March 28, 1944. C. G. SWEBILIUS 2,345,077

CARTRIDGE-EJECTING MEANS FOR FIREARMS

Original Filed Oct. 15, 1940 2 Sheets-Sheet 1

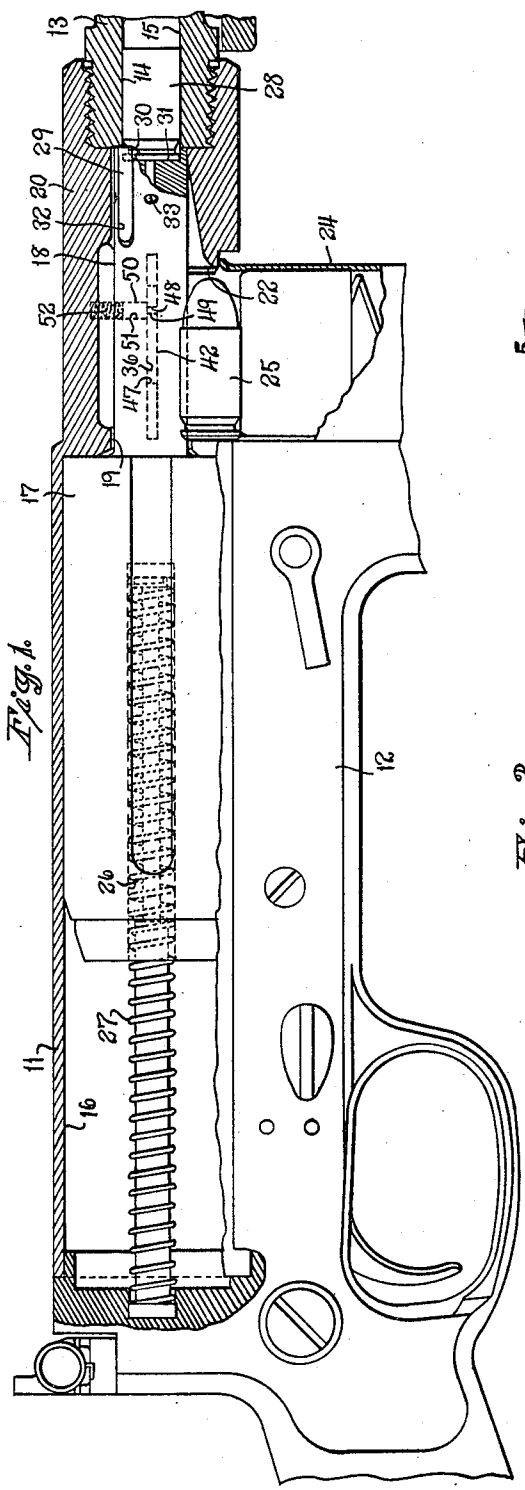


Fig. 1.

