4 Sheets—Sheet 1.

H. BORCHARDT.

BREECH-LOADING FIRE-ARM.

No. 185,721. Patented Dec. 26, 1876.

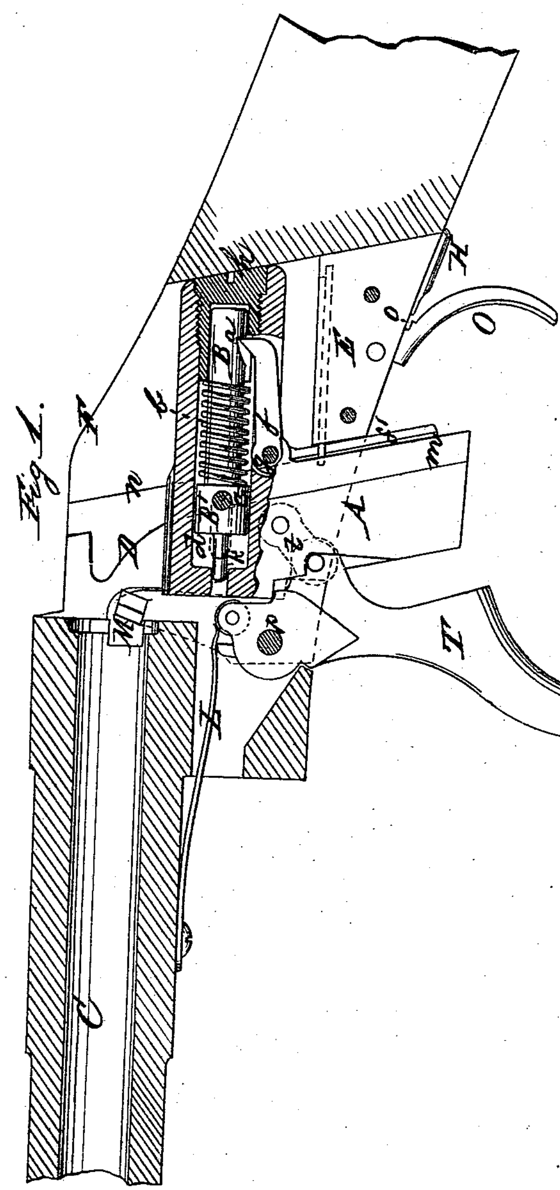


Fig. 1.

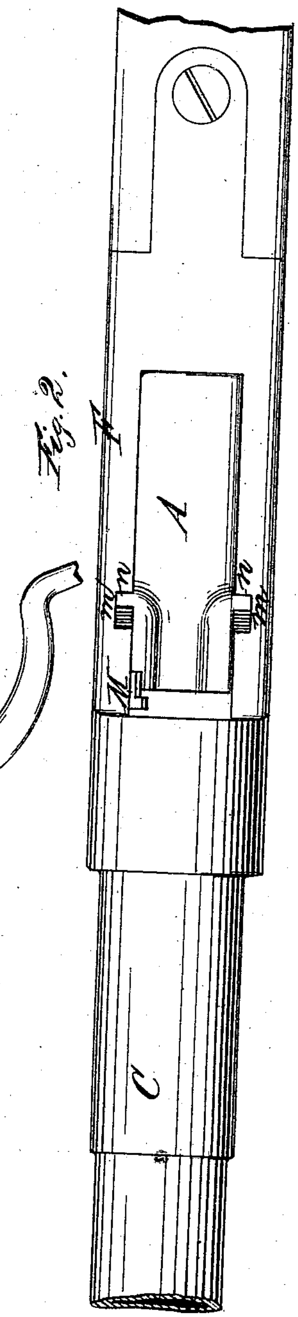


Fig. 2.

