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(54) **AMBIDEXTROUS MAGAZINE CATCH FOR FIREARMS**

(57) **ABSTRACT**

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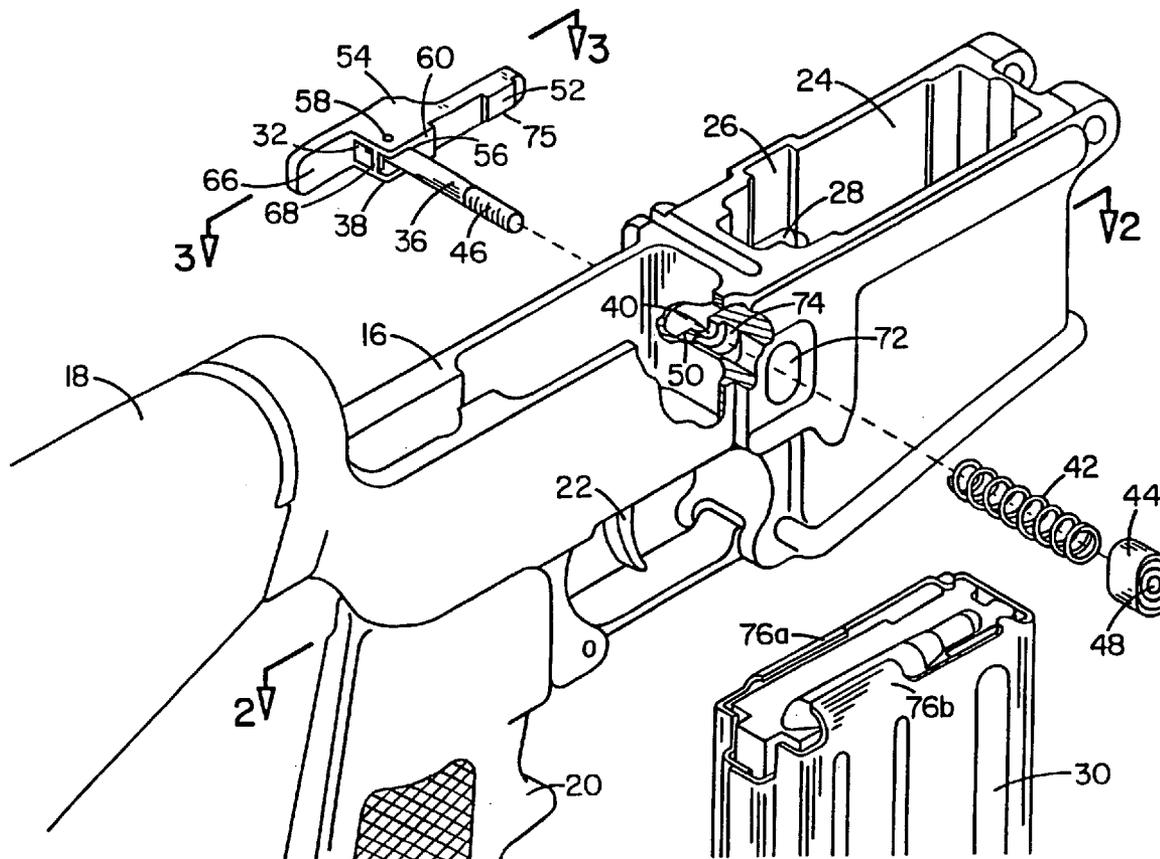
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The present invention relates to a retaining and release mechanism for the magazines of automatic and/or semi-automatic firearms, in particular to a type of magazine which is provided with a lateral securing slot. A tooth (52) of lever (54) is designed to engage lateral securing slot (34) of magazine (30). Said lever (54) is pivotally connected to a shaft (36), located transversely in body (16) of the firearm, by means of a pin (58) and attached at its opposite end to an operating push button (44). A lever seat (60) of said lever (54) is urged towards said body (16) of the firearm and firmly abuts a seat (50) of a magazine catch slot (28) by energy exerted through a spring (42) against said operating push button (44) and a spring cavity (74). The tooth (52) can be disengaged from lateral securing slot (34) by depressing either operating push button (44) or a depression extension (66) of said lever (54). The magazine (30) can thus be released from both sides of the rifle.





