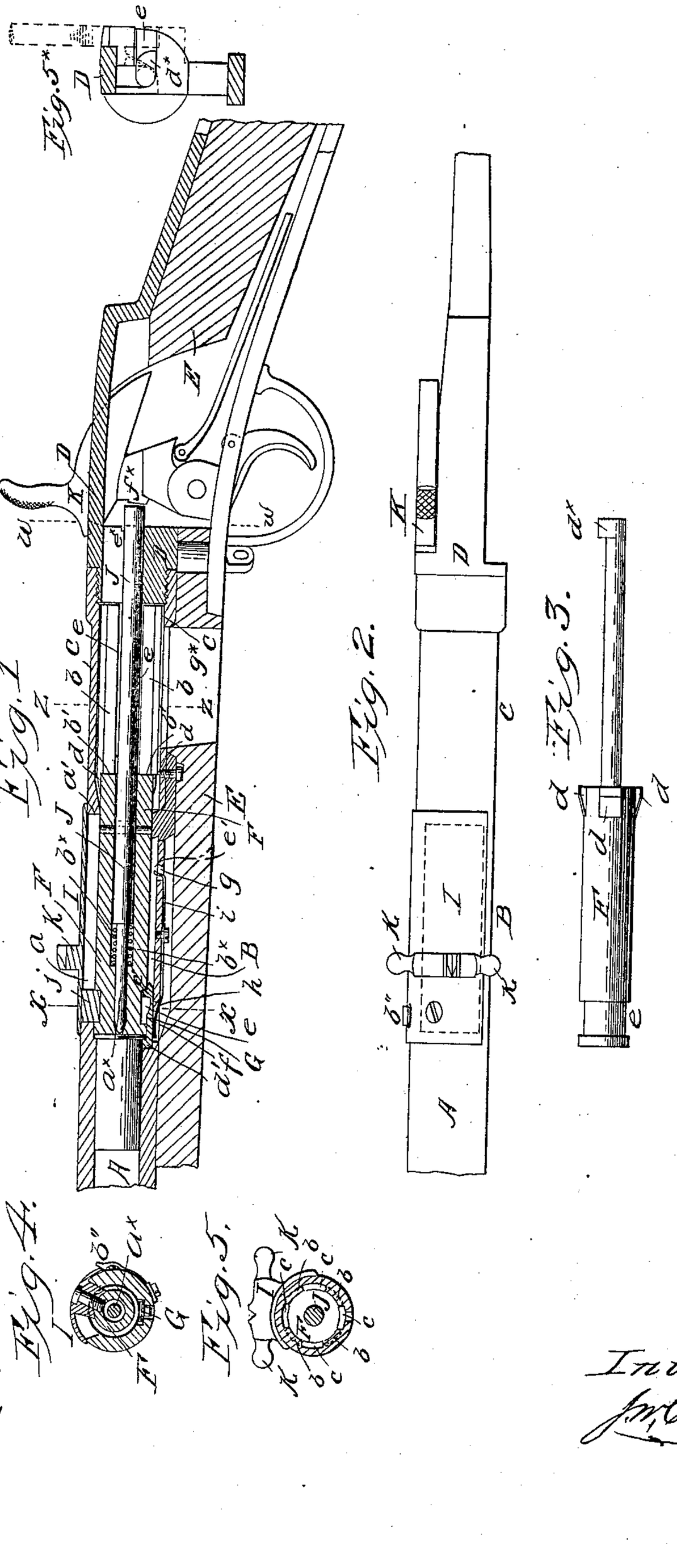
2 Sheets—Sheet 1.

J. W. COCHRAN.

BREECH LOADING FIREARM.

No. 75,627. Patented Mar. 17, 1868.



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2 Sheets—Sheet 2.

