fulcrum *t*, the motion of the arm being thus accelerated to the end of the same.

This arm *s*⁴ lies between two jaws, *t*¹ *t*², on the hammer, the lower one *t*¹ of which permits the said arm to pass freely downward, but when the exterior side lever *o* is released, the said jaw *t*¹ strikes the arm *s*⁴, and throws the extractor forward into the proper position to again effect the extraction of a shell lying in the charge-chamber.

A projection, *s*⁵, on the extracting-lever, is formed to come in contact with the projection *t*² on the cock or hammer, to prevent the falling back of the extractor-bar if the hammer should be let down gently upon the firing-pin when the piece is held with the muzzle elevated.

Without this means for securing the said lever some inconvenience might be occasioned by the accidental withdrawal of the unexploded cartridges from the barrel.

The tumbler *h*, which is connected to the breech-block *f*, as hereinbefore described, is formed with the two notches 1 2, and a small auxiliary trigger, *u*, is arranged at the side of the main trigger *v*, to take into these notches, and thereby prevent the accidental opening of the breech and drawing back of the extractor.

I may also use a third trigger, *w*, which I have shown in fig. 8; to render the piece perfectly secure without setting the hammer at "half cock."

This third trigger is pivoted to the trigger-guard at *w*¹, and holds the main trigger *v* with the arm *w*², and the auxiliary trigger *u* with the other arm, *w*³.

When it is desired to fire the piece, the arm *w*¹ is pressed, and the triggers are simultaneously released.

In this case the notch 1 in the tumbler for the auxiliary trigger *u*, shown in fig. 4, is dispensed with.

The main trigger *v* is also formed with the notch *v*^{*}, and is thus held with perfect security till the trigger *w* is operated.

The two triggers *u* *v* and the extractor-lever *s* are all fitted on one pin, *t*, which passes through the side plates *n*¹ of the lock.

At the rear of the bottom plate *n* is a screw, *n*², which passes through the said plate into the trigger-guard *t*^{*}.

This screw *n*² holds the spring *v*¹, which presses the triggers *u* *v* into the notches 1, 2, and 3. The pressure of this spring prevents the accidental removal of the pin *t* from the lock, but if the screw *n*² is taken out and the spring *v*¹ removed, the pin *t* may be readily withdrawn from the lock. The triggers *u* *v* then fall out, and, if the mainspring *m* is not secured with the connecting-rod *i*, or secured with the pins between the spring

plate, the cock *l*, and tumbler *h*, and the other parts of the lock may be removed without the aid of any tools or implements, the trigger-guard being also released by the same operation.

When the firing-pin *p* extends through the block longitudinally, or in a line with the barrel, as shown in the drawings, the cock or hammer *l* must project up through the center of the breech-shoe into the proper position to act on the said pin.

The lock-plates *n*¹, shoe *a*, and stock *c*, are secured together by the screw *y*, which is arranged at the rear of the barrel, as shown.

This screw passes through a block, *n*², which connects the side plates *n*¹ of the lock, and whereon the extractor-bar *r* slides.

By this means I prevent any possibility of the springing of the said extractor away from the cartridge-shells when the same are to be extracted from the barrel, or being blown away by the bursting of a cartridge.

I prefer that the barrel of my improved fire-arm should be rifled in such a manner as to leave small ribs or "lands" projecting inside the bore, so as to obtain the desired rotation of the projectile with the least amount of friction thereon, and so that the said projectile may leave the barrel with its cylindrical form but very slightly changed.

I claim as my invention—

1. The combination of the breech-block, the cock or hammer, and the extracting devices, together, and with the rod *i* and side lever *o* for operating the same, substantially in the manner set forth, so that the

breech is opened, the piece cocked, and the cartridge-shell extracted by one movement of the hand, without changing the position of the piece.

2. The peculiar combination and arrangement of the tumbler and cock or hammer, and the operating side lever *o*, substantially as described, for the purpose set forth.

3. Connecting the breech-block and tumbler together by means of the rod *i*, and the pins and slots which allow the said block and tumbler to move freely in their respective planes while the said rod works in a closely-fitting guide, substantially as and for the purpose set forth.

4. The combination with the firing-pin *p* and the connecting-rod *i*, of the small withdrawing-lever *p*¹, operating substantially as and for the purpose set forth.

5. The combination of the extractor with the lever *s* and the cock or hammer *l*, constructed as described, whereby the said lever has its motion accelerated from the beginning to the end of its throw, substantially as and for the purposes set forth.

6. The combination of the triggers *u* and *v* with each other and with the tumbler *h* and hammer *l*, substantially as described and for the purpose set forth.

W. SOPER. [L. S.]

Witnesses:

M. WYNN,
H. I. GEDGE.