ABSTRACT OF THE DISCLOSURE

A firearm having a magazine extending rearwardly from a position below the opening of the cartridge chamber is provided with a cartridge selector including an arm pivotally attached to the firearm and having a projection adapted to extend into the path of the breech bolt. The selector also includes a U-shaped portion extending transversely of said arm and forming two lips spaced apart in the direction of the path of the cartridges and movable into and out of the path of the cartridges in the magazine. Spring means is provided to urge the lips into the path of the cartridges.

This invention relates to a cartridge feeding system and more particularly to an improved system for feeding various sized cartridges from the butt end of a firearm to the receiver.

In cartridge feed systems designed for feeding from the butt end of the firearm difficulty has been experienced in designing a system that can accommodate 22 caliber short, long, and long rifle rounds interchangeably. Such difficulty is due primarily to the differences in length, bullet contour, and center of gravity between the 22 caliber short and 22 caliber long rifle.

Feed systems of the type adapted to feed from the butt end of the rifle generally include a cutoff operable to stop the feeding of the second round before it enters the feed chamber when the bolt is open. However, a single cutoff properly designed for a long rifle cartridge would, in many instances, double feed (feed two instead of one) when used with shorters. In other instances where not actually feeding two shorts there would be a jamming of two rounds in the breech which would prohibit the closing of the bolt. A cutoff properly designed for shorters would fail to feed a long rifle properly because two cartridges would jam in the feed chamber. If a cutoff is tried and the cutoff located between the position required for long rifle and the position required for shorts, the result is a high feed malfunction rate.

Accordingly, it is an object of the present invention to provide a cartridge feed system which overcomes the above-mentioned difficulties.

More particularly it is an object to provide a cartridge feed system for feeding cartridges from the butt end of a firearm.

A further object of this invention is to provide a tubular cartridge feed system having an improved cutoff means operable to prevent jamming or double feeding when cartridges of different lengths are interchangeably used.

These and other objects may be accomplished according to a preferred embodiment of the invention through the provision of cutoff means positioned in the throat of a tubular magazine feed having two spaced cartridge engaging lips, one being designed to be contacted by the head of the second round when one size cartridge is used and the second designed to be engaged by the head of the second round when cartridges of a different size are used.

A floating feed ramp is provided having ramp means thereon and being spring biased upwardly toward the breech whereupon when the bolt of the firearm is opened, the feed ramp moves the first cartridge upwardly into a position to be engaged by the head of the bolt. When the bolt engages the cartridge and moves it forward, the rim of the cartridge feeds up the ramps into proper position in relation to the axis of the bolt.

The present invention will be more fully understood by reference to the following description and to the accompanying drawings in which:

FIGURE 1 is a longitudinal, vertical sectional view taken through the receiver section of a firearm embodying the present invention showing the bolt in the breech open position and the feeding of 22 caliber short cartridges.

FIGURE 2 is a longitudinal, horizontal sectional view taken along the lines 2—2 of FIGURE 1.

FIGURE 3 is a sectional view taken along the lines 3—3 of FIGURE 1.

FIGURE 4 is a view similar to FIGURE 1, but showing the bolt in the breech closed position.

FIGURE 5 is a view similar to FIGURE 1, but showing the feeding of 22 caliber long rifle cartridges, and

FIGURE 6 is a view similar to FIGURE 5, but showing the bolt in the breech closed position.

Referring to the drawings, a tubular feed guide 2 embodying the features of the present invention is shown attached to a receiver 4. The receiver 4 includes a barrel 6 connected to the forward end thereof in any approved manner. A bolt 8 is mounted for reciprocal movement in the breech portion of the receiver 4 and includes a head 10 having horizontally opposed lugs 12 adapted to extend into oppositely disposed grooves 14 in the receiver 4.

The tubular feed guide 2 extends into an elongated opening 16 in the receiver 4 and is held in place by means of a suitable clamp 18. One end of the clamp 18 is attached to the receiver 4 by means of a screw 20 and the other end includes a channel-shaped portion in engagement with the forward bottom surface 22 of the tubular feed guide 2. The tubular feed guide 2 is preferably made from a plastic material in two halves and held together by means of a horseshoe-type clip 24.

The tubular feed guide 2 includes a rearward tubular portion 26 adapted to communicate with a magazine tube in the butt stock of the firearm and a forward feed portion 28 having a forward opening 29 communicating with the breech portion of the receiver 4.

