

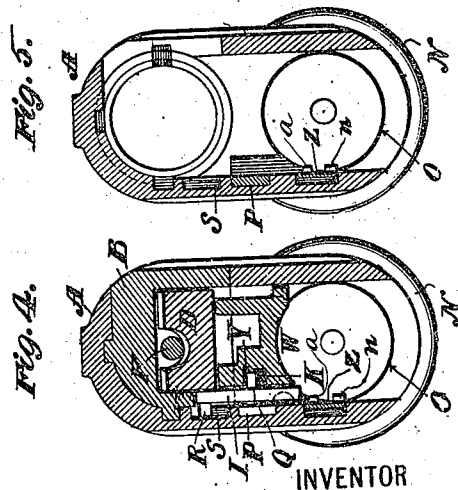
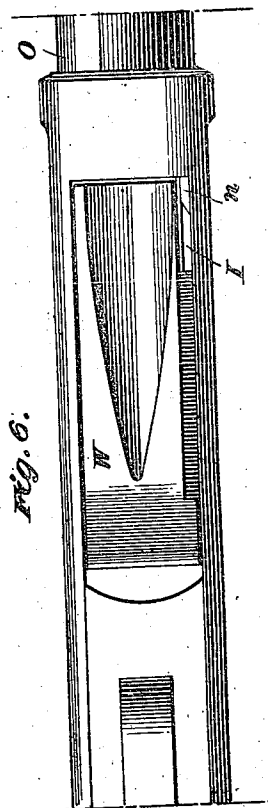
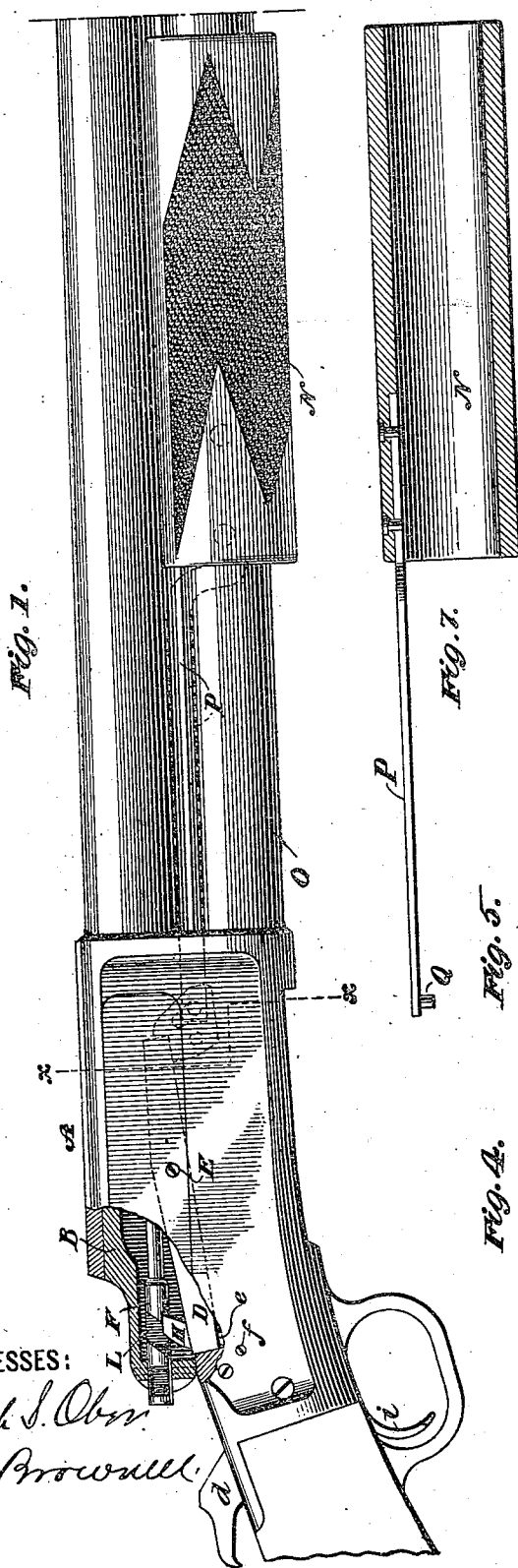
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3 Sheets—Sheet 1.

