

March 24, 1964

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3,125,821

REPEATING GUN WITH CARTRIDGE LIFTER AND CARTRIDGE STOP MEMBER

Filed April 2, 1962

4 Sheets-Sheet 1

FIG. 1

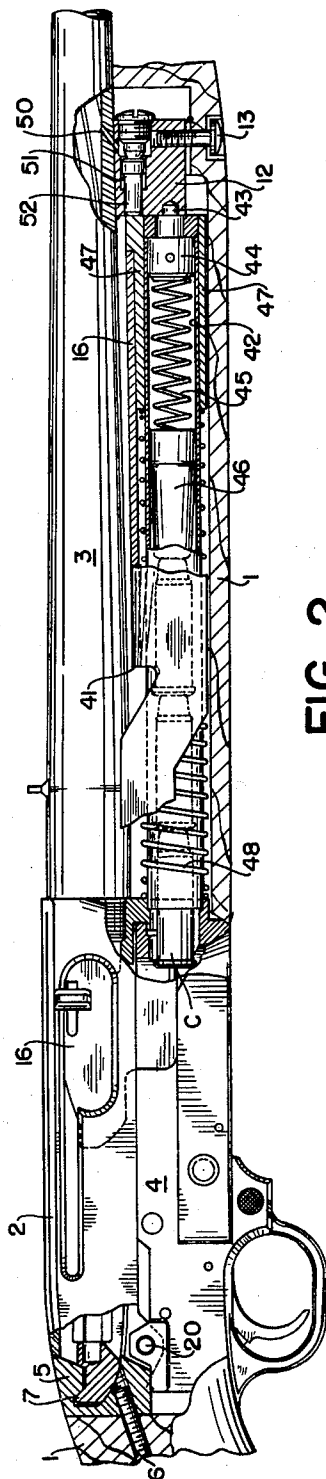
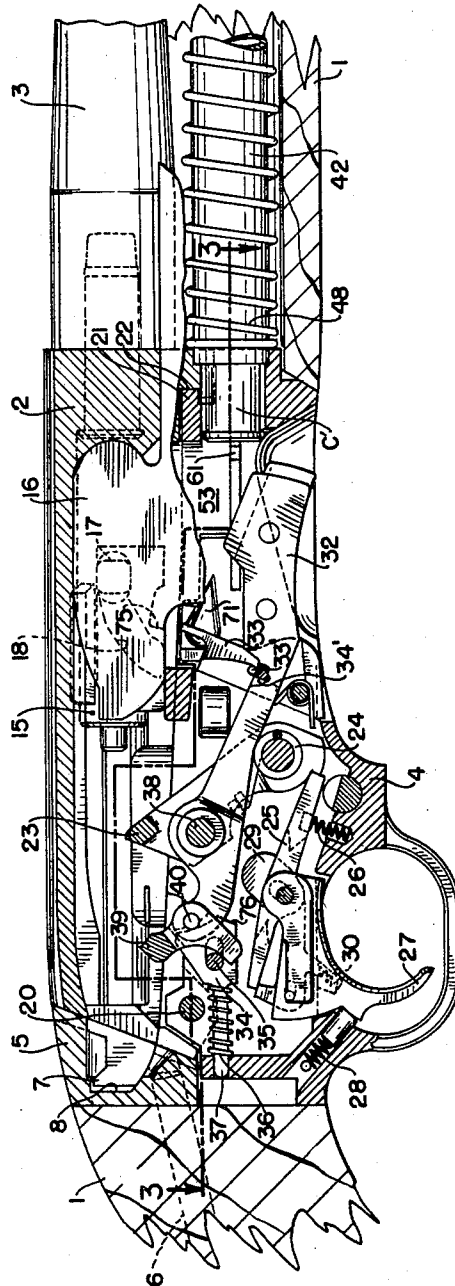


