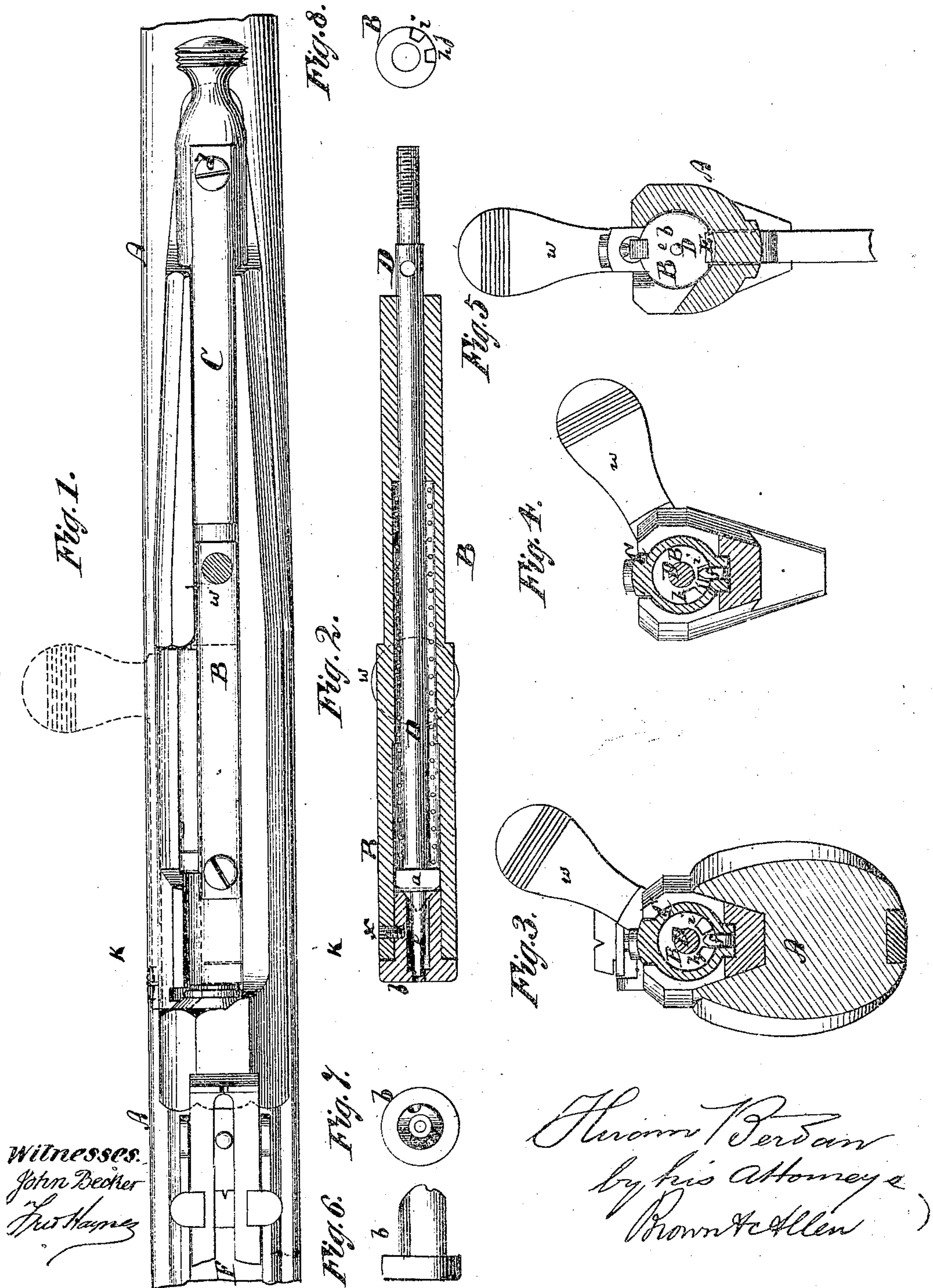


H. BERDAN.
Breech-Loading Fire-Arms.

No. 157,783.

