

E. MAYNARD.  
Breech-Loading Fire-Arm.

No. 86,566.

Patented Feb. 2, 1869.

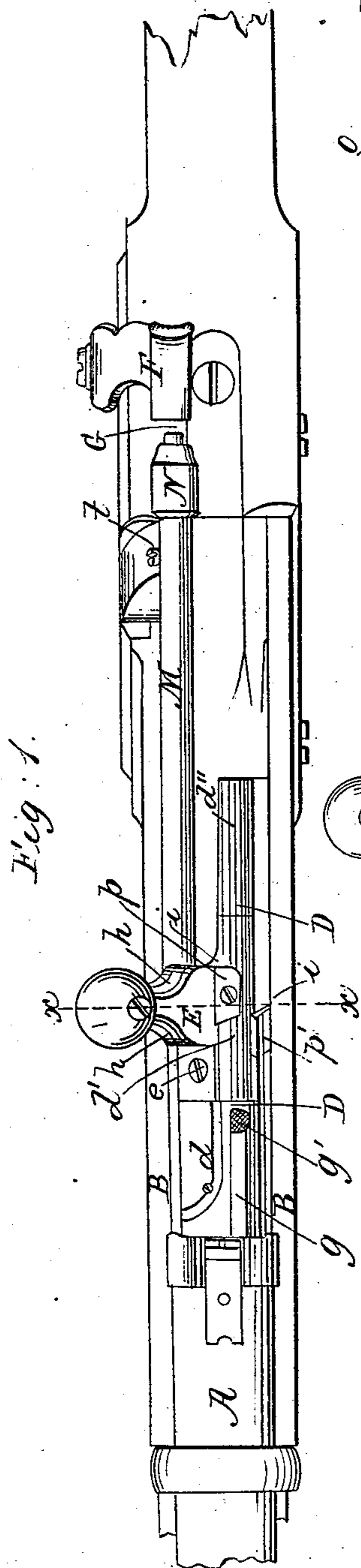


Fig. 1.

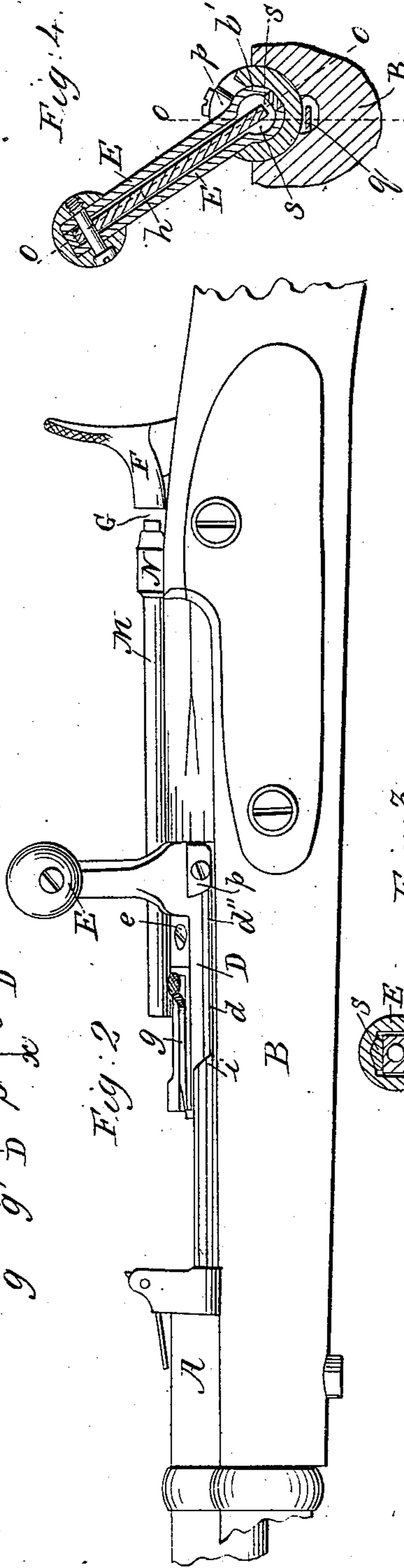


Fig. 2.

