March 6, 1956 E. M. HARVEY 2,736,977

MAGAZINE LATCHING MEANS

Filed April 17, 1953

Fig. 1.

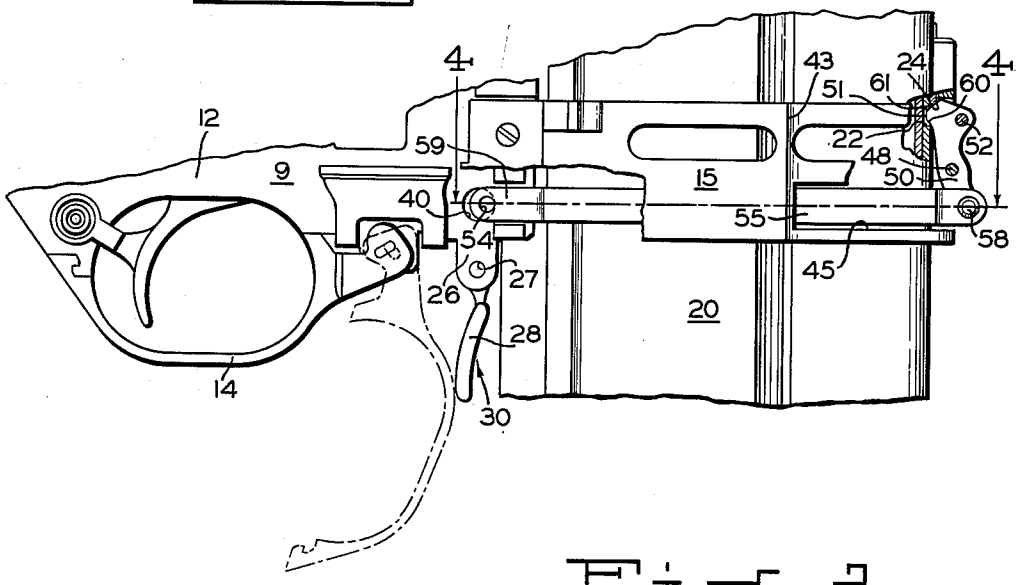


Fig. 2.

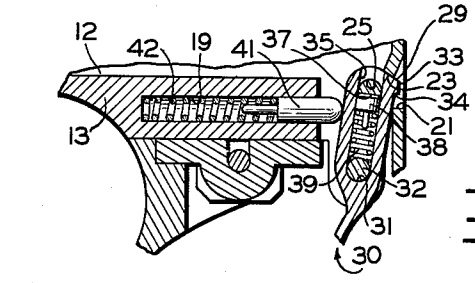


Fig. 3.

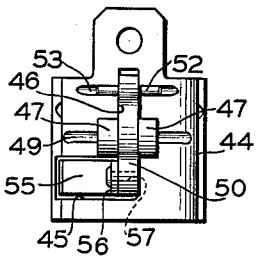


Fig. 5.

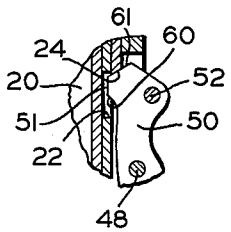
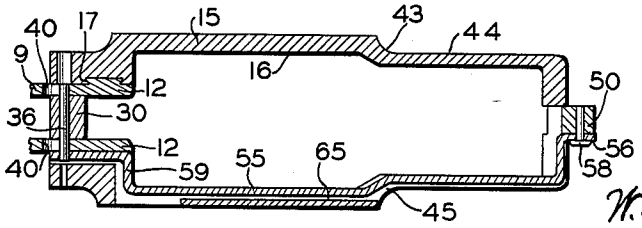


Fig. 4.



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MAGAZINE LATCHING MEANS

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Application April 17, 1953, Serial No. 349,579

4 Claims. (Cl. 42—50)

(Granted under Title 35, U. S. Code (1952), sec. 266)

The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment of any royalty thereon.

This invention relates to firearms of the type wherein the cartridges are fed from a replaceable magazine and relates more particularly to means for releasably latching the magazine to the firearm.

In firearms embodying a box-type magazine, a latching mechanism is provided for releasably retaining the magazine within the firearm structure. It is conventional in firearms of such type for the magazine to be latched either at one position or at two positions by separate latches. Where the magazine is latched at only one position, it can readily be seen that the magazine is subject to tilting or camming which might interfere with the proper feeding of the cartridges from the magazine. In the firearms provided with a latching system which latches the magazine at both front and rear by separate latching devices, the magazine is conventionally installed by engaging one of the latches with the magazine and then fully inserting the magazine into the weapon with a rotary motion for engagement with the other latch. The magazine is removed with a reverse rotary motion. These motions are convenient in magazine installation and removal but they require a large clearance between the front and the rear of the magazine and the magazine receiving passageway through which dust, water and other foreign matter may enter the weapon.

