Nov. 1, 1966 E. M. STARK 3,281,979

CARTRIDGE AND MAGAZINE EJECTOR

Filed Aug. 18, 1965

Fig. 1.

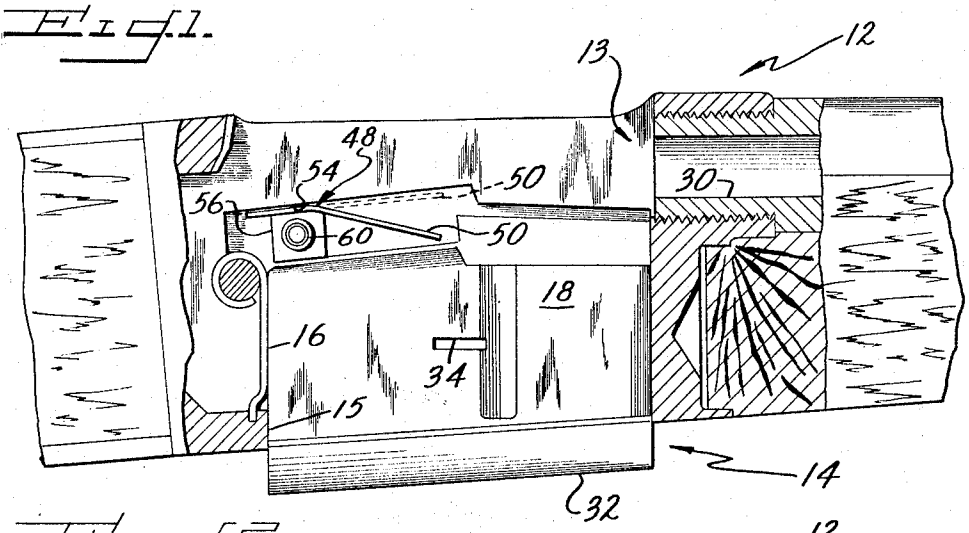


Fig. 2.

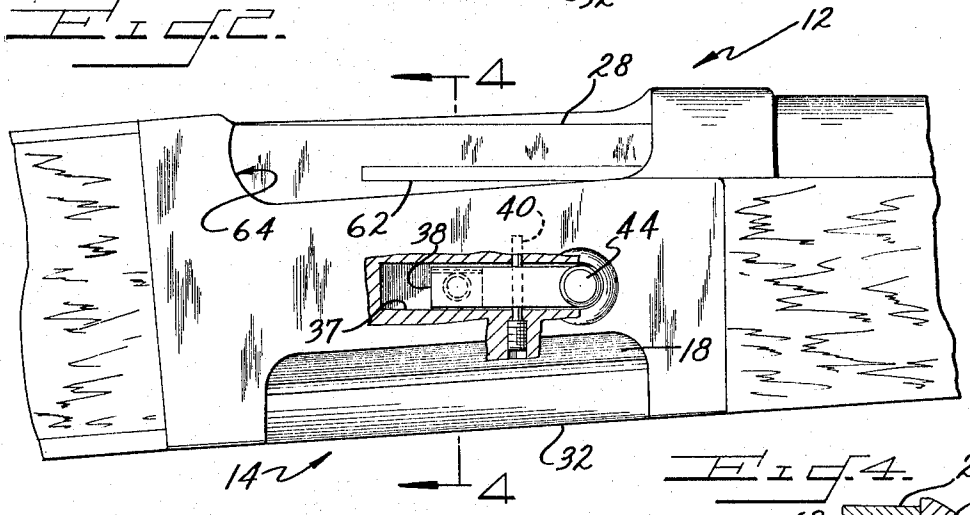


Fig. 3.

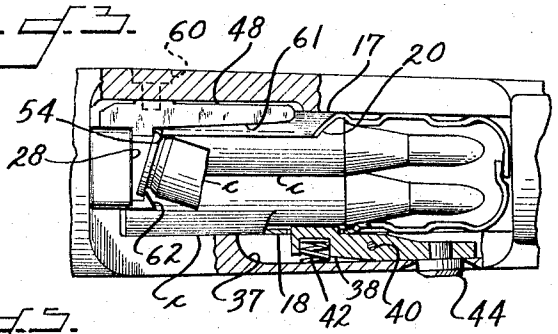


Fig. 4.

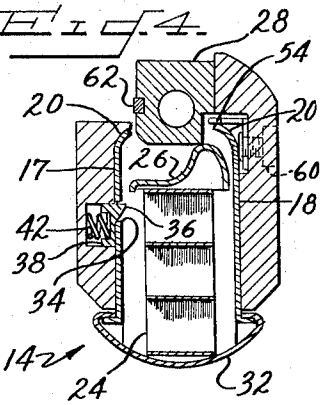
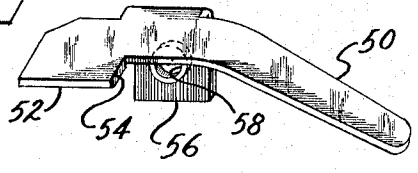


Fig. 5.