L. L. HEPBURN.
MAGAZINE GUN.

No. 528,905.

Patented Nov. 6, 1894.



WITNESSES:

Frank S. Ober.
H. B. Brownell.

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Lewis J. Hepburn.

BY
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ATTORNEY

(No Model.)

3 Sheets—Sheet 2.

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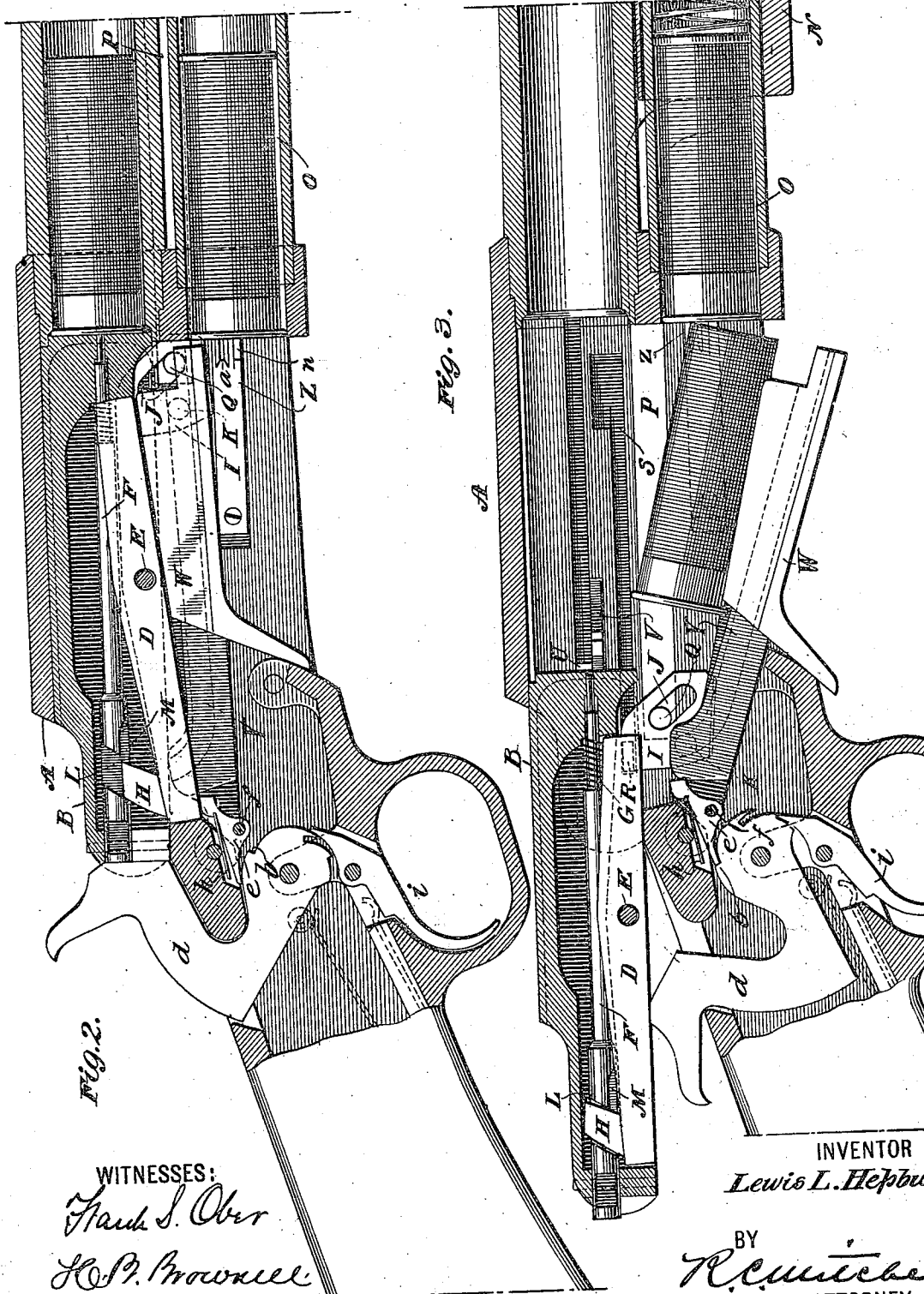


Fig. 2.

Fig. 3.

