(No Model.) 4 Sheets—Sheet 1.

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MAGAZINE FIRE ARM.

No. 421,663. Patented Feb. 18, 1890.

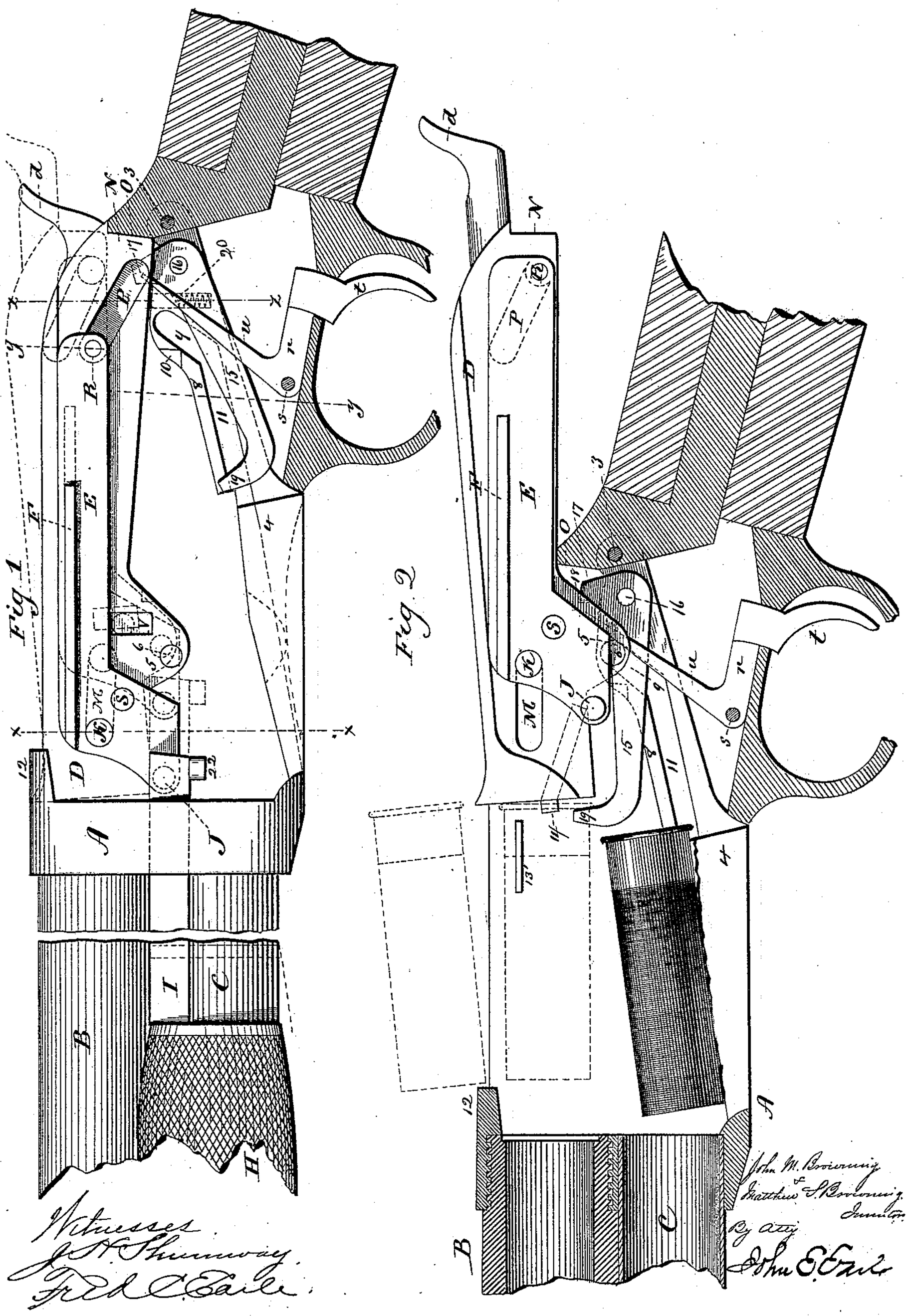

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Fig. 3

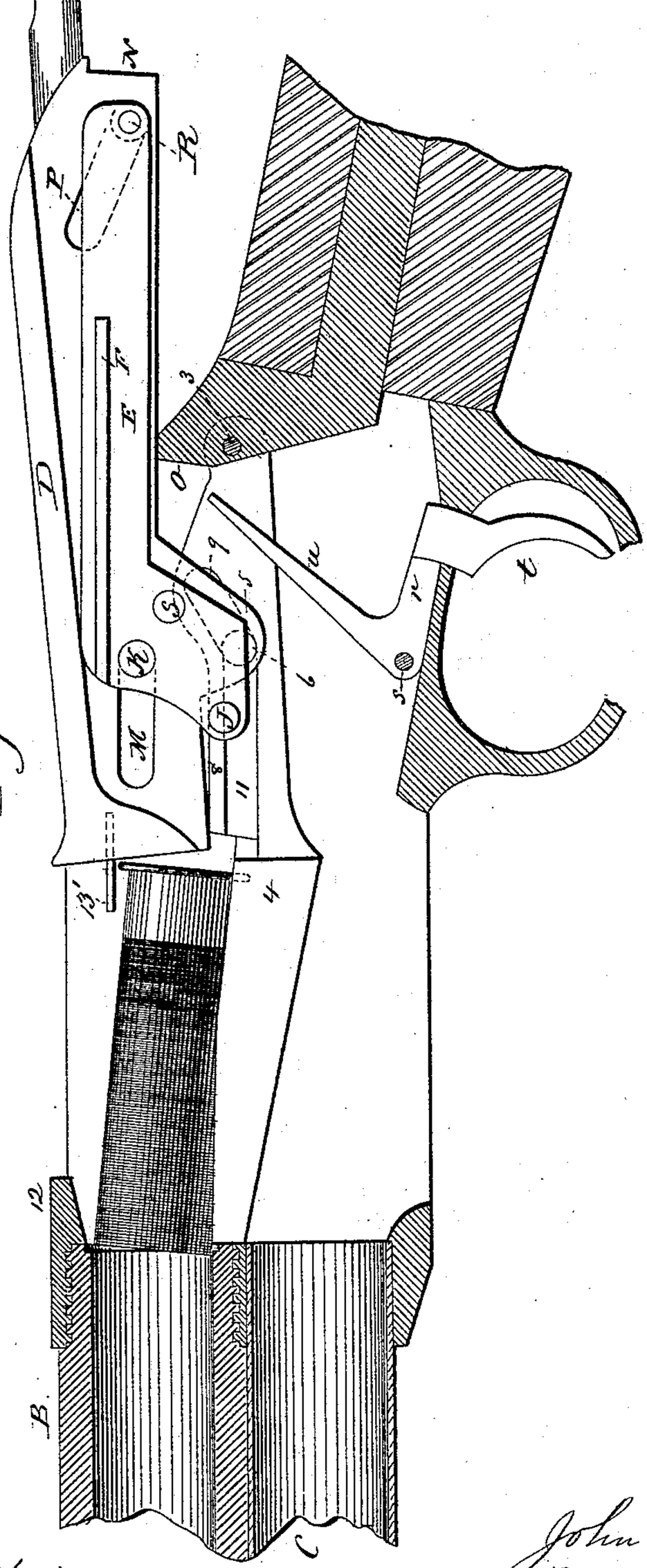
