(No Model.) 2 Sheets—Sheet 1.

# B. MERRITT.

## REVOLVING FIRE ARM.

No. 338,760. Patented Mar. 30, 1886.

Fig. 1.

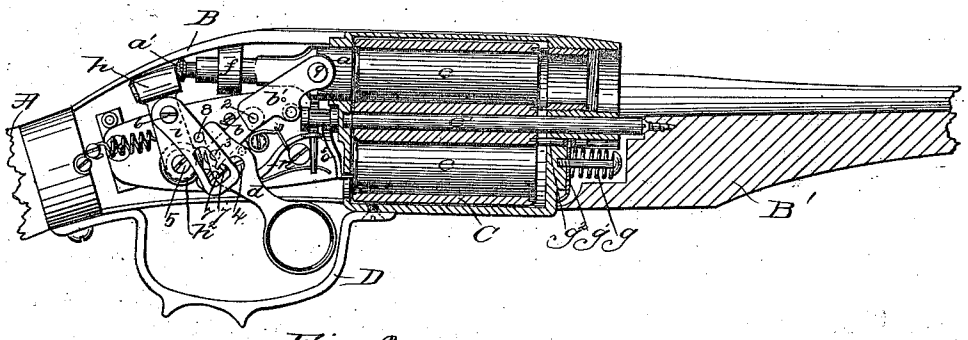


Fig. 2.

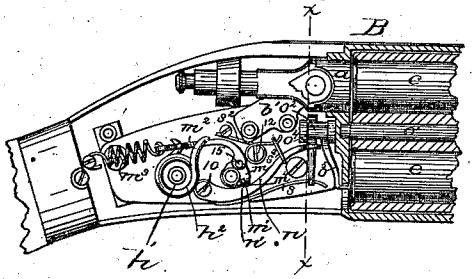


Fig. 3.

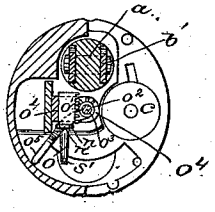


Fig. 4.

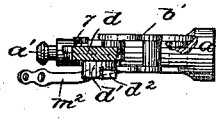


Fig. 5

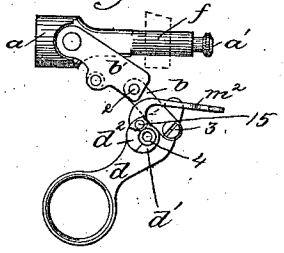
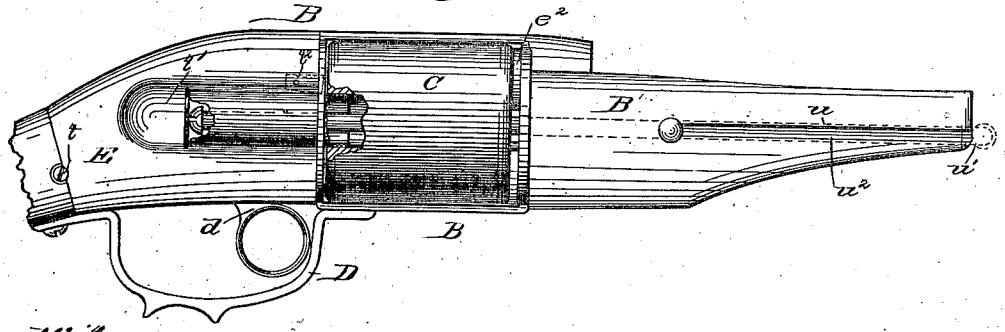


Fig. 6.



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(No Model.)

2 Sheets—Sheet 2

# B. MERRITT.

## REVOLVING FIRE ARM.

No. 338,760. Patented Mar. 30, 1886.

Fig: 7.