FIG. 2



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FIG. 3

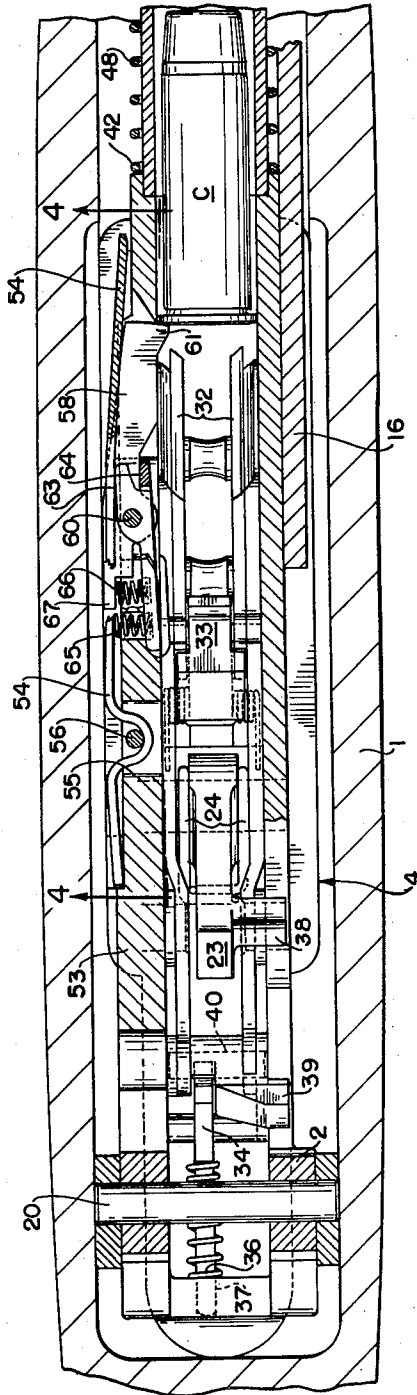
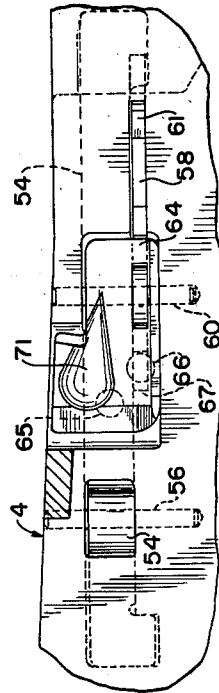


FIG. 4



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FIG. 5

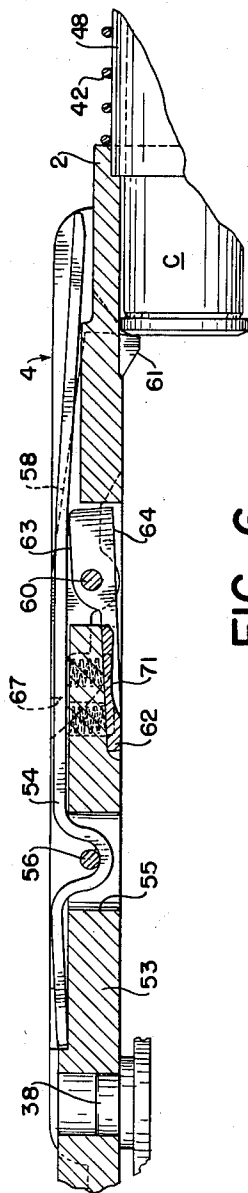


FIG. 6

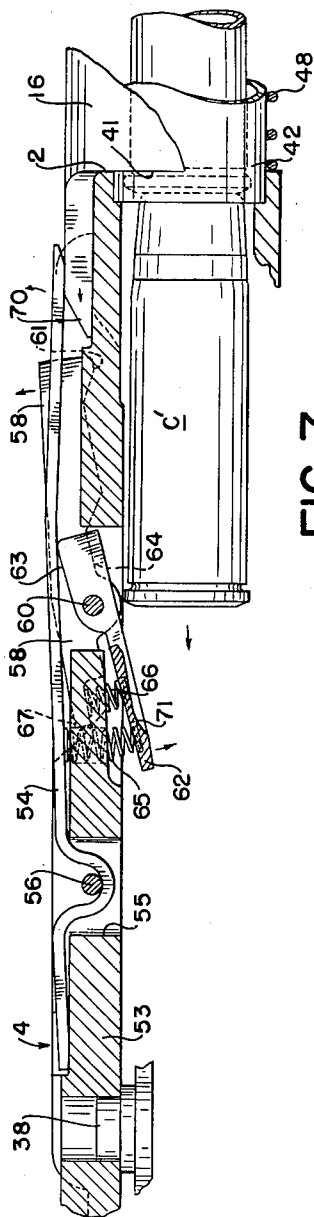
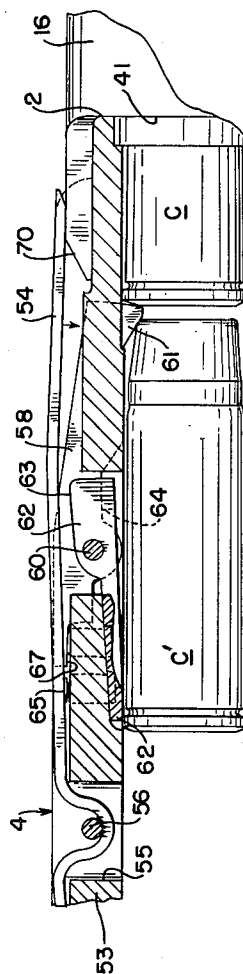


