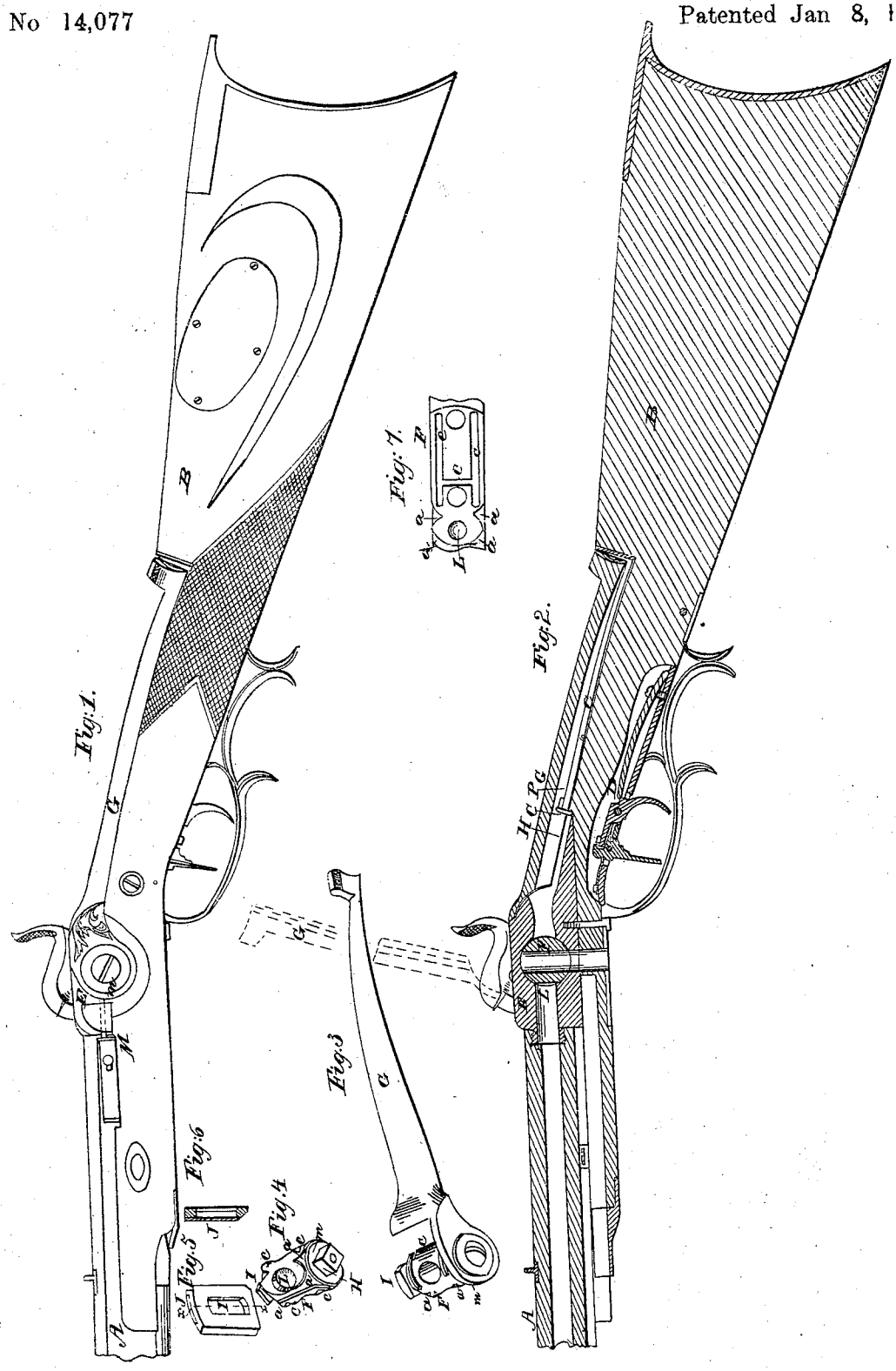
J. H MERRILL.

Breech-Loading Fire-Arm.

No 14,077

Patented Jan 8, 1856



UNITED STATES PATENT OFFICE.

JAMES H. MERRILL, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN FIRE-ARMS.

Specification forming part of Letters Patent No. **14,077**, dated January 8, 1856.