Patented Dec. 15, 1874.



Witnesses.
John Becker
Fred Wagner

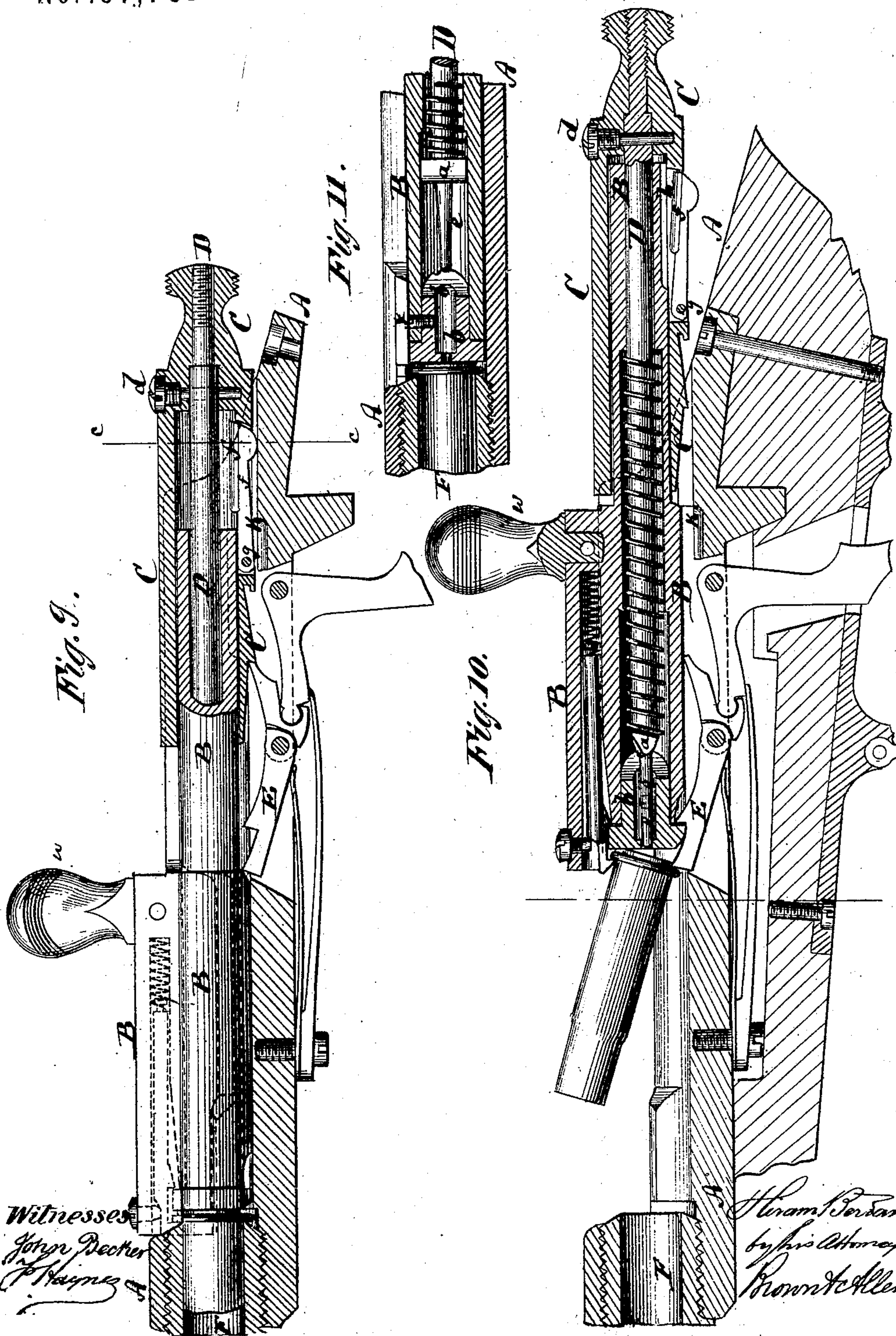
Hermon Berdan
by his Attorneys
Brown & Allen

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UNITED STATES PATENT OFFICE

HIRAM BERDAN, OF NEW YORK, N. Y.