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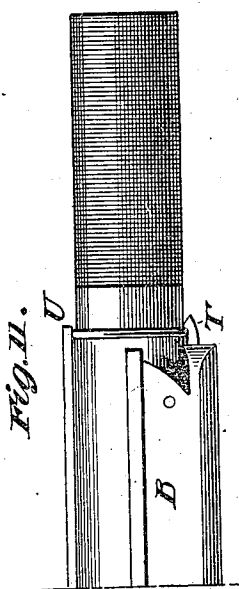
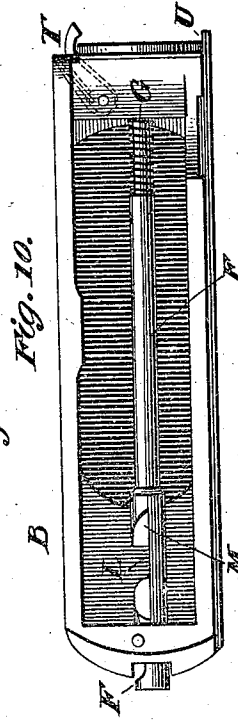
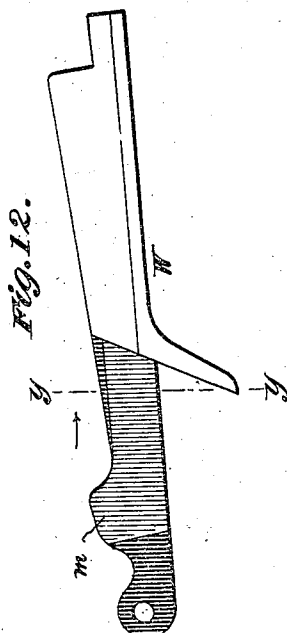
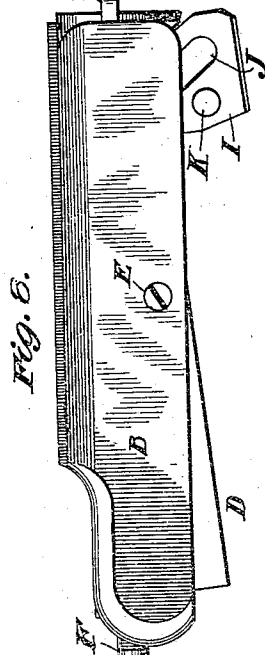
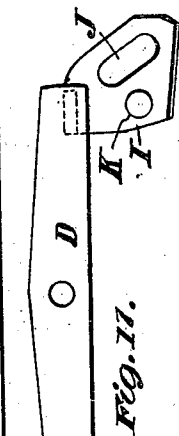
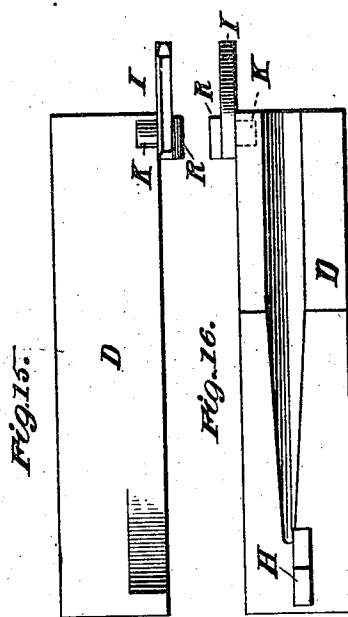
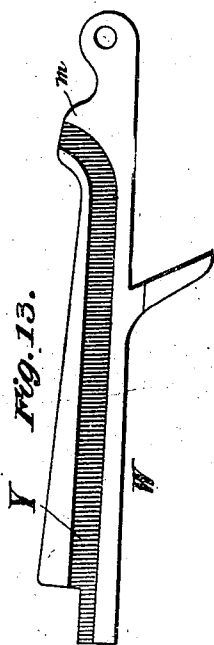
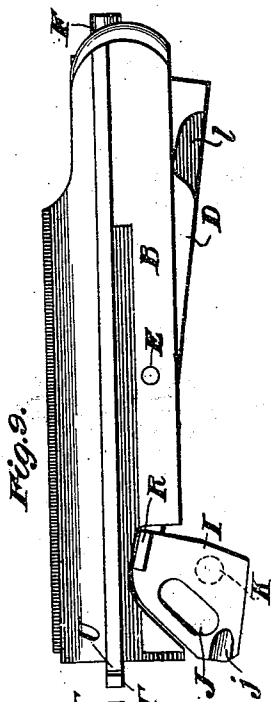
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3 Sheets—Sheet 3.

