

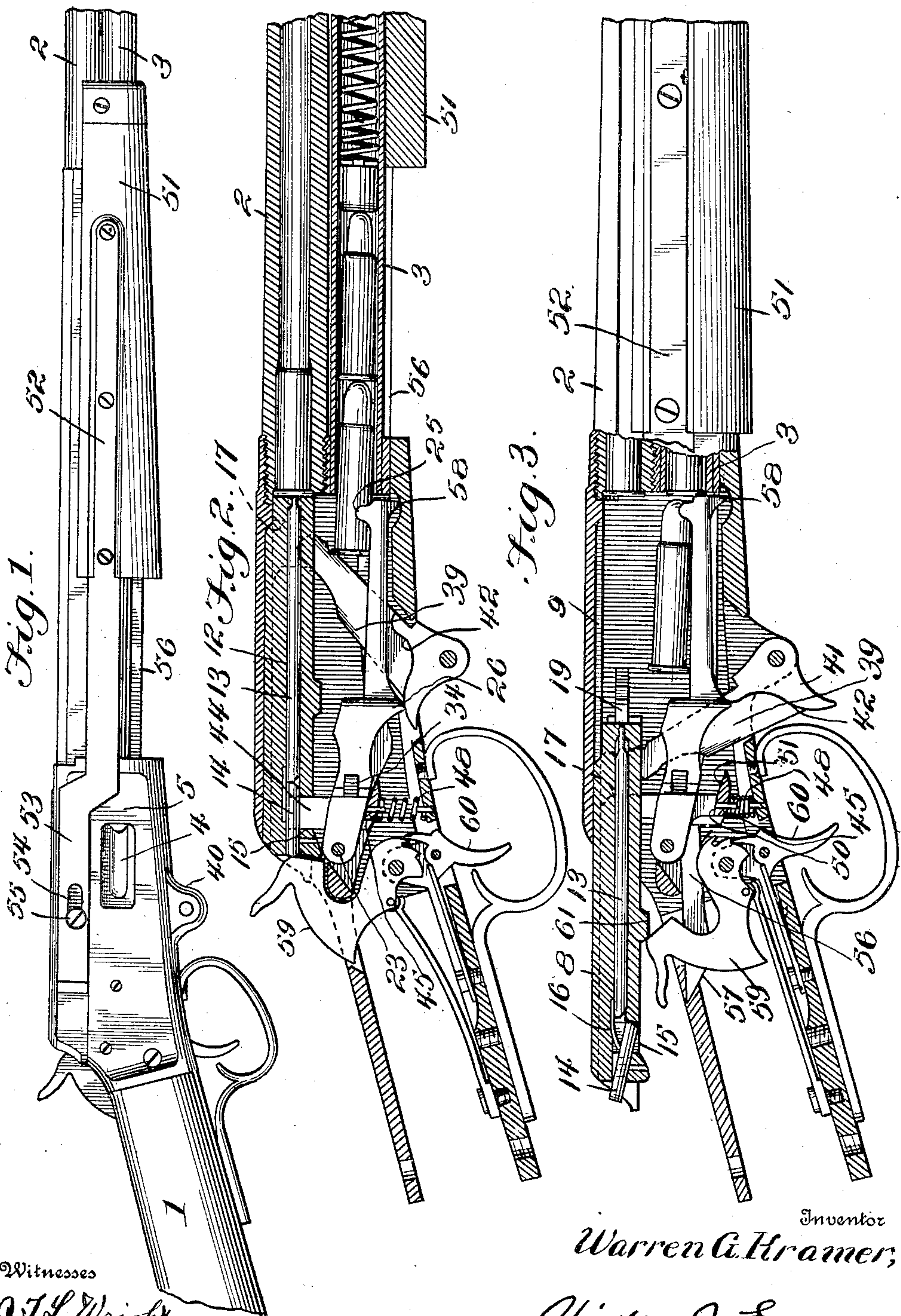
W. G. KRAMER.
MAGAZINE RIFLE.

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Patented June 15, 1909.

3 SHEETS—SHEET 1.

925,350.



