

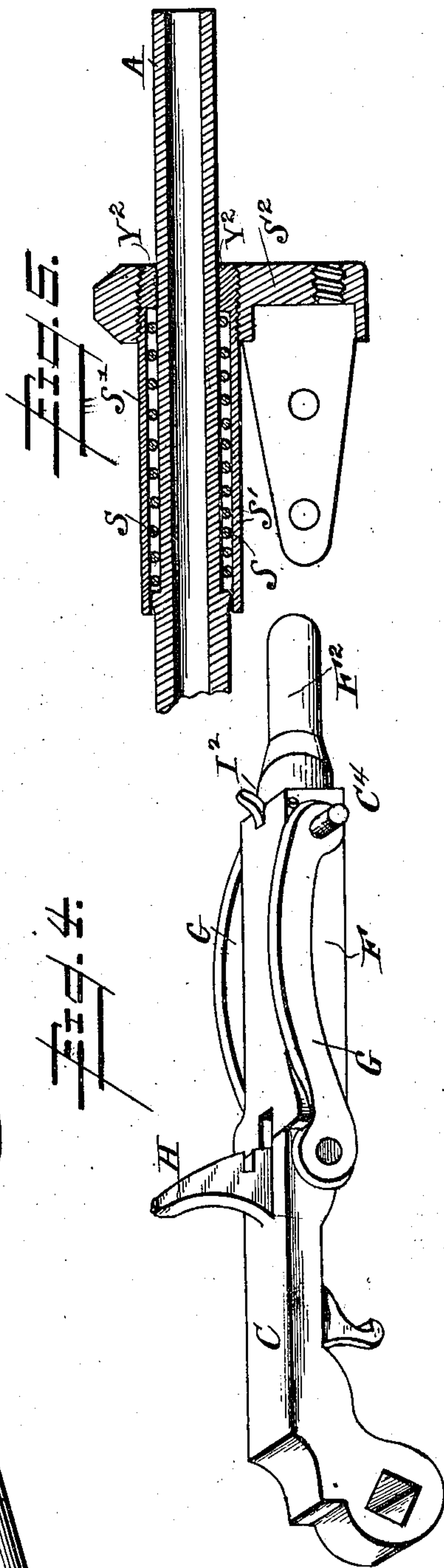
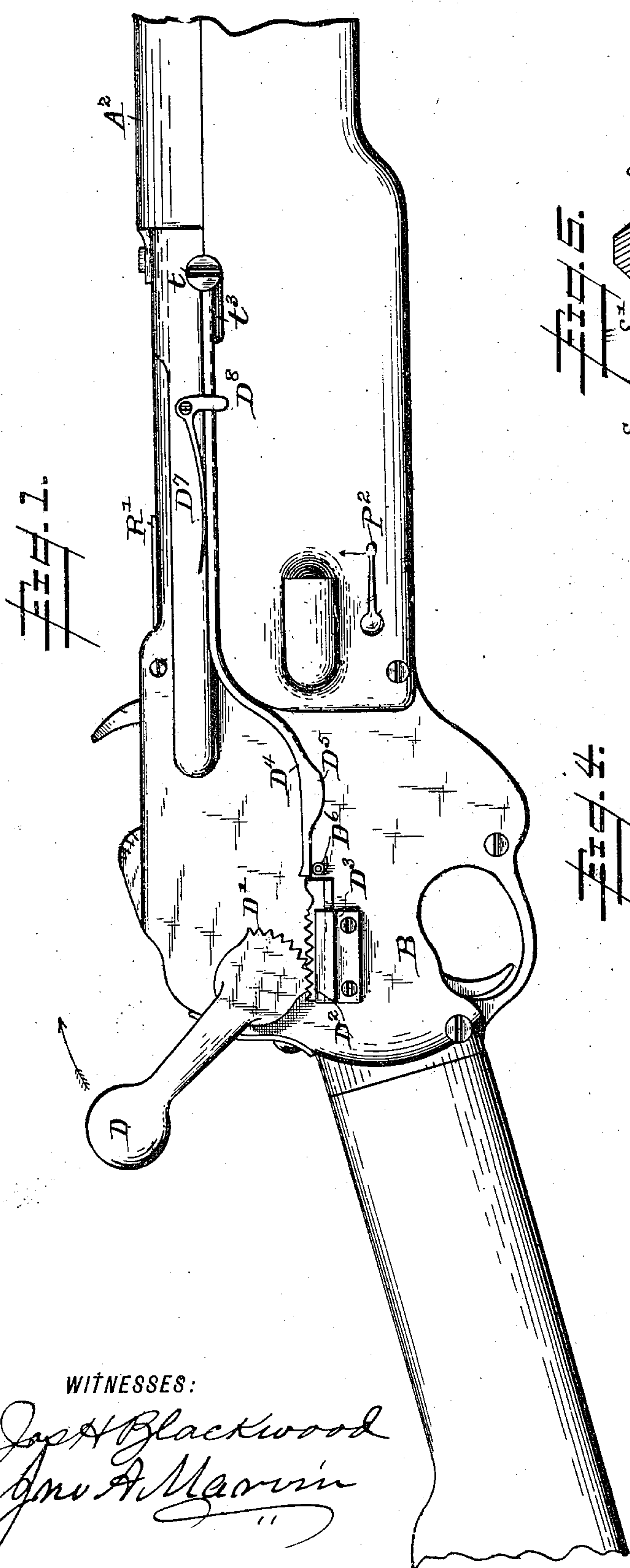
(No Model.)