To all whom it may concern:

Be it known that I, JAMES H. MERRILL, of the city of Baltimore and State of Maryland, have invented a new and useful Improvement in Fire-Arms, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which make part of this specification, and in which—

Figure 1 represents a side elevation of a rifle embracing my improvements; Fig. 2, a longitudinal section through the center of the breech, including the adjacent parts of the barrel and stock; Fig. 3, a view in perspective of the lever and breech-pin detached; Fig. 4, a similar view of the breech-pin in a different position; Fig. 5, a similar view of a plate having an oblong opening, into which the button of the breech-pin locks; Fig. 6, a section of the plate at the line *x x* of Fig. 5, and Fig. 7 the periphery of the breech-pin developed upon a plain surface.

My improvement relates to the breech; and the principal object which I have in view is to produce a breech-loading fire-arm which shall combine facility in loading, efficiency in the discharge, safety in using, ease in cleaning, and simplicity in construction.

The rifle in the accompanying drawings consists of a barrel, A, a stock, B, ramrod C, and lock D, with the usual guards and hair-trigger. The breech B of the barrel is of the faucet variety, and the plug or breech-pin F is turned to open or close the breech by means of a lever, G, which shuts down upon the grasp of the stock to close the breech and turns up to an erect position to open it. I prefer, for convenience in constructing this fire-arm, to have the breech separate from the barrel and screw the two together when finished; but the breech and barrel may be made with a little more labor in one piece. In the drawings I have represented a breech, E, made separate from the barrel A and screwed into the same, and the bore extended through both in the same line. The bore at the rear end of the breech is slightly expanded at the sides and top to facilitate the introduction of the charge; and for the purpose of still further facilitating its entrance the stock is cut away behind the breech to admit a metallic trough, H, to guide the charge into the entrance of the breech. The breech is pierced with a transverse opening to receive a breech-pin, F. The axis of this opening is at right angles to and intersects that of the bore of the barrel, and it is about double the diameter of the bore. This transverse hole may be made cylindrical, or, if preferred, slightly tapering, to facilitate the withdrawal of the breech-pin, which must be made of corresponding form; but its taper must not be great, or else the unequal pressure toward the opposite ends of the pin consequent upon their unequal diameter will greatly endanger its being blown out, and in any event will produce great and injurious lateral strain upon the piece. Into this transverse hole in the breech the pin is accurately fitted. This pin has a projection on each end, one, I, in the form of an oblong button, which enters a slot, I², in a piece dovetailed into the lock-plate, and then, by being turned across the same, holds the pin securely in the breech. The slot and button are protected from injury and concealed by a sliding cover, J. The projection K on the opposite end of the pin has the lever G fastened to it, by which the pin is turned. The bore of the breech, which receives the charge, is larger than that of the barrel, and this enlarged bore is continued through the breech-pin, so that when the lever G is raised at right angles, or thereabout, to the barrel, as seen in red lines in Fig. 2, the bore will be continuous through the barrel, breech, and pin. When the lever is turned down upon the grasp, as seen in Fig. 1, the breech will be closed and the solid side of the pin will become the bottom of the chamber. That part of the side of the pin which forms the bottom of the chamber has a cylindrical cavity, L, formed in it; or, preferably, the cavity should be of a parabolic form, in order that the force of the explosion may be concentrated against the center of the ball; and this cavity or indentation has the further effect of preventing to some extent the escape of smoke through the joint round the pin. To prevent the smoke, gunpowder-dust, &c., which, from the great violence of the explosion, are in a greater or less degree forced into the joint round the pin, the cavity L, which forms the base of the chamber, is surrounded at a short distance from its edge by

grooves *a*, Fig. 7, which extend to the end of the pin, to let out the smoke. The edges of the grooves are sharp, to scrape the soot, &c., off the concave surface of the hole in which the pin turns. As the pins become heated and the joints dry the friction rapidly increases. To counteract this to a considerable extent, I have discovered that it is only necessary to keep the pin lubricated with suet or other hard fat, and for this purpose I have formed deep channels *c* on the side of the pin opposite that which forms the bottom of the chamber, and these grooves I fill with hard tallow, which does not melt while the plug is cool, and does not need a lubricant, but will melt when the heat becomes so great that if the lubricant were not present the joint would be filled with dust and the plug or pin turn with difficulty. For the purpose of preventing the accidental dropping out of the pin while the button is turning over the slot, a bolt, M, enters a groove, *m*, at the end of the pin on which the lever G is fixed. When it is desired to withdraw the pin from the breech to wipe it, which is often necessary, or to replenish the tallow, this bolt is pressed back with one hand and the pin withdrawn with the other.

