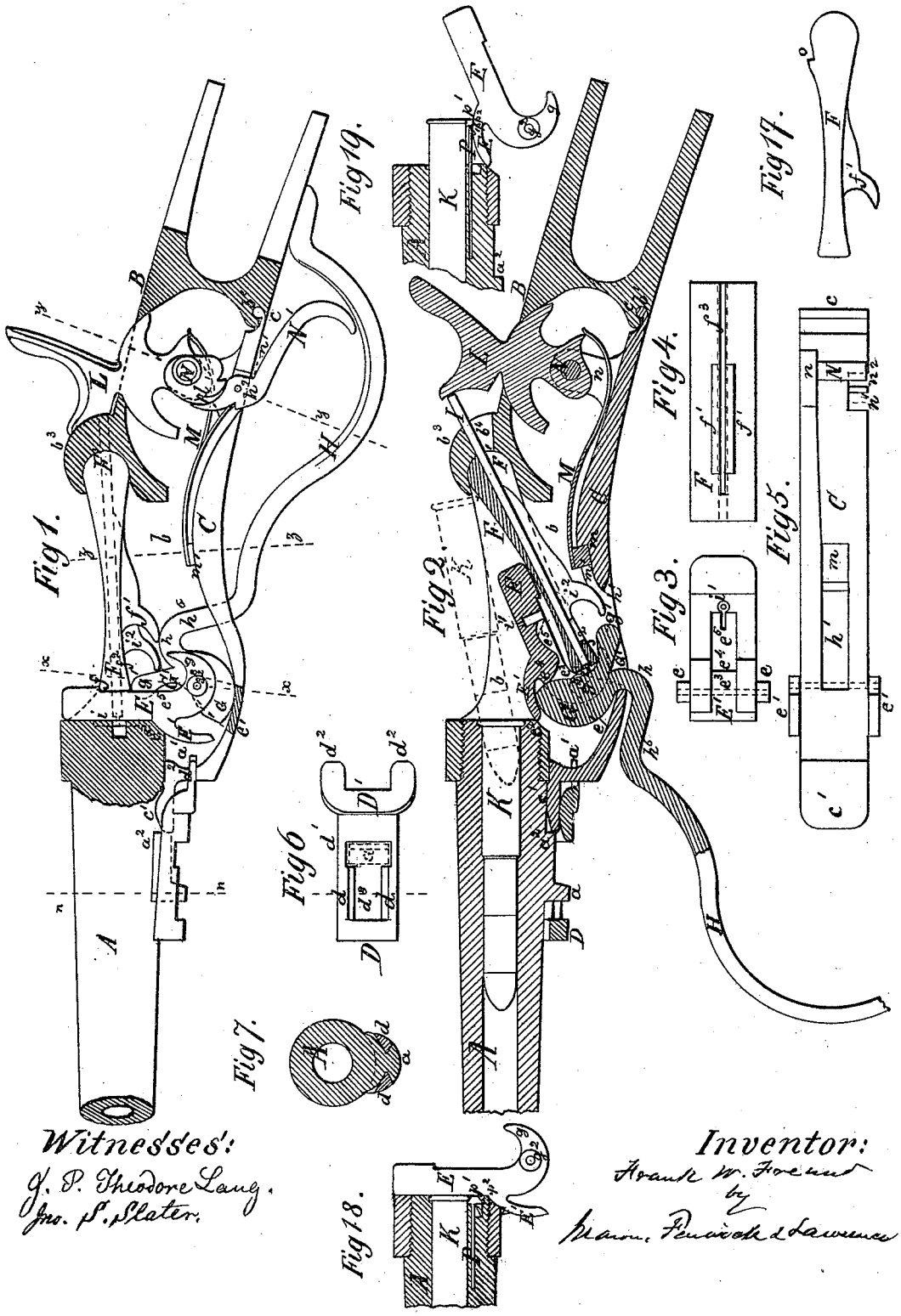
2 Sheets—Sheet 1.

F. W. FREUND.

BREECH-LOADING FIRE-ARM.

No. 184,203. Patented Nov. 7, 1876.



Witnesses:
J. P. Theodore Laug.
Jno. S. Slater.