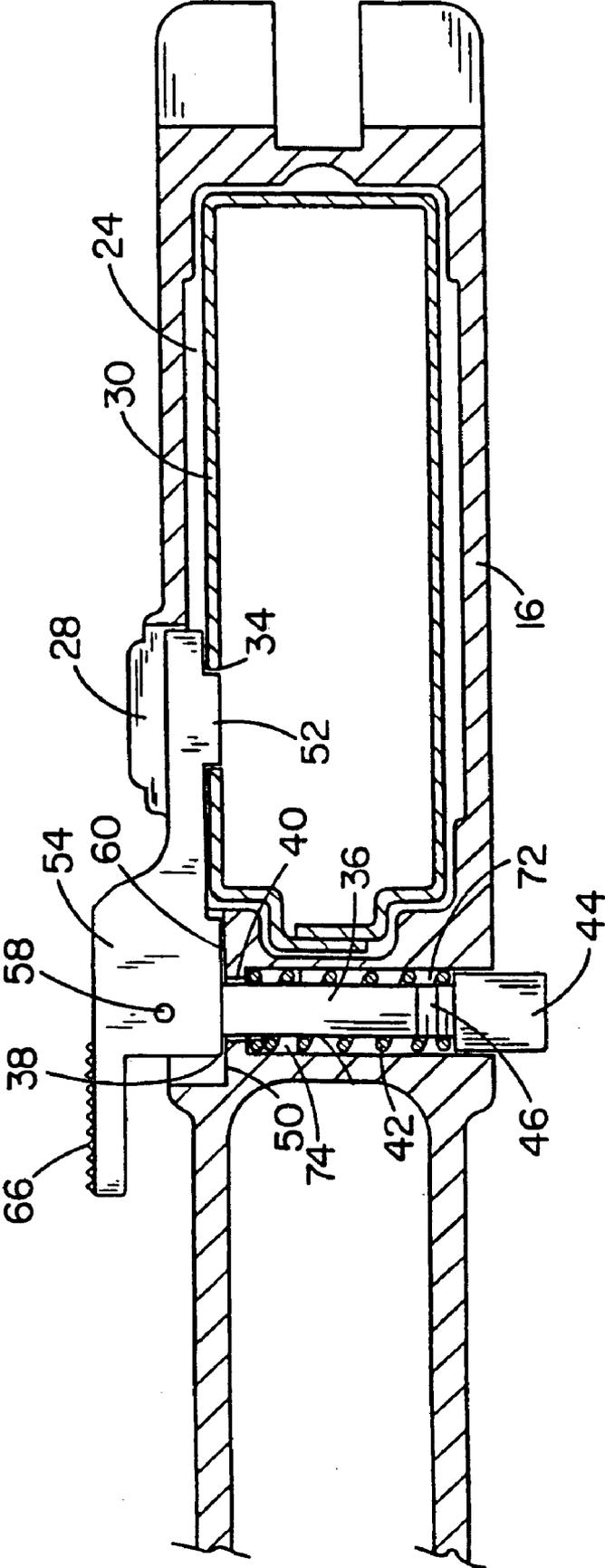


FIG. 2

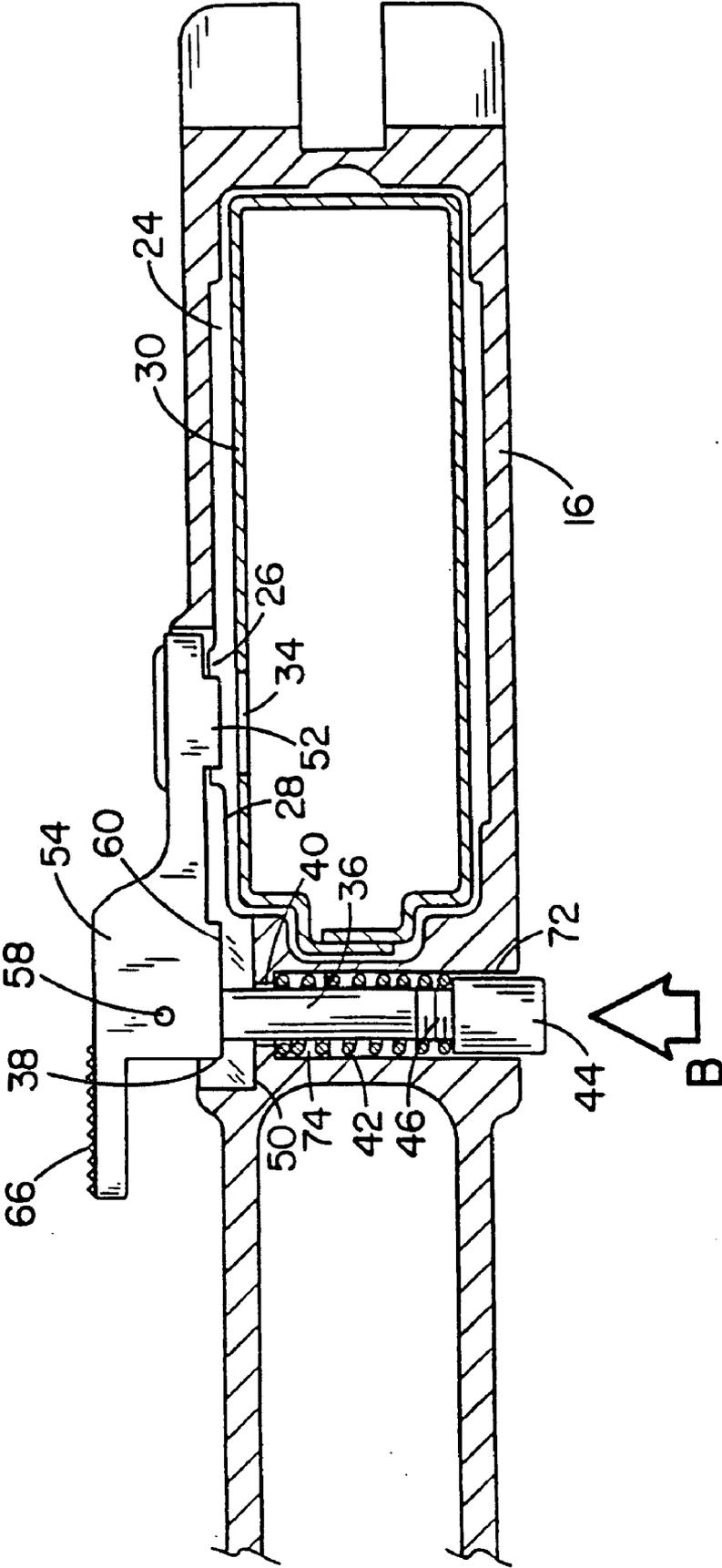


FIG. 3



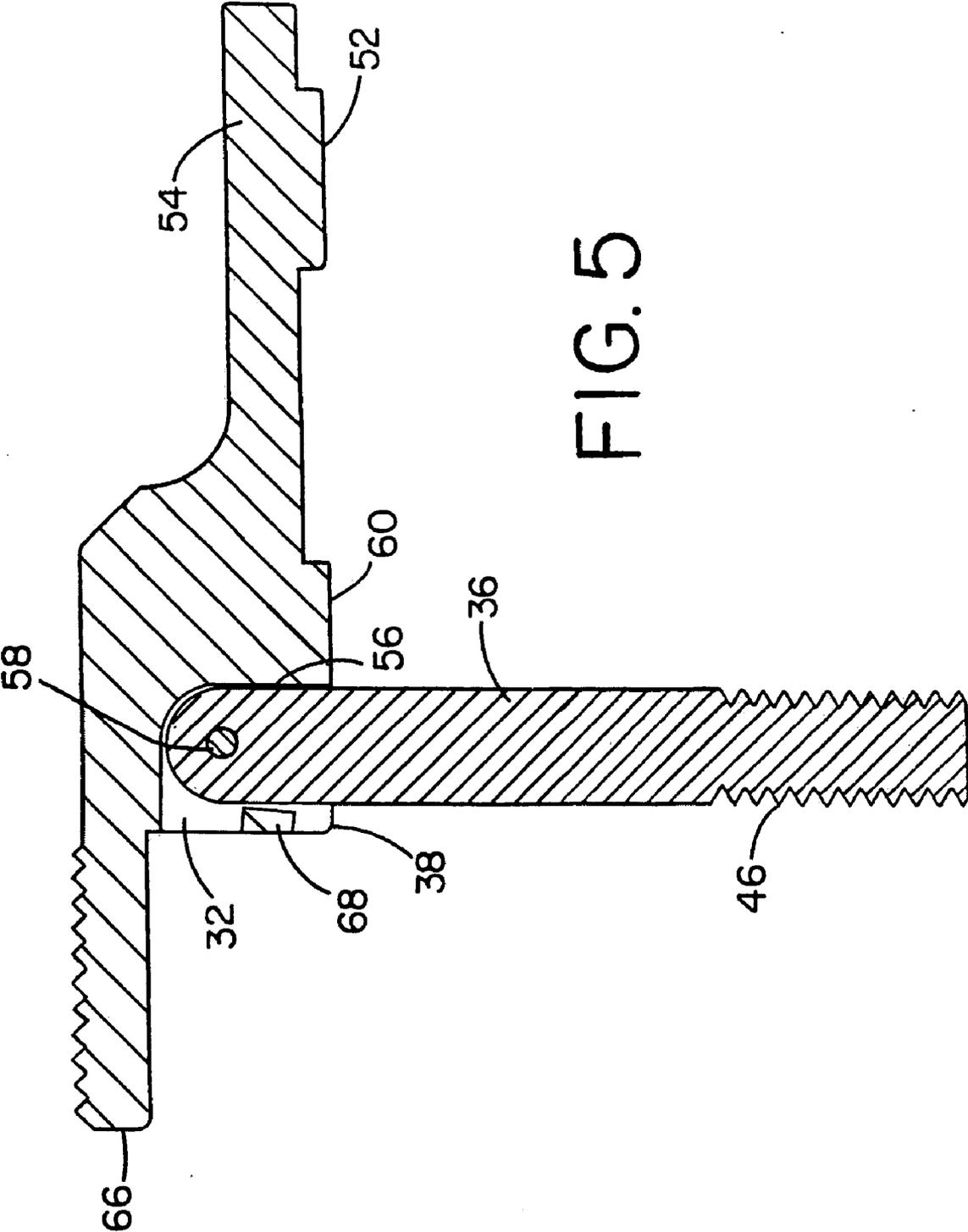