The feed portion 28 of the tubular feed guide 2 includes spaced feed lips 30 extending substantially tangential with the internal surface of the receiver 4 covering a portion of the opening 29 and a forward feed surface 32, concave in cross section, and taping upwardly into alignment with the forward inner surface of the receiver 4. A floating feed ramp 34 is mounted for limited vertical movement beneath the forward opening 29 of the forward feed portion 28 and the feed lips 30 and includes legs 36 having turned-in flanges 38 mounted in suitable grooves 40 in the internal surface of the tubular feed guide 2. A spring member 42 is mounted between a suitable counterbore 44 in the tubular feed guide 2 and the bottom surface of the feed ramp 34 to bias the feed ramp 34 upwardly. The forward portion of the feed ramp 34 is provided with spaced upwardly extending wings 45 having their top portions slightly folded over to hold the cartridge until it is pushed through by the bolt 8. The rearward surfaces 47 of the wings 45 taper forwardly and upwardly.

A cutoff 46 includes an arm portion 48 positioned outside of the tubular feed guide 2 and mounted for pivotal movement about pin 59 extending through the
receiver 4. A U-shaped member 51 forming two spaced cutoff lips 52 and 54 extends transversely from the arm portion 48 at the rearward end thereof into a slot 56 in the tubular feed guide 2. The upper surfaces of each of the lips are generally concave. A lobe 58 extends upwardly from the arm portion 48 into the breech portion of the receiver 4.

A wire spring 60 having a hook at one end positioned in a suitable opening in the clamp 18 is held between the clamp 18 and the bottom surface of the tubular feed guide 2 and extends rearwardly into engagement with the lower end of the U-shaped member 51.

A spring biased follower 62 is positioned rearwardly of the cartridges in the feed guide 2 to urge the cartridges forwardly in the tubular feed guide 2.

In operation, when the bolt 8 is in the breech open position as shown in FIGURES 1 and 5, the spaced cutoff lips 52 and 54 are urged upwardly about pin 50 by spring 60 where they are in a position to be abutted by the rim of the cartridge. Accordingly, when cartridges are first loaded into the tubular feed guide 2, with the bolt 8 in the breech open position, the cutoff 46 will be in its cartridge engaging position so that the follower 62 urge cartridges forwardly until the rim portion of the first cartridge engages the rearward most cutoff lip 54. This will be true no matter what size cartridge is loaded.

However, when 22 caliber short are loaded into the tubular feed guide 2 and the bolt 8 is moved into its breech closed position thereby depressing the cutoff 46 by means of the bolt 8 contacting and depressing lobe 58 to pivot the cutoff 46 downwardly about pin 50, the follower 62 will urge all the cartridges forwardly in the tubular feed guide 2 until the feed ramp 34 is depressed and the forward most cartridge is wedged into the space between the bottom surface of the bolt 8 and the ramp 34 in the manner shown in FIGURE 4. When the bolt 8 is then opened into the position shown in FIGURE 1, the cutoff will be urged upwardly and the follower 62 will urge the cartridges slightly forwardly until the rim of the second cartridge abuts the forward cutoff lip 52 preventing further movement of all the cartridges. At the same time, the feed ramp 34, under the influence of spring 42 will move upwardly urging the forward most cartridge up to the head portion of the cartridge engages the spaced feed lips 30 with a portion thereof protruding through the space between the feed lips 30 into the breech of the receiver 4 in a position to be contacted by the head 10 of the bolt.

When the bolt 8 is again closed, the bolt head 10 contacts the forward most cartridge forcing it forwardly through the wings 45 of the feed ramp 34 until the rim contacts the rearward surfaces 47 of the wings 45. Because of the taper of the rearward surface 47, the rim of the cartridge will be cammed upwardly into proper position in relation to the bolt head 10 while at the same time the forward feed surface 32 will urge the nose of the cartridge upwardly. Since the cutoff 46 is depressed as the bolt 8 is closed, the remaining cartridge will then be urged upwardly until the forward most one is wedged into the space between the bottom surface of the bolt 8 and the ramp 34. When the bolt is again opened, the feed guide 2 will function as described above with the forward cutoff lip 52 always being engaged by the second cartridge to prevent improper feeding.