L. L. HEPBURN.
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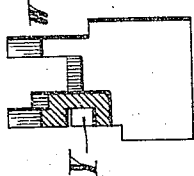


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Fig. 14.



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UNITED STATES PATENT OFFICE.

LEWIS L. HEPBURN, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE
MARLIN FIRE ARMS COMPANY, OF SAME PLACE.

MAGAZINE-GUN.

SPECIFICATION forming part of Letters Patent No. 528,905, dated November 6, 1894.

Application filed May 8, 1894. Serial No. 510,449. (No model.)

To all whom it may concern:

Be it known that I, LEWIS L. HEPBURN, of the city and county of New Haven, and State of Connecticut, have invented certain new and useful Improvements in Magazine-Fire-arms, of which the following is a full, clear, and exact specification.

My invention relates to new and useful improvements in magazine firearms and consists in the novel arrangement and combination of mechanical parts hereinafter fully described.

The object of my invention is to construct a new and improved magazine firearm that shall consist of comparatively few parts, that shall be simple in operation, that can be easily taken down for the purpose of cleaning, and that will rapidly and effectively perform the functions of loading, firing and ejecting the ammunition to be used therewith.

My invention is illustrated by the accompanying drawings, in which—

Figure 1 is a side elevation of my invention, showing part of the breech in section to illustrate one position of part of the interior mechanism. Fig. 2 is a side elevation of my invention, the interior mechanism in another position, and shown partly in central longitudinal section. Fig. 3 is a side elevation of my invention, the interior mechanism being shown in a different position, and partly in longitudinal section. Fig. 4 is a cross-section on line $x-x$ Fig. 1, the interior mechanism being in the position shown in Fig. 2. Fig. 5 is a similar sectional view, the mechanism being in the position shown in Fig. 3. Fig. 6 is a view of the lower side of the breech of the gun. Fig. 7 is a sectional view of a reciprocating handle and connecting rod. Fig. 8 is a side elevation of the breech-block and locking-bolt combined. Fig. 9 is a similar view of the opposite side of the mechanism shown in Fig. 8. Fig. 10 is a view of the lower side of the breech block and firing-pin. Fig. 11 is a plan of a portion of the breech-block illustrating the cartridge extractor mechanism. Fig. 12 is a side elevation of the carrier block. Fig. 13 is a similar view of the opposite side of the mechanism shown in Fig. 12. Fig. 14 is a section taken on the line $y-y$ Fig. 12, looking in the direction of the arrow indicated thereon. Fig. 15 is a view of the

lower side of the locking-bolt. Fig. 16 is a plan view of the same, and Fig. 17 is a side elevation of the same.

The subject matter of this invention is applicable to either magazine rifles or shot-guns, but it constitutes more of an advance however in the art of manufacturing shot-guns. The moving parts are few and simple and are very compactly assembled. The operation is certain and effective. The cartridge injecting and ejecting mechanism is not controlled through the medium of a swinging lever worked by the same hand that operates the trigger, but, on the contrary, is caused by the other hand which grasps a reciprocating handle which is adapted to slide under the magazine chamber thereby dividing the work and so facilitating the more rapid operation of the fire-arm. Furthermore, by keeping the trigger pressed the fire-arm may be operated by the reciprocating handle alone, as hereinafter fully described.

A is a receiver located in the breech of the gun and forming part thereof. The side of this receiver is cut away as shown, to permit the introduction of a sliding breech-block B. Through this opening in the side the discharged cartridge shells are ejected.

D is a locking-bolt, inserted in a recess in the under side of the breech-block B and adapted to loosely tilt therein upon a pivot E. The hole in the locking-bolt through which the pivot E extends should be of slightly greater diameter than the diameter of the pivot so as to permit a slight play.

F is a firing-pin, associated with the breech-block B in the ordinary manner, said firing-pin being provided with a suitable retracting spring G.

H is a horn projecting from the rear and upper side of the locking bolt and adapted to perform the functions hereinafter described. Secured to the forward lower side of the locking-bolt is a downwardly projecting shoulder plate I. The shoulder plate I is provided with an inclined slot J and with an inwardly projecting stud K, both for the purpose hereinafter described.