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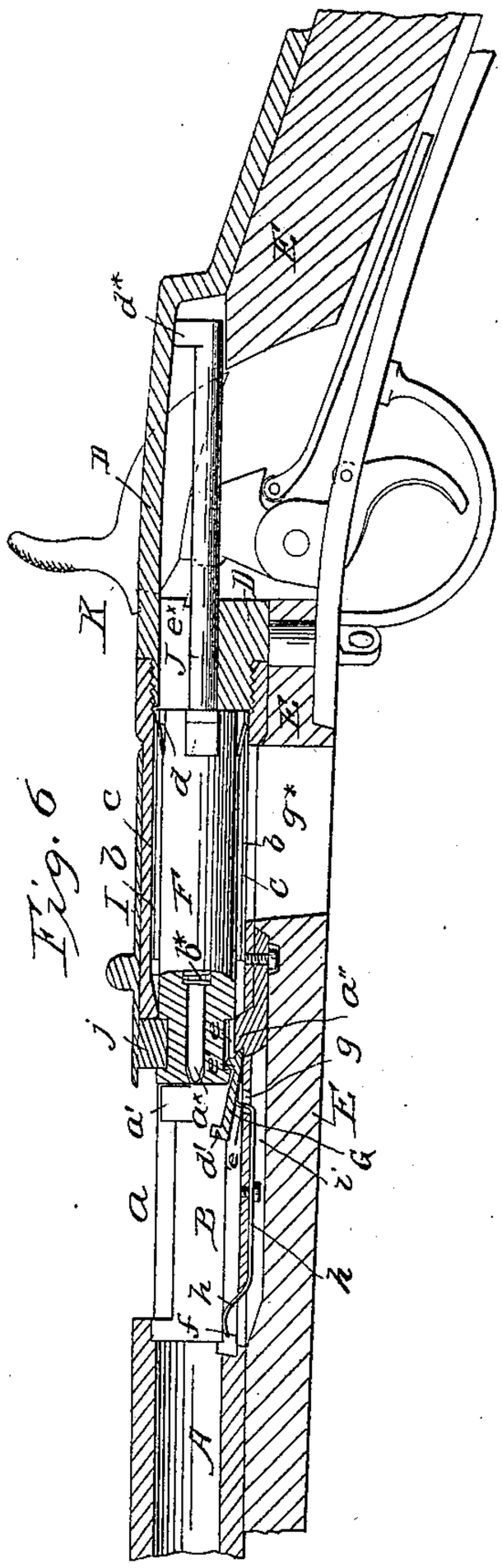