FIG. 7



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FIG. 8

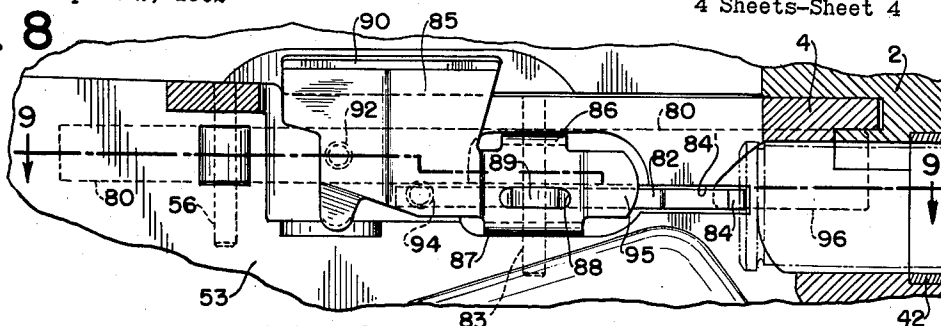


FIG. 9

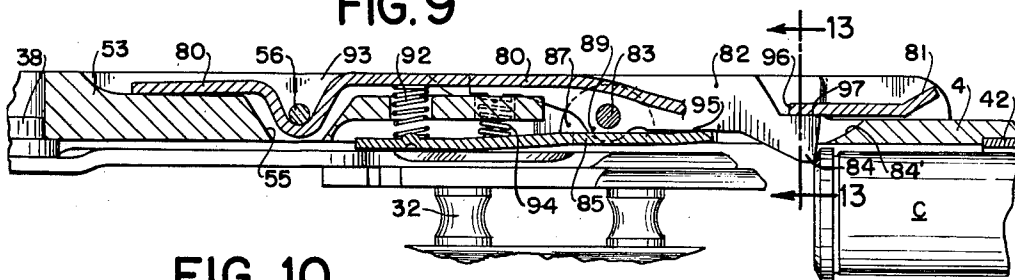


FIG. 10

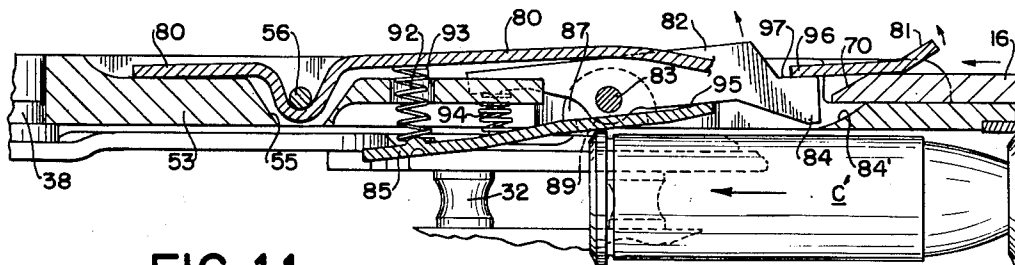


FIG. 11

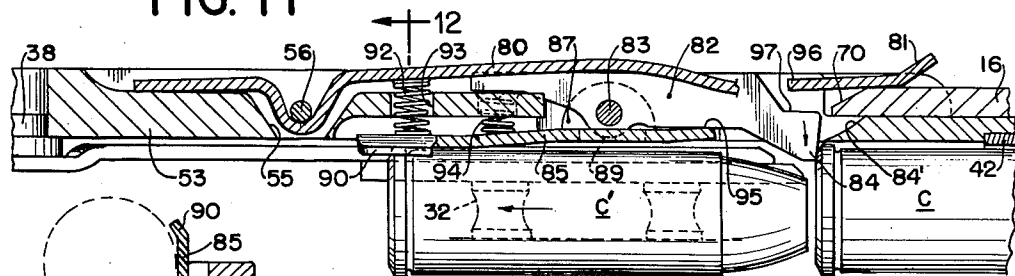


FIG. 12

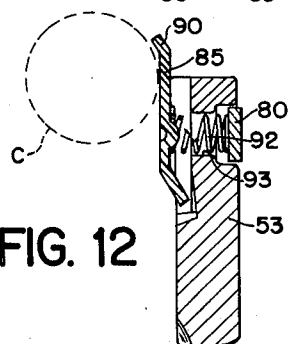
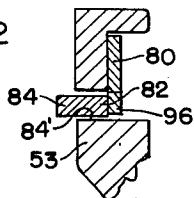


FIG. 13



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REPEATING GUN WITH CARTRIDGE LIFTER AND CARTRIDGE STOP MEMBER

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Filed Apr. 2, 1962, Ser. No. 184,195

10 Claims. (Cl. 42—17)

This invention relates to firearms, especially to the so-called shoulder arms which include shotguns and rifles, and has for its object the provision of certain improvements in repeating firearms.

The invention is primarily concerned with guns, both rifles and shotguns, having a tubular magazine, a means such as a cartridge lifter for receiving a cartridge or shot shell from the magazine and lifting it into position for entering the barrel chamber, and a slide in operable connection with a reciprocable breechblock, and provides an improved means for controlling the movement of the cartridges or shot shells (hereinafter called cartridges) during the feeding thereof from the magazine to the cartridge lifter.

Although the invention is applicable to both shotguns and rifles, it will be described with reference to a rifle, merely to avoid repetition. Moreover, the invention will be illustrated and described with reference to the rifle of the application of William B. Ruger, Serial No. 106,991, filed March 1, 1961, on which this application is based as a continuation-in-part. This rifle is capable of utilizing not only the usual rifle cartridges, but also short and relatively large diameter cartridges.

The invention provides means for controlling the feed of cartridges from the magazine to the lifter comprising a cartridge stop member and spring means operated by the slide for setting stop member in cartridge-holding position when the slide is forward, and means associated with the slide and stop member to operate the stop member to release the cartridge when the slide moves rearward, and means