The firing-pin F is provided near its rear end, and directly above the horn H, with a groove L, into which the horn may slide when

the firing-pin is in its forward position. See Fig. 2. By preference, the forward and rear edges of the horn H are inclined as clearly shown in Figs. 1, 2, 3, and 17, and the sides of the groove in the firing pin are correspondingly inclined, so that when the locking bolt is tilted into the horizontal position the rear inclined edge of the horn pressing against the rear edge of the slot L in the firing pin will cause by cam action the firing pin to retract and hold it, as shown in Fig. 3, until the cartridge is fully seated in the breech of the barrel and the mechanism locked, so that an accidental blow from the hammer cannot force the firing pin forward to discharge the cartridge until the proper time. Although the retracting spring will ordinarily perform the function of retracting said firing pin, nevertheless, should the cartridge primer be forced into the forward opening through which the point of the firing pin projects so as to clog the said firing pin so that the retracting spring G might not operate to force back the firing pin, the horn H will surely do so. The lower side of the firing pin may be provided with a horizontal groove M communicating with the groove L or may be flattened off, so that when the mechanism is in position for firing, the upper end of the horn H will rest in the said horizontal groove, or against the flat under side of the firing pin, so that it cannot be raised, thereby causing the mechanism to be locked. (See Fig. 1.)

The locking bolt as above indicated is loosely pivoted in the breech-block and when in the horizontal position the said breech block is free to reciprocate. When it is tilted into the position indicated in Fig. 2, the rear end of the said locking bolt tilts down and rests against the rear inner end of the frame A. At the same time the forward end rises and rests against the forward inner end of the breech-block B, so as to prevent the said breech-block from being retracted in the slightest degree. By preference the forward end of the locking bolt is cut on a slight curve as indicated. The point from which the said curve is struck being slightly below the center of the pivot E, the forward inner end of the breech-block is cut on a similar curve so that when the locking bolt is tilted into the position indicated in Fig. 2, the forward end of the locking bolt will operate as a cam to set the said parts very tightly together and to securely hold the breech-block in the extreme forward position. The fact that the locking-bolt is loosely pivoted to the breech-block permits a cam action between said parts which, although slight, is sufficient to hold the parts together very tightly. This curve at the forward end of the locking bolt will facilitate the disengagement of the parts, when it becomes necessary to tilt the locking bolt into the horizontal position.

The recoil occasioned by the discharge of the cartridge is taken first by the forward end of the breech-block, then by the forward end

of the locking bolt and then finally transferred directly against the rear inner end of the frame, as shown, so that the firearm is very strongly fortified against the tendency of the cartridge to blow out the breech-block.

N is a reciprocating handle adapted to slide under the magazine chamber O.

P is a connecting rod one end of which is secured to the handle, the opposite end extending inside the frame A and is provided near the inner end with a stud Q. The perforation or slot in the forward end of the frame A through which the connecting rod P projects is sufficiently long to afford a bearing surface to prevent vertical or lateral displacement of the handle, so that, even though the magazine chamber were dispensed with, the gun could be operated. The presence of the magazine chamber, however, acts as an additional means of preventing displacement.

The stud Q operates in the inclined slot J of the locking bolt plate I and the backward and forward movement of the reciprocating handle is thereby imparted to the breech-block B. A projection R extends from the side of the plate I. This projection is adapted to slide in a groove S milled in the inner side of the frame adjacent to said projection R. The forward end of this groove is considerably widened, as shown in Fig. 3, so that when the mechanism is in the position shown in Fig. 2, it will permit the locking bolt to be tilted for the purpose of locking the mechanism as above recited. This tilting is caused by advancing the sliding breech block B forward until the breech block abuts against the breech of the barrel.