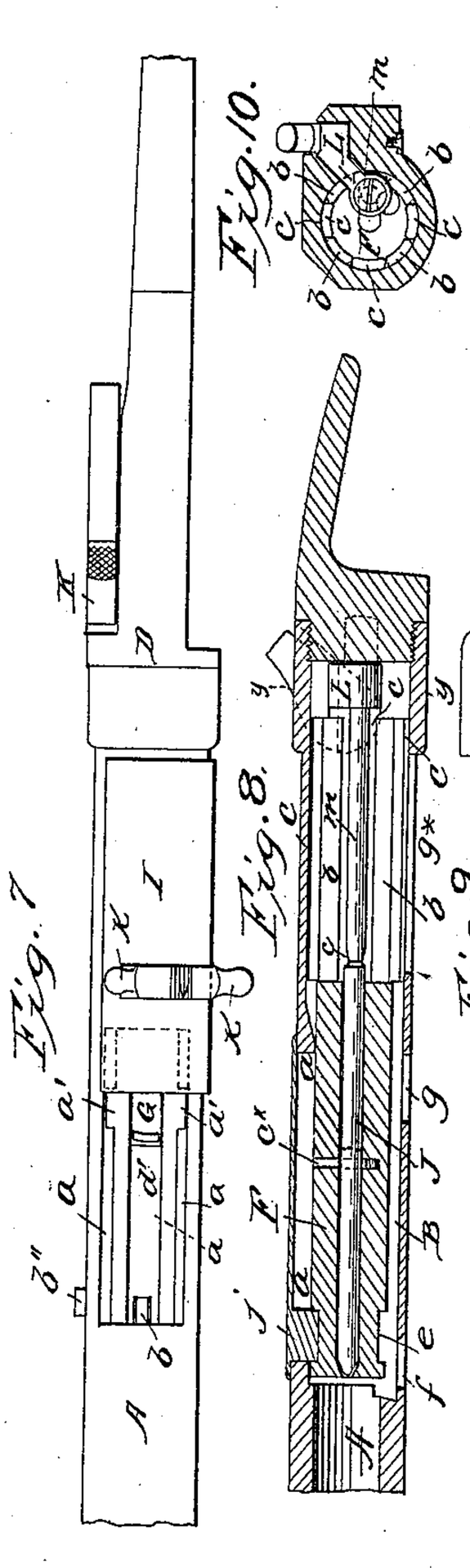

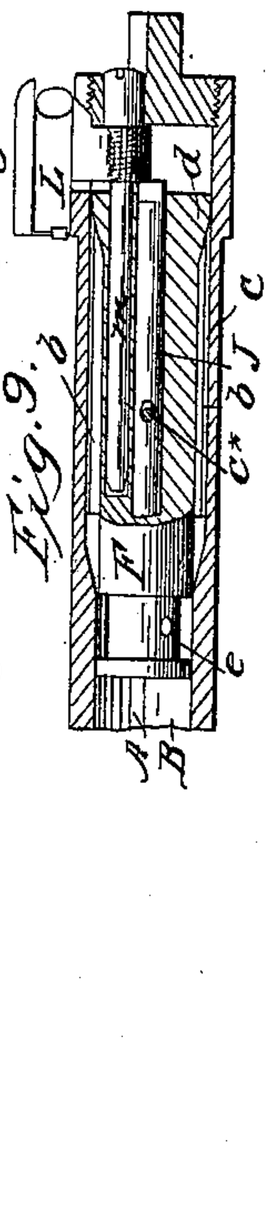

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J. WEBSTER COCHRAN, OF NEW YORK, N. Y.

Letters Patent No. 75,627, *dated March* 17, 1868.

IMPROVEMENT IN BREECH-LOADING FIRE-ARMS.

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

TO ALL WHOM IT MAY CONCERN:

Be it known that I, J. WEBSTER COCHRAN, of the city, county, and State of New York, have invented certain new and useful Improvements in Breech-Loading Fire-Arms; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a portion of this specification, in which—

Figure 1 is a longitudinal section of a fire-arm constructed according to my invention, showing the same with the recoil-bolt in position to close the breech.

Figure 2 is a plan view of the same with the recoil-bolt in a corresponding position.

Figure 3 is a detached view of the recoil-bolt and firing-pin of the same.

Figure 4 is a transverse section of the same, taken in the line *x x* of fig. 1.

Figure 5 is a transverse section of the same, taken in the line *z z* of fig. 1.

Figure 5* is a transverse section of the same, taken in the line *w w* of fig. 1.

Figure 6 is a longitudinal section of the arm, showing the same with the recoil-bolt in position to open or unclose the breech.

Figure 7 is a plan view of the same with the recoil-bolt in the same position.

Figure 8 is a longitudinal section, showing certain features of the invention as employed in the conversion of muzzle-loading arms into breech-loaders.

Figure 9 is a longitudinal section of the same, taken at right angles to fig. 8.

Figure 10 is a transverse section of the same, taken in the line *y y* of figs. 9 and 10.

Similar letters of reference indicate corresponding parts in all the figures.

This invention relates more especially to that class of breech-loading fire-arms in which the breech is closed by a bolt, which has a sliding movement in the line of the bore for opening and closing, and a movement about its axis for the purpose of locking and unlocking it, provision being made for inserting the cartridges through an aperture of just sufficient size in the barrel or breech-receiver, when the bolt is drawn back to a suitable position, and the firing of the cartridges being provided for by a pin passing through the said bolt, and struck by a hammer in rear thereof.

The invention consists in a novel combination, with such a recoil-bolt, of a cover for covering up the aforesaid aperture in the barrel or breech-receiver when the bolt is closed and locked, and which is also made to serve, in part, as a means of locking the bolt. It also consists in a certain construction of the firing-pin and the hammer, whereby the possibility of firing the cartridge prematurely, or before the recoil-bolt is closed and locked, is effectually prevented, but whereby, at the same time, provision is afforded for the firing-pin to pass the hammer when it is drawn back with the bolt in opening the breech. It also consists in an improvement upon the cartridge-shell ejector, which is the subject of my Letters Patent, dated February 20, 1866, whereby its efficiency is increased.

To enable others skilled in the art to make and use my invention, I will proceed to describe it with reference to the drawings.

