2 Sheets—Sheet 1.

F. W. FREUND.

BREECH-LOADING FIRE-ARM.

No. 185,911. Patented Jan. 2, 1877.

Fig 3.

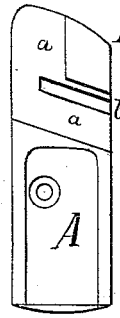


Fig 4.

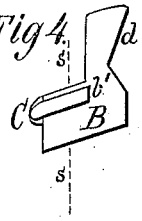


Fig 5.

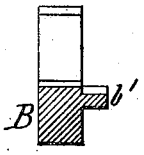


Fig 1.

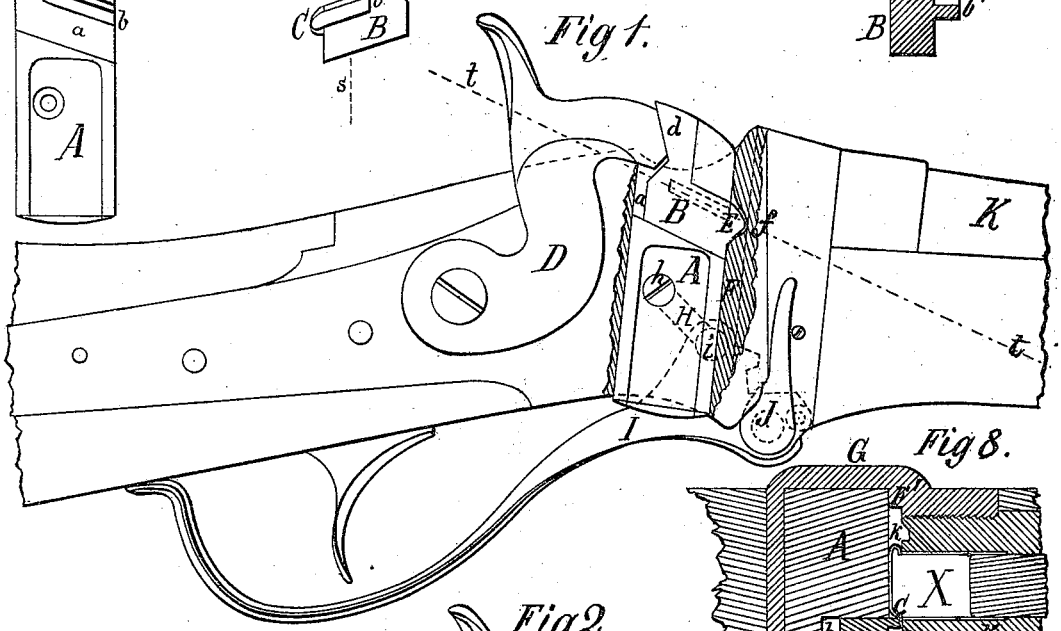


Fig 8.

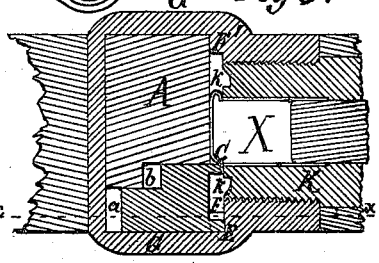


Fig 2.

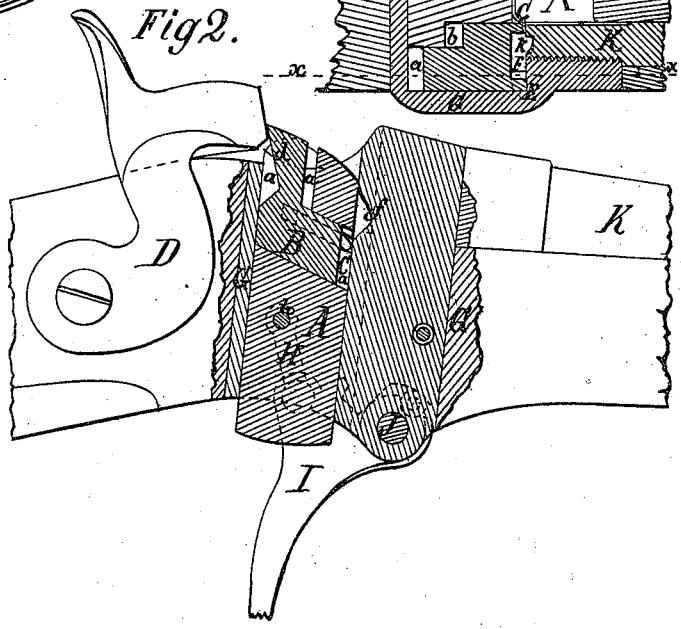


Fig 6.

