H. M. ERSKINE.
Revolving Fire-Arm.

No. 207,168. Patented Aug. 20, 1878.

Fig. 1.

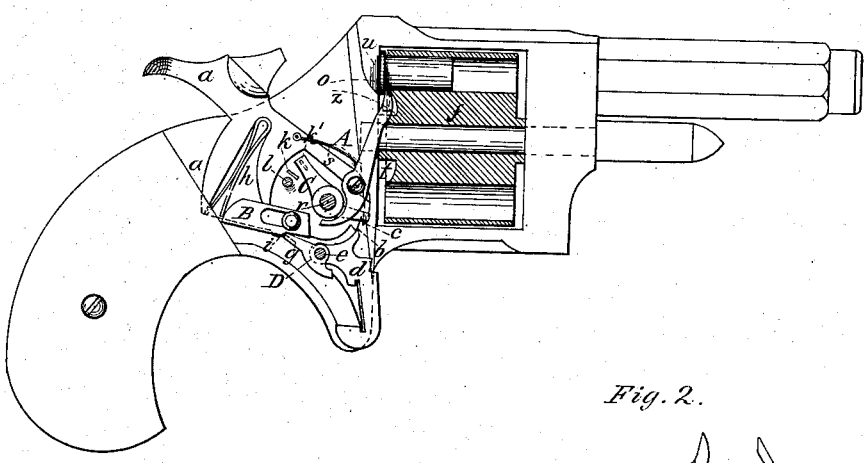


Fig. 2.

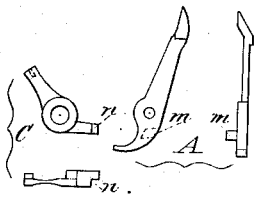
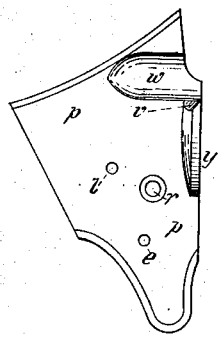


Fig 3



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HENRY M. ERSKINE, OF ILION, NEW YORK.

IMPROVEMENT IN REVOLVING FIRE-ARMS.

Specification forming part of Letters Patent No. **207,168**, dated August 20, 1878; application filed March 23, 1878.

To all whom it may concern:

Be it known that I, HENRY M. ERSKINE, of Ilion, Herkimer county, New York, have invented certain new and useful Improvements in Revolving Fire-Arms, of which the following is a specification:

In the construction of revolvers it has long been a desirable object to provide a device for automatically extracting the cartridge-shells after each shot; but the requirements necessary in a device of this class are of such a nature that heretofore they have not been fully satisfied. In the first place it is necessary that the extractor be entirely automatic in its action and operated by the ordinary motions of the lock mechanisms, yet without in the least interfering with its usual functions or requiring other attention than that necessary in the usual movement of hammer and trigger. Moreover, while the extractor must effectually remove the empty shells after each shot, it must, on the other hand, be so organized as to become restrained in its extractive function when the weapon is freshly loaded, so as to avoid the extraction of a loaded shell when the hammer is raised for a first shot, while this function must be again immediately restored to remove the empty shells at each subsequent cocking, and all this must be accomplished unconsciously or automatically, else the device is of little practical value.

It is therefore the object of my invention to fulfill these requirements, and to provide an extractor which will perform all the above-mentioned functions in an entirely unconscious and automatic manner, without in any way interfering with the ordinary mechanism of the cylinder and lock, but accomplished solely by the usual movements of the mechanism of the pistol in cocking, firing, or loading.

Cartridge-extractors have been heretofore devised for revolving arms designed to accomplish the extraction automatically, yet not in a manner fully satisfactory, while the restraining operation to miss the loaded shell at the first shot has not been heretofore effected automatically, it being a more difficult problem.

In one form of extractor a prying-lever has been employed which catches under the flange of the shell and is actuated by the sudden fall of the hammer in firing; but this arrangement is objectionable, as the hammer should then be free to exert its full force on the explosion of the cartridge. In another form of device, however, the extractor has been actuated by the movement of the hammer in cocking; but in this case the extracting device consists of a sliding bar hooked at the point to catch under the flange of the shell, and so organized as to quickly act during the short interval of half-cocking and before the cylinder begins to revolve. It thus requires to act very suddenly, and hence with little power, and necessitates a modification in the movement of the cylinder and lock to suit its operation, all of which is objectionable.

Now, in my invention I employ a prying-lever the point of which catches under the flange of the shell; but this lever is actuated by the movement of the hammer in cocking, and its prying action on the shell is gradual and positive during the whole, or nearly the whole, movement of cocking, commencing to act upon the shell as it leaves the recoil-shoulder and while the cylinder is revolving, and continuing to act gradually and with great leverage to pry the shell loose till the hammer reaches full-cock, when it receives a quick movement from the blow of a spring-bolt released at or near the point of full-cock, and which throws out the loosened shell, these movements being effected with ease and precision without in any way interfering with the ordinary motions of the cylinder and lock.

