No. 691,040. Patented Jan. 14, 1902.

F. K. YOUNG.

FIREARM.

(Application filed Apr. 16, 1901.)

(No Model.) 4 Sheets—Sheet 1.

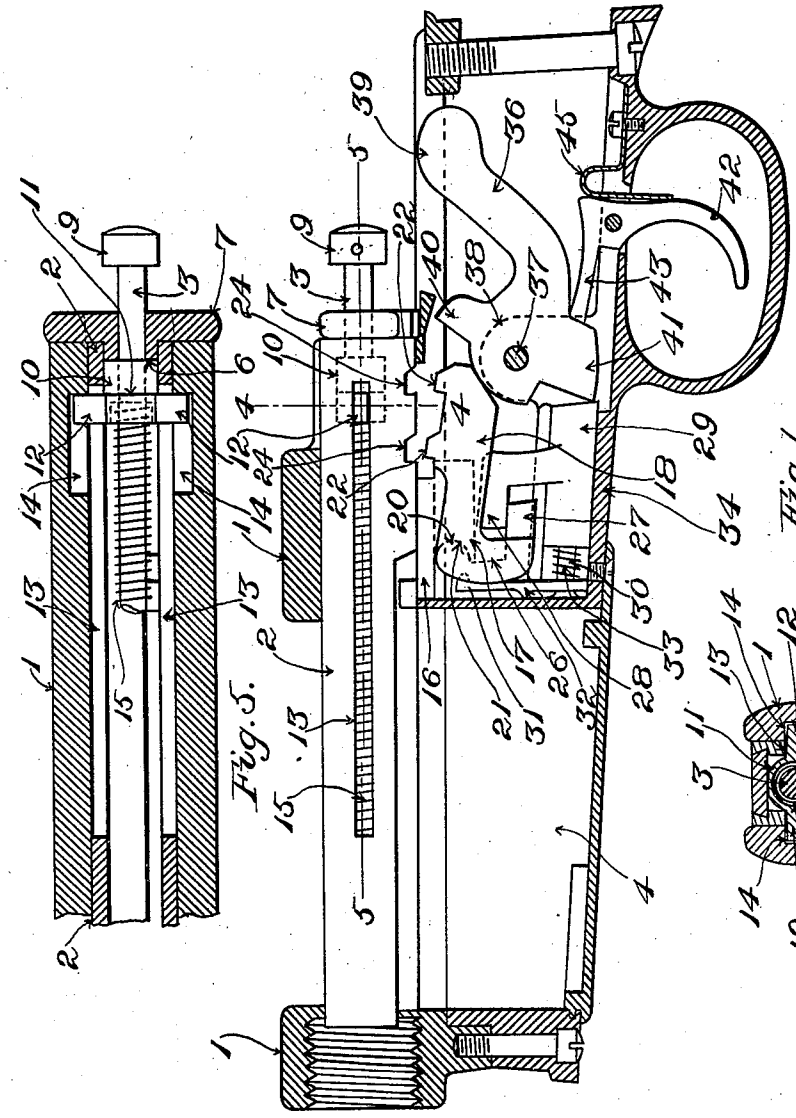


Fig. 1.

Fig. 5.

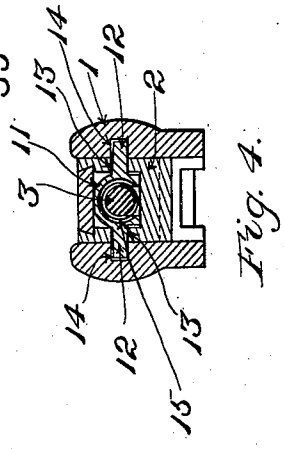


Fig. 4.

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Arthur B. Randall

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(No Model.) 4 Sheets—Sheet 2.

