Nov. 23, 1943. C. G. SWEBILIUS 2,334,798

BOLT-ACTION FIREARM

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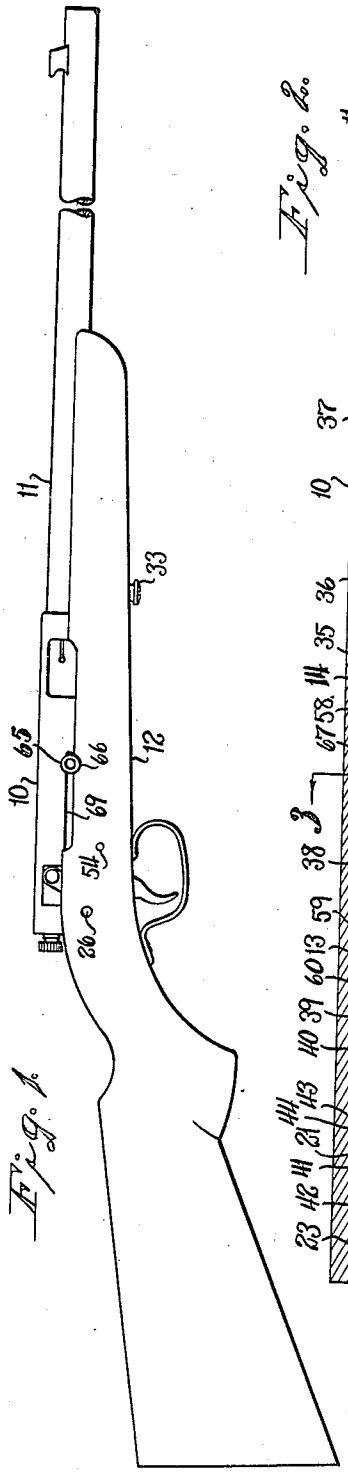


Fig. 1.

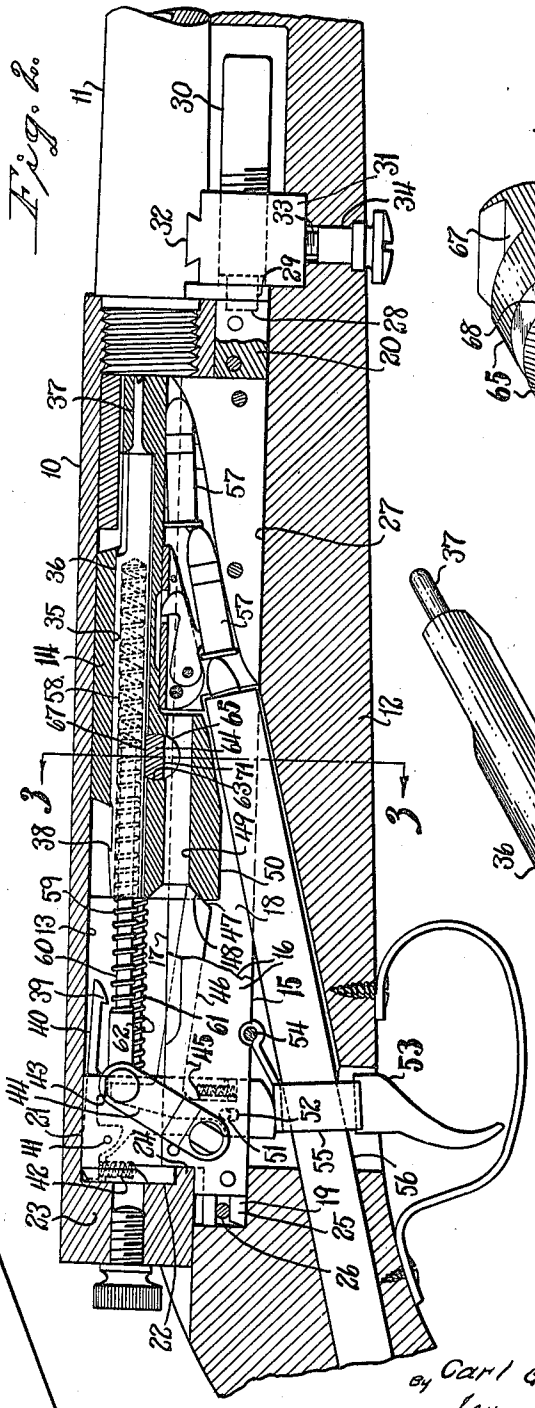


Fig. 2.