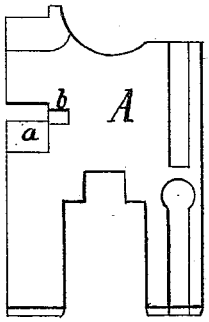
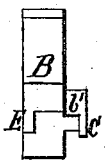


Fig 7.



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2 Sheets—Sheet 2.

F. W. FREUND.

BREECH-LOADING FIRE-ARM.

No. 185,911. Patented Jan. 2, 1877.

Fig 9.

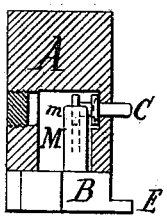


Fig 10.

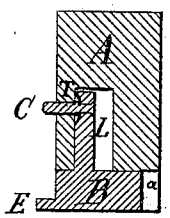


Fig 11.

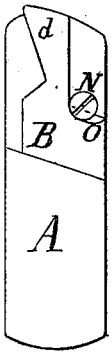


Fig 12.

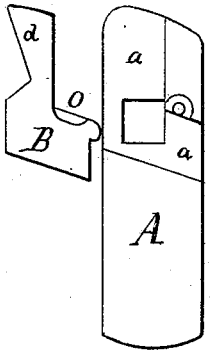


Fig 13.

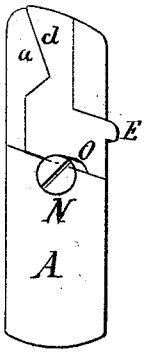


Fig 14.

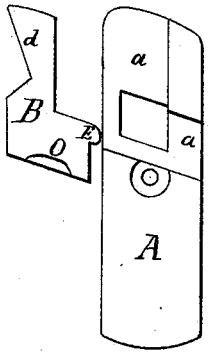


Fig 15.

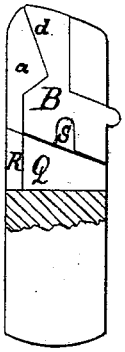


Fig 16.

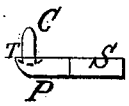


Fig 17.

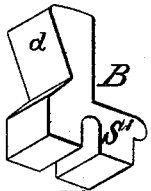


Fig 18.

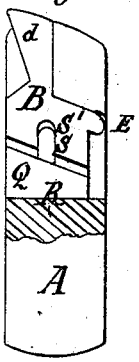


Fig 22.

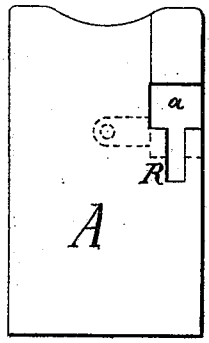


Fig 20.

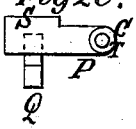
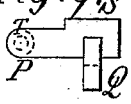


Fig 21.

Fig 19.



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J. S. Theodore Lang.

Inventor:
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by Munn & Co
Attys

UNITED STATES PATENT OFFICE.

FRANK W. FREUND, OF CHEYENNE CITY, WYOMING TERRITORY.

IMPROVEMENT IN BREECH-LOADING FIRE-ARMS.

Specification forming part of Letters Patent No. **185,911**, dated January 2, 1877; application filed December 3, 1875.

To all whom it may concern:

Be it known that I, FRANK W. FREUND, of Cheyenne City, in the county of Laramie and Territory of Wyoming, have invented a new and useful Improvement 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, forming part of this specification, in which—

Figure 1 is a side elevation of my improved fire-arm (constructed for "rim" firing) as it appears just after it has been fired off. In this view a portion of the side of the stock or lock-frame is broken out and section lined in order to expose parts covered by it. Fig. 2 is a longitudinal section of the fire-arm in the line *x x* of Fig. 8 as it appears when the breech-block is lowered by the guard-lever for the purpose of putting in a new cartridge. Fig. 3 is a side view of the breech-block detached from the arm, and with the firing-pin and the carrying-block removed. Fig. 4 is a side view of the firing-pin and its carrying-block removed from the breech-block. Fig. 5 is a vertical section, on the line *s s* of Fig. 4, of the firing-pin and its carrying-block. Fig. 6 is a view of the front face of the breech-block. Fig. 7 is a front view of the firing-pin and its carrying-block. Fig. 8 is a section of the fire-arm in the plane of the line *t t* of Fig. 1. Fig. 9 is a section a little above the plane of the line *t t* of Fig. 1, showing a modification of the fire-arm whereby the firing-pin is adapted for center firing; and said pin is constructed separate from the carrier, and arranged to be moved by the carrier. This view also shows the back aperture of the breech-block through which the separate firing-pin is inserted, filled up and closed tight by a screw. Fig. 10 is also a section in the plane of the line *t t*, Fig. 1, showing another modification, whereby the firing-pin, attached fast to its carrier, is adapted for center firing. Figs. 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, and 22 show views of parts of further modifications of the invention.

