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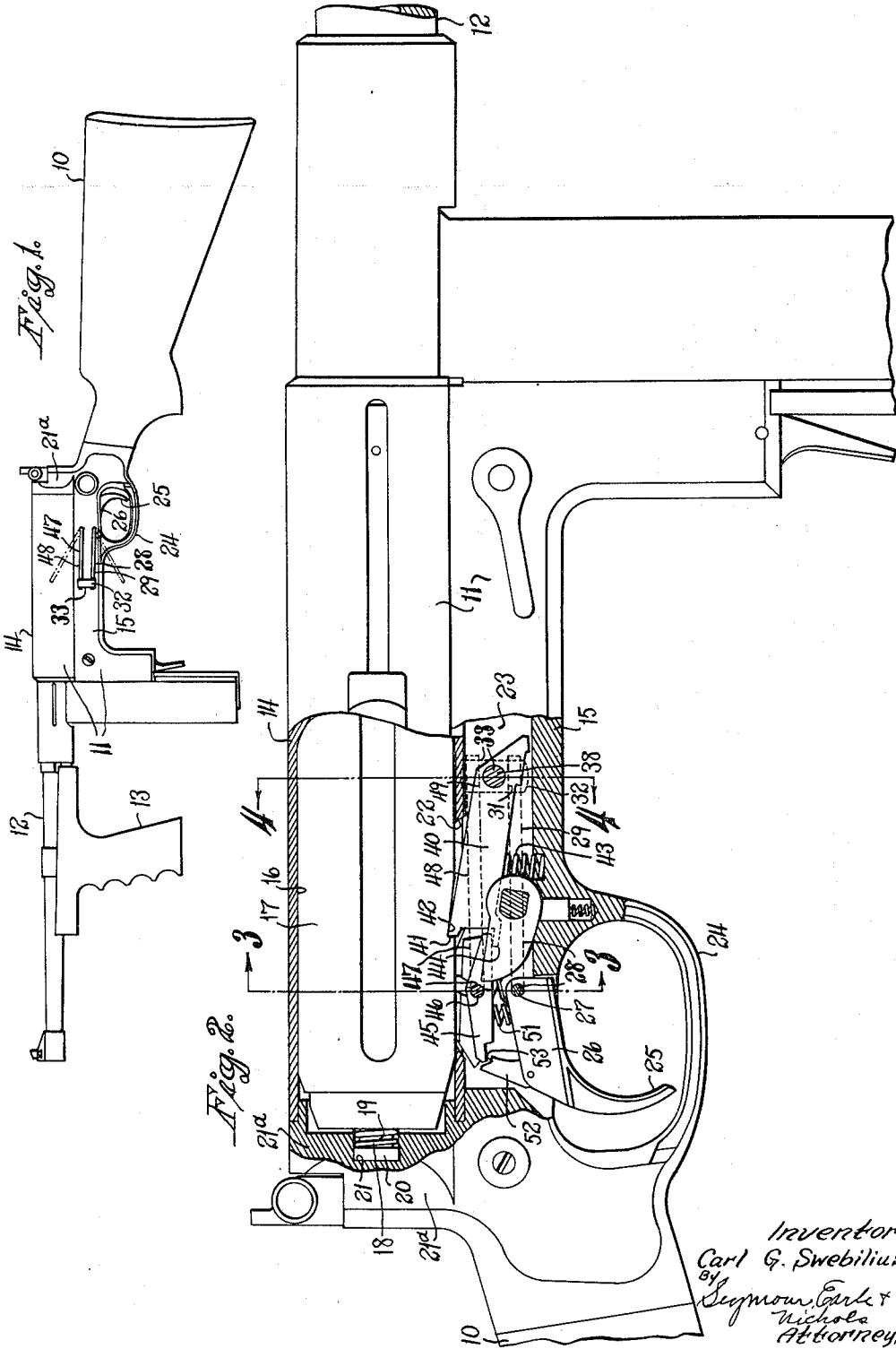
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2,303,510

ASSEMBLY MEANS FOR FIREARMS

Filed July 2, 1941

2 Sheets-Sheet 1



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Fig. 3.

