I. W. HEYSINGER.

LOCKS FOR FIRE-ARMS.

No. 194,680. Patented Aug. 28, 1877.

Fig 1

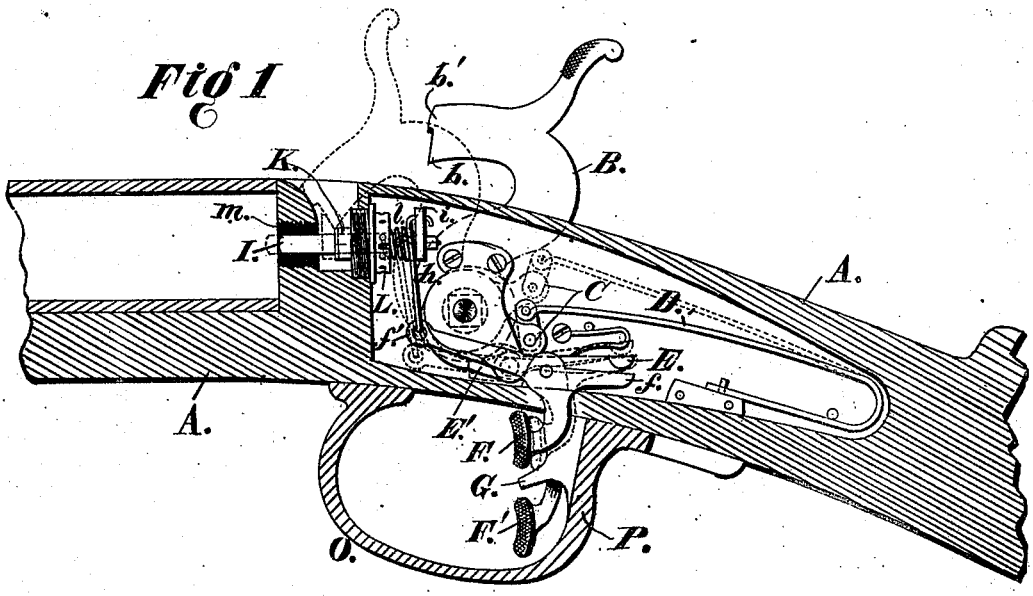


Fig 2

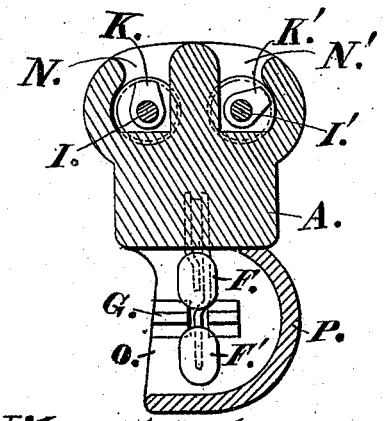


Fig 3

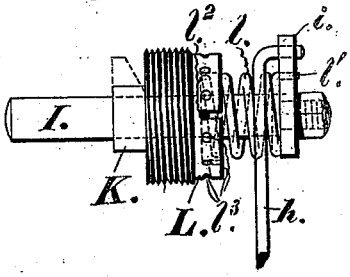
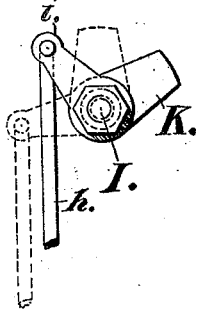


Fig 4



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IMPROVEMENT IN LOCKS FOR FIRE-ARMS.

Specification forming part of Letters Patent No. **194,680**, dated August 28, 1877; application filed February 2, 1877.

To all whom it may concern:

Be it known that I, ISAAC W. HEYSINGER, of Philadelphia, in the county of Philadelphia, State of Pennsylvania, have invented an Improved Discharging Mechanism for Breech-Loading Fire-Arms, of which the following is a full, clear, and exact description, reference being had to the drawing accompanying and forming part of this specification.

The first part of my invention relates to the construction and arrangement of the firing-pin and its attachments, whereby the gun, of which it forms part, may be secure against accidental discharge. At the same time, and in conjunction with this, the parts are so arranged that the firing-pin is disengaged from the exploded cartridge after firing, and retracted independently of the hammer, whereby the necessity for rebounding locks, with their complication of parts and loss of power, is done away with, and a better result at the same time secured.

The third part of my invention relates to the arrangement of the triggers of double-barrel breech-loaders, whereby greater security against accident is secured, and less liability of seizing the wrong trigger when about to fire, while all the parts are more compact and durable.

