

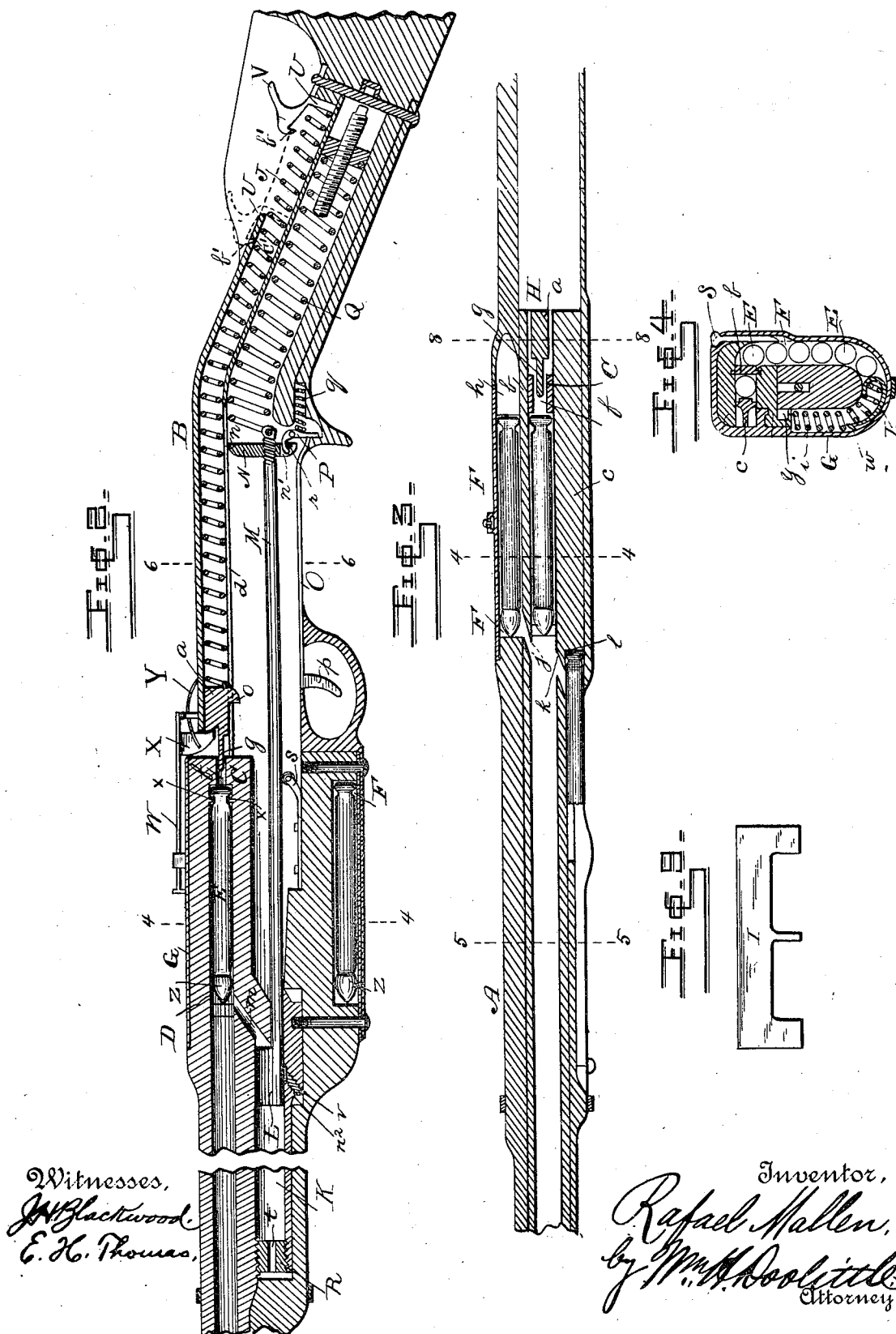
(No Model.)

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R. MALLIN.
MAGAZINE FIRE ARM.

No. 386,889.

Patented July 31, 1888.



UNITED STATES PATENT OFFICE.

RAFAEL MALLEN, OF MEXICO, MEXICO.

MAGAZINE FIRE-ARM.

SPECIFICATION forming part of Letters Patent No. 386,889, dated July 31, 1888.

Application filed August 25, 1887. Serial No. 247,880. (No model.)