Witnesses
J. T. L. Wright
K. Allen

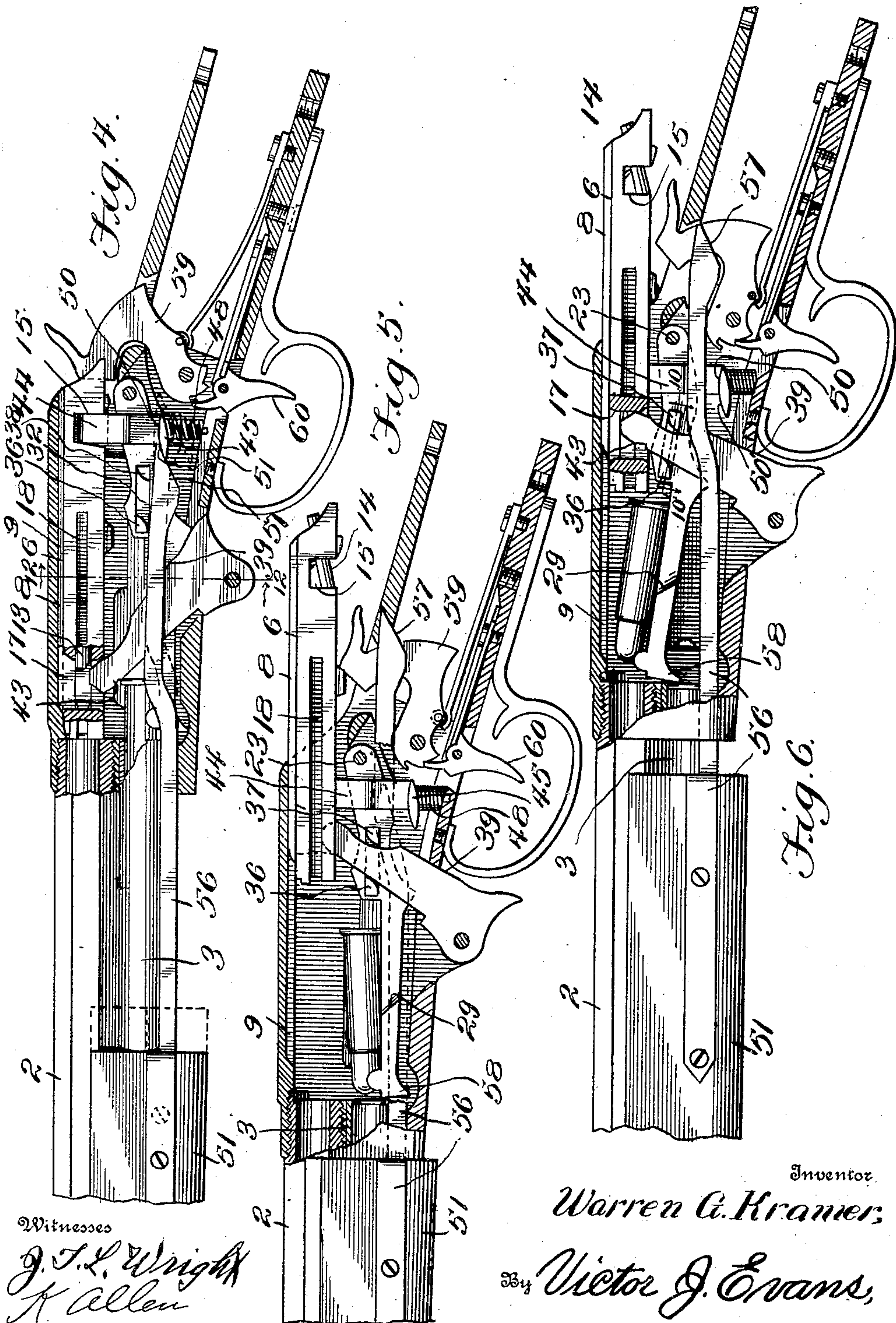
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3 SHEETS—SHEET 2.