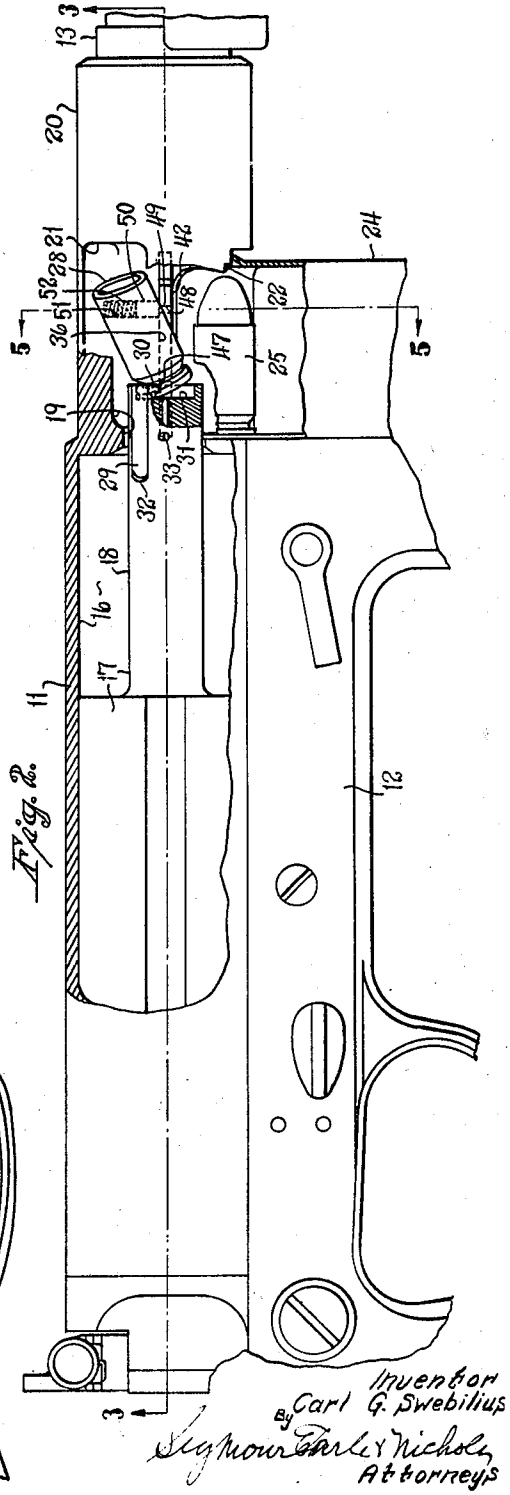


Fig. 2.

Inventor
Carl G. Swebilius
By Seymour Earle & Nichols
Attorneys

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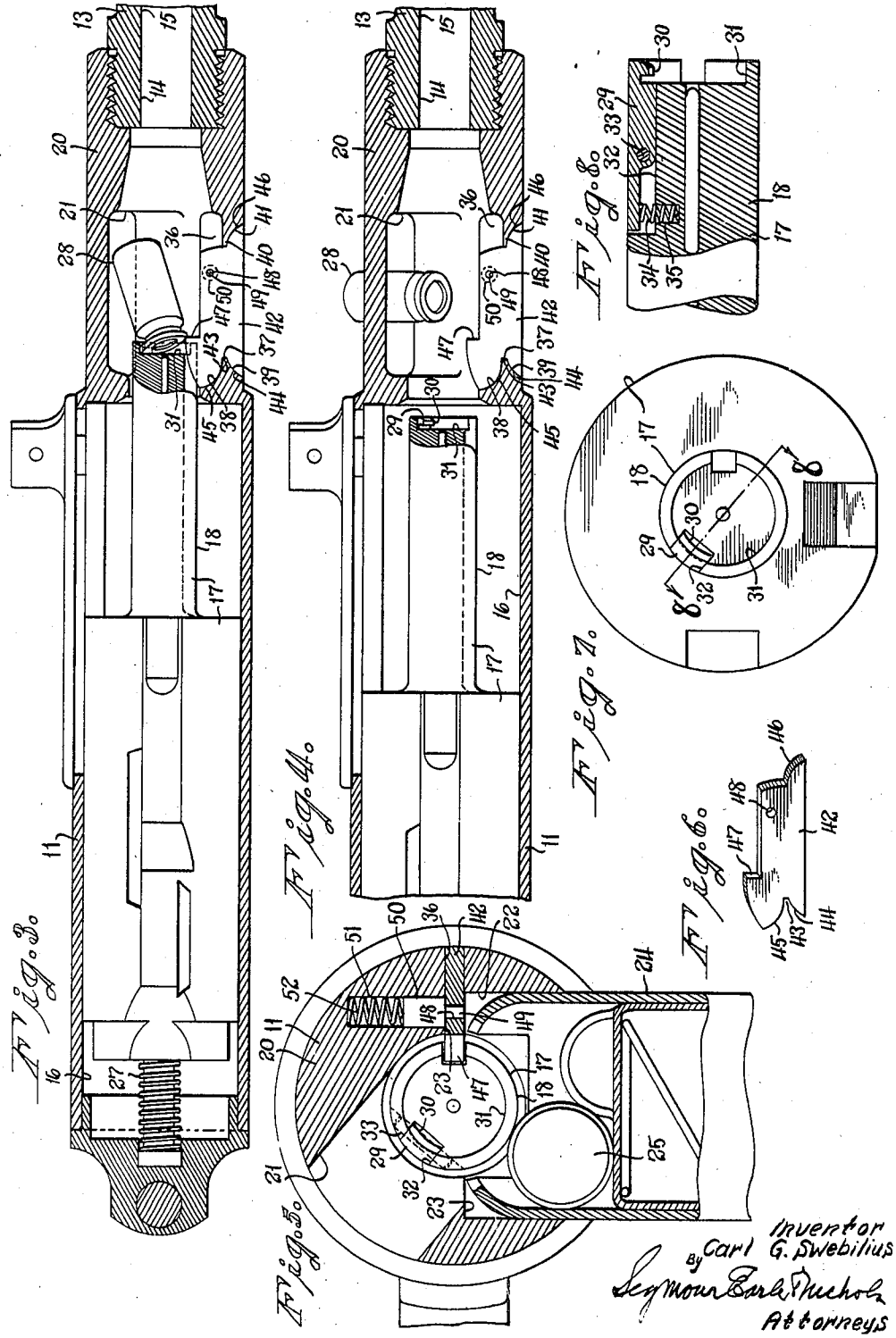


Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

Inventor
Carl G. Swebilius
By Seymour Earle Nichols
Attorneys

Patented Mar. 28, 1944 2,345,077

UNITED STATES PATENT OFFICE

2,345,077

CARTRIDGE-EJECTING MEANS FOR FIREARMS

Carl G. Swebilius, Hamden, Conn., assignor to The High Standard Manufacturing Corporation, New Haven, Conn., a corporation of Connecticut

Original application October 15, 1940, Serial No. 361,208. Divided and this application October 31, 1941, Serial No. 417,250

1 Claim. (Cl. 42—25)

The present invention relates to improvements in firearms and relates more particularly to improvements in cartridge-ejecting means for firearms.

The present application constitutes the division of my co-pending application Serial No. 361,208 filed October 15, 1940.

One of the objects of the present invention is to provide a firearm-structure with superior means for ejecting cartridges and characterized by low cost for manufacture and ease and facility of assembly and disassembly.

Another object of the present invention is to provide superior cartridge-ejecting means for firearms which is so firmly supported in the firearm-structure as to virtually preclude its derangement and the consequent malfunctioning of the firearm.

With the above and other objects in view, as will appear to those skilled in the art from the present disclosure, this invention includes all features in the said disclosure which are novel over the prior art and which are not claimed in any separate application.

In the accompanying drawings, in which certain modes of carrying out the present invention are shown for illustrative purposes:

Fig. 1 is a view of the central portion of a firearm embodying the present invention and showing the same partly in side elevation and partly in vertical central-longitudinal section with the breech-bolt shown in its breech-closing position;

Fig. 2 is a view similar to Fig. 1 but showing the breech-bolt partly retired rearwardly;

Fig. 3 is a transverse sectional view taken on the line 3—3 of Fig. 2;

Fig. 4 is a view similar to but less comprehensive than Fig. 3 and showing the breech-bolt in its fully-retired position;

Fig. 5 is a broken transverse sectional view taken on the line 5—5 of Fig. 2 but omitting the cartridge-casing in process of being ejected;

Fig. 6 is a perspective view of the ejector detached;

Fig. 7 is a view in front-end elevation of the breech-bolt detached; and

Fig. 8 is a broken transverse sectional view taken on the line 8—8 of Fig. 7.

The particular firearm herein chosen for purposes of illustrating the present invention is of the self-loading repeating type wherein the discharge of a given cartridge effects the rearward retirement of the breech-bolt and the automatic extraction and ejection of the just-fired cartridge.

The firearm shown in the accompanying drawings includes in the main a buttstock 10, an upper receiver-member 11, a lower receiver-member 12 and a barrel 13. The upper receiver-member 11 and the lower receiver-member 12 are coupled together into a unit in any approved manner, and the buttstock 10 is secured to the lower receiver-member 12 in any approved manner, such for instance, as the manner shown in my co-pending application above referred to.

The upper receiver-member 11 is generally of cylindrical form exteriorly and has the rear end of the barrel 13 threaded into its forward end. The said barrel is formed at its rear end with an axial cartridge-chamber 14 from which forwardly leads a bore 15.