As shown in Fig. 3, it will be seen that in tilting the locking bolt out of the horizontal position during the locking movement, the forward edge of the horn will necessarily bear against the forward end of the recess L in the firing-pin, and, inasmuch as the said adjacent edges are inclined forward at an angle, this downward movement of the horn H will necessarily cause the firing-pin to advance slightly until the horn passes below the lower edge of the forward end of said slot L, at which moment the retracting-spring G will cause the firing-pin to again slide back to its extreme retracted position, so that the lower side of the firing-pin will slide slightly over the upper end of the horn H, as clearly shown in Fig. 1, thereby preventing the locking-bolt from being tilted until the firing-pin is advanced as above described. At this point the stud Q rests in the upper end of the inclined slot J. By pushing the handle O ahead still farther, the slot J rides up on the stud Q and tilts the locking bolt up until the stud Q rests in the lower end of said slot J. At the forward end of the breech block and on the side adjacent to the opening in the frame is a spring extractor hook T of the ordinary construction and on the opposite side is a finger U. Between the spring and this finger, the annular bead around the head of the car-

tridge, is grasped in the usual manner. On the inner side of the frame and projecting from a recess in the frame A is a spring arm V provided with an outwardly projecting step or shoulder adapted to stand in the way of and hit against the end of the cartridge head when the discharged shell is fully drawn from the breech of the gun barrel, and while it is being moved backward, thereby causing the said shell to be ejected through the opening in the side of the frame.

The mechanism by which the cartridge is taken from the magazine and thrown into position in front of the breech block B and thereby pushed into the breech of the barrel, consists of a carrier W pivoted at its rear end to the frame. This carrier is adapted to be intermittently raised and lowered by means of the stud K projecting from the locking bolt plate I, and moving in a groove Y in the adjacent side of the carrier as the breech block and locking bolt advance or retreat. The lower side of the frame or receiver A is cut away to permit the carrier W to lower into the position shown in Fig. 3, and to also permit the cartridges to be inserted into the magazine, through the recess thus formed, when the carrier is in the position shown in Fig. 2. The rear end of the slot Y in the carrier curves sharply upward as clearly shown in Fig. 13, so that just as the breech block and locking bolt approach the position shown in Fig. 3, the carrier will be quickly moved into the position therein indicated, so that its upper surface is below the opening in the magazine O through which the cartridges are expelled by means of the well known coil spring contained within said magazine. By the same means, as the breech block is advanced, the carrier block is raised, as above indicated, and the cartridge is quickly thrown up in front of the sliding breech block, by which means it is pushed into the barrel Y.

The device whereby the cartridges are held in the magazine, until such time as it is necessary to allow one to slip out, is a spring Z. This spring is preferably set in a recess in the side of the receiver A, the rear end being fastened, the front end free. From the outer face of this spring projects an incline *a* which normally stands above the slotted recess in which the spring is set and which acts as a stop to prevent the cartridge from being expelled from the magazine until it is depressed. The sides of this incline *a* are beveled, so that when the locking bolt is tilted into the horizontal position, the lower edge of the plate I will slide over and depress the said incline *a* causing the same to retreat away from behind the cartridge, thereby permitting it to be expelled against the forward end of the carrier W, which is then directly behind it.

It will be observed that there is a slight space between the forward end of the carrier W and the head of the cartridge, when the cartridge is held forward by the spring Z, so that when this spring is depressed, as above

indicated, and the cartridge slips back and abuts against the end of the carrier-block, the annular bead around the head of the cartridge will cause the spring Z to be held back so that as the plate I is continued to be moved backward, because of its direct association with the locking bolt, the spring Z will not operate to hold the cartridge. When the breech block approaches the position shown in Fig. 3, the carrier W as above, stated is quickly lowered and the cartridge will be expelled from the magazine into the position indicated in Fig. 3, the spring Z will rise to its normal position, and prevent the next cartridge in the magazine from being expelled until the proper time.

The mechanism thus far described shows the operation of expelling the cartridge from the magazine at the proper time into the frame raising it at the proper time by means of the carrier into position to be inserted into the barrel, inserting said cartridge in barrel where it is located until the firing pin is depressed, as in the position shown in Fig. 2, then extracting it from the barrel and ejecting it from the side opening in the receiver. I have thus far described no means by which the hammer will be automatically held back until the cartridge is seated in the barrel and then automatically released, the trigger being constantly held back.

b is a separate notch in the hammer *d*.

e is an automatic sear which performs the function of a separate automatic trigger. This sear *e* is located inside the frame and is hung on a suitable pivot *f*.

h is a spring operating in conjunction with the sear to cause one end of said sear to normally press against the periphery of the hammer *d*, as shown in Fig. 3, so that when the hammer is pushed back to full cock the end of sear *e* will engage the notch *b* and thereby hold said hammer back until the sear is tripped. The tripping of the sear is occasioned by the tilting of the bolt *D*. At the instant the mechanism is locked the rear end of the locking bolt strikes against the disengaged end of the automatic sear, depressing it, and lifting the opposite end, thereby releasing the hammer which can then spring forward and impart to the firing pin a blow of the same force as though released by the regular trigger *i*. The spring Z, by preference, is provided with another projection *n* in addition to the projection *a*.