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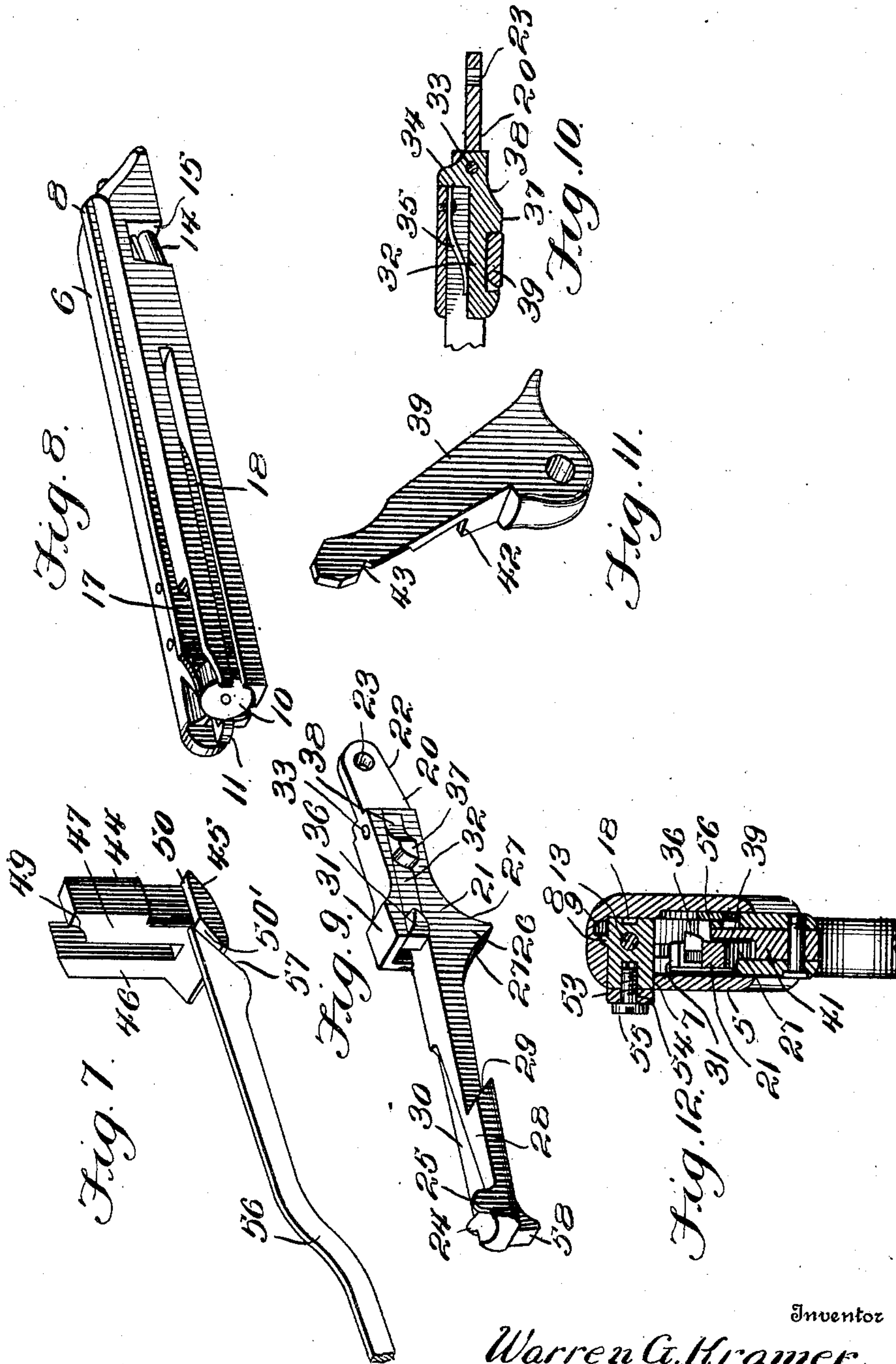
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UNITED STATES PATENT OFFICE.

WARREN G. KRAMER, OF ORWIGSBURG, PENNSYLVANIA.

MAGAZINE-RIFLE.

No. 925,350.

Specification of Letters Patent.

Patented June 15, 1909.

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To all whom it may concern:

Be it known that I, WARREN G. KRAMER, a citizen of the United States, residing at Orwigsburg, in the county of Schuylkill and State of Pennsylvania, have invented new and useful Improvements in Magazine-Rifles, of which the following is a specification.