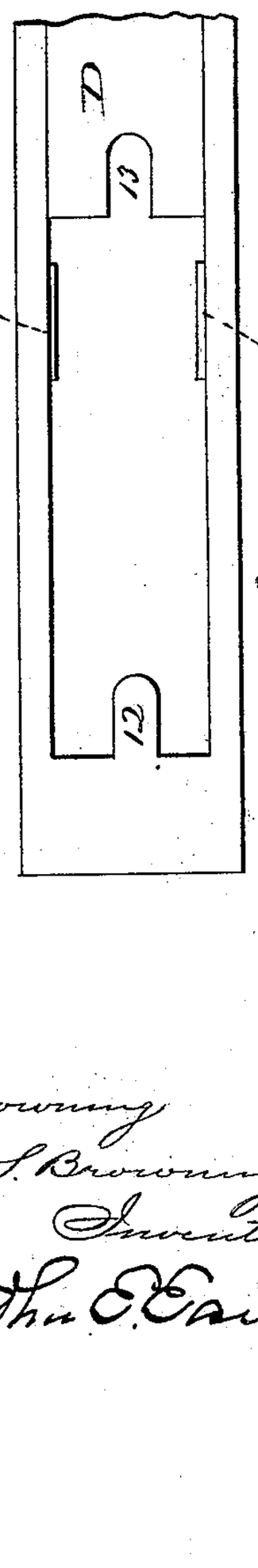


Fig. 4



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J. M. & M. S. BROWNING.

MAGAZINE FIRE ARM.

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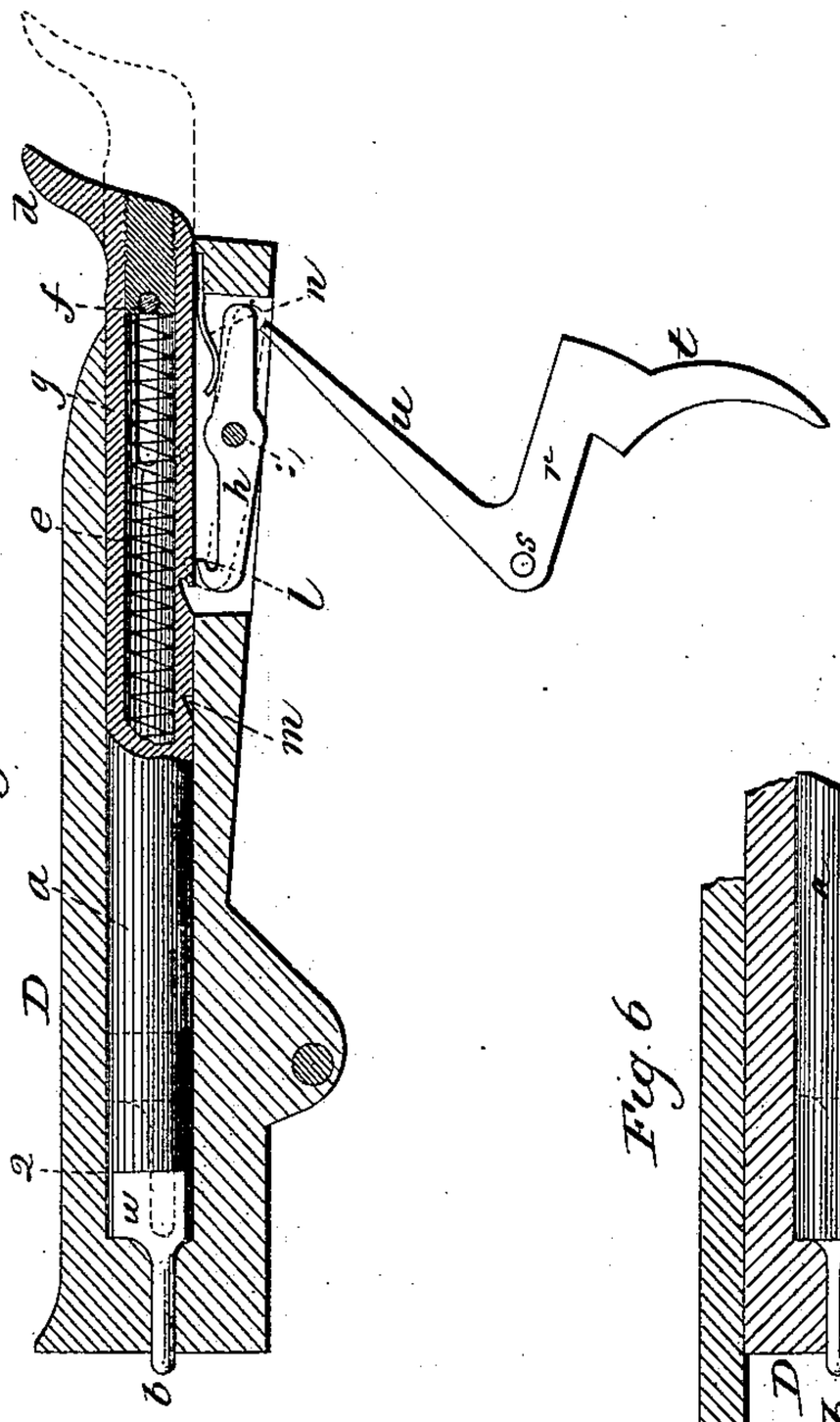

