June 10, 1952 D. M. WILLIAMS 2,600,176

UNITARY HAMMER-SPRING AND TRIGGER-SPRING FOR FIREARMS

Filed Dec. 13, 1949

Fig. 9.

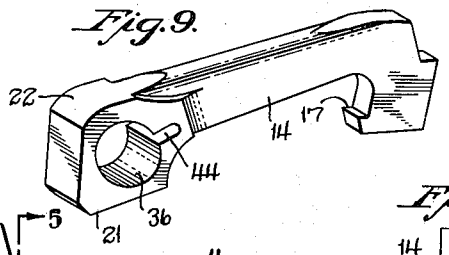


Fig. 1.

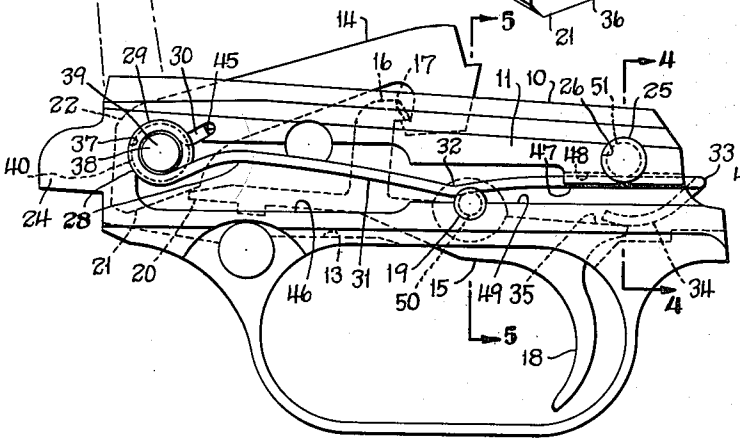


Fig. 2.

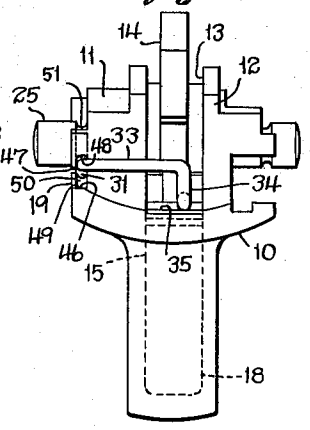


Fig. 3.

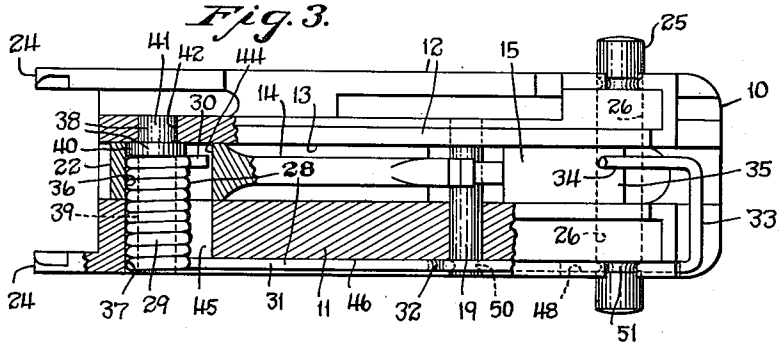


Fig. 8.

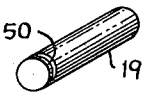


Fig. 4.

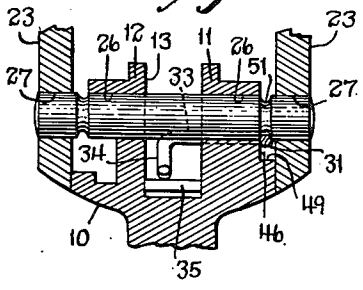


Fig. 5.