Although the projection *a* may serve to hold the cartridge in the magazine until the proper time to release it, it is preferable to have the projection *n* perform this function, while the projection *a* is relied upon, in conjunction with the plate I, to afford a means for depressing said spring Z for the purpose described. Fig. 9 shows a small rounded out groove *j* in the plate I at a point near its forward lower corner and adjacent to the projection *a* on the spring Z. The purpose of this groove *j* is to permit the projection *a* to spring up therein,

that the spring Z will be depressed only a sufficient time to allow one cartridge to partially slip out of the magazine as above described.

l is a recess in the lower side of the locking bolt D to accommodate the projection m on the carrier block W when the mechanism is in the position shown in Fig. 2, thereby facilitating the compact assembling of the parts. The operation of the fire-arm is as follows: The magazine is charged with ammunition. It will assume there is one cartridge in the breech of the barrel ready to be discharged. The breech-block is in the forward position holding the said cartridge in place. The rear end of the locking bolt, which is tilted, rests against the rear inner side of the frame A and thereby provides a reinforcement for the breech-block against the recoil when the cartridge is discharged. The hammer is at full-cock and the firing pin is in the retracted position so that the horn H of the locking bolt rests against the under side of the firing-pin. The locking-bolt cannot therefore be tilted until the firing-pin is advanced. The mechanism is therefore locked and the operator may pull against the handle N in elevating and pressing the stock of the gun against the shoulder without danger of unseating the cartridge to be discharged. The hammer, when released, springs forward against the firing-pin, discharging the cartridge and unlocking the mechanism, as shown in Fig. 2. By pulling back the handle N the stud Q operating in the inclined slot J tilts the locking bolt D and the carrier W so that the forward end of said carrier stands directly in the rear of the cartridge in the magazine. At this point the spring Z is depressed by the plate I on the locking bolt and a cartridge from the magazine slips back against the forward edge of the plate I. By continuing to pull back the handle N, the breech-block and locking-bolt retreat into the position shown in Fig. 3. On this backward movement the charged cartridge shell is extracted from the breech of the barrel and ejected, by the mechanism described, through the side opening in the frame A, and the carrier is dropped to permit the cartridge from the magazine to be expelled into the frame and above the carrier. The backward movement of the breech-block pushes the hammer back to full-cock, as shown. The handle is then advanced and the carrier quickly rises and throws the new cartridge up in front of the breech-block, which pushes the said cartridge into the barrel as it advances. When the cartridge is fully seated within the breech of the barrel, the locking-bolt is tilted in the manner indicated heretofore, tripping the automatic sear and locking the mechanism in the position just described. See Fig. 1. By means of the sear e it will be seen that the hammer is held back at each operation of the fire-arm until the cartridge is firmly seated. If desirable, instead of releasing the ham-

mer in the ordinary manner by the trigger i, the said trigger may be held back during the entire operation of the automatic parts and the sear e will operate as an automatic trigger to release the hammer after the cartridge is fully seated and the mechanism locked.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a magazine firearm, a tilting locking-bolt D having a horn H projecting from its upper rear end and having projecting from its forward end a depending plate provided with an inclined slot J, and operated by a pin projecting from the horizontal movable connecting rod, substantially as described.

2. In a magazine firearm, the combination of a reciprocating handle and connecting-rod attached thereto with a locking-bolt hung in the breech-block, said locking-bolt being provided with a projecting arm adapted to move in a groove S in the side of the frame adjacent thereto, said groove S being widened toward its forward end to permit the locking bolt to be tilted, substantially as described.

3. In a magazine firearm, the reciprocating handle, the connecting-rod, the locking-bolt adapted to be tilted as described, said locking-bolt having a projection R adapted to slide in a groove in the frame, and having a stud K projecting from the side of the depending plate I, adjacent to and adapted to slide in a groove in the adjacent side of a carrier-block, which is hinged near its rear end to the frame, for the purpose of raising and lowering the same, substantially as and for the purpose specified.