engaged by the advancing cartridge to reengage the cartridge stop member and hold the next cartridge in the magazine. In one feature of the invention the advancing cartridge is, in effect, an operative component operating a pivoted member to permit the cartridge stop member to move into a position in the path of the next cartridge.

These and other novel features of the invention will be better understood after considering the following discussions taken in conjunction with the accompanying drawings in which:

FIG. 1 is a side elevation, with parts removed, of a semi-automatic rifle in accordance with the said Ruger application, and embodying this invention;

FIG. 2 is a side elevation, partly in section, of an enlarged portion of the rifle shown in FIG. 1 showing the position of the cartridges and the elements when the gun is ready for firing;

FIG. 3 is a plan view at 3—3 of FIG. 2;

FIG. 4 is a fragmentary side view at 4—4 of FIG. 3;

FIG. 5 is a fragmentary plan view, on an enlarged scale, of FIG. 3;

FIGS. 6 and 7 are views similar to FIG. 5 illustrating the different positions of the elements in a sequence of movement of a cartridge from the tubular magazine during firing;

FIG. 8 illustrates an elevational view from the inside of a modification of the means for controlling the sequence of movement of a cartridge from the tubular magazine;

FIGS. 9, 10 and 11 are sectional plan views at 9—9 of FIG. 8 showing different positions of the elements;

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FIG. 12 is a sectional view at 12—12 of FIG. 11; and
FIG. 13 is a sectional view at 13—13 of FIG. 9.

The embodiment of the invention illustrated in FIGS. 1 to 7 of the drawings is a semi-automatic gas-operated rifle especially constructed and arranged to function with pistol cartridges, such for example as the 44 cal. magnum pistol cartridge which has a substantially cylindrical rimmed case and a heavy flat-nosed lead bullet. Notwithstanding their weight and shape these cartridges can be fed from a tubular magazine into the barrel even in a semi-automatic action in a reliable and efficient manner in the improved gun of the invention. Of course, other types of cartridges may be used.