IMPROVEMENT IN BREECH-LOADING FIRE-ARMS.

Specification forming part of Letters Patent No. 157,783, dated December 15, 1874; application filed October 17, 1873.

To all whom it may concern:

Be it known that I, HIRAM BERDAN, of the city, county, and State of New York, have invented an Improvement in Breech-Loading Fire-Arms, of which the following is a specification:

Figure 1 is a top view of my improved arm. Fig. 2 is a longitudinal horizontal section of the movable breech-piece and firing-pin. Figs. 3 and 4 are transverse sections on the line *cc*, Fig. 9, showing the parts in the different positions. Fig. 5 is a transverse section on the line *kk*, Fig. 1, looking backward. Fig. 6 is a detail side view of the adjustable face of the movable breech-piece; Fig. 7, a detail end view thereof. Fig. 8 is a detail back view of the movable breech-piece. Fig. 9 is a side view, partly in section, of the lock and breech organism, showing the piece in position ready for firing. Fig. 10 is a similar sectional view, showing the parts in position ready for loading. Fig. 11 is a detail horizontal longitudinal section of the front part of the breech-block and firing-pin, when the same are in position ready for firing.

Similar letters of reference indicate corresponding parts in all the figures.

The first part of my invention relates to the construction of the firing-pin; and consists in a firing-pin so constructed that its point is made separate from its body, so that it can be renewed at pleasure without its being necessary to renew the whole pin, and by the reason of the firing-pin being fitted with a cam or wedge, as before explained, it is more convenient that the point should be made separate from the body, instead of its being rigidly attached thereto.

The second part of my invention relates to a new construction of the hammer; and consists, substantially, in providing a latch in the under side of said hammer, working in a slot formed in the under side of the bolt or breech-piece, for the purpose of preventing the hammer from coming forward until the breech-piece is fully closed. The said latch is also fastened to prevent the unlocking of the breech-piece when the hammer is at half-cock, and this result is obtained by forming an angle, or an incline or groove in the bottom of the shoe on which the said latch is

caused to slide, so that when the hammer is at half-cock, it is impossible to unlock the breech-piece by reason of the said angle or incline forcing the latch into the groove provided in the rear end of the breech-piece.

In the accompanying drawing, the letter A represents the breech-receiver, B the movable breech-piece, C the hammer, D the firing-pin, E the extractor, and F the barrel, all of which parts, together with the trigger, sear, and their accompanying springs, are arranged substantially partly in the manner common to breech-loaders of the sliding-bolt construction, and partly in accordance with the Letters Patent granted to me in Great Britain on the 9th day of April, 1868, No. 1,200. The firing-pin D is provided with a double-faced cam, *a*, as shown in Figs. 2, 10, 11, upon which a cam or wedge is caused to work on the rear end of the adjustable face *b* of the breech-block B. A pin, *x*, secures the adjustable face *b* in position, as shown in Fig. 11, and insures its partial revolution with the breech-piece B, while the firing-pin is prevented from revolving by a pin, *d*, which secures it to the hammer C, as shown in Fig. 10.

The act of unlocking the breech-piece causes the withdrawal and consequent sheathing of the firing-pin, as shown in Fig. 10, where the cam *a* of the pin is shown to be resting in the shallower of the two sets of notches in the back end of the adjustable face, and which sets of notches are clearly shown in Figs. 6 and 7, 10 and 11. Upon fully locking the piece, and drawing the firing-pin D back to full cock, the deeper of the two sets of notches in the adjustable face *b* is presented to the cam *a* of the firing-pin—that is to say, brought in line with said cam, which is thus allowed as soon as the trigger is detached and the pin thrown forward to enter the deeper groove, and to cause the pin to protrude from the breech-block and ignite the cartridge.

The double cam-face of *a* possesses the further advantage of insuring the force necessary to withdraw the pin, being applied only above and below its center in opposite directions, and, therefore, in a line parallel to its longitudinal axis.