4 Sheets—Sheet 1.

R. MALLÉN.
RECOIL OPERATED MAGAZINE GUN.

No. 472,377.

Patented Apr. 5, 1892.



WITNESSES:

Jas H Blackwood
 Geo A Marvin
 "

INVENTOR

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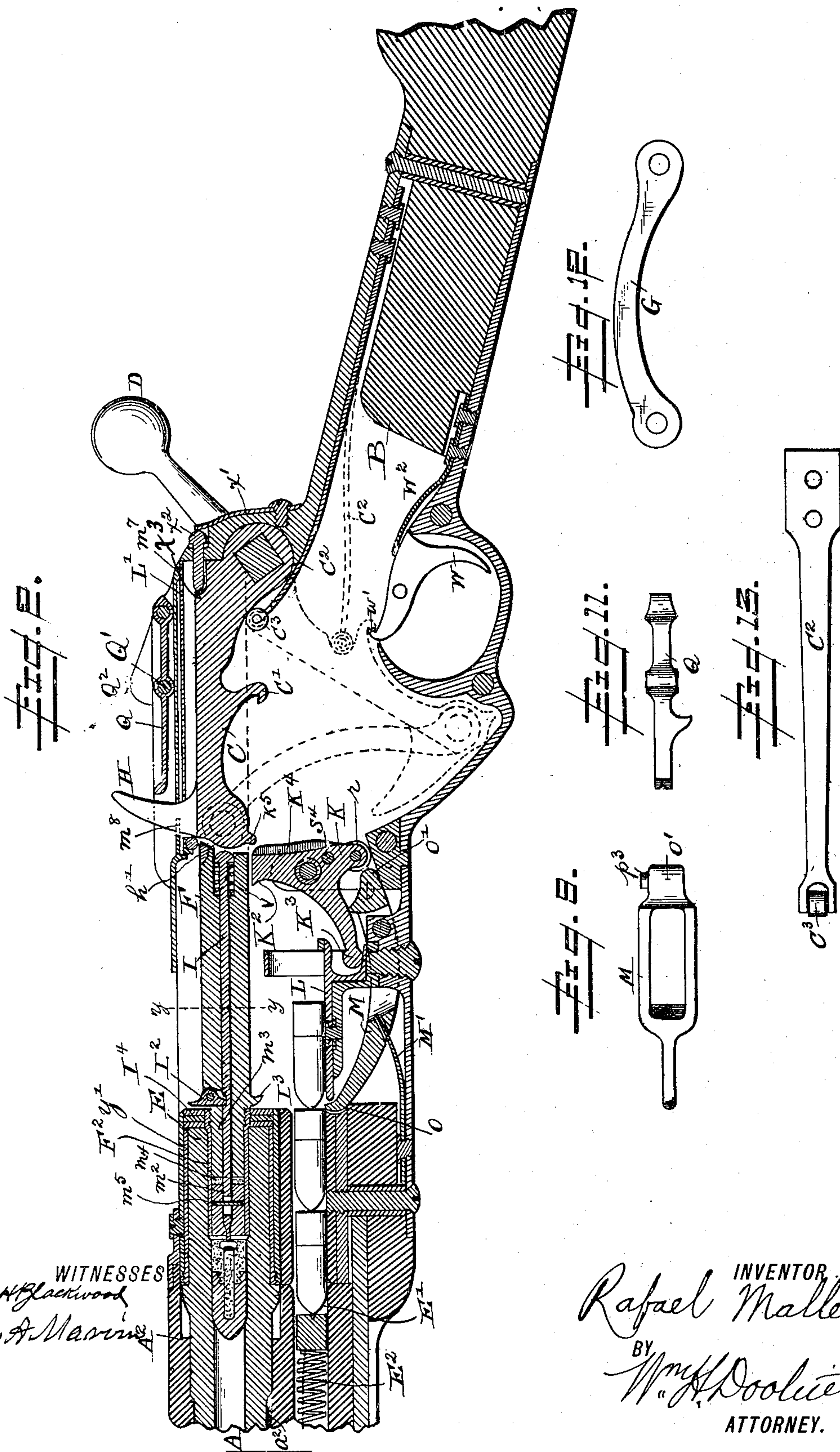
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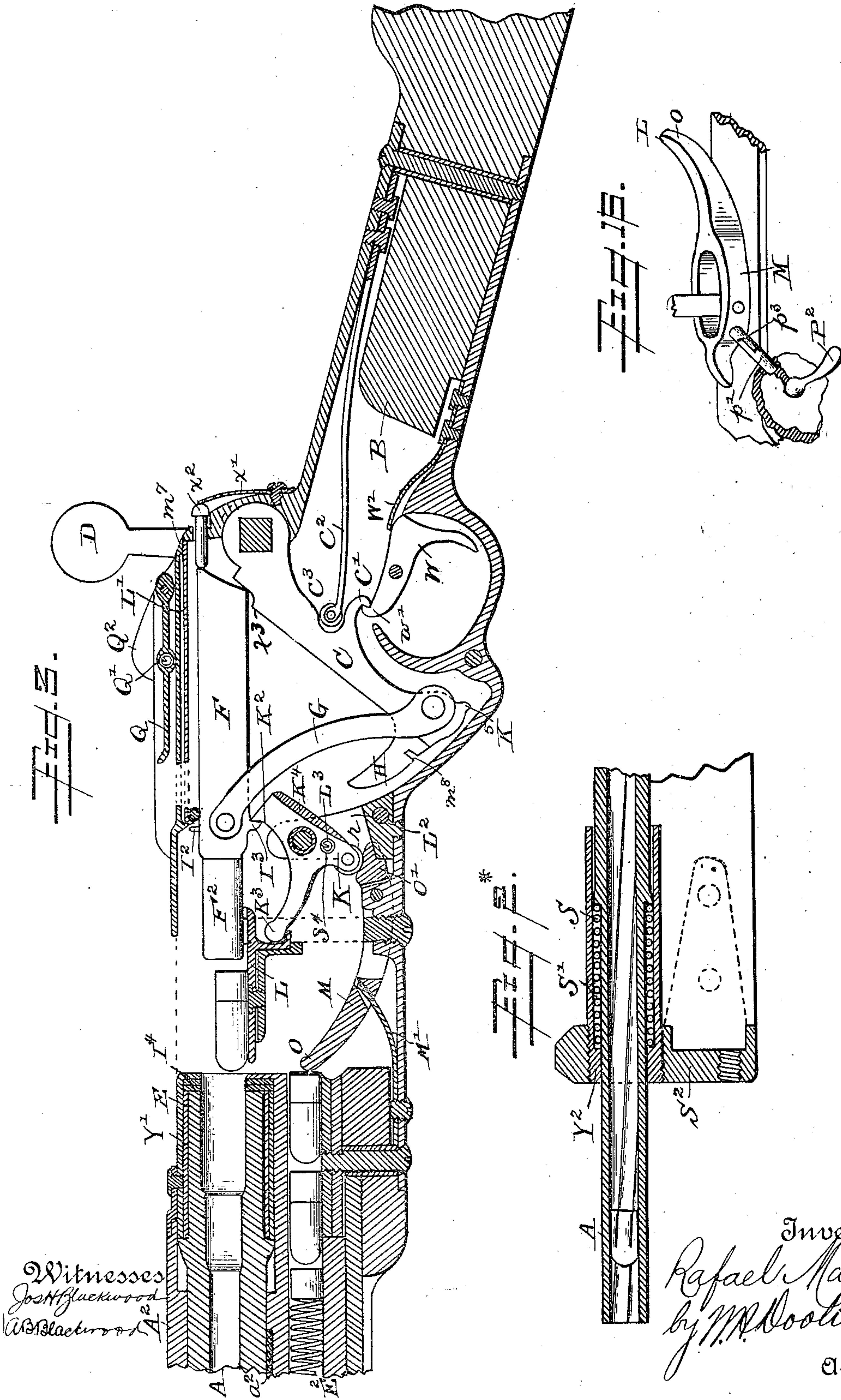