Fig. 5.

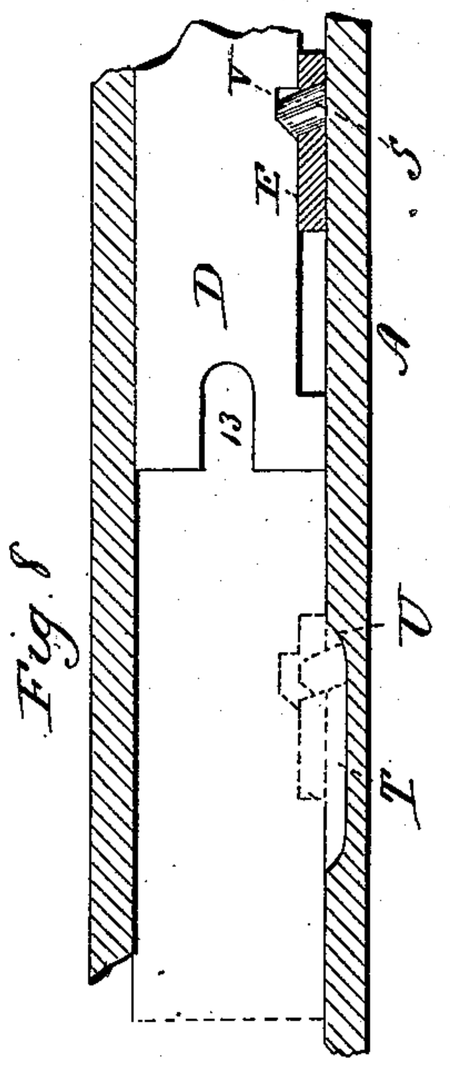

Fig. 8

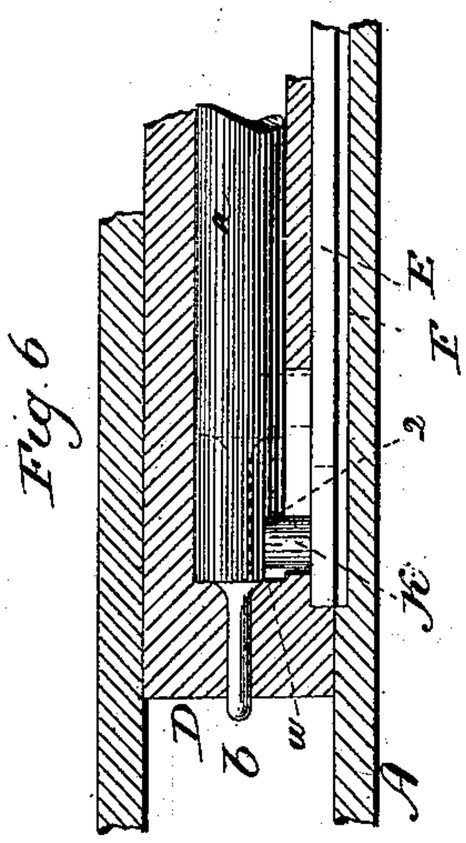

Fig. 6.

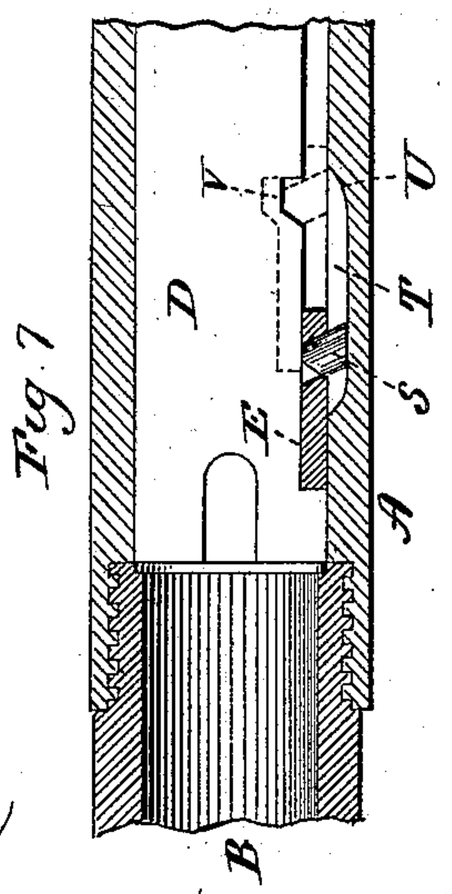

Fig. 7.

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MAGAZINE FIRE ARM.