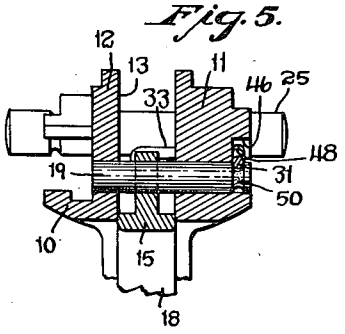


Fig. 7.

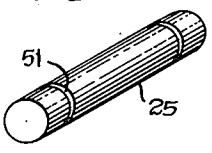
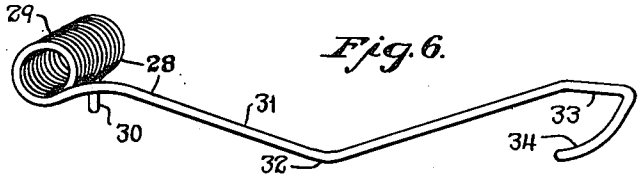


Fig. 6.



David M. Williams
Inventor

By Seymour Earle Nichols
Attorneys

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UNITARY HAMMER SPRING AND TRIGGER SPRING FOR FIREARMS

David M. Williams, New Haven, Conn., assignor to Olin Industries, Inc., New Haven, Conn., a corporation of Delaware

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7 Claims. (Cl. 42—69)

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The present invention relates in general to firearms and more especially to improved fire-control means of economical and simplified construction.

An object of the invention is to provide the fire-control means of a firearm with a single unitary element to serve both as a hammer-spring and as a trigger-spring.

A further object of the invention is to provide the fire-control means of a firearm with a unitary hammer-spring and trigger-spring for effecting low cost of manufacture and economy of space and smooth and uniform operation.

A further object of the invention is to provide the fire-control means of a firearm with a unitary hammer-spring and trigger-spring wherein the hammer-spring constitutes a helical spring which is used for pivotally mounting the hammer in the frame of the firearm while a reach of the helical spring serves as the trigger-spring.

A still further object of the invention is to provide the fire-control means of a firearm with a unitary resilient element of durable and dependable construction to serve as a hammer-spring, as a pivotal support for the hammer, as a trigger-spring, and as means for locking the trigger pivot-pin and the trigger-plate and frame-assembly pin in the trigger-plate of the firearm.

Other objects and advantages will appear to those skilled in the art from the following, considered in conjunction with the accompanying drawings.

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

Fig. 1 is a side elevation of the trigger-plate of a firearm embodying the improved unitary hammer-spring and trigger-spring of this invention, the hammer being shown by full lines in its cocked position and by broken lines in its firing position;

Fig. 2 is a rear end elevation of the trigger-plate shown in Fig. 1 with the hammer in its cocked position;

Fig. 3 is a plan elevation partly in section of the trigger-plate of Figs. 1 and 2 showing the hammer mounted on the unitary hammer-spring and trigger-spring of this invention;

Fig. 4 is an enlarged end elevation in section on line 4—4 of Fig. 1 showing the trigger-plate and frame-assembly pin of the trigger-plate locked therein by the reach of the unitary hammer-spring and trigger-spring;

Fig. 5 is an enlarged elevation in section on line 5—5 of Fig. 1 showing the pivot-pin of the trigger locked in the trigger-plate by the reach of the unitary hammer-spring and trigger-spring;

Fig. 6 is an enlarged perspective view of the unitary hammer-spring and trigger-spring of this invention;

Fig. 7 is an enlarged perspective view of the assembly-pin for assembling the trigger-plate in the frame of the firearm;

Fig. 8 is an enlarged perspective view of the trigger pivot-pin; and

Fig. 9 is an enlarged perspective view of the hammer of the fire-control means.

For the purpose of illustrating the present invention, the latter is embodied in a firearm of the type wherein the fire-control mechanism is assembled as a unit in a trigger-plate which constitutes a separable frame-member of the frame of the firearm and which is adapted to be detachably secured thereto by means of an assembly-pin in the manner hereinafter described. It will be understood, however, that the invention is applicable to firearms of the type wherein the fire-control mechanism is assembled directly in the frame of the firearm and that the illustrated embodiment of the invention is not a limitation thereof, the scope of which is defined by the appended claims.