FIG. 5

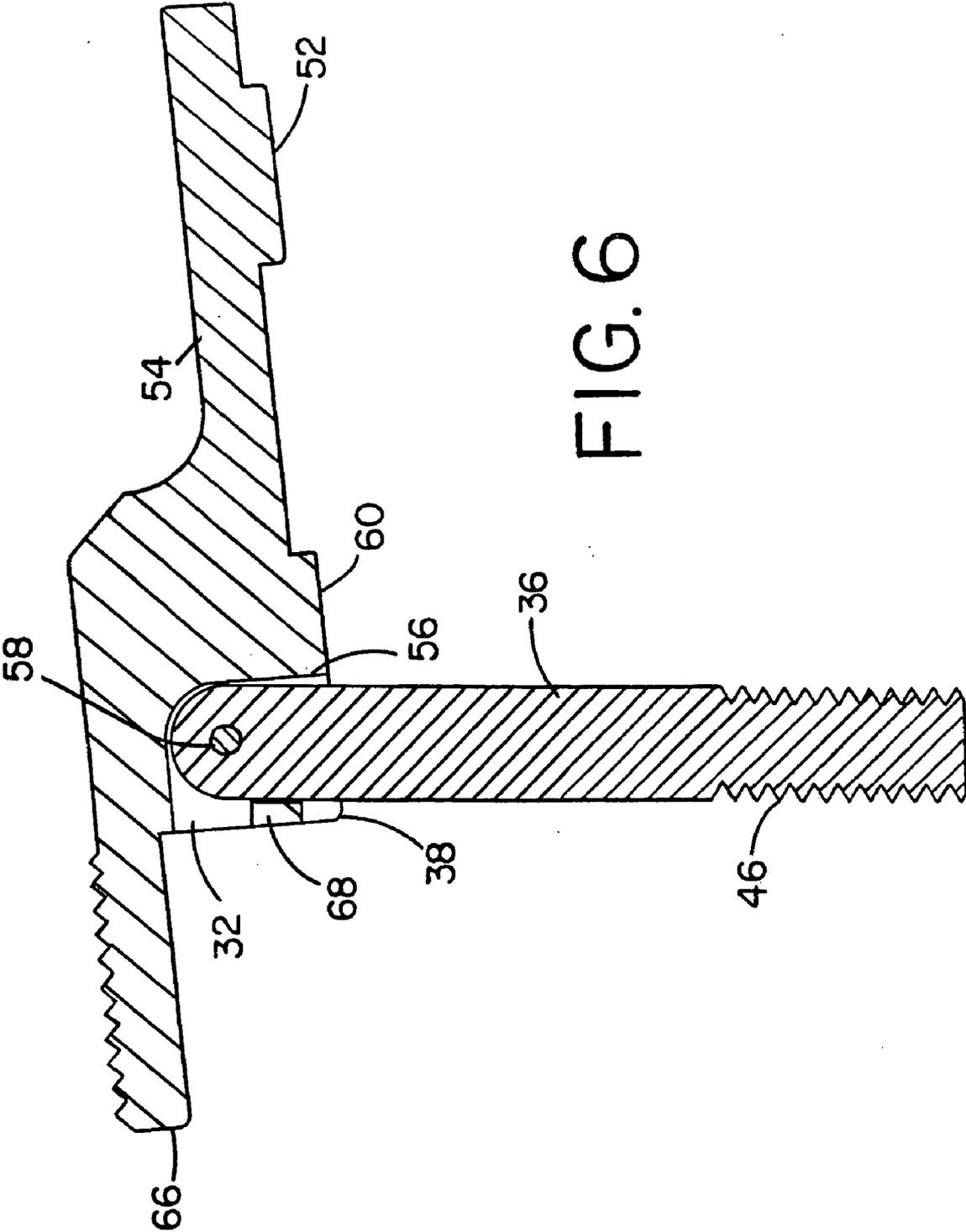


FIG. 6

## AMBIDEXTROUS MAGAZINE CATCH FOR FIREARMS

### BACKGROUND

#### [0001] 1. Field of Invention

[0002] The present invention relates to improvements of mechanisms used to retain or release magazines of automatic and/or semi-automatic firearms.