My invention may therefore be stated to consist in the combination, with the hammer, of an extracting pry or lever so arranged and connected with the hammer that the first movement of the hammer in cocking forces the extractor gradually and positively against the cartridge-shell to loosen the same, while the terminating movement of the hammer in cocking imparts a final quick motion to the extractor to eject the shell; in the combination, with the lock mechanism, of a shell-extractor actuated by the movements of the lock mechanism, and so combined and arranged relatively thereto that the movement of half-cocking serves to lock the extractor and render it inoperative, so as to miss the loaded shell at the first shot, while the movement of full-cocking unlocks the extractor and permits

the extraction of the empty shells at each subsequent cocking; in receding bevels formed on the casing of the cylinder to admit the gradual retraction of the shell by the action of the pry as soon as possible after leaving the recoil-shoulder, and to continue it as long as possible before the chamber acted on passes the shell-ejecting aperture of the breech or casing; and in other minor features, as hereinafter fully set forth.

In the annexed drawings, Figure 1 is a longitudinal view, partly in section, of an ordinary revolver provided with my improved extractor. Fig. 2 is a view of a portion of the extractor mechanism removed, and Fig. 3 repsents the inclosing side plate removed.

In the drawings, *a* is the hammer, moving on the pivot *r*, and provided, as usual, with the half and full cock notches *b c*. *d* is the trigger, hung on the pivot *e*, and engaging with the hammer in the usual manner. A is the prying or extractor lever, which is pivoted on the hammer, as shown, and moves with it. The long arm of this lever projects toward the chambers of the cylinder *f*, being pressed forward by a light spring, *s*, and is pointed to easily catch under the flange of the cartridge-shells, as represented, the point working in an annular groove, *t*, formed on the cylinder within the circle of the chambers, as represented. B is a spring-bolt, which is also carried by the hammer and slides thereon, as will be understood.

Now, as the hammer is cocked the lever A rises with it, and its point wedges itself under the flange of the shell, thus prying it from the chamber. By the time the shell is well loosened through the prying action of the lever the hammer reaches full-cock, as represented, and the spring-bolt B, which has been drawn back by the action of cocking, now becomes suddenly released, and, striking suddenly against the short arm of the lever A, thus forcibly ejects the loosened shell.

In Fig. 1 the hammer is shown just near full-cock, and at the point where the spring-bolt B becomes released. The bolt is slid back and released at the proper time by its engagement with a tripping-pawl, D, which is hung on the same pivot with the trigger. The nose of the pawl engages with a shoulder, *g*, on the bolt, and it will be understood that as the hammer is cocked the bolt, moving with it and pressing against the pawl, which is stationary, is slid backward against the spring *h*; but by the time the hammer reaches full-cock the pawl strikes and rides over an incline, *i*, on the lower edge of the hammer, thus releasing the bolt, which becomes forcibly thrown by the compressed spring *h* against the extractor-lever A.

It will thus be seen that the first motion of the extractor A is therefore a gradual, positive, and powerful one by the direct motion of the hammer, which pries the shell loose with great leverage. The second motion is a sudden one from the flying of the bolt, and which throws out the loosened shell. Thus, by each successive motion of the hammer to a full-cock each shell is successively ejected.

It will be understood that the greatest effort of the extractor is first required to loosen the shell in the chamber, after which it is easily ejected. In my device this loosening takes place under great mechanical advantage, as the longest available interval is given to its accomplishment—viz., the full movement of cocking—yet without interfering with the ordinary lock and cylinder movements.

The extractor commences its gradual positive action upon the shell just as or a little before it leaves the recoil-shoulder, and continues to so act till the hammer reaches full-cock and the shell comes opposite the ejecting-aperture of the casing, when it receives the final quick movement to throw out the shell, as described.

The extractor is thus rendered very effective in its action, while in former devices the extractor had to act either suddenly during the sudden fall of the hammer or rapidly during the short inverval of half-cocking, in either case obviously having less power, and more liable to become deranged.

In order to admit this gradual motion of the shell as soon as possible after leaving the recoil-shoulder, and to be continued as long as possible before passing the ejecting-aperture, the casing in rear of the cylinder is provided with a receding bevel, as shown at *u*, Fig. 1, running forward and downward to the edge, or a little beyond the edge, of the recoil-shoulder, and also preferably with another receding bevel, *v*, Fig. 3, on the edge of the flange *y*. These bevels, as will be understood, admit the earlier commencement of this movement and its longer continuance than if these surfaces were straight, as in the usual manner.

The ejecting-aperture of the casing is formed partly by a groove, *w*, in the inclosing-plate *p p*, as seen in Fig. 3, the end of which terminates in a rounded or inclined surface, as represented, which serves to deflect the shell laterally.