The invention relates to an improvement in magazine rifles and is particularly directed to a pumping mechanism therefor in the use of which discharged shells may be quickly ejected and loaded shells transferred from the magazine to the rifle barrel.

The main object of the present invention is the provision of a pumping mechanism controlled and operated by the usual forearm, which, for the purposes of the invention, is slidably mounted on the magazine, the initial movement of the forearm unlocking the breech-bolt and the subsequent movement of said arm moving the breech-bolt longitudinally to eject the discharged shell, the opposing movement of the forearm returning the breech-bolt to closed position and during such movement elevating a loaded shell from the magazine into the path of the breech-bolt.

The invention will be described in the following specification, reference being had particularly to the accompanying drawings, in which:—

Figure 1 is a broken side elevation of a gun constructed in accordance with my invention. Fig. 2 is a longitudinal section, partly in elevation of the same, the breech-bolt being shown closed. Fig. 3 is a similar view of the breech-bolt open. Fig. 4 is a longitudinal section with the internal parts in elevation, the view being taken on the opposite side of the actuating lever beyond that of Fig. 2. Fig. 5 is a view similar to Fig. 4 with the breech-bolt open. Fig. 6 is a view similar to Fig. 5 with the parts in the position occupied just succeeding the initial return movement of the breech-bolt. Fig. 7 is a perspective view, illustrating particularly the locking key for the breech-bolt and the means for operating said key. Fig. 8 is a perspective view of the breech-bolt. Fig. 9 is a perspective view of the carrier. Fig. 10 is a broken horizontal section taken through the carrier-housing. Fig. 11 is a perspective of the actuating lever. Fig. 12 is a section on line 12—12 of Fig. 4.

Referring particularly to the accompany-

ing drawings, my improved magazine rifle includes a stock 1, barrel 2, and magazine 3, all parts being of the usual type and construction, the cartridges being fed in the magazine through the usual trap opening 4 in the wall of the chamber 5.

A breech-bolt 6 is slidably mounted in the chamber, being arranged in the upper portion thereof and having one side edge adapted to close a discharge opening 7 in the chamber. The breech-bolt, which is more particularly illustrated in Fig. 8 of the drawings, is of rectangular shape in cross section and approximately of solid construction, being formed on its upper edge with a tongue 8 to fit in a groove 9 in the upper wall of the chamber. The forward end of the breech-bolt is formed to provide an abutment 10 and is provided with the usual spring extracting finger 11 for withdrawing the discharged shell in the opening movement of the bolt, it being understood that the shell rests against the abutment 10 when in firing position, as clearly shown in Fig. 2. A breech-bolt is longitudinally cored for the reception of the firing pin 12, which, as has been heretofore constructed, is preferably made up in a firing section 13 and a driving section 14 mounted in alinement in the core of the bolt with the latter designed to receive the impact of the hammer and the former to discharge the cartridge. The breech-bolt, as more clearly shown in Fig. 3, is formed near its rear end with a recess 15 opening through the lower surface of the bolt so arranged that the driving section 14 of the firing pin may be tilted in the bore of the bolt so as to dispose said section out of alinement with the firing section, that wall of the bore immediately in rear of the recess 15, which underlies the driving section of the firing pin, being inclined to permit a tilting action of said driving pin and a spring 16 being used to normally induce such tilting action. In rear of the abutment 10 and to one side of the bore, the breech-bolt is formed with an opening 17 extending vertically of and entirely through the bolt, while the relatively inner side of the bolt is formed with a longitudinally extending groove or channel 18 to permit movement of and insure operation of the ejecting member 19 as is usual in this type of gun, it being understood that the ejecting member is mounted in the side wall of the chamber 5 and operates to deflect the discharged shell as the latter is drawn rearwardly by the

breech-bolt so as to cause the shell to be projected through the opening 7 of the chamber.