[0003] The use of a catch or latch to retain and/or release a magazine with a lateral securing slot in automatic and/or semi-automatic firearms, such as the "standard NATO 5.56 mm", is known. Many firearms already incorporate the use of a hook or catch which operates in a recess allowing for its engagement into the magazine thereby securing the magazine in the firearm.

[0004] The hook or catch is typically attached to a rod or shaft which is guided transversely through the body of the weapon and secured to a push-button. A spring, located around the shaft, is used to hold an engagement tooth of the hook in a position that secures the magazine. Depressing of the push-button towards the body of the rifle forces the hook or catch away from the lateral securing slot, releasing the magazine from the firearm. This push-button is usually located on the right side of the firearm and is, in some circumstances, difficult to operate by "left-handed" shooters.

[0005] There are several accepted methods of removal and replacement of magazines. The "European Method" stresses the need to maintain the expended magazine on one's person. European firearms have a magazine release that is located conveniently close to the magazine well. The "European" soldier, therefore, is trained to cradle the weapon with his "non-firing" hand, remove his "firing-hand" from the pistol grip, place his "firing-hand" around the magazine body and use the thumb of the "firing-hand" to actuate a magazine release button. The soldier then places the spent magazine in a magazine pouch and uses this same "firing-hand" to retrieve a loaded magazine. The "firing-hand" is again used to insert the loaded magazine into the weapon. Then, the "firing-hand" is placed back on the pistol grip, the bolt is released and the soldier is free to re-acquire and engage targets.

[0006] The "American Method" stresses the importance of speed during a magazine change. The M16 and AR-15 rifles are provided with a magazine release that is situated so that the soldier can readily depress it with the index finger of his "firing-hand" while in its normal position on the pistol grip. In this manner, the soldier has the ability to release a magazine with the index finger of his "firing-hand", allowing the spent magazine to fall away, while simultaneously retrieving a loaded magazine with his "non-firing" hand. This "non-firing" hand inserts the loaded magazine, releases the bolt and the shooter need only move his index finger back to the trigger to re-engage targets. It is obvious that this method of changing a magazine requires much less time to execute than the "European Method" described above.

[0007] Both of the methods described above were developed for a "right-handed" shooter firing a weapon designed for a "right-handed" shooter. The "left-handed" shooter, using a firearm designed for a "right-handed" shooter, must use his "non-firing" hand to change magazines while his "firing-hand" is maintained on the pistol grip. In doing so, he

must first depress the existing magazine release with the thumb of his "non-firing" hand and remove the spent magazine before he can use the same "non-firing" hand to retrieve and insert a loaded magazine. As you can see, the "American Method" for the "right-handed" shooter is, again, much more expedient. It is, therefore, important to provide a firearm with a magazine release mechanism that is operable in a like manner for both "left-handed" and "right-handed" shooters. This ambidextrous release mechanism must also be constructed so that it is easily depressed by the index finger of the "firing-hand" while in its normal position on the pistol grip.

[0008] The need for an ambidextrous magazine release is not limited to the "left-handed" shooter alone. Often times, in a combat situation, a soldier is forced to switch from his dominant shooting posture to take advantage of cover and concealment. The act of changing a magazine in this less familiar posture can cost the soldier valuable time when trying to reload his weapon.

[0009] An injury sustained by a soldier could also change his dominant shooting posture. The loss of a dominant eye or digits of his "firing-hand" may force him to use a weaker position. A wounded hand could still be used to steady the weapon and perform the less complicated task of replacing a magazine.

[0010] When a shooter uses a sling to better stabilize his position, the "non-firing" hand is physically "bound" to the forearm by the sling. The "right-handed" shooter must use his "firing-hand" to remove and replace an expended magazine. The "left-handed" shooter, using a firearm designed for a "right-handed" shooter, is forced to assume an extremely awkward position, often times having to reach over the entire weapon to release and remove a spent magazine. This excess movement takes valuable time and reduces the "left-handed" shooter's ability to re-engage targets at the same speed as his "right-handed" counterpart.

[0011] It should be clear to the reader that an ambidextrous magazine release mechanism must not only be easily accessible by the index finger of either "firing" hand while that "firing-hand" is maintained on the pistol grip, but it must also be equally accessible to the thumb of the "firing" or "non-firing" hand that is used to both remove and replace a magazine.

#### [0012] 2. Description of Prior Art

[0013] Inventors have created several types of ambidextrous magazine release/retaining mechanisms to enable "left-handed" shooters to use the same firearm as "right-handed" shooters.