The rifle of the said Ruger application, preferably and very advantageously, comprises a single or one-piece stock 1 of the type used on bolt action rifles of the Mauser type, a receiver 2 having a barrel 3 threaded therein and a trigger housing 4 removably attached to the under portion of the receiver. The stock has a receiver attaching block 5 secured thereto by the screw 6. The receiver has a tail piece in the form of a hook 7 which engages an angular slot 8 in the block to removably secure the end of the receiver to the stock. The barrel has a depending block 12 secured to the under surface which is tapped and threaded to receive the stock securing screw 13. (The stock may also be attached to the barrel by a band.) When screw 13 is removed and the forward end of the gun is lifted from the stock the tail piece 7 swings out of its engagement with the slot 8 of block 5. The receiver has a hollow interior in which is mounted a reciprocable breechblock (bolt) 15 which is locked and unlocked by the slide 16 by means of a cam lug 17 operating in a groove 18 in the bolt. The trigger housing 4 is attached at the rear to the receiver by the coupling pin 20 and at the front by the lip 21 which enters a slot 22 in the receiver.

The trigger housing 4 has several elements mounted therein including a hammer 23 driven by coil springs 24 (one on each side of the hammer), a sear 25, sear spring 26, trigger 27, trigger spring 28, trigger disconnecter 29 and its spring 30. The trigger housing also has mounted therein the cartridge lifter 32, a cartridge-lifter latch 33 and a two-way cam 34 mounted on the pin 35, the cam being pushed towards the right by the spring 36 on the stem 37. The cartridge lifter is pivotally mounted in the housing 4 by the studs 38 and the rearward end of the lifter has a dog 39 pivotally connected thereto by the pin 40.

The tubular magazine 42 is connected at the front to the block 12 by the projecting lug 43 on the spring stop 44. The magazine feed spring 45 has a follower 46 against which the cartridges bear and are pushed onto the lifter 32.

The slide 16 extends forward and has on its forward end a weighted collar 47 which abuts against the block 12 in its forward position. The slide is urged forward by the return spring 48 which surrounds the magazine tube 42 and bears rearward against the receiver and trigger housing.

The gas port 50 in the barrel connects with a chamber 51 in the block 12 in which is mounted a piston 52 which is arranged to strike a hard blow on the collar 47 and drive the entire slide and its connected bolt 15 rearward.

The aforementioned elements are described in greater detail in the said Ruger application and further discussion is unnecessary since this invention is concerned with means to hold the cartridges in the magazine and control their movement from the magazine to the lifter and their feed into the barrel chamber.

FIGS. 3 to 7 illustrate in greater detail one embodi-

ment of the means for controlling the movement of a cartridge from the magazine and the positioning of it on the cartridge lifter 32, while preventing obstructing movement of the next cartridge in the magazine. The left or back side 53 of the trigger housing as viewed in these drawings is cut out to receive the flat spring 54 which is held in the pocket 55 by the pin 56. The right end of this spring normally presses inward towards the side 53. The cartridge stop member or latch 58 is pivotally mounted in the trigger housing on the pin 60. The right end of this latch has a projection 61 which can engage the rim of a cartridge as it emerges from the magazine and stop its further motion, as shown in FIGS. 5 and 7. The cartridge operated dog 62 is also pivoted on the pin 60 and has an edge 63 on which the spring 54 bears normally holding it within a recess in the trigger housing wall 53, as shown in FIG. 5. This dog has a flat lateral lip 64 (FIG. 3) which engages an inner surface of the stop latch 58 to hold this stop latch in an inoperative position as shown in FIG. 6 only when the flat spring 54 is urged outward. The dog 62 is normally urged in the direction of the arrow of FIG. 6 by the coil spring 65. The dog also carries a coil spring 66 which bears on the left extension 67 of the cartridge stop latch 58.

FIG. 5 represents a position of the members as when the gun is loaded in which case the spring 54 holds the dog 62 in the inoperative position and the spring 66 forces the cartridge stop latch 58 to turn clockwise and put the extension 61 into the path of the cartridge. When the gun fires and the slide moves rearward the cam surface 70 on slide 16 pushes the end of spring 54 in the direction of the arrow (FIG. 6) thereby freeing the dog 62 which, by reason of the lip 64, pushes the cartridge stop latch 58 outward thereby releasing the cartridge which is forced rearward by the compressed spring 45. The base of this cartridge strikes the cam surface 71 and rotates the dog clockwise around pin 60, compressing spring 65. This rotation is transmitted to cartridge stop latch 58 through spring 66 and puts extension 61 into the path of the next cartridge C, thereby arresting its further rearward movement as shown in FIG. 7.