Pivotally mounted in the chamber 5 is what I term a carrier 20, which is illustrated in detail in Fig. 9. The carrier comprises an elongated body 21 from the rear end of which projects an angularly related ear 22 formed with an opening 23 for the reception of the pivot pin. The carrier 20 is of such length that when in lowered or inoperative position the forward end of the body terminates immediately in rear of the rear end of the magazine, and said forward end of the body is formed on its upper surface with a rounded depression 24 and an ear 25 projecting upwardly from the edge of said depression, whereby to receive and guide the cartridge as hereinafter described. The lower edge of the carrier is formed at a point slightly rearward of its center with a triangular projection 26, which depends from said lower edge and has its side or operative edges 27 slightly curved, as shown. From the forward edge for a portion of its length the body of the carrier is of greater width than the remainder, as at 28, which section of increased width terminates in an abrupt shoulder 29, the edge of which inclines upwardly and forwardly, as shown. The upper surface of the body is formed with a rounded depression 30, which at its forward end is coincident with the depression 24 and toward the rear inclines from the longitudinal median line of the body toward the side edge, so that the cartridge receiving depression is, as an entirety, inclined with respect to the longitudinal line of the carrier so that in the movement of the cartridge lengthwise said depression it will be deflected to one side of the carrier. Secured on the upper edge of the body immediately in advance of the rear ear 22 is a housing 31, one wall 32 of which is free and pivotally supported in the body at 33, being formed adjacent the pivot with a lateral projection 34 designed when the wall 32 is in normal position or in alinement with the adjacent side edge of the body to engage the opposing side wall of the housing and limit further outward movement of the wall 32. A spring 35 is arranged within the housing to normally maintain said wall 32 at its limit of outward movement, and said wall on its outer side is formed with lateral projections 36 and 37 arranged respectively adjacent the ends of the wall. The projection 36 is, on that edge adjacent the projection 37, downwardly and forwardly curved, as shown, while the adjacent edge of the projection 37 is oppositely curved the rear edge of the projection 37 is forwardly and rearwardly curved at 38, for a purpose which will presently appear.

An actuating lever 39 is pivotally mounted in ears 40 extending below the chamber, said lever being plain on one face throughout its length and formed on the opposing face with

a cam dog 41, having its relatively upper edge 42 of cam formation, as clearly shown in Fig. 3. The lever is of such length that when in place the upper end thereof will extend into the opening 17 in the breech-bolt, so that in the reciprocal movement of said bolt the lever is operated. The relatively forward edge of the lever immediately below that portion engaging the breech-bolt is formed with a notch 43 arranged to cooperate with the cartridge, as will presently appear.

A locking key 44 is arranged in the chamber to lock the breech-bolt in closed position, said key comprising a plate 45 forming the base of the key and uprights 46—47 rising from the plate in spaced relation, the upper ends of the bolt uprights 46 and 47 being designed when the breech-bolt is in closed position to project into the opening 15 in said bolt, and a spring 48 is arranged within the chamber, encircling pins carried by the bottom wall of the chamber and depending from the lower surface of the plate 45 to normally maintain the key in locking position. The upright 47 is of greater thickness than the upright 46, and the relatively inner edge thereof is formed at the upper portion with a rounded depression 49, which, when the key is in elevated or locking position, is designed to engage the driving section 14 of the firing pin and maintain it in operative position, that is in alinement with the firing section 13 of the pin, as will be clearly apparent from Fig. 2 of the drawings. The uprights 46—47 of the locking key are spaced apart to permit passage therebetween of the ear 22 of the carrier, so that the key in effect straddles the carrier in operation. The relatively outer surface of the upright 47 is cut out to provide a squared shoulder 50 and the forward edge of the plate 45, which is projected in advance of the forward edges of the uprights, is inclined forwardly and downwardly relative to the uprights, as at 50', terminating at its highest point in coincidence with the shoulder 50, for a purpose which will presently appear.

The forearm 51 is, for the purpose of this invention, slidably mounted upon the magazine 3 of the gun, and from said forearm there is rearwardly extended a strip or operating arm 52, which has its rear portion 53 offset vertically and formed at an appropriate point with a slot 54 to permit the passage therethrough of a screw 55 designed to take into a threaded opening in the breech-bolt. A setting bar 56 extends rearwardly from the forearm, preferably from the side opposite the operating arm, said setting arm extending through an opening in the forward portion of the chamber and extending lengthwise within the same, as clearly shown in Fig. 6. At the rear portion the setting arm is provided with an inclined or cam edge 57, which is designed to cooperate with the in-

clined portion 50' and shoulder 50 of the locking key, the parts being so arranged that in the rearward movement of the forearm, the setting arm will operate to depress the locking key and release the breech-bolt.