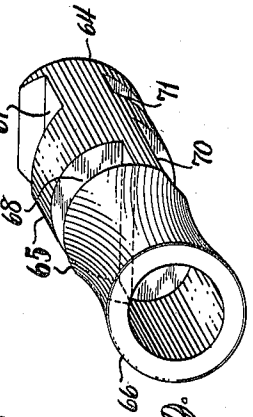


Fig. 9.

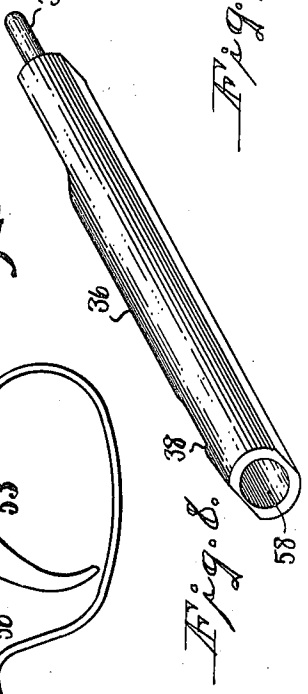


Fig. 8.

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BOLT-ACTION FIREARM

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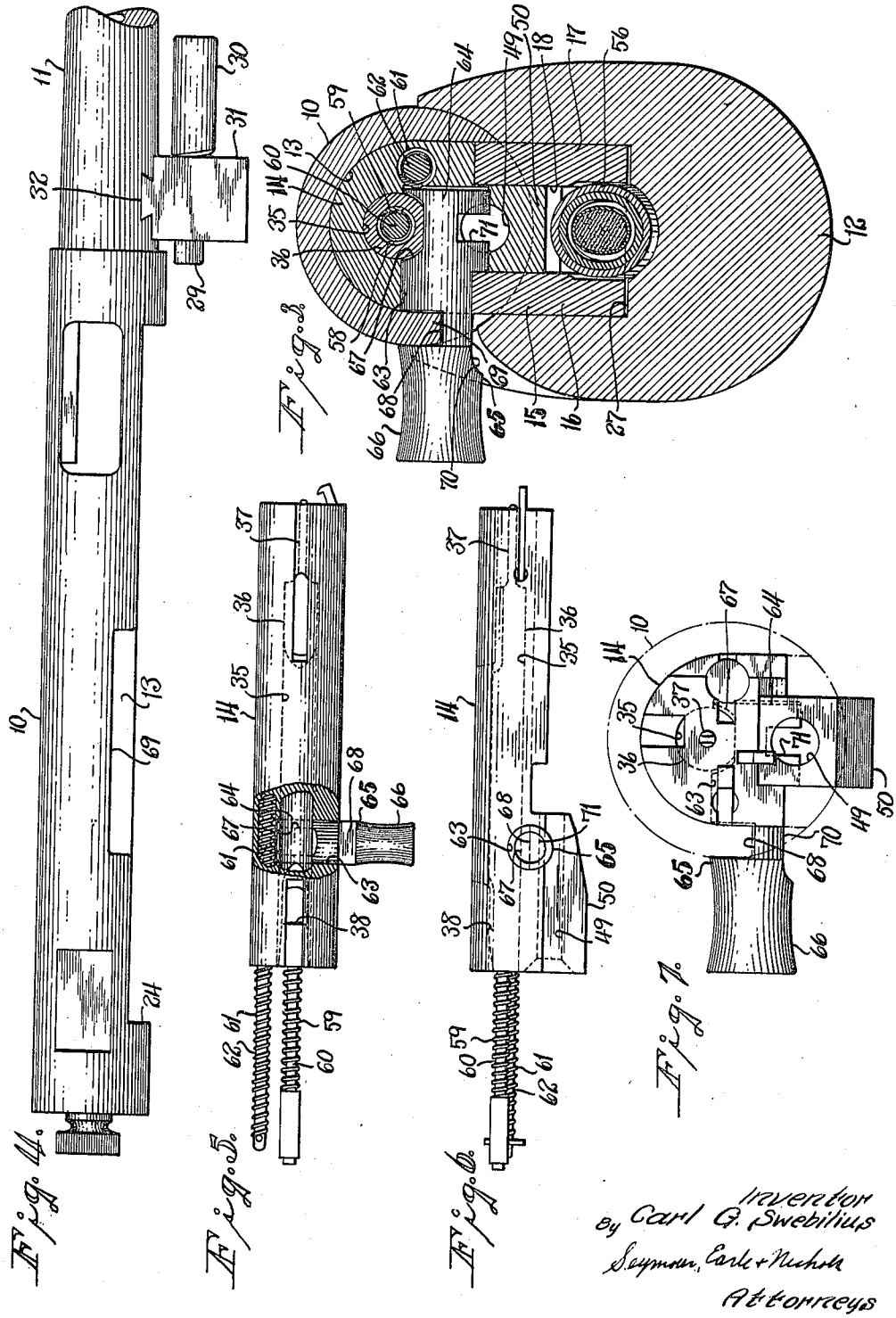


Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

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Patented Nov. 23, 1943 2,334,798

UNITED STATES PATENT OFFICE

2,334,798

BOLT-ACTION FIREARM

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Application June 21, 1939, Serial No. 280,221

3 Claims. (Cl. 42—17)

The present invention relates to improvements in bolt-action firearms, and relates more particularly to a construction and arrangement of parts for the retention in place of a bolt-operating handle or its equivalent.

One of the objects of the present invention is to provide a superior bolt-action firearm-construction wherein a bolt-operating handle is retained in operative association with the firearm-structure by simple, reliable and effective means.

Another object of the present invention is to provide a superior bolt-action firearm-construction wherein a removable breech-bolt is employed and wherein the bolt-operating handle is retained in place against dislodgement when the breech-bolt is removed from the receiver of the firearm, by means of a firing-member normally associated with the said breech-bolt.

A further object of the present invention is to provide a superior bolt-action firearm-construction wherein a breech-bolt is provided with a laterally-projecting operating-handle which is so associated in cooperative relationship with the receiver as to avoid cramping action or undue friction.

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 in side elevation of a bolt-action firearm embodying the present invention;

Fig. 2 is a broken view in vertical central-longitudinal section with the barrel, magazine and some of the associated parts shown in side elevation, and with the breech-bolt in its closed position;

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

Fig. 4 is a view in side elevation of the unit comprising the receiver and the barrel;

Fig. 5 is a top or plan view of the breech-bolt unit shown partly in horizontal section;

Fig. 6 is a view thereof in side elevation;

Fig. 7 is a front-end view thereof;

Fig. 8 is a perspective view of the firing-pin, detached; and

Fig. 9 is a perspective view of the bolt-operating handle, detached.

The particular bolt-action firearm herein chosen for the illustration of the present invention, is of the automatic type wherein a just-fired cartridge is automatically extracted and a fresh cartridge automatically inserted into the cartridge-chamber of the firearm. The said firearm includes three major components, namely, a receiver 10, a barrel 11 and a stock 12.

