

UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN REVOLVING FIRE-ARMS.

Specification forming part of Letters Patent No. 17,032, dated April 14, 1857.

To all whom it may concern:

Be it known that I, JOSIAH ELLS, of Pittsburg, county of Allegheny, and State of Pennsylvania, have invented a new and useful Improvement in Revolving-Breech Fire-Arms; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the annexed drawings, forming part of this specification, in which—

Figure 1 is a longitudinal section of a revolving-breech pistol constructed with my improvements. Fig. 2 is a side view of a similar pistol, a portion of the lock-plate being removed to show details of the lock. Fig. 3 is a sectional side view of the stock, lock-plate, and lock, showing the reverse side of the lock to that exhibited in Figs. 1 and 2. Fig. 4 is a perspective representation of the rotating breech. Fig. 5 is a sectional side view of the lock-frame, all the works of the lock being removed. Fig. 6 is a view of the under side of the lock-frame, Fig. 5. Fig. 7 is a front view of the rotating chambered breech. Fig. 8 is a perspective representation of the trigger-spring. Fig. 9 is a side view of the spring and pawl for cocking the pistol, detached from the trigger. Fig. 11 is a perspective view of the trigger constructed as shown in Figs. 1 and 2. Fig. 12 is a perspective view of the hammer constructed as shown in Figs. 1, 2, and 3. Fig. 17 is a side view of the trigger, being the reverse side to that shown in Figs. 1 and 11. Figs. 13 and 15 show different modifications of the construction and arrangement of the trigger and hammer. Figs. 10 and 16 represent the trigger, and Fig. 14 the hammer, constructed as shown in Fig. 15.

The red lines on Fig. 12 indicate the slight variation of construction of the hammer required by the arrangement shown in Fig. 13. The trigger used in that arrangement is precisely like that shown in Fig. 17.

In the several figures like letters of reference denote similar parts of my pistol.

In Fig. 1 the several parts of the lock are shown in a state of rest, as they appear before the trigger is drawn back or the hammer raised to full-cock.

In Fig. 2 the pistol is represented at full-cock, the trigger being drawn back or the hammer raised, the hammer being prevented from falling until the trigger is still farther drawn back

by the spring-pawl attached to the trigger, resting in a notch in the toe of the hammer, also showing the action of the trigger-spring in locking the rotating chambered breech.

Fig. 3 shows the trigger drawn fully back and the hammer fallen. When the trigger is released the several parts of the lock assume their first position, (shown in Fig. 1,) ready for repeated action.

The pistol represented in the drawings, being in several respects similar to that for which Letters Patent of the United States were granted to me on the 1st August, 1854, and other parts being common to fire-arms of this description, will need in those respects no detailed description.

My invention consists in the use and combination of a hammer, trigger, and spring-pawl so constructed and arranged, as herein-after described, that the breech may be rotated and the hammer raised to and retained in position at full-cock, preparatory to firing, either by pulling the trigger or by lifting the hammer by hand, so that the pistol may be cocked by the hammer, or cocked by pulling the trigger, or fired without standing at full-cock, at pleasure; also, in dispensing with the use of a separate locking-bolt or other device for preventing the motion of the rotating chambered breech, and holding it securely in the proper position, when the pistol is fired, by constructing the trigger-spring and rotating breech in such a manner as to effect the same object, thus simplifying the construction of my lock, and rendering it less liable to get out of order.

To enable others skilled in the art to make and use my invention, I will proceed to describe the construction and operation.

In the several figures, *S* is the stock of the pistol. *b* is the lock-plate. *c* is the barrel; *d*, the revolving chambered breech. The arbor *e*, attached to the lock-plate, projects parallel to the axis of the barrel far enough to enter or pass through the bracket *h* of the barrel, and a key, *l*, passing through the bracket and through a hole in the arbor, fastens the barrel in its place, and the screw-head *s*, inserted into the bracket immediately above the key *l*, prevents its dropping out when pushed back, to allow of the removal of the breech and barrel.

The rotating chambered breech *a* is made of

the usual form and construction, the nipples f f being set in deep recesses in the rear end of the breech.

Through the center of the rotating breech d is a bore, g , of the exact diameter of the arbor e , the breech rotating on the arbor as its axis. Close around this bore g , at the rear or nipple end of the rotating breech, is a circular row of ratchets or teeth, i , equal in number to the chambers in the breech. These teeth i project from the end of the breech d , close to the end of the bore g , and (when the breech is in place on its arbor e) enter a circular recess, n , in the lock-plate around the base of the arbor e , when it is united to the lock-plate, (see Figs. 1 and 3,) and the finger k , (the point of which enters the recess n around the arbor,) being attached by a pin, a' , to the trigger o far enough back of the center-pin a of the trigger o to give the requisite motion and leverage when it is raised by drawing back the trigger in the act of firing, engages one of the ratchets or teeth i and moves the rotating breech d round just far enough to bring the nearest chamber in exact line with the bore g of the barrel c , as shown in Fig. 1. On the return of the trigger o , after firing, the finger k is drawn down again so far as to engage the next tooth i in the ratchet, and thus the rotating breech is moved round the distance of one chamber each time the pistol is fired.