Witnesses
E Rockwell
R. Ellsdeney

Inventor
Hugo Borchardt

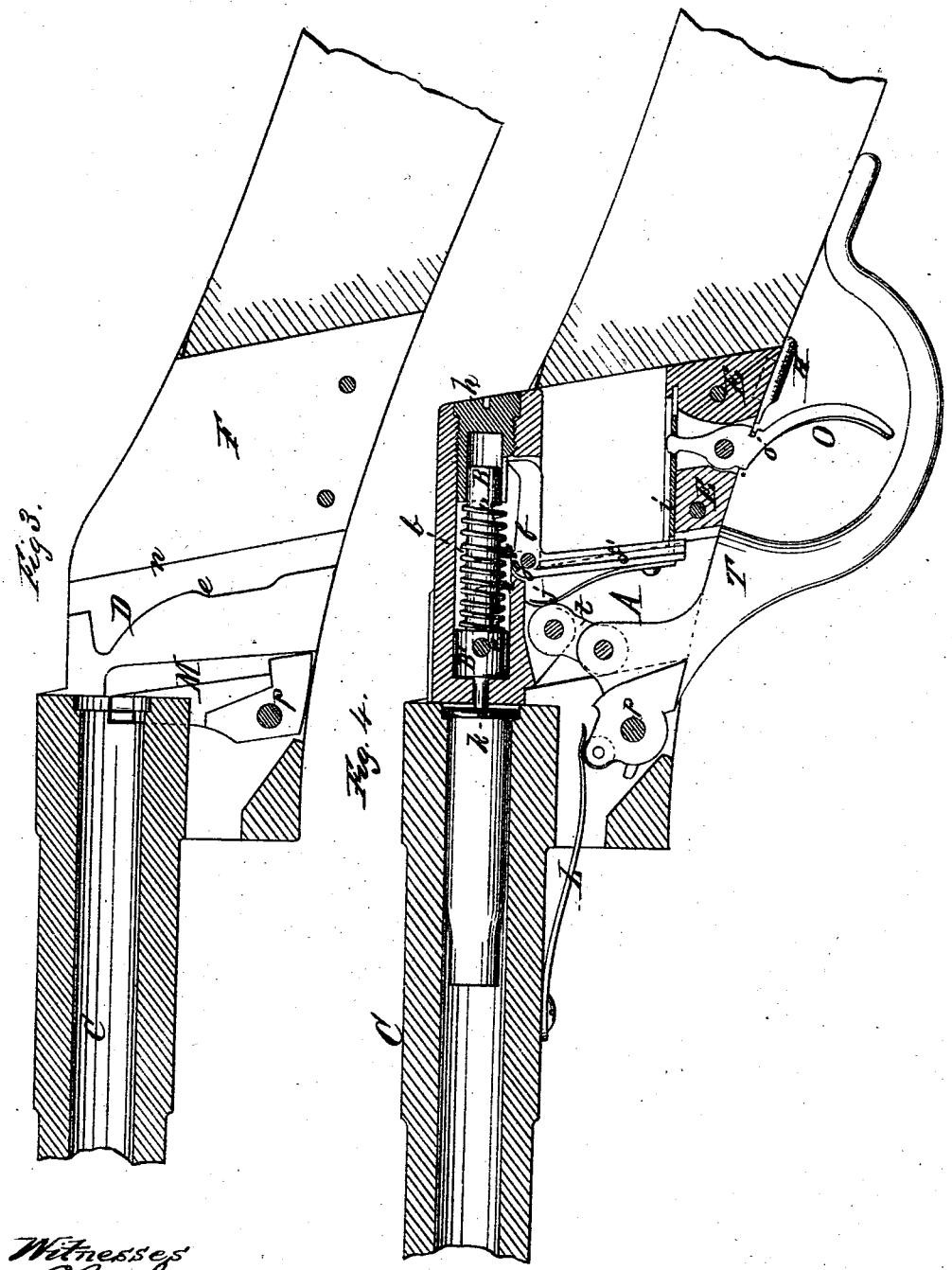
THE GRAPHIC CO.N.Y.

4 Sheets—Sheet 2.

H. BORCHARDT.

BREECH-LOADING FIRE-ARM.

No. 185,721. Patented Dec. 26, 1876.



Witnesses
C. Rockwood
R. Ridgeway

Inventor
Hugo Borchardt

H. BORCHARDT.

BREECH-LOADING FIRE-ARM.

No. 185,721. Patented Dec. 26, 1876.

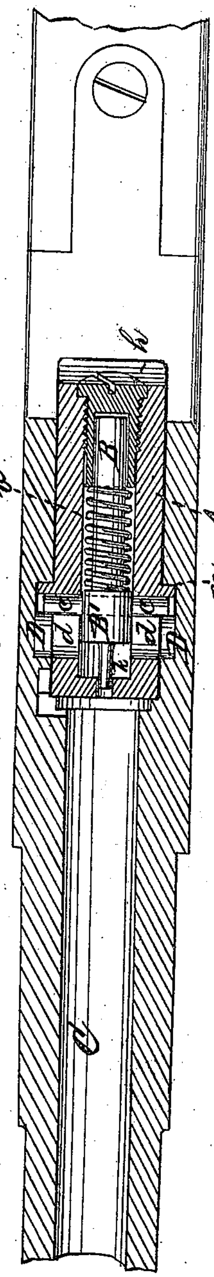


Fig. 5.

