Feb. 13, 1945. K. J. LOWE 2,369,244

FIREARM

Original Filed Nov. 28, 1939 2 Sheets-Sheet 1

Fig. 1

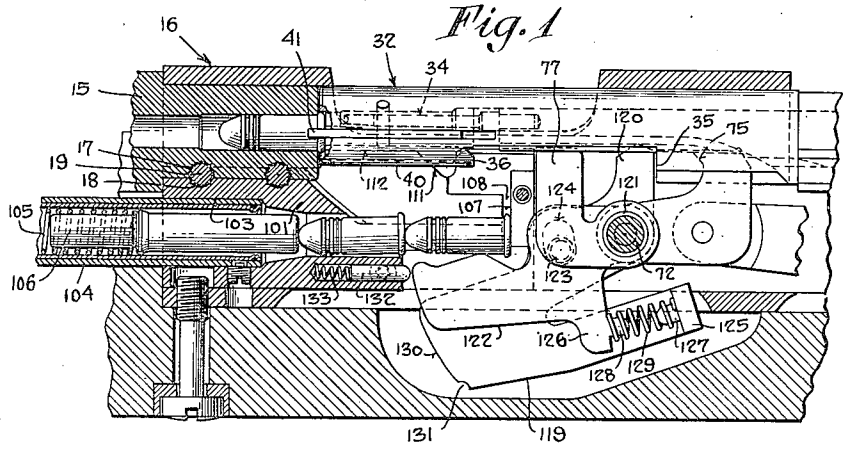


Fig. 2

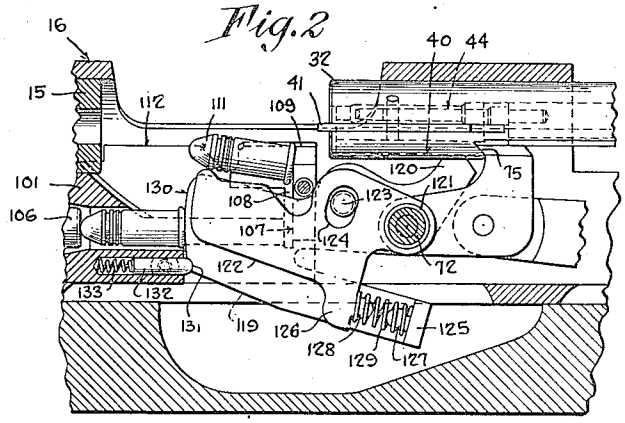
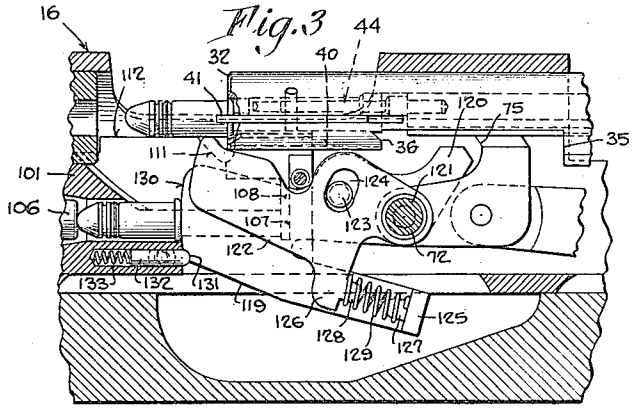