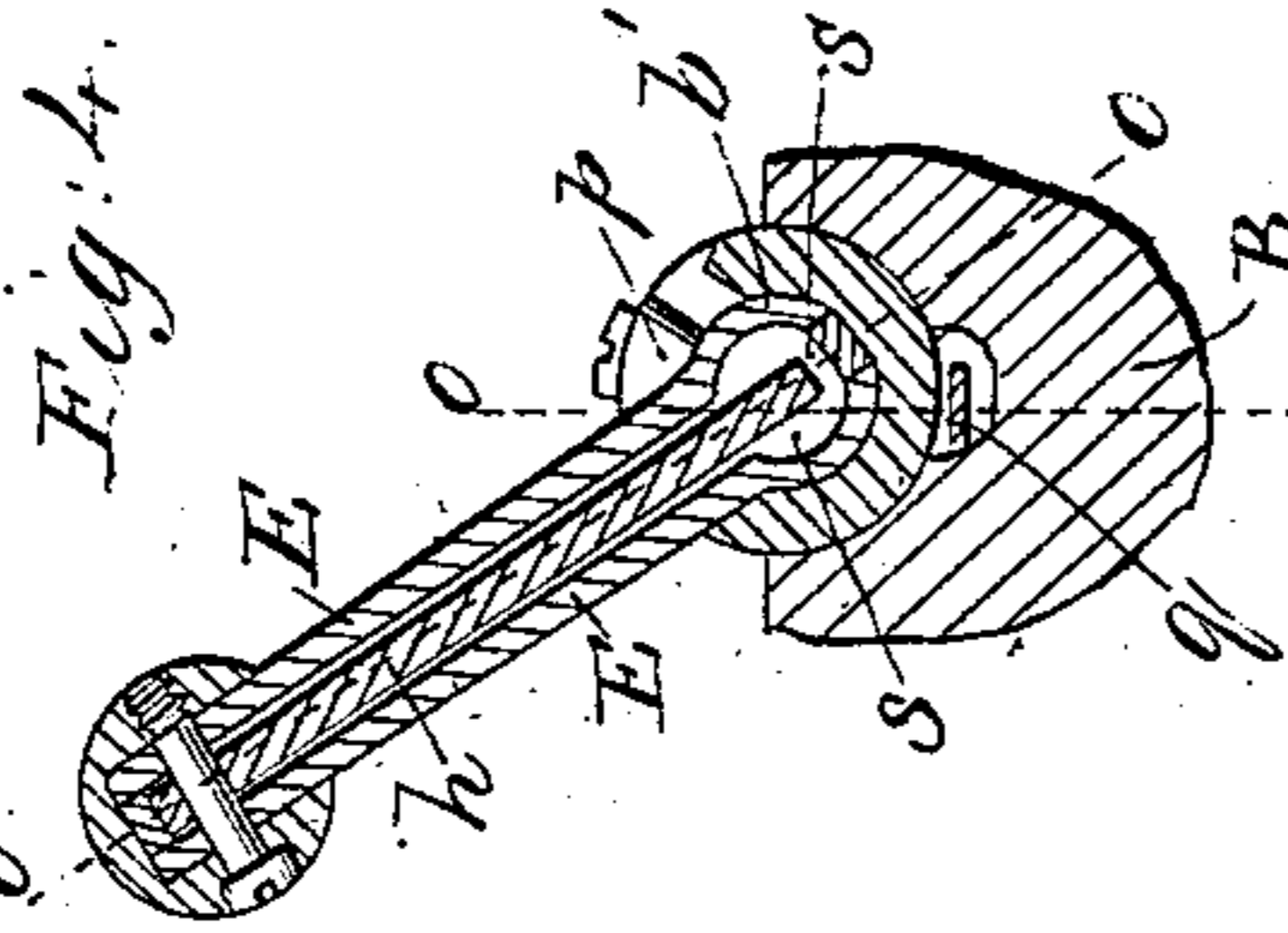


Fig. 4.