The trigger o is attached to the lock-plate by the center-pin a , which is immediately under the nipples f f when the rotating breech d is in place. The trigger o is furnished with a vibrating stud, q , and its spring r , which operates in conjunction with the bevel-edged hammer m , with notch in its toe, exactly as described in the specification to my patent of 1st August, 1854, before referred to.

The trigger-spring u , of the shape shown in Fig. 8, is attached to the lock-plate at one extremity by the screw s^3 . The other end passes over, without touching, the top of the trigger o , and rests on the trigger o , to the rear of the center-pin a , so as to keep the trigger pressed forward. This spring u rests on the trigger o only at its point, for as it passes over the center of motion of the trigger it would fail to serve its purpose as a trigger-spring if it came in contact with the trigger on both sides of its center-pin a . The spring u is curved near the end which rests on the trigger, for the double purpose of preventing any part of the spring but the point touching the trigger o , and also so as to form a projection or shoulder, n' , (see Fig. 8,) which is just large enough to enter a slit or groove, v , in the lock-plate, (see Figs. 3, 5, and 6,) immediately under the base of the arbor e , close to the recoil-shield of the lock-plate.

When the trigger o is at rest, before it is drawn back, the shoulder or stock n' of the spring u lies below the slit or groove v , without entering it, as in Fig. 1; but as the trigger is drawn back the end of the spring u , press-

ing on the trigger, is raised up and enters the groove or slit v , projecting into the space between the lock-plate and the arbor e occupied by the rotating breech d , as seen in Figs. 2 and 3. Here it enters a small curved recess, t , in the circumference of the rotating breech d , (see Figs. 2 and 4,) one such recess t being placed on side of each nipple f in the space between the deep recesses for the nipples. This serves as a stop to prevent the further rotation of the breech in the direction in which it is moved by the finger k , while the finger k , pressing against its ratchet i , prevents its returning in the other direction. It is thus held firmly in place from the time the pistol is cocked by the drawing back of the trigger, as seen at Fig. 2, until the pistol is fired, (see Fig. 3,) the finger k holding it on one side and preventing its turning backward, and the shoulder n' on the spring u pressing against the side and face of the recess t , preventing its further progress forward. So soon, however, as the trigger o is released after firing and the parts of the lock resume their first position (see Fig. 1) the stop or head n' of the spring u recedes from the groove v , the finger k is lowered by the returning of the triggers, and the rotating breech d is then free to be turned by hand at pleasure if the point of the hammer is raised enough to be discharged from the recess in the breech d .

I will now proceed to describe the construction and operation of parts of the lock used in cocking and firing the pistol.

The hammer m is attached to the lock-plate by its center-pin a^2 , on which it swings, the mainspring x acting through the bridle q on the heel of the hammer m below and slightly back of the hammer-pin a^2 . The vibrating stud p of the trigger o , which rests on the toe of the hammer m , is placed near the extremity of a cam-like projection, o' , from the rear of the trigger o , and operates to raise hammer to full-cock, in the manner described in the specification to my patent of August 1, 1854.

Immediately above the extremity of the toe of the hammer m is a notch, y , (see Fig. 12,) to receive the point of the pawl w . This pawl is of the shape shown in Fig. 9, and is swung on the center-pin a of the trigger o . It is pressed up to the face of the hammer by the hair-spring t' , but is prevented from getting out of place and falling down by the vibrating stud p , as seen in Figs. 2 and 15. This pawl w and notch y do not prevent in any way the cocking and firing of the pistol by pulling the trigger o , as the vibrating stud p prevents the detention of the hammer m at full-cock, if the trigger be drawn fully back, by forcing the pawl w out of the notch y in the toe of the hammer; but the pistol may also be cocked by drawing back the hammer by means of the thumb-piece or ear z , in which case the trigger acts as a hair-trigger, and the pistol is fired by a very slight touch, which is very desirable when steadiness of hand and accuracy of aim are re-

quired. To effect this the hammer *m* is constructed as shown in Fig. 12, having a claw, *b'*, curving forward from its heel.

