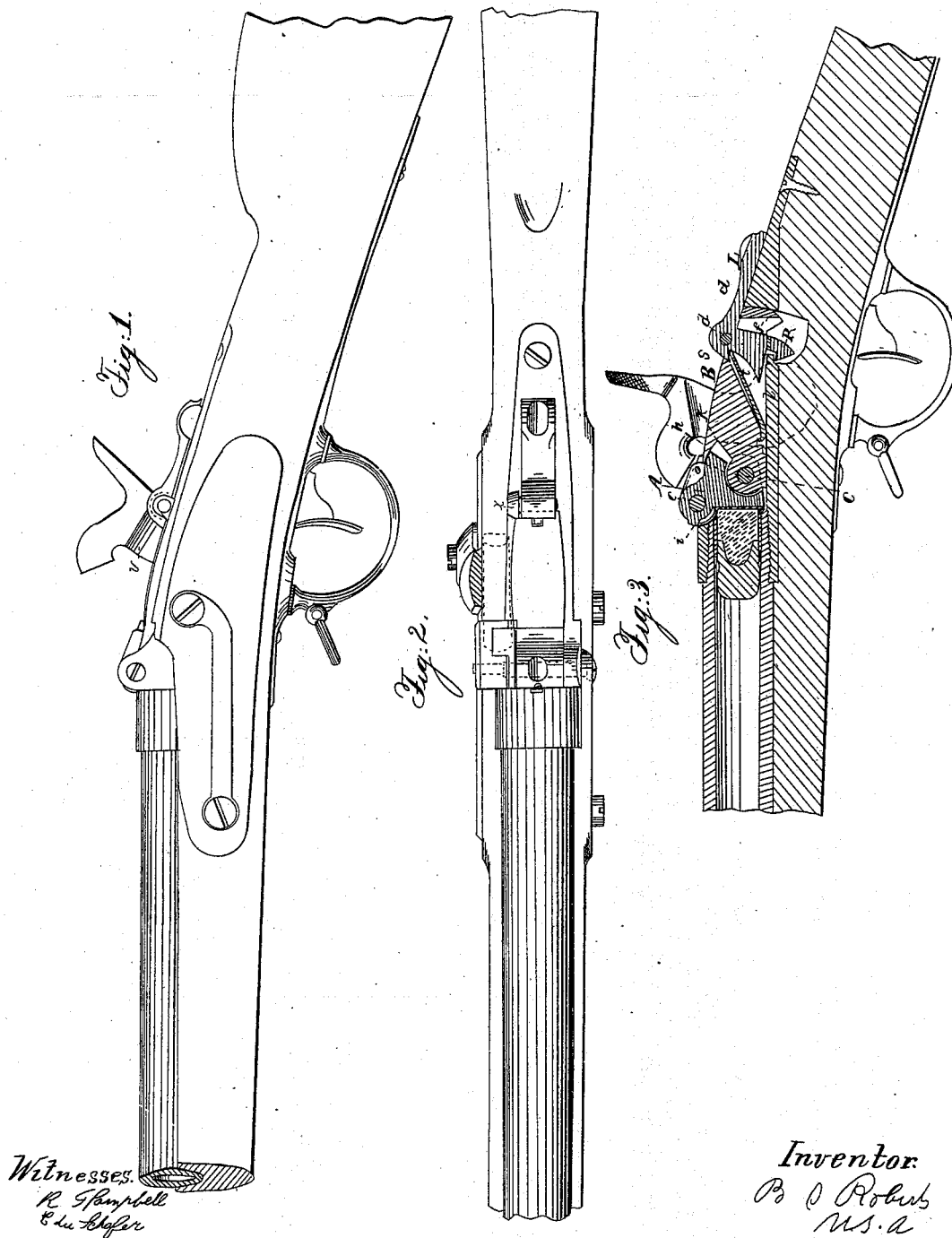


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Breech-Loading Fire-Arm.

No 52,887.