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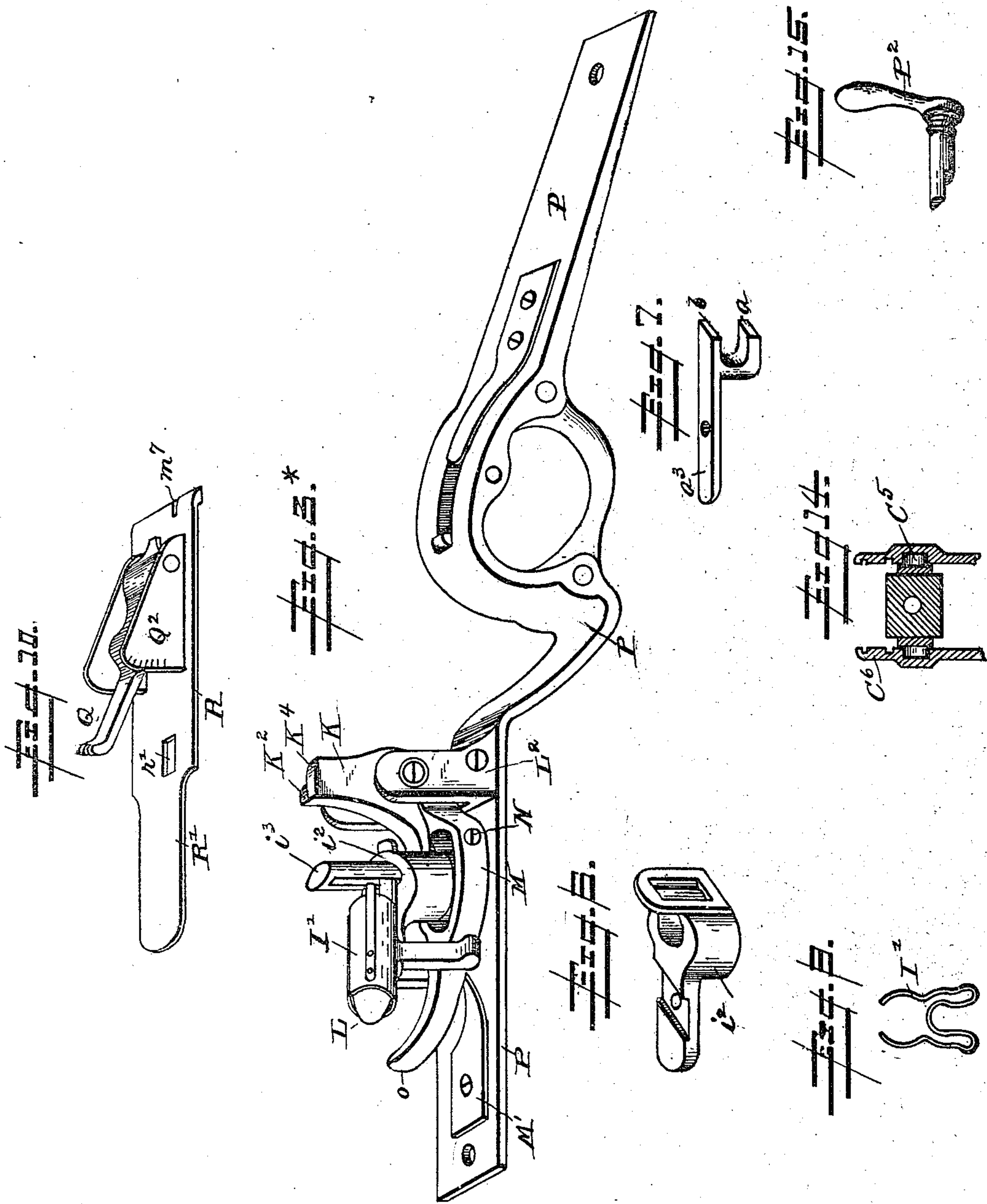
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UNITED STATES PATENT OFFICE.

