June 1, 1943. R. E. CLARKSON 2,320,348

FIREARMS

Filed Jan. 31, 1940 2 Sheets-Sheet 1

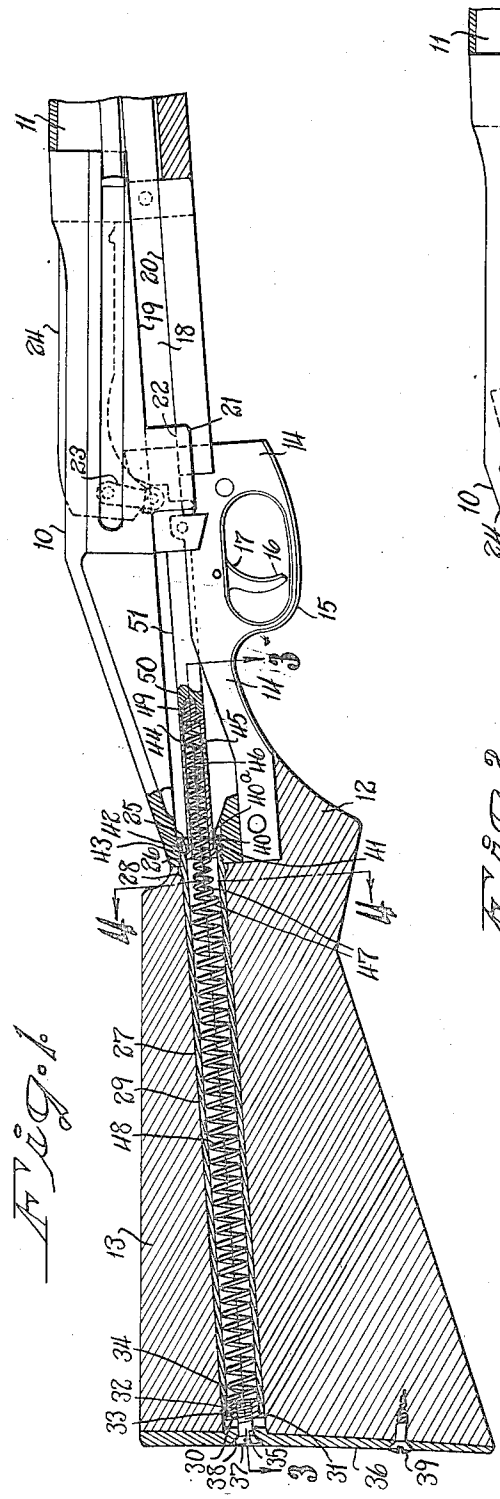

Fig. 1.