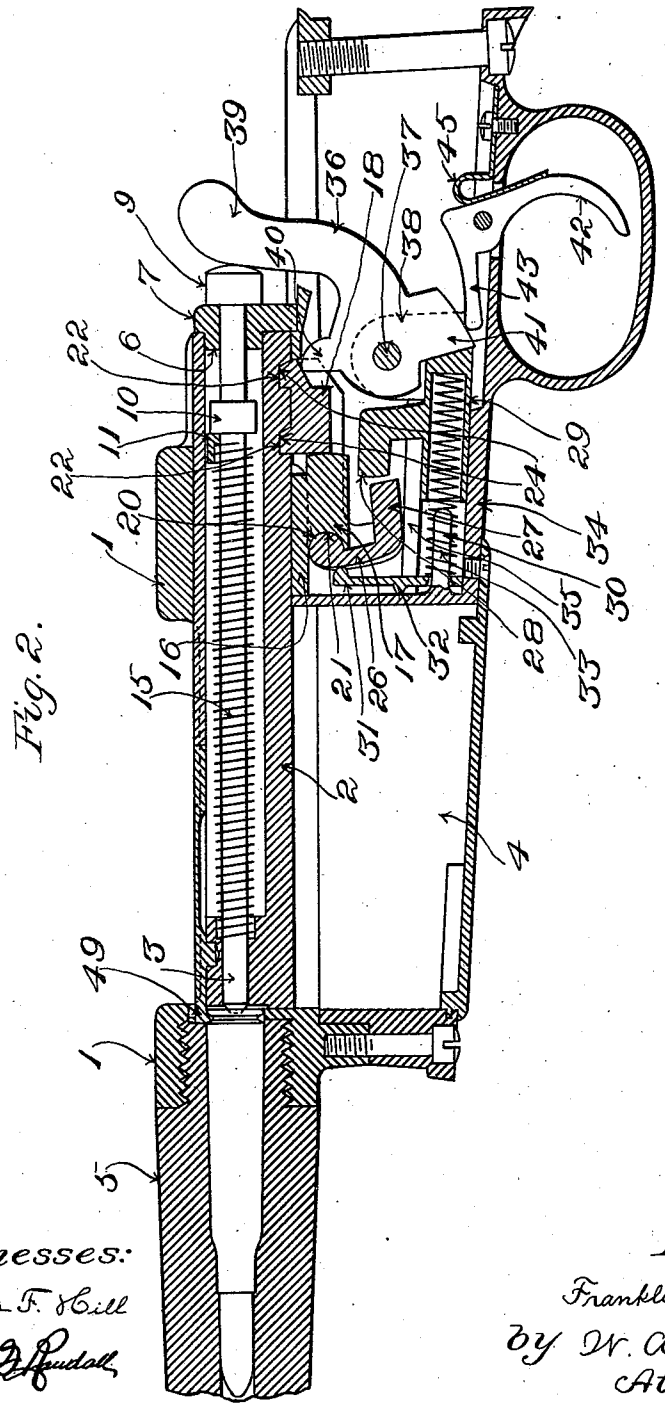


Fig. 2.

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(Application filed Apr. 16, 1901.)

(No Model.) 4 Sheets—Sheet 3.

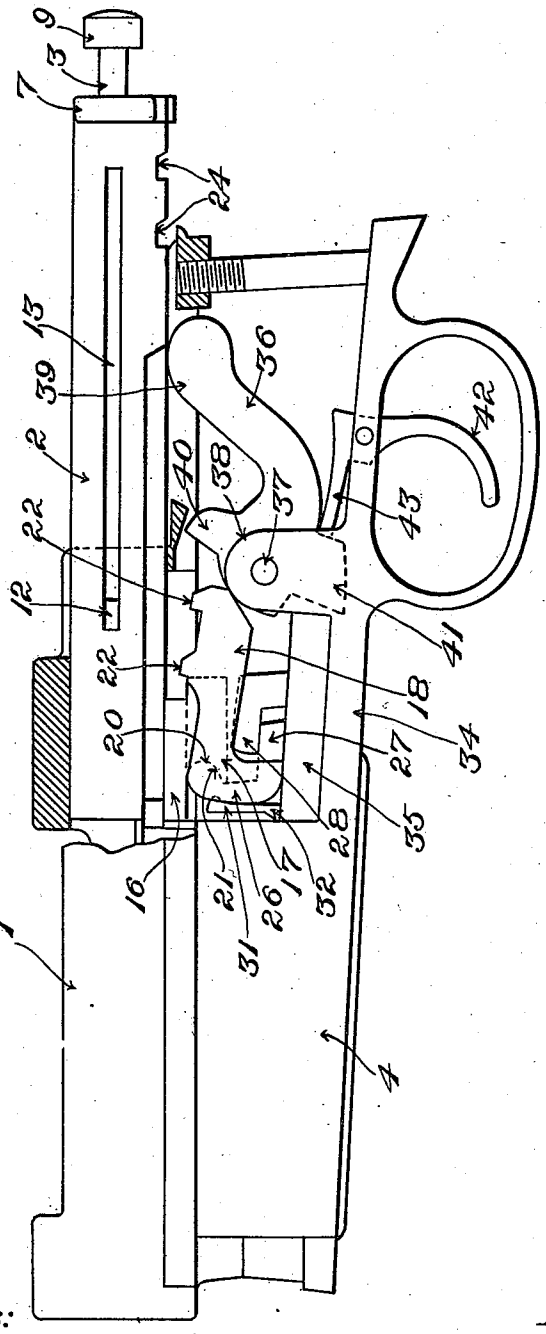


Fig. 3.