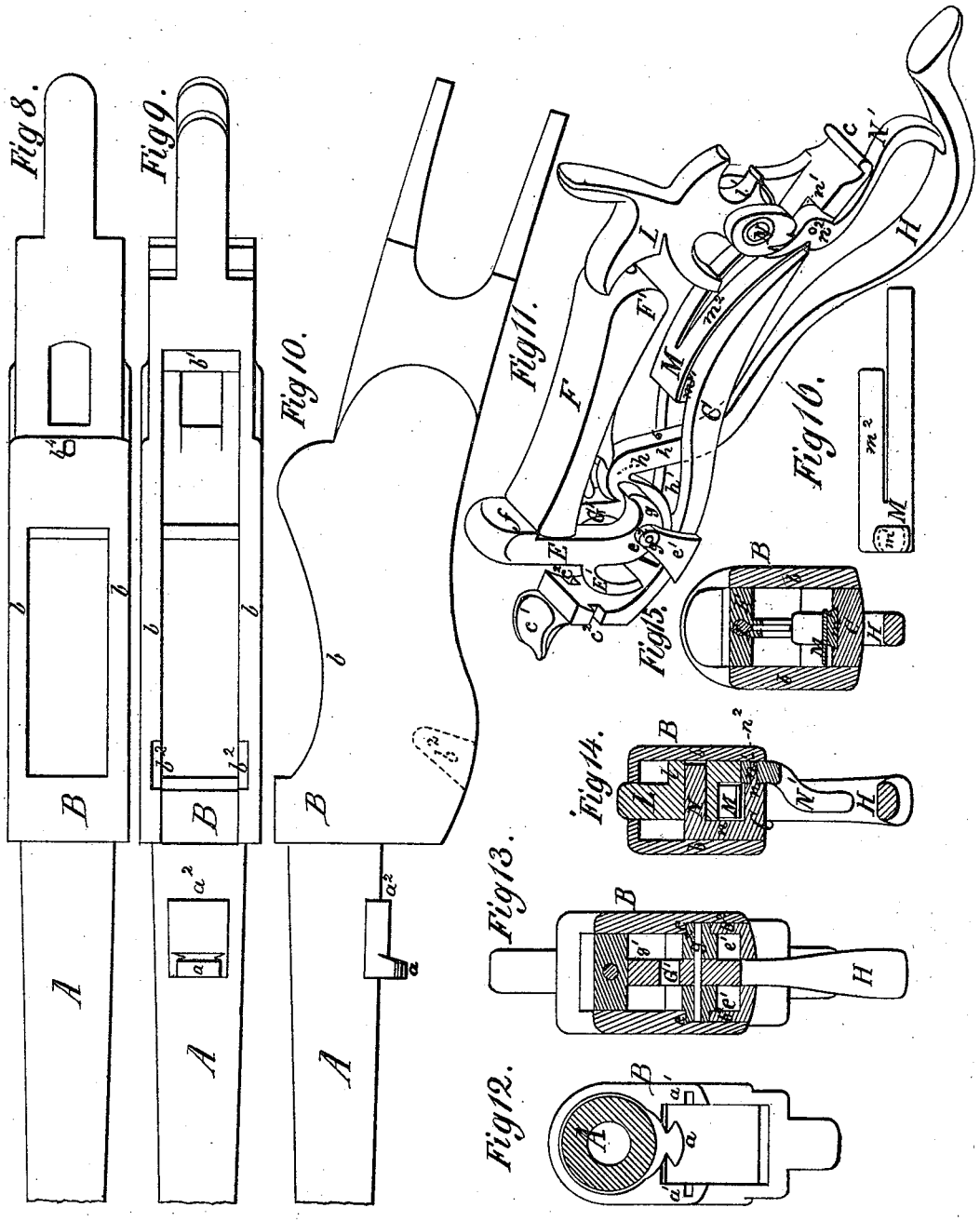
Inventor:
Frank W. Freund
by
Munn, Penwick & Lawrence

2 Sheets—Sheet 2.

F. W. FREUND.

BREECH-LOADING FIRE-ARM.

No. 184,203. Patented Nov. 7, 1876.



Witnesses:
J. P. Theodore Laug,
John S. Slater.

Inventor:
Frank W. Freund
by
Brown, Pomeroy & Lawrence

UNITED STATES PATENT OFFICE.

FRANK W. FREUND, OF CHEYENNE, WYOMING TERRITORY.

IMPROVEMENT IN BREECH-LOADING FIRE-ARMS.

Specification forming part of Letters Patent No. **184,203**, dated November 7, 1876; application filed February 23, 1876.

CASE A.