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Fig. 13

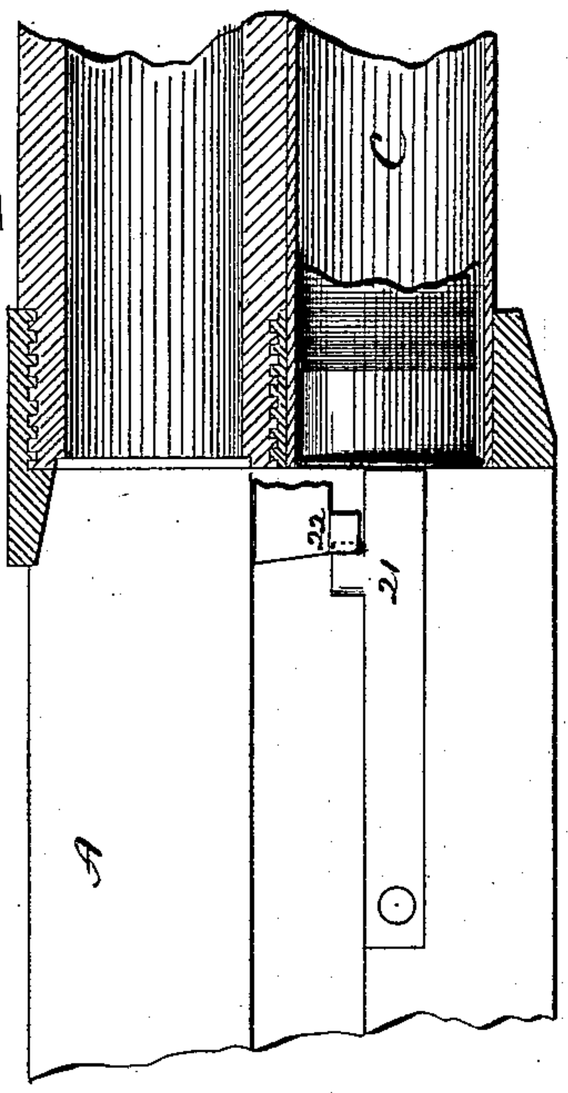


Fig. 12

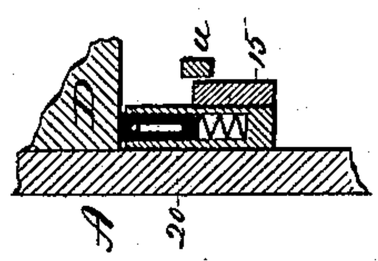


Fig. 11

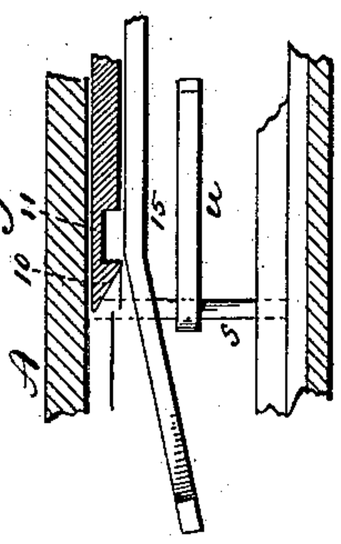


Fig. 10

Fig. 14

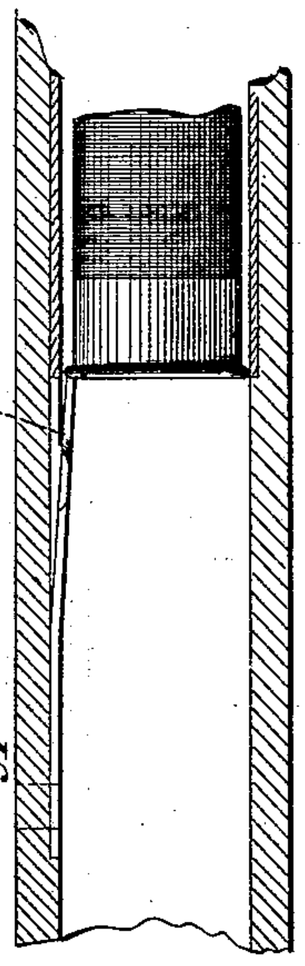
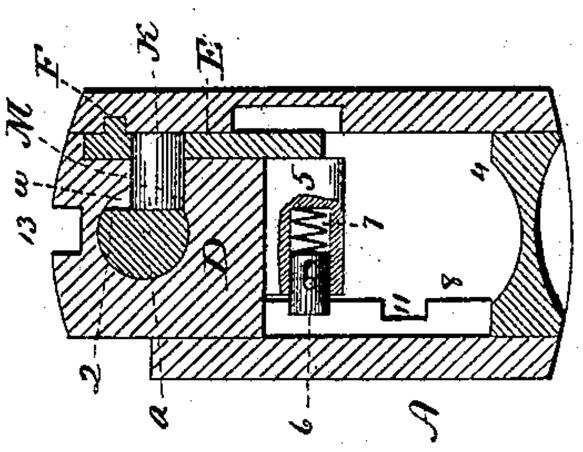


Fig. 9



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JOHN M. BROWNING AND MATTHEW S. BROWNING, OF OGDEN, UTAH TERRITORY, ASSIGNORS TO THE WINCHESTER REPEATING ARMS COMPANY, OF NEW HAVEN, CONNECTICUT.

MAGAZINE FIRE-ARM.

SPECIFICATION forming part of Letters Patent No. 421,663, dated February 18, 1890.

Application filed June 4, 1889. Serial No. 313,052. (No model.)