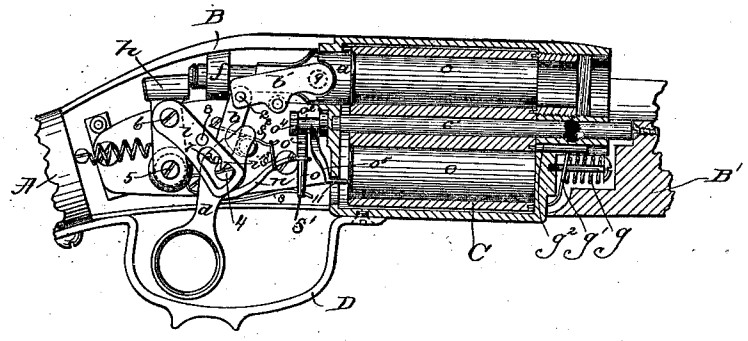



Fig: 8.

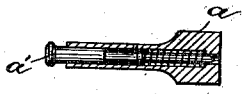



Fig: 9.

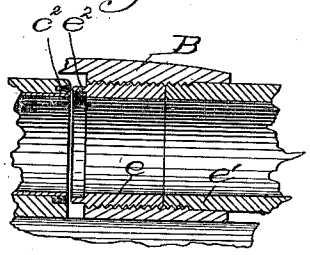
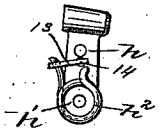



Fig: 10.

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# UNITED STATES PATENT OFFICE.

BENJAMIN MERRITT, OF NEWTON, MASSACHUSETTS.

## REVOLVING FIRE-ARM.

SPECIFICATION forming part of Letters Patent No. 338,760, dated March 30, 1886.

Application filed May 22, 1885. Serial No. 166,781. (No model.)

*To all whom it may concern:*

Be it known that I, BENJAMIN MERRITT, of Newton, county of Middlesex, and State of Massachusetts, have invented an Improvement in Revolving Fire-Arms, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to and is intended as an improvement upon that class of fire-arms shown in Patent No. 233,363, granted to me October 19, 1880, and has for one of its objects to tightly press a cartridge into its chamber and securely hold it by means of a pressure-block while being exploded, the pressure-block also simultaneously forcing the cylinder forward upon an annulus attached to the frame-work and in line with the open rear end of the barrel, the said annulus preventing the escape of the powder-gases.

My invention also has for its object to provide suitable means for moving the said pressure-block and to operate the hammer to strike the firing-pin; also, to provide means for storing up a power during the backward movement of the trigger, which may be expended during the forward movement of the trigger to revolve the cylinder; also, in various other details wherein the construction and operation of a fire-arm of the class above referred to may be improved.

The invention consists in a cylinder to receive cartridges and its frame, combined with a horizontally-sliding cartridge-pressure block adapted to bear against and securely hold the cartridge therein, as will be described; also in a cartridge-receiving cylinder provided with annular grooves concentric with the chamber, and the frame to receive the cylinder provided with an annulus in prolongation of the barrel, combined with a horizontally-sliding cartridge-pressure block to bear against the cartridge to be fired and move the cylinder longitudinally, whereby the grooved part of the cylinder is forced upon the said annulus to prevent the escape of gas; also, in the combination, with the horizontally-sliding cartridge-pressure block, of the trigger and connecting mechanism for moving the said pressure-block; also, in the combination, with the cartridge-pressure block, its firing-pin, the trigger and connecting mechanism, of the hammer, and means, substantially as will be described, for operating the same to strike the firing-pin; also, in the combination, with the trigger, of mechanism operated thereby during its backward movement, said mechanism co-operating with the cylinder and revolving the same automatically during its forward movement; also, in other details of construction, as will hereinafter be pointed out in the claims at the end of this specification.

Figure 1 shows in side elevation a portion of a fire arm embodying my invention, the cylinder and its frame being in longitudinal section, the face-plate of the frame being removed to fully show the operating mechanism; Fig. 2, a similar view, the trigger, hammer, and connecting-link and a portion of the compound link connecting the trigger with the pressure-block being removed; Fig. 3, a cross-section of Fig. 2 on the dotted line *x x;* Fig. 4, an under side view of the cartridge-pressure block, trigger, and compound link connecting the same; Fig. 5, a rear side view of the cartridge-pressure block, trigger, and connecting mechanism; Fig. 6, a side elevation of a portion of the fire-arm, the face-plate being applied; Fig. 7, a similar view to Fig. 1, the trigger being in its backward position and the co-operating parts correspondingly changed; and Figs. 8. 9, and 10 details to be referred to.

