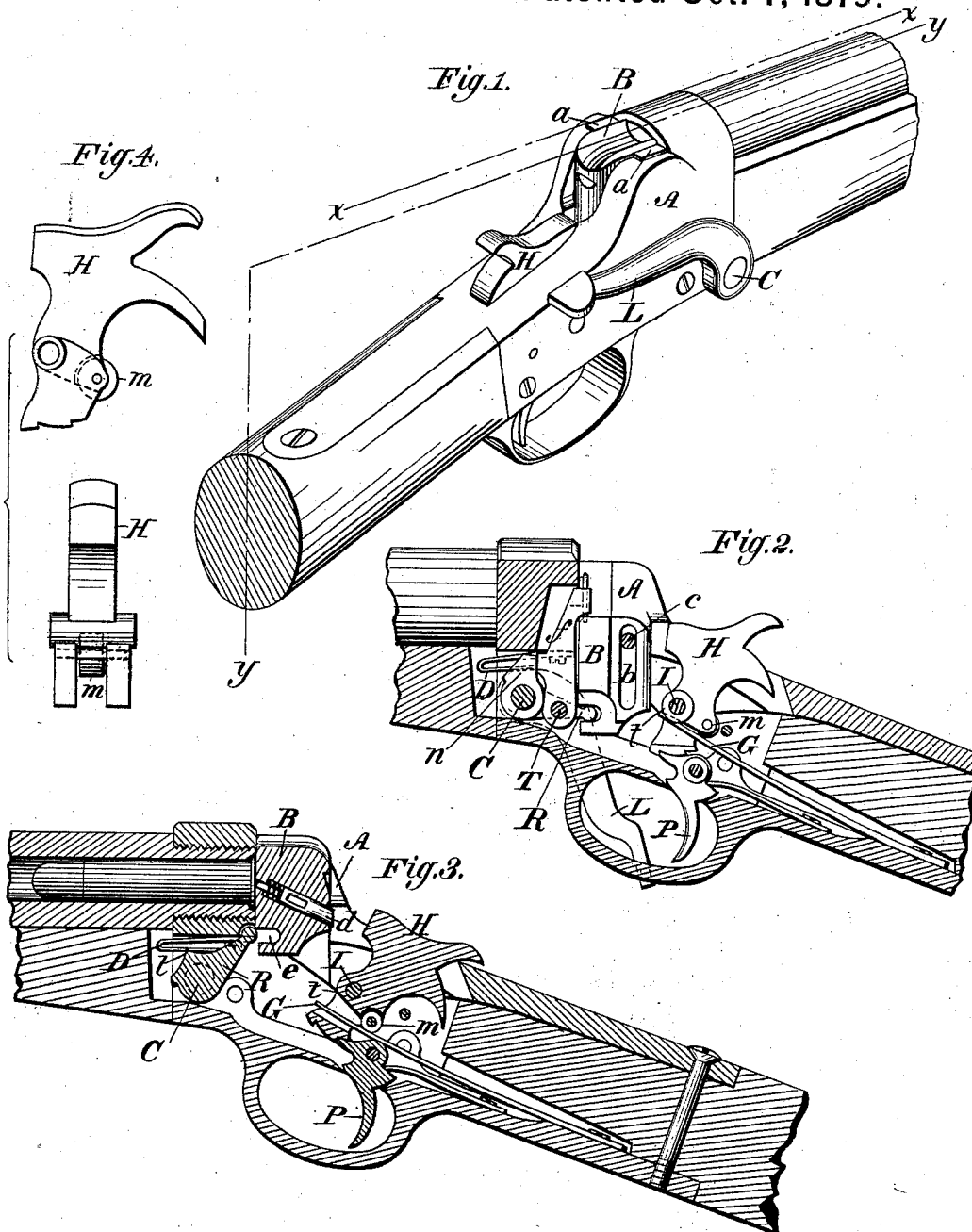


L. L. HEPBURN.
Breech-Loading Fire-Arm.

No. 220,285.

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Witnesses:
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UNITED STATES PATENT OFFICE.

LEWIS L. HEPBURN, OF ILION, NEW YORK, ASSIGNOR TO E. REMINGTON
& SONS, OF SAME PLACE.

IMPROVEMENT IN BREECH-LOADING FIRE-ARMS.