To all whom it may concern:

Be it known that I, FRANK W. FREUND, of Cheyenne, in the county of Laramie and Territory of Wyoming, have invented a new and useful Improvement in Breech-Loading Guns, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 is a partial section and side view of my improved gun, the line of section cutting off one of the cheek-pieces and exposing the operating mechanism in rear thereof as the same appears after the arm has been fired. Fig. 2 is a central longitudinal vertical section of the same, showing the arm in the act of being loaded. Figs. 3, 4, 5, 6, 7 are detailed views of parts of the arm. Fig. 8 is a top view, Fig. 9 a bottom view, and Fig. 10 a side view, of my improved gun after removal of the operating parts. Fig. 11 is a perspective view of the operating parts, and the trigger-plate removed from the gun and in the same position as they occupy when within it, as shown in Fig. 1. Figs. 12, 13, 14, 15 are cross-sections in the line *n n*, *x x*, *y y*, *z z*, respectively, (shown in Fig. 1,) showing the connections of the several movable parts with the trigger-plate and with the arm. Fig. 16 is a bottom view of the spring. Fig. 17 is a modification of one of the operating parts.

The main object of my invention is to make a gun which has its breech and lock mechanism within a breech-frame which is closed at its sides, without making perforations through the sides or cheeks of the frame for the insertion of screws, pins, or other similar fastenings; and another object of my invention is to make such arm with a lock and breech mechanism, the different parts of which are adapted to interlock together and to the frame, and to be finally secured in position in the breech-frame by a final fastening, which can be operated by hand without the aid of any instrument.

Another object of my invention is to make the parts of the fire-arm with the necessary pivots, bearings, lugs, and recesses on and in them, so that the interlocking of these parts with one another, and with the breech-frame, barrel, and stock, may be effected without separate screws, pins, keys, or other similar fastenings, and the whole secured by a final fastening, which may be operated by hand, and by operating said final fastening all the parts may be removed from the arm together, and any one of the interlocked parts separated without the removal of pins or screws, and without the aid of instruments; and another object of my invention is to greatly improve the construction and operation of breech-loading fire-arms in other respects than those specially mentioned above, as will be hereinafter set forth.

The nature of my invention consists in certain constructions, combinations, and arrangements of parts, as will be hereinafter described and specifically claimed, whereby the objects above mentioned are secured in a very simple manner, and at the same time the following results are produced: First, the line of resistance of the breech-piece and its locking-piece to the explosion in the gun is caused to come in the center line of the gun-barrel, thus insuring the greatest strength; second, great facility for inserting the cartridge is secured; third, the number of separable parts of the breech and lock mechanism of the gun are reduced, as the parts respectively have their functions multiplied, and detached pins and screws are not used, except in one instance, and in that instance even it may be avoided; fourth, provision for removing all the parts of the breech and lock mechanism is made by simply removing the trigger-plate, and when thus removed all the parts can be removed and replaced by hand without aid of instruments, and when all the parts are adjusted for insertion into the breech-frame they can be inserted and fastened without the aid of instruments; fifth, the trigger-guard is made the means for opening, folding up, and closing the breech-piece and its locking-piece, and half-cocking the arm; sixth, the trigger-guard is kept from casual motion by the force of the mainspring; seventh, the cartridge is forced into the gun-barrel by the operation of the breech-piece; eighth, a breech-frame which has the whole mechanism between its sides or cheeks, and serves to aid in sustaining the

said mechanism and its supports in place, is provided in which there are no screw or pin holes extending entirely through it.

In the drawings, A denotes the barrel of my gun, fastened to a breech-frame, B. A trigger-plate, C, is fitted between the parallel cheek-pieces *b* of the said breech-frame, forming the bottom thereof. A notch, *b'*, across the back part of the breech-frame B, receives and retains the back end *c* of the trigger-plate C. The front end *c'* of the said trigger-plate rests upon the bottom part of the barrel, and is kept there by a sliding wedge, D. The said wedge is made to slide on a dovetailed head, *a*, below the barrel A, by means of dovetail guides *d* formed on the wedge. A T-shaped opening, as at d^1, is made through the wedge to enable the operator to slip the wedge D on or off the head *a*. Near the hole d^1 the wedge D is provided with a forked head, D^1, and two flat prongs, d^2, which are inserted with about one-half of their breadth in notches a^1 in the front end of the breech-frame, and the remaining breadth in notches c^2 of the trigger-plate, as seen in the drawings. The upper part of the head D^1 bears against the end c^1 of the trigger-plate, and keeps it against the barrel A. A projection or step, a^2, on the barrel bears against the front end c^1 of the trigger-plate, and thereby prevents a horizontal movement of the same.