The rifle illustrated in FIGS. 1 to 7 functions as follows:

FIG. 2 shows the rifle with a cartridge in the barrel chamber and with the hammer cocked. The slide 16 is in the forward position shown in FIGS. 1 and 2. Also the cartridge C in the magazine is held by the projection 61 as shown in FIGS. 2 and 5. When the bullet has passed beyond the gas port 50 the high pressure gas strikes the plunger 52 a short, hard blow driving the plunger into contact with the slide collar 47. This imparts sufficient momentum to the slide to carry it rearward to the end of its stroke when the edge 41 strikes the front end of the receiver 2. In this rearward travel of the slide the lug 17 operating in the cam slot 18 turns the bolt from its locked position to its unlocked position and carries it rearward. The empty case is extracted and ejected in the usual way by means not shown. During this rearward travel the slide engages the hammer 23 and turns it rearwardly. As the bolt and slide move forward slightly the dog 39 engages the notch 75 in the slide and prevents any further return of the bolt and slide. When the slide has reached its rearward position the cam surface 70 thereof has pushed the spring 54 to the outward position shown in FIG. 6 thereby releasing the first or leading cartridge C' of the magazine so that it can be pushed onto the cartridge lifter 32 when the lifter is in the position as shown in FIG. 2. The released leading cartridge moves rearward as shown in FIG. 6 and strikes the cam surface 71 of the dog 62 and depresses it to the position shown in FIG. 7. When dog 62 is depressed, its rotary motion around pivot 60 is transmitted through spring 66 to latch 58 so that the end 61 thereof is made to assume the position of FIG. 7 and stop the rearward

movement of the next cartridge C in the magazine. The impact of the base of the cartridge C' against the lifter latch 33 swings it in a counterclockwise direction so that its cross-pin 33' is moved off the edge 34' of the lifter. This action released the cartridge lifter 32 for upward movement initiated by the downward pressure on the dog 39 in the notch 75 as the slide moves forward. This movement turns the dog clockwise depressing the rearward end of the lifter and raising the forward end towards the position for forcing the cartridge into the barrel chamber. As the slide acts upon the dog 39, the cam surface 76 of the cam 34 takes over, bearing on the pin 40, and raises the cartridge lifter to its final upper position so that the bolt can push the cartridge into the chamber. Meanwhile, the bolt is advanced rapidly and pushes the cartridge into the chamber as shown in FIG. 2. As fully described in said Ruger application the early closing bolt initiates the downward movement of the forward end of the lifter which raises pin 40 until cam 34 can urge pin 40 upward to complete the movement of the lifter downward into the position of FIG. 2 for receiving another cartridge. The cartridge lifter can be pushed upward out of the way when pushing cartridges into the magazine.

The modified cartridge feed mechanism illustrated in FIGS. 8 to 13 comprises the same general elements as FIGS. 1 to 7, namely the receiver 2, trigger housing 4, slide 16, tubular magazine 42, wall part 53 of the trigger housing, cam 70 and part of the cartridge lifter 32 which is pivoted on the pin 38.

The flat spring 80 is also mounted in the recess 55 and held in position by the pin 56. This spring has an upturned end 81 which is engaged by the cam 70 of the slide 16 when the slide travels rearward. The cartridge stop member or latch 82 is pivotally mounted on pin 83 in the trigger housing. The right end of this latch has a projection 84 which, as best shown in FIG. 8, projects through slot 84' in the wall of the trigger housing and can engage the base of the cartridge C as it emerges from the magazine as shown in FIG. 9. The cartridge operated dog 85 is also pivoted on the pin 83 on lateral ears 86 and 87 and has a slot 88 for the clearance of the hub 89 of the latch 82. This dog may be pressed out of flat steel and has a rearward part extending upwardly and having an inward lip 90 which engages the cartridge C much in the manner of a box magazine lip and holds it against rising (FIG. 12).

The coil spring 92 in the hole 93 bears at one end on the spring 80 and on the other end on the dog. When the slide 16 has lifted spring 80 as in FIG. 10, spring 92 can turn the dog 85 to cause the right end thereof, which bears on the underside 95 of the latch 82, to move latch 82 out of the way of the cartridge. The coil spring 94 bears at one end on the dog 85 and at the other end on the rear end of latch 82. The spring 80 lies above the latch 82 (in vertical position as in FIG. 8) but has a downwardly extended portion 96 which bears on the shoulder 97 of the recessed forward end of the latch (FIGS. 9 to 11). When the slide is forward as in FIGS. 8 and 9, the end 81 of spring 80 lies near the trigger housing 4 and bears on the shoulder 97 of the latch 82 holding it down to cause the projection 84 to stop the cartridge C in the magazine. The underside 95 of the latch also bears on the forward end of the dog and compresses spring 92 to the position shown in FIG. 9.