The forward edge of the carrier 20 is provided with a depending lip 58, for a purpose which will presently appear, and it is to be understood, of course, that the firearm is provided with the usual hammer 59 and trigger 60 for coöperation and actuation in the usual manner.

The lower surface of the breech-bolt is formed with a depending projection 61 designed in operation of the breech-bolt to engage a hammer, and in the movement of said breech-bolt to open position so actuate the hammer as to set or cock the same within the influence of the trigger.

The various parts described are, when in normal position within the gun and the breech-bolt closed, relatively disposed as follows: The breech-bolt is at its limit of forward position in which the cartridge with its rim engaged by the finger 11 is held in the barrel of the gun, and the locking key elevated so that the sections of the firing pin are in alinement to transfer the impact of the hammer to the cartridge. The carrier with its ear 22 between the uprights of the locking key is extended in the forward position with the lip 58 resting on the bottom of the chamber and the cartridge groove in alinement with the lower portion of the magazine wall, so that a cartridge could, so far as the carrier was concerned, be discharged from the magazine onto the carrier by the spring pressed piston within the magazine. The actuating lever 39, however, is in the forward position, that is inclined forwardly with respect to its pivotal connection. In this position said lever has its upper end in the opening 17 in the breech-bolt and its forward edge bearing against the inclined shoulder 29 of the carrier. In this position the size and arrangement of the parts is such that the notch 43 in the forward edge of the actuating lever will form a receiving notch to limit the rearward movement of the cartridge in the magazine, so that said cartridge is but partially projected onto the carrier, all as clearly shown in Fig. 2.

Assuming now the firearm to have been discharged and it being desired to eject the fired shell and recharge the barrel, the operation is as follows: The arm 51 is moved in the rearward direction that is toward the chamber 5. Owing to the slot and pin connection between the operating arm 52 and the breech-bolt, the initial rearward movement of the forearm is without effect upon said bolt, while such initial movement through the medium of the cam portion 57 of the setting arm 56 operates to withdraw the locking key from engagement with the bolt.

The further rearward movement of the forearm tends to move the breech-bolt in the rearward direction, or toward the open position. This movement causes a similar rearward movement of the upper end of the actuating lever 39. The initial effect of the rearward movement of said lever is to permit the cartridge normally overlying the carrier to follow said lever until the cartridge rests wholly on the carrier. During the rearward movement of the lever as described and just prior to the time at which the cartridge is wholly discharged from the magazine onto the carrier, the cam surface 42 of the dog 51 engages the forward edge 27 of the projection 26 depending from the carrier and slightly elevates the forward end of the carrier. This movement of the carrier will, of course, raise the forward end thereof above or out of alinement with the lower surface of the magazines forming a stop to prevent the discharge of any other cartridge from the magazine. The complete rearward movement of the upper end of the lever is without further effect upon the carrier except that as said lever continues its rearward movement it will engage the forward projection 36 on the carrier, forcing the forward end of the wall 32 inwardly to permit the lever to pass the projection. In the final position of the parts, therefore, when the breech-bolt is open the actuating lever rests between the projections 36 and 37 on the carrier, a loaded cartridge is resting upon the carrier and the latter is in position to form a stop to prevent egress of the next succeeding cartridge from the magazine. It is, of course, to be understood that, as is usual in this type of gun, the projection 61 of the breech-bolt will, in the opening movement of the latter, actuate the hammer to cock the gun, while the ejector 19 will force the discharged shell from the breech-bolt and direct the same through an opening 7 provided as the breech-bolt moves rearwardly. In the forward movement of the forearm the breech-bolt is drawn in the forward direction, thereby again rocking the upper end of the actuating lever forwardly. As said lever is between the stops 36—37 of the carrier, the movement of the lever will gradually elevate the forward end of the carrier until the forward end of the cartridge resting on the carrier is in line with the barrel. As the cartridge groove 30 in the carrier inclines, the rear end of the cartridge will be offset from the longitudinal line of the carrier and by the elevation of the latter the rear end of the cartridge will be disposed in position to be engaged by the forward end of the breech-bolt, so that the forward movement of the latter will force the cartridge into the barrel. The elevating influence of the actuating lever on the carrier will continue until said lever has reached a point beyond which it cannot force the carrier upward,