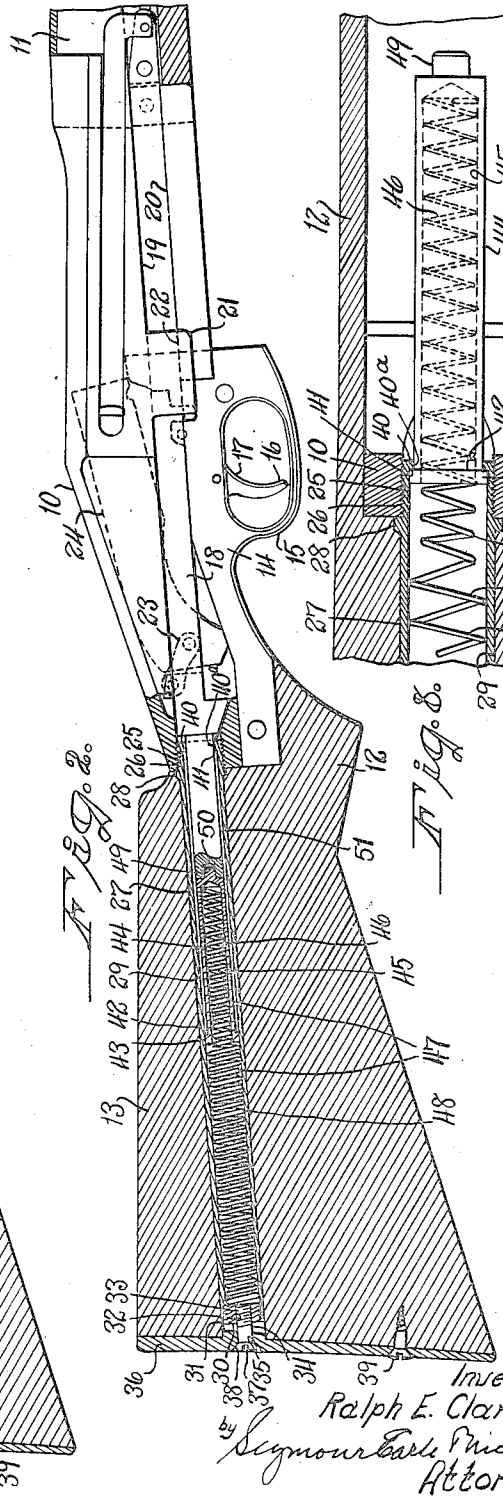

Fig. 2.

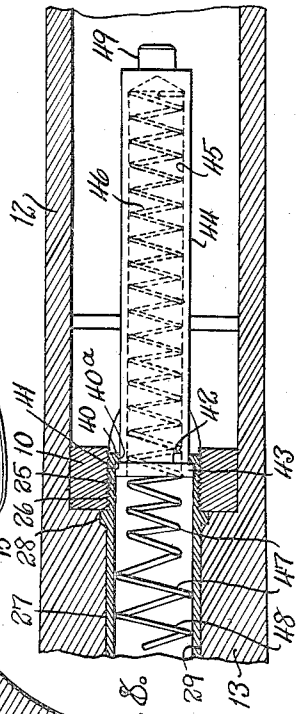

Fig. 3.

Inventor
Ralph E. Clarkson
by Seymour Earle Nicholls
Attorneys

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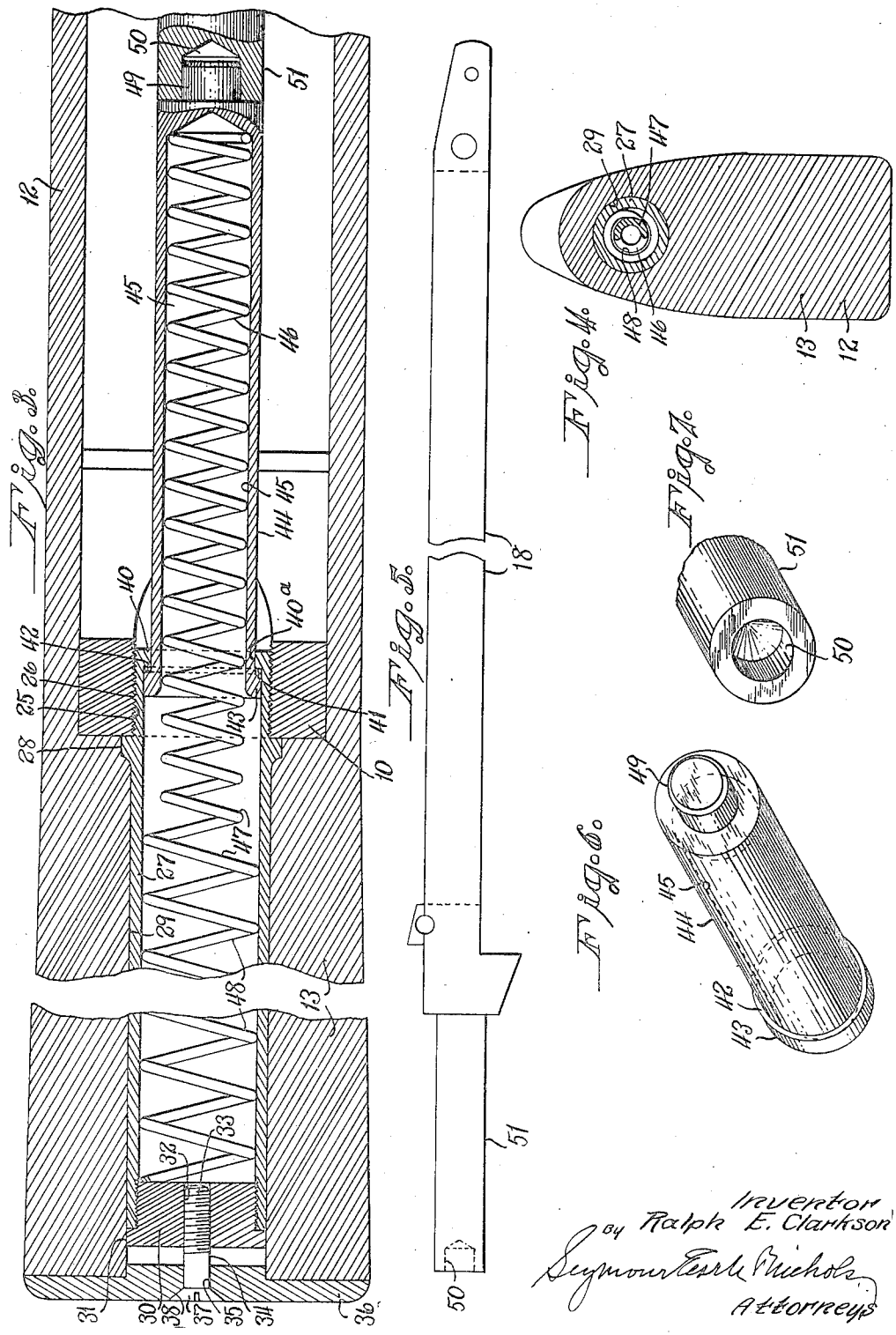