The receiver 10 is cylindrically contoured exteriorly and has its forward end interiorly threaded for the threaded connection of the exteriorly threaded rear portion of the barrel 11, as is shown in Fig. 2 of the drawings. Extending substantially throughout its length, the receiver 10 is formed with a downwardly-opening bolt-receiving chamber 13 having its upper half cylindrically contoured to conform to the similarly contoured upper half of a reciprocating breech-bolt generally designated by the reference character 14. The said breech-bolt 14 is retained in place in the bolt-receiving chamber 13 in the receiver 10 against downward displacement therefrom, by a bar-like mounting-member generally designated by the reference character 15. The said mounting-member projects slightly upwardly into the lower portion of the bolt-receiving chamber 13 in the said receiver 10, as will be particularly well observable by reference to Fig. 3.

The bar-like mounting-member 15 above referred to, includes two substantially-corresponding parallel side-plates 16 and 17 which are laterally spaced from each other to provide a central longitudinal and vertical channel 18, by a rear spacing-block 19 and a front spacing-block 20, as is shown in Fig. 2.

The upper portion of the rear spacing-block 19 projects above the upper surface of the side-plates 16 and 17 of the mounting-member 15, to form a head 21 which conforms in cross-sectional form to the transverse form of the bolt-receiving chamber 13 in the receiver 10. The head 21 of the rear spacing-block 19 is formed with a rearwardly-projecting coupling-extension 22 (Fig. 2) which abuts against the forward face of the rear wall 23 of the receiver 10 and overhangs a forwardly-extending coupling-lip 24 projecting forwardly from the lower portion of the said rear wall 23. As thus arranged, the said coupling-extension 22 and the coupling-lip 24 serve to normally prevent the downward movement of the rear portion of the mounting-member 15 with respect to the bolt-receiving chamber 13 in the receiver 10.

Projecting rearwardly from the rear spacing-

block 19 of the mounting-member 15 at the lower end thereof, is a coupling-lip 25 which is adapted to extend under a coupling-pin 26 extending transversely across the rear portion of a longitudinally-extending upwardly-opening recess 27 formed in the stock 12 before referred to. The said coupling-pin 26 thus forms a permanent feature of the stock 12.

To couple the forward portion of the bar-like mounting-member 15 to the assembly comprising the receiver 10 and the barrel 11, the front spacing-block 20 is formed with a forwardly-opening recess or coupling-socket 28 (Fig. 2) which is adapted to receive the cylindrically-contoured rear end 29 of a coupling-screw 30. The said coupling-screw 30 is threadedly mounted in a block-like stock-attaching lug 31 depending from the rear portion of the barrel 11 and fixedly attached thereto by means of a dovetail connection 32. The said stock-attaching lug 31 has threaded into it the threaded upper end of a stock-attaching screw 33 which extends upwardly from the under face of the stock 12 through an escutcheon 34 mounted in the said stock 12, and serves to secure the forward portion of the said stock to the barrel 11 and hence to the receiver 10 and its associated parts.

The breech-bolt 14 is provided with a longitudinal passage 35 in which reciprocates a firing-plunger or member 36 formed at its forward end with a firing-point 37 adapted to impinge against and fire a cartridge in the cartridge-chamber of the barrel 11 in the usual manner of firearms. In its upper rear portion the firing-plunger 36 is formed with a forwardly-facing cocking-abutment 38 which is releasably engaged by a sear-nose 39 located at the forward end of a sear 40. The said sear is mounted for pivotal movement upon a transverse pin 41 mounted in the head 21 of the rear spacing-block 19. The rearwardly-projecting portion of the sear 40 is pressed upwardly by a helical sear-spring 42 as shown in Fig. 2.

Intermediate the sear-nose 39 and the pin 41, the sear 40 is formed with a downwardly-facing actuating-abutment 43 which is adapted to be engaged by the upper end of the body-portion 44 of a transmitting-member generally designated by the reference character 45. The said transmitting-member 45 also includes a forwardly-extending finger 46 having its forward end beveled to provide a forwardly- and upwardly-sloping cam-surface 47 which is engageable by a similarly-sloping disconnecting-cam 48 formed at the rear end of a clearance-passage 49 formed in a lug 50 depending from the rear end of the breech-bolt 14.