The curved trough H, which extends from the rear end of the breech to the shoulder N on the stock at the rear end of the grasp, not only facilitates the introduction of the charge, as before mentioned, but it also serves as a receptacle and guide for a rammer, C, which is secured in it, and can move forward a distance limited by a bridge, P, near the front of the trough, against which the thumb-piece of the rammer is thrust forward and then drawn back. This construction and arrangement of the rammer insures the entrance of the ball to the required distance into the chamber to give abundant space for the powder and allow it to pass into the chamber in front of the pin, thus preventing waste, and rendering the ignition and explosion of the powder more thorough and complete, thus making the discharge as forcible and efficient as possible.

The rear end of the rammer may extend back into a hole bored into the stock and be connected with a helical spring to retract it, which would dispense with the necessity of drawing it back by hand, and leave the latter at liberty to shut down the lever G to close the breech by the same motion that would draw the rammer back. By this means the rapidity of firing will be increased. The lever G is a broad plate having a concave end, into which a spring, S, fastened to the shoulder N, enters, to hold it in place when shut down to cover the rammer and trough in which it is arranged, so as effectively to exclude rain from the entrance to the breech. The piece, when loaded or before loading, looks like a common fire-arm, except that a broad plate covers the upper part of the grasp and the breech externally is wider than usual. To load the piece, the lever is thrown up, which uncovers the channel H in the grasp and brings the axis of the hole in the stopper and the axis of the bore into the same line. Supposing the piece to be a rifle, a ball is dropped into the breech, and, passing through the chamber, lodges against the shoulder formed by the meeting of the bores of the chamber and barrel. The charge of powder is then poured in and the lever shut down, the hole in the stopper cutting off any excess of powder, or, if a cartridge is used, the end of the cartridge, and dropping the same through an opening left for the purpose under the breech and just in front of the guard. Thus much for the facility of loading. As regards safety in using, it will be seen that the load is in the chamber of the piece, and that the movable stopper forms the bottom of the chamber only, so that there is no firing through a joint, which is confessedly objectionable. Again, throwing up the lever and drawing out the stopper, the barrel becomes a simple tube, and the stopper may be wiped and the barrel cleaned with the greatest facility, the whole arrangement presenting the utmost simplicity of construction.

The importance of the grooves *a* and *c* in the breech pin or plug F is such that without these aids my piece could not be discharged half a dozen times without a manifest increase of friction, yet with them it may be discharged, as I have discharged it, a hundred times without any sensible difference between the first disharge and the last in the facility of throwing up the lever.

I would state I am aware that Alonzo D. Perry, in his patent of December 11, 1849, claims, "in combination with a vibrating breech turning within a chamber, the making of a groove or grooves in the inner periphery of the chamber, and extending out at the side or sides thereof, for the purpose and in the manner substantially as herein described." This I do not claim; but

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

1. The construction of the breech-pin with a receptacle for tallow to lubricate the joint, as herein set forth.

2. The depression L in the breech-pin opposite the end of the bore, as I have found it advantageous.

3. The combination of the button on one end of the breech-pin, and the slotted plate in connection with which the button works to secure the breech-pin firmly in place while the breech is closed, in combination with a catch, M, or the equivalent thereof at the opposite end of the breech-pin, to prevent the pin from dropping out while the breech is open and the button in a line with the slot, by which means the breech is securely closed, while the charge is exploded, and the pin at the same time capable of being readily removed.

4. The arrangement of the rammer in the rear of the breech, in combination with the breech-pin, substantially as herein set forth.

5. The construction and arrangement of the breech-pin, the lever for turning the same, the trough H to receive the charge and guide the rammer C in such manner that the lever, when shut down upon the stock, will cover and protect the rammer and charging-channel, substantially as herein set forth.

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Witnesses:

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