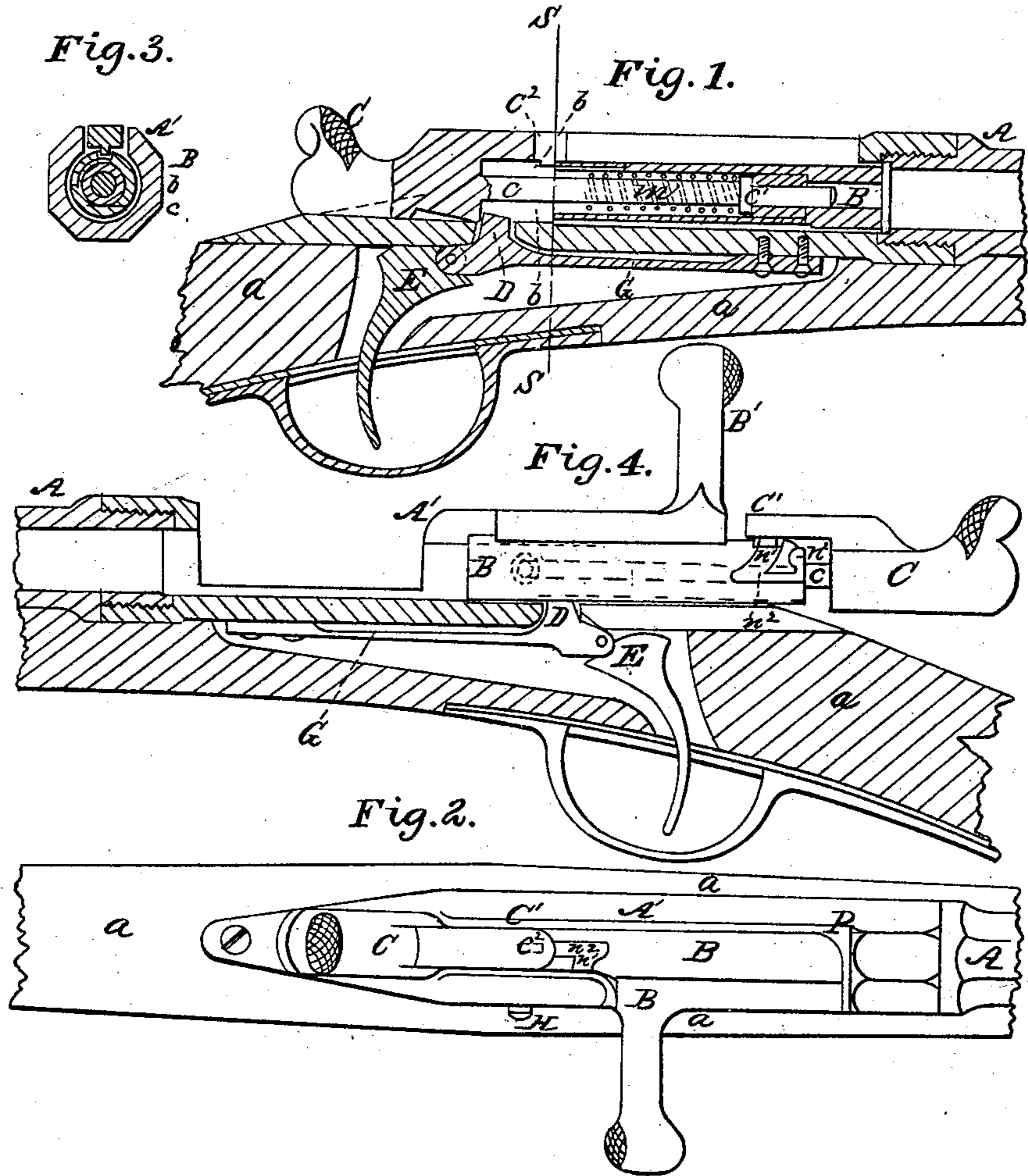


B. B. HOTCHKISS.  
 Breech-Loading Fire-Arm.

No. 93,822.

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Witnesses:  
*L. L. Swings*  
*A. C. Dep.*

Inventor:  
*B. B. Hotchkiss*  
 by his attorney  
*J. D. Eaton*

# United States Patent Office.

B. B. HOTCHKISS, OF NEW YORK, N. Y.

Letters Patent No. 93,822, dated August 17, 1869; antedated August 13, 1869.

## IMPROVEMENT IN BREECH-LOADING FIRE-ARMS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, B. B. HOTCHKISS, of the city and county of New York, and State of New York, have invented certain new and useful Improvements in Breech-Loading Fire-Arms; and I do hereby declare that the following is a full and exact description thereof.

My invention may be applied to many or all varieties of fire-arms, but is more particularly intended for use on the small-arms employed in the military service.