Fig. 3



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Fig. 4

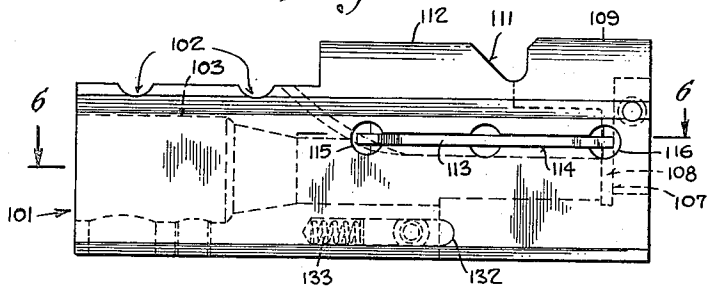


Fig. 5

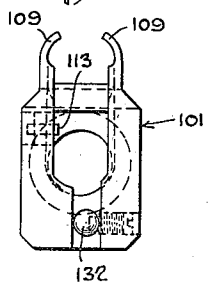


Fig. 6

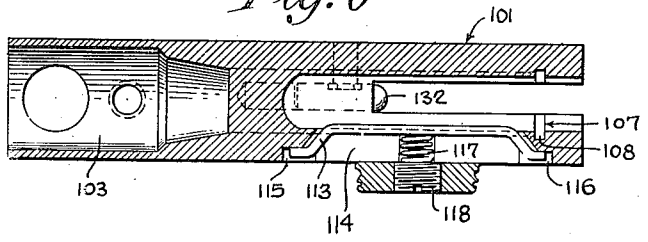
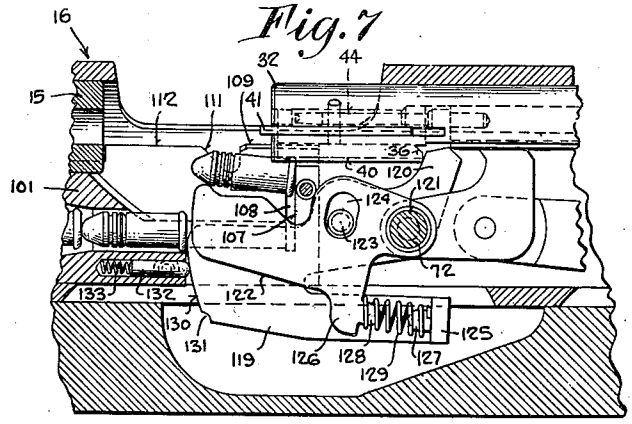


Fig. 7



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2,369,244

FIREARM

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Original application November 28, 1939, Serial No. 306,457. Divided and this application October 2, 1942, Serial No. 460,489

1 Claim. (Cl. 42—17)

This invention relates to firearms, and contemplates improvements in cartridge feed mechanism, particularly devices for feeding cartridges from a tubular magazine located beneath the barrel to a position in front of the breech bolt.

The present application is a division of prior application Serial No. 306,457, filed November 28, 1939, now Patent No. 2,356,257, August 22, 1944.

In the drawings:

Fig. 1 is a sectional side elevation of as much of a firearm as is necessary to show the application of the invention thereto, the breech mechanism of the gun being closed.

Fig. 2 is a view substantially similar to Fig. 1 but showing the breech bolt fully retracted and the cartridge feed mechanism in a corresponding position.

Fig. 3 is a similar view, showing the breech bolt in an intermediate position during its forward movement, the cartridge feed mechanism in its fully operated position, and a cartridge in position to be thrust into the chamber as the breech bolt completes its forward movement.

Fig. 4 is a side elevation of the cartridge feed block removed from the receiver.

Fig. 5 is a rear elevation of the cartridge feed block shown in Fig. 4.

Fig. 6 is a horizontal section through the cartridge feed block substantially on the line 6—6 of Fig. 4.

Fig. 7 is a sectional elevation similar to Figs. 1 to 3, showing the breech bolt in an intermediate position in its rearward or breech opening movement, in which the cartridge which is to be fed into the chamber is positioned beneath and engages the forward portion of the breech bolt.

The firearm comprises a barrel 15 secured to a receiver 16, preferably by means of transverse grooves 17 in the barrel and apertures 18 in the receiver; said apertures being adapted to receive securing pins 19 which may be provided with a plurality of radial projections which in assembly are forced into the metal forming the peripheries of said grooves and apertures. Pins 19 likewise serve as securing means for the cartridge feed block to be hereinafter described.

The upper portion of the receiver 16 constitutes a housing and guide for a breech bolt identified generally by numeral 32. Within the breech bolt is a striker 34, and the lower mid-portion of bolt 32 is cut transversely to give access to the striker. Said transverse cut terminates rearwardly in a shoulder 35 which functions in conjunction with the cartridge feeding devices in a manner to be described.

Integral with the forward end of the breech bolt is a depending rib 40, the front end of which is flush with the face of the breech bolt and engages the head of a cartridge to initiate its movement from the cartridge feed block to the chamber. Rib 40 terminates rearwardly in a shoulder 36 having a function to be described.