owing to the different pivotal supports of the parts. When this position has been reached the further forward movement of the lever will engage the projection 36 with such pressure as to again force inward the wall 32 and free the lever from further connection with the carrier. It is at this time or just prior to this time that the breech-bolt has engaged the cartridge and forced the same part way at least into the barrel, so that immediately the carrier is released from the lever said carrier is free to gravitate to normal position, though this action is assured by the fact that when the lever is in normal position it will engage the shoulder 29 of the carrier and force the latter if necessary to a proper position.

The thickness or vertical dimension of the forward end of the body of the carrier coupled with the height of the lip 58 are of such aggregate vertical dimensions as to prevent a complete unclosing of the magazine mouth during the operative movement of the carrier, so that at any time during the actuation of the mechanism, the forward end of the carrier serves to prevent the escape of the next succeeding cartridge from the magazine.

Owing to the few parts and the fact that no correlation requiring time in successive actuation is necessary it will be obvious that the action of the improved pumping mechanism may be as rapid as desired, and that the discharged shell is ejected with certainty and the fresh shell disposed in discharging position without loss of time. A rifle may be emptied in considerably less time than the usual lever action and the present improvements can be readily applied to any form of lever action.

Having thus described the invention what is claimed as new, is:—

1. A magazine firearm including a magazine and a barrel, a cartridge carrier operating between the magazine and barrel, a breech-bolt, means for operating the breech-bolt in both directions, a lever mounted within the firearm and engaging the breech-bolt, means carried by the lever to engage and elevate the carrier during movement of the breech-bolt in one direction, and means operated by the lever during movement of the breech bolt in the opposite direction to further elevate the carrier.

2. A firearm including a breech - bolt formed with an opening, means for locking the breech-bolt in closed position, a lever pivoted within the firearm and engaging the opening in the breech-bolt, a cartridge carrier pivotally mounted within the firearm, means carried by the lever to engage and elevate the carrier during movement of the breech-bolt in one direction, and means formed on the carrier to be engaged by the lever in the movement of the breech-bolt in the opposite direction to further elevate the carrier.

3. A firearm including a breech - bolt, a key mounted for sliding movement within the firearm and adapted to lock the breech-bolt in one position, a slidable member mounted on the firearm for manual operation, an arm projecting from the member and coöperating with the key, and an operating arm projecting from the member and connected with the breech-bolt, said connection permitting a limited independent movement of said operating arm relative to the breech-bolt.

4. A firearm including a breech-bolt and a forearm, means for locking the breech-bolt in closed position, means projecting from the forearm for operating the breech-bolt in both directions, and means carried by the forearm to engage and operate the bolt locking means in the initial movement of the forearm.

5. A magazine firearm including a breech-bolt and a forearm, an operating connection between the forearm and breech-bolt whereby the latter may be operated in both directions in the corresponding movement of the forearm, means for locking the breech-bolt in closed position, and an arm projecting from the forearm and adapted in the initial movement of the latter to engage and operate the locking means to release the breech bolt, the connection between the forearm and breech-bolt permitting a free limited movement of the forearm without affecting the breech-bolt.

6. A firearm including a breech-bolt and a forearm, an operating arm projecting from the forearm and engaging the breech-bolt, means for locking the breech-bolt in closed position, and an arm projecting from the forearm and adapted to engage the locking means in the initial movement of the forearm to release the breech-bolt, said arm being formed to retain the locking means in breech-bolt releasing position during the complete reciprocatory movement of the forearm.

7. A firearm including a breech - bolt, a lever pivoted within the arm and engaging the breech-bolt, a forearm, a connection between the forearm and breech-bolt whereby to operate the latter in the movement of the forearm, a cartridge carrier mounted in the firearm, said lever being formed with a shoulder to underlie the cartridge carrier to elevate the latter in the movement of the lever, and means formed on the carrier to be engaged by the lever when in its fully operative position to prevent return of the carrier to normal position.

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

WARREN G. KRAMER.

Witnesses:

JNO. S. FULICK,
J. M. HAESLER.