To adjust the wedge to its permanent place, when in position, the shoulder on the forward part of the wedge is made to bear against a shoulder above a cut in the forward part of the stock or breech-frame, which will adjust the wedge to its proper place and hold it there against further movement toward the lock of the arm, while the rear portion of the shoulder, which is attached to the barrel, will bear against the front shoulder of the trigger-plate, and thereby prevent forward movement of the said plate.

The wedge can also be permanently attached to the arm and hooked into the front of the stock, in place of having it to slide into the stock or breech-frame, and thus answer the same purpose.

The breech mechanism consists of a breech-piece, E, which swings on a pivot, and a breech-locking block, F, which also swings about another axis. The breech-piece E stands in a vertical position, and the locking-block in a horizontal position when the breech is closed; but both occupy an inclined position, the breech-piece E lying flat on top the block F when the breech is opened. The breech-block E is provided with journals *e*, which have their bearings in depressions b^2 in the sides of the breech-frame, and are kept in position by stays e^1 on the trigger-plate, which are fitted into the said depressions and form the lower bearing for said journals. A segmental shield, E^1, concentric with the journals *e*, is attached to the breech-block E, which bears against the lower front corner e^2 of the breech-frame, and thereby prevents the entrance of dust and other injurious matter into the room below when the said breech-block is turned down. The breech-block E is also provided, as shown in Fig. 3, with a slot, e^3, for the reception of a swinging cam-head, G, on the trigger-guard H, which is there secured by a pivot-pin, g^2. From the foot of the breech-block E two semi-crescent prolongations, *g*, extend backward at either side of the cam-head G, the purpose of which is to receive and operate the forward end of the horizontal breech-locking piece F at its lowest position.

A step, *f*, Fig. 11, serves as a check against the upward movement of the said horizontal piece beyond the center line of the gun-barrel. The back end F' of the piece F is semicircular, and has a semicircular bearing in the abutment b^3. The connection between the trigger-guard H and the cam-head G is effected by a neck, *h*, the straight part h^6 of which stands at a right angle to the trigger-plate when at its normal position, as seen in Fig. 1, and is entirely outside of the trigger-plate when swung to the front for loading, as seen in Fig. 2. By this construction of the neck *h* the length of the slot h^1 of the trigger-plate in which it moves may be reduced to a minimum, whereby the trigger-plate is not unnecessarily weakened. The cam-head G is also provided with a neck, G', having a rounded head, g^1, which head pushes the piece F down by means of the neck-piece f^1 on the lower side of the latter. The piece F is flared at f^2, near its forward end, so that it may be lifted into its normal position by the forward swinging head g^1. The said head g^1 when in its normal position is turned a little beyond its vertical center, and is then embedded in a notch, e^5, in the breech-piece E. Through the center of the piece F, and through a slot, b^4, of the anvil-abutment b^3, the center firing-pin I is passed into the breech-piece E, so that only the teat *i* passes through the latter, and projects far enough from the other side to reach and explode the center-firing cartridge. The breech-piece E is, for the above purpose, provided with a perforated socket or stepped hole, i^1, as seen in Fig. 2. The firing-pin I is provided with a flat neck, i^2, whereby the head g^1 may operate to push it back out of the socket i^1 in the breech-piece E, and against the hammer L, moving it to half-cock. The said neck i^2 moves in an open slot, f^3, of the breech-block F, which slot is continued to the semicircular end F', so that the firing-pin I may be removed from the said block. The hammer L is of the usual construction, except that the cam *l* with the ratchets for half-cock and full cock are not below it, but attached to one side of it, so that the mainspring M may pass them. The said mainspring M is fastened in front of the hammer in a dovetail groove, *m*, of the trigger-plate C by means of a dovetailed wedge-head, m^1, at the end of the mainspring,

and it operates the hammer by means of a tail-piece, l^1. The wedge-head m^1 is inserted into the groove m by holding the mainspring at a right angle with the trigger-plate, and by then turning the mainspring into its normal position the wedge-head m^1 wedges and fastens itself in the said groove m. The hammer L is pivoted on a pin, N, which forms a part of a flange or lug, n, of the trigger-plate C. The trigger N′ is inserted sidewise into a notch, n^1, in the trigger-plate, and pivoted to a pin, n^2, in the said notch. The said trigger is operated in the usual way by a spring, m^2, which is a branch of the mainspring M.