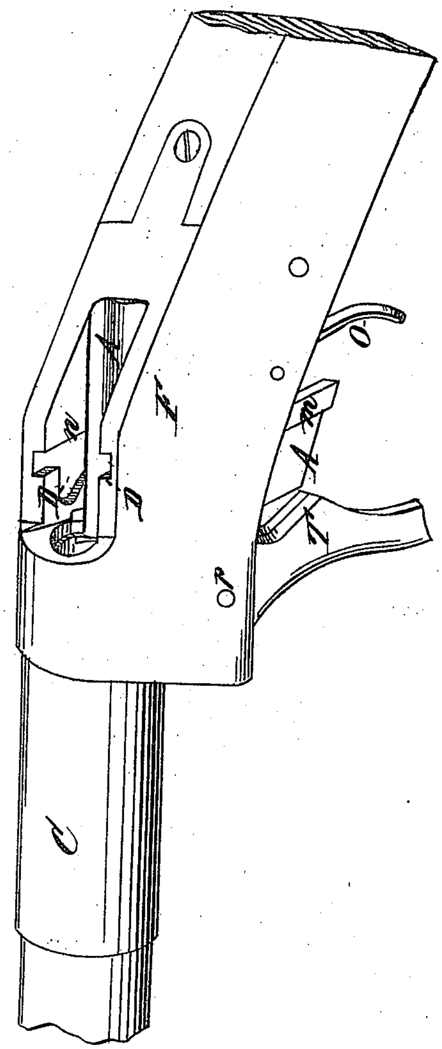


Fig. 6.