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(Application filed Apr. 16, 1901.)

(No Model.) 4 Sheets—Sheet 4.

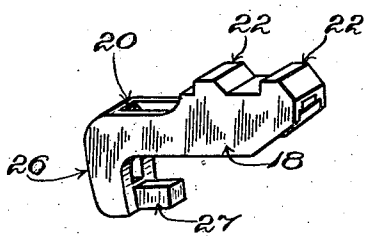


Fig. 6.

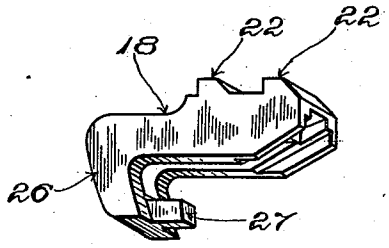


Fig. 7.

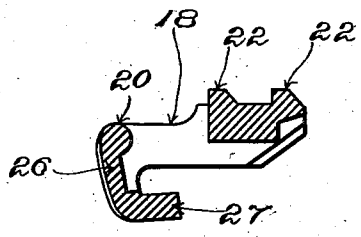


Fig. 8.

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UNITED STATES PATENT OFFICE.

FRANKLIN K. YOUNG, OF BOSTON, MASSACHUSETTS.

FIREARM.

SPECIFICATION forming part of Letters Patent No. 691,040, dated January 14, 1902.

Application filed April 16, 1901. Serial No. 56,078. (No model.)

To all whom it may concern:

Be it known that I, FRANKLIN K. YOUNG, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Firearms, of which the following is a specification.

My invention relates to an automatically-reloading firearm, both small-arms and ordnance, in which the operation of the mechanism does not depend upon a movable barrel.

The object of my invention is to produce a gun of this character in which the loading and firing mechanism consists of few parts and is of simple construction.

My invention consists in mechanism having the novel features, which will be fully described herein and which will be particularly pointed out in the claims at the close of this specification.

In the drawings, Figure 1 is a side elevation, partly in section, of a breech mechanism illustrating my invention, showing the hammer cocked. Fig. 2 is a vertical longitudinal section showing the position of the mechanism after the hammer is thrown forward and the firing-pin has struck the cartridge. Fig. 3 shows the hammer, bolt, and firing-pin thrown back after the discharge. Fig. 4 is a cross-section on line 4 4 of Fig. 1. Fig. 5 is a sectional plan of a part of the bolt and receiver on line 5 5 of Fig. 1. Figs. 6 and 7 are detailed perspective views of the locking-block. Fig. 8 is a vertical longitudinal section of the locking-block.

While I have shown my invention in the drawings as applied to a shoulder-gun, I do not intend to limit myself to such application, as it is adapted for use in other forms of firearms.

Referring now to the drawings, 1 is the receiver for the bolt 2, which holds the firing-pin 3.

4 is the magazine, which may be varied in form to adapt it to the style of gun to which the invention is applied and opens into the receiver 1.

The barrel 5 is represented in Fig. 2 as broken away and as screwed into the end of the receiver 1. The bolt 2 is formed with a hollow interior and is perforated at front and rear to permit reciprocation of the firing-pin. The cross-head 7 is preferably formed with an offset or short stem 6, which fits in and closes the rear end of the bolt 2. The pin 3 has a head 9 on its rear end outside of the bolt 2 and has a collar 10 a short distance inside of the bolt, the reciprocating movement of the firing-pin relative to the bolt being limited by the head 9 and the collar 10. In front of the collar 10 is a yoke 11, having flanges 12, which extend through the longitudinal slots 13 in the sides of the bolt 2 and project into the recesses 14 in the sides of the receiver 1. The yoke has a sliding movement, as will be described hereinafter.

Surrounding the firing-pin 3 is a spring 15, one end of which abuts against the forward end of the bolt 2 and the other end of which abuts against the yoke 11. The tension of the spring normally holds the yoke 11 in its rearmost position, the location of the collar 10 on the firing-pin being such that when the yoke is in its rearmost position, as described, the yoke will abut against the collar 10.

A bridge 16 extends from side to side of the receiver 1 beneath the bolt 2. Attached to or integral with said bridge and projecting downwardly therefrom is a hanger 17, on which is fulcrumed the locking-block 18. The locking-block is formed with a slot and with a rounded pivot portion 20 at the forward end of the slot, which fits in the curved notch 21 in the end of the hanger 17 as a bearing, the body of the hanger projecting through the slot in the locking-block when the locking-block is in position.