The stock A, metal frame B, and block B′ are of suitable shape to receive and support the operating mechanism, cylinder C, and the barrel *e′*. The cylinder C, in this instance chambered to receive four cartridges, *c*, is made to revolve loosely, and also to slide upon a spindle, *c′*, taking its bearings in the frame-work B. The pressure block or piston *a*, having a bearing-face corresponding in diameter with the diameter of the cartridge against which it bears when the cartridge is being exploded, is arranged to slide horizontally in bearings in line with the cartridge to be next exploded, and is bored longitudinally to receive a spring-controlled firing-pin, *a′*. The cartridge-pressure block *a* is reciprocated horizontally by a combined link-connection, shown in this instance as consisting of two members, *b b′*, loosely jointed together by a pin, 2, the member *b′* consisting of two flat pieces of

metal rigidly secured together at sufficient distance apart to straddle and be loosely connected by pin 9 to the pressure-block *a* near its forward end, the member *b* being also loosely connected to an extension of the trigger *d* by a pin, 3, somewhat back of the pivotal pin 4, upon which the trigger *d* turns. The cylinder at its forward end is provided with grooves $c^2$, concentric with the chambers therein, as shown in Fig. 1, and in detail in Fig. 9 by the heavy black lines, the said grooves being rectangular in cross-section, and receiving an annulus, *e*, screwed into the main frame-work B, forming a continuation of the barrel *e'*, (see Fig. 9,) said annulus being provided with an annular projection, $e^2$, of sufficient size to snugly enter the groove $c^2$, the latter being somewhat deeper than the said annular projection $e^2$. As the trigger *d* is turned on its pivot 4, the compound link-connection *b b'* forces the cartridge-pressure block *a* forward against the cartridge *c* and pushes the cylinder C forward until the annular projection $e^2$ enters the groove $c^2$, as best shown in Fig. 7, when the apparatus is rendered gas-tight, the member *b'* of the link-connection in this position bearing against an abutment, *f*, depending from the frame-work B, the abutment thus serving as a bearing for the cartridge-pressure block and receiving the shock when the cartridge is exploded. The cylinder C is forced back to its normal position by a spiral spring, *g*, acting upon a flat spring, *g'*, one end of which is secured to the frame-work B and the other end thereof being secured to a sliding pin, $g^2$, which bears against the forward end of the cylinder C. The hammer *h*, provided with a hub, *h'*, is pivoted to turn freely upon a pin or stud, 5, secured to the frame-work, the mainspring $h^2$ surrounding said hub *h'*, and having one end connected with the hammer *h* by a link, 13, pivoted to said hammer *h* at 14. (See Fig. 10.) The hammer *h* is connected with the trigger *d* by a link, *i*, loosely attached to the said hammer by a pin, 6, and cut out interiorly at its opposite end, as shown in Figs. 1 and 7, leaving a small projection, *i'*, which co-operates with two studs, 7, secured to the trigger *d*, to release the mainspring and trip the hammer. The link *i* has extended from its inner side a safety pin or projection, 8, which, by bearing against the upper end or extension of the trigger *d*, prevents the hammer *h* from touching the firing-pin *a'* when the trigger is in its normal position, thus preventing accidental explosion of the cartridge. A bent link, $m^2$, is loosely attached to the trigger *d* by a pin, 15, slightly eccentric to the main pivot 4, the opposite end of the said link being connected with the mainspring $h^2$, a spiral spring, $m^3$, (see Figs. 2 and 4,) secured to the frame-work, being also connected with the said bent link $m^2$ at its extreme end and controlling its movement.