To all whom it may concern:

Be it known that we, JOHN M. BROWNING and MATTHEW S. BROWNING, of Ogden, in the county of Weber and Territory of Utah, have invented a new Improvement in Magazine Fire-Arms; and we do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a side view, parts in vertical section, showing the mechanism as in the normal or breech-closed position; Fig. 2, same view showing the parts as the breech-piece open and as preparatory to the return movement; Fig. 3, a similar view showing the parts as in the position after the breech-piece has commenced its closing movement and brought the carrier to its raised position; Fig. 4, a top view showing the breech-piece in its open position to illustrate the cartridge-guards; Fig. 5, a longitudinal vertical section of the breech-piece, showing the trigger and sear in side view; Fig. 6, a horizontal central section through the breech-piece and receiver in the plane of the hammer; Figs. 7 and 8, horizontal sections through the receiver in the plane of the engaging-pin S, to illustrate the operation of the said pin; Fig. 9, a transverse section cutting on line *x x* of Fig. 1, looking rearward; Fig. 10, a transverse section on line *y y*, Fig. 1, looking rearward; Fig. 11, a horizontal longitudinal section on line *x x* of Fig. 10; Fig. 12, a partial transverse section on line *z z* of Fig. 1; Fig. 13, a partial longitudinal section illustrating the latch for holding the column of cartridges in the magazine; Fig. 14, a horizontal section cutting above the latch and showing the latch as in the engaging position.

This invention relates to an improvement in that class of magazine fire-arms in which the magazine is arranged beneath the barrel, both the barrel and magazine open into the receiver at the rear, and having a breech-piece arranged to slide backward and forward longitudinally, actuated by a sliding handle arranged forward of the receiver and beneath the barrel, and having a carrier adapted to receive a cartridge from the magazine, transfer it to a position forward of the front face of the open breech-piece, and so that a return of the breech-piece will force the cartridge from the carrier to its place in the barrel, the object of the invention being a simple construction, which will adapt the arm for shot and sporting purposes, yet applicable to rifles; and the invention consists in the construction as hereinafter described, and particularly recited in the claims.

A represents the receiver, of substantially usual form, and having a chamber therein open through top and bottom for the operative mechanism. To the forward end of the receiver the barrel B is secured, and the magazine C beneath the barrel, both the barrel and magazine opening into the chamber in the receiver at the rear in the usual manner for this class of arms.

D represents the breech-piece, which is arranged to slide longitudinally backward and forward in the receiver from the closed position seen in Fig. 1 to the open position seen in Fig. 2 and return.

E represents a slide, which is arranged in one side of the receiver between that side and the breech-piece, (see Figs. 8 and 9,) the breech-piece being recessed therefor, as shown in those figures, and the slide is constructed with a longitudinal rib F on its outer side, which works in a corresponding longitudinal groove G in the receiver, and so that the said rib and groove serve as a guide for the longitudinal movement of the slide. A longitudinal reciprocating movement is imparted to the said slide from a handle H beneath the barrel, suitably guided, a bar I extending from the said handle through the forward end of the receiver into connection with the slide, as at J. (See Fig. 1.) Connection is made between the slide and the breech-piece by means of a stud on the one and corresponding groove on the other. As represented, the stud K is on the slide F, (see Fig. 9,) and ex-

tends into a longitudinal groove M in the breech-piece. (See Figs. 2 and 9.) Because of this groove-connection between the slide and the breech-piece a longitudinal movement is permitted to the slide without effect at that point upon the breech-piece. The object of this independent movement of the slide is to give to the breech-piece its locking and unlocking movement, the length of the groove being only sufficient for this purpose, and so that the slide may move rearward a certain distance before the breech-piece commences its rear movement.

When the breech-piece is in the fully-closed position, as seen in Fig. 1, its rear end N stands behind a stationary abutment O in the receiver to serve as a resistance for the breech-piece against recoil of the explosion. It is therefore necessary to raise the breech-piece from this locked position before it can commence its rear movement. To accomplish this unlocking movement a groove P is formed in the side of the breech-piece, between it and the slide E. (See Fig. 1.) This groove inclines downward and backward. Its inclination is to the extent required for the rising movement, and its length corresponds substantially to the length of the groove M at the forward end. On the slide E is a stud R, which extends into and works in the said inclined groove P, as seen in Figs. 1 and 10, substantially as does the stud K in the groove M at the forward end, thus making a connection between the breech-piece and its slide both at the rear and forward end. When in the fully-closed position, the studs K and R stand at the forward end of their respective grooves, the breech-piece in the locked position.