RAFAEL MALLÉN, OF MEXICO, MEXICO.

RECOIL-OPERATED MAGAZINE-GUN.

SPECIFICATION forming part of Letters Patent No. 472,377, dated April 5, 1892.

Application filed April 13, 1891. Serial No. 388,644. (No model.)

To all whom it may concern:

Be it known that I, RAFAEL MALLÉN, a citizen of the Republic of Mexico, residing at the city of Mexico, Mexico, have invented certain new and useful Improvements in Magazine-Guns; 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.

My invention relates to improvements in magazine-guns; and the objects of the same are to lessen the number of parts in such a gun, to increase the speed in firing, and to render the working of some of the principal parts automatic.

It is illustrated in the accompanying drawings, in which—

Figure 1 is an exterior side view in elevation; Fig. 2, a longitudinal section showing the position of parts in the act of firing; Fig. 2*, a continuation of Fig. 2, showing the spring for throwing back the barrel compressed; Fig. 3, a similar view showing the gun open with cartridge-carrier raised; Fig. 3*, a perspective view of guard-plate and cartridge-carrying mechanism for changing the firing-chamber; Fig. 4, a perspective of the swinging and sliding breech-pieces. Fig. 5 is a continuation of Fig. 3; Figs. 6, 7, 8, and 9, details of parts of the cartridge-carrier; Fig. 10, a detail of the sliding sight-plate and extension covering a space over the sliding breech-piece; Fig. 11, a plan of the sight; Fig. 12, a detail of one of the arms connecting the swinging and sliding breech-pieces; Fig. 13, a detail of forked spring to hold the breech-block up in place; Fig. 14, a cross-section of upper part of metallic case inclosing the sliding breech-piece on line *yy* of Fig. 2. Fig. 15 is a detail of a handle for holding the regulator up, as hereinafter described; and Fig. 16, a detail showing said handle connected to the regulator.

Referring to the drawings, A is a barrel adapted to be slid inside the wooden casing A² by the action of the ball and a spiral spring S, as hereinafter described, and is inclosed by two short brass tubes Y' Y² at opposite ends of the barrel to reduce the friction. To further reduce the friction of the sliding barrel that part of the stock which receives the bar-

rel is lined with a leather or cloth bushing a² to keep out the dirt. The spring S surrounds the barrel and is inclosed in a tubular chamber S', formed by tube Y², and the latter is held in place by means of a screw ring-plate S², as shown in Fig. 5.

B is the stock.

C is a locking-brace pivoted on a shaft of breech-lever D and normally held up in position by a spring C². One end of this spring is screwed to the stock and the other end is forked and carries between the forks an anti-friction roller C³, which rides on the under curved surface of the locking-brace C. The locking-brace C is also provided with a hammer H, nose h', and a catch C'.

E is the firing-chamber, E' the storage-chamber, and E² a spiral spring in the storage-chamber to force the cartridges back.

F is a sliding breech-piece connected, as shown in Fig. 4, to the locking-brace C by arms G. These arms are pivoted to the sides of the piece C by pins and to the sliding piece F by roller-pins C⁴, which rollers move in grooves C⁵, formed in the sides of a receiver C⁶.

I is the firing-pin placed within the sliding breech-piece F and having a flanged head in a chamber on a line with the hammer-nose. A spiral spring V is put around the pin within said chamber bearing against the flange, and the function of which spring is to redraw the pin from the cartridge-head after firing. This withdrawal is aided by the action of a lever I², pivoted in the breech-piece near the firing-chamber, and the nose of which fits in a slot in the firing-pin. The sliding breech-piece F is also provided with a hook I³ to engage with and operate a carrier-lever K, as hereinafter described. The head of the sliding piece F is provided with a brass tube F², screwed thereto, which tube has the function of reducing the friction of the piece F within the firing-chamber.

My gun is so constructed that very little gas could escape from the firing-chamber on explosion of the cartridge without making any special provision therefor; but to entirely prevent such escape I provide at the inner end of the firing-chamber and at the end of the tube Y' disks I⁴, composed of a central cork disk and two outer steel disks, compressed slightly on explosion. By this means a per-

fectly-tight gas-joint is formed at the junction of the stock and firing-chamber.

The breech-lever D is on the outside of the casing, and, as shown in Fig. 1, is provided at its lower end with toothed segment D', which engages with a rack D², sliding in a plate D³, secured to the casing.