The point *e* of the firing-pin is made separate from its body, so that it can be renewed

at pleasure, without the necessity of renewing the whole pin.

The operation of this part will be readily understood. The face-piece *b*, being secured to the bolt or block *B*, turns with the same as said bolt is turned from the locked to the unlocked position. In the locked position, when the handle *w* is turned aside, as in Fig. 4, the deeper groove in the face-piece will be in line with the cam *a*, as in Fig. 11, and when the piece is applied said cam will enter the deeper groove. When thereupon the knob *w* is taken hold of, and the breech-block turned to bring the notch into an upright position, such turning will cause the cam to be drawn back as it is forced to leave the deeper groove, until such cam finally enters the shallower groove and remains therein. By such withdrawal of the cam from the deeper to the shallower groove, the point of the pin is withdrawn or sheathed into the face *b*, and prevented therefore from farther protruding beyond such face. In this position—that is to say, in the position shown in Fig. 10, the cam remains with respect to the face-piece *b*, during all the subsequent motions of the breech-block and hammer, until the breech-block is again moved against the breech end of the barrel, when the face is withdrawn from the cam *a*, when, by the subsequent turning of the breech-block into the locked position, the deeper groove is again brought in line with the cam *a*, and the parts are again in the position shown in Fig. 2. To the hammer *C* is applied a latch, *f*, which is pivoted to it by a pin, *g*, and working within a slot in the under side of the hammer. Two grooves, *h* and *i*, which are clearly shown in Figs. 3, 4, and 8, are formed in the rear end of the breech-piece *B*. If the breech-piece be either fully locked or fully unlocked, one or the other of these grooves is presented to the latch, which can then go forward, as in Fig. 4. Should the breech-piece, however, be only partially locked, the latch *f*, and, consequently, the hammer *C*, is prevented from going forward by the intermediate solid portion *j*, between the grooves *h* and *i*, which then presents itself to the latch, as in Fig. 3. The said latch also, in the following manner, prevents the unlocking of the breech-piece when the hammer is at half-cock. An angle or incline, *k*, is formed in the bottom of the shoe or breech-receiver *A*. When the hammer is at half-cock the latch *f* rests upon the top of the angle or incline *k*,

and must have entered the groove *h*. Thus, if at the time of placing the hammer at half-cock the breech-piece were locked, it cannot now be unlocked, because the latch of the hammer locks the breech-piece. At full-cock, as in Fig. 9, the breech-piece can be either locked or unlocked, because the latch is then drawn backward and quite clear of both notches *h* and *i*. After the hammer has gone fully forward the breech-piece can be either locked or unlocked, because the latch then has fallen down the incline or angle *k*, and is therefore below and quite clear of the grooves *h* and *i*. Thus the groove *i* serves to receive the latch when the hammer is being fired, though subsequently—that is, when the firing has ceased—the latch will drop down the incline and become disengaged from the breech-piece, allowing the latter to be turned with the knob *w* into an upright position, whereupon the groove *h* will be in line with the latch, receiving it as the bolt is being moved backward, and the latch thereby lifted on the incline *k*.

I am aware that a lever has been arranged on the hammer for the purpose of locking the bolt when the sear is in the half-cock notch. Said lever was operated through a fulcrum, and the sear on entering the half-cock notch struck one end of the lever, thereby forcing the opposite end into the groove in the bolt. The objection to the said lever is that it weakens the safety-notch in the hammer, when room has to be made for the lever, and there is nothing to prevent the hammer from going forward before the bolt is locked, when the hammer is at full-cock. Mine is a latch for the reason that it operates from the same end that locks the bolt, and it is so arranged that the hammer cannot go forward until the bolt is locked.

I claim as my invention—

1. The firing-pin of a breech-loading firearm, having its point *e* made detachable, substantially as specified.

2. The combination of the latch *f* of the hammer with the breech-block *B*, having two grooves or notches, *h* and *i*, as and for the purpose described.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

H. BERDAN.

Witnesses:

HERMANN KREISMANN,
HENRY T. BROWN.