To take my improved gun apart, turn it upside down, after which the wedge D is pulled frontward, and slipped over the head a. The trigger-guard H is now swung frontward, and the hammer L thereby set at half-cock. The end c^1 of the trigger-plate is then moved up from the barrel A and slipped out of its place, thereby taking along with it the trigger-guard H, the breech-piece E, the piece F, the hammer L, the spring M, and the trigger N′. The pin g^2 is made to drop out by its weight, and then the breech-piece E is free, and the trigger-guard H may be taken from the trigger-plate. The trigger N′ is slipped off its pin n^2 and out of the notch n^1. The hammer L is slipped off its pin N, and finally the spring M is turned at a right angle with the trigger-plate, and lifted from the groove m.

The firing-pin may be taken out from the piece F by slipping it back in its bearing, and drawing its forward end away from said piece.

The gun may be put together again in working order by reuniting the separate pieces in the reverse order.

Operation: If the gun is to be loaded the trigger-guard H is turned forward, as shown in Fig. 2. The neck G′ by this act pushes the center-pin I, by means of the neck i, back against the hammer L, thus effecting a half-cock. The neck G′ next comes in contact with the neck f^1 on the piece F, and the head g^1 bears on the inner or top part of the said neck, thereby swinging the said piece down. At the same time the cam-head G enters the slot e^3 and comes in contact with the lower end e^4 of the breech-piece E and turns the said breech-piece down upon the piece F, as seen in Fig. 2. The cartridge K is now inserted, and the trigger-guard H moved back. The neck G′ lifts the piece F, the flared end of which slides along the inner curved surface of the breech-piece E, and thereby lifts it and finally forces it against the breech of the barrel A, where it becomes firmly locked by the head g^1 passing beyond the vertical center. The gun is now loaded, and so far ready for service that only the hammer has to be moved to full cock. The firing-pin I is caused by the cartridge to project beyond the anvil abutment b^3, and when struck by the hammer is driven on or against the cartridge and teat i, striking the fulminate, and causes the explosion to take place.

To prevent the locking-piece F from moving above its horizontal position the step f^2 on the breech-piece E may be omitted and a step, o, as seen in Fig. 17, may be fixed on the back part of the piece F, which, by coming in contact with the anvil-abutment b^3, would effectually check any movement beyond that wanted.

By using a forked guard-lever like the one patented to me March 16, 1875, the pin g^2 in the trigger-guard H may be dispensed with.

The breech-piece E and locking-piece F may be so operated that the horizontal piece F is above the vertical breech-piece E when they are folded up, and I contemplate applying for Letters Patent for the said modification.

The sliding wedge D may be so attached to the gun-barrel as to constantly remain thereon. The pin g may be omitted, and the guard-lever may be so constructed as to have its bearing on one side of the vertical breech-piece, and a cartridge-shell extractor may be on the same or on the other side, but without a separate or loose pin for a bearing.

In Figs. 18 and 19 I have shown a modification of the invention whereby the cartridge-shell is extracted by the movement of the vertical breech-block. In the said figures, E represents the vertical breech-block, the segmental shield E′ of which is provided with a hook, p. An extractor, P, is fitted into the metal of the gun, just below the cartridge, and with its head p^1 resting against the rim of the cartridge, and is provided with a hook, p^2, below its head, by which the hook p may pull out the extractor when the breech-block E is moved down, thus extracting the cartridge.

A cartridge shell extractor similar to the one shown and described in my application designated as "B," to be filed hereafter, is contemplated to be used by me in connection with the invention herein described, and in such use the separate pin g^2 shown in this application "A" will be dispensed with in the construction of the gun.

Other modes beside the pivoted trigger-guard may be adopted for operating my breech mechanism; as, for instance, the substitution for the swinging trigger-guard of a side hand-lever, or by a hand-lever on the locking-piece F, or by the hammer constructed especially for that purpose. The different modifications enumerated will all be embodied and represented in drawings and presented to the Patent Office for the purpose of obtaining Letters Patent for them as soon as practicable.

Having thus described my improved breech-loading gun, what I claim as new, and desire to secure by Letters Patent, is—

1. The breech-frame, closed at its sides and constructed to receive and interlock with and aid in sustaining the movable and detachable mechanism of the fire-arm, whereby the necessity for perforations for screws and pins through the breech-frame is avoided, substantially as described.