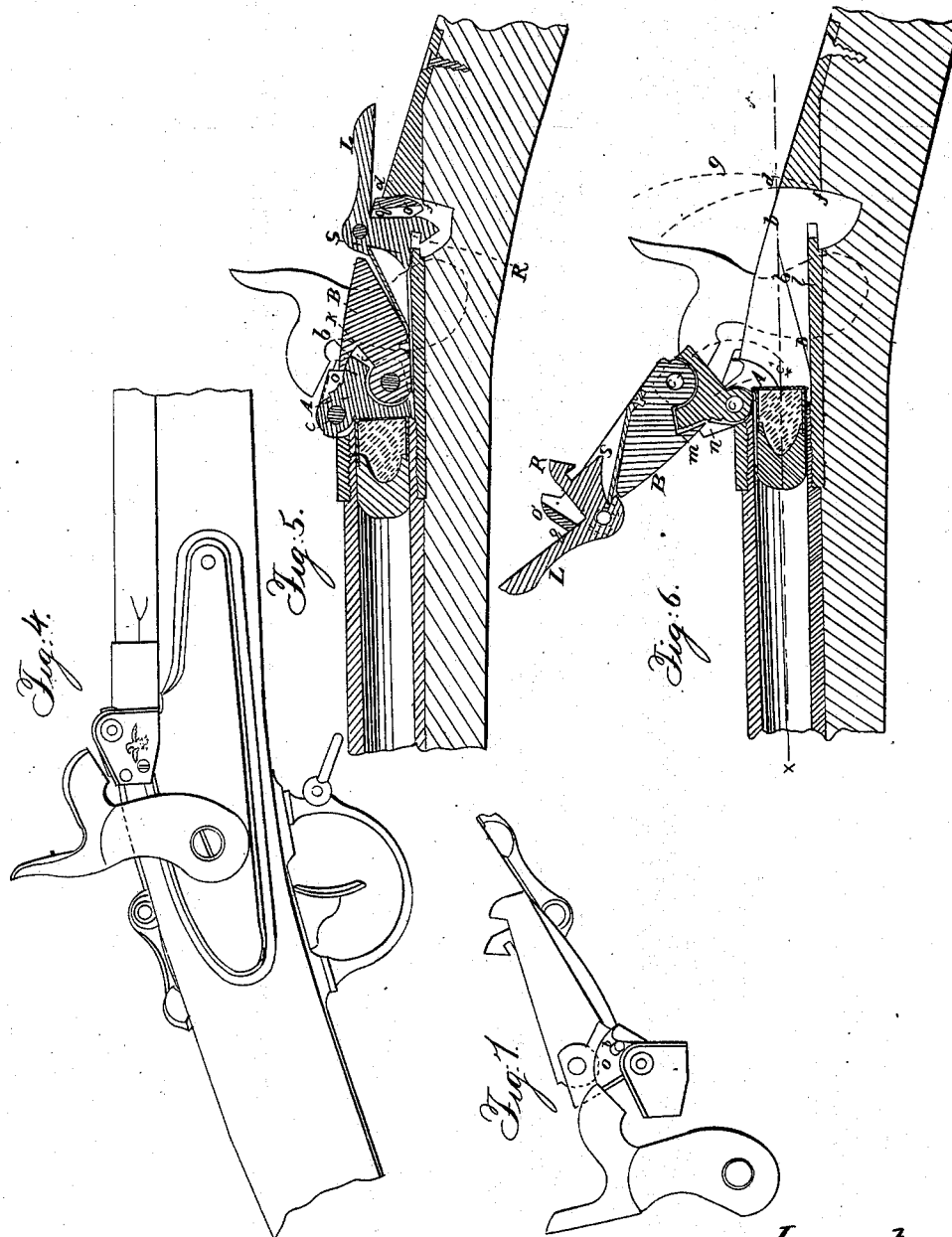
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BENJAMIN S. ROBERTS, OF UNITED STATES ARMY.

IMPROVEMENT IN BREECH-LOADING FIRE-ARMS.

Specification forming part of Letters Patent No. 52,887, dated February 27, 1866.

To all whom it may concern:

Be it known that I, BENJAMIN S. ROBERTS, of the United States Army, have invented a new and useful Improvement in Breech-Loading Fire-Arms; and I do hereby declare the following to be a full, clear, and exact description of my invention, which will be better understood by reference to the accompanying drawings, found on two separate sheets, the several figures in which will be sufficiently explained as they are hereinafter more particularly referred to.

My invention consists, in the first place, in contrivances so constructed and arranged that in raising the lever which works the swinging breech-plug in order to insert a second cartridge the piece is brought to a half-cock without fail.

It consists, secondly, in an adjustment and construction of parts by which, in the act of cocking the gun, the lever which works the breech-plug is brought home to its bearing, so that the piece may be safely discharged.