D⁴ is a slide-rod, one end of which is secured to the gun-barrel by a short screw-rod *t*, while the other end is free and adapted to bear against the rack-plate D². The screw-rod *t* is placed in a longitudinal slot *t*³ in the casing, and consequently the slide-rod D⁴ and the barrel have a movement the length of such slot. The free end of the slide-rod rests on a small roller D⁶, and D⁴ has also a curved projection D⁵ on its underside, which in the rearward movement of the slide-rod comes in contact with said roller, rides up thereon, and lifts the slide-rod out of engagement with the rack-bar D².

D⁷ is a spring secured to the barrel-casing with its free end pressing on the rod D⁴, so that after the latter is lifted, as just described, it will be forced down again on the opposite movement of the barrel.

D⁸ is a dependent lug on the fastened end of the spring and extending over the side of the slide-rod to hold it in place.

L is a carrier for lifting the cartridges from the storage-chamber to a point on a line with the firing-chamber. The carrier is composed of four parts—namely, the movable cartridge-holder I', (shown in Figs. 3* and 8,) the movable base *z*², (shown in detail in Fig. 6,) on which rests the cartridge-holder, a stationary yoke *z*³, on which the carrier is carried up or down, and the carrier-lever K.

M is an automatic regulator, the function of which is to automatically separate a cartridge on the carrier from those in the storage-chamber, and as such cartridge is lifted to follow it up, pressing against those in the storage-chamber and not permitting one of the latter to come forward onto the carrier until the latter has descended. This regulator is pivoted at N to a stud rising from the guard-plate P. Its forward end terminates in a nose *o*, which is forced up between the cartridges, as above explained, and its rear end is forked, embracing the base, to which it is pivoted, the forked ends terminating in a heel *o'*. (Shown in Fig. 9.)

The regulator M is normally held down to the plate by action of a spring-bar M', one end of which is screwed to the guard-plate. The carrier-lever K is centrally pivoted between supports L², rising from guard-plate P. At its top it is provided with a catch K², and at its lower end it is provided with a nose K³, which is placed between the lugs *a* *b* in piece *a*³ on carrier, (shown in Fig. 7,) and with a heel, to which a roller *r* is secured, which is adapted to ride on the heel *o'* of the automatic regulator. A small spiral free spring L³ is put in from the inner sides of standards L² to an aperture S¹ in the lever to hold the

lever in the position in which it may be placed. The lever K is also provided with a flange K⁴, with which a projection K⁵ on the hammer-block engages for the purposes hereinafter described.

W is a trigger provided with a nose *w'* and spring W².

Q is a sight-frame and plate. (Shown in detail in Figs. 10 and 11.) This plate is a sliding one, and through a slot *r'* extends the hammer. The part R' of the plate in front of this slot acts as a cover for the opening in the casing over the sliding breech-piece when the gun is not in use.

x' is a spring secured to the stock back of the locking-brace and adapted to press against the head of a sliding bolt *x*² in a slot in the stock, the opposite end of which bolt bears against a shoulder *x*³ at the rear end of the locking-brace, thereby maintaining a constant pressure of this piece against the sliding breech-piece.

A small spiral spring Q' is employed (put between the walls Q² of sight-plate and bearing against the sides of the sight) to keep the sight in place and against displacement by jars or wear and tear.

P² is a handle on the outside of the metal plate of the stock, as shown in Figs. 15 and 16, which carries a half-pin, which is to be put through the casing and connect with a half-pin *p*³ on the end of regulator M, whereby, when desired, by turning the handle P² the regulator is held up so that its nose is held fixed in place over the mouth of the storage-chamber to prevent a cartridge coming therefrom to the carrier and so that cartridges may be supplied to the carrier by hand, while the cartridges in the storage-chamber are held as a reserve, or as a single-loader after the cartridges from the storage-chamber are exhausted and the time of recharging the storage-chamber is desired to be saved.

The sliding breech-block F terminates in two cylindrical parts *m*² *m*³, through which the firing-pin also moves, and which cylindrical parts are separated by a cork disk *m*⁴, all covered by tube or sleeve F². There is a hole through the cork; but the cork presses against the firing-pin and acts as a gas-check to prevent the gas escaping into the back channel of the firing-pin. In the front part *m*² the firing-pin is provided with a slot, through which a pin *m*⁵ extends for the purpose of holding in place the said cylindrical parts and restricting the moving distance of the firing-pin. The sight-plate R is also provided with a narrow slot *m*⁷ at its rear end.