Assuming the parts to be as in Fig. 1, the hammer *h* is operated to strike the firing-pin *a'* as follows: The trigger *d* is turned on its pivot 4 by the finger of the operator, and in the first part of its backward movement throws the cartridge-pressure block *a* forward, as described, drawing the bent link $m^2$ forward, contracting the mainspring $h^2$, and extending the spiral spring $m^3$, the pivot of the bent link $m^2$ in the extreme backward position of the trigger being at a dead-center with the pivot 4, thus relieving the trigger from the tension of the springs. During this movement of the trigger *d* the small projection *i'* of the link *i* bears against one of the studs 7 (see Fig. 1) and turns the hammer slightly back on its pivot, the mainspring being loosely connected by link 13, permitting such movement; but in the further movement of the trigger backward the other stud, 7, engages the link *i* at the opposite side of the projection *i'* and forces said projection out of engagement with the first-mentioned stud, thus leaving the hammer free to be operated by the retraction of the main spring $h^2$ and to strike the firing-pin *a'*. When the trigger *d* is returned to its normal position, the studs 7 pass freely over the projection *i'* into position to re-engage the same, as shown in Fig. 1, the safety-pin 8, bearing on the extension of the trigger *d*, assuring this result. The trigger *d* is also provided with a hub, *d'*, surrounding the pivot 4, said hub being cut away or recessed, as at $d^2$, leaving straight edges which may strike against a projection or stud, *m'*, on a cam-disk, *m*, also loosely mounted upon said pivot 4 immediately beneath the hub or projecting portion *d'* and turn the said cam-disk. The cam-disk *m* in its movement bears against a bent lever, *n*, pivoted to the main frame-work by a pin, 10, said lever *n* being cut away to form a projection, *n'*, over which the projecting portion $m^4$ of the cam-disk *m* rides, the said projection in practice having an anti-friction roller to permit a free and easy movement. The bent lever *n* is provided at its forward end with an eye, which is passed over a short bar, *o*, having rack-teeth *o'*, (see Figs. 3 and 7,) which mesh with the teeth of a hub, $o^2$, turning on a spindle, $o^3$, having bearings $o^4$, said hub $o^2$ having a finger, $o^5$, integral with it and bent at its end, as at 11, into line with the axis of the hub to engage and lock the cylinder C by entering suitable holes made in the rear end thereof, in the present instance four such holes being made between the chambers. The bent lever *n*, when turned on its pivot, bears against and compresses a spring, *s*, one end of which is secured to the bent lever *n*, while its opposite end is loosely attached to the rack-bar *o* at *s'*, the said bent lever *n* being returned to its normal position by a spring, $s^2$, encircling a stud, 12, and connected with said lever *n* by a link, $s^3$.

The mechanism just described is employed to revolve the cylinder C as follows: The trigger, when started to turn on its pivot 4, forces