To open the breech-piece the handle H is moved rearward, which imparts a corresponding rearward movement to the slide E. The stud R works in the inclined groove P, while the stud K slides in its longitudinal groove M. The inclination of the groove P operates as a cam with the stud R, and so that the said rear movement of the slide imparts a rising movement to the rear end of the breech-piece, as seen in broken lines, Fig. 1, sufficient to carry the breech-piece entirely above its abutment O. The stud K at the forward end serves as a pivot upon which the breech-piece may thus swing upward at the rear. As soon as the breech-piece has been thus raised, and as seen in broken lines, Fig. 1, one or both the studs K R will have reached the rear end of their respective grooves and so as to make positive engagement with the breech-piece, and because of such engagement the continued rear movement of the handle will impart to the slide and the breech-piece together a rear movement until the breech-piece reaches its fully-open position, as seen in Fig. 2. On the return of the handle a corresponding forward movement will be imparted to the breech-piece; but without some provision to the contrary the stud R in its inclined groove P would have a tendency to at once force the breech-piece downward, and so as to produce a considerable friction between the parts while the breech-piece was advancing to its closed position, where it could be locked. It is desirable to avoid such frictional resistance to the closing movement of the breech-piece. To accomplish this result we interlock the slide and breech-piece after the breech-piece shall have been raised from its locked position. To thus interlock the breech-piece and slide a transverse pin S is arranged through the slide, preferably in a diagonal position, inclined inward and forward, as seen in Fig. 7. In the side of the receiver a longitudinal groove T is formed, into which the pin S may extend when the breech-piece is in the closed position, as seen in Fig. 3, the groove extending rearward to substantially the extent required for the rear movement of the slide in unlocking the breech-piece. The rear end U of the said groove T is inclined rearward and inward, as seen in Fig. 7. In the breech-piece, in a position corresponding to the said incline U, a notch V is formed of a depth corresponding to the depth of the groove T. Consequently as the slide E moves rearward, as represented in broken lines, Fig. 7, the pin S rides in its groove T independent of the breech-piece until it reaches the incline U, where the longitudinal movement of the slide causes the pin S to ride up over the incline U, which forces the pin S into the notch V, as seen in broken lines, Fig. 7. Such entering of the pin S into the groove V of the breech-piece interlocks the breech-piece and slide substantially independent of the studs between the slide and breech-piece, before described, and as the pin S has now passed from the groove T it will ride on the inner surface of the receiver to its rear position—say as seen in Fig. 8. Then as the handle and slide are returned the pin S retains its engagement with the breech-piece and causes the breech-piece to positively move with the slide without applying any material force to the inclined groove tending to force the rear end of the breech downward, and this operation will continue until the breech-piece approaches its forward position, and when the pin S reaches the groove, as seen in broken lines, Fig. 8, then the pin is free to slide outward into its groove, as seen in broken lines, Fig. 8, and so as to escape from its notch, at which point the breech-piece has reached its fully-closed position. Then the continued forward movement of the handle will carry the pin to the forward end of its groove independent of the breech-piece, as seen in Fig. 7.

To facilitate the return of the pin S into its slot as the breech-piece approaches its forward position, and avoid the employment of springs, the pin is arranged in a position inclined inward and forward, as before mentioned. This gives to the back of the pin an inclined position, so that the notch in the breech-piece will operate thereon as a cam, tending to force the stud outward. Preferably the forward surface

of the inner end of the pin is beveled backward, to facilitate its entrance into the notch in the breech-piece.

The hammer *a* is in the form of a tubular spindle, arranged longitudinally through the breech-piece, terminating at its forward end in a firing-pin *b* and at its rear end in a cocking-finger *d*, so that the hammer may be pulled rearward into the cocked position by hand, if desired. The mainspring *e* is arranged within the hammer, its forward end bearing against the hammer and its rear end against a stud *f*, stationary in the breech-piece and extending diametrically through longitudinal grooves *g* in the hammer, and so that as the hammer is drawn rearward the spring will be compressed to react when the hammer is free, so as to drive the hammer forward, a common construction in this class of arms. In the breech-piece, beneath the hammer, a two-armed sear *h* is hung upon a pivot *i*, the forward end terminating in a nose *l*, adapted to engage the cocking-notch *m* in the hammer. When the hammer is drawn to the full-cock position, as indicated in Fig. 5, a half-cock notch may be provided, if desired. A sear-spring *n* is provided, the tendency of which is to force and yieldingly hold the nose of the dog into the notch of the hammer. In the frame below the breech-piece the trigger *r* is hung upon a pivot *s*, the finger-piece *t* extending through the lower side of the receiver into the guard in the usual manner. The upper arm *u* extends up to a position to engage the sear when the breech-piece is in the closed position, as seen in Fig. 5, so that a pull upon the trigger will throw the sear out of engagement with the hammer. In the rear movement of the breech-piece the sear passes with the breech-piece to the rear of the trigger.

To make the hammer self-cocking, the hammer is provided at its forward end with a vertical recess *w*, forming a shoulder 2. (See Figs. 5, 6, and 9.) This shoulder 2 stands immediately in rear of the stud K when the parts are in their fully-closed position; hence as the slide commences its rear movement and before the breech-piece is interlocked the engagement of the stud K with the hammer causes it to move rearward with the slide, as indicated in broken lines, Fig. 5, to a position to be engaged with the sear, as also seen in broken lines, Fig. 5, so that the hammer is brought to the locked position before the breech-piece is fully released, and as the trigger cannot reach the sear until after the breech-piece has been brought to its closed and locked position accidental firing in the act of closing the breech-piece, because of bringing the firing-pin into contact with the primer, is impossible. This construction also permits very rapid firing, because the trigger can be held in the pulled position so that as the rear end of the breech-piece drops to its locked position the sear will strike the trigger and release the hammer, so that the completion of the locking movement of the breech-piece will release the hammer. Consequently the rapidity of firing is only limited to the rapidity with which the handle may be moved from its extreme forward to rear position, and return.

In the receiver, beneath the breech-piece and upon a pivot 3, a carrier 4 is hung so as to swing up and down from the position seen in Fig. 1 to that seen in Fig. 3. In the down position the rear cartridge from the magazine may pass onto the carrier, and then as the carrier rises after the breech-piece is open the said cartridge will be brought into a position forward of the front face of the breech-piece, as seen in Fig. 3, and so that as the breech-piece next advances it will force the cartridge from the carrier into its place in the barrel.