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CARTRIDGE AND MAGAZINE EJECTOR

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7 Claims. (Cl. 42—25)

This invention relates to firearms having removable box-type magazines and more particularly, to positive acting means for ejecting the magazine box from the receiver.

While many firearms, especially rifles, are equipped with box-type magazines, these generally extend outwardly of the firearm and reloading is readily accomplished by releasing the magazine retaining catch and removing the empty case by hand and inserting a loaded magazine. The term cartridge case is often used to mean the empty shell of the cartridge.

This invention has particular advantage in weapons in which the magazine box is mounted flush with the bottom wall of the firearm. In these designs, after actuation of the magazine retaining catch, the magazine is generally removed by gravity and/or the magazine follower urged by the follower spring against the bolt. If for any reason the magazine fails to clear the receiver by gravity, or the bolt is open after firing the last round from the magazine, it must be manually removed either by grasping the edges of the magazine with the finger tips or by sharply rapping the underside of the rifle. Obviously, neither of these procedures results in efficient and high speed unloading, preparatory to reloading with a loaded spare magazine, which for competition, hunting or self-defense is a great advantage.

It is the principal object of this invention to provide a positive-acting, compact and economical magazine ejecting system for the removal of flush mounted magazine boxes.

It is another object of this invention to provide a unitary magazine and cartridge case ejector.

The above and other objects and advantages of this invention will be more readily apparent from the following description and with reference to the accompanying drawings in which:

FIG. 1 is an elevational view of the receiver portion of a firearm, in cross section, showing an ejector system embodying my invention;

FIG. 2 is an elevational view of the firearm shown in FIG. 1, with portions cut away;

FIG. 3 is a plan view of the receiver of the firearm with parts cut away;

FIG. 4 is a section taken along line 4—4 of FIG. 2; and

FIG. 5 is a perspective view showing a unitary ejector member embodying my invention.

In FIGS. 1 and 2 there is shown a bolt action firearm 12 having a receiver 13. A magazine box 14 is shown in FIG. 1 partially inserted into the bottom opening 15 of the receiver. In FIG. 2 the magazine is shown fully inserted in the receiver with its bottom disposed more or less flush with the undersurface of the firearm. A metal stamping in the form of bracket 16 forms the rear wall of the receiver and together with the front wall provide smooth uninterrupted walls for easy insertion and removal of the magazine box.

The magazine as best shown in FIGS. 3 and 4, comprises side walls 17 and 18 having toward the back end of the box inwardly curved upper edges 20 providing means for retaining rounds of ammunition in the magazine box until moved forward by the bolt 28 of the firearm. Disposed within the box 14 is a follower spring

24 and plate 26 which together cooperate to feed rounds into position to be picked up by the bolt 28 as it moves toward the chamber 30 (FIG. 1) of the firearm. The magazine shown also includes a base plate 32 which, as shown in FIG. 2, is generally disposed flush with the underside of the weapon.

Means is provided for releasably retaining the magazine in place in the receiver. As shown, side wall 17 of the magazine includes a slot 34 disposed to receive a protrusion or latch finger 36 extending inwardly from one end of arm 38 pivotably mounted near its center on a pin 40. The pin 40 extends upwardly from a ledge 37 into a recess provided in the sidewall of the receiver. A coil spring 42 urges the after end of the arm 38, bearing latch finger 36, inwardly. From the other end of the arm 38, there extends an actuator button 44 which projects outwardly of the wall of the receiver. When the button is depressed, the latch finger is retracted from the slot 34 permitting ejection of the magazine from the receiver as will be described below.

The magazine is ejected by the ejector shown generally at 48 in FIGS. 1, 3 and 5. The ejector comprises a tempered spring steel member having an arm or finger portion 50 extending outwardly and downwardly in its relaxed or unflexed condition, from a generally horizontal portion 52. The horizontal blade extends outwardly of the side of the arm 50 providing a shoulder 54 which serves as ejector for empty cartridge cases, as will be hereinafter disclosed. The inner edge 60 of the spring arm 50 tapers outwardly from the shoulder 54 toward the chamber 30, as best seen in FIG. 3. This inward taper, leading from the chamber of the firearm to the cartridge case ejecting shoulder 54, serves to gradually urge the flange of a cartridge case *c*, FIG. 3, into firm engagement with the lip of extractor 62 as the case is drawn rearward by the bolt 28. This arrangement assures proper ejection of the expended cases precisely at the instant the case strikes the ejecting shoulder 54. Extending downwardly from the inner edge of the horizontal base portion of the ejector is a flange 56 by which the ejector is mounted on the side wall of the receiver. The flange includes a threaded hole 58 which receives the threaded end of a mounting screw 60, FIG. 4.

The spring metal ejector is unitary in construction and fabricated by a simple punch press operation with the arm 50 bent into its downwardly extending position before tempering. With this economy of construction, there is provided both a magazine and cartridge case ejector characterized by simplicity of construction and ease of manufacture and assembly while being most reliable in operation.