the cylinder C forward, as above described, and releases the same from engagement with the finger $o^5$, and one edge of the cut-away portion $d^2$ of the hub $d'$ then strikes against the projection $m'$ of the cam-disk $m$ and turns the same, and its projecting portion $m^4$, bearing against the lever $n$, passes over the projection $n'$ thereof, turning said bent lever $n$ on its pivot against the tension of the spring $s^2$. The bent lever $n$ in its movement bearing against the spring $s$ draws the rack-bar $o$ downward, it in turn engaging the hub $o^2$ and turning the finger $o^5$ a quarter of a rotation, ready to engage the succeeding hole in the cylinder C. As the backward movement of the trigger is continued, the cam-disk $m$ moves on the lever $n$ beyond the projection $n'$, holding said lever depressed, during which time the firing-pin $a'$ is struck by the hammer $h$. During the first part of the forward movement of the trigger $d$ the cartridge-pressure block $a$ is returned to its normal position by the compound link-connection, and the cylinder C is forced back by the spring $g$, permitting the finger $o^5$ to engage the same, the bent portion thereof entering the hole succeeding the one which it released in the first part of the backward movement of the trigger. Upon further forward movement of the trigger the cam-disk recedes over the projection $n'$ and the parts are released, the spring $s^2$ returning the lever $n$ to its normal position, and the end of the said lever bearing against the toothed portion of the bar $o$ forces the said bar upward, such movement, by its engagement with the toothed hub $o^2$, turning the finger $o^5$ back to its normal position and carrying the cylinder C with it, bringing the cartridge to be next exploded into position. It will be seen that the cylinder C is forced forward in the first part of the backward movement of the trigger, and backward in the first part of the forward movement of the trigger, and immediately upon the release of the finger $o^5$ from the cylinder the same commences to revolve on its axis, as described, and by the cooperation of the lever $n$ and the several springs the power is acquired which is expended during the last part of the forward movement of the trigger—viz, after the cam-disk has passed over the projection $n'$ of the lever $n$, to give to the cylinder a quarter rotation to bring the next cartridge to be exploded into place. It will also be noticed that the cylinder C cannot reciprocate on its spindle in either direction without coming into engagement with either the finger $o^5$ or the annular projection $e^2$, thus preventing the cylinder from revolving when the apparatus is not properly operated, and preventing accident which might occur by the explosion of a cartridge should the cylinder be at an intervening point. The grooves 2 in the cylinder are made considerably deeper than the annular projection $e^2$, to compensate for varying thicknesses of the cartridge-shell and for dust and other foreign substances which may accumulate in said grooves, and the sides of the grooves being straight, the apparatus is rendered gas-tight, whether the annular projection $e^2$ enters the groove more or less, but in no case is it allowed to bottom in said groove.

The member $b'$ of the compound link-connection may consist of one piece and be forked to straddle the cartridge-pressure block $a$, or it may be loosely connected with the cartridge-pressure block $a$ by a suitable projection on each forked end adapted to drop into a corresponding recess in the cartridge-pressure block, as shown in Fig. 4.

The trigger-guard D, secured to the frame B, is of suitable construction and shape to serve as a rest for the fingers that are not employed to turn the trigger $d$.

The face-plate E (shown in Fig. 6) is secured to the frame B by a screw, $t$, and suitable dowel-pins at its forward end, (not shown,) and is provided with a longitudinal depression, $t'$, in which a cartridge may be placed and pushed forward into the cylinder C. After a cartridge has been thus inserted, a spring-controlled pivoted latch, $t^2$, drops back of the rear end of the cartridge and holds the same in position against any shock that might tend to throw it out.

To unload the fire-arm or force the shell from the cylinder C, I have supplied the block B' with a sliding rod, $u$, bent at its end, as at $u'$, to overlap the end of the block B' and serve as a hand-piece. This rod $u$ is arranged to slide easily in a hole bored longitudinally through the said block. Thus when a shell is desired to be removed, the hand-piece $u'$ is turned half a revolution, and, projecting laterally from the block B', is moved downward, the hand-piece $u'$ following in the guideway or slot $u^2$, made in the side of the block. The rod enters the chamber holding the shell to be removed, and in its further downward movement strikes the shell and forces it out at the rear end of the cylinder into the depression $t'$. The rod may then be returned to its normal position and the hand-piece turned over upon the end of the block B', thus locking it in place.

It is obvious that, instead of employing a compound link, connection for reciprocating the pressure-block, any other suitable means may be employed.

I claim—

1. In a fire-arm, a horizontally-reciprocating pressure-block, $a$, having a flat face to bear against a cartridge, a firing-pin passing longitudinally through said pressure-block, the trigger $d$, and means connecting said trigger with the pressure-block for reciprocating the latter, substantially as and for the purpose described.

2. In a fire-arm, the combination, with the stock and a revolving cylinder mounted in a frame connected with the stock, of a horizontally-reciprocating cartridge-pressure block sliding in bearings within the frame, the firing-

pin passing through the pressure-block, the trigger, and compound link-connection, substantially as described, for operating the cartridge-pressure block, as set forth.

3. In a fire-arm, the combination, with the stock, the revolving cylinder and its frame connected with the stock, of a cartridge-pressure block reciprocating in bearings in the frame, the firing-pin, trigger, and compound link-connection, substantially as described, for operating the cartridge-pressure block, and the abutment *f*, to receive the shock, as set forth.