It is therefore an object of this invention to provide for automatic firearms a magazine latch system by which the magazine is insertable into the firearm in a straight vertical motion and thereby permits a closer relationship between the magazine and the magazine receiving passageway.

It is another object of this invention to provide positive mechanical latching at both the front and the rear of the magazine.

It is a further object of this invention to provide a means of unlatching the front and the rear latches simultaneously by a single convenient handle.

It is a still further object of this invention to provide a magazine latching system in which the handle means is cooperable with the firearm trigger guard when in open winter-trigger position to assist in the unlatching of the magazine.

The specific nature of the invention as well as other objects and advantages thereof will clearly appear from a description of a preferred embodiment as shown in the accompanying drawings in which:

Fig. 1 is a side view of a trigger housing and magazine guard partially cross-sectioned showing a magazine retained therein by the latching mechanism of this invention;

Fig. 2 is a front view of the magazine guard;

Fig. 3 is an enlarged fragmentary longitudinal cross-sectional view of the rear latch;

Fig. 4 is a view taken along line 4—4 of Fig. 1 without the magazine; and

Fig. 5 is an enlarged fragmentary longitudinal cross-sectional view of the front latch.

Shown in the figures is a trigger housing 9 having spaced-apart longitudinal sides 12 and a base portion 13 therebetween. A trigger guard 14 is pivotally mounted to base portion 13 so as to swing downwardly and forwardly therefrom to an open, winter-trigger position. Extending forwardly from trigger housing 9, and secured to the outside surfaces of sides 12 as by dovetail 17 and screw means, is a substantially U-shaped magazine guard member 15 which cooperates with the front end of trigger housing 9 to form a magazine receiving passageway 16. Receivable in passageway 16 is a conventional box-type magazine 20 having a rear latch receiving notch 21 and a front latch receiving notch 22 provided, respectively, in the rear and front sides thereof. Facing downwardly into notches 21 and 22 are conventional engaging portions, 23 and 24, respectively.

A pair of oppositely disposed lugs 26, provided with laterally aligned holes 27, depend from the forward portions of sides 12, and received therebetween is a rear latch member 30 having an approximately central transverse bore 31. A pin 32 is snugly received by bore 31 and is rotatably mounted in holes 27 to provide for pivotal movement of rear latch 30 between an engaged and a disengaged position, in respect to magazine 20.

That portion of rear latch 30 below bore 31 is formed as a handle 28 which is operable by trigger guard 15 when in an open, winter-trigger position. Protruding forwardly from the top portion of rear latch 30 is a nose portion 33 which is receivable by rear notch 21 when magazine 20 is fully inserted in passageway 16. The lower side of nose portion 33 is provided with a cam surface 34 whereby upward movement of magazine 20 thereagainst during installation in passageway 16 moves rear latch 30 to the disengaged position. The top side of nose portion 33 is provided with an engaging surface 29 which cooperates with engaging portion 23 of rear notch 21. Engaging surface 29 is arranged to incline forwardly and downwardly when rear latch 30 is in either engaged or disengaged positions to facilitate the movement of nose portion 33 in and out of rear notch 21.

Provided in the upper portion of rear latch 30 is a lateral hole 25 and a cylindrical channel 35 which extends downwardly from the top side thereof to provide communication between bore 31 and hole 25. A pin 36, having a segmental recess 37 approximately central thereof, is received by hole 25 and projects outwardly from either side of rear latch 30. A cylindrical detent member 38 and a coiled compression spring 39 are received by channel 35 and are so arranged that detent 38 is receivable by recess 37 and spring 39 is compressed between pin 32 and detent 38 to resiliently bias detent 38 into recess 37 whereby pin 32 is releasably maintained in rear latch 30. The extending ends of pins 32 are received by a pair of oppositely disposed holes 40 in sides 12 of trigger housing 9. Holes 40 have a larger diameter than pin 32 to permit limited pivotal movement of rear latch 30 between the engaged and disengaged positions. The engaged position of rear latch 30 is so arranged that when nose portion 33 is received in rear notch 21, engaging surface 29 is forwardly out of vertical alignment with pin 32. Thus, the downward pressure of engaging portion 23 of rear notch 21 against engaging surfaces 29 of rear latch 30 applies a torque to rear latch 30, to retain nose portion 33 in rear notch 21.