Witnesses
E. Rockwell
R. E. Heaney

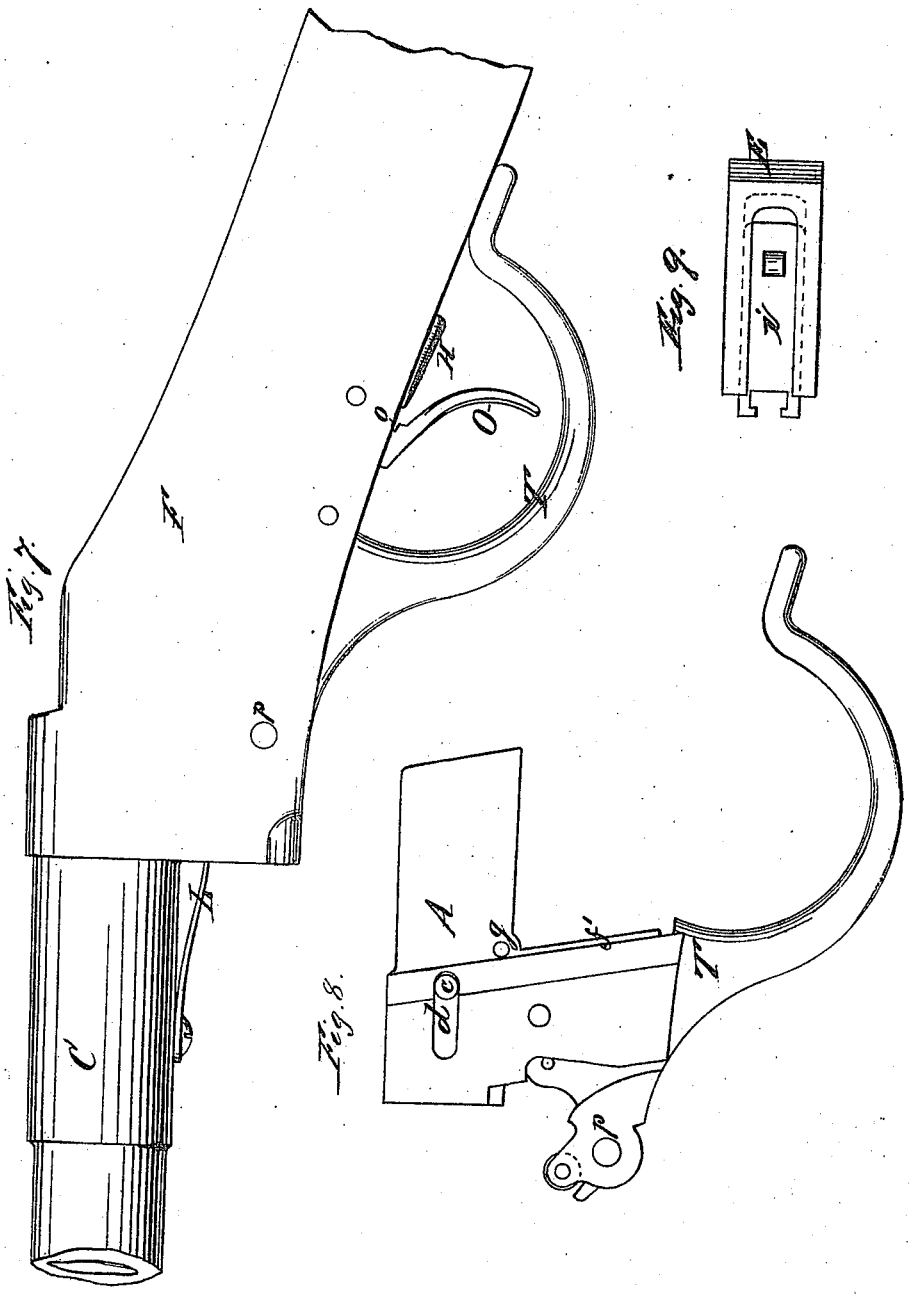
Inventor
Hugo Borchardt

4 Sheets—Sheet 4.

H. BORCHARDT.

BREECH-LOADING FIRE-ARM.

No. 185,721. Patented Dec. 26, 1876.



Witnesses
E Richard
R Ridgaway

Inventor:
Hugo Borchardt

UNITED STATES PATENT OFFICE

HUGO BORCHARDT, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE SHARPS RIFLE COMPANY.

IMPROVEMENT IN BREECH-LOADING FIRE-ARMS.

Specification forming part of Letters Patent No. **185,721**, dated December 26, 1876; application filed October 17, 1876.

To all whom it may concern:

Be it known that I, HUGO BORCHARDT, of the city of Bridgeport, in the State of Connecticut, have invented a new and Improved Form of Breech for Breech-Loading Fire-Arms; and that the following is a full, clear, and exact description thereof, when taken in connection with the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section of the arm with the breech open and the firing-pin drawn back. Fig. 2 is a top view of the arm with the breech open. Fig. 3 is a longitudinal vertical section with the breech-block removed, showing the inside of part of the breech-frame and one of the cams for cocking the arm. Fig. 4 is a vertical longitudinal central section of the arm with the breech closed. Fig. 5 is a horizontal section through the upper part of the breech-block. Fig. 6 is a perspective view, showing the chamber with the breech-block partly open. Fig. 7 is a side view of the arm with the breech closed. Fig. 8 is a side view of the breech-block removed from the arm. Fig. 9 is a top view of the piece carrying the trigger.

My invention relates to a breech for a breech-loading fire-arm, in which the breech-block slides downward to open the breech, and which breech-block carries the firing-pin, spring, and sear-bolt. It also relates to a method of cocking the arm by the joint operation of stationary cams formed upon the breech-frame of the gun and projections from the firing-pin. It also relates to the arrangement of a safety-check slide behind and in line with the trigger.

At A is seen the breech-block, which slides downward to open, and upward to close, the breech, which operations are effected by moving the trigger-guard, (seen at T,) which is hinged to the breech-block by the connecting-link, *t*, and to the breech-frame by a pin, *p*. Within the cavity of the breech-block A is the firing-pin B, surrounded by the coiled spring *b*, which drives the firing-pin, and which is supported or kept in position by the plug or stopper *h* at one end, and at the other end presses against the enlargement of the firing-pin at B′. The firing-pin moves in the plane of the axis of the barrel C. At *c c* is seen the pin which I put through the enlarged part B′ of the firing-pin B. This transverse pin projects on both sides beyond the breech-block A, and can slide backward and forward with the firing-pin, moving in the horizontal slots *d*, cut through the breech-block on both sides. Attached to the inner part, on both sides of the breech-frame, are the stationary cams, having the shape shown at D D in the figures. These cams may be a part of the breech-frame F, or may be attached thereto, as found most convenient. The pin *c* bears against the cams D D at both ends, and as the breech-block falls downward the pin *c* slides down on the cams, thus retracting the firing-pin B in the breech-block A, compressing the spiral spring *b*, and cocking or making ready for firing the arm.

The shape of the cams D D is such that when the cross-pin *c* of the firing-pin B has passed the projections of the cams (shown at *e* in Fig. 3) during the cocking movement, the sear-bolt will then take the entire pressure of the mainspring, and allow the breech-block A to move freely, to eject the empty shell, the momentum being imparted to it by the spring L. The projections *e* of the cams D D will push back the firing-pin as the block A moves upward, if by accident it had been released while the breech was entirely open. At the rear portion of the firing-pin B, and on its under side, is a notch, *a*, within which the upwardly-turned end of the sear-bolt catches.