[0014] One invention, U.S. Pat. No. 4,429,479 to Johnson, seeks to provide rifles, like the Heckler and Koch Models 91 and 93, with a mechanism that enables a "right-handed" shooter to release and remove a magazine with the "non-firing" hand. A pivotal assembly, with a depressable extension, is attached to the transversely located shaft of the existing magazine release. When depressed, the pivotal assembly "cams" against an inside "stamped metal" wall of the firearm, causing the shaft to move in the direction necessary to disengage the hook from the lateral securing slot of the magazine. The extension is designed to be depressed with the thumb of the "non-firing" hand while it is positioned around the magazine. This requires the exten-

sion to be located conveniently close to the magazine well. The operation of this invention depends on the extension being located behind the magazine and under the firearm. A “left-handed” shooter can change magazines in a similar manner. The “left-handed” shooter simply depresses the existing operating push button, located near the magazine well, with the thumb of his “non-firing” hand. This invention does provide an ambidextrous means of magazine removal. It still fails, however, to provide the shooter access to the magazine release with the index finger of the “firing-hand” while in its normal position on the pistol grip. The shooter is still required to use his “non-firing” hand to remove and secure the magazine before he can use the same “non-firing hand” to retrieve and install the fresh magazine into the firearm. It is obviously faster to release the magazine with the finger of the “firing-hand”, allowing the magazine to fall away, while simultaneously retrieving and installing a loaded magazine with the “non-firing” hand. As stated, this invention requires a portion of the assembly to “pivot” against a inside wall of a “stamped metal” body. Since the majority of the firearms using the “standard NATO 5.56 mm” magazine are machined from a block of aluminum alloy, it is clear that there is no cavity in which to house or operate this invention. The installation or “retro-fitting” of this assembly would be complicated, requiring tools and a limited amount of expertise.

[0015] Another invention, U.S. Pat. No. 4,615,134 to Beretta, was designed to enable a “right-handed” shooter to release a magazine when a buttstock is folded against the body of a receiver, blocking a “right-hand” biased magazine release button. A rocking lever, located on the left side of the firearm, is pivotally connected to the magazine catch. When a pressable portion, located on the forward end of the rocking lever, is depressed, the assembly “cams” against the body of the firearm lifting the catch away from the magazine. The major disadvantage of this mechanism is the location of the pressable portion forward and away from the pistol grip. This configuration cannot be operated by the index finger of the “firing-hand” while in its normal position on the pistol grip. As previously discussed, the shooter must be able to depress the magazine release with the index finger of his “firing-hand”, while in its normal position on the pistol grip, in order to execute the fastest possible magazine change. The lever is not protected and is susceptible to accidental release by laying the firearm on its side or by being struck with equipment that is worn by a soldier. Another disadvantage of the forward location of the lever is that it creates a “fork” which will be prone to snagging by foliage and equipment.

[0016] U.S. Pat. No. 5,519,954 discloses an invention which addresses the shortcomings of the patents previously discussed. The self-contained assembly uses a second spring to apply force to the engagement tooth of a lever and incorporates several “bosses” and a low profile to reduce the possibility of accidental release of the magazine. The only shortcoming of this design is that it may not readily adapt to a few of the weapon designs that use stamped metal construction of the receiver in which the standard magazine catch operates.

[0017] Advances in metallurgy and coatings of weapons has reduced the possibility of wear from an ambidextrous magazine release assembly that “cams” on the outer surface of the weapon. Some weapons that are constructed of

stamped metal also incorporate a folding stock to reduce the weapon’s overall length for close quarters battle. These designs still require some type of ambidextrous magazine release for the reasons previously discussed.

OBJECTS AND ADVANTAGES

[0018] Accordingly, one of the objects of my ambidextrous magazine release mechanism is to overcome the disadvantages mentioned above and to provide a mechanism that can be easily manipulated by “left-handed” or “right-handed” shooters employing all of the methods of changing a magazine previously discussed. Another object of the invention is to provide an improved magazine retaining and release mechanism that is readily adaptable to existing assemblies without the need for alteration of the firearm. My invention’s “simplified” design makes installation quick and easy, requiring only a simple tool and no expertise. Yet another object of my invention is to provide an ambidextrous release that “cams” on the outer surface of the weapon but provides access to the shooter’s trigger finger while the firing hand is placed around the pistol grip. The location of the depression portion of my invention is located to the rear making it less susceptible to snagging by foliage and battle-field obstacles. The design is such that the pivot location acts to reduce the possibility of accidental release much like the invention disclosed in U.S. Pat. No. 5,519,954.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] The present invention will now be described further by way of example, with reference to the accompanying drawings, in which:

[0020] FIG. 1 is a right side perspective view of a rifle;

[0021] FIG. 2 is a partial longitudinal cross-section view taken along line 2-2 of FIG. 1, showing my magazine release engaged with a magazine;

[0022] FIG. 3 is a similar partial longitudinal cross-section view taken along line 2-2 of FIG. 1, showing the manner in which the magazine is released by pushing on an operating push-button;

[0023] FIG. 4 is another partial longitudinal cross-section view taken along line 2-2 of FIG. 1, showing the manner in which the magazine is released by depressing an extension of my magazine release.