To all whom it may concern:

Be it known that I, RAFAEL MALLEN, an officer in the Mexican Army and a citizen of the Republic of Mexico, residing at the City of Mexico, in the Republic of Mexico, have invented certain new and useful Improvements in Repeating-Rifles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The main characteristics of this improved rifle in which the improvements mainly consist are as follows: The rifle has a fixed breech-block, and the firing-chamber at the base of the barrel in which the cartridges are located when fired is rectangular in cross-section. The cartridge-receiving or storage chamber incloses the barrel of the rifle and is placed parallel with the firing-chamber. Communication is established between the storage and firing chambers to reload the gun, and at the same time the firing chamber is opened to discharge the fired shell by means of a sliding carriage of peculiar construction. This carriage comprises in a single piece the two side walls of the firing chamber and the firing or percussion pin, and it is adapted to be drawn back toward the stock of the rifle. When so drawn back, the firing-chamber is opened on opposite sides to discharge the spent shell and to receive a fresh cartridge. The forward movement of the carriage closes the sides of the firing chamber, and just as this is accomplished the firing or percussion pin explodes the percussion-cap and fires the charge. The backward movement of the sliding carriage and the consequent reloading of the rifle are effected by the utilization of a portion of the gases resulting from the explosion of the cartridge, which act upon suitable mechanism to accomplish the desired result. The forward movement of the sliding carriage is effected by means of a spring.

In addition to these main features the invention also comprises safety devices for preventing the firing of the rifle except when desired, a signal device for showing when the storage-chamber needs replenishing, and mechanism for putting the parts into operative position for the first firing of the same.

The cartridge herein shown and described

is the subject of my application, No. 258,559, filed December 21, 1887.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side view of the rifle complete. Fig. 2 is a central vertical longitudinal section thereof, parts being broken away to permit its illustration on a larger scale. Fig. 3 is a central horizontal longitudinal section, also broken away. Fig. 4 is a cross-section through the storing and firing chambers in a plane indicated by the line 4 4 in Figs. 1, 2, and 3. Fig. 5 is a cross section on the line 5 5. Fig. 6 is a cross section on the line 6 6. Fig. 7 is a detail perspective of the sliding carriage. Fig. 8 is a cross section of the rear end of the same. Fig. 9 is a detail view of the cartridge-follower. Fig. 10 is a longitudinal section of the cartridge, and Fig. 11 is a cross section thereof on the line 11 11.

A is the barrel of the rifle; B, the stock; C, the stationary breech-block, and D the firing-chamber, in which is located a cartridge, E. Partly surrounding and inclosing the barrel and parallel with the firing-chamber is the storage-chamber F, which is inclosed by a thin plate, G, entirely surrounding the rifle.

H is the sliding carriage, which is composed of a breech-piece, *a*, located behind the breech-block, and side pieces, *b c*, integral with or rigidly secured to the breech-piece *a*, which slide on either side of the firing-chamber and constitute the side walls thereof, one of the pieces, *b*, separating the firing-chamber from the storage-chamber. In order to permit the passage of the cartridges from the storage to the firing chamber, the sliding carriage must be moved back so that the side piece *b* will offer no obstruction to the passage of a cartridge, and since the breech-piece *a* of the carriage is behind the breech-block the stock of the rifle is made hollow to permit the movement of the carriage. The barrel of the rifle and the side pieces of the carriage are suitably tongued and grooved to guide the carriage, and longitudinal guide-strips *d d* in the stock of the rifle co-operate with slots *e e* in the breech-piece of the carriage to hold and guide the same.

The breech-block C of the rifle is provided with a central longitudinal aperture, *f*, in which enters the firing or percussion pin *g*,

which is formed on the breech-piece *a* between the side pieces, *b c*.

The cartridges are introduced into the storage-chamber *F* in the usual manner, as in the
 5 "Winchester" rifle, through an aperture, *h*, in the side of the rifle, which aperture may be closed by a plate, as is usual in such cases. Within the storage-chamber is a sliding plate or follower, *I*, against which the innermost
 10 cartridge rests. This follower is forced forward by means of coiled springs *i*, interposed between the plate and the closed end of the storage-chamber, which press the cartridge toward the side *b* of the sliding carriage. When
 15 the rifle has been fired and the sliding carriage drawn back, the springs *i* force the fresh cartridge against the empty shell in the firing-chamber. The withdrawal of the sliding carriage also withdraws the side piece *c*, constituting the side wall of the firing-chamber opposite the entrance of the loaded cartridges,
 20 and into the space created by the withdrawal of the side piece *c* the empty shell is forced by the tension of the springs *i*, a loaded cartridge replacing it in front of the breech-block.
 25 When now the sliding carriage is again advanced, the forward ends of its side pieces enter on one side between the empty shell and the cartridge in position in front of the breech-block, and on the other side between the cartridge in position and the remaining cartridges in the storage-chamber. To facilitate the entrance of the side pieces their forward ends, *j k*, are beveled, as shown. The extreme
 30 end *k* by the side piece *c* is contracted in width, so that a shoulder, *l*, is formed at its forward end, which shoulder, on the advance of the carriage, comes in contact with the empty shell, which is thus forced forward out through an aperture at that side of the rifle,
 40 and is thus discharged. This action will be repeated until the cartridges in the storage-chamber are exhausted.