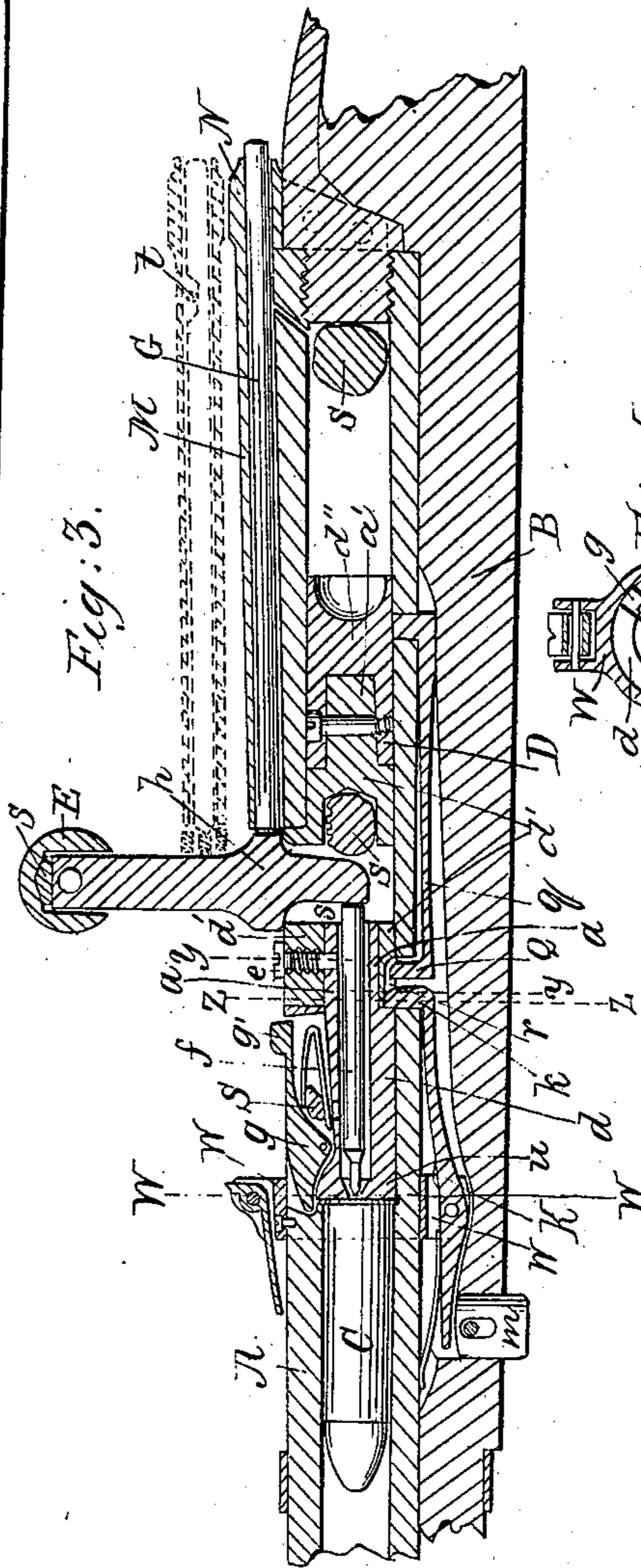


Fig. 3.