4. In a fire-arm, a cartridge-pressure block mounted within the frame B, the trigger, and means connecting said trigger with the pressure-block for forcing the latter against a cartridge, and the revolving cylinder *c*, also mounted in said frame, and having grooves $c^2$ concentric with the chambers, and capable of being forced forward by said pressure-block, combined with an annulus, *c*, forming a continuation of the barrel, as described, and co-operating with the concentric grooves $c^2$ to produce a gas-tight chamber, together with means for returning said cylinder to its normal position, as set forth.

5. In a fire-arm, the frame B, a cartridge-pressure block mounted therein, the trigger, and means, substantially as described, connecting said trigger with the cartridge-pressure block, the revolving cylinder, also mounted in said frame, capable of being forced forward by said pressure-block, and having grooves rectangular in cross-section at its forward end concentric with the chambers, combined with an annulus, *e*, forming a rearward continuation of the barrel and projecting sufficiently to enter the grooves $c^2$, but not bottom therein, all substantially as and for the purpose set forth.

6. The combination, with the cartridge-pressure block mounted in bearings in the frame B, its firing-pin *a'*, the trigger, and mechanism connecting said trigger with the cartridge-pressure block for forcing the latter against a cartridge, of the hammer pivoted within the said frame, and means, substantially as described, for operating it to strike the firing-pin, as set forth.

7. The combination, with the trigger pivoted within the frame B, and having studs 7, of the hammer, also pivoted within the frame, its mainspring, and the link *i*, connecting the hammer with the trigger, said link being provided with the projection *i'*, to co-operate with the studs 7, and the safety-pin 8, substantially as described.

8. The combination, with the trigger pivoted within the frame B, of the bent link $m^2$, and mainspring and hammer controlled thereby, the said bent link being attached to the trigger to turn eccentrically to its main pivot 4, and to the mainspring *h'*, to contract the latter, and mechanism, substantially as described, connecting said hammer with the trigger, whereby the hammer may be tripped after the bent link has arrived at its dead-center, substantially as described.

9. The combination, with the trigger pivoted within the frame B, of the cam-disk operated thereby, the spring-controlled lever *n*, moved by the cam-disk, rack-bar *o*, meshing with the toothed hub $o^2$, located at the rear of the cylinder, the finger $o^5$, and the cylinder to be engaged and rotated by the finger $o^5$, all substantially as described.

10. The combination, with the trigger pivoted within the frame B, of the bent link $m^2$, and mainspring and hammer controlled thereby, the said bent link being attached to the trigger to turn eccentrically to its main pivot 4 and to the mainspring *h'*, to contract the latter, and the supplemental withdrawing-spring $m^3$, and mechanism, substantially as described, connecting the hammer with the trigger, all as set forth.

11. The combination, with the trigger pivoted within the frame B, of the cam-disk operated thereby, the lever *n*, moved by said cam-disk, the rack-bar *o*, and springs S $S^2$, controlling the movement of the said lever and rack-bar, the toothed hub engaged and rotated by the said finger $o^5$, all substantially as described.

12. In a fire-arm, the face-plate E, placed over and concealing the operating parts, and having a depression, *t'*, to receive the extracted cartridge, combined with a spring-controlled pivoted latch, $t^2$, hinged in the frame and extended normally into the depression *t'*, to prevent accidental withdrawal of a cartridge, substantially as described.

13. In a fire-arm, the trigger pivoted within the frame B, the cylinder, also mounted therein and provided with cartridge-chambers, and cylinder-revolving mechanism combined with the lever *n*, controlling-spring $s^2$, and means, substantially as described, operated by the said trigger, whereby the said lever is moved and the spring is compressed during the backward movement of the trigger, and the spring is released and the lever returned to its normal position, actuating the cylinder-revolving mechanism during the forward movement of the said trigger, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

BENJ. MERRITT.

Witnesses:
B. J. NOYES,
F. CUTTER.