Extractors 41 and 42 are mounted in the forward end of the breech bolt at opposite sides thereof.

The cartridge feed block (Fig. 4), identified generally by numeral 101, is secured in the lower forward portion of the receiver and is preferably held in place by the aforementioned assembly pins 19, the lower portions of which occupy grooves 102 in the feed block, which grooves match with the grooves 17 in the barrel.

The block comprises a longitudinal bore 103 adapted to receive the end portion of a tubular magazine 104, the forward end of which is supported below the barrel in the usual manner. The tubular magazine contains the usual spring 105 and spring follower 106 by which the column of cartridges therein is thrust rearwardly. Aligned with the bore 103 of the feed block is a bore of a diameter suitable to receive the cartridges as delivered one at a time from the tubular magazine, the rearmost cartridge coming to rest against shoulders 107 at the end of said bore. The rear end of the feed block comprises a vertical slot through which operate the cartridge feeding devices to be described. The block is likewise slotted vertically above the aforementioned cartridge receiving bore to permit the passage of the body of a cartridge, and the walls bounding said block comprise vertical recesses 108 traversed by the rim of the cartridge in its upward movement.

At the upper rear end of the block are inturned cartridge retainers 109 spaced by a distance which does not permit the passage of the body of a cartridge but does permit the passage of the cartridge feeding rib 40 on the bolt, the inturned retainers 109 traversing the grooves 38 and 39. Forward from the retainers 109 are notches bounded by the forwardly and upwardly inclined rear ends 111 of ribs 112, said ribs being spaced by a distance which permits the passage of the body of a cartridge but not the rim thereof. It will be apparent that as a cartridge is thrust forward from under the retainers 109 by the breech bolt rib 40 the rim thereof rides up the inclines 111 and along the flat upper margins of rib 112 as said cartridge is moved toward the chamber by the breech bolt rib.

The cartridge in the bottom of the feed block in alignment with the tubular magazine is yieldingly retained against upward movement from this position by a suitable yieldable retainer; the form of retainer which has been illustrated (Fig. 6) comprises a stiff wire 113 lying in a longitudinal slot 114 in one of the side walls of the feed block. The end portions of this wire are offset and laterally engage the bottoms of recesses 115 and 116 communicating with said slot 114. The mid-portion of the wire is engaged by a spring 117 which is compressed by a screw 118 held in the side of the receiver. Thus, the cartridge in the bottom of the feed block cannot be accidentally displaced upwardly, but a positive pressure thereon will compress the spring and permit its upward movement, its rim traversing the aforementioned vertical slots 108 in the interior side walls of the feed block. Other similar and equivalent forms of a yieldable retainer may be employed if desired.

To move a cartridge from its position in the bottom of the feed block to a position immediately beneath the retainers 109 at the proper time, that is when the breech bolt has been fully retracted, suitable means are provided, one form of which is described as follows: Upon the pin 72 is pivoted an actuator or elevator 119 provided with an upstanding arm 120 adapted for engagement upon its forward edge with the breech bolt shoulder 36, said forward edge being inclined to permit the breech bolt to move thereover (Fig. 2) after the actuator has been rocked the desired amount by such engagement. The rearward edge of arm 120 is engaged by the breech bolt shoulder 35 to restore the actuator to normal position as the breech bolt approaches its forward position. Adjacent the pin 72 the actuator is provided with a hub 121 upon which is pivoted a cartridge feed lever or cartridge lifter 122. Movement of the cartridge feed lever with respect to the actuator is limited by a stud or stop abutment 123 projecting from the actuator into a slot 124 in the feed lever. The feed lever is urged upwardly with respect to the actuator by means of a spring or yieldable means 129 compressed between a laterally and forwardly turned ear 125 on the actuator and a foot 126 on the feed lever. Preferably, spring retaining pilots 127 and 128 are formed integral with the ear 125 and the foot 126 for retaining the spring 129 in place. The actuator 119 comprises an arcuate forward face 130 adapted to engage the head of the rearmost cartridge in place throughout the displacement of the actuator from its normal position. In the lower portion of the face 130 is an arcuate recess 131 adapted, when the actuator is in its uppermost position, to receive the rounded end of a pin 132 partially housed in a recess in the feed block and urged rearwardly by a spring 133. The engagement of pin 132 in the recess 131 serves to yieldingly retain the actuator in its uppermost (operated) position during the forward movement of the breech bolt after the bolt rib 40 has moved out of contact with the arm 120.