The transmitting-member 45 is mounted with capacity for both vertical reciprocating movement and rocking movement in the rear spacing-block 19 by means of a pin 51 mounted in the said spacing-block and extending through a vertical-slot 52 in the lower portion of the body-portion 44 of the said transmitting-member as is shown in Fig. 2. The under edge of the body-portion 44 of the transmitting-member 45 is adapted to be engaged and lifted by the upper end of a trigger generally designated by the reference character 53 and mounted for pivotal movement upon a transverse pin 54 mounted in the stock 12. The said trigger is formed with a tubular-portion 55 through which a magazine-tube 56 extends at an upwardly- and forwardly-sloping angle to feed cartridges such as 57 into position to be inserted one at a time into the usual cartridge-chamber of the barrel 11, in a manner not requiring detailed description herein.

Returning now to the breech-bolt 14 and the firing-plunger 36 which it carries, it will be noted by reference to Figs. 2 and 8 in particular that the said firing-pin is formed with an axial rearwardly-opening bore 58 which is adapted to receive the forward portion of a helical firing-spring 59 which latter thrusts forwardly at its forward end against the end wall of the bore 58 in the said firing-plunger. At its rear end the firing-spring 59 encircles a spring-guide plunger 60 which, in turn, is seated against the forward face of the head 21 of the rear spacing-block 19, and which is adapted to be telescopically received in the bore 58 in the firing-plunger 36.

For the purpose of yieldingly urging the breech-bolt 14 into its breech-closing position, a helical breech-closing spring 61 is employed which, as is shown in Fig. 5, encircles a spring-guide plunger 62 adapted also to press at its rear end against the forward face of the head 21 of the rear spacing-block 19.

Adjacent its rear end the breech-bolt 14 is provided with a transverse cylindrically-contoured handle-receiving pocket 63 which, in the instance shown, intersects the right face of the said breech-bolt but does not extend through the left face. The axial center line of the pocket 63, just referred to, is located vertically intermediate the longitudinal passage 35 and the longitudinal clearance-passage 49 in the breech-bolt 14 so that the said pocket breaks through and intersects both thereof.

Extending into the handle-receiving pocket 63 in the breech-bolt 14 is the shank 64 of a bolt-operating handle generally designated by the reference character 65 and having a spool-like outwardly-extending finger-piece 66. The shank 64 of the bolt-operating handle 65 is, generally speaking, cylindrically contoured but is provided with several cuts or notches, including an upwardly-opening firing-plunger-receiving notch 67 in the upper portion of the shank 64 adjacent the inner end thereof. Also formed in the shank 64 of the bolt-operating handle 65 closely adjacent the finger-piece 66, is an upwardly-opening retaining-notch or groove 68 which receives the lower portion 69 of the side wall of the receiver 10 for the purpose as will hereinafter appear. Formed mainly in the outer end of the under portion of the shank 64 and partly in the finger-piece 66 thereof, is a retaining-notch 70 receiving the upper edge of the side-plate 16 of the mounting-member 15, as is shown in Fig. 3. Formed in the under portion of the shank 64 centrally in line with and parallel with the notch 67 is a clearance-notch 71 which intersects the clearance-passage 49 in the breech-bolt 14 and provides for the clearance of the finger 46 of the transmitting-member 45 in a manner as will hereinafter appear.

For the purpose of making clear the operation of the automatic bolt-action firearm herein chosen for the illustration of the present invention, let it be assumed that the breech-bolt 14 is in its breech-closing position and that no cartridge is, at the moment, in the firing-chamber of the gun.