In loading of 22 caliber long rifle, when the bolt 8 is closed and the cutoff 46 depressed by means of the bolt 8 contacting the lobe 58 and pivoting the cutoff 46 downwardly about pin 50, the follower 62 will urge all such cartridges forward until the feed ramp 34 is depressed and the forward most cartridge is forced into the space between the bottom surface of the bolt 8 and the feed ramp 34 in the manner shown in FIGURE 6. It will be noted that, because of the length of the 22 caliber long rifle, the rim of the second cartridge is positioned behind the rearward most cutoff lip 54. When the bolt 8 is then opened, the follower 62 will force the cartridges forwardly until the rim of the second one abuts the rearward most cutoff lip 54 and further movement of the cartridge is prevented. At the same time, the feed ramp 34 moves upwardly under the influence of the spring 42 whereupon the rim of the first cartridge engages the feed lip 30 with a portion of the head extending through the space between the feed lips 30 into a position to be engaged by the bolt head 10.

When the bolt 8 is closed, the bolt head 10 abuts the head of the first cartridge pushing it forwardly against the rearward surfaces 47 of the wings 45 which cam the head upwardly into proper position in relation to the bolt head 10 while the forward feed surface 32 cams the nose of the cartridge upwardly. This above-described action is repeated for each opening and closing of the bolt 8.

With the above-described arrangement it is also possible to feed any combination of 22 caliber short and 22 caliber long rifle cartridges. The combined axial length of the short and long rifle cartridge is such that when the bolt 8 is closed, and the cutoff 46 depressed, the rim of the second cartridge will be positioned to the rear of the rearward cutoff lip 54 whereby when the bolt 8 is opened, the rearward cutoff lip 54 will be abutted by the rim of the second cartridge preventing further movement of the cartridges. The first cartridge, whether it be a 22 caliber long rifle or 22 caliber short will be in a position to be moved upwardly by the feed ramp 34 under the influence of its spring 42 into a position whereby the head thereof can be engaged by the bolt 8 upon forward movement thereof.

Because of the similarities of axial length between a 22 caliber long rifle and 22 caliber long, the above-described magazine can also be loaded with 22 caliber longs. The functioning of the cutoff 46 will be the same as that described above for the 22 caliber long rifle.

Although reference has been made to a particular embodiment of the present invention, various modifications will readily suggest themselves to those skilled in the art and reference should be made to the appended claims to determine the scope of the invention.

What is claimed is:

1. In a repeating firearm construction; a receiver; a barrel attached to said receiver and having a cartridge chamber rearwardly thereof; breech bolt means movable in said receiver between a breech open and a breech closed position; a magazine position wherein said magazine having an opening communicating with the interior of said receiver; follower means positioned in said magazine for urging cartridges therein into a position to be contacted by said breech bolt means; cartridge cutoff means including an arm pivotally attached to said firearm, said arm having a projection adapted to extend into the path of said breech bolt means, and a U-shaped portion extending transversely of said arm forming two lips spaced apart in the direction of the path of said cartridges and movable into and out of the path of the cartridges in said magazine; and spring means engaging the bottom of said U-shaped portion to urge said lips into the path of said cartridges.

2. In a repeating firearm construction, a receiver, a barrel attached to said receiver and having a cartridge chamber rearwardly thereof, a breech bolt means movable in said receiver between a breech open and a breech closed position, a magazine position below the opening of said cartridge chamber and extending rearwardly of the firearm, said magazine having an opening communicating with the interior of said receiver, follower means positioned in said magazine for urging cartridges therein into a position to be contacted by said breech bolt means, cartridge cutoff means pivotally attached to said firearm,
arms and including a pair of spaced lips movable into and out of the path of cartridges in said magazine, said lips being spaced such that one of said lips is adapted to be engaged by the rim of a cartridge of one length and the other of said lips is adapted to be engaged by the rim of a cartridge of a different length, spaced feed lips adjacent a portion of the opening of said receiver, and elevator means positioned below the feed lips for moving a cartridge upwardly until its rim engages said lips with a portion of the head of the cartridge extending into said receiver in a position to be engaged by said breech bolt means, said elevator means comprising a ramp mounted in said magazine for limited movement toward and away from the opening thereof and resilient means biasing said ramp toward said opening.

3. In the firearm of claim 2, said ramp having wings thereon for gripping the body of a cartridge, said wings having a cam surface along its rearward edge to urge a rim of a cartridge upwardly into the receiver as said breech bolt means engages said cartridge and moves it toward said cartridge chamber.

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