Inventor
By Ralph E. Clarkson
Seymour Esserly Nichols
Attorneys

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UNITED STATES PATENT OFFICE

2,320,348

FIREARM

Ralph E. Clarkson, Hamden, Conn., assignor to Western Cartridge Company, New Haven, Conn., a corporation of Delaware

Application January 31, 1940, Serial No. 316,501

4 Claims. (Cl. 42—3)

The present invention relates to improvements in firearms and more particularly relates to a construction and arrangement of parts whereby the breech-bolt and associated parts (commonly referred to as the firearm-action) are returned to their normal position after being operated by forces developed by the discharge of the firearm.

One of the objects of the present invention is to provide a firearm with a superior construction and arrangement of parts whereby the breech-bolt and associated parts are returned to their normal positions after having been operated by the discharge of the firearm preparatory to again discharging the firearm.

Another object of the present invention is to provide a superior firearm in which the breech-bolt-return spring and associated parts, acting to return the breech-bolt, etc., to their normal positions, may be of sufficient length to function substantially uniformly and which may be conveniently accommodated within the buttstock of the firearm without requiring undue lengthening of the buttstock or receiver.

A further object of the present invention is to provide an automatic firearm with a superior construction and arrangement of parts whereby the action-slide and breech-bolt may be removed from and replaced in the firearm-structure without undue interference by the breech-bolt-return spring and in which the said breech-bolt-return spring may remain organized with the firearm-structure upon the removal of the said action-slide and breech-bolt.

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 broken view partly in side elevation and partly in vertical central-longitudinal section of the rear portion of an automatic firearm constructed in accordance with the present invention;

Fig. 2 is a corresponding view but showing the breech-bolt and the action-slide, together with their associated parts in the positions which they assume immediately following the discharge of the firearm and the movement of the said breech-bolt into its rearwardly-retired position;

Fig. 3 is a broken horizontal sectional view taken on the line 3—3 of Fig. 1;

Fig. 4 is a transverse sectional view taken on the line 4—4 of Fig. 1;

Fig. 5 is a broken view in side elevation of the action-slide detached;

Fig. 6 is a perspective view of the action-slide follower detached;

Fig. 7 is a similar but broken view of the rear portion of the stem of the action-slide; and

Fig. 8 is a view corresponding to Fig. 3 but showing the breech-bolt-return spring and associated parts in the positions they assume when the action-slide is demounted or disassembled from the firearm-structure.

The particular automatic firearm herein chosen for the purpose of illustrating the present invention includes a receiver 10 having rigidly secured to its forward end, the rear end of a forwardly-extending barrel 11 having the usual axial bore through which the projectiles are forwardly propelled in the usual manner of firearms. Attached to the receiver 10 and the barrel 11 is a stock 12 preferably formed of wood or the like and which includes a buttstock portion 13.

Secured to the underside of the receiver 10 is a trigger-plate 14 provided with the usual loop-like trigger-guard 15, in which is located the finger-piece 16 of a trigger 17 by means of which the firearm may be discharged in any suitable manner, and forming a usual part of the fire-control mechanism of the firearm.