General construction

Referring to the drawings, the trigger-plate on which the unitary hammer-spring and trigger-spring of this invention is assembled is indicated generally at 10 and comprises a substantially-rectangular body-portion having two longitudinal spaced-parallel substantially-vertical side walls 11 and 12 respectively, the left-hand side wall 11 (as seen in Fig. 2) being considerably thicker than the right-hand side wall 12. The longitudinal slot 13 which extends between the two side walls 11 and 12 is adapted to accommodate a hammer 14 and a trigger 15, the latter including a sear 16 which, in the normal forward position of the trigger, is adapted to engage the cocking-lip 17 of the hammer to hold it in its cocked position as shown in Fig. 1, and to disengage the cocking-lip 17 of the hammer when the trigger-finger 18 is pulled rearwardly to discharge the firearm. The sear 16 is located on the trigger 15 forwardly of the pivot-pin 19 of the trigger, the forward extremity 20 of the trigger being adapted to be held upwardly normally in position for cooperative engagement with a cam-lug 21 of the hammer-hub 22 by means of a trigger-spring

adapted to engage with the rear end of the trigger rearwardly of its pivot-pin 19 in the manner hereinafter described. The cam-lug 21 of the hammer-hub 22 is adapted, in a manner well known in the art, to engage and depress the forward extremity 20 of the trigger when the hammer is released by the sear thereby to positively hold the sear from moving up into engagement with the cocking-lip of the hammer until such time as the hammer is in its fully-retracted position.

The aforesaid trigger-plate 10 is assembled in the frame 23 (Fig. 4) of the firearm by engaging a pair of trigger-plate tongues 24, which extend forwardly from the front end of the trigger-plate, in corresponding recesses of the frame; and by inserting an assembly-pin 25 through axially-aligned apertures 26 and 27 in the rear ends of the trigger-plate and frame respectively.

Unitary hammer-spring and trigger-spring

The improved unitary hammer-spring and trigger-spring of this invention is indicated generally by the numeral 28, and embodies a hammer-spring which serves as means for pivotally mounting the hammer in the trigger-plate; and a trigger-spring for resiliently holding the trigger in its normal forward position. The hammer-spring per se comprises a helical spring 29 having at one end a relatively-short finger 30, and at its opposite end a relatively-long resilient reach 31. The latter is bent substantially intermediate its opposite ends to provide a knee 32, the free end of the resilient reach being bent back on itself to form a substantially U-shaped hook 33, the short leg 34 of which is bent downwardly with respect to the resilient reach so as to engage the rear end of the trigger as shown in Fig. 1. The short leg 34 of the resilient reach thus serves as a trigger-spring by engagement with the upper surface of the rear end-portion 35 of the trigger, the short leg or trigger-spring 34 being of concave curvature to provide a satisfactory bearing against the upper surface of the trigger.

The helical convolutions of the hammer-spring 29 are adapted to function as a bushing for pivotally mounting the hammer in the longitudinal slot 13 of the trigger-plate and to this end, the hammer-hub 22 is provided with a cylindrical aperture 36 extending transversely therethrough, the diameter of the cylindrical aperture 36 corresponding substantially to the maximum outside diameter of the helical hammer-spring 29, whereby the latter may be assembled therein. As shown especially well in Fig. 3, the over-all length of the hammer-spring 29 exceeds the width of the hammer-hub 22 by an amount corresponding substantially to the thickness of the left-hand side wall 11 of the trigger-plate. To mount the hammer and hammer-spring in the slot 13 of the trigger-plate, the side wall 11 of the trigger-plate is provided with a cylindrical aperture 37 extending transversely therethrough and corresponding in diameter to the maximum outside diameter of the hammer-spring 29, the outwardly-extending portion of the hammer-spring 29 being adapted to engage in the aperture 37 and to be supported by the circumferential walls thereof.