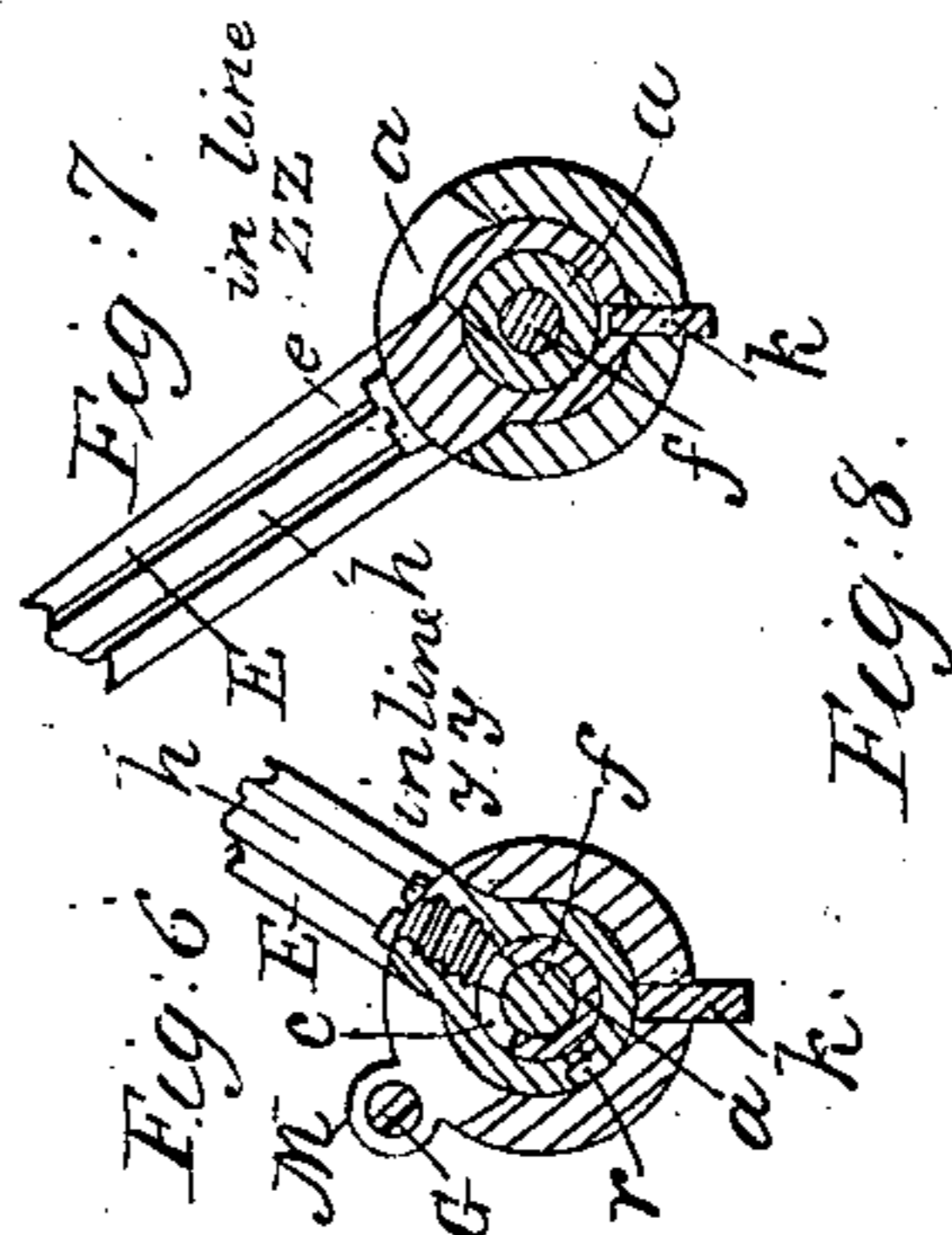


Fig. 6.

Fig. 7.



Fig. 8.

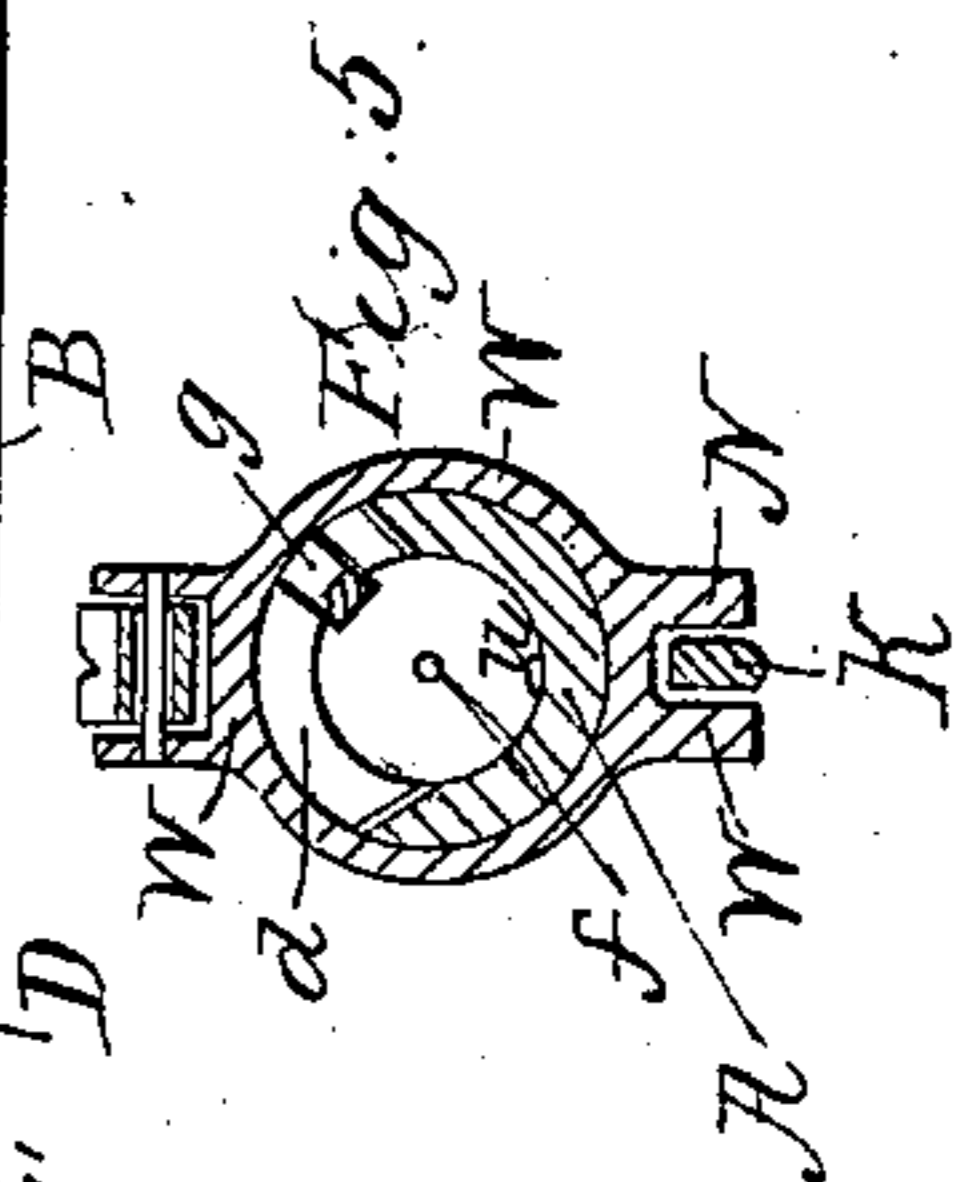


Fig. 5.