[0024] FIG. 5 is a sectional view taken along the line 3-3 of FIG. 1, showing my magazine release with the lever “at rest”;

[0025] FIG. 6 is a similar sectional view taken along line 3-3 of FIG. 1, showing my magazine release with the extension of the lever “depressed”;

REFERENCE NUMERALS IN DRAWINGS

- [0026] 16 body
- [0027] 18 buttstock
- [0028] 20 pistol grip
- [0029] 22 trigger
- [0030] 24 magazine well
- [0031] 26 alignment recess

- [0032] 28 magazine catch slot
- [0033] 30 magazine
- [0034] 32 cavity
- [0035] 34 lateral securing slot
- [0036] 36 shaft
- [0037] 38 cam edge
- [0038] 40 orifice
- [0039] 42 spring
- [0040] 44 operating push button
- [0041] 46 threaded portion
- [0042] 48 threaded hole
- [0043] 50 seat
- [0044] 52 tooth
- [0045] 54 lever
- [0046] 56 engagement stop
- [0047] 58 pin
- [0048] 60 lever seat
- [0049] 66 depression extension
- [0050] 68 pivot stop
- [0051] 72 elongated recess
- [0052] 74 spring cavity
- [0053] 75 bevel
- [0054] 76a feed lip (left)
- [0055] 76b feed lip (right)

Description of the Preferred Embodiment—FIG. 1

[0056] In FIG. 1 a lower receiver or body 16 of an automatic or semi-automatic rifle is shown including a buttstock 18, a pistol grip 20, a trigger 22, and a magazine well 24. Within magazine well 24 is an alignment recess 26 and an adjacent magazine catch slot 28. A magazine 30 is inserted into magazine well 24. When magazine 30 is fully seated in magazine well 24, a lateral securing slot 34 coincides with magazine catch slot 28. A shaft or rod 36, which is pivotally attached to lever 54 by means of a pin 58, is guided transversely through an orifice 40, a spring 42, and is connected to an operating push button 44 by means of a threaded portion 46 which is screwed into a threaded hole 48 extending through operating push button 44. Spring 42, acting against operating push button 44 and spring cavity 74, urges lever 54 towards body 16 within magazine catch slot 28. Lever seat 60 of lever 54 comes to rest on a seat 50 allowing for the engagement of a tooth 52, of lever 54, with lateral securing slot 34 (not shown) of magazine 30. A pair of feeding lips 76a and 76b are formed in the construction of magazine 30. The outer radius of feeding lip 76a contacts a bevel 75 of tooth 52 allowing tooth 52 to “ride-over” magazine 30 pushing tooth 52 out of magazine well 24 when magazine 30 is inserted into magazine well 24. Tooth 52 slides along the outside of magazine 30 until lateral securing slot 34 coincides with magazine catch slot 28. Energy from spring 42 acts against operating push button 44, which is

connected to shaft 36 by threaded portion 46 and threaded hole 48, and spring cavity 74 pulling shaft 36 which firmly seats lever seat 60 against seat 50 of magazine catch slot 28 urging tooth 52 of lever 54 into the aligned lateral securing slot 34 of magazine 30.

[0057] FIG. 1 shows clearly a spring cavity 74 for alignment of spring 42. An elongated recess 72 allows for sufficient depression of operating push button 44 into body 16 to accommodate the rotation of lever 54 when connecting threaded portion 46 of shaft 36 to threaded hole 48 of operating push button 44 (this connection could also be achieved by pinning shaft 36 to operating push button 44). When a sufficient number of rotations of lever 54 are achieved to completely engage threaded portion 46 within threaded hole 48, lever 54 is aligned with magazine catch slot 28 and operating push button 44 is released. The elongated shape of recess 72 also acts to restrict radial movement and rotation of operating push button 44 eliminating the need for hardware to fix operating push button 44 to shaft 36.

Operation—FIGS. 2-4

[0058] In FIG. 2 (rest position) lever 54 is shown with lever seat 60 firmly contacting seat 50 of magazine catch slot 28 with tooth 52 positively engaging magazine catch slot 34. Cam edge 38 is shown disengaged. Cam edge 38 can be solid or skeletonized as depicted in FIG. 1. Depression extension 66 is located to the rear allowing the “left-handed” shooter to access it with the index finger of his “firing-hand” while in its normal position on the pistol grip. The existing operating push button 44 is already accessible to the index finger of the “firing-hand”, of a “right-handed” shooter, while in its normal position on the pistol grip. The removal of magazine 30 may be brought about by depressing either operating push button 44 or depression extension 66. In the first case, it is sufficient to press operating push button 44 in the direction of arrow B in FIG. 3. In the second case, it is sufficient to depress depression extension 66 in the direction of arrow D in FIG. 4. The depression of depression extension 66 rocks lever 54 on cam edge 38 drawing tooth 52 out of engagement with magazine catch slot 34 drawing operating push button 44 into elongated recess 72 slightly due to the pivotal connection of shaft 36 to lever 54. This camming action can take place on the exterior of the weapon or within a recess used to house an existing non-ambidextrous magazine catch.