4. In a magazine firearm, the reciprocating handle, the connecting-rod, with the locking-bolt hung in the breech-block, said locking-bolt having a plate I depending from its forward end having a stud K projecting therefrom adapted to slide in a groove Y in the carrier W, said groove Y being curved sharply upward toward the rear end of the carrier, substantially as and for the purpose specified.

5. In a magazine firearm, a reciprocating handle and connecting-rod adapted to tilt the locking-bolt which is provided with a horn as described, the forward and rear edges of which are inclined forward as shown, in combination with a firing-pin actuated by a retracting spring G and having a groove L the forward and rear sides of which are inclined as shown, the forward incline facilitating the retraction of the firing pin by action of the horn, the forward incline being for the purpose of advancing said firing-pin slightly ahead, so that when the horn has passed the lower edge of the firing pin, the spring G will cause the said firing pin to snap back over the top of the horn H, thereby locking the locking-bolt, all substantially as and for the purposes specified.

6. In a magazine firearm, a reciprocating handle and connecting-rod, adapted to tilt the locking-bolt hung in the breech-block,

said locking-bolt being provided with a horn as described in combination with a firing-pin having a groove L adapted to permit the horn to slide therein and provided with another groove M in its lower side, communicating with the groove L, all substantially as and for the purpose described.

7. In a magazine firearm, a device for releasing the cartridges from the magazine, consisting of a spring Z having a projection *m* adapted to stand normally in the path of the cartridge to be ejected from the magazine, and with a projection *a* provided with inclined sides, all adapted to be depressed by the downward action of the depending plate I provided with the groove *j*, substantially as described.

8. In a magazine fire arm, a reciprocating handle and connecting rod attached thereto adapted to tilt the locking bolt hung in the breech-block, said locking bolt having toward its rear end an upwardly projecting horn, in combination with a firing-pin locking said locking bolt when in the retracted position to prevent its being tilted and releasing said locking bolt when in the forward position, substantially as described.

9. In a magazine fire arm, a device for releasing the cartridges in the magazine consisting of a spring Z secured to the frame of the gun the forward end of said spring being loose and adapted to normally stand slightly into the path of the cartridge to be expelled from the magazine with the tilting locking bolt D provided with the depending plate I adapted to depress said spring Z on its downward movement as the locking bolt is being tilted into the horizontal position and with the carrier-block W, the forward end of which terminates slightly to the rear of the forward end of the spring Z, substantially as and for the purpose specified.

10. In a magazine fire-arm, the reciprocating parts, in combination with a spring pressed supplemental sear hung in the frame and engaging in a supplemental notch in the

periphery of the hammer, and the locking bolt, said locking bolt tripping said supplemental sear at the final locking point and after the breech is fully closed substantially as described.

11. In a magazine fire arm, the reciprocating breech-block B, carrying a locking bolt D loosely mounted in a recess in the lower side of said breech-block, in combination with a depending plate I, secured to the forward end of said locking bolt said plate being provided with an inclined slot J and a projection R moving in a longitudinal groove S in the frame A and with a stud-projection K on said depending plate adapted to move in a groove in the side of the carrier-block W for the purpose of intermittently raising and lowering said carrier-block, substantially as described.

12. In a magazine fire-arm, the longitudinally reciprocating breech block having a locking bolt loosely hung therein upon a pivot of reduced diameter, whereby the said locking bolt has limited longitudinal movement, a cam abutment on the breech block engaged by the forward end of the locking bolt, the depending plate on the locking bolt having the inclined slot J, the operating bar P, the stud Q on said bar working in said inclined slot J, whereby the locking bolt is tilted into and out of the locking position, and the breech-block is crowded home by the cam engagement of its forward end.

13. In a magazine fire arm, a reciprocating breech-block carrying a locking bolt loosely mounted upon a pivot E of less diameter than the diameter of the perforation in the locking bolt through which it extends, the bearing surface at one end of the locking bolt being cut on a curve eccentric to the pivotal center E, to effect a cam action as the locking bolt is tilted, substantially as described.

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Witnesses:

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M. E. WARD.