The opposite or inner end of the hammer-spring 29 engages in the aperture 36 of the hammer-hub and forms a supporting-bushing therefor, the inner end of the hammer-spring being normally freely mounted on a pin 38 having a substantially-cylindrical shank-portion 39 which extends through the hammer-spring. A stop-collar 40 is provided on the pin 38 adjacent one end thereof, but spaced inwardly therefrom a distance corresponding substantially to the thickness of the corresponding side wall 12 of the trigger-plate so as to form a pin-pilot 41. The latter is adapted to be mounted in an aperture 42 in the aforesaid side wall 12 of the trigger-plate to support the corresponding end of the pin therein, with its stop-collar 40 abutting the inner surface of the side wall 12 to prevent the pin from moving through the aperture 42 thereof, the aperture 42 being in axial alignment with the spring-supporting aperture 37 in the left-hand side wall 11 of the trigger-plate. As assembled thus in the trigger plate, the inner end of the hammer-spring 29 will abut against the stop-collar 40, the diameter of which is slightly less than the diameter of the aperture 36 in the hammer.

To function as a hammer-spring for actuating the hammer of the firearm, the reach 31 of the helical spring 29 is adapted to be anchored to the trigger-plate, the opposite end of the helical spring 29 being detachably secured to the hammer. To this end, the rear wall of the hub-aperture 36 is provided with a longitudinal groove 44 in which the finger 30 of the hammer-spring is adapted to engage, thereby to secure the helical hammer-spring against rotation in the aperture of the hub. As shown especially well in Fig. 3, access to the longitudinal groove in the aperture of the hammer-hub is provided by forming a similar groove 45 in the rear wall of the spring-supporting aperture 37 in the side wall 11 of the trigger-plate, the two grooves 44 and 45 being in axial alignment when the hammer is in its cocked position. In this connection, it will be apparent that when the hammer is cocked, the spring 29 is tensioned, with the result that the convolutions of the helical spring are contracted such that the outside and inside dimensions of the helical spring are slightly less than the corresponding dimensions when the hammer is in its normal firing position, at which time the aforesaid dimensions are substantially maximum.

As pointed out above, when the helical spring is in its normal firing position, its inner end is supported freely on the pin 38. However, when the hammer is cocked, the resulting decrease in the inside diameter of the helical spring is such that the latter makes a close fit around the pin so as to insure engagement of the hammer-lip with the sear.

In order to anchor the resilient reach 31 of the hammer-spring to the trigger-plate and, in particular, substantially flush with the outer face of the left-hand side wall 11 thereof, the aforesaid face is provided with a clearance-recess 46 which extends from the forward wall of the hammer-spring supporting-aperture 37 in the side wall 11 of the trigger-plate rearwardly to intersect the rear end of the side wall, the upper edge or shoulder 47 of the clearance-recess adjacent the rear end of the side wall 11 being undercut as at 48, as indicated especially well in Fig. 5, to accommodate the corresponding end of the resilient reach 31, thereby to prevent the rear end thereof from springing outwardly of the clearance-recess. The bottom edge or shoulder 49 of the clearance-recess adjacent the pivot-pin 19 of the trigger is substantially coincident with the axis of the pivot-pin, as a consequence of which the upper half of the corresponding end of the trigger

pivot-pin 19 is exposed, this exposed portion of the pivot-pin being immediately rearward of the knee 32 of the resilient reach. As shown especially well in Figs. 5 and 8, this exposed end of the pivot-pin 19 is provided with an annular groove 50, the depth of which corresponds substantially to one-half the diameter of the resilient reach 31. The latter, and in particular the portion thereof immediately rearwardly of its knee 32, is adapted thus to snap into an adjacent portion of the groove 50, and by engagement with the transverse walls thereof to lock the pivot-pin 19 in its assembled position in the trigger-plate. In a similar manner, the trigger-plate assembly-pin 25 is provided with an annular groove 51 in the end thereof which projects from the left-hand side wall 11 of the trigger-plate. As illustrated especially well in Fig. 4, the grooved end of the assembly-pin intersects the undercut-portion 48 of the upper shoulder 47 of the trigger-plate, whereby the corresponding portion of the resilient reach 31 is adapted to snap into the groove 51 of the assembly-pin 25 to lock the latter to the trigger-plate.