Witnesses  
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EDWARD MAYNARD, OF WASHINGTON, DISTRICT OF COLUMBIA.

Letters Patent No. 86,566, dated February 2, 1869.

## 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, EDWARD MAYNARD, of the city of Washington, in the District of Columbia, have invented a new and improved Breech-Loading Fire-Arm; and I hereby declare the following to be a full and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a plan view of my improved gun;

Figure 2, a side elevation thereof;

Figure 3, an irregular longitudinal section of the gun, following the lines indicated at *o o o o* of fig. 4;

Figure 4 being a transverse section in the line *x x* of fig. 1;

Figure 5, a transverse section in the line *w w* of fig. 3;

Figure 6, a transverse section in the line *y y*; and

Figure 7, a similar section in the line *z z* of fig. 3; the former illustrating the sliding bolt, when turned for withdrawal and disengaged from its locking-catch, and the latter the bolt, when it is closed for firing and locked by its catch.

Figure 8, a detached bottom view of the bolt, showing the forms of the slot and recesses cut therein to receive and permit a play of its locking-catch and of the spring-detent.

A top or plan view of the hammer-pin, in the position indicated by the section thereof in fig. 3, but illustrating the same driven forward against the swinging lever of the bolt-handle, is given in red lines over the fig. 3.

Similar letters of reference indicate like parts in all of the views.

My invention relates to improvements in breech-loading fire-arms which are closed by a sliding bolt, said improvements being of such nature as to admit of being readily combined with the ordinary muzzle-loading Springfield rifles, so as to convert them into breech-loaders adapted to the use of the regulation-cartridges of the United States service.

The object of said invention is to avoid weakening the attachment of the barrel to the stock, or of the lock to the stock and barrel, and also any alteration whatever in the locks of the fire-arms, adopted in the United States service, and to obtain a breech-loader as strong and secure in the breech and lock as any of the old forms of improved muzzle-loading guns, and which shall possess therewith advantages, in respect to rapidity and accuracy of fire, range, simplicity of parts, and facility of operation, superior to those of any of the breech-loading arms now in use.

The nature thereof consists—

First, in the use of a divided sliding bolt, made in two or more pieces, so as to allow the bolt to be put into place within a suitable aperture in the upper side of the barrel, near the breech of the gun, without displacing or taking out the breech-pin, or in any manner changing the attachment of the barrel to its stock, or the combination of the lock therewith.

Second, in so combining the first or foremost sec-

tion of the divided sliding bolt, closing the chamber of the gun and containing the firing-pin, with the second and remaining sections in the rear thereof, as that, whilst the whole bolt may slide longitudinally, without separation, the sections in the rear of the first may unitedly revolve upon their longitudinal axis independently of said first section, so far as may be required to bring the handle from the plane, in which it moves longitudinally to open the chamber of the gun, over to a position in line with the hammer and hammer-pin, when said chamber is closed.

Third, placing within the handle of the sliding bolt, slotted for this purpose, a bar arranged to swing in line with the axis of the gun, (its upper end being pivoted in the outer end of the handle, and its lower end left free in contact with the firing-pin in the front section of the sliding bolt,) so that when, upon closing the gun, the handle of the bolt is turned into line with the hammer, the front end of the hammer-pin shall be in line with the swinging bar, and impart thereto the blow of the hammer to be communicated thereby to the firing-pin. By this arrangement of the mechanism of the sliding bolt, a blow from the hammer can be communicated to the firing-pin only when the bolt is in a proper and safe position for firing.

Fourth, imparting such an inclination to the opposite edges of the opening in the gun, against which the base of the handle of the sliding bolt must bear, when turning in and out of line with the hammer, as that, when the handle is being turned into a position for its longitudinal-sliding movement, the inclined edge on one side shall act as a wedge to start back the bolt and disengage the cartridge from the chamber of the gun, and when turned into line with the hammer, the opposite inclined edge shall force the cartridge forward closely and tightly into said chamber.

Fifth, the disengagement of the lock-catch, or device which locks the recoil-bolt or block, closing the rear end of the cartridge-chamber of a breech-loading fire-arm, by means of a lever or other equivalent device, to be operated by the simple weight of the fire-arm, when it lies in the hand for support in opening or closing the said chamber, or by its weight in connection with the grip of the hand supporting the gun in such position.

Sixth, the attachment of a tubular shield to the outside of the barrel, in front of the hammer, for the purpose of guiding and protecting the hammer-pin, and the combination of a hammer-block with the rear end of said shield and pin, to protect the shield from the blow of the hammer in striking the pin.

Seventh, the combination of sponge or other absorbing-material, saturated with any proper lubricant, with receptacles, formed for the purpose in the sliding bolt, the barrel behind it, or both, and in other of the working-parts of the fire-arm, so that the action of the mechanism, or the heat of the gun, or both causes combined, shall cause the said sponge or other material to keep the mechanism constantly lubricated.