Internal Detail—FIGS. 5-6

[0059] FIG. 5 shows the minimum clearance necessary for function of the assembly in which cavity 32 is provided for free movement of shaft 36 during operation. At rest, engagement stop 56 abuts shaft 36 limiting engagement of tooth 52 and acts to “station” lever 54 so it can be drawn out of engagement with lateral securing slot 34 of magazine 30 when operating push button 44 is used to release the magazine (primary method). FIG. 5 also shows a pivot stop 68 which limits travel of lever 54 to eliminate the possibility of depression extension 66 making contact with the outer surface of the weapon. FIG. 6 shows lever 54 depressed and in contact with pivot stop 68. FIG. 5 and FIG. 6 show the pivotal end of shaft 36 radiused. The pivotal end could be

simply beveled as long as there is sufficient space provided by cavity 32 for operation. Impact to lever 54 forward of depression extension 66 forces lever seat 60 against seat 50 of magazine catch slot 28 preventing tooth 52 of lever 54 from disengaging from lateral securing slot 34 of magazine 30 holding magazine 30 securely in the weapon.

[0060] Thus the reader will see that my ambidextrous magazine release can be easily operated from either side of a firearm by both "right-handed" and "left handed" shooters, in a similar manner. The reader will also note that my magazine release incorporates design features that reduce the possibility of accidental release of a magazine and snags from foliage and equipment. My magazine release is readily adaptable to existing firearms and enhances a "left-handed" or "right-handed" shooter's ability to execute a magazine change.

[0061] While the description above contains many specificities, these should not be construed as limitations on the scope of the invention, but rather as an exemplification of one preferred embodiment thereof. Many other variations are possible.

[0062] Accordingly, the scope of my invention should be determined not by the embodiment illustrated, but by the appended claims and their legal equivalents.

Summary

[0063] It should, therefore, be clear to the reader that the structure of my invention will enable "left-handed" and "right-handed" shooters to release and retain magazines in the fastest possible manner, by reducing the excess movements required to change a magazine with existing release mechanisms. Furthermore, the structure of my invention has additional advantages in that

[0064] it requires no special tools or expertise to install;

[0065] it is readily adaptable to a wide range of "NATO" firearms currently in production;

[0066] the pressable portion is accessible by the index finger of the "firing-hand" while in its normal position on the pistol grip, for both "left-handed" and "right-handed" shooters;

[0067] it can also be manipulated by the thumb of the hand used to remove the magazine;

[0068] it overcomes the disadvantages associated with the use of a folding stock;

[0069] it provides a "left-handed" shooter, using a sling, with the same ability to change magazines as his "right-handed" counterpart;

[0070] it contains elements that protect the assembly from accidental depression;

[0071] it incorporates design features that make the assembly less prone to snagging from foliage and equipment.

I claim:

1. An ambidextrous magazine release and retaining mechanism for use with a gun, comprising:

a rod having first and second ends transversely and slidably mounted within the gun;

a spring for biasing the rod towards the first end thereof;

a pushbutton connected to the first end of the rod for pushing the rod against the bias of the spring;

a lever pivotally connected to the second end of the rod; said lever having first and second ends;

the first end of the lever for engaging with the magazine and the second end of the lever including a pressing surface which when pressed towards the gun moves the first end of the lever away from the magazine, the pressing surface of the second end of the lever disposed exterior to the gun and directly pressable by a user.

2. A mechanism according to claim 1, wherein the rod and lever are arranged such that when the push button is pressed towards the gun, the lever moves away from the gun without the lever pivoting.

3. A mechanism according to claim 1, wherein: the lever has a rounded surface on the first end thereof, the rounded surface facing away from the gun.

4. A gun having an ambidextrous magazine release and retaining mechanism, comprising:

a gun body for accepting a magazine;

a rod having first and second ends transversely and slidably mounted within the gun;

a spring for biasing the rod towards the first end thereof;

a pushbutton connected to the first end of the rod for pushing the rod against the bias of the spring;

a lever pivotally connected to the second end of the rod; said lever having first and second ends;

the first end of the lever for engaging with the magazine and the second end of the lever including a pressing surface which when pressed towards the gun moves the first end of the lever away from the

magazine, the pressing surface of the second end of the lever disposed exterior to the gun and directly pressable by a user.

5. A gun according to claim 4, wherein the rod and lever are arranged such that when the push button is pressed towards the gun, the lever moves away from the gun without the lever pivoting.

6. A gun according to claim 4, wherein:

the lever has a rounded surface on the first end thereof, the rounded surface facing away from the gun.

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