G. H. FOX.

Breech-Loading Fire-Arm.

No. 196,748. Patented Nov. 6, 1877.

Fig. 1.

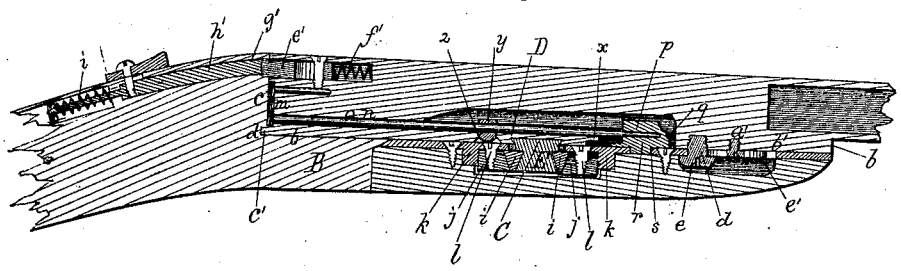


Fig. 2.

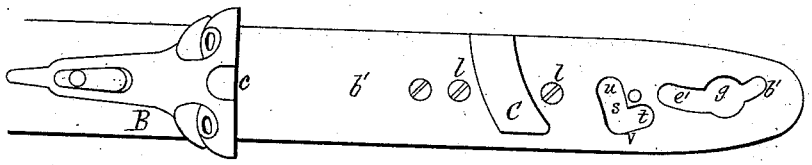


Fig. 3.

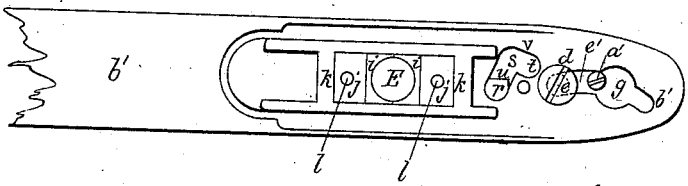
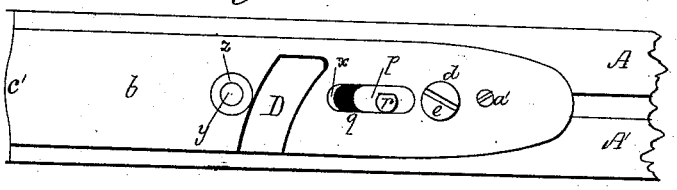


Fig. 5.



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UNITED STATES PATENT OFFICE.

GEORGE H. FOX, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN BREECH-LOADING FIRE-ARMS.

Specification forming part of Letters Patent No. **196,748**, dated November 6, 1877; application filed June 22, 1877.

To all whom it may concern:

Be it known that I, GEORGE H. FOX, of Boston, Suffolk county, Massachusetts, have invented certain Improvements in Breech-Loading Guns, of which the following is a specification:

These improvements are based upon a class of breech-loading shot-guns shown and described in Letters Patent issued to me on the 4th day of January, 1870, in which the barrels move to open and close the breech by a sidewise vibration from a point of vibration or oscillation which is outside of the outline of the barrels. The said barrels, instead of being guided in these movements by an actual pivot located at such point, are guided and controlled by pins or studs working in grooves concentric with a center outside of the outline of the gun, which may be termed an "imaginary center."

The drawings accompanying this specification represent, in Figure 1, a longitudinal section of so much of a fire-arm as is necessary to show the application of my improvements. Fig. 2 is a plan of the lower plate or frame upon which the barrels are supported, and Fig. 3 an under side view of the same. Fig. 4 is an under side view of the rear part of the barrels and attachments.

In these drawings, the two barrels of a shot-gun are shown at A A', while brazed or otherwise secured to their under rear parts is a plate, *b*, flat on its under side to rest upon the upper surface *b'* of the frame B, the recoil-seat or breech of the frame B being shown at *c*.

The barrels, in moving upon the base-plate *b'*, describe a curved path, and are guided by a stud or screw, *d*, which screws into the plate, and whose head *e* overlaps the sides of a curved slot, *e'*, created in the said base-plate *b'*, this slot being a segment of a circle struck from a center outside of the frame of the gun—say at *f*—such slot having an enlargement, *g*, to permit of escape of the head of the screw when it is desired to detach the barrels from the stock. The head of the screw *d* serves, in part, to prevent the throwing up of the forward ends of the barrels when the cartridge is exploded.

The screw or its equivalent is a very important element, as it serves to enable the rib to travel freely in its channel, and to permit of the requisite slip movement between the barrels and stock.