The object of my invention is to provide breech-loading rim or center fire arms with a gas-check, which will certainly close gas-tight all rear joints or passages leading from the firing-pin to the rear of the breech-block when the arm is fired.

Another object is to provide a gas-check or firing-pin actuator, which will be caused to half-cock the hammer, when it is bearing upon the gas-check or firing-pin carrier, by the operation of lowering or raising the guard-lever.

Another object is to have the firing-pin thus arranged move in a straight line, and thereby overcome the difficulty and danger of clogging when the breech-block is lowered for reloading.

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

A is the breech-block, constructed with an angular depression, *a*, for the reception of the carrier B of the firing-pin C. The lower part of the said depression has parallel walls and a parallel notch or groove, *b*, in which a tongue or projection, *b'*, of the carrier B may slide in a direction inclined to the breech-block and tangential to the arc of the descending hammer D, where it strikes the thrust-surface *d* of the carrier, as represented in Fig. 2.

The carrier B is also provided with a small cam, E, the elevation of which corresponds with the stroke of the carrier in the groove *b*, and which, in a normal position, bears against the high surface of a guide-rib, F, in the mortised breech-block frame G of the gun. The said guide-rib F has its counterpart F' in the opposite corner of the mortised frame G, and both serve as the bearing for the breech-block on the front side, which forms the support for the cartridge-head.

A depression, *f*, in the guide-rib F serves to receive the cam E of the carrier B, when the breech-block is at the proper elevation for the hammer D to strike the carrier B, and thereby pushing the firing-pin C against the rim of the cartridge X, as shown in Fig. 8.

At the time of this described operation the surface of the carrier B, upon which the tongue *b'* is attached, covers the groove *b* in the breech-block A entirely, thereby preventing the escape of burning gases along the firing-pin C, the tongue *b'*, and thence from

the back part of the carrier B into the face of the operator. The side and rear bearings of the breech-block A are the inner surfaces of the mortised frame G.

The movements of the breech-block are effected in the mode generally adopted for this class of guns, viz., by a link, H, pivoted at *h* to the breech-block, and at *i* to the guard-lever I of the gun, to which the guard-lever is pivoted by the pin J. The thrust-surface *d*, on the upper part of the carrier B, receives the blow of the hammer D at an angle less than a right angle to the tangent above described, so as to partly prevent a rebound of the hammer and carrier in case of an extraordinarily heavy explosion at the rim of the cartridge, and to throw the hammer back at "half-cock" when the breech-block is in any other position than that necessary for firing.

The barrel K of the gun, which is screwed into the frame G, is, at its rear end, provided with an annular depression, *k*, which leaves just enough bearing-metal for the rim of the cartridge X to be exploded upon.

When the gun is to be loaded, the operator moves the guard-lever I down, thereby lowering the breech-block, and by the action of the cam E on the guide-rib F the carrier B is pushed back, and the hammer D is raised to half-cock.

The operator continues to move the breech-block down as far as the guard-lever I will permit, and the breech end of the barrel K being entirely cleared, the cartridge is inserted, and the guard-lever I and the breech-block A are moved back to their normal positions, while the hammer D remains at half-cock. The cam E of the carrier is now opposite the depression *f* of the guide-rib F, and is prevented from slipping into it by the firing-pin C, which rests against the rim of the cartridge X. Thus the carrier bearing on the hammer and on the cartridge is prevented from playing back and forward, and accidentally discharging the gun by its own movement. The described position is represented by Fig. 2.

For the purpose of firing the gun the hammer is drawn back to full-cock, and remains so till the operator is ready to fire the arm.

If by any accident the hammer should be moved from the half-cock position down to its rest, it would, by the ascending breech-block, be brought in contact with the upper end of the carrier, and thereby be pushed back into the position of half-cock again before the breech-block is in position for firing. This prevents all accidents to which other guns are subject between the acts of loading and firing, such as the premature discharge of the arm by a heavy thrust on the ground at the command "order arms," which often happens when the hammer is bearing on the firing-pin, or its carrier thereby exerting a pressure on the cartridge; or, if in drilling with a loaded gun, the hammer at rest should receive a blow, the premature discharge will take place.

