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F. W. SAMPSON ET AL

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COCKING BOLT OF MACHINE GUNS

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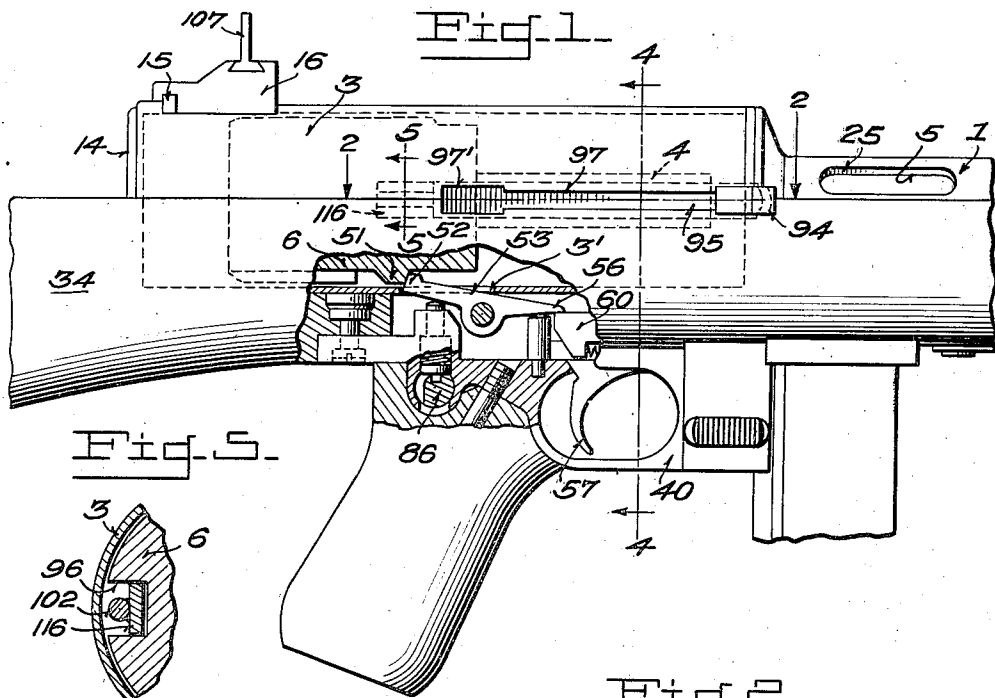


Fig. 5

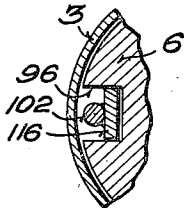


Fig. 4

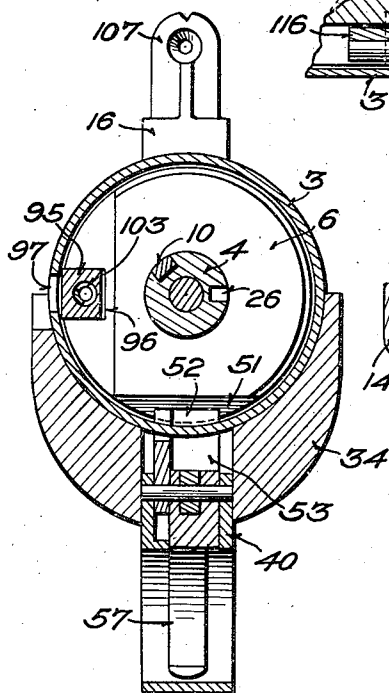


Fig. 2

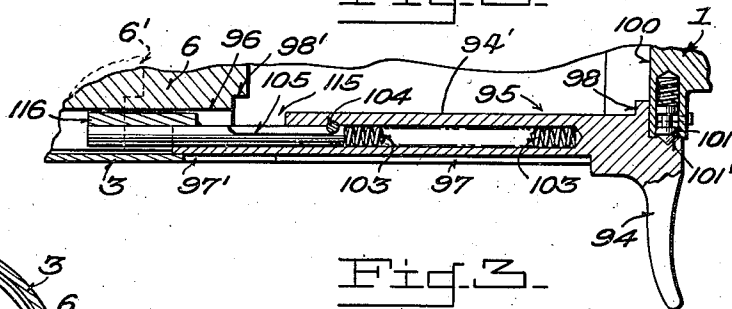
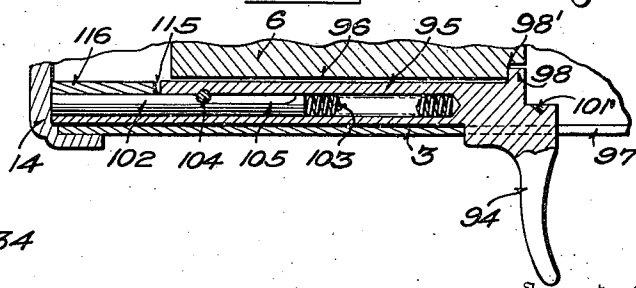


Fig. 3



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COCKING BOLT OF MACHINE GUNS

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2 Claims. (Cl. 42—16)

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The invention relates to an improvement in means for cocking the bolt of a machine gun in which the bolt is operated by recoil forces. It is designed in the present instance specifically for use with a gun illustrated in our copending application of August 14, 1946, Serial No. 690,518, in which the breech bolt is operated by blow back. The present invention is concerned with the means for operating the breech bolt for the first shot, or in case of failure in operation of the firing mechanism to complete any shot.