C in the drawings represents a curved fin or guide-plate, disposed upon the top of the base-plate *b'*, and having its side edges undercut or dovetailed to cling to a similarly-formed groove, D, cut in the under side of the plate *b*, the said plate C and groove D being disposed tangential to the axis of the frame, at such an angle and segment of a circle as to adapt themselves to the vibrating movements of the barrels.

The fin C is formed upon the upper end of a cylindrical stud or pivot, E, which extends downward through the base-plate, and by means of which the fin may be turned upon its center to find its true position with respect to the groove D and the barrels. It will be evident that if the position of the fin C be varied longitudinally of the base-plate *b'*, the rear ends of the barrels will be caused to approach or recede from the recoil-seat of the breech of the gun, and the fin may then be made a means of compensating for or taking up the wear between such seat and barrels, should any occur, as well as to bring the barrels into their proper position in making a new gun.

To confine the pin C rigidly and securely in place I envelop its shank E with a sectional block or pair of recessed blocks, *i i*, and alongside of each of these blocks *i i*, I place a second block, *j*, whose outer edge abuts against a ledge, *k*, formed upon the under side of the plate *b*. The contiguous faces of the blocks *i* and *j* are disposed obliquely to the longest plane of the plate *b'*, and are securely held in place by screws *l l*, which pass through them from the plate *b* above, and it will be seen that if the screws *l l* are loosened, and one block, *j*, be lowered and the other raised, the fin C will be moved in one direction, and vice versa, thus enabling a perfect joint between the barrels and breech to be insured at all times.

So, too, in fitting a new gun, the screws *l l* are loosened and the barrels turned up to place against the breech, the fin finding its true position, naturally, when the screws are tightened and the barrels are perfectly adjusted.

The extractor of this gun is a slide-plate, *m*,

recessed to receive the head of the shells, and, when the gun is in firing position, extends into a recess formed in the rear end of the barrels, said slide-plate being supported on the rear end of a rod, *n*, which plays in a bore, *o*, created longitudinally in the plate *b*. In order that the movement of the barrels, as they recede from the breech, may force the extractor *m* outward to remove the shell in each barrel, I employ a slide-plate, *p*, which is let into a recess, *q*, formed in the lower part of the plate *b*, and having on its under side a spur, *r*, which enters a right-angular orifice or slot, *s*, formed in the plate *b'*, one part (viz., *t*) of such slot being practically lengthwise of the said plate, and the other portion, *u*, being at right angles thereto. The forward end of the extractor-rod *n* is let into the slide-plate *p*, and it will be seen that as the barrels swing to one side, in the act of unclosing the breech, the portion *u* of the slot *s*, acting upon the stud *r*, forces the slide-plate *p*, and with it the extractor-rod *n* and plate *m*, backward, also, to such an extent as to start the cartridge-shell from the barrel. The barrels are swung to one side, as stated, until the side *v* of the portion *t* of the slot *s* abuts against the spur *r*, when further movement of the barrels is arrested by such spur.

It will be seen, when the slide-plate *p* is in the position last named—that is, with the extractor withdrawn and the barrels turned full to one side—that the spur *r* constitutes, as stated, a stop to any further movement of the barrels, and serves to prevent accidental disengagement of the barrels and stock, the rising of the said plate and the disengagement of its spur being prevented by a lip, *x*, formed upon the rear boundary of the recess or slot *q*, it being understood that when the extractor is pushed home the said plate *p* is pushed forward beyond this lip.

When it becomes desirable to disengage the barrels from the stock, the former are first swung to one side to the fullest extent, and the gun then turned bottom upward, with the barrels in the left hand. The extractor is now pushed inward, which removes the slide-plate *p* from engagement with the lip *x*, and the said plate is lowered by the thumb of the left hand until the spur *r* retreats from the slot *s*, when the stock may be disengaged from the barrels, as the enlargement of the slot *g*, as before stated, permits of passage of the head *e* of the screw *d*.

To enable this depression of the slide-plate *p* to be easily and expeditiously accomplished, I extend the extractor-rod through a pin, *y*, which is disposed within an orifice, *z*, created in the plate *b*, and by pressing upon which pin with the thumb of the left hand the rod and plate are lowered.

To engage the barrels and stock, the two are turned bottom upward, the head *e* of the screw *d* passed into the enlargement *g* of the slot *e'*, the stock pressed down upon the barrel-plate *b* to crowd the plate *p* downward, and the barrel swung into alignment with the stock, the spur rising upward into the slot *s*, while to give proper direction to the swinging movements of the barrels, until the shank of the screw *d* passes into the slot *e'*, I employ a screw or pin, *a'*, which depends from the plate *b* and enters the outer end *b'* of the said slot.