When the slide 16 moves rearward and the cam 70 rises the spring 80 as in FIG. 10 the spring 92 turns the dog 85 to lift the latch 82 and release the leading cartridge as in FIG. 10. As the cartridge travels rearward it strikes the dog 85 and pivots it to the position of FIG. 11, compressing spring 92, while spring 94 causes the latch 82 to turn to the position shown in FIG. 11 to bring the projection 84 into the path of the next leading cartridge C and stop its further movement. FIG. 11 shows the cartridge engaged by the flat upright side of the dog

85 which holds the cartridge against the opposite side of the receiver (not shown) and in position to be picked up by the lifter 32 while the lip 90 is positioned so as to yieldably restrain upward movement of the base of the cartridge until the lifter 32 elevates the cartridge past lip 90 and into feed position for entering the chamber.

Loading of the magazine is accomplished by disengaging the lifter latch 33 and elevating the lifter 32 until the nose of the cartridge being loaded is aligned with the magazine.

As the cartridge is pushed into the magazine, lip 84 of the cartridge stop latch 82 is moved out of the path of the cartridge by the cartridge itself. Movement of the dog 85 is blocked by the elevated position of the lifter 32, therefore as latch 82 is moved by the cartridge, spring 94 is compressed. As the base of the cartridge is moved past the lip 84, the cartridge stop latch 82 is moved back to its engaged position by the spring 94, thus restraining the cartridge as shown in FIG. 9.

We claim:

1. In a repeating gun having a receiver, an attached barrel, a trigger housing attached to the receiver, a tubular magazine secured at the rear to the receiver and located below the barrel, a bolt in the receiver, slide means engaging the bolt and reciprocable therewith, means for moving the slide and bolt rearward and forward in the firing cycle, a cartridge lifter arranged to receive a cartridge from the magazine and raise it to a position to be fed into the barrel, a cartridge stop member which moves into the path of the leading cartridge in the magazine and stops its rearward travel when the gun is in position for firing, means operated by the slide for disengaging the cartridge stop member, and means operated by said cartridge to reengage the cartridge stop member and hold the next cartridge in the magazine.

2. In a repeating gun having a receiver, an attached barrel, a trigger housing attached to the receiver, a tubular magazine mounted at the rear to the receiver and located below the barrel, a bolt including means to lock the bolt to the receiver, slide means for locking and unlocking the bolt during forward and rearward travel of the slide, a cartridge lifter mounted in the trigger housing arranged to receive a cartridge from the magazine and raise it to a position to be forced into the barrel by the bolt, a pivoted member in the trigger housing which can move into the path of the leading cartridge in the magazine and stop its rearward travel, means on the slide to release tension on the pivoted member as the slide travels rearward to permit the pivoted member to release the leading cartridge so that it can be pushed onto the lifter, and means actuated by the leading cartridge as it moves onto the lifter to reset the pivoted member to engage and hold the next leading cartridge in the magazine.

3. In a repeating gun having a receiver with an attached barrel, a tubular magazine located below the barrel, a bolt reciprocable in the receiver, a slide for operating the bolt, a trigger housing attached to the receiver having means mounted therein for transferring a cartridge from the magazine to the barrel chamber, a cartridge stop member in the trigger housing for engaging and holding the leading cartridge in the magazine to stop its rearward movement, a spring member in the trigger housing which normally bears on the stop member when the slide is forward and out of contact with the spring member, means on the slide to engage the spring member when the slide has moved rearward to permit the stop member to release the cartridge for entrance onto the means for transferring a cartridge, and means operated by the advancing cartridge to reset the stop member to engage and hold the next leading cartridge.

4. The improvement in repeating guns having a tubular magazine and means to feed the cartridges from the magazine into the barrel chamber and a bolt operated by a slide, which comprises a pivoted means located near the magazine having means for engaging the base of the lead-

ing cartridge in the magazine to prevent its rearward movement, an intermediate member in operative connection between the pivoted means and the slide, means on the slide to engage the intermediate member when the slide has traveled rearward and permit the pivoted member to release the leading cartridge for transfer to the barrel chamber, and means operated by the advancing cartridge to reset the pivoted means to move into the path of the next leading cartridge and stop its rearward movement.