In the gun mentioned, as may be found to be the case in many others to which my invention would be applicable, the breech bolt reciprocates in a housing, and a cocking slide is provided to move the breech bolt to recoil position manually, so that the sear may engage. This movement involves the formation of a slot in the side of the housing for the handle of the cocking slide, and to close the slot, normally a bar is formed on the cocking slide to close the slot. The breech bolt recoils a distance greater than the length of the slot, and rearward of the cocked position, but it is desired to keep the closure piece engaged slidably with the breech bolt throughout recoil of the latter. This would require the cocking slide to be too long to move to full cocking position in a simple casing made to accommodate only the normal recoil movement of the bolt. It is therefore the purpose of the present invention to so construct the cocking slide that its necessary movement may be effected, and yet its slidable engagement with the breech bolt preserved throughout reciprocation of the latter.

A further important aim of the invention is to present a novel construction of the cocking slide and a novel coordination thereof with a simple snap latch to enable self-return of the slide to normal position inoperative during reciprocation of the breech bolt ordinarily, but yieldable to manual operation when required.

Additional objects, advantages and features of invention reside in the specification construction, arrangement and combination of the parts involved in the embodiment of the invention, as will be apparent or understood from the following description and the accompanying drawings, wherein:

Figure 1 is a fragmentary side elevation of a fire-arm constructed in accordance with the invention, with portions broken away to show the essential trigger and sear parts in relation to the breech bolt;

Figure 2 is a horizontal longitudinal section on

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the line 2—2 of Figure 1, with the parts in normal position;

Figure 3 is a similar view with the parts in cocking position;

5 Figure 4 is a cross section on the line 4—4 of Figure 1;

Figure 5 is a fragmentary cross section on the line 5—5 of Figure 1.

Referring more particularly to the drawings, there is illustrated a firearm comprising a receiver 1 as in our said other application, fixed coaxially with which there is a rearwardly extending breech bolt housing 3, the latter being a simple cylindrical tube closed at its rear end by a manually removable cap 14 having a bayonet slot engagement at 15 with a block 16 welded to the top of the housing, the latter carrying a rear sight 107. Slidably fitted in the housing 3 there is a breech bolt body 6, which is a substantially solid cylinder, and as described in said other application and usual in automatic arms, this breech bolt is urged forward by a conventional driving spring, these last details not being illustrated, since they comprise no novel part of the present invention. As also described in said other application, the breech bolt body is relieved at its forward under part and formed with a stop lug 51 against which the heel 52 of the sear engages to hold the breech bolt cocked, and a tripper element 60 on the trigger proper 57 engages under the toe 56 of the sear to move the latter to let off in a familiar function. The trigger and sear structure being no novel part of the present invention are not further described or illustrated, and details of a spring and safety device 86 more particularly described in said other application are not dealt with in detail herein.

The breech bolt body 6 is formed with a longitudinal channel 96 in the right hand side thereof extending throughout its length, having parallel upper and lower sides and a vertical inner bottom surface. The housing 3 has a longitudinal slot 97 cut therein in alignment with the channel 96 and extending from the extreme forward end of the housing rearwardly, where it is enlarged upwardly and downwardly as at 97' forming a rectangular opening. A cocking slide 95 is provided having a handle 94 extending outwardly through the slot from within the housing 3 and fitted snugly between the sides of the slot for sliding movement therein, its outer part being enlarged closely adjacent the periphery of the housing to a form and size corresponding to those of the enlargement and opening 97', so

that when the handle is at the rear limit of its movement and the breech bolt is out of the way the handle may be pressed inwardly through the enlargement 97' for removal. The handle is formed with an integral bar 94' extending longitudinally within the housing 3 and adapted to fit slidably in the channel 96 of the breech bolt, its inner side adapted to lie close to the said vertical bottom face of the channel, while its outer side is adapted and arranged to lie close against the edge portions of the housing 3 above and below the slot 97. When the slide is at its forward limit of movement, its rear end also laps the housing beyond the rear end of the slot 97. The portion of the receiver 1 around which the housing 3 is fitted is also relieved in line with the slot 97 so that a portion of the base of the handle 94 may extend forwardly beside the relieved part. The underlying part of the receiver is radially bored and fitted with a spring-pressed bullet latch device 101, a convex nose portion of which engages with a dimple 101' in the overlying part of the handle 94 to hold the latter at its forward-most position yieldable to manual operation when desired.