To prevent rising of the rear end of the barrels when the cartridge explodes, I form upon the lower rear corner of the plate *b* a small lip, *c'*, which takes into a corresponding recess, *d*, cut in the breech-block, while to lock the said barrels in firing position I employ a spring-bolt, *e'*, let into a socket, *f'*, created in the rear end of the barrels, as shown in Fig. 1 of the drawings, the rear end of this bolt protruding a short distance, and entering a coinciding socket, *g'*, created in the breech-seat *c*.

A push-pin, *h'*, retracted by a spring, *i'*, is disposed in the socket *g'*, and, when pushed forward until its front end is flush with the front face of the recoil-seat *e*, serves to remove the bolt from said socket *g'*, and release the barrels.

By removing the dovetailed guide or fin and its groove from the corner at the intersection of the recoil-seat *c* and plate *b'*, where they were located in my previous patent, I greatly strengthen the parts, and obviate what has been considered by some a serious objection. I also obviate any liability of the hand of the user being caught by the fin C as the barrels are returned to position.

One important feature in my present improvements relates to the recoil-seat *c* with respect to the rear ends of the barrels, and consists in the form of such seat, whereby the resisting face opposed to each barrel is presented at right angles to the axes of the latter.

It has been the custom to form the recoil-seat in a flat plane common to the two barrels, and as the axes of such barrels diverge at rear, a falling away between such seat and one side of the head of the cartridge-shells takes place. Consequently the heads do not bear fairly upon the recoil-seat, and such shells are forced out of shape, and in some cases the heads blow off without the cause being apparent.

By this form of the recoil-seat a perfect fit of the rim of the cartridge-head in the circular groove of the cartridge-chamber is at all times insured. For the same reason the cartridge-case retains its original shape, and fracture is impossible.

In this gun a compound movement of the barrels with respect to the breech takes place—that is to say, a lateral vibratory movement and a longitudinal slip. As laid down in my patent before named, this movement of the barrels is described as a vibratory one in the arc of a circle struck from an imaginary center outside of the stock or frame. This is not literally essential, as the gist and value of my invention will be seen to consist in the construction by which I am enabled to readily and expeditiously separate the stock and bar-

rels without the removal of screws, &c., or the use of an instrument, and the path of movement of the barrels to accomplish this may vary somewhat from that described.

In the manipulation of the gun in loading and firing, &c., these movements of the barrel or barrels, in the act of closing or unclosing the breech, are guided or effected by an obliquely-disposed segmental rib or fin in the one traversing a coinciding groove or channel in the other, as stated, while a screw or pin in one, working a curved slot in the other, aids in steadying and giving direction to these movements of the barrels, and constitutes, practically, a pivot for the necessary swinging movements of such barrels, and allows of the requisite longitudinal slip between them and the stock, a proper stop being employed to determine the length of such movement and prevent separation of the two.

Were this compound swinging and slip movement of the barrels upon the frame or stock the only one to be accomplished, the rib and groove, and the guiding pin or stop, would suffice; but it becomes important to be able to detach or separate the barrels and stock, and if some means were not provided for compelling the barrels to move in the arc of a circle immediately after the rib and groove separate in the act of dismembering the gun, the two would not coincide when the barrels and stock were put together.

This important office is filled, in my patented gun before named, by the pin *g*, and in my present gun by the screw or stud *a'*.

Though I have confined the description of the construction of my gun to a pair of barrels operating with a stock or frame, it is hardly necessary to observe that I do not confine myself to two barrels, as the operations of the gun, and the advantages to be derived from my invention, are entirely independent of the number of barrels.

I claim—

1. The fin or guide C, in combination with the plate *b*, forming part of or attached to the barrels, and provided with groove D, substantially as herein shown and explained, whereby such fin constitutes a means of compensating for wear between the barrels and breech, of preventing throwing forward of the barrels on explosion of the charge, and of enabling the barrels, in fitting new guns, to find their true position with respect to the recoil-seat of the breech, the whole being essentially as and for purposes stated.

2. The dovetailed guide or fin C, swiveled to and longitudinally adjustable in the plate *b*, essentially as and for purposes stated.

3. The combination of the dovetailed guide C and its pivot or shank E with the blocks *i i* and *j j*, the latter being inclosed within the ledges *k k*, and the whole operating substantially as and for purposes stated.

4. The locking-bolt *e'*, as arranged within the barrels, and operating in connection with a push-pin in the breech *c*, substantially as and for purposes stated.

5. The pin *a'*, in combination and operating with the stud or screw *d*, to guide the barrels to the fin C, substantially as and for purposes stated.

6. The combination of the extractor *m* with the slide-plate *p* and stud *y*, substantially as explained, so that when the extractor is partially or wholly withdrawn such plate and pin may be removed, substantially as and for purposes stated.

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