When firing, the hammer is forced through the slot *r'*; but after firing and when the piece is not in use the hammer is withdrawn from the slot *r'* and said plate R is pushed forward by hand. Then the hammer is raised and the plate is pulled back a little, so that the hammer enters the slot *m*⁷ and is held in place and against accidental displacement and discharge, and just before the piece is

fired and when the hammer is pulled down for that purpose this plate will be automatically forced back by the lever I^2 , actuated by arms G, which are connected to and operated by the locking-brace C, to which also the hammer is connected.

I use no metallic cartridges, but one especially constructed for this gun, consisting of a charge of solid powder at the butt of the cartridge, the powder being so hard that no wrapping is required.

The operation is as follows: Let the magazine be filled and the parts be in position indicated in full lines in Figs. 1, 2, 4, and 5. Then by giving the breech-lever D a forward push the locking-brace C, secured to the shaft of the lever, will be turned down and the sliding breech-piece F pulled back, the arms taking the position indicated by dotted lines in Fig. 2. The sliding back of the piece F uncovers the firing-chamber, and as it slides back the hook I^3 on breech-piece F engages with catch K^2 on the upper end of the carrier-lever K, throws the head of said lever backward, and its toe K^3 upward, which toe, extending between the forks $a b$ of the cartridge-carrier L, lifts the carrier, together with a cartridge thereon, to the level of the firing-chamber, as shown in Fig. 2*. The heel r of the carrier-lever at the same time forces down the heel o' of the regulator M, carrying its toe up between the cartridge on the carrier and those in the storage-chamber and holding the latter in place. When the locking-brace descends, its catch C' engages with the catch w' on the trigger and is locked thereby until released by the pulling of the trigger. When the trigger is pulled, the action of spring C^2 on the locking-brace C is to force it up, which movement also carries forward the sliding breech-piece F. The tubular head of the piece F pushes the cartridge ahead of it in the firing-chamber, the cartridge-carrier is brought down by contact of the ascending hammer H on the flange K^4 of carrier-lever K, and the regulator M at the same time forced down by the action of the spring M' . When the hammer and the head of the carrier-lever are up, as shown in Fig. 2, the projection K^5 on the hammer also serves to prevent the carrier from being accidentally turned backward. As the cartridge is carried into the firing-chamber by the sliding breech-piece the firing-pin carried by this breech-piece follows it, and at the moment the cartridge is in place the nose h' of the locking-brace C strikes the head of the firing-pin and drives it against the cartridge and explodes it. The firing-pin is retired by the action of the spring V and lever I^2 , the upper end of which lever as the breech-piece is carried back strikes the guard-plate R, which forces the guard-plate a little distance, as before described, and then the lower end of the lever in the slot of the firing-pin is carried forward, accelerating the outward movement of the firing-pin. When the cartridge is exploded, the barrel is carried forward by the force of the escaping ball

against the wings of the barrel and to the extent of the slot t^3 in the casing, as before stated. For this purpose the barrel must slide very freely, and hence the employment of the metal anti-friction tubular bearings $Y' Y^2$, before described. By the forward movement of the barrel the spiral spring surrounding and in contact with it is compressed against the tube Y^3 , and then after discharge the spring recoils, carrying the barrel back with it. The barrel having secured to it the slide-rod D, as before described, the recoil of spring and barrel serves to move back the rack and set the breech-lever, which engages with it for the next operation.

It will be observed that the only manual action necessary in working the gun after it is loaded is pulling the trigger, the rest of the movements being automatic. It will also be seen that many parts of my invention may be varied as to form and yet accomplish the same functions. I do not wish, therefore, to be understood as confining my claims to the precise features in all respects herein described, but to embrace their equivalent mechanisms.

What I claim is—

1. In a magazine fire-arm, a locking-brace provided with a hammer and secured on a shaft in the stock so as to turn with said shaft, in combination with an operating-lever, also secured to said shaft, and a sliding breech-piece provided with arms pivoted to and connecting the said brace and breech-piece, whereby when the said brace and arms are forced down by said lever the sliding piece is forced back to uncover the firing-chamber, substantially as described.

2. In a magazine fire-arm, the combination, with a pivoted locking-brace, of a sliding breech-piece connected to said brace, an operating-lever connected to the brace, said brace provided with a hammer and a catch to engage the trigger, the trigger provided with a catch to engage the catch on the hammer, and springs for operating the said breech-piece and trigger, substantially as described.

3. In a magazine-gun, in combination with a guard-plate and standards rising from said plate, a cartridge-carrier composed of a cartridge-holder and a movable support, a stationary yoke rising from the guard plate in which the said support is carried, and a carrier-lever pivoted between said standards and operating in said yoke to force up the cartridge-support, substantially as described.