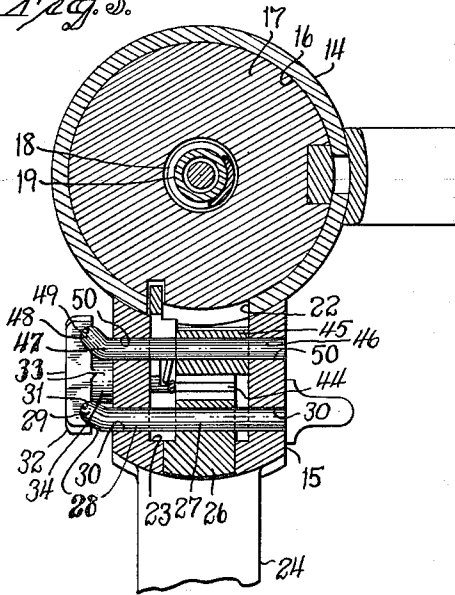


Fig. 4.

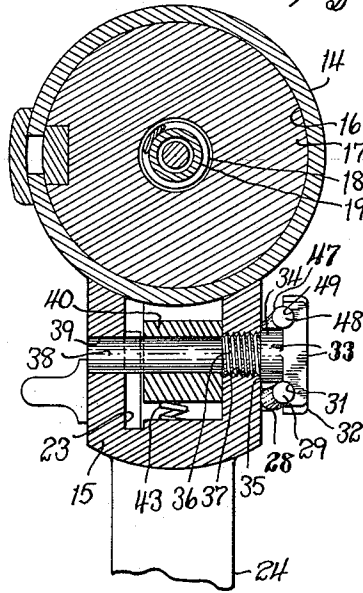


Fig. 5.

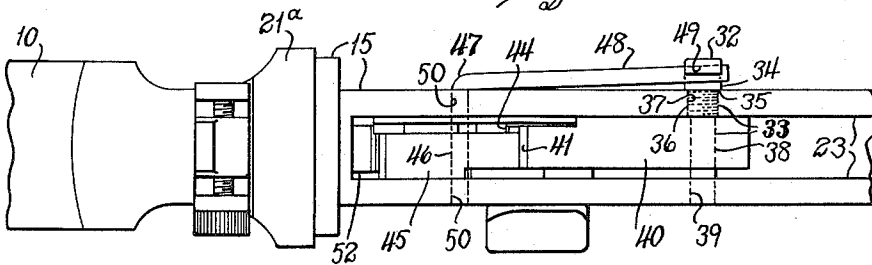


Fig. 7.

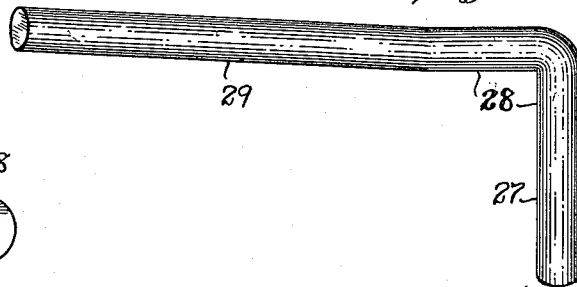
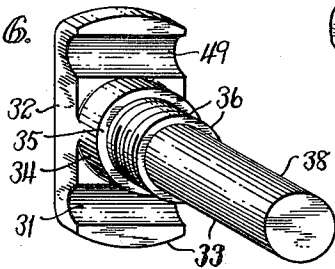


Fig. 6.



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# UNITED STATES PATENT OFFICE

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## ASSEMBLY MEANS FOR FIREARMS

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Application July 2, 1941, Serial No. 400,723

4 Claims. (Cl. 42-69)

The present invention relates to improvements in firearms and more particularly to means whereby the elements of the firearm may be held in assembled relationship with capacity for ready disassembly.

The present invention is particularly designed for use in military firearms, though available for use in other types of firearms, since for military service firearms are required which may be readily taken apart for cleaning and reassembled in the very minimum of time and under the most adverse conditions.

One of the objects of the present invention is to provide a superior firearm-construction whereby separable elements of the firearm may be releasably but securely held in assembled relationship with capacity for being freed from such relationship in a minimum of time.

A further object of the present invention is to provide a superior firearm-construction whereby the elements thereof may be securely held in assembled relationship with capacity for being demounted by the employment of such a simple tool as a cartridge or by the fingers of the user when required.