Eighth, the combination of a spring-detent with the



bottom of the sliding-bolt recess, for the purpose of tripping the cartridge, and to serve as a brake to the sliding bolt, to prevent accidental slipping thereof; and also in combining a retractor upon the sliding bolt with said detent, in such manner as that, when an empty cartridge is withdrawn by the retractor in the movement of the sliding bolt, it shall trip against the detent, and be thrown out from the gun, whilst a loaded cartridge would remain in position, the retractor being so arranged as that a loaded cartridge may be readily released therefrom, and received into the hand, independently of the ejecting-device.

Ninth, in the combination of supports for the back-sight and the locking-lever of the bolt upon a single band encircling the barrel.

In the accompanying drawings—

A represents the barrel of my improved fire-arm, secured to the stock B in the usual manner, and provided with the ordinary lock, or with any improved description of lock which may be preferred, secured in the same manner and in the same position, relatively to the barrel and stock, as in the ordinary Springfield rifles.

In the upper side of the barrel A, an aperture or slot is cut down to the bore, commencing immediately over the rear end of the cartridge-chamber C of the gun, and extending back toward the breech.

The rear portion of the aperture is but little larger in width than the handle of the sliding bolt, so as to allow simply a longitudinal movement thereof in the direction of the bore of the gun, but it is enlarged in front sufficiently to allow a lateral rotary movement of the handle, when the chamber is closed sufficient to bring the handle in line with the hammer of the gun.

Through this aperture the sliding bolt, closing the cartridge-chamber C, is inserted into the cylindrical bore of the breech-end of the barrel in the rear of said chamber, the bore being slightly enlarged, as illustrated in fig. 3.

In the alteration of the Springfield rifles, or other muzzle-loading guns, a very slight enlargement of the bore, in the rear of the cartridge-chamber, is required, the bore of the barrel proper being reduced in diameter by inserting a reinforce therein.

The sliding bolt D is made in three solid pieces or sections, *d d' d''*.

These sections of the bolt are united by means of tongues *a a'*, projecting centrally from the rear ends of the two foremost sections, *d d'*, fitting into counterpart sockets in the front ends of the two rear sections, *d' d''*, as illustrated in fig. 3.

The tongues *a a'* are secured within their sockets by means of screws *e e'*.

The second and third sections of the bolt are rigidly united by the screw *e'*, which passes entirely through the tongue *a'* of the second section *d'*, as shown in fig. 3.

The end of the screw *e*, which secures the first and second sections *d* and *d'* together, passes, however, into a slot, *c*, fig. 6, cut circumferentially about the tongue *a* of the front or first section *d*, so that the second section, *d'*, may partially revolve about its axis independently of the first section.

A firing-pin, *f*, fig. 3, is inserted centrally through the first section, *d*, of the bolt and its tongue *a*, and plays loosely therein. The pin is made somewhat longer than the section *d* and the tongue *a*, so as to project slightly rearwardly therefrom into a slot in the second section. A shoulder in the front end of the aperture in which the pin plays, prevents it from passing too far forward.

A retracting-lever, *g*, is pivoted within a slot cut in the upper side of said front section *d*, as seen in fig. 3. The forward end of this retracting-lever is hooked, to engage the flange of the cartridge. This engagement

is secured by means of a spring placed beneath its rear arm, its rear end being fitted with a thumb-piece, *g'*, projecting slightly above the outer surface of the section, for the purpose of depressing the lever, and releasing its hook, when desired.

The hooked end of the retractor, projecting slightly beyond the flange of the cartridge when the gun is loaded and the bolt closed, passes into a recess in the end of that part of the gun-barrel immediately forward of the loading-aperture, as shown in fig. 3 of the drawings.

The handle E of the bolt D is formed upon its central section, *d'*, and projects therefrom at right angles thereto.

A central longitudinal slot, *s*, is cut down entirely through this handle E, in a right line with the axis of the bolt, and is continued down through the central section.

The rear end of the firing-pin *f* projects therein beyond the end of the tongue of the first section, enclosing it.

Within this slot *s* is fitted a lever, *h*, pivoted by means of a pivot-screw passing through the head of the handle and the upper end of the lever, as seen in fig. 3.

The lower end of the lever *h* extends down, through the central section *D'* of the bolt, to a point below the end of the firing-pin *f*, so as to come fairly in contact therewith.

The hammer F of the gun is combined with the stock in the usual manner, but the end of the hammer is cut down, in the form indicated in the drawings, to strike fairly the end of a firing-pin, G, secured upon the barrel by means of a tubular shield, M, enclosing the same, as illustrated in the drawings, and which extends in a right line from the hammer to a plane coincident with the rear face of the handle E of the bolt.