Extending obliquely with respect to the axis of the barrel 11 is a reciprocating action-slide 18 which is guided by a downwardly-facing guide-surface 19 formed on the receiver 10 and a parallel upwardly-facing guide-surface 20 formed on the trigger-plate 14. In addition to being guided by the guide-surfaces 19 and 20 just referred to, the action-slide 18 is retained against lateral outward displacement by a retaining-arm 21 extending downwardly from the side wall of the receiver 10 and having an upwardly-facing guide-ledge 22 formed on its inner face and coacting with the under edge of the said action-slide 18.

The action-slide 18 may be moved rearwardly in any suitable manner, such, for instance, as by a gas-operated piston as is shown in co-pending application Serial No. 313,650, filed January 13, 1940. The said action-slide has pivotally attached to it, adjacent its rear end, the lower end of a bolt-operating link 23 which has its upper end pivotally connected to the rear portion of a breech-bolt 24 mounted for tilting and longitudinal reciprocating movement within the receiver 10.

The rear end of the receiver 10 is provided with a threaded bore 25 arranged axially in line with the path of reciprocation of the action-slide 18. Threaded into the bore 25 in the receiver 10 is the threaded terminal 26 at the forward end of a tubular receiver-extension 27. Immediately to the rear of its threaded terminal 26 the receiver-extension 27 is provided on its outer periphery with an annular stop-flange 28 which is seated against the rear end of the receiver 10 to locate the said fitting with respect to the said receiver. The receiver-extension 27 is accommodated in a bore 29 longitudinally formed in the buttstock portion 13 of the stock 12 and which extends rearwardly therethrough opening through the rear face thereof.

The rear end of the tubular receiver-extension fitting 27 is internally threaded to threadedly receive the externally-threaded portion of a plug-member 30 provided with an annular stop-flange 31. The inner or forward face of the flange 31 of the plug-member 30 is seated against the rear edge of the receiver-extension 27 and serves to position or locate the said plug-member with respect to the receiver-extension 27. Axially formed in the plug-member 30 is a threaded bore 32 receiving the threaded terminal 33 of a stock-attaching screw 34 extending rearwardly from the plug-member 30 axially in alignment with the fitting 27.

The stock-attaching screw 34 passes through a passage 35 formed in a butt-plate 36 and is provided with a conically-contoured kerfed head 37 seated in a similarly-shaped recess 38 in the butt-plate 36 in axial alignment with the passage 35 therein. The butt-plate 36 is located against the rear face of the buttstock portion 13 of the stock 12 as is clearly shown in Figs. 1, 2 and 3. The stock-attaching screw 34 serves to hold the upper portion of the said butt-plate 36 in place and the lower portion of the said butt-plate is retained against the rear face of the buttstock portion 13 by means of a screw 39. The stock-attaching screw 34 also serves to securely and rigidly couple the buttstock portion 13 of the stock 12 to the receiver 10 through the intermediary of the tubular receiver-extension 27.

At its forward end the tubular receiver-extension 27 is formed with an inwardly-extending annular flange 40 providing a rearwardly-facing stop-shoulder 41 and an axial guide-passage 40*a*. The stop-shoulder 41 just referred to, is adapted upon occasion to be engaged by a forwardly-facing annular stop-shoulder 42 constituting the forward face of an annular bearing-flange 43 provided at the rear end of a cup-shaped reciprocating action-slide follower 44. The said follower has bearing in and extends forwardly through the guide-passage 40*a* of the receiver-extension 27 as is particularly well shown in Fig. 3.

The outer diameter of the bearing-flange 43 of the cup-shaped action-slide follower 44 is such as to engage the inner surface of the receiver-extension 27 with a free sliding fit. The said bearing-flange 43 is accommodated within the hollow interior of the tubular receiver-extension 27, as is clearly shown in the drawings. The action-slide follower 44 normally projects forwardly with a free sliding fit through the guide-passage 40*a* of the receiver-extension 27, as shown in Figs. 1 and 3. The said action-slide follower 44 is provided with an axially-extending and rearwardly-opening spring-receiving pocket 45 receiving the forward small-diametered portion 46 of a two-diametered helical breech-bolt-return spring generally designated by the reference character 47, and having a rear large-diametered portion 48.