2. The constituent movable and operating parts of a fire-arm, interlocked singly and severally with one another, and sustained within the breech-frame substantially as described, whereby external screws, pins, or other fastenings inserted through the breech-frame for connecting the parts together are rendered unnecessary, and the parts may be separated without the aid of instruments, substantially as described.

3. The constituent parts of the fire-arm held in their interlocked condition, and fastened together by a final fastening device, which is capable of being operated by hand without the aid of screw-driver or other instrument, and which, when operated, places all the parts in a condition to be removed from the breech-frame and separated by hand, substantially as described.

4. The combination of the breech-piece E and breech-locking piece F, the former swinging on its axis backward and forward, and the latter on its axis downward and upward, substantially as described.

5. The trigger-plate C, or its equivalent, substantially as described, for holding interlocked or connected parts of a fire-arm in position in the breech-frame, said plate C being adapted to be secured in position without the aid of screws, pins, or other fastenings passed through the frame, substantially as described.

6. The combination, in a fire-arm, of two pieces, E and F, and a firing-pin, I, arranged to operate substantially as and for the purpose described.

7. The combination of the firing-pin I, hammer L, and lever H, or its equivalent, so arranged and constructed that the hammer is brought to the half-cock by the firing-pin without moving the breech piece or pieces, as set forth.

8. The combination of a breech-piece, E, locking-piece F, trigger guard or lever H, and trigger-plate C, constructed to operate in recesses, cavities, or curved surfaces or axis, or their equivalents, and released by the removal of the trigger-plate, substantially as described.

9. The trigger-plate C, having a flange, n, constructed on one side thereof, and a permanent pin, N, in combination with the hammer L, constructed and operated substantially as described.

10. The detachable trigger-plate C, having a notch, n^1, and a permanent pin, n^2, in combination with the trigger N′, constructed and operated substantially as set forth.

11. The spring M, having two prongs, formed by splitting one end of the spring, in combination with the trigger and hammer, in the manner shown and described, whereby said spring is adapted to operate by one prong upon the hammer, and by the other upon the trigger, as set forth.

12. The spring M, provided with a dove-tailed head, m^1, in combination with the trigger-plate, provided with a correspondingly-shaped recess, whereby said spring is attached by inserting its head in said recess, and giving it a partial turn, as described.

13. The combination of the hammer L, the trigger N′, spring M, and detachable trigger-plate C, arranged so that, when the plate C is removed from the frame, the other pieces specified may be detached from or attached to the trigger-plate without the removal of pin or screw, or the use of any instrument, substantially as described.

14. The combination of the slide D or an equivalent, and barrel A, constructed with a lug, a, for the purpose of fastening the trigger-plate in position, substantially as described.

15. The combination of the slide D, the trigger-plate C, and the front of the stock or breech-frame, constructed as and for the purpose set forth.

16. The combination of the breech-piece E, locking-piece F, firing-pin I, and lever H, substantially as and for the purpose described.

17. The trigger-plate C, having shoulders e^1, with bearings, to hold the journals e of the breech-piece E, substantially as and for the purpose described.

18. The breech-frame B, having recesses b^2 for the reception of the journals e of the breech-piece E and of the shoulders e' of the trigger-plate, substantially as and for the purpose set forth.

19. The frame B, provided with the inclined slot b^1, adapted to receive the end c of the lock-plate C, and which, in connection with the slide or key D, serves as a means for attaching said plate C, as described.

20. The frame B, having an abutment, b^3, with a semicircular bearing for the piece F, and a slot, b^4, for the firing-pin I, substantially as and for the purpose described.

21. The piece F, having an opening, f^3, on its under side, which communicates with the passage for the firing-pin, and extends nearly the entire length of said block, in combination with a firing-pin, provided with an abutment, i^2, by which longitudinal movement of the firing-pin within the block is permitted, as set forth.

22. The beech-frame B, having notches a^1 for the reception of the prongs d^2 of the slide D, substantially as set forth.

23. The trigger-plate C, having notches c^2 for the reception of the prongs d^2 of the slide D, substantially as set forth.

24. The trigger-guard H, having the construction shown at h, g^1, and h^6, substantially as and for the purpose described.

25. The combination of trigger-plate C, wedge D, shoulder a^2 on the barrel, and the front of the stock or breech frame, substantially as and for the purpose described.

Witness my hand in the matter of my application for a patent on a breech-loading fire-arm this 3d day of February, A. D. 1876.

FRANK W. FREUND.

Witnesses:

F. THRALL,

L. C. STEVENS.