Specification forming part of Letters Patent No. **220,285**, dated October 7, 1879; application filed April 21, 1879.

To all whom it may concern:

Be it known that I, LEWIS L. HEPBURN, of Ilion, in the county of Herkimer and State of New York, have invented certain Improvements in Breech-Loading Guns, of which the following is a specification.

My invention relates to that class of breech-loading guns which have a breech-block moving at right angles to the bore; and the invention consists of a vertically-sliding breech-block, operated by an arm attached to a rock-shaft, which, in turn, is moved by a thumb-lever at the side of the receiver or frame, the rock-shaft having an angular projection bearing against a spring in such a manner that the breech-block, after being moved a certain distance, is thrown automatically the rest of the distance, and is held either open or closed, as the case may be.

It further consists in a device for operating the extractor, and in a special construction and arrangement of a rebounding hammer, together with other details, all as hereinafter more fully described.

Figure 1 is a perspective view; Fig. 2, a sectional view on the line *xx* of Fig. 1, and Fig. 3 a longitudinal vertical section on the line *yy* of Fig. 1. Fig. 4 represents the hammer in a modified form.

To construct a gun on this plan, I make the receiver A with a vertical mortise or opening, in its general form like that of the well-known Sharps rifle, the barrel being screwed into the front end of the receiver, in the usual manner.

The breech-block B consists of a solid piece of metal of the form shown in Figs. 1 and 3, it being provided on its sides with rectangular projections or ribs *a*, which slide in vertical grooves of corresponding shape and size made on the inner faces of the cheeks or sides of the receiver, as shown in Fig. 1. Near its lower end, and on its front face, this breech-block B has a recess or groove, *e*, cut in it, as shown in Figs. 2 and 3, in which engages the end of an arm, R, which is rigidly attached to a transverse rock-shaft, C, mounted in the receiver near its front lower corner, as shown, with one

end extending out through the receiver on the right-hand side, and to which projecting end is secured a thumb-lever, L, as shown in Fig. 1.

The body of the arm R, where it surrounds the shaft C, is made of the form shown in Fig. 3, or substantially so, by which there is left an angular lip or projection, *l*, on its upper side, and which lip or projection bears against a spring, D, as shown in Fig. 3. On each side of this lip *l* the piece is flattened, so that when the arm R is moved by the lever L the lip first compresses the spring, but after it has passed the center the spring operates to throw it, and with it the breech-block B, after which the spring, pressing on the flat face at either side of the lip *l*, holds the parts stationary, thereby holding the breech-block either up or down, according as the spring bears on one or the other of the flat faces on the opposite sides of the lip *l*.

The extractor consists of a lever, *f*, Fig. 2, which is pivoted at its lower end on a pin, T, and has its upper end fitted into a suitably-formed recess, so as to bring its lip in the proper position to engage under the flange of the shell when in the chamber of the arm. This extractor is operated by an arm or projection, *n*, which may be formed on the body of the arm R, as represented in Fig. 2, or which may be made separately and secured to it or to the shaft C at the side of the body of said arm, so as to move with it. In practice it will be made solid with the arm R, and as part of it, the whole being forged in a single piece, and then finished up in the usual manner.

In order to limit the movement of the breech-block B, a vertical groove, *b*, is cut in one side, as shown in Fig. 2, and a screw, *c*, is inserted through the side of the receiver in such a position that its inner end will enter the slot *b*, and thus serve as a stop to limit the movement of the block.

As shown in Fig. 3, the arm R and the breech-block B may be so proportioned and arranged that when the latter is elevated the end of the arm will just bear against the block sufficiently to prevent the latter from dropping down, and when the parts are in that position

it is only necessary to turn back the screw *c* far enough to withdraw its inner end from the slot *b*, when the breech-block can be at once removed, there being a small notch in its rear face for the thumb-nail to engage in to lift it out, or, by turning the arm over, it will drop out. It is obvious that instead of the single arm *R*, there may be two or more arranged to engage successively in corresponding notches in the breech-block; but I prefer the single arm, as it is simpler and cheaper, and is amply sufficient for all purposes.

The hammer *H* is located centrally in the frame, directly in rear of the breech-block, as shown in the several figures of the drawings; and in order that it may be sufficiently low to permit the cartridge to be inserted and extracted over the top of it, I so construct and arrange this hammer that although its head, when swung forward, will be so high as to be in the way of the cartridge or shell, it will, after delivering its blow, immediately fly back and occupy a lower position out of the way of the shell.