The hammer-pin G is confined within the shield M by means of a screw, *t*, whose inner end passes into a recess cut in the side of the pin, and extended sufficiently to allow the desired longitudinal movement of the pin, as shown in the red lines of fig. 3.

The rear end of the tubular shield terminates at the rear end of the barrel, and is protected by a hammer-block, N, passing down in the rear of the breech-pin, and secured to the breech-plate by screws, as illustrated by dotted lines in fig. 3.

This hammer-block is pierced with an aperture, coinciding with that of the shield M, and the hammer-pin G extends through the same, as shown in the drawings, fig. 3, and see red lines therein.

The handle E, with the central and rear sections of the bolt A, is left, by the form of the aperture cut in the barrel, free to revolve sufficiently far, when the gun is closed, to bring the lever *h*, pivoted centrally therein, in line with the hammer-pin G.

The edges *i i'* of the bolt-aperture, at the point of its enlargement forward, to permit the turning of the bolt, are so bevelled and inclined as that the rear face of the handle, bearing against the bevelled face *i*, will force the bolt forward, when its handle is turned into line with the hammer-pin, (and thus secure a close joint of the flange of the cartridge with the end of the barrel of the gun,) and the anterior face of a projecting piece, *p*, secured upon the upper side of the bolt, working against the bevelled face *i'*, will start the bolt back, when the handle is turned back, to open the gun.

A piece of hardened steel, *p'*, is screwed down upon the barrel A, fig. 1, so that its rear end shall form the bevelled face *i'*, receiving the blow of the projecting piece *p* on the bolt, and protect the soft metal of the barrel at this point from the battering effect incident to the shooting forward of the bolt in its slot, in closing the gun.

The handle is thus made to work as a lever, where-



with to overcome, in the latter case, the adhesion of the cartridge within the gun-chamber after it has been fired, and, in the former, to close securely the joint between the cartridge and the gun-barrel.

Upon the under side of the bolt D, at the front end of the second or middle section, *d'*, a recess, *r*, fig. 8, is cut out in its forward end, terminating at the rear face of the first section, *d*, of the bolt, which thus serves to form a square shoulder at that point. (See fig. 3.)

A catch, *k*, figs. 3, 6, and 7, upon the rearward longer arm of a lever, K, which is pivoted between ears *w w*, projecting from the under side of a band, W, fig. 5, encircling the barrel over the mouth of its cartridge-chamber, C, passes into this recess *r*, (see fig. 7,) when the bolt is shot forward, to close the gun, and is turned into position for firing, as seen in figs. 1, 3, 4, and 7.

A spring is placed under the rear end of the lever K, which causes the catch *k* to bear constantly against the bolt D, and to fall into the recess *r*, so soon as it attains a proper position therefor.

A button, *m*, is, however, inserted through the stock B, to bear upon this arm of the lever, so that a pressure on the button shall overcome the force of the spring, and move the lever sufficiently to disengage its catch *k* from the bolt, and permit a partial revolution of the bolt, as seen in fig. 6, and its withdrawal from the chamber of the gun.

The button *m* is so situated upon the under side of the stock B as that, when the gun is laid naturally in the left hand for support, to be opened with the right, the button shall rest on the palm of the hand, and the weight of the gun, thus brought to bear on the lever by means of the button, will suffice to disengage the catch, and unlock the bolt, so that it may be turned and drawn back, as above described.

A detent, Q, upon the end of a spring, *q*, secured on the under side of the barrel, passes into the rear part of the recess, *r*, on the under side of the bolt, as illustrated in fig. 3.

The portion of the recess in which the detent plays is enlarged laterally, as illustrated clearly in fig. 8, to permit the partial revolution of the bolt, as heretofore described, the enlargement being of such form as to act as a cam, in the partial revolution of the bolt, in the act of opening the same, to force down the detent out of the recess, leaving it free to bear up, with the entire force of its spring, against the under side of the bolt, whilst it is drawn back. The detent will thus act as a brake therefor, to prevent any loose or accidental movement thereof.

A small notch, *u*, is cut at a point in the angle of the front face of the bolt, with the under side thereof in line with the detent, (see figs. 3 and 5;) and the relative position of the detent and bolt is so adjusted as that, so soon as the bolt is drawn back far enough to bring the front end of an empty cartridge out of the gun-chamber, and clear of the barrel at the front end of the loading-aperture, the notch will reach the detent, which will fly up therein, immediately in the rear of the flange of the cartridge.

As the bolt is drawn still further back, the lower portion of the cartridge-case, striking the detent, will be arrested, whilst the retractor, still acting upon the flange on the upper side, to draw it back, will cause the cartridge-case to trip and fly up, and, if the bolt be drawn back with ordinary force, will cause it to be thrown out wholly from the gun.