As assembled thus in the clearance-recess 46 of the trigger-plate, the U-shaped hook-portion 33 of the resilient reach 31 encircles the rear end of the left-hand side wall 11 of the trigger-plate so as to enter the trigger-spring 34 into the rear end of the slot 13 of the trigger-plate for engagement with the rear end 35 of the trigger.

From the foregoing description and drawings, it will be clear that, as assembled in the trigger-plate of the firearm, the unitary hammer-spring and trigger-spring constitutes a hammer-spring for actuation of the hammer and serves also as a bushing for pivotally mounting the hammer in the trigger-plate. Moreover, the resilient reach of the hammer-spring serves as a trigger-spring to resiliently hold the trigger in its normal inoperative position, and also as means for locking the trigger pivot-pin and the trigger-plate assembly-pin in position in the trigger-plate. The unitary hammer-spring and trigger-spring is thus a single element which is of durable and economical construction, which occupies a minimum of space in the trigger-plate, and which performs a multiplicity of functions essential to the operation of the fire-control mechanism.

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 unitary hammer-spring and trigger-spring for a firearm embodying a frame-member, a hammer having an apertured hub, a sear, and a trigger having an operative connection with said sear for holding said sear in cocking engagement with said hammer, said unitary hammer-spring and trigger-spring comprising: a helical spring constructed and arranged to be supported in said frame-member and to engage in the apertured hub of said hammer to pivotally mount said hammer in said frame-member; means to secure one end of said helical spring to the apertured hub of said hammer; and a resilient reach at the opposite end of said helical spring, said resilient reach being constructed and arranged to engage and resiliently hold said trigger in a position to hold said sear in cocking engagement with said hammer.

2. A unitary hammer-spring and trigger-spring for a firearm embodying a frame-member, a hammer having an apertured hub, a sear, and a trigger having an operative connection with said sear for holding said sear in cocking engagement with said hammer, said unitary hammer-spring and trigger-spring comprising: a helical spring constructed and arranged to be supported in said frame-member and to engage in the apertured hub of said hammer to pivotally mount said hammer in said frame-member; means to secure one end of said helical spring to the apertured hub of said hammer; a resilient reach at the opposite end of said helical spring; and stop-means on said frame-member arranged to engage and hold the resilient reach of said helical spring in engageemnt with said trigger thereby to resiliently hold said trigger in a position to hold said sear in cocking engagement with said hammer.

3. A unitary hammer-spring and trigger-spring for a firearm embodying a frame-member, a hammer having an apertured hub, a sear, and a trigger having an operative connection with said sear for holding said sear in cocking engagement with said hammer, said unitary hammer-spring and trigger-spring comprising: a helical spring constructed and arranged to be supported in said frame-member and to engage in the apertured hub of said hammer to pivotally mount said hammer in said frame-member; means to secure one end of said helical spring to the apertured hub of said hammer; a resilient reach at the opposite end of said helical spring, said resilient reach having a trigger-engaging finger; and stop-means on said frame-member arranged to engage the resilient reach of said helical spring to hold the trigger-engaging finger thereof in enagement with said trigger thereby to resiliently hold said trigger in a position to hold said sear in cocking engagement with said hammer.