The operation of the lock as thus constructed will be seen by Figs. 1 and 2. When the hammer is drawn back the claw *b'*, resting on the under side of the cam *o'* of the trigger *o*, immediately under the vibrating stud *p*, elevates the cam *o'* and draws back the trigger *o*, while the point of the pawl *w* slides down the face of the hammer until it reaches the notch *y*, into which it drops or is pressed by its spring *v'*. Now, if the hammer *m* could be drawn still farther back, so as to cause the vibrating stud *p* to pass the toe of the hammer, this pawl *w* would be forced out again and the hammer *m* fall; but this is prevented by the claw *b'* on the hammer, which passes into the recess of the trigger formed by the projecting cam *o'*, and, pressing against the trigger *o*, secures the hammer and trigger in their position as full-cocked, as shown in Fig. 2. When in this position a slight touch on the trigger will cause the vibrating stud *p* to force the pawl *w* out of the notch *y*, and the hammer *m* to instantly fall and fire the pistol.

So far as the construction and arrangement of the hammer and trigger just described are concerned, they are similar in principle to other fire-arms heretofore used and patented by me, my improvement consisting in the devices used for making a trigger-cocking fire-arm susceptible of being also cocked, and with greater certainty, by manipulating the hammer.

In describing this part of my improvement I do not wish to confine myself to the exact arrangement and construction of parts already described, nor to the use of the pawl *w* and claw *b'* on the hammer, as other equivalent devices, being merely modifications of the same principle and effecting the same result, may be used, a few of which I will briefly describe.

In Fig. 15 the hammer *m*, instead of having a claw of the shape shown in Figs. 1, 2, and 12, has a projection, *e'*, under the toe of the hammer, so placed as to form a groove or slot, *e'*, (see Figs. 14 and 15,) wide enough to receive the vibrating stud *p* of the trigger *o*, the pawl *w* on the trigger being constructed and arranged as before described. The vibrating stud *p* traverses the slot *e'* when the hammer is cocked by the trigger; and when the cocking is accomplished by drawing back the hammer, the under side of the groove *e'*, being the upper edge of the projection *e'*, pressing on the vibrating stud *p* of the trigger *o*, raising the cam *o'* of the trigger *o*, draws the trigger back far enough for the pawl *w* to drop into the notch *y* at the toe of the hammer *m*, and when in this position the projection *e'*, pressing upward against the vibrating stud *p*, prevents being drawn too far back, while a slight touch of the trigger will release the pawl *w* and fire the pistol.

Another modification is shown at Fig. 13, where the use of the pawl and the notch into

the toe of the hammer is dispensed with, and in place of it a catch, *d'*, which has a slight vibrating motion, is placed on the hammer-pin *a'* in a recess in the side of the hammer. The projecting finger of this catch *d'* fits on a recess in the toe of the hammer *m*, but is pressed down to the position shown in Fig. 13 (which is as far as it can go) by the slight spring *t'*. This arrangement cocks the pistol as effectually when the hammer is raised by the trigger as when raised by the hand, with the difference only that the trigger may be drawn back so far in the hurry of cocking as to fire the piece without allowing it to rest at full-cock.

The operation is as follows: The vibrating stud *p* in the trigger *m*, pressing on the under side of the projecting arm of the catch *d'* and forcing it into its recess, raises the hammer until it passes the extremity of the projecting arm, but has not passed over the point of the toe of the hammer. The spring *t'* then causes the catch *d'* to drop, forming a notch, in which the vibrating stud *r* rests securely. When the hammer is raised by hand the claw *b'*, similar to that used in Figs. 11, 12, pressing under the cam *o'* of the trigger, prevents the hammer being raised too far, as before described.

The modifications of the principle involved in this part of my invention may be various; but being equivalent devices, I need refer to no others, as I do not desire to confine myself to the exact construction and arrangement of parts described.

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

1. The use of a self-acting spring-stop operating directly by the trigger, in combination with suitable recesses, *t t*, in the revolving chambered breech, or their equivalents, for the purpose of locking the breech at the moment of firing and leaving it free to rotate at other times, substantially as described.

2. Making a cam, *o'*, for the bearing of the trigger-spring on the trigger back of the center, on which it springs in order to admit of easy play and short motion of the spring where a long sweep of the trigger is necessary.

3. Constructing and arranging the trigger-spring in such a manner as to serve the double purpose of a trigger-spring and spring-stop for locking the bolt, as hereinbefore described.

4. The combination and arrangement of the claw *b'* and notch *y* on the hammer, the pawl or catch *w*, and cam *o'* on the trigger or other equivalent devices for the purpose of retaining the hammer in their respective positions when at full-cock, and for effecting the rotation of the breech and cocking of the hammer preparatory to firing, either by lifting the hammer or pulling the trigger, substantially as hereinbefore described.

JOSIAH ELLS.

Witnesses:

L. P. STONE,
W. DUDLEY KING.