Projecting from the upper face of the locking-block are the ribs 22. On the under side of the bolt 2 are the recesses 24, into which the ribs 22 enter when the locking-block is closed, thereby locking the bolt. A slight downward turn of the block on its pivot unlocks the bolt. One rib 22 would do the work, but I prefer to have more than one.

Extending downwardly from the forward end of the locking-block is an arm 26, and extending rearwardly from arm 26 is an arm 27, which, when the locking-block is open, as in Figs. 1 and 3, is engaged by the sliding arm 28 to hold the locking-block open until the hammer is tripped. This sliding arm, which holds the locking-block in its open position, as just described, consists of an angle-bar mounted on

or projecting upward and integral with a cylinder 29, which is closed at its rear end and open at its forward end. Extending rearwardly from the magazine 4 is the frame 34, from which rise the walls 35 35, forming a sort of trough, within which the cylinder 29 slides.

Projecting rearwardly from the magazine 4 is a pin 30, on which is pivoted the dog 31, which I term the "locking-block-closing" dog. This dog is pivoted loosely enough on the pin 30 to permit a slight rocking movement forward and back and has a projection 32, which forms a fulcrum bearing against the rear wall of the magazine. The rear part of the dog 31 at its upper end bears against the arm 26 of the locking-block. Surrounding the pin 30 is a coil-spring 33, one end of which bears against the lower portion of the dog 31 and the other end of which extends into the cylinder 29 and abuts up against the rear end of the cylinder.

The hammer 36 is pivoted at 37 between ears 38.

39 is the head of the hammer, which strikes the head 9 of the firing-pin. A toe spur or boss 40, rising from the pivoted end of the hammer, bears against the rear part of the locking-block when the hammer is up and prevents the locking-block from being opened until the hammer is again brought back.

Projecting downwardly from the pivoted end of the hammer is a heel spur or boss 41, the front face of which forms a back-stop for the cylinder 29 and pushes in the cylinder, compressing the spring 33 when the hammer is thrown backward. The rear face of the spur 41 forms a catch for the trigger.

The trigger comprises a finger-piece 42 and a trip-arm 43, formed integral with each other or rigidly connected, so as to act together, and pivoted at 44 in the frame 34. 45 is the trigger-spring.

The operation of this firearm, whether small-arms or ordnance, may be performed either by hand or automatically. In the latter case such operation is preferably performed by means of a special cartridge, such as is described in United States Letters Patent Nos. 624,145 and 624,146, dated May 2, 1899, granted to me. Assuming the mechanism to be in position ready for firing with the hammer back and a cartridge in the barrel, as shown in Fig. 2, the locking-block is open and is locked in its open position by the sliding arm 28 engaging the arm 27 of the locking-block. When the block is thus locked in its open position, the cylinder 29 of the sliding arm 28 is held in its forward position by the heel-spur 41 on the hammer and the spring 33 is compressed. When the trigger is pulled, it releases the trip-arm 43 from engagement with the spur 41 of the hammer, and the spring 33 is free to expand. The expansion of this spring throws back the cylinder 29 and throws the hammer violently forward. The rearward movement of the cylinder 29 releases the sliding arm 28 from the arm 27 of the locking-block. As the spring 33 exerts its pressure in both directions, its forward tension on the lower arm of the dog 31 causes the upper arm of the dog which rests on the locking-block to close the locking-block as soon as the sliding arm 28 releases the arm 27. If a cartridge of the kind described in my former patents referred to be used with the intent to operate the firearm automatically, then when the hammer strikes the head 9 of the firing-pin, as shown in Fig. 2, the latter is driven forward until it engages the rear of the igniting-plunger contained in the cartridge. By this engagement the igniting-plunger in turn is driven forward into contact with the rear of the bullet 47. The result of this contact of the igniting-plunger with the rear of the bullet explodes the fulminate or primer situated between the rear of the bullet and the front end of the igniting-plunger. By this explosion the charge of powder or other explosive contained in the cartridge is ignited, and by the resulting explosion of this charge the igniting-plunger is driven violently backward, and being engaged with the firing-pin 3 of the gun the firing-pin also is thrown violently backward until the collar 10 is brought into contact with the cross-head 7 of the bolt. During this movement of the firing-pin and before the collar 10 has come in contact with the cross-head 7 the hammer has been forced backward by the firing-pin head 9 and the backward movement of this hammer, pushing cylinder 29 forward, has caused the sliding arm 28 to engage the arm 27, thus unlocking and opening the locking-block. The bolt 2 now being unlocked, the collar 10 comes violently in contact with the front of the cross-head 7 and throws the bolt to the rear until the forward ends of the slots 13 come in contact with the front of the flanges 12 of the yoke 11, compressing the spring 15 between the yoke and the forward end of the bolt. The rearward movement of this bolt has forced downward and passed the hammer, causing the latter to become cocked by the engagement between the spur 41 and the trigger, as in Fig. 3. This rearward movement of the bolt also has extracted the empty shell from the cartridge-chamber by means of the extractor 49 and ejected it from the gun by means of the ejector, thus permitting the magazine-spring to force upward a cartridge into the proper position for being inserted into the cartridge-chamber by the subsequent forward movement of the bolt. This forward movement is performed by the expansion of the spring 15, which occurs immediately after the bolt has completed its backward movement.