The upper receiver-member 11 is formed in its interior with a cylindrically-contoured longitudinal mechanism-receiving chamber 16 in which is adapted to reciprocate a breech-bolt 17 exteriorly of substantially-cylindrical form. The said breech-bolt 17 is provided with an integral coaxial and forwardly-projecting breech-closing stem 18 of cylindrically-contoured form and adapted to be entered into and retired from a longitudinal passage 19 in the upper receiver-member 11. The said passage 19 is formed in the forward reduced-diameter portion 20 of the upper receiver-member 11 and at its rear the said passage 19 opens into and communicates with the mechanism-receiving chamber 16 before referred to. At its forward end the passage 19 communicates with the rear end of the cartridge-chamber 14 in the barrel 13.

Leading upwardly and outwardly from the passage 19 in the forward portion 20 of the upper receiver-member 11, is an ejection-opening 21, while leading downwardly from the said passage 19 is a vertical magazine-receiving passage 22 having on each of its respective opposite sides one of two downwardly-facing longitudinally-extending shoulders 23—23.

Extending into the magazine-receiving passage 22 just above referred to is the upper end of a box-magazine 24 which may be of any convenient or usual construction not requiring detailed description herein other than to note that, as shown, it is adapted to force upwardly a column of cartridges exemplified by the cartridge 25.

For the purpose of yieldingly urging the breech-bolt 17 forwardly into its breech-closing position, as shown in Fig. 1, the said breech-bolt is formed in its rear portion with an axial spring-receiving bore 26 opening through the

rear end of the said breech-bolt. The spring-receiving bore 26 receives a helical breech-closing spring 27 which exerts a constant effort to move the said breech-bolt into its forward breech-closing position.

For the purpose of extracting cartridge-casings such as 28 from the cartridge-chamber 14 of the barrel 13, the breech-closing stem 18 of the breech-bolt 17 is provided with an extractor 29 having at its forward end an inwardly-extending extracting-lip 30 extending radially into an annular recess 31 formed in the forward face of the said stem 18 and adapted to successively receive the heads of cartridges. The said extractor 29 is accommodated in a longitudinal recess 32 formed in one side of the stem 18 of the breech-bolt 17, as is especially well shown in Fig. 8. The said extractor 29 is pivoted about midway of its length upon a pivot-pin 33 mounted in the stem 18. Pressing outwardly upon the rear portion of the extractor 29 is a helical spring 34 seated in a substantially-radial pocket 35 in the stem 18 of the breech-bolt 17, as is shown in Fig. 8.

The left side wall of the front portion 20 of the upper receiver-member 11 is formed with a horizontal longitudinally-extending slot 36 extending laterally completely through the wall of the said forward portion 20 from the longitudinal passage 19 therein outwardly to the periphery thereof. The rear portion of the said slot 36 is shaped to provide a forwardly-projecting retaining-finger 37 having on its inner side a forwardly-and-inwardly-facing concave retaining-abutment 38 and having on its outer side a forwardly-and-outwardly-facing concave retaining-abutment 39. The said slot 36 is also formed in its forward end with a rearwardly-extending retaining-finger 40 provided in its outer face with a concave rearwardly-and-outwardly-facing retaining-abutment 41.

The longitudinal slot 36 in the forward portion 20 of the upper receiver-member 11 receives with a slip fit a plate-like ejector 42, as is shown particularly well in Figs. 3, 4 and 5. The ejector 42 may be conveniently formed of sheet or plate steel and is formed in its rear end with a notch 43 receiving and substantially conforming in shape to the retaining-finger 37 in the slot 36 of the upper-receiver-member 11. The outer wall of the notch 43 just referred to is convex and constitutes a rearwardly-and-inwardly-facing retaining-abutment 44 substantially conforming to the curvature of the retaining-abutment 39 at the rear of the slot 36. The inner wall of the notch 43 in the ejector 42 is convex and provides a rearwardly-and-outwardly-facing retaining-abutment 45 conforming in shape to and engageable with the concave retaining-abutment 38 in the rear of the slot 36.

At its forward end, the ejector 42 is formed with a convex inwardly-and-forwardly-facing retaining-abutment 46 normally seated against the retaining-abutment 41 in the front of the slot 36.