4. In a magazine-gun, in combination with a pivoted locking-brace and operating-lever, a cartridge-carrier, and carrier-lever, the said locking-brace provided with a hammer adapted to trip the carrier-lever and force down the carrier, substantially as described.

5. In a magazine-gun, in combination with a storage-chamber for holding the cartridges, a movable cartridge-carrier, a stationary support for said carrier, a lever pivoted in uprights rising from the guard-plate for raising said carrier, and a regulator pivoted to a pro-

jection from said plate and operated by the said lever for separating the cartridges on the carrier from those in the said chamber and holding the latter in place, substantially as described.

6. The combination, with the guard-plate, of a cartridge-carrier supported on said plate, a lever for operating said carrier pivoted on standards rising from said plate, a regulator pivoted to a projection from the plate and operated by the said lever to separate and hold the cartridges, and a spring secured to said plate and bearing on the regulator to force it down after the same has been raised and disengaged from the lever, substantially as described.

7. In a magazine-gun, in combination with a breech-operating lever mounted on a shaft in the stock of the gun, a locking-brace secured so as to turn with said shaft and carrying a hammer, a sliding breech-block having link connections with said brace, and a spring, one end of which is secured to the stock and the other end free and bearing against the under side of said locking-brace to hold the latter normally up and which free end is provided with an anti-friction roller, substantially as described.

8. In a magazine-gun, the combination of a sliding breech-piece, a sliding firing-pin carried in the center of said breech-piece, a locking-brace pivoted to said piece and provided with a hammer, and a spring for operating said brace and driving it against said firing-pin, substantially as described.

9. The combination, with a spring-actuated recoil-barrel, of an operating breech-lever mounted on a shaft in the stock and provided with a toothed segment, a sliding rack, a sliding rod connecting said barrel and rack, the casing provided with a slot in which the connection of said rod and barrel moves, a roller in the stock under the free end of the rod, a projection on said rod to ride on said roller, and a spring secured to the barrel-casing and pressing upon said rod, substantially as and for the purpose described.

10. In a fire-arm, in combination with a stock, a barrel and barrel-casing, said casing provided with a separate tubular bearing for the barrel and in which said barrel is adapted to freely slide, and a spring within the barrel-casing and in contact with the barrel and its casing, whereby the barrel and spring are carried freely forward by the action of the ball in the discharge of the piece and then carried backward by the recoil of the spring against the barrel-casing, substantially as described.

11. In combination with the casing of a gun,

a barrel, a metal tubular anti-friction bearing for said barrel and in which said barrel slides, and a spring surrounding said barrel, said casing provided with a shoulder against which the spring is pressed by the barrel as it is carried forward by the discharge of the ball and said barrel provided with a shoulder against which the spring is compressed and the barrel carried backward by the recoil of the spring, substantially as described.

12. The combination, with the stock, of the sliding breech-piece, the pivoted locking-brace, a bolt x^2 , passing through a slot in the stock, with one end bearing against a shoulder in the said breech-piece, and a spring x' , secured to the stock back of said brace and pressing against the head of bolt x^2 , whereby a constant pressure of the said brace against the breech-piece is maintained, substantially as described.

13. The sliding breech-block provided with a central channel in which the firing-pin is placed and in which it moves, in combination with a cork disk near one end of the breech-block, acting as a gas-check and dividing the breech-piece in two cylindrical parts at that end, said firing-pin also provided with a slot, and a pin extending through said slot to hold the cylindrical portion in place and restrict the movement of the firing-pin, substantially as described.

14. The sliding sight-plate provided with an aperture for the entrance therethrough of the hammer and also with a slot at one end to hold the hammer after the gun is fired, in combination with the hammer, the lever I^2 , and the locking-brace for forcing the plate back automatically, substantially as described.

15. In a magazine-gun, the combination, with the barrel, of the sliding breech-piece F, provided with the tubular head, the pivoted locking-brace C, the arms G, connecting the brace and breech-piece, and an operating-lever whereby when the breech-piece is forced forward its said tubular head will be carried into the barrel, substantially as and for the purpose set forth.

16. In a magazine-gun, the cartridge composed of hard powder and ball screwed together and provided at one end with the fulminate, whereby the gun may be used and fired without an extractor, substantially as described.

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

RAFAEL MALLÉN.

Witnesses:

P. M. HOUGH,
W. H. DOOLITTLE.