What I claim is—

1. In an automatically-acting breech mechanism for firearms, a locking-block, means for opening and closing said block and locking it in an open or closed position, a hammer which when it is thrown back actuates the locking-block-opening mechanism to open

and lock said block and which prevents the said block from being unlocked until the hammer is thrown forward, and when the hammer is thrown forward it actuates the locking-block-closing mechanism, substantially as described.

2. In an automatically-acting mechanism for firearms, a locking-block, means for opening the locking-block and locking it in an open position, a hammer which when it is thrown back actuates the locking-block-opening mechanism to open said block and to hold it open until the hammer is thrown forward, mechanism which closes the locking-block when the hammer is thrown forward, the hammer then locking said block in its closed position, substantially as described.

3. In an automatically-acting breech mechanism for firearms, a locking-block, a hammer having a projection which when the hammer is thrown back opens the locking-block and locks it open until the hammer is thrown forward and then releases it, and having a projection which when the hammer is thrown forward and the locking-block is closed locks it in the closed position, substantially as described.

4. In breech mechanism for firearms, a pivoted locking-block having an arm, and a sliding arm actuated by the hammer when the latter is thrown back which engages with the arm of the locking-block and opens said block and locks it open, substantially as described.

5. In breech mechanism for firearms, a pivoted locking-block, means for opening said block when the hammer is thrown back, a pivoted dog which engages said block, a spring which tends to actuate the dog to close said block, means which lock said block open while the hammer is back, and which release the block when the hammer is thrown forward, whereby said dog is permitted to close said block, substantially as described.

6. In breech mechanism for firearms, a locking-block, a sliding arm having a tubular base, a spring which is held in said tube, and a hammer which when thrown back actuates said arm to open and lock said block and compress said spring, said spring actuating said arm to release said block when the hammer releases the arm, substantially as described.

7. In breech mechanism for firearms, a slotted bolt, a recessed receiver for the bolt, a firing-pin within said bolt and extending through the rear end thereof, stops on said firing-pin which permit a limited sliding movement thereof relative to the bolt, a flanged yoke in front of the inside stop which extends through said bolt into said receiver, whereby when the firing-pin is moved either forwardly or rearwardly it will move a limited distance without movement of the bolt, substantially as described.

8. In breech mechanism for firearms, a slotted bolt, a recessed receiver for the bolt, a firing-pin extending through the rear end of the bolt, stops on said firing-pin outside and inside of said bolt which permit a limited movement of the pin relative to the bolt, a flanged yoke on said firing-pin in front of the inside stop which extends through said bolt into said receiver, whereby when the firing-pin is moved rearwardly from its forward position it will move a limited distance without movement of the bolt and then further rearward movement of the firing-pin will also move the bolt rearwardly, a spring around said firing-pin between the yoke and the forward end of the bolt which tends to hold the bolt closed and the firing-pin in its rearward position, substantially as described.

9. In an automatically-acting breech mechanism for firearms, a bolt, a locking-block, a hammer which when in its forward position against the firing-pin locks said block in engagement with the bolt, mechanism actuated by the hammer when thrown back which opens said block and locks it open, thereby releasing the bolt, a firing-pin which extends through the rear end of the bolt and has a limited sliding movement before the bolt is moved, and which in its rearward movement throws back the hammer, the locking-block and bolt being kept locked by the hammer until the hammer has been thrown a portion of its backward throw by the firing-pin and then being unlocked, the bolt then being carried rearward by the further movement of the firing-pin, substantially as described.

10. In breech mechanism for firearms, a bolt, a pivoted locking-block, a sliding arm which engages said block to open it and lock it open, a spring in combination with said sliding arm, a pivoted dog which engages said block to close it, a hammer which engages said sliding arm, and a firing-pin which in its rearward movement engages said hammer and thereby actuates said sliding arm to open said block, substantially as described.

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

FRANKLIN K. YOUNG.

Witnesses:
WILLIAM A. COPELAND,
ROBERT WALLACE.