5. The improvement in repeating guns defined in claim 4 in which the intermediate member is a flat spring and a second pivoted member operated by the leading cartridge having an interior projecting lip which yieldably holds the base of the advancing cartridge from upward motion.

6. In a repeating gun having a receiver, an attached barrel, a trigger housing attached to the barrel, a tubular magazine suspended below the barrel, a bolt in the receiver, slide means engaging the bolt and reciprocable therewith, means for moving the slide and bolt rearward, a cartridge lifter arranged to receive a cartridge from the magazine and raise it to a position to be fed into the barrel, a pivoted member mounted in the trigger housing having means for engaging and holding the leading cartridge in the magazine, a spring member arranged to press against the pivoted member and hold it in the path of the cartridge, means on the slide to engage the spring member and lift it out of holding contact with the pivoted member when the slide travels rearward, and spring operated means pivoted to the trigger housing to force the pivoted member out of contact with the cartridge when the spring member has been lifted by the slide permitting the leading cartridge to be pushed onto the lifter, said spring operated means being actuated by the advancing cartridge to reset the pivoted member to engage the next leading cartridge.

7. The improvement in a repeating gun defined in claim 6 in which the pivoted member and the spring operated means are both mounted on the same pin, said spring operated means being a cartridge operated dog having a lip for engaging and lifting the pivoted member when the spring member is lifted by the slide, a coil spring in the trigger housing which normally holds the dog lip in engagement with the pivoted member and a second coil spring in the trigger housing which normally urges the dog lip to raise the pivoted member out of contact with the cartridge, and a surface on the dog to be engaged by the leading cartridge to cause it to compress the second coil spring and urge the pivoted member into blocking engagement with the next leading cartridge, the spring member being sufficiently strong that when it is released by the slide it can bear against the dog to compress the second spring and move the pivoted member into the path of the next leading cartridge.

8. The improvement in a repeating gun defined in claim 6 in which the pivoted member and the spring operated means are both mounted on the same pin, said spring operated means being a cartridge operated dog having a lip for engaging and lifting the pivoted member when the spring member is lifted by the slide, a coil spring in the trigger housing which normally holds the dog lip in engagement with the pivoted member and a second coil spring in the trigger housing which normally urges the dog lip to raise the pivoted member out of contact with the cartridge, and a surface on the dog to be engaged by the leading cartridge to cause it to compress the second coil spring and urge the pivoted member into blocking engagement with the next leading cartridge, the spring member being sufficiently strong that when it is released by the slide it can bear against the pivoted member to compress the second spring and move the pivoted member into the path of the next leading cartridge.

9. In a repeating gun having a receiver with an attached barrel, a tubular magazine located below the bar-

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rel, a bolt reciprocable in the receiver, a slide for operating the bolt, a trigger housing attached to the receiver having means mounted therein for transferring a cartridge from the magazine to the barrel chamber, a cartridge stop member in the trigger housing for engaging and holding the leading cartridge in the magazine to stop its rearward movement, a spring member in the trigger housing which when the slide is rearward engages and holds the spring member out of contact with the stop member but which bears on the stop member when the slide is forward and out of contact with the spring member, means on the slide to engage the spring member when the slide has moved rearward to permit the stop member to release the cartridge for entrance onto the means for transferring a cartridge, and a pivoted member operated by the leading advancing cartridge having a spring which bears on the cartridge stop member to turn the cartridge stop member into the path of the next advancing cartridge and stop its rearward movement.

10. In a repeating gun having a receiver with an at- 20

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tached barrel, a tubular magazine located below the barrel, a bolt reciprocable in the receiver, a slide for operating the bolt, a trigger housing attached to the receiver having means mounted therein for transferring a cartridge from the magazine to the barrel chamber, a cartridge stop member in the trigger housing for engaging and holding the leading cartridge in the magazine to stop its rearward movement, a spring member in the trigger housing which normally bears on the stop member when the slide is forward and out of contact with the spring member, means on the slide to engage the spring member when the slide has moved rearward to permit the stop member to release the cartridge for entrance onto the means for transferring a cartridge, and means on the spring member which bears on the cartridge stop member to force it into the path of the advancing cartridge when the slide has moved forward out of engagement with the spring member.

No references cited.