The barrel A has provided at its rearmost end a breech-receiver, B C, continuous with the bore thereof, and having screwed upon it a lock-frame, D, as shown more fully in figs. 1 and 6, the said parts being secured to the stock E in any suitable manner. The forward portion, B, of the breech-receiver B C, has a longitudinal opening, *a*, provided in its upper side, through which the cartridge is placed in the said receiver in loading the arm. The opening aforesaid has its forward or main portion of such width as to readily admit the body of the cartridge, but not the flanch or rim thereof, the said rim being designed to pass down through the widened or enlarged rear portion *a'* of the opening, in order that it may necessarily be brought in proper relation with the shell-extractor, as hereinafter further set forth. The back or rear portion C of the breech-receiver is provided internally with longitudinal ribs, *b*, between which are an equal number of grooves, *c*, and the forward ends, *b*, of which form flat shoulders, situated at right angles to the bore of the barrel. The recoil-bolt is shown at F, and consists of a cylindrical piece of metal, of such size that it may pass freely between the internal ribs just mentioned, and furnished at its rearmost end with radial lugs, *d*, corresponding in number with the ribs *b* of

the breech-receiver, and so shaped that when the recoil-bolt, by being turned upon the longitudinal axis within the forward portion of the breech-receiver, is brought with the lugs *d* in front of the ribs *b*, the said ribs will serve as solid butments behind the lugs, the breech being closed when the bolt is in this position, and the latter being thus sustained against the explosion of the charge in firing; and when the said bolt is turned to bring the lugs thereof in line with the grooves *c* between the ribs, the block may be brought back longitudinally with the lugs sliding in the aforesaid grooves, thus opening the breech to permit the insertion of the cartridge through the opening *a*, as just set forth. Formed near the forward end of the recoil-bolt, circumferentially in the under side thereof, is a broad groove, *e*, into which is fitted the upwardly-projecting spur *e* of the extractor G, the tooth *d* of which, being situated in front of the flanch or rim of the cartridge-shell, acts to withdraw the same from the barrel when the recoil-bolt is drawn back as just mentioned. Formed in the bottom of the forward part, B, of the breech-receiver, one near each end of such portion, are two slots, *f g*, through the forward one, *f*, of which works the curved or convex part of a spring, *h*, secured to the under side of the receiver, and which may be formed in one piece with another spring, *i*, the extremity of which forms a prong, *e*, extending up through the slot *g*, as shown in figs. 1 and 6, the functions of the said springs being hereinafter made to fully appear. I represents a shield, arc-shaped or semicircular in its cross-section, and attached to the recoil-bolt by a solid connecting-piece, *j*, at the forward end thereof, and so arranged that when the recoil-bolt is brought into position to close the breech, as hereinbefore explained, it will cover the opening *a*, as shown in fig. 1, and when the recoil-bolt is drawn back to open the breech, will be brought outside of the rear portion of the breech-receiver, as shown in fig. 6. This shield is furnished at its forward end with knobs, *k*, by which the recoil-bolt connected therewith may be conveniently manipulated in opening or closing the breech, as the case may be.

The firing-pin is shown at J, and passes through a suitable slot, provided centrally in the recoil-bolt, and is of such length that when the breech is closed, its rearmost end will still project into the lock-frame D, as indicated in fig. 1. The forward portion, *a**, of this firing-pin is reduced in diameter, and has placed around it, within a cavity formed for the purpose, a spiral spring, *h**, which tends to press back the firing-pin, which, furthermore, is formed with a transverse oblong slot, through which passes a pin, *c**, the said pin serving to limit the backward movement of the firing-pin with reference to the recoil-bolt, and also causing the firing-pin to turn with the said recoil-bolt when the same is turned upon its longitudinal axis, as hereinbefore explained.

At the rearmost end of the firing-pin is a radial spur, *d**. When the recoil-bolt is forward to close the breech, and the hammer K is down, as shown in fig. 1, this spur *d** is fitted into a notch, *e**, provided in the front part of the lock-frame D, the said spur being pressed into the aforesaid notch by the pressure of the hammer upon it. The innermost side of the hammer is recessed or cut away, as shown at *f**, in such manner that when the hammer is brought back, as, for instance, to "half cock," and the spur *d** is brought out of the recess just mentioned and turned upward into a vertical position, it may pass the hammer when the recoil-bolt, with the firing-pin attached thereto, is brought back, as hereinbefore explained, to unclose the breech.

Formed in the bottom of the rear part, C, of the breech-receiver B C, is an opening, *g**, which also extends through the stock, and the object of which is to provide a means whereby, when the breech-receiver and the recoil-bolt are cleaned, by pouring water into the said receiver through the upper opening, *a*, thereof, and working the recoil-bolt backward and forward, the dirt and extraneous matter, together with the water, may freely pass out or escape therefrom.