Longitudinally arranged in base 13 is a cylindrical well 19 and received therein is a plunger 41, engageable with the upper portion of rear latch 30, and a coiled compression spring 42 which is compressed between the end of well 19 and plunger 41 to normally bias rear latch 30 to the engaged position.

The longitudinal sides of magazine guard **15** are provided with intermediate arcuations **43** which extend inwardly, conforming to the contours of magazine **20**, and extending forwardly therefrom is a magazine guard portion **44** of reduced width. Provided along one side of portion **44**, and spaced equidistant from the lower side thereof, is an elongated opening **45** which extends to midway of the front end of magazine guard **15** to communicate with the lower portion of a vertical slot **46**. Provided on either side of vertical slot **46** and above opening **45** are a pair of oppositely disposed flanges **47** through which there is rotatably mounted a pin **48**. Clearance grooves **49** aid installation of pin **48** in flanges **47**.

Snugly mounted on pin **48** in slot **46** is a front latch member **50**. Projecting rearwardly from the top portion of front latch **50** is a nose portion **51** having a cam surface **60** and an engaging surface **61** of similar configuration and purposes as cam surface **34** and engaging surface **29** on nose portion **33** of rear latch **30**. A pin **52** is transversely mounted through the upper portion of front latch **50** and is receivable by a semi-cylindrical recess **53** in the front end of magazine guard **15**. The engagement of pin **52** with recess **53** limits the engaged position of nose portion **51** in passageway **16** and is so arranged that when nose portion **51** is in engaged position, engaging surface **61** thereof is rearwardly out of vertical alignment with pin **52**.

A connector bar **55** links the lower portion of front latch **50** to the upper portion of rear latch **30** thus joining latches **50** and **30** for simultaneous latching or disengaging of magazine **20** in passageway **16**. Connector **55** has a longitudinal portion which is received by opening **45** and a clearance groove **65** which extends rearwardly therefrom along the inside wall of magazine guard **15**. The forward portion of connector **55** is received within opening **45** and terminates in a portion **56** which projects longitudinally forwardly and adjacent to the near side of front latch **50**. A hole **57** transverses portion **56** and rotatably receives a headed rivet **58** mounted laterally in the lower portion of front latch **50**. The rear portion of connector **55** skirts passageway **16** and terminates in a portion **59** arranged adjacent to the near side of rear latch **30**. Provided in portion **59** is a lateral hole **54** which receives an extending end portion of pin **36**. Connector **55** is mounted on pin **36** before magazine guard **15** is assembled to trigger housing **9** as the inside wall of magazine guard **15** is arranged to block disengagement of connector **55** from pin **36**.

As has already been explained, latches **30** and **50** are normally biased by spring **42** to engaged positions in passageway **16**. When magazine **20** is slidably inserted in passageway **16**, the engagement of the front and rear sides thereof with cam surfaces **60** and **34**, pivot latches **50** and **30** to disengaged positions. When magazine **20** is fully installed in passageway **16**, nose portions **33** and **51** of latches **30** and **50** are received by their respective cooperating notches **21** and **22**, with surfaces **29** and **61** engaging portions **23** and **24**. As surfaces **29** and **61** are positioned into passageway **16** out of vertical alignment with the pivotal centers of latches **30** and **50**, provided by pins **32** and **48**, the downward pressure exerted against magazine **20** during fire applies a torque to latches **30** and **50** to urge nose portions **33** and **51** into their respective cooperating notches **21** and **22**. Moreover, any increase in pressure against latches **30** and **50** by magazine **20** increases the torque holding them in engagement therewith. However, as latches **30** and **50** are resiliently maintained by spring **42** against their individual stopping means, pins **36** and **52**, the pounding of magazine **20** during automatic fire is absorbed by pins **36** and **52** with no portion of it being transmitted to or through connector **55**.

With handle **28** located adjacent magazine **20** and arranged to unlatch the latching mechanism by forward pressure, it is readily apparent that the operator by grasping both magazine **20** and handle **28** in one hand, may easily unlatch and remove magazine **20** by tightening his grasp and pulling downwardly. Also, with handle **28** operable by trigger guard **22** when in open winter-trigger position, the operator is given an added facility for removing magazine **20**.

Although a particular embodiment of the invention has been described in detail herein, it is evident that many variations may be devised within the spirit and scope thereof and the following claims are intended to include such variations.