The rear large-diametered portion 48 of the breech-bolt-return spring 47 is located in the hollow interior of the tubular receiver-extension 27 with its rear end seated against the forward face of the plug-member 30. The external diameter of the rear portion 48 of the helical breech-bolt-return spring 47 is such as to slide freely within the interior of the receiver-extension 27 and the forward portion 46 of the said spring is freely slidable within the spring-receiving pocket 45 in the cup-shaped action-slide follower 44 with its forward end seated against the end wall of the said pocket.

As thus constructed and arranged, the breech-bolt-return spring 47 is jointly housed within the tubular receiver-extension 27 and the cup-shaped action-slide follower 44 in such manner that the thrust of the said spring tends to urge the said follower forwardly with respect to the said receiver-extension. The forward movement of the action-slide follower 44 is normally limited by the action-slide 18 in the position in which the parts are shown in Fig. 3 in particular. If, however, the action-slide 18 is removed from the gun structure, the forward movement of the action-slide follower 44 will be limited by the engagement of its forwardly-facing stop-shoulder 42 with the rearwardly-facing stop-shoulder 41 of the receiver-extension 27. The engagement of the respective stop-shoulders as just referred to effectively checks the action-slide follower 44 from moving forwardly beyond a predetermined point or from being axially separated from the receiver-extension 27 under the forward urge of the breech-bolt-return spring 47.

For the purpose of supporting the forward end of the action-slide follower 44 against lateral deflection, the same is provided with a forwardly-extending tenon 49 normally extending into a rearwardly-opening axial socket 50 formed in the rear of a stem 51 formed integral with and projecting rearwardly from the action-slide 18 before referred to.

The external diameter of the stem 51 of the action-slide 18 is preferably the same as the external diameter of the action-slide follower 44 so as to slide freely into the interior of the tubular receiver-extension 27 through the axial guide-passage 40*a* thereof when the parts are moved into the positions in which they are shown in Fig. 2.

For convenience of description, the breech-bolt 24, together with its associated parts including the action-slide 18, may be considered as constituting the so-called "action" of the firearm herein chosen for illustrating the present invention, in accordance with well understood terminology in the firearm art.

When the action-slide 18 is moved rearwardly, following the discharge of the firearm, to correspondingly move the breech-bolt 24 to effect the extraction and ejection of the just-fired cartridge, the action-slide follower 44 will be bodily moved rearwardly into the interior of the tubular receiver-extension 27 to compress the breech-bolt-return spring 47. Under the conditions just described, the major portion of the stem 51 at the rear of the action-slide 18 will also be projected into the interior of the receiver-extension 27, at which time the parts will have completed their movements from the positions in which they are shown in Fig. 1 to the positions in which they are shown in Fig. 2.

After rearward force upon the action-slide **18** is relaxed, the breech-bolt-return spring **47** will assert itself to restore the parts to the positions in which they are shown in Fig. 1, and thereby insert a fresh cartridge into the firearm preparatory to the same being again discharged.

In the event that it should be desirable to remove the action-slide from the firearm-structure, the bolt-operating link **23** may be disconnected from the said action-slide **18** permitting the latter to be moved forwardly to clear the retaining-arm **21**, after which the said action-slide may be removed from the firearm-structure. When released, after the removal of the action-slide **18** as just referred to, the action-slide follower **44** will be unhindered in its forward movement by the said action-slide and hence will move forwardly until its forwardly-facing stop-shoulder **42** abuts against the rearwardly-facing stop-shoulder **41** of the receiver-extension **27**. The parts will now have assumed the positions in which they are indicated especially well in Fig. 8.

It will thus be apparent that by the construction and arrangement of the parts herein shown and described, the breech-bolt-return spring **47** is prevented from moving forwardly out of its position in the receiver-extension **27** and that upon the removal of the action-slide **18**, the said breech-bolt-return spring and its associated parts remain a corporate part of the receiver of the firearm. By preventing the separation of the breech-bolt-return spring and the action-slide follower from the receiver-extension **27**, the sudden unlimited longitudinal expansion of the said breech-bolt-return spring is prevented, thus eliminating the danger of too sudden separation of the parts and the hindrances offered by an unconfined spring during the removal and reinstallation of the action-slide, etc.