In order to load the arm, the hammer is first brought back to "half cock," thus allowing the spiral spring *b** to force back the firing-pin J until its spur *d** clears the recess *e**. The recoil-bolt, together with the shield I attached thereto, is turned toward the left hand, upon the longitudinal axis of the said bolt, thus bringing the lugs *d* of the recoil-bolt in line with the grooves *c* between the ribs *b*, as hereinbefore explained, and, at the same time, turns the firing-pin, so that its spur *d* is brought into a vertical or nearly vertical position, which being done, the recoil-bolt is brought longitudinally back within the receiver, the lugs *d* traversing the grooves *c* between the ribs *b* and the recess *f** in the inner side of the hammer, permitting the spur *d**, in its vertical position, to pass the said hammer. As the recoil-bolt is thus drawn back, the tooth *d'* of the extractor, catching in the ordinary manner upon the flanch or rim of the cartridge-shell, draws back the same until the rear end of the extractor strikes the fixed stud *a''*, which tilts upward the forward end of the extractor, and the suddenness and force of such tilting movement of the extractor being very materially increased by the upward pressure of the spring *i*, the cartridge-shell is thrown completely out of the breech-receiver, through the opening *a*, uncovered by the backward movement of the sheild I with the recoil-bolt, as hereinbefore fully set forth.

As the recoil-bolt is thus moved back, the curved portion of the spring *h* projects upward through the slot *f*, in the position shown in fig. 1. The breech being thus opened, and the empty shell ejected from the arm, the cartridge for the succeeding charge is dropped into the forward part of the breech-receiver, its flanched or butt part passing through the enlarged rear portion, *a'*, of the opening *a*, and dropping with the flanch behind the tooth *d'* of the extractor, whereupon the recoil-bolt is pushed forward, and forcing the cartridge before it, forces the same into its place in the barrel, the inclined or curved surface of the spring *h* acting as a guide to prevent the cartridge from striking at the forward end of the breech-receiver as it enters the barrel. This being done, the recoil-bolt is turned to bring its lugs in front of the shoulders *b*, formed by the forward ends of the ribs *b*, thus closing the breech, as herein fully described, the recoil-bolt being held in this position by a supplemental spring friction-catch, *b''*, attached at one side of the breech-receiver, and catching into a suitable notch formed near the edge of the shield I, the spur *d** of the firing-pin being at the same time brought into its original position with regard to the recess *e**, and in front of the striking surface or portion of the hammer, in such

bolt is not in the proper position, being prevented by the striking, which would occur, of the spur *d** of the firing-pin upon that portion of the lock-frame adjacent to the aforesaid recess, *e**.

In figs. 8, 9, and 10 is shown a modification, whereby the principle of the invention may be employed in the conversion of muzzle-loading to breech-loading arms, and which differs, for the most part, from the construction hitherto herein described, in this, that the striking surface, which actuates the firing-pin, instead of being formed directly upon the hammer, is constituted by the forward end of a rod, indicated at *m*, and formed upon a sliding piece, L, forced forward in firing by the impact of the hammer upon it. The rod *m* is so arranged that when the recoil-bolt is in position to close the breech, the spur *d** of the firing-pin thereof will be situated in front of the said rod, so that the forward movement of the latter will operate the firing-pin to ignite the cartridge, and when the recoil-bolt is turned preparatory to bringing back the same, the spur will be brought out of line with the said rod, so as to permit such movement of the bolt; the rod, as the recoil-bolt is thus brought back, entering a hole formed in the latter parallel with the firing-pin, as shown in fig. 9, whereby the just-mentioned movement thereof is allowed. In this case, as in the other hereinbefore described, the width of the forward portion of the opening *a*, through which the body of the cartridge is passed to the breech-receiver, is less than the diameter of the recoil-bolt working within the said receiver, so that any tilting upward of the forward portion of the recoil-bolt, which would be caused if the width of such part of the opening were equal to the diameter of the aforesaid bolt, is effectually provided against.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The external shield I, in combination with the recoil-bolt, constructed and operated as described, substantially as and for the purpose specified.

2. The firing-pin J, in combinalion, substantially as described, with the recoil-bolt F, and the hammer or striking-device, whereby, when the re-oil-bolt is turned preparatory to opening the breech, the firing-pin shall be turned or brought out of line or contact with the said hammer or device, substantially as and for the purpose specified.

3. The head *d** of the firing-pin, arranged in relation with the recess *e** and the hammer, substantially as and for the purpose specified.

4. The arrangement of the head *d** of the firing-pin with reference to the recessed portion *f** of the hammer, substantially as and for the purpose specified.

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