I claim:

1. In a firearm having a magazine receiving passageway, a magazine receivable in the passageway, said magazine being provided with a front and a rear notch and downwardly facing engaging portions formed thereby, a front and a rear latch pivotally mounted in the firearm on transverse pins and arranged to pivot between engaged and disengaged positions, said latches being provided with nose portions receivable in said notches when said latches are in said engaged position, said nose portions arranged to be retained in said notches by said latches through a torque produced therein by downward pressure of said engaging portions against said nose portions, a connector mounted between said latches for translation of rotation of one of said latches to counterrotation of the other to provide simultaneous movement of said latches to said engaged or disengaged positions, spring means to normally bias said latches to said engaged positions, and handle means to move said latches to said disengaged positions.

2. In a firearm having a magazine receiving passageway, a magazine receivable in the passageway, said magazine being provided with a front and rear notch and downwardly facing engaging portions formed thereby, a front and a rear latch pivotally mounted in the firearm on transverse pins for engaging cooperation with said notches and each of said latches arranged to pivot between notch engaged and disengaged positions, means to limit the movement of said latches to said engaged positions, nose portions projecting from the upper portions of said front and said rear latches and arranged to be received by said notches, said nose portions arranged to be so positioned out of vertical alignment with said pins that downward pressure of said engaging portions against said nose portions produces a torque in said latches whereby said latches secure said nose portions against disengagement from said notches, a connector mounted between said latches for translation of rotation of one of said latches to counterrotation of the other to provide simultaneous movement of said latches to said engaged or disengaged positions, spring means to normally bias said latches to said engaged positions, a handle to move said latches to said disengaged positions, and a trigger guard mounted to said trigger housing for pivotal movement between a closed position and an open position wherein said trigger guard may operate said handle.

3. In a firearm, a trigger housing and a U-shaped magazine guard attached forwardly thereof to form a magazine receiving passageway therebetween, a magazine receivable in said passageway, said magazine being provided with a front and a rear notch and downwardly facing engaging portions formed thereby, a first pin mounted transversely in the front portion of said magazine guard, a second pin mounted transversely in the front portion of said trigger housing, a front and a rear latch mounted on said pins for pivotal movement between engaged and disengaged positions, nose portions projecting from the top portions of said latches and adapted to be received by said notches when said latches are in said engaged position, cam surfaces provided on the underside of said nose portions whereby said latches are cammed to said disengaged positions by movement of said magazine thereagainst when being installed in said passageway, engaging surfaces provided on the top

side of said nose portions and arranged to engage said engaging portions when said nose portions are received by said notches, a connector pivotally mounted at one end to said front latch below said first pin and at the other end to said rear latch above said second pin for simultaneous movement of said latches to said engaged or disengaged positions, spring means biased against said rear latch to resiliently urge said latches to said engaged positions and thereby normally retain said magazine in said passageway, said engaging surfaces are so related to said pins when said latches are in said engaged positions that a torque is produced in said latches when said engaging portions press against said engaging surfaces whereby said nose portions are secured against disengagement from said notches, stopping means to limit the movement of said latches to said engaged positions, a handle provided on said rear latch below said second pin for movement of said latches to said disengaged position, and a trigger guard mounted to said trigger housing for pivotal movement between a closed position and an open position wherein said trigger guard may operate said handle.

4. In a firearm, a trigger housing and a U-shaped magazine guard attached forwardly thereof to form a magazine receiving passageway therebetween, a magazine receivable in said passageway, said magazine being provided with a front and a rear notch, a front and a rear latch mounted in said magazine guard for pivotal movement between engaged and disengaged positions, a first pin mounted transversely in the upper portion of said front latch, said pin being engageable with the front side of said magazine guard to limit the movement of said front latch to said engaged position, a second pin mounted

transversely in the upper portion of said rear latch and arranged to extend outwardly therefrom to form projecting ends, said projecting portions being received by a pair of oppositely disposed holes provided in said magazine guard, said holes being of greater diameter than said second pin whereby said rear latch is limited in movement between said engaged and said disengaged position, nose portions projecting from said latches above the pivotal centers thereof and arranged to be received by said notches when said latches are in said engaged positions, spring means to resiliently urge said latches to said engaged positions whereby said nose portions are biased into said notches to normally retain said magazine in said passageway, said nose portions are secured against disengagement from said notches by said latches through a torque produced therein by downward pressure of said magazine against said nose portions, a connector pivotally mounted at one end to said front latch below the pivotal center thereof and at the other end to one of said projecting ends of said second pin, a handle to move said latches to said disengaged positions, and a trigger guard mounted to said trigger housing for pivotal movement between a closed position and an open position wherein said trigger guard may operate said handle.

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