The detent, projecting upward in front of the bolt, when it is thus wholly withdrawn, will prevent any accidental slipping forward thereof, when the muzzle of the gun is depressed.

The rear end of the bolt D is concaved, as illustrated in fig. 3, and a piece of sponge, S, or other ab-

sorbing-material, saturated with glycerine, or other lubricant, is placed in the rear end of the bore, so that, when the bolt is drawn back against the same, it may gently compress the sponge, and thereby lubricate the bolt, this use of sponge, or its equivalent, as a fountain, or reservoir, of lubricating-material, in combination with the moving parts of a machine, being an invention for which I am about to make a separate application for Letters Patent.

The sponge not only operates to lubricate the parts, but also collects and holds all abraded particles, and any dirt which may work thereinto.

A small aperture, *v*, is pierced through the barrel, to communicate, from this sponge-seat, with the shield, M, of the hammer-pin, so that the pin may also be lubricated by the sponge S.

A recess is also formed in the rear portion of the central section of the bolt D, and a piece of sponge placed therein, so that the lever *h*, striking the sponge, will be lubricated thereby in every movement.

I place also smaller pieces of saturated sponge, or its equivalent, over the upper end of the lever in the head of the handle E, and under the springs actuating the retractor and the locking-levers, and the lock of the gun.

The back sight of the gun is hinged between ears on the upper side of the band W, fig. 5, to the under side of which the lever K is pivoted, to lock the bolt D, as shown in figs. 3 and 5.

When my improved fire-arm is supported upon the left hand, in the usual manner for loading, the palm of the hand, bearing naturally against the button *m*, will operate to disengage the catch Q, and unlock the bolt D, so that its handle E may be turned, and the bolt withdrawn from the cartridge-chamber C.

If the metallic cartridge therein be unloaded, so soon as its front rim has passed out from the chamber, its lower rear end will strike the detent, so that the retractor, acting against its upper rear rim, will operate to throw it entirely out from the loading-aperture.

If, however, the cartridge be still loaded, the presence of the projectile will prevent the cartridge from being thrown out when it trips against the detent, and it will remain in the loading-aperture.

To remove the loaded cartridge, the retractor must be disengaged therefrom by pressure upon its thumb-piece, and the gun turned over, or reversed, when the cartridge will drop out into the hand.

After the bolt has been withdrawn, and the loading-aperture thus opened, a loaded cartridge is inserted therein in the usual manner, the bolt shot home, and its handle turned into line with the hammer-pin, when it is ready for firing.

In the act of turning the handle, the inclined edges of the aperture in the handle, and of the handle, force the bolt closely up against the cartridge in closing the gun, and, in the reverse movement, starts the cartridge from its chamber.

So soon as the handle is turned into position for firing, it is locked, and held by the catch in that position.

The blow of the hammer upon the hammer-pin is communicated to the lever in the handle, and thence to the firing-pin, to strike the fulminate-point on the cartridge, and explode the same.

As is evident, the gun cannot be discharged by a blow from the hammer until the bolt is properly and safely secured.

I contemplate the use of a simple sliding catch, actuated by a spring, and disengaged by pressure upon its outer end, as an equivalent substitute for the pivoted lever K, in locking and unlocking the sliding bolt D; and I contemplate the application of a locking-catch, so arranged and combined with the gun and bolt as that it may be operated, and disengaged from the



bolt, by the weight of the gun, when resting in the hand, as herein described, to all forms of revolving or sliding bolts for closing the cartridge-chamber.

Having thus fully described my improvements in breech-loading fire-arms,

What I claim therein as new, and desire to secure by Letters Patent, is—

1. A divided sliding bolt, D, made in two or more sections, one of which is so extended as to form a handle, containing and carrying a pivoted lever, *h*, to transmit motion from the hammer to the firing-pin of the gun, substantially in the manner herein set forth.

2. The combination of a pivoted lever, *h*, with the handle E of a sliding bolt, and with a firing-pin, *f*, on one side, and a hammer-pin, G, on the other side thereof, substantially in the manner and for the purpose herein set forth.

3. The combination of a pivoted lever, K, and catch, *k*, substantially as herein described, or any equivalent

therefor, with the sliding or revolving bolt, D, of a breech-loading fire-arm, to lock the same, when so arranged and combined with the stock B thereof as that it may be actuated, to unlock the bolt, by the weight of the gun resting upon the hand in loading, all substantially in the manner and for the purpose herein set forth.

4. The combination of lubricating-sponge, or other absorbent material, with the working-parts of a fire-arm, substantially in the manner and for the purpose herein set forth.

5. The lubricating-aperture *v*, in combination with the tubular shield M, and the lubricating-recess in the bore, in the rear of the sliding bolt D, substantially as and for the purpose herein set forth.

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