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 in side elevation of self-loading repeating firearm embodying the present invention;

Fig. 2 is a view of the central portion of the firearm structure shown partly in vertical central-longitudinal section and partly in side elevation, with the parts shown in cocked position preparatory to the discharge of the firearm;

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

Fig. 4 is a similar view taken on the line 4-4 of Fig. 2;

Fig. 5 is a broken top or plan view of the lower receiver-member and a portion of the buttstock;

Fig. 6 is a perspective view of the mounting-and-retaining screw, detached; and

Fig. 7 is a similar view of one of the L-shaped resilient mounting-and-retaining members, detached.

The particular firearm herein chosen for purposes of illustrating the present invention is of

the self-loading repeating type wherein cartridges may be fired singly for each pull of the trigger or the mechanism may be set to sequentially discharge an entire magazine full of cartridges. The said firearm comprises a buttstock 10, a two-part receiver generally designated by the reference character 11, a barrel 12 and a fore-end grip 13.

The receiver 11 above referred to includes an upper receiver-member 14 and a complementary lower receiver-member 15, which are normally firmly and rigidly coupled together by any suitable means such, for instance, as the means illustrated in my co-pending application, Ser. No. 361,208, filed October 15, 1940. The said upper receiver-member 14 is generally of cylindrical form exteriorly and has the barrel 12 rigidly extending forwardly from its front end. The said barrel in turn has the fore-end grip 13 rigidly attached to and depending from it, as is shown particularly well in Fig. 1.

The upper receiver-member 14 is formed in its interior with a substantially-cylindrical bolt-receiving chamber 16 extending longitudinally of the said receiver-member and accommodating with capacity for reciprocating movement a substantially-cylindrically-contoured reciprocating breech-bolt 17. The said breech-bolt 17 is urged forwardly by a helical breech-closing spring 18 mounted upon a breech-closing plunger 19 having a head 20 seated in a forwardly-opening pocket 21 formed in the forward face of an integral upwardly-extending portion 21a formed at the rear of the lower receiver-member 15, as is especially well shown in Figs. 2 and 5. At its rear the bolt-receiving chamber 16 in the upper receiver-member 14, has communicating with it a longitudinal clearance-passage 22 communicating at its lower end with an upwardly-opening longitudinal mechanism-receiving chamber 23 formed in the lower receiver-member 15. At its rear the mechanism-receiving chamber 23 just referred to intersects the space enclosed by a trigger-guard 24 formed integral with and depending from the under portion of the lower receiver-member 15.

Located within the space defined by the integral trigger-guard 24 above referred to, is the finger-piece 25 of a pivotal trigger 26 located mainly in the lower rear portion of the mechanism-receiving chamber 23 in the lower receiver-member 15, as is shown particularly well in Fig. 2. The said trigger 26 is mounted for pivotal movement upon a relatively-short pivot-arm 27 of a resilient mounting-and-retaining member

generally designated by the reference character 28. The said member 28 is of L-shaped form and includes a relatively-long retaining-arm 29. The said mounting-and-retaining member 28 may be conveniently formed of spring-tempered steel or other suitable material and has its pivot-arm 27 extending through and supported in complementary coaxial transverse passages 30—30 respectively formed in the side walls of the lower receiver-member 15 on each of the respective opposite sides of the mechanism-receiving chamber 23 therein. The retaining-arm 29 of the resilient mounting-and-retaining member 28 extends forwardly from the pivot-arm 27 and has its forward end normally entered into an inwardly-opening retaining-groove 31 formed in the inner face of the head 32 of a mounting-and-retaining screw generally designated by the reference character 33.

The mounting-and-retaining screw 33 above referred to also includes a relatively-short cylindrically-contoured neck 34 centrally extending inwardly from the head 32 and arranged so that its inner face constitutes, in effect, an annular inwardly-facing stop-shoulder 35 normally seated against or located closely adjacent to the adjacent outer face of the lower receiver-member 15.

Projecting inwardly, in turn, from the neck 34 of the mounting-and-retaining screw 33 is a threaded shank 36 threadedly engaged with a threaded bore 37 formed in the left side wall of the lower receiver-member 15, as is particularly well shown in Fig. 4. The mounting-and-retaining screw 33 also includes a cylindrically-contoured pivot-pin 38 of sufficient length to extend completely across the mechanism-receiving chamber 23 in the receiver-member 15 and into a cylindrically-contoured bore 39 formed in the right side wall of the lower receiver-member 15 in axial alignment with the threaded bore 37 before referred to.