Instead of employing a spring-bolt, as described, to impart a final quick motion to the extractor, the same effect may be produced by arranging the short arm of the extractor A to strike a fixed point in the handle of the pistol, so as to impart the final quick motion thereto in a positive manner by the terminating movement of the hammer; but the use of the spring-bolt is thought more effective.

The other important feature of my invention, and the one more difficult to understand, will be now described.

It will be understood that when the cylinder of the revolver is freshly loaded it would not do to have the loaded cartridge extracted by the cocking of the hammer to fire the first shot. A device is therefore used which restrains or locks the extractor by the act of

half-cocking when the cylinder is to be loaded, so that when the hammer is afterward raised to a full-cock for the first shot the extractor moves out idly without performing any extractive action. This is effected by the little detent or elbow-lever C, which is hung on the same center as the hammer, and lies in a cavity therein, as represented. This detent has two arms, one of which acts as a spring-catch to engage with either of two notches, *k k'*, on the hammer, so that it may be held in either of two positions. The other arm projects toward the nose of the trigger, and is provided with a shoulder or projection, *n*, which corresponds to a similar shoulder, *m*, on the inner surface of the short arm of the lever A, which overlies the arm of the detent C, as shown more fully in Fig. 2. Now, when the hammer is raised to a half-cock (to permit the free rotation of the cylinder to insert the loaded cartridges) the nose of the trigger, in the act of falling into the half-cock notch, passes under the detent and forces it upward, thus causing the shoulders *m n* on the detent C and lever A to interlock, and at the same time shifting around the detent so as to engage with the other notch, *k*, thus locking the extractor-lever A fixedly to the hammer, so that when the hammer is let down from the half-cock after the loading, and is then raised to a full-cock to fire the first shot, the lever A, being thus locked to the hammer, moves bodily with it without making any extractive action on the loaded cartridge, the path of its extracting-point being in this case an arc, *z*, struck from the center of the hammer, while, when the lever is unlocked and its extractive function in action, the path of its motion is represented by the line *o*.

Now, on the other hand, it will be understood that after the first shot is fired the extractor should be unlocked and come into action at the cocking for a second shot, so as to remove the shell previously fired and all subsequent ones. This is effected as follows:

When the hammer is cocked for the first shot, the extractor, being locked, as described, makes no extraction; but as the hammer reaches the full-cock the catching end of the detent strikes a fixed pin, *l*, in the pistol-handle, and becomes shifted back into the first notch, *k'*, as seen in Fig. 1, thus unlocking the extractor and permitting it to perform its functions, so that when the hammer is raised for the second shot the extractor comes into full action and ejects the shell of the cartridge fired at the first shot, and so continues to act on all the subsequent shells.

Thus the act of half-cocking to load locks the extractor and prevents its ejecting a loaded cartridge at the first shot, while the act of full-cocking for the first shot unlocks the extractor and permits its full action at each subsequent cocking, so as to remove the shells after each shot.

My improved extractor is thus entirely automatic in its action, so that the extraction of the empty shells, as well as the avoidance of the loaded shells, is accomplished in an entirely unconscious manner by the ordinary conscious movements of the lock mechanism, thus accomplishing the desirable objects of the invention, and constituting an important improvement in devices of this class.

The fixed pin *l*, which effects the unlocking of the extractor, may be made movable, so that it can be shifted from the outside of the casing, when desired, to allow the extractor to remain locked and inoperative continuously, or for an indefinite time, if so desired.

The features which I claim as novel, and as constituting my invention, are as follows:

1. In a revolving fire-arm, the combination, with the hammer *a*, of the shell-extracting prying-lever A, pivoted to and moving with the hammer, and so arranged and connected with the hammer that the first movement of the hammer in cocking forces the prying end of the lever gradually and positively against the cartridge-shell to loosen the same, while the terminating movement of the hammer in cocking imparts a final quick movement to the extractor to eject the shell by the blow of a spring-bolt or its equivalent applied to the opposite end of the lever, substantially as herein shown and described.

2. The combination, with the extractor A, which is actuated positively by the first movement of the hammer, of the spring-bolt B, depressed by the first movement of the hammer, and released at the terminating movement to impart a final quick motion to the extractor, substantially as shown and described.

3. The combination, with the hammer *a* and extractor A, of the locking-detent C, which is actuated by the movement of the hammer in one direction by contact with the nose of the trigger or other definite fixed point, and in the other direction by contact with the fixed pin *l* or other definite point in the casing, to effect the locking or unlocking of the extractor, to restrain or restore its extractive function, substantially as shown and described.

4. In a revolving fire-arm provided with a shell-extractor, the receding bevels *u* and *v* on the cylinder-casing, either or both, substantially as and for the purpose set forth.

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Witnesses:
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EDWARD H. WALES.