The operation of the cartridge feed mechanism may be described as follows: When the tubular magazine is loaded and the breech closed, the mechanism is in the condition illustrated in Fig. 1. A cartridge lies in the bottom of the feed block, being thrust against the shoulders 107 by the pressure of the column of cartridges in the tubular magazine, the cartridges being urged rearwardly by the magazine spring. The cartridge in the bottom of the feed block is yieldingly retained against upward displacement by the retainer wire 113. The actuator and cartridge feed lever are in their lowermost positions, their upper surfaces being beneath the cartridge. If the breech bolt is now unlocked and retracted, during its rearward movement, shoulder 36 engages and passes over the arm 120, rocking the actuator counterclockwise and elevating the portion thereof in front of pivot 72. The cartridge in the feed block which overlies the actuator and cartridge feed lever is engaged by the upper surface of said feed lever and, as the actuator is moved, the spring 129 is compressed and energy stored therein until sufficient force is exerted upon the cartridge to cause the retainer to yield, thereby allowing the cartridge to be moved upwardly towards the inturned retainers 109. This happens before the movement of the actuator is completed. Upward movement of the cartridge is first stopped by its contact with the rib 40 on the breech bolt (Fig. 7). As the bolt is further retracted the cartridge rises into contact with the retainers 109 and the cartridge feed lever spring is again compressed; the parts assuming the position illustrated in Fig. 2. The movement of the actuator has brought the recess 131 into alignment with the pin 132 which is engaged therein to retain the actuator during forward movement of the breech bolt. As the breech bolt completes its rearward movement, its face passes to the rear of the ejector 77 and the fired shell which has been extracted from the chamber is ejected. Immediately thereafter rearward movement of the breech bolt is stopped by the engagement of the forward edge 75 of the trigger with shoulder 36. As the breech bolt moves forward, the face of the breech bolt rib engages the head of the cartridge held in the top of the feed block and thrusts this cartridge forwardly out from under the inturned retainers 109. As it passes from the retainers, said cartridge is free to move upwardly and is so moved by the cartridge feed lever under the compression of the spring 129. This movement insures the proper engagement of the rim of the cartridge under the claws of the extractors 41 and 42. The rim of the cartridge thereafter moves upwardly along the inclined rear edges 111 of the ribs 112 and is carried into the chamber. As the breech bolt approaches its forward position, the rear face of arm 120 of the actuator is engaged by shoulder 35 on the breech bolt, and the actuator and cartridge feed lever are restored to their normal (Fig. 1) position. As the actuator passes below the rearmost cartridge in the magazine, this cartridge is moved to the rear by the magazine spring, leaving the parts again in the condition shown in Fig. 1.

The invention is not considered as limited to the specific construction shown and described by way of illustration, since it extends to all equivalent constructions falling within the scope of the appended claim.

I claim:

A firearm comprising a chambered barrel, a receiver, a chamber-closing breech bolt reciprocable in said receiver, a tubular cartridge magazine supported beneath said barrel, a feed block in said receiver communicating with said tubular magazine and comprising passages adapted for the transfer of cartridges one at a time from a position in alignment with said tubular magazine into position to be engaged and moved into said chamber by said breech bolt, means for yieldably retaining a cartridge in said feed block in sub-

stantial alignment with said tubular magazine comprising a lateral slot in a side wall of said feed block, a yielding device held in said slot and projecting therethrough into the path of transfer of cartridges through said feed block, and means at the top of said feed block for retaining a cartridge therein in position for engagement by said breech bolt; and means for transferring a cartridge through said feed block comprising an actuator having a portion arranged for engagement by said breech bolt and a portion underlying a cartridge in said feed block provided with a face arranged to close the passage from said tubular magazine to said breech block when said actuator is in displaced position, and a detent for yieldably retaining said actuator in displaced position arranged for engagement with a portion of said cartridge stopping face.

KENNETH J. LOWE.