The fourth part of my invention relates to the construction of the trigger-guard, whereby the triggers are still further protected against accident.

Referring to the drawing, Figure 1 is a vertical longitudinal section through the right-hand firing-pin of a gun embracing my improvements, showing the lock in elevation beyond. Fig. 2 is a vertical transverse section through the firing-pin, at the point where the hammer engages with it. Fig. 3 is a side view of the firing-pin and its coacting parts removed from the gun; and Fig. 4 is an end view of the same.

The dotted lines in all the figures show the position of the parts when the hammer has just fallen—the full lines when the firing-pin is retracted, and in Fig. 1 the hammer is seen at full cock.

The lettering is uniform in all the figures, and well-known references are omitted.

The essential part of my invention consists in giving the portion of the firing-pin which is struck by the hammer in its descent a lateral, in addition to its forward and back, motion, and so connecting it with the trigger, or other similar part, that by the action of such part at the time of firing the piece, the firing-pin is brought under the falling hammer, and, when the blow has been given, by relaxing the pressure upon the trigger or like part, the end of the firing-pin slips aside from the face of the hammer into a recess provided therefor, and is then retracted by its spring, irrespective of the position or pressure of the hammer.

By this means very important results are secured. The firing-pin is automatically retracted, so as to allow the breech to be opened for loading, and the hammer may be snapped at will without the least danger of explosion, as it constantly passes alongside the firing-pin, and strikes only upon the solid breech-piece. Of course an obvious corollary of this idea would be to make the hammer adjustable to the firing-pin instead of the converse, but this construction would be clumsy, weak, and inefficient.

To fire the gun it is requisite to cock it and draw the trigger. When the firing-pin is erected the hammer descends upon it, and the piece is discharged. As soon as the finger is relaxed the lateral spring swings the firing-pin aside, the coiled spring throws it to the rear alongside the hammer, where it lies, sheltered from every blow or pressure, in a recess out of sight till the hammer is raised and the trigger again drawn. The firing-pin cannot be erected when the hammer is down. I use the ordinary gun-lock, save that the half-set in the tumbler may be advantageously filed out or omitted, as it is useless here. The face of the hammer is also made flat, as is shown, with a projecting portion to rest upon the standing breech-piece when the firing-pin is withdrawn. The drawing shows a back-action lock, but either form may be used.

Fig. 3 shows the firing-pin, and Fig. 1 its method of insertion. It will be seen that I prefer a firing-pin turning aside upon an axis in the line of the barrels, because I find it simpler and stronger in construction, and less liable to admit dirt or moisture to the interior portions of the lock, but a firing-pin the rear

end of which swings vertically upon its front end as a pivot would fulfill the object sought, and was the method originally adopted.

It will be noticed that the retracting-spring of the firing-pin, instead of being placed in a chamber in the forward portion of the standing breech, surrounds the rearmost extremity of said firing-pin, in rear of the standing breech altogether, and in the space occupied by the lock mechanism. By this construction the spring is easily accessible at all times, and weakening of the standing breech is avoided. The hammer, likewise, is made to strike farther forward, and nearer the point of impact upon the cartridge, while the horizontal firing-pin gives a direct face blow thereupon, instead of the usual sloping one.

The firing-pin lies in a horizontal line, its front end ready to engage with the cap of the cartridge, its rear passing backward through the breech-block into the space occupied by the lock mechanism. It is capable of end motion. The upper surface of the breech-block is cut down vertically at N, Fig. 2, to expose a portion of the firing-pin, and to admit the end of the hammer B. A shoulder, K, rises upon the exposed portion of the firing-pin, the rear face of which is struck by the descending hammer, and the firing-pin thus driven forward, as shown in the dotted lines, Fig. 1.

From the rear end of the firing-pin rises a crank-arm, *i*, fitted upon a square shoulder to prevent turning. The coiled retracting-spring *l* surrounds the firing-pin I in front of the arm *i*, and abuts against the rear of the screw-plug L, which is inserted to sustain the firing-pin I against recoil, and which fills the space through which the firing-pin I with its shoulder K was introduced.

An orifice, l^1, is seen in the arm *i*, through which passes an end of the coiled spring *l*. Its other end is seen at l^2, Fig. 3, where it engages in a slot in the rear face of screw-plug L. It is now plain that if the screw L is revolved to the right by means of a pin inserted in the holes l^3, Fig. 3, provided therefor, the coiled spring will be screwed up likewise, so as not only to retract the firing-pin, but also to throw the crank-arm *i* over to the right, and with it the shoulder K, by which means it is disengaged from the hammer when down, previously to being thrown back out of reach. By means of these holes l^3 the lateral tension of the coiled spring may be regulated at pleasure. Of course, if desired, a separate spring may be used for this purpose.