4. A unitary hammer-spring and trigger-spring for a firearm embodying a frame-member, a hammer having an apertured hub, a sear, and a trigger having an operative connection with said sear for holding said sear in cocking engagement with said hammer, said unitary hammer-spring and trigger-spring comprising: a helical spring constructed and arranged to engage in the apertured hub of said hammer; means to support said helical spring in said frame-member; means to secure one end of said helical spring to the apertured hub of said hammer; a resilient reach at the opposite end of said helical spring, said resilient reach having a trigger-engaging finger; and stop-means on said frame-member arranged to engage said resilient reach to hold the trigger-engaging finger thereof in engagement with said trigger to resiliently hold said sear in position for cocking engagement with said hammer.

5. A unitary hammer-spring and trigger-spring for a firearm embodying a frame-member, a hammer having an apertured hub, a sear, a trigger, a pivot-pin having a transverse abutment and arranged to pivotally mount said trigger in said frame-member, said trigger having an operative connection with said sear for holding said sear in cocking engagement with said hammer said unitary hammer-spring and trigger-spring comprising: a helical spring constructed and arranged to be supported in said frame-member and to engage in the apertured hub of said hammer to pivotally mount said ham-

mer in said frame-member; means to detachably connect one end of said helical spring to the apertured hub of said hammer; a resilient reach at the opposite end of said helical spring, said resilient reach being provided at its free end with a trigger-engaging finger; and stop-means on said frame-member arranged to engage the resilient reach of said helical spring to hold a portion of said reach intermediate its opposite ends in engagement with the transverse abutment of said pivot-pin to lock said pivot-pin in said frame-member and to hold the trigger-engaging finger of said reach in engagement with said trigger thereby to resiliently hold said trigger in a position to hold said sear in cocking engagement with said hammer.

6. A unitary hammer-spring and trigger-spring for a firearm embodying a frame, a trigger-plate, an assembly-pin provided with a transverse abutment and adapted to secure said trigger-plate in said frame, a hammer having an apertured hub, a sear, and a trigger having an operative connection with said sear for holding said sear in cocking engagement with said hammer said unitary hammer-spring and trigger-spring comprising: a helical spring arranged to be supported in the said trigger-plate and to engage in the apertured hub of said hammer to pivotally mount said hammer in said trigger-plate; means to detachably connect one end of said helical spring to the apertured hub of said hammer; a resilient reach at the opposite end of said helical spring, said resilient reach being provided with a trigger-engaging finger at its free end; and stop-means on said trigger-plate arranged to engage the resilient reach of said helical spring to hold the portion of said reach adjacent said assembly-pin in cooperative engagement with the transverse abutment thereof to lock said assembly-pin in said trigger-plate, and to hold the trigger-engaging finger of said reach in engagement with said trigger so as to resiliently hold said trigger in a position to hold said sear in cocking engagement with said hammer.

7. A unitary hammer-spring and trigger-spring for a firearm embodying a frame, a trigger-plate having a transverse aperture, an assembly-pin having an annular groove and adapted to secure said trigger-plate in said frame, a hammer having an apertured hub provided with a transverse groove, a sear, a trigger, a pivot-pin having an annular groove and arranged to pivotally mount said trigger in said trigger-plate, said trigger having an operative connection with said sear for holding said hammer in cocked position, said unitary hammer-spring and trigger-spring comprising: a helical spring arranged to be engaged in the transverse aperture of said trigger-plate and in the apertured hub of said hammer to pivotally mount the hammer in said trigger-plate; a finger extending from one end of said helical spring and arranged to engage in the transverse groove of said apertured hub to secure said spring thereto; a resilient reach extending from the opposite end of said helical spring, said resilient reach being provided with a trigger-engaging finger at its free end; and a shoulder on said trigger-plate arranged to engage the resilient reach of said helical spring to hold said reach in the annular grooves of said assembly-pin and said pivot-pin respectively to lock said assembly-pin and said pivot-pin in said trigger-plate, and to hold the trigger-engaging finger of said reach in engagement with said trigger so as to resiliently hold said trigger in a position to hold said sear in cocking engagement with said hammer.

DAVID M. WILLIAMS.

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