Just before or at the instant that the firing-pin *g* strikes the loaded cartridge the ends of the side pieces, *b c*, come in contact with the barrel of the rifle, thus making an unbroken bore.

The sliding carriage is projected forward to fire the cartridge by means of a coiled spring, *J*, interposed between the breech-piece of the carriage and the butt of the rifle. It is retracted by the following means: Beneath the barrel of the rifle is a cylinder, *K*, which communicates with the bore of the barrel by means
 55 of a passage, *m*, which opens from the bore just in front of the cartridge. In this cylinder is fitted a piston, *L*, the rear end of which is at all times forward of the point where the passage *m* enters the cylinder. This piston is formed with a rearwardly-extending piston-rod, *M*, which extends back into the hollow stock of the gun. At its rear end this piston-rod carries a tail-piece, *N*, the upper end of
 60 which is beveled to constitute a hook or catch, *n*, which is in the path of the lower part of the

breech-piece of the carriage *H*. The carriage is formed in the line of the catch *n* with a beveled lip, *o*, to engage the catch.

O is a sliding trigger plate having trigger
 70 *p*, which has a limited sliding movement in a slot in the bottom of the stock. The rear end of this trigger-plate acts against the lower end of a bell-crank lever, *P*, pivoted within the hollow stock. This lever and trigger-plate
 75 are pressed normally forward by a coiled spring, *q*, and the lever is rocked by the manual retraction of the trigger-plate. The upper end of the bell-crank enters a slot, *n'*, in the lower end of the tail-piece *N* of the sliding
 80 piston-rod immediately above a cross-pin, *r*, therein.

Assuming now that the sliding carriage occupies its rear position with its lip *o* engaged by the catch *n*, on sliding back the trigger-
 85 plate the bell-crank lever is rocked and the tail-piece *N* is depressed, the piston-rod having sufficient elasticity for this purpose. The tail-piece by this means is depressed, so as to disengage the catch *n* and lip *o*. The sliding
 90 carriage, being thus disengaged, is thrown forward by the impulse of the spring *J* and fires the cartridge, as before described. As soon as the cartridge is fired, a portion of the gas formed enters under pressure the cylinder
 95 *K* through the passage *m* in the rear of the piston *L*, thus forcing the same forward until the catch *n* again comes in contact with the lip *o* engaging the two. The engagement of the lip and catch is facilitated by a spring,
 100 *s*. As soon as the ball or charge has passed out of the gun, the gas generated by the explosion passes into the open air, thus restoring the pressure within the cylinder *K* to the normal. The piston is then retracted to its original
 105 position by a strong coiled spring, *Q*, which is secured at opposite ends to the piston-rod and the stock of the rifle. This spring *Q* is considerably stronger than the spring *J*, so that the sliding carriage is carried back with the
 110 piston in position ready for the next firing. The rifle can thus be fired practically as rapidly as the finger can draw back the trigger-plate.

In order to ease the forward movement of
 115 the piston, a screw-plug, *R*, having central aperture, *t*, is fitted in the forward end of the cylinder *K* to constitute an air-compressing chamber to cushion the piston. A passage, *n'*, is formed in the lower part of the cylinder
 120 in line with the passage *m*, which is closed by a screw-plug, *v*, its object being to enable the passage *m* to be readily cleaned.

In case the cartridges become exhausted in the storage-chamber without the user being
 125 aware of the fact the follower *I* would be pressed into the firing-chamber and would be injured by the forward movement of the carriage. To prevent this, and at the same time notify the user when it is necessary to replenish the cartridges, a sliding indicator-pin, *S*,
 130 projects outwardly from the storage-chamber.

The rear end of the follower-plate I is provided with a hook, *w*, which engages (by the spring in the follower-plate) the lower end of the pin S. As the follower is then pressed forward, it lifts the pin S above the level of the rifle-barrel, which indicates to the user that the supply of cartridges needs replenishing.

In the case of the first using of the rifle the catch *n* and lip *o* should not be in engagement; or, if in its use they should for some reason fail to engage, the rifle would not be operative. It will also be noted that in the loading of the firing-chamber in case there is no empty shell to be discharged a loaded cartridge will be forced into the space left vacant by the side piece *c*, which would be discharged and lost. To engage the catch and lip, and at the same time prevent the loss of a cartridge, the following mechanism is adopted:

The breech-piece of the carriage is provided with a downwardly-extending tongue, *a'*, and in line with this tongue is an aperture, *y*, extending through the wall of the rifle-barrel beneath the path of the side piece *c* and opening out into the space where the empty shells are discharged. In this aperture slides a rod, T, having a thumb-operating piece, *z*. By pressing back on this thumb-piece the rod T will be brought into contact with the tongue *a'*, and so press back the carriage into engagement with the catch *n*. Secured to the operating end of the rod T is an elastic or spring plunger, U', which, when the rod T is pressed back, is pushed into the space left vacant by the side piece *c*, filling the same and occupying the space which is normally filled by an empty cartridge shell.