It consists, thirdly, in an arrangement by which the cartridge-shell, after being loosened by the retractor, shall fall to the earth by its own gravity whenever the muzzle of the piece is sufficiently elevated.

It consists, fourthly, in the use of a cam attached to an appropriate lever, by which the brace, which receives the shock of the explosion shall be started from its bed after the piece is discharged.

My invention is specially designed to be used in changing muzzle-loading arms into breech-loaders. For this purpose the lever which works the breech-piece should swing upward and forward, so as to avoid the necessity of cutting down through the stock or in any other way of requiring any essential change in its form and construction.

In order to enable those skilled in the art to make and use my invention the following more definite description is given.

A is a swinging breech-plug working around the pivot *c*. B is a lever or brace pivoted to this breech-plug at *c'*, and having a limited motion around that pivot, which is shown by the opening from *h* to *k*.

The arc *d f*, Figure 3, is described from the center of the pivot *c'*. The brace B extends to and is made to fit closely in this arc *d f*. It forms, with the swinging breech-plug, a sort of double-jointed lever.

The piece represented in the drawings is intended for the use of fixed ammunition, there being a fulminating compound arranged around within a little rim or flange at the base of the shell; but the invention may be readily adapted to other modes of discharging the gun.

Fig. 3 shows all the parts in readiness for the discharge. To effect this the piece is cocked and fired in the usual way. The hammer, instead of being formed with a cavity on its striking-surface, has that surface made flat, and is faced with steel. It is brought down on the firing-pin *o*, which is made nearly in the form of the sector of a circle whose center is *c*, around which it has a limited motion sufficient for the purpose intended. When the hammer strikes on the anvil of this firing-pin it forces the blunt point, which is at the other extremity of this sector, against the rim of the shell which contains the fulminate and thus causes the explosion.

In order to prevent this firing-pin from being driven so far forward as to cause a puncture of the metallic shell or case, I employ a pin, *b*, Fig. 7, which passes through a slot in the firing-pin and is made fast in the breech-plug A. The motion of the firing-pin is thus limited by the length of this slot. The lever L, which turns on its pivot *p*, is then raised, which disengages the hook R. The cam *s*, pressing upon the plate *l*, causes the brace B to turn on its pivot *c'* until its outer end rises sufficiently to clear the shoulder at *d*. By this time, and not before, the space *h k* should be closed, and the whole compound lever B A turns on its pivot *c*. As it rises the hook or catch *i* engages with the rim of the shell of the cartridge and partly retracts it, as is shown in Fig. 6. This shell being made slightly tapering, it becomes loosened by this retraction so as to fall out by its own gravity when the muzzle of the piece is sufficiently elevated, when the piece is ready for another cartridge. This being inserted, as shown at Fig. 6, the lever is brought down around its pivot *c*. Its outer end will strike upon the shoulder *d*, but a pressure being exerted upon the forward part of the brace B, in rear of the joint which separates it from the breech-plug A, the latter is turned around its pivot *c* until the cartridge is brought home and the pivot *c'* comes to the position shown in Fig. 3. The outer end of the brace B will then just fit into the arc *d f*, and the catch R,

urged by the spring *t*, holds the brace B securely in its place.

In order to take off all strain from the pivot *c'*, in consequence of the explosion, there should be rather more play around this pivot than there is around the rule-joint which separates the brace B from the breech-plug A. In that case the shock will be received upon the surface of the joint and not upon the pivot.

The joint uniting the breech-plug A to the brace B is so constructed as to admit of no more motion in the one direction than merely to bring the lever home to its position, as shown in Fig. 3, while in the other direction it permits the outer end of the lever to rise just clear of the shoulder *d* before the space between *h* and *k*, Fig. 3, is closed. In such circumstances it will be apparent that the recoil against the breech-plug would not tend to throw the brace B out of its seat even without the aid of the catch R, for that lever being rigid when in its seat, as shown in Fig. 3, the shock of the explosion would tend to turn the whole lever around the pivot *c*.

In Fig. 6 will be seen the two arcs of circles *f d* and *f g*. The latter of these is described around the center *c*, the former around the center *c''*, which is the position that the center of the pivot *c'* will occupy when the brace B is in its seat. The lever, therefore, as shown in Fig. 3, cannot be thrown from its seat by force of the explosion without forcing away the wedge of solid metal included between the arcs *f d* and *f g*, as shown at Fig. 6.