As shown in Figs. 1 and 2, the hammer *H* is pivoted on a pin or journal, *I*, in such a position that when the nose of the hammer strikes the firing-pin the face of the nose will stand in a vertical line parallel with the rear face of the breech-block *B*, at which time the top of the hammer will be in its most elevated position. Below its pivot-pin *I* the hammer has a recess cut in its side, as shown in Fig. 3, in such a manner as to leave a shoulder, *t*, just forward of the pivot *I*, with a second shoulder, *m*, in rear, and much farther from the pivot, there being a friction-roller secured in this rear shoulder.

The mainspring *G* has its front or free end arranged to rest within the recess cut in the side of the hammer, and in such a manner that when the nose of the trigger is in the half-cock notch the spring will bear on both shoulders *t* and *m*, as shown in Fig. 2; but when the hammer is drawn back to full-cock the rear shoulder only will bear on the spring, and this being farther from the pivot than the front shoulder, and therefore giving much greater leverage, will throw the hammer forward with sufficient momentum to overcome for the instant the pressure of the spring on the front shoulder and cause the hammer to deliver its blow to the firing-pin, when the front shoulder only will bear on the spring, and which will throw the hammer back to the half-cock, thereby throwing its top backward and downward out of the way of the shell, which, as the breech is opened, is thrown out over the head of the hammer.

Instead of making the hammer with the recess in its side for the end of the spring *G* to rest in, it may be made, as shown in Fig. 4, with the recess at the center of its lower end, with an arm extending down each side for the trigger to engage with. By this modification

a spring can be used without any offset or notch in its side.

By examining Fig. 3 it will be observed that the highest point of the hammer, when at half-cock, is just on or a trifle below the line of the lower wall of the chamber in which the shell rests, and the upper edge of the nose of the hammer is slightly beveled or hollowed out, so as to prevent any accidental stoppage of the shell in case the latter happens to hit the nose of the hammer as the shell is ejected. In like manner the upper front edge of the breech-block is also beveled, so that in case the cartridge should not be fully in its seat, the breech-block, as it is closed, will force it in, and thus also prevent the obstruction to the closing of the breech that would otherwise occur.

It is obvious that the lever *L* for operating the breech mechanism, as described, may be located on the under side of the receiver by connecting it to the body of the arm *R* and extending it through a suitable opening made in the bottom of the receiver, instead of locating it at the side; but I prefer the plan shown, for the reason that it is more convenient, as it can be operated by the thumb and finger without removing the hand from the arm, as it must be when the lever is placed underneath.

In this case I have shown the receiver as being made open on its under side, said opening being closed by the guard-strap; but it is obvious that, if preferred, it may be made with its under side closed, and making a portion of one of the sides removable, in which case the arm *R*, with its body and the shaft *C*, may all be made in a single solid piece, with journals on its ends, instead of extending the shaft *C* through it, as shown, it being a mere matter of expediency as to which plan shall be adopted in constructing the arm. The plan shown is, however, believed to be the best, for the reason that the receiver when made in this way is of equal strength on both sides or cheeks, and it is also easier or more convenient to machine when thus made.

An arm thus constructed is exceedingly simple, strong, and convenient to operate.

I am aware that a rebounding lock constructed to operate on this general plan is not new, and I do not claim such, broadly considered; but I am not aware that one has ever been constructed and arranged in the manner shown.

Having thus described my invention, what I claim is—

1. The combination of the sliding breech-block *B*, provided with the recess *e* and slot *b*, with screw *c*, rock-shaft *C*, and arm *R*, provided with the shoulder or lip *l*, spring *D*, and side lever, *L*, all constructed and arranged to operate substantially as shown and described.

2. The pivoted extractor *f*, in combination with the arm *n*, lip or shoulder *l*, and spring

D, said parts being arranged to operate substantially as described, whereby the spring D imparts to the extractor a sudden movement as the breech is opened to eject the shell, as set forth.

3. The rebounding hammer H, located in rear of the breech-block and in such relation to the chamber of the gun that while its head is in line with the bore while delivering its

blow, it is thrown back out of the way by the rebounding action of the mainspring, thereby permitting the shell to be thrown out by the opening of the breech, as set forth.

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Witnesses:

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