As thus constructed and arranged, the rear portion of the ejector 42 is stabilized against outward movement by the engagement of the retaining-abutments 45 and 38 and is retained against inward movement by the engagement of the abutments 44 and 39. Furthermore, the ejector is prevented from having rearward displacement by the respective engagement of the retaining-abutments 38—45 and 39—44.

The forward end of the ejector 42 is stabilized against inward displacement which is the main strain to which it is subjected, by the engagement of its retaining-abutment 46 with the retaining-abutment 41 at the front of the slot 36. When a cartridge-casing such as the cartridge-casing 28 is pulled rearwardly by the extractor 29 during the rearward travel of the breech-bolt 17, the rear face of the said cartridge-casing adjacent its left side will be brought into violent engagement with the ejection-abutment 47 of the ejector 42 and will tilt out from under the extracting-lip 30 of the said extractor and be thrown outwardly through the ejection-opening 21 in the upper receiver-member 11. This violent and oft-repeated engagement of a cartridge with the ejection-abutment 47 of the ejector 42 will tend to move the said ejector rearwardly, which movement, however, will be prevented by the interengagement of the retaining-abutments 44 and 45 respectively with the retaining-abutments 39 and 38. The strains applied to the ejector 42 under the circumstances just referred to, will also tend to drive the rear end of the ejector outwardly, but displacement is prevented by the engagement of the retaining-abutments 45 and 38. Furthermore, during the engagement of a cartridge with the ejection-abutment 47, the ejector 42 will tend to have its forward end swing inwardly, but such movement is, in turn, prevented by the engagement of the retaining-abutments 46 and 41.

To releasably hold the forward portion of the ejector 42 against accidental outward displacement, the said ejector is provided adjacent its said forward end with a vertical latching-socket 48 receiving the downwardly-extending latching-nose 49 (Fig. 5) formed at the lower end of a latching-plunger 50. The said latching-plunger 50 is mounted for reciprocation in a vertical direction in the lower end of a downwardly-opening pocket 51 formed in the forward portion 20 of the upper receiver-member 11 and opening downwardly through the face of the left shoulder 23 thereof. The pocket 51 also accommodates a helical spring 52 which yieldingly urges the latching-plunger 50 downwardly to maintain its latching-nose 49 in the latching-socket 48 in the ejector 42.

Should it be desired to remove the plate-like ejector 42 from the upper receiver-member 11, a pin may be inserted upwardly through the magazine-receiving passage 22 in the upper receiver-member 11 to retire the latching-plunger 50. When the latching-plunger 50 is retired in any suitable manner, the ejector 42 may have its forward end rocked outwardly until its front inner corner clears the retaining-finger 40 in the upper receiver-member, whereupon the said ejector may be moved forwardly and completely removed from the firearm. The reinstallation of the ejector 42 may be accomplished by substantially reversing the steps just referred to.

The invention may be carried out in other specific ways than those herein set forth without departing from the spirit and essential characteristics of the invention, and the present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive, and all changes coming within the meaning and equivalency range of the appended claim are intended to be embraced therein.

I claim:

A self-loading repeating firearm including in combination: a reciprocating breech-bolt; an extractor carried by the said breech-bolt; a receiver

having a mechanism-receiving chamber therein in which the said breech-bolt reciprocates and having a magazine-receiving passage leading downwardly from its said chamber, the said receiver having a downwardly-facing shoulder located in its said chamber in position to overlie the upper end of the said magazine-receiving passage, the said receiver also having a slot in its side wall in substantial registry with the downwardly facing shoulder and extending between the mechanism-receiving chamber therein outwardly to its outer face; a plate-like ejector installed in the slot in the side wall of the said receiver and having an ejection-abutment extending into the mechanism-receiving chamber of the said receiver in position to be engaged by a cartridge as the same is moved rearwardly by the extractor carried by the said breech-bolt, the said ejector being formed with a substantially-vertical detent-receiving recess; and a substantially-vertical spring-pressed plunger mounted in the portion of the said receiver located above the shoulder therein and having a lower portion entering the recess in the said ejector to releasably hold the same in place in the slot in the said receiver and in position to be retired by an instrument inserted upwardly into engagement with it through the magazine-receiving opening in the receiver.

CARL G. SWEBILIUS.