In operation when a loaded magazine box 14 is inserted in the receiver its inwardly turned upper edge 20 comes into contact with the undersurface of ejector spring arm 50. Continued upward movement of the magazine box tensions the spring arm 50 upwardly, as shown in dotted lines in FIG. 1. Simultaneously, the side wall of the magazine box presses latch finger 36 inwardly compressing spring 42 until the latch finger snaps into the slot 34, latching the magazine in place in the receiver.

When the magazine is fully inserted and latched in position, the tapered edge 61 and ejector shoulder 54 are disposed in generally the same plane, and generally diametrically opposite the extractor 62 carried by the bolt. As the bolt is retracted carrying an empty cartridge case, the flange of the case is cammed or moved into firm engagement with the lip of the extractor. When the cartridge case strikes shoulder 54, a torque results which forcefully kicks the case out of the receiver through the relieved portion of the receiver called the ejection port 64.

When it is desired to unload the magazine box, such as when it is empty, it is only necessary for the shooter to place the palm of his right or left hand, as the case may be, under the bottom of the magazine while pressing the button **44** with the thumb or finger of the same hand. Depressing button **44** causes arm **38** to pivot about pin **40**, compressing coil spring **42** and withdrawing latch finger **36** from the magazine slot **34**. Upon disengagement of the latch, the loaded magazine ejector spring arm **50** immediately resumes its relaxed position and forcefully ejects the magazine box directly into the palm of the hand disposed under the receiver. It should be noted that since the arm **50** is directly engaged with the upper edge **20** of the magazine that the full force of the spring arm acts directly downward on the magazine itself. There is thus practically no chance of the magazine being jammed or stuck in the receiver whether or not the bolt is open or closed. In addition, the arm **50** is tensioned to a nearly horizontal position by the magazine and develops sufficient force to eject the magazine completely out of the receiver as soon as the latch is released.

Having thus disclosed this invention, what is claimed is:

1. For use in firearms having a removable magazine box, a magazine ejector comprising a spring steel arm mounted in the receiver portion of the firearm and extending downwardly, in its relaxed condition, sufficiently to engage said magazine box before it is fully inserted into the receiver, means for latching the magazine in said receiver when fully inserted therein, said arm and latch means being disposed so that the spring arm is substantially tensioned upwardly when the magazine box is latched in the receiver.

2. For use in firearms having a removable magazine box, a magazine ejector comprising a unitary metal spring mounted in the receiver of said firearm and disposed in overlying relation to the magazine box to engage the upper edge portion thereof when the box is inserted in said receiver, said spring including an arm portion extending downwardly, in its relaxed condition, at an oblique angle to the upper edge portion of said magazine box and being tensioned in its latched position to a generally horizontal position by the box when the latter is fully inserted in said receiver.

3. For use in firearms having a removable magazine box, a magazine ejector as set forth in claim **2** in which the arm portion of the metal spring extends forwardly toward the chamber of the firearm and downwardly when in a relaxed condition.

4. For use in bolt-action firearms having a removable flush mounted magazine box with a releasable catch for holding the magazine in place in the receiver of the firearm and a cartridge case extractor carried by said bolt, a magazine and cartridge case ejector comprising a unitary member mounted in the sidewall of the receiver of said

firearm and disposed, at least in part, in overlying relation to an upper edge portion of the magazine box, said member including a spring metal arm extending forwardly toward the chamber of said firearm and downwardly when in a relaxed condition at an oblique angle to the upper edge of said magazine box, said arm being tensioned to a generally horizontal condition when the magazine box is latched in the receiver, said unitary member being disposed in said receiver generally diametrically opposite said extractor and including a portion projecting inwardly of said spring metal arm for ejecting cartridge cases from said receiver.

5. For use in bolt-action firearms as set forth in claim **4**, a magazine and cartridge case ejector in which the inner edge portion of said spring metal arm tapers inwardly from the end disposed toward the chamber of the firearm and terminates at a shoulder which forms said portion projecting inwardly, the tapered edge serving to urge the flange of a cartridge case toward the extractor carried by said bolt.

6. For use in firearms having a removable magazine box, a magazine ejector comprising a spring steel arm mounted in the receiver portion of the firearm and extending downwardly in its relaxed condition sufficiently to engage said magazine box before it is fully inserted into said receiver, means for releasably latching the magazine box in said receiver when the box is fully inserted therein, said magazine box when in its latched position being generally flush with the undersurface of the firearm, said arm and latch means being disposed so that the spring arm is tensioned when the magazine box is latched in the receiver, the inner edge of said spring steel arm being tapered and terminating in a shoulder which together with the tapered edge of said arm serve in the ejection of expended cartridges from the firearm.

7. A firearm having an opening for receiving a magazine box, a magazine box removably insertable into said opening and dimensioned so that when fully inserted in said opening its undersurface is disposed generally flush with the undersurface of the firearm, means for releasably latching the magazine box when fully inserted in said opening, and a spring interengageable with the magazine and being tensioned when the magazine is fully inserted in said receiver, said spring and latch means cooperating to eject the flush mounted magazine box from the firearm upon release of said latch.

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