It is to be understood that at half-cock the hammer can only be moved by the operator himself, and no accident but that which produces breakage of the trigger or the notched tumbler of the hammer, can cause the hammer to move down to its rest. For center firing the firing-pin C is so placed in the breech-block A as to be opposite the center of the cartridge when ready for firing. The carrier B is then provided with an arm, L, to which the firing-pin C is fastened, as seen in Fig. 10; or if a horizontal movement of the firing-pin in the direction of the center-line of the gun-barrel is desired, the carrier B is provided with an arm, M, in the shape of an inverted gutter, which operates on the rim *m* of a firing-pin, C, (made separate from the carrier) without interfering with the horizontal movement of the said pin in the front wall of the breech-block. This latter modification is represented by Figure 9. Figs. 11, 12, 13, and 14 represent two modifications for center firing, in which the carrier B is kept in the depression of the breech-block by the overlapping and countersunk head of a screw, N, which is fastened to the breech-block either above the carrier, as seen in Figs. 11 and 12, or below the carrier, as seen in Figs. 13 and 14. In both cases the overlapping head of the said screw moves in a depression, O, of the carrier B. The screw N may be dispensed with, as these parts will remain together when applied in position. A modification for center firing, with horizontally-moving firing-pin, is represented by Figs. 15 to 22 inclusive, where the firing-pin C is attached to the arm P of a bottom block, Q, which moves in a horizontal groove, R, in the breech-block A and beneath the carrier B. An elevated cross-arm, S, on the bottom block Q fits into a groove, S′, of the carrier B, and, by this means, the movements of the carrier B are transmitted to the block Q and firing-pin C. The groove R in the inclined bottom bearing, for the carrier B, occupies only as much room as will permit of its operations and those of the carrier B.

The main features of construction and operation of the breech-block A, the carrier B, and the firing-pin C, are the same in the plan, Fig. 1, as in the several modifications represented.

In applying the invention herein described, a gas-cup, T, is constructed at the base of the firing-pin C for catching the gas and breaking its force, and preventing its scattering farther and dirtying the inside of the breech-block.

The firing-pin by moving in a straight line always strikes the cartridge exactly in the center, and in throwing the breech-block down to reload, the pin is not likely to cut the metal of the cup, as it offers but little resistance, and retracts at the least movement of the shell. Whereas, the pin as made by

others, being held firmly in place when the breech-block is first started, cuts into the cup of the cartridge-shell, and the arm is often clogged with the brass or copper thus fractured.

In breech-loading fire-arms in use, there is danger and liability of the piece being accidentally discharged in quick loading, if the hammer happens to be down, for the bringing of the guard-lever up quickly, brings the firing-pin against the cartridge, and frequently explodes it; or setting the gun down heavily at "order arms" is liable to explode the cartridge if the hammer happens to be down; and in the use of the heavy charges, ninety to ninety-five grains of powder for long-range shooting, the cup of the shell is liable to break out, and the powder force itself back through the firing-pin hole, and through the breech-block, directly into the face of the person firing the arm, which often destroys the eyesight, and causes other serious injury to the person firing the arm. This is more often the case when the firing-pin hole and other parts have worn loose.

My improvements obviate both these imperfections. With my arm it is not left to the presence of mind of the person using the gun to prevent accidents in quick loading, for when the breech-block passes the hammer it sets at "half-cock," and this whether the lever is thrown up or down—that is, if the lever is thrown down after firing, the hammer comes to half-cock; then let the hammer down, and throw the lever up, and the hammer will again come to half-cock; and while this is the case, the leakage of gas is prevented by constructing the breech-block entirely closed behind the firing-pin by solid metal or a firmly-secured screw-plug, which latter may be adopted to facilitate manufacture where the pin is constructed and inserted separate from the carrier. The firing-pin being entirely inside the breech-block and its insertion-passage closed, no gas can escape to injure the face and eyes of the person firing the arm; and in the event of the pin becoming clogged by pieces of exploded shells, or from any cause, it can be removed readily, so as to be freed from any such obstructing matters, and this can be done almost as readily in the dark as in the light.

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

1. A firing-pin, or its equivalents, combined with the breech-block, hammer, and breech of the gun, whereby either an up or down movement of the breech-block half-cocks the hammer, substantially as described.

2. A firing-pin, in combination with a breech-block closed in a direct line behind the pin proper, substantially as and for the purpose set forth.

3. The combination of hammer, breech of gun, and firing-pin, or its equivalent, to bring the hammer to half-cock, substantially as set forth.

4. The breech-block closed in a direct line at the rear of a firing-pin proper, substantially as and for the purpose described.

5. The gas-cup T around the firing-pin C, substantially as described.

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