To facilitate moving back the carriage by the rod T, the tension of the spring J may be relieved. This spring bears against a sliding back plate, U, which has an operating thumb-piece, V, and a tongue, *b'*, which normally engages a catch-aperture, *c'*, to hold the plate U forward with the spring under tension. By disengaging the tongue *b'* the plate U will be pressed back, thus relieving the tension of the spring. When thus moved back, the plate U constitutes a safety device, since the spring will then not have sufficient tension to explode the cartridge. A positive safety device is, however, provided to absolutely prevent the discharge of the cartridge by preventing the firing-pin coming in contact with the cartridge. Pivoted to the stock of the rifle is an arm, W, having a downwardly-extending bifurcated projection, X, which enters a slot in the stock immediately in the rear of the breech-block. When the projection X is thus located, as shown in Fig. 2, the breech-piece of the carriage, when it is moved forward, comes in contact with it, and thus the firing-pin fails to reach the cartridge. When the rifle is to be fired, the arm W is swung back out of the way.

Y is a spring to hold the arm W in place.

The firing-chamber wherein the loaded car-

tridge is placed to be fired, it will be observed, is necessarily rectangular in cross-section. With an ordinary cartridge a portion of the gas resulting from the explosion of the charge would pass out around the ball and either prevent or interfere with the projection of the ball. Moreover, with a fixed breech-block an ordinary cartridge which could be introduced would be moved forward in the chamber instead of fired by the contact of the firing-pin. A peculiar construction of cartridge and ball is therefore required. The cartridge-shell is cylindrical and carries a conical ball, Z. A portion of the ball, however, extends a considerable distance within the cartridge-shell, and is within the cartridge-shell a hollow cylinder. When now the cartridge is fired, the ball will have entered the cylindrical bore of the rifle before the cylindrical portion of the ball has quitted the shell, so that no gas can pass in front of the ball.

The rear end of the cartridge shell has a cylindrical groove, *d'*, which is engaged by projections *x x* on the top and bottom wall of the firing-chamber, which prevent the displacement of the shell. Between this groove and the rear end of the cartridge is placed a small perforated metallic plate, *e'*, between which and the rear end of the cartridge the fulminate is placed, it communicating with the powder through the apertures in the plate. The fulminate is thus held behind an unyielding surface, which insures its explosion when the rear wall of the cartridge is struck by the firing-pin.

I claim as my invention—

1. In a repeating-rifle, a firing-chamber, a storage chamber alongside said firing-chamber, and a stationary breech-block, in combination with a sliding carriage having sides which constitute the opposite walls of the firing-chamber and which separate the firing and storage chambers, substantially as set forth.

2. In a repeating-rifle, a firing-chamber, a storage chamber alongside the same, and a stationary breech-block, in combination with a sliding carriage composed of a breech-piece in the rear of the breech-block, side pieces connected to said breech-piece, which constitute the side walls of the firing-chamber, and a firing-pin carried by the breech-piece, substantially as set forth.

3. In a repeating-rifle, a firing-pin, a spring which impels said firing-pin forward to fire the charge, a cylinder alongside the bore of the rifle, and a passage connecting the bore of the rifle with the rear end of said cylinder, in combination with a piston within said cylinder, which is moved forward by the gases generated by the explosion of the charge, a piston-rod connected to said piston, a catch on said piston, which engages said firing-pin when the piston is moved forward, and a spring for retracting said piston and with it said firing-pin, substantially as set forth.

4. In a repeating-rifle, a spring-actuated fir-

ing-pins and a catch engaging therewith, in combination with a bell-crank lever connected with said catch, and a sliding trigger-plate which upon being moved comes in contact with said lever and rocks the same, substantially as set forth, whereby said catch is depressed and the firing-pin is released.

5 5. In a repeating-rifle, a firing-chamber, a storage-chamber, and a sliding carriage whose
10 side pieces constitute the opposite side walls of the firing chamber, one of which sides separates the firing and storage chambers, in com-

bination with a sliding plunger which occupies the space left vacant by the side piece of the carriage opposite to the mouth of the storage-chamber when the carriage is moved backward, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

RAFAEL MALLÉN.

Witnesses:

WM. HELMICK,

JOS. H. BLACKWOOD.