The user of the firearm may now, by grasping the finger-piece 66 of the bolt-operating handle 65, draw rearwardly upon the breech-bolt 14 against the tension afforded by the breech-closing spring 61. During this movement of the

breech-bolt, as well as when the breech-bolt is in its breech-closing position, the bolt-operating handle 65 will be retained in place against axial displacement by the portions of the firearm structure which extend into the retaining-notches 68 and 70 of the said handle.

The initial rearward movement of the breech-bolt 14 will cause the disconnecting-cam 48 thereof to so engage the cam-surface 47 on the forward end of the finger 46 of the transmitting-member 45 as to rock the said transmitting-member in a counterclockwise direction about the pin 51. By this action, the upper end of the body-portion 44 of the transmitting-member 45 will be swung rearwardly clear of the actuating-abutment 43 of the sear 40 so that in the event that the trigger 53 is actuated, the sear 40 will not itself be actuated but the said transmitting-member 45 will be merely idly and ineffectively lifted.

As the breech-bolt 14 continues its rearward travel after having rocked the transmitting-member 45 as above described, the finger 46 of the said transmitting-member will ride idly through the clearance-passage 49 in the breech-bolt 14 and through the clearance-notch 71 in the bolt-operating handle 65.

As the breech-bolt 14 approaches the limit of its rearward movement, the cocking-abutment 38 of the firing-plunger 36 will be moved to the rear of the sear-nose 39 so that the latter may snap down in front thereof.

Also as the breech-bolt 14 approaches the limit of its rearward travel, the foremost one of the cartridges 57 will move up in front of the forward face of the said breech-bolt in position to be loaded into the firing-chamber of the firearm when the breech-bolt is closed by the breech-closing spring 61. Relaxation of the rearward draft upon the finger-piece 66 of the bolt-operating handle 65 will permit the breech-closing spring 61 to move the breech-bolt into its breech-closing position to insert a cartridge into the firing-chamber of the firearm and to leave the firing-plunger 36 held in its rearmost or cocked position by the sear 40.

As the breech-bolt 14 reaches substantially its breech-closing position the disconnecting-cam 48 thereof will move into position to permit the transmitting-member 45 to rock in a clockwise direction and thereby again position the upper end of the body-portion 44 of the said transmitting-member into position to engage with the actuating-abutment 43 of the sear 40 when the trigger 53 is pulled. The firearm is now in position for firing which may be accomplished by pulling the trigger 53.

Since the firearm shown is of the automatic type the pulling of the trigger 53 and the consequent release of the firing-plunger 36 will discharge the firearm and the recoil developed by the just-fired cartridge will kick back, so to speak, the breech-bolt 14 and the parts carried thereby and thus automatically effect the same series of operations as was described in connection with the manual retraction of the said breech-bolt.

It will be seen from the foregoing, that the interfitting of portions of the firearm-structure with the retaining notches 68 and 70 of the bolt-operating handle 65 will serve to hold the latter in place against axial displacement while the breech-bolt is in place in the receiver 10.

Should it be desired for any reason to remove the breech-bolt 14 and the parts carried thereby from the receiver 10, it is first necessary to remove the mounting-member 15 from its association with the said receiver. This removal of the mounting-member may be effected by first backing-off the coupling-screw 30 so as to retire its rear-end 29 out of the coupling-pocket 28 in the front spacing-block 20. When this has been done the forward end of the said mounting-member may be swung downwardly about the coupling-lip 24 as a fulcrum and ultimately moved downwardly and forwardly to completely disengage the coupling-extension 22 of the rear spacing-block 19 from the coupling-lip 24 of the receiver 10.

When the breech-bolt 14 has been removed from the receiver 10 by first removing the mounting-member 15 as above described, the bolt-operating handle 65 will no longer be retained against axial displacement by the interfitting of portions of the gun structure with its retaining-notches 68 and 70. However, when the breech-bolt is free of the receiver 10 and associated parts, as is shown in Figs. 5 to 7 inclusive, the bolt-operating handle 65 will be retained against axial displacement by the extension of the lower portion of the firing-plunger 36 through the firing-pin-receiving notch 67 in the upper face of the shank 64 of the said handle 65. Should it be desired to remove the handle 65 from the breech-bolt 14 it is only necessary now to withdraw the firing-plunger 36 rearwardly from the said breech-bolt whereupon the said bolt-operating handle will be freed for withdrawal from the handle-receiving pocket 63 in the said breech-bolt.