The breech-piece moves rearward to a greater extent than that required for the cartridge to be inserted, as seen in Fig. 2, thus giving to the breech-piece an over motion. This over motion of the breech-piece we utilize as a means for raising the carrier. On the under side of the breech-piece is a downward projection 5. (See Figs. 2 and 9.) In this downward projection 5 is a transverse spring-stud 6, the spring 7 serving to force and yieldingly hold the stud outward. Near the rear end of the carrier is a vertical longitudinal flange 8, (see Figs. 2, 9, and 10,) and in this flange is a downwardly and forwardly inclined groove 9, Fig. 2, and the surface of the carrier, immediately forward of the upper end of this groove, is inclined, as at 10, Figs. 10 and 11, and so that as the breech-piece reaches its extreme rear position the said stud will ride over this incline 10 and spring into the groove 9, as represented in Fig. 2. This inclined groove 9 opens at its lower end into a longitudinal groove 11 in the carrier, which extends forward to about the position of the rear end of the cartridge, which may lie upon the carrier, as seen in Fig. 2, the groove 11 opening at its forward end. After the stud 6 has thus engaged the inclined groove 9 on the carrier, the first part of the forward movement of the breech-piece will cause the said stud to operate as a cam upon the inclined groove 9 in the carrier, and thereby raise the carrier, as from the position in Fig. 2 to that seen in Fig. 3, and this rising will be completed, as seen in Fig. 3, as the cartridge has been raised to its proper position forward of the front face of the breech-piece. From this position the forward movement of the breech-piece will cause the cartridge to enter the barrel, and the stud 6 will pass out at the forward end of the groove 11, the said groove 11 in the up position of the carrier standing in substantially a direct longitudinal line with the barrel, and so that the carrier will be supported in this position during the entering movement of the cartridge.

As the stud 6 escapes from the groove 11, the carrier is free to return, and it may be returned by the rear end of the breech-piece

striking upon the top of the flange 8 of the carrier, when the breech-piece is dropped to its locked position.

To prevent the sudden rise of the carrier from giving the cartridge an impulse which will throw it too far upward, a rearward-projecting finger 12 is formed in the receiver, immediately above the opening into the barrel, as seen in Figs. 3 and 4, which extends sufficiently far rearward to serve as a guard to prevent such over movement of the cartridge. The breech-piece D at its forward end is constructed with a recess 13, (see Fig. 4,) corresponding to this finger 12, so that as the breech-piece comes to its closed position the said recess will pass onto and inclose the finger 12, and rearward on the sides of the receiver inwardly-projecting ribs or projections 13′ are preferably employed, to prevent the rise of the rear end of the cartridge, these projections being above the head of the cartridge and projecting inward, so that the space between the said projections is less than the diameter of the head.

The breech-piece is provided with an extractor-hook 14, which may be a common spring-extractor, adapted to engage the flange of the cartridge and so that in the rear movement of the breech-piece the cartridge or the exploded shell will be withdrawn from the barrel.

To insure the ejection of the withdrawn shell or cartridge, as the case may be, we provide an automatic ejector, which shall operate as the breech-piece reaches its rear position to give to the cartridge an ejecting movement sufficient to throw it from the arm. This ejector is in the form of a lever 15, hung in the carrier upon a transverse pivot 16, and so as to swing in a vertical plane. The ejector-lever 15 is hung near the rear end of the carrier, but forward of the carrier-pivot. From the hub of the lever 15 a finger 17 extends upward into the path of a shoulder 18 on the breech-piece, and so that as the breech-piece approaches its extreme rear position the shoulder 18 will engage the finger 17 and throw the ejector up from the position seen in Fig. 1 to that seen in Fig. 2. The forward end of the lever 15 forms a nose 19, forward of the front face of the breech-piece, and which as it rises will strike the under side of the cartridge or shell and give to it an impulse to throw it upward, as indicated in broken lines, Fig. 2. Then as the breech-piece commences its forward movement the ejector-lever will return, and may be forced so to do by constructing the rear end of the breech-piece so as to engage the finger 17 during the dropping movement of the breech-piece, as represented in Fig. 1.

To charge the magazine we make use of the carrier as a trap.

The under surface of the carrier closes the opening through the bottom of the receiver, and in the carrier, near its rear end, we arrange a vertical spring 20, between the carrier and the rear end of the breech-piece, and so that when the breech-piece is closed this spring will bear upon the breech-piece between it and the carrier, and so as to yieldingly hold the carrier in its down position, but yet so as to permit the carrier to be pressed inward so far as to open the rear end of the magazine, as seen in Fig. 3, the carrier being recessed, as indicated in broken lines, Fig. 1, below the downward projection on the breech-piece, and so as to permit such inward movement of the carrier while the breech-piece is closed, the intention being to charge the magazine while the parts are in their closed or normal position. A spring-latch 21 is arranged in the side of the receiver to engage the successive cartridges as they are so entered and prevent their rear movement, as seen in Figs. 13 and 14. This is a common device for this purpose. The slide is provided with a cam 22, which will throw this latch out of engagement with the cartridges when the breech-piece comes to its closed position, as seen in Fig. 13; but after the breech-piece has commenced its rear movement and the rear cartridge in the magazine has started onto the carrier and passed the nose of the latch 21 the latch is released to come again into the path of the heads of the cartridges, and so that the head of the next cartridge will be stopped by said latch, while the rearmost cartridge will pass completely onto the carrier, as usual in this class of arms.

The carrier itself will serve as a trap to hold the column of cartridges as they are successively introduced into the barrel.

The breech-piece and the devices for operating it, which we have fully described, are applicable to other arrangements of carriers or to single breech-loading fire-arms.

We claim—

1. In a fire-arm in which the barrel opens into the receiver at the rear, the combination therewith of a breech-piece arranged longitudinally in the receiver at the rear of the barrel, a handle beneath the barrel forward of the receiver, a longitudinally-guided slide in the receiver at the side of the breech-piece, a connection between said handle and slide, whereby the longitudinally-reciprocating movement of the handle will be imparted to said slide, the receiver constructed with an abutment at the rear of the breech-piece and forward of which the rear end of the breech-piece will stand in its closed position, the side of the breech-piece adjacent to said slide constructed with a longitudinal groove at the forward end, and the slide provided with a stud to work in said groove, whereby a limited longitudinal movement may be imparted to the slide independent of the breech-piece, the breech-piece constructed with a downward and rearwardly inclined groove at its rear end upon the side adjacent to said slide, and the slide provided with a stud to work in said inclined groove, substantially as described.