The first point of this invention is sufficiently shown in Figs. 5 and 7. Around the outer circumference of the firing-pin *o* is a cylindrical surface on which the face of the hammer is supported. It will be seen that as the brace B is raised from its seat, as shown in Fig. 5, the rear corner of the anvil will lift the hammer till it shall reach a distance from the pivot *c* equal to the radius of the sector-shaped firing-pin. The parts can readily be so adjusted that the sear of the lock will fall into the first notch in the tumbler, or it will be thrown past that notch so that it will fall into and remain in it when the brace B is thrown down again into its seat.

In regard to the second point of my invention, I construct my hammer with an overhanging shoulder, as shown at *v*, Fig. 1. When this hammer is drawn back its shoulder strikes upon a button, *x*, Fig. 2, and before the hammer can be brought to a full-cock the lever B is forced in this manner home to its seat, and the catch R engages with the projection provided for that purpose, as shown in Fig. 3.

The third point of my invention is shown in Figs. 2 and 6, wherein L shows the lever placed centrally over the breech.

R is the catch worked thereby, and *b' b'* are the slides placed on either side of this catch and of the brace B, which it holds in place while it receives the shock of the discharge.

The fourth point of my invention is illustrated in Fig. 5.

I construct the recess in rear of the chamber in such a way that its bottom or bed piece *b* is parallel, or nearly so, with the axis of the piece, and so that the brace B may receive the shock of the discharge in the line of its length, as shown at Figs. 5 and 6. The rear end of the brace abuts directly against the shoulder *f d*, so that no essential strain comes upon either of the pivots, as has been hereinbefore stated. But in order to prevent the cartridge-shell as it falls from the chamber of the piece from lodging against this shoulder or abutment *f d*, and thus requiring to be removed by the hand, I construct a sliding way on each side of this recess, which is shown in profile at *b'*, Fig. 6. These slides are so far apart as to leave the thickness of the brace B sufficiently great to enable it to resist the shock of the explosion, and still sufficiently near together to serve as a means of carrying the cartridge-shell above the shoulder *d*.

I am aware that a taper-shaped cartridge-shell has been partially retracted in the act of raising the actuating-lever, and I only claim such partial retraction when used in connection with such an opening in the rear of the cartridge-chamber that the shell will fall to the ground of its own accord when the lever is thrown forward and the muzzle elevated.

I have described a gun so arranged that the brace B shall rise upward and forward in leaving its seat after a discharge; but I do not intend to limit myself to this particular arrangement. The principle of my invention permits its various features to be applied when the brace is thrown downward or horizontally, and also when it is thrown backward; and I intend the patent to be as broad as the principle of the invention.

I am aware that several breech-loading fire-arms have been constructed, each having a swinging breech-piece which formed a portion of a double-jointed lever, the whole so constructed and arranged that when the breech-piece is brought home to its seat it is securely locked there by means of a double pivot, the whole working substantially upon the same principle as is above described, except that the strain is not taken off from the pivots and received upon the solid iron. Such an arrangement and construction I do not claim, except as hereinafter stated.

I am also aware that a single slide or way has been used to carry a cartridge-shell over a shoulder after it is loosened from its chamber; but this would not answer my purpose, as it would not permit the use of a brace, B, nor of the catch R, centrally located in the manner contemplated by me; but

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

1. In a breech-loading fire-arm, the cam *o*, so shaped and controlled that while it serves to fire the gun by means of its small projection and pin that strikes against the flange containing the fulminate when the breech-piece is brought home to its seat; also half-

cocks the gun when the breech-piece is swung upward after the gun is fired, and holds the breech-piece in its forward position while the cartridge is being inserted in its chamber in the act of reloading, substantially as described.

2. In a breech-loading fire-arm, the combination of the shoulder *v* and the pin *x*, by which the swinging breech-piece, if not entirely in its seat, is brought home there in the very act of cocking the piece, thus preventing an accidental discharge before the breech-piece is securely locked, substantially as above described.

3. In a breech-loading fire-arm intended for cartridges with metallic cases, and having a

swinging breech-piece with an open space in rear of the chamber for the insertion of cartridges and the retraction of the cases, the use of ways *b' b'*, in combination with the hook *R*, located between them, all substantially as and for the purpose described.

4. In such breech-loaders, the use of a cam, *s*, operated by a secondary lever, *L*, for the purpose of starting the brace *B* from its seat, as shown in Fig. 5, substantially as and for the purpose above described.

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