Upon the portion of the pivot-stem 38 of the mounting-and-retaining screw 33 spanning the mechanism-receiving chamber 23 is the forward portion of a sear 40. The said sear is formed at its upper rear corner with a cocking-nose 41 releasably engageable by the rear wall of a cocking-notch 42 formed in the under face of the breech-bolt 17. The said sear 40 is yieldingly urged to turn in a clockwise direction (as viewed in Fig. 2) by a helical sear-spring 43 thrusting at its upper end against the under face of the sear 40 and thrusting downwardly at its lower end against the lower receiver-member 15. At its lower rear portion and below its cocking-nose 41, the sear 40 is provided with a rearwardly-extending actuating-lip 44 with the upper face of which is engageable the forward portion of a pivotal sear-actuating lever 45. The said lever 45 is pivotally mounted about midway of its length upon the pivot-arm 46 of a resilient L-shaped mounting-and-retaining member generally designated by the reference character 47 and corresponding to the mounting-and-retaining member 28 before referred to. Like the member 28, the mounting-and-retaining member 47 is provided with a relatively-long retaining-arm 48 having its outer or free portion bent slightly outwardly beyond right-angled relationship with the pivot-arm 46 in a manner similar to the arrangement of the respective arms 27 and 29 of the companion member 28. The retaining-arm 48 extends forwardly along the left side wall of the lower receiver-member 15 and has its for-

ward portions normally fitting within an inwardly-opening retaining-groove 49 formed in the inner face of the head 32 of the mounting-and-retaining screw 33 before referred to. The retaining-groove 49 just referred to corresponds to the retaining-groove 31 before referred to but is located on the opposite side of the axis of the screw 13 therefrom. As will be seen by reference to Fig. 3 in particular, the pivot-arm 46 of the mounting-and-retaining member 47 is supported in cylindrically-contoured transverse passages 50—50 respectively formed in the left and right side walls of the mechanism-receiving chamber 23 in the lower receiver-member 15.

Interposed between the trigger 26 and the sear-actuating lever 45 is a helical spring 51 which exerts a constant but yielding effort of a relatively-light character to swing the trigger 26 in a counterclockwise direction (Fig. 2) and the sear-actuating member 45 in a clockwise direction.

Pivotally mounted in the upper rear portion of the trigger 26 is a sear-actuating dog 52 having an upwardly-facing actuating-abutment 53 which is adapted to engage with the under face of the rear portion of the sear-actuating lever 45. It is to be noted that the tension of the spring 51 is markedly less than the tension of the more rugged sear-spring 43 so that despite the constant effort of the said spring 51 to turn the sear-actuating lever 45 in a direction required to depress the rear end of the sear 40, that nevertheless such effort is effectively resisted by the sear-spring 43.

With the breech-bolt in its cocked position as shown in Fig. 2, the said breech-bolt may be released for firing the gun by pulling rearwardly upon the finger-piece 25 of the trigger 26, thus causing the said trigger to swing about the pivot-arm 27 to thereby lift the actuating-dog 52 and cause the same to rock the sear-actuating lever 45 in a clockwise direction about the pivot-arm 46 before referred to. The movement of the sear-actuating lever 45 as just described will cause the forward end thereof to rock the rear end of the sear 40 downwardly to thereby disengage the cocking-nose 41 of the said sear from the cocking-notch 42 of the breech-bolt 17.

The trigger 26, dog 52, lever 45, sear 40 and associated parts may be viewed as elements of the firing-mechanism of the firearm and should it be desired in the particular structure chosen for illustration to demount the trigger 26, lever 45 and sear 40, such may be accomplished by inwardly pressing the resilient retaining-arms 29 and 48 respectively of the mounting-and-retaining members 28 and 47 to a degree sufficient to permit them to be swung about their respective pivot-arms 27 and 46 into the positions in which they are indicated by broken lines in Fig. 1. When the said mounting-and-retaining members 26 are freed as just above described, they may be withdrawn laterally away from the firearm-structure completely free to thereby release the trigger 26 and sear-actuating lever 45 for complete removal from the firearm.

The release of the resilient mounting-and-retaining members 28 and 47 will in turn release the mounting-and-retaining-screw 33 for being unscrewed from the lower receiver-member 15 and completely separated therefrom to thereby free the sear 40 for withdrawal from the lower receiver-member.