2. In a fire-arm in which the barrel opens into the receiver at the rear, the combination therewith of a breech-piece arranged longitudinally in the receiver at the rear of the barrel, a handle beneath the barrel forward of the receiver, a longitudinally-guided slide in the receiver at the side of the breech-piece, a connection between said handle and slide, whereby the longitudinally-reciprocating movement of the handle will be imparted to said slide, the receiver constructed with an abutment at the rear of the breech-piece and forward of which the rear end of the breech-piece will stand in its closed position, the side of the breech-piece adjacent to said slide constructed at its rear end with a downward and rearwardly inclined groove and the said slide with a corresponding stud, the breech-piece at the forward end constructed with a longitudinal groove and the slide with a corresponding stud, whereby limited longitudinal movement is permitted to said slide independent of the breech-piece, a transverse loose pin through said slide near its forward end, the side of the receiver in the path of said pin constructed with a longitudinal groove-dying out at a point corresponding to the termination of the said independent movement of the slide, and at that point the breech-piece constructed with a notch, with which the said pin may engage, substantially as described.

3. In a fire-arm in which the barrel opens into the receiver at the rear, the combination therewith of a breech-piece arranged longitudinally in the receiver at the rear of the barrel, a handle beneath the barrel forward of the receiver, a longitudinally-guided slide in the receiver at the side of the breech-piece, a connection between said handle and slide, whereby the longitudinal reciprocating movement of the handle will be imparted to said slide, the receiver constructed with an abutment at the rear of the breech-piece and forward of which the rear end of the breech-piece will stand in its closed position, the side of the breech-piece adjacent to said slide constructed with a downward and rearwardly inclined groove near the rear end of the breech-piece, and the slide provided with a stud to work in said groove, the forward end of the breech-piece and slide engaged to permit a limited amount of longitudinal movement to said slide independent of the breech-piece, a hammer arranged longitudinally in said breech-piece, a two-armed sear hung in the breech-piece below the hammer, the nose of the sear adapted to engage a corresponding notch in the hammer when the hammer is brought to the cocked position, and a trigger hung in the receiver and adapted to disengage said sear when the breech-piece is in the closed position, substantially as described.

4. In a fire-arm in which the barrel opens into the receiver at the rear, the combination therewith of a breech-piece arranged longitudinally in the receiver at the rear of the barrel, a handle beneath the barrel forward of the receiver, a longitudinally-guided slide in the receiver at the side of the breech-piece, a connection between said handle and slide, whereby the longitudinal reciprocating movement of the handle will be imparted to said slide, the receiver constructed with an abutment at the rear of the breech-piece and forward of which the rear end of the breech-piece will stand in its closed position, the side of the breech-piece adjacent to said slide constructed with a downward and rearwardly inclined groove near the rear end of the breech-piece, and the slide provided with a stud to work in said groove, the forward end of the breech-piece and slide engaged to permit a limited amount of longitudinal movement to said slide independent of the breech-piece, a hammer arranged longitudinally in said breech-piece, the hammer constructed with a shoulder near its forward end, and a stud extending from the said slide inward and adapted to engage said shoulder of the hammer, with a sear hung in the breech-piece to engage the hammer at full-cock, with a trigger hung in the receiver adapted to disengage said sear when the breech-piece is in the closed position.

5. In a magazine fire-arm in which the magazine is arranged beneath the barrel, and the barrel and the magazine both opening into the receiver at the rear, a breech-piece arranged longitudinally in the receiver at the rear of the barrel, a longitudinally-reciprocating handle beneath the barrel forward of the receiver, a longitudinally-guided slide arranged in the receiver beside the breech-piece, a connection between said handle and said slide, whereby said slide may partake of the reciprocating movement of the handle, the receiver constructed with an abutment in rear of the breech-piece and against which the rear end of the breech-piece rests when the breech-piece is in the closed position, the breech-piece constructed with a rearward and downwardly inclined slot at its rear end and on the side adjacent to the said slide, the said slide provided with a stud to work in said groove, the breech-piece hung to the slide at the forward end and so as to permit a limited amount of longitudinal movement of said slide independent of said breech-piece, a carrier hung in the receiver below the barrel, the said carrier constructed with a downward and forwardly inclined groove 9, opening into a longitudinal groove 11, with a spring-stud 6 in said breech-piece adapted to engage said inclined groove as the breech-piece approaches its extreme rear position, substantially as and for the purpose described.

6. In a magazine fire-arm in which the magazine is arranged beneath the barrel, and the barrel and the magazine both opening into the receiver at the rear, a breech-piece arranged longitudinally in the receiver at the rear of the barrel, a longitudinally-reciprocating handle beneath the barrel forward of

the receiver, a longitudinally-guided slide arranged in the receiver beside the breech-piece, a connection between said handle and said slide, whereby said slide may partake of the reciprocating movement of the handle, the receiver constructed with an abutment in rear of the breech-piece and against which the rear end of the breech-piece rests when the breech-piece is in the closed position, the breech-piece constructed with a rearward and downwardly inclined slot at its rear end and on the side adjacent to the said slide, the said slide provided with a stud to work in said groove, the breech-piece hung to the slide at the forward end and so as to permit a limited amount of longitudinal movement of said slide independent of said breech-piece, a carrier hung in the receiver beneath the breech-piece and so as to swing upward and downward, the breech-piece adapted to engage the carrier during the last part of its opening movement and so as to impart rising movement to said carrier, and ejector-lever 15, hung in said carrier, the ejector-lever constructed with an upwardly-projecting finger 17 in the path of a corresponding shoulder on the breech-piece, and the forward end of said ejector terminating in a nose 19, substantially as and for the purpose described.

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