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-structure including in combination: an action-slide movable longitudinally of the firearm-structure; a receiver; a breech-bolt movable in the said receiver and operatively connected to the said action-slide; a stock attached to the said receiver and having a passage in its butt-portion; a tubular receiver-extension projecting rearwardly from the said receiver into the passage in the said stock, the said tubular receiver-extension having an open forward end attached to the said receiver and provided with a rearwardly-facing stop-abutment; a cup-shaped plunger slidably mounted in the said tubular receiver-extension having a spring-receiving pocket smaller in diameter than and rearwardly opening into the interior of the said receiver-extension, the said plunger also having a forwardly-facing stop-abutment engageable with the rearwardly-facing stop-abutment of the said tubular receiver-extension to limit the forward movement of the plunger, the said plunger being operatively associated with the said action-slide to urge the same forwardly; and a two-diametered helical breech-closing spring having a relatively-large-diametered rear portion located in the said tubular receiver-extension and having a relatively-small-diametered forward portion extending into the spring-receiving pocket of the said cup-shaped plunger.

2. A firearm-structure including in combination: an action-slide movable longitudinally of the firearm-structure; a receiver; a breech-bolt movable in the said receiver and operatively connected to the said action-slide; a stock attached to the said receiver and having a passage in its butt-portion; a tubular receiver-extension projecting rearwardly from the said receiver into the passage in the said stock, the said tubular receiver-extension having an open forward end attached to the said receiver and provided with a rearwardly-facing stop-abutment; a cup-shaped plunger slidably mounted in the said tubular receiver-extension having a spring-receiving pocket smaller in diameter than and rearwardly opening into the interior of the said receiver-extension, the said plunger also having a forwardly-facing stop-abutment engageable with the rearwardly-facing stop-abutment of the said tubular receiver-extension to limit the forward movement of the plunger, the said plunger being operatively associated with the said action-slide to urge the same forwardly; a two-diametered helical breech-closing spring having a relatively-large-diametered rear portion located in the said tubular receiver-extension and having a relatively-small-diametered forward portion extending into the spring-receiving pocket of the said cup-shaped plunger; and a telescopically-interfitting socket-and-tenon connection between the said cup-shaped plunger and the said action-slide to laterally stabilize each thereof with respect to the other and to permit their axial separation.

3. A firearm-structure including in combination: a receiver; a breech-bolt movable in the said receiver; a stock attached to the said receiver and having a passage in its butt-portion; a tubular receiver-extension projecting rearwardly from the said receiver into the passage in the said stock, the said tubular receiver-extension having an open forward end defined by a substantially-annular inwardly-projecting stop-flange; a cup-shaped plunger slidably mounted in the said tubular receiver-extension and rearwardly opening thereinto and having adjacent its open rear end an outwardly-projecting substantially-annular stop-flange engageable with the inwardly-projecting stop-flange of the said tubular extension to limit the forward movement of the plunger; a two-diametered helical breech-closing spring having a relatively-large-diametered rear portion located in the said tubular receiver-extension and having a relatively-small-diametered forward portion extending into the interior of the said cup-shaped plunger; and an action-slide operatively connected to the said breech-bolt for shifting the same and positioned to be engaged by the said cup-shaped plunger for being moved forwardly thereby.

4. A firearm-structure including in combination: a receiver; a breech-bolt movable in the said receiver; a stock attached to the said receiver and having a passage in its butt-portion; a tubular receiver-extension projecting rearwardly from the said receiver into the passage in the said stock, the said tubular receiver-extension having an open forward end defined by a substantially-annular inwardly-projecting stop-flange; a cup-shaped plunger slidably mounted in the said tubular receiver-extension

and rearwardly opening thereinto and having adjacent its open rear end an outwardly-projecting substantially-annular stop-flange engageable with the inwardly-projecting stop-flange of the said tubular extension to limit the forward movement of the plunger; a two-diametered helical breech-closing spring having a relatively-large-diametered rear portion located in the said tubular receiver-extension and having a relatively-small-diametered forward portion extending into the interior of the said cup-shaped plunger; an action-slide operatively connected to the said breech-bolt for shifting the same; and a telescopically-interfitting socket-and-tenon connection between the said cup-shaped plunger and the said action-slide.

RALPH E. CLARKSON.