It is to be noted that when the mounting-and-retaining-members 28 and 47 are in assembled relationship with respect to the mounting-

and-retaining screw 33, the said members are prevented from accidental displacement by their engagement with the said screw 33 and, conversely, the engagement of the said mounting-and-retaining members serve to hold the mounting-and-retaining screw 33 against turning movement with respect to the lower receiver-member 15.

In the particular instance shown in the accompanying drawings, it happens to be the trigger 26 and sear-actuating lever 45 which are pivotally mounted upon the mounting-and-retaining members 28 and 47 respectively, though other demountable features of a firearm may be held in place. Thus, while the mounting-and-retaining screw 33 serves as a pivot for the sear 40, the said screw or its equivalent may be employed for demountably supporting another removable element of a firearm-structure without departing from the inventive concept of the present invention.

It is to be noted that the lateral boundaries of the retaining-grooves 31 and 49 in the screw 33 act in effect as stop-abutments to keep the respective retaining-arms 29 and 48 from being accidentally swung about their respective pivot-arms 27 and 46.

From the foregoing, it will be seen that by employing a mounting-and-retaining screw such as 33 or its equivalent in conjunction with one or more resilient mounting-and-retaining members such as 28 or its equivalent, a mutual readily-releasable interlocking effect is achieved which permits the very rapid demounting of the firearm parts and their reassembly.

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 claims are intended to be embraced therein.

I claim:

1. A firearm including in combination: a frame having a first passage and a second passage therein spaced from each other and extending in substantial parallelism; a first element detachably related to the said frame and having a passage therein; a second element also detachably related to the said frame and having a passage therein; a mounting-and-retaining screw extending through the said first passage in the said frame and into the passage in the said first element, the said screw having threaded engagement with one of the said passages; and a resilient mounting-and-retaining member having two angularly-related arms one of which extends through the said second passage in the said frame and into the passage in the said second element and the other arm of the resilient mounting-and-retaining member extending into elastic releasable engagement with the said mounting-and-retaining screw to yieldingly hold the same against turning movement and to be itself held against displacement by engagement with the said screw.

2. A firearm including in combination: a frame having a first passage and a second passage therein spaced from each other and extending in substantial parallelism; a first element de-

tachably related to the said frame and having a passage therein; a second element also detachably related to the said frame and having a passage therein; a mounting-and-retaining screw extending through the said first passage in the said frame and into the passage in the said first element, the said screw having threaded engagement with one of the said passages and provided with a stop-abutment facing inwardly toward the axis of the screw; and a resilient mounting-and-retaining member having two angularly-related arms one of which extends through the said second passage in the said frame and into the passage in the said second element and the other arm of the resilient mounting-and-retaining member extending into elastic releasable engagement with the stop-abutment of the said mounting-and-retaining screw to yieldingly hold the same against turning movement and to be itself held against displacement by engagement with the said screw.

3. A firearm including in combination: a frame having a first passage and a second passage therein spaced from each other and extending in substantial parallelism; a first element detachably related to the said frame and having a passage therein; a second element also detachably related to the said frame and having a passage therein; a mounting-and-retaining screw extending through the said first passage in the said frame and into the passage in the said first element, the said screw having threaded engagement with one of the said passages and having a head provided on its inner face with a stop-abutment facing toward the axis of the screw; and a resilient mounting-and-retaining member having two angularly-related arms one of which extends through the said second passage in the said frame and into the passage in the said second element and the other of which arms extends into elastic releasable engagement with the stop-abutment on the inner face of the head of the said mounting-and-retaining screw to yieldingly hold the same against turning movement and to be itself held against displacement by engagement with the said screw.

4. A firearm including in combination: a frame having a first passage and a second passage therein spaced from each other and extending in substantial parallelism; a first element detachably related to the said frame and having a passage therein; a second element also detachably related to the said frame and having a passage therein; a mounting-and-retaining screw extending through the said first passage in the said frame and into the passage in the said first element, the said screw having threaded engagement with one of the said passages and having an overhanging head formed in its inner face with a tangential inwardly-opening groove; and a resilient mounting-and-retaining member having two angularly-related arms one of which extends through the said second passage in the said frame and into the passage in the said second element and the other of which arms extends beneath the head of the said mounting-and-retaining screw and into the tangential retaining-groove therein to yieldingly hold the said screw against turning movement and to be itself held against displacement by engagement with the head of the said screw.

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