I will first describe what I consider the best means of carrying out my invention, and will afterward designate the points which I believe to be new therein.

The accompanying drawings form a part of this specification.

Figure 1 is a central longitudinal section through the breech of the barrel, and through the parts adjacent thereto.

Figure 2 is a plan view, and

Figure 3 is a cross-section on the line S S in fig. 1.

(All these figures represent the parts in the position ready for firing.)

Figure 4 is a side elevation, partly in section, showing the parts in the condition ready to receive a fresh cartridge.

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

A is the barrel of a rifled musket or shoulder-arm. *a* is a portion of the stock.

A' is an extension connected in the ordinary manner by strong screw-threads, and forming an immovable connection, and in effect, a single piece, with the barrel A. The part A' is open at the top and side as indicated, and is chambered through in line with the bore of the barrel.

B is a sliding bolt, having a stout handle, B', and adapted to move forward and backward in the extension A', and to be secured in its proper position by being turned a quarter of a revolution.

C is a piece connected in the rear of, and capable of moving axially with the part B.

D is a spring-catch secured to the under side of the extension A', as represented, and adapted to hold back the part C.

E is a trigger which will draw down the catch D, and allow the part C to move forward by the action of the spring *m*, when it is desired to fire the piece.

My invention may be used with many varieties of cartridges. I have represented it as intended for a centre-firing percussion-cartridge, of which what is known as the "Boxer" cartridge may be considered a good specimen.

My invention may be used with any of the varieties of needle-cartridges, but it is better adapted for those cartridges which are to be fired by a simple blow against the rear.

One of the difficulties attending the employment of cartridges of this character in bolt-arms, is due to the liability of the cartridge to be exploded by the sudden shock which results from the vigorous moving forward of the bolt into its front position.

As such arms have been heretofore constructed, there have been two distinctly-separate movements required—one to carry forward the bolt into its extreme forward position, against, or in close proximity to the rear of the cartridge, and another motion to partially turn, and thereby lock the bolt in its forward position.

My bolt B is moved forward, and is turned and locked, but the movement is changed gradually from the forward to the turning motion. It does not, as is the case with the corresponding part in ordinary bolt-arms, first move forward to its extreme front position and there come to rest momentarily, and then commence to turn; the movement is changed gradually from the forward motion to the turning motion. It moves forward until near its extreme forward position, say within a quarter of an inch; it then commences its turning motion, and for awhile, both of these motions proceed simultaneously. It by degrees attains its extreme forward position, and its last motion is, or may be, exclusively a turning motion. This gradual checking of the forward motion, and the gradual changing of the forward, or progressing, or axial motion, into a turning motion, avoids any concussion of the bolt against the rear of the cartridge. It may press with any required degree of force against the rear of the cartridge, without subjecting the cartridge to concussion.

The details of the construction in which this and the several other peculiarities of my invention are involved, are very clearly shown in the drawings.

Tints are used merely to distinguish parts, and do not imply differences of material. The material of the metallic parts may be iron and steel.

A pin, *c*, which is formed as a part of, or is firmly connected to the rear part C, extends through the hollow interior of the bolt B, in the line of the axis, and forms the exploding-pin to act on the cartridge. It is provided with a collar, *c*<sup>1</sup>, which receives the force of a stout spiral spring, *m*, which abuts against a piece, *b*, fitted in the rear of the bolt B, as represented. The spring *m* tends to carry the pin *c* and its connections into their extreme forward position, in which position the part C is close to, and partly lapping upon the bolt B, and the front end of the firing-pin *c* protrudes a little from the front of the bolt B.

This, which is the position of all the parts when the piece is fired, will be readily understood by those familiar with this class of arms. The part of C which laps upon the bolt B, is designated C<sup>1</sup>. An internal projection, *c*<sup>2</sup>, extending downward from this over-

lapping face, stands in a groove in the bolt B, as shown in the figures, marked  $n n^1$ , &c.

It will be understood that the part C does not turn, but is capable simply of a forward and backward motion. On pulling the trigger E, and depressing the catch D, so as to liberate the piece C and its connections, the pin  $c$  moves forward with all the force due to the tension of the spring  $m$ , and fires the cartridge. In effecting this movement the projection  $c^2$  traverses forward in the straight portion of the groove referred to.

In preparing to reload the piece, the first operation is to turn the handle B' into an upright position. This turns the bolt B one-fourth of a revolution, and in this movement the internal projection  $c^2$ , on the part C', is traversed along in the curved portion  $n^1$ , of the groove aforesaid. This movement, by reason of the curvature of the groove  $n^1$ , draws back the projection  $c^2$ , and consequently the entire piece C, and its connections.

The curvature of this portion of the groove is such that the portions B C, and their connections, are drawn back to a sufficient extent to draw the front of the firing-pin  $c$  just within the front end of the bolt B.