To the end of the arm *i* is attached a stirrup, *h*, the lower end of which is jointed to the long arm *f'* of the trigger F, the rear end of which engages with the dog of the sear E in the usual manner.

The modus operandi will now be as follows: The gun is at full cock, the finger is pressed upon the trigger F, the long arm *f'* descend, carrying with it the stirrup *h* and end of the crank-arm *i*, which tilts the stud or shoulder K into a vertical position. At this instant the arm *f* of the trigger F releases the sear E' from its notch in the tumbler, the hammer descends, and the gun is fired. The finger is now taken from the trigger, the side strain of the coiled spring *l* turns the firing-pin on its axis, the shoulder K escapes from beneath the hammer B, the firing-pin is suddenly sprung back by the coiled spring *l*, during which movement the arm *i*, stirrup *h*, and trigger-arm *f'* will have risen and drawn the trigger F forward to its place again. The hammer remains down. The entrance of the recess N, is filled by the hammer B, when down, and a bit of greased rag may be habitually kept under the hammer, effectually protecting the parts from rust or damp.

I have preferred introducing the firing-pin into its recess from the rear, but it may equally well be inserted from the front, and the sectional screw *m*, Fig. 1, will show how it may be done.

Now, this gun cannot be exploded by accident unless it be carried at full cock, which should never be done in any case, and some obstruction then catch upon the trigger, when a discharge may take place. To guard against this, however, I have modified the construction of the triggers and adjacent parts, and, while securing additional safety, I render the gun more useful, and stronger. Instead of placing the triggers one in rear of the other, I place them upon the same vertical line nearly, but one above the other, with a projection, G, between the two. So long as the finger lies in contact with the under surface of the gun-stock, the right barrel will be discharged, but when the finger lies against the guard, it will be the left. Hence no mistake can occur, and both barrels can be successively fired with the same finger with great rapidity, while accidental slipping from the front to the rear trigger will be avoided. The length of leverage is not changed, as the relative distances are the same, though in a different direction.

As an additional security I also inclose and cover the left side of the guard, so that, while the finger may be readily inserted from the proper side, accidental obstructions will be less liable to enter than if open through. This construction is seen at P, Figs. 1 and 2.

While these latter parts of my invention are more particularly adapted to sporting-guns, it is evident that the discharging mechanism will be found especially useful in breech-loading ordnance and military rifles, where accidents from loaded guns among large masses of men are so apt to occur. By a slight modification of the existing construction it is readily applicable to the Springfield and other guns of that class, as the firing-pin would act against the rear end of the pin which passes through the swinging breech-block, and which pin should then be horizontal, and, by being projected against said pin and into its recess, would securely lock the swinging block into position until the withdrawal of the finger

from the trigger, when the firing-pin would be retracted, and the gun would be ready for opening and loading without the necessity of half-cocking the piece. It is well also to remember that the rebounding lock is not adapted to the Springfield rifle, as the hook of the hammer assists in sustaining the swinging breech-block against rising by recoil.

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

1. A firing-pin for fire-arms capable of being swung out of reach of the hammer, and adjustable in relation thereto, constructed to operate substantially as and for the purpose described.

2. A firing-pin, I, provided with an impact shoulder, K, arranged to escape from under the face of the hammer B into a recess provided therefor, and to be retracted therein, substantially as described.

3. The firing-pin I, provided with a double-acting side and retractor-spring, *l*, and a swinging shoulder, K, in combination with the crank-arm *i*, the stirrup *h*, and a lever arranged to operate the same, the whole substantially as and for the purpose described.

4. A firing-pin for fire-arms arranged to be struck by the hammer in front of the retractor, substantially as described.

5. The combination of the firing-pin I, provided with the impact shoulder K, the retractor-spring *l*, and the adjustable screw-plug L, for regulating the tension of the same, the whole constructed to operate substantially as and for the purpose set forth.

6. The trigger F, in combination with a firing-pin arranged to be swung out of reach of the hammer B, the whole constructed to operate substantially as and for the purpose described.

7. The arrangement, in a double-barrel gun, of the finger-pieces of the triggers F F′, one above the other, substantially as and for the purpose described.

8. In a fire-arm, the trigger-guard O, permanently closed upon one side, the other being left open for the reception of the finger, substantially as described.

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Witnesses:

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