The sear-bolt *f* is formed in the shape of a bell-crank, pivoted to the breech-block at *g*, and falls with it. The lower portion of the sear, which is marked *f′*, has in it a groove running vertically on both sides from its lower extremity almost to its point of suspension, *g*, A sliding piece, *i*, as shown in the drawings. slides in a piece of metal, E, attached to or forming a part of the breech-frame F.

The end of this piece embraces the downwardly-projecting portion *f′* of the sear-bolt *f*, and as the finger acts on the trigger, pushing the sliding piece *i* forward, the motion is communicated to the portion *f′* of the sear-bolt, pushing the lower portion forward, and consequently depressing the horizontal por-

tion of the sear-bolt, and freeing its upwardly-projecting end from contact with the notch in the firing-pin, which then is free, and is driven forward by the spring *b*, striking the cartridge with the portion *k* of the firing-pin B, and thus discharging the cartridge within the barrel C. As the sear-bolt moves with the breech-block when the breech is opened, the connection between the piece *i* and the portion *f'* of the sear-bolt is so made as to admit of the sliding of the latter within the embracing portion of the piece *i*. A spring, *j*, attached to the sear-bolt *f'*, as shown, presses against a pin or some appropriate portion of the breech-block, and keeps the sear-bolt pressed with its lower portion *f'* backward, and with its horizontal portion ready at all times to lock in the notch *a* in the firing-pin B.

Whenever the operation of fully opening and closing the breech is performed, the arm will be in readiness to be discharged, no half-cock or notch being provided to hold the firing-pin in the midway position, or in the position known ordinarily as "half-cocked." To guard against the premature discharge of the arm when carried at "full-cock," I provide a safety-check slide, consisting of a sliding button, H, roughened on the lower side, and arranged to slide backward and forward directly behind the trigger O, the forward end of the button H being so formed as to fit into a notch, *o*, made in the back of the trigger O. Thus, when the arm is cocked and ready to discharge, the button H may readily be pushed forward by the finger, catching in the notch formed in the back of the trigger, thus making it impossible to operate the trigger O, the sliding piece *i*, and the sear-bolt *f* till such time as the button H is moved backward, and out of connection with the trigger. The position given to the button H makes it secure against accidental displacement when it is pushed forward into the safety or locked position, while at the same time its operation is not attended with any serious difficulty.

At L is seen a spring, which presses upon a portion of the trigger-guard T, and which, when the trigger-guard is thrown down, acts upon it, throwing it, during the last part of its movement, with considerable velocity. The object of this is to give to the extractor (seen at M) a sufficiently violent blow to completely expel the cartridge. The extractor is similar to the one ordinarily used in the Sharps rifle, and needs no description. The breech-block A is provided with two ribs, as seen at *m m*, which impinge against shoulders *n n* of the breech-frame, and which serve as guides for the breech-block A, and support the shock due to the explosion of the cartridge.

I am aware that a vertically-rising breech-block is old. Such, however, is not my invention, which consists in a breech-block, which moves upward and downward, combined with the firing-pin having the projections which bear against the cams on the breech-frame. I sometimes give my block an angular or oblique motion, which construction aids in pushing the cartridge home in the chamber of the barrel.

Referring to the construction of my breech-block A, the plug *h* is screwed into the rear end, and by removing it the spiral spring can be taken out; and to guard against the accidental unscrewing of this plug until the sear-bolt is removed, I allow the upwardly-turned end of the sear-bolt *f* to operate within a slot or opening cut in the hollow screwed portion of the plug. In the arm as constructed according to my invention a clear view may be had through the barrel when the breech is thrown down, so that a rod may be pushed through from the breech toward the muzzle in clearing the barrel.

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

1. In combination, the pin C of the firing-pin B, and the cams D D, operating to cock the gun, as described.

2. The transverse pin of the firing-pin, in combination with cams, as described, for cocking the gun, and with a breech-block moving upward and downward, as described.

3. A sear-bolt with two arms, as described, combined with a firing-pin, and a trigger attached to the breech-frame of the gun.

4. The safety-check H, situated and operated as described, arranged to move forward and backward into and out of contact with a notch in the trigger.

5. In a breech-loading fire-arm, the combination of a breech-block, screw-plug, and sear-bolt, when the sear-bolt locks the screw-plug, substantially as described.

HUGO BORCHARDT.

In presence of—
E. ROCKWELL,
R. E. GEANEY.