Now by drawing directly backward on the handle B', all the parts, that is to say, the bolt B, and also the part C and its several connections, the firing-pin  $c^1$ , &c., are drawn back to the extent shown in fig. 4. The limit to which this bolt and its attachments are capable of moving, is controlled by a screw-pin, H, tapped through the side of the part A', and standing in a longitudinal groove in the side of the bolt B, being in this respect precisely similar to that in other approved forms of bolt-arms.

Any approved method may be adopted for removing the remains of the cartridge after firing.

In order to introduce a fresh cartridge, it is necessary simply to drop, or otherwise deposit the cartridge in the ample space provided by the drawing back of the bolt, and now, on pressing forward the handle B', results occur which are worthy of close attention.

First the bolt B, and the connected parts C C, &c., move forward together, without turning, and without any motion relatively to each other. This condition obtains until the further forward motion of the rear piece C, and its connections, is arrested by the catch or spring-stop D. In this condition the rear part C C', with the firing-pin  $c c^1$ , &c., becomes entirely motionless. The bolt B, continuing to move forward by the forcible action of the hand against the handle B', the spring  $m$  is compressed, and in this movement the force is accumulated in this spring, which is afterward to be available in the act of firing. The bolt B and handle B' move forward without turning, until the root of the handle B' strikes the curve P, and commences thereby to be turned.

It is not important that this curved surface P be located in the position here represented. It is simply necessary that there shall be a provision (of which this is the best form known to me) for transferring or changing the impetus of the hand of the operator, and of the several parts, so that the forward motion of the bolt B shall be changed to a turning motion of the same part and its connections. As the movement progresses, (the operator, of course, assisting the turning motion to some extent,) it will result that the forward-progressing motion becomes gradually and ultimately completely changed into a turning motion, without progress, as above described.

The movement to obtain this condition is, in fact, but a single movement. It commences with a direct

forward motion, which changes gradually, being for a time partly of the forward and partly of the turning motion, but terminating with a motion which is exclusively a turning motion.

During this single yet compound motion, the projection  $c^2$ , which has been several times referred to, traverses a recess, or rebate  $n^2$ , on the surface of the bolt B. This, it will be observed, has a form and position corresponding to the motion of the bolt B, relatively to the bolt C; that is to say, the rebate  $n^2$  extends first directly backward, then changes gradually, by curving into a lateral direction, and at the end of the motion, the projection  $c$  stands in the junction of the groove  $n$  with the rebate, or groove  $n^3$  ready to move forward freely when the trigger is pulled.

A notch,  $n^3$ , is provided, as represented, in the front face of the rebate  $n^2$ , in which the projection  $c^2$  may be allowed to take when it is desired that the gun shall remain at "half-cock."

In order to effect this, it will be understood that the piece C is held back by the thumb applied on the part C', and the trigger being pulled to depress the catch D; the forward motion of the bolt C, and its connections is restrained, while the handle B' is turned into a position intermediate between the horizontal and the upright. In this position the part C is allowed to move forward until the projection  $c^2$  rests in the notch  $n^3$ .

In this condition the gun cannot be fired by any violence, and when it is desired to "full cock" the piece from its "half-cocked" condition, it is only necessary to draw back the piece C into the full cock condition, and to turn the handle B' down.

The curvature of the groove  $n^1$  promotes safety.

It effects this in three ways, and performs three distinct functions.

The firing-pin cannot strike the cartridge until the bolt B is fully turned, and the handle B' is horizontal. It thus acts as a stop to prevent firing with the bolt B not fully turned; and this is one function.

Another function is to hold the part B firmly over and prevent its turning back again into a false position under the concussion and recoil of the firing.

Still a third is to insure that the firing-pin  $c$  shall be drawn back within the bolt B, in the act of preparing to introduce a cartridge, and shall be held back there when the new cartridge is struck, in the act of being pushed forward into the barrel.

If the groove  $n^1$  were not curved, the pin  $c$  would protrude at the front of B, during the first portion of the motion of pushing in the cartridge, and it would be possible to explode the cartridge by using the hand with great energy in the act of merely commencing to push the cartridge home.

Having now fully described my invention,

What I claim as new, and desire to secure by Letters Patent, is as follows:

1. I claim the means herein described for cocking the piece C, in combination with the single compound movement of the piece B, as and for the purposes herein described.

2. I claim the within-described arrangement of the recesses  $n n^1 n^2$ , and of the half-cock notch  $n^3$ , relatively to each other and to the bolt B, rear part C, and the internal projection  $c^2$ , as and for the purposes herein set forth.

In testimony whereof, I have hereunto set my name, in presence of two subscribing witnesses.

B. B. HOTCHKISS.

Witnesses:

THOMAS D. STETSON,  
C. C. LIVINGS.