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 bolt-action firearm including in combination: a receiver-unit comprising a tubular receiver having a bolt-receiving chamber therein and also having a handle-retaining portion, and a bar-like mounting-member removably coupled to the said tubular receiver; a breech-bolt reciprocatable in the bolt-receiving chamber of the tubular receiver of the said receiver-unit and provided with a longitudinal plunger-receiving passage and with a transverse handle-receiving pocket intersecting the said plunger-receiving passage and opening through the side wall of the breech-bolt; a firing-plunger movable in the plunger-receiving passage in the said breech-bolt; and a bolt-operating handle removably installed in the handle-receiving pocket in the said breech-bolt and having a clearance-cut therein in line with the plunger-receiving passage in the said breech-bolt to permit the free movement of the said firing-plunger, the said bolt-operating handle also having two outwardly-facing abutments respectively positioned to engage the handle-retaining portion of the tubular receiver of the said receiver-unit and a portion of the bar-like mounting-member.

2. A bolt-action firearm including in combination: a breech-bolt provided with a longitudinal plunger-receiving passage and with a transverse handle-receiving pocket intersecting the said plunger-receiving passage and opening through the side-wall of the breech-bolt; a receiver-unit comprising a tubular receiver having a longitudinal bolt-receiving chamber accommodating the

said breech-bolt and having a substantially-vertical passage leading downwardly from its said bolt-receiving chamber through the underside of the receiver and having a width and length sufficient to permit the vertical installation and the removal of the said breech-bolt with respect to the bolt-receiving chamber of the receiver, the lower side portion of the said receiver being cut away to provide a downwardly-facing wall-edge flanking the bolt-receiving passage and extending longitudinally of the receiver and below which wall-edge the receiver-wall is totally removed to afford free vertical access to the said wall-edge, the said receiver-unit also including a mounting-member removably coupled to the underside of the said tubular receiver and having upwardly-facing bolt-guiding means thereon in position to support the said breech-bolt in the bolt-receiving chamber of the said receiver; a firing-plunger movable in the plunger-receiving passage in the said breech-bolt; and a bolt-operating handle removably installed in the handle-receiving pocket in the said breech-bolt and having a clearance-cut therein in line with the plunger-receiving passage in the said breech-bolt to permit the free movement of the said firing-plunger, the said bolt-operating handle also having an upwardly-opening notch receiving the downwardly-facing wall-edge of the wall of the said receiver flanking the bolt-receiving passage therein; whereby, following the detachment of the said mounting-member, the said breech-bolt and its said bolt-operating handle may be removed as a unit from the said receiver by a direct joint downward movement.

3. A bolt-action firearm including in combination: a breech-bolt provided with a transverse handle-receiving pocket opening through the side-wall of the breech-bolt; a receiver-unit comprising a tubular receiver having a longitudinal bolt-receiving chamber accommodating the said breech-bolt and having a substantially-vertical passage leading downwardly from its said bolt-receiving chamber through the underside of the receiver and having a width and length sufficient to permit the vertical installation into and the removal of the said breech-bolt from the bolt-receiving chamber of the receiver, the said receiver-unit also including a mounting-member removably coupled to the underside of the said tubular receiver and having upwardly-facing bolt-guiding means thereon in position to support and guide the said breech-bolt in the bolt-receiving chamber of the said receiver; and a bolt-operating handle removably installed in the handle-receiving pocket in the said breech-bolt and having an outwardly-facing abutment positioned to engage a portion of the said mounting-member to restrain the said handle against axial outward displacement.

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