The breech bolt body 6 has a cocked position as illustrated in Figures 1 and 2, in which its forward part extends a short distance forwardly beside the bar 94' and under the slot 97. At forward or battery position of the breech bolt it engages the rear breech face 100 of the receiver 1. A cocking lug 98 is formed on the base of the handle 94 extending inwardly close beside this breech face of the receiver and the forward end of the breech bolt 6 is recessed as at 98' to receive the lug 98. Thereby, when the handle is drawn rearwardly the lug 98 moves the breech bolt rearwardly also. The bar 94' is bored from its rear end, and has engaged slidably therein a rod 102, which confines a helical spring 103 in the forward part of the bore. The latter tends to thrust the rod rearwardly from the bore but extension of the rod is limited by means of a cross pin 104 inserted through the bar, and across a space in the bore beside the rod afforded by a relieved side portion 105 of the rod, this relieved part stopping short of the inner end of the rod so that the shoulder thus formed engages the pin when the rod is fully extended. The rod at its extended position projects rearwardly a distance sufficient to remain in the channel 96 while the slide is at its forward limit when the breech bolt recoils to its maximum rearward position as dotted at 6' in Figure 2. The inner side of the bar 94' is relieved as at 115 from top to bottom. At its rear part and fixed on the inner side of the rod extending from the extremity of the rod forwardly there is a block 116, the vertical dimension of which is sufficient to engage slidably against the upper and lower faces of the channel 96, the relieved part 115 and the length of the block 116 being such that the rod may be pressed forwardly by the cap 14 to such distance as necessary when the handle 94 is moved to the rear end of the slot 97. The block 116 has a radial dimension with respect to the breech bolt 6 which is only a small part of the radial depth of the channel 96, and the top and bottom portions of the bar 94' adjacent the relieved part 115 occupy the remaining space in the channel outwardly of the block whenever the breech bolt is at cocked position. However, when the breech bolt recoils to its maximum limit it will move beyond the body of the bar 94', and will receive only the block 116 therein.

Due to this mutual functional relation of the cocking slide and breech bolt, the cocking slide may be depended upon to hold the breech bolt against rotation around its longitudinal axis, so that extractor and ejector devices may function properly in relation to the discharge port 25 for spent cartridge cases, in a conventional way. Also, the lug 51 is kept aligned with the sear 53.

It is thus made possible to embody a gun action and housing of extreme simplicity, and low cost; but perhaps most important, to enable complete sealing of the housing, which conventionally is closed in guns of this type by some form of closure which is opened during firing of the arm, this detail not being illustrated here. In place of a special closure, the breech bolt may be left at battery position when the arm is being ported, the forward part of the bolt fitting snugly in the bore of the receiver 1 as disclosed in the said other application.

The receiver 1, is formed with an axial bore 5, at the left side of which an ejector not shown is fixed movable through a clearance cut or groove 26 in the left side of the reduced forward part 4 of the breech bolt, so as to engage the butt of a spent cartridge held by the conventional extractor 10 at the upper side of the bolt 4. An ejection port 25 is formed in the upper right side of the receiver, through which the spent cartridge is thrown by the ejector on recoil of the breech bolt in a familiar way. When the breech bolt is in battery, its portion 4 will close the port 25.

The housing is slotted at its lower side as at 3', and it will be noted that the sear is of such form as to completely close this last named slot. The pivotal point of the sear being so located that its top part over the pivot lies close to the under side of the housing at the forward part of this slot, while the rear part of the sear is at all times inclined upwardly into the housing, with a substantially vertical rear end face at the heel 52, which face lies close to the rear end edge of the slot at all positions of the sear.

An unusually well closed housing for the bolt is thus provided when the gun parts are assembled as shown.

As may be seen from Figures 1 and 4, the trigger assembly is enclosed by the stock 34 and the trigger frame 40 at all sides except the top, and therefore when the housing and receiver are assembled to the stock and trigger frame as shown the trigger action is completely enclosed also. The trigger assembly is open at its upper side so that when the housing with its receiver on the one hand, and the stock and trigger frame on the other hand are detached, the trigger parts are exposed sufficiently for ordinary inspection and cleaning.

The function of the spring 103 is such that when the handle is pulled to its rearmost or cocking position and released abruptly, the reaction of the spring between the cocking slide and end of the rod while the latter bears against the cap 14, is such that the cocking slide is thrust rapidly forward, and after the rod is checked against the pin 104 the greater mass of the handle and bar parts is such that the cocking slide will continue its forward motion rapidly, by momentum, until the dimple 101' engages over the bullet latch 101, retaining the cocking slide at this forward position until its next manual operation is required. As will be apparent, the breech bolt 6 in its semi-automatic or automatic firing functions may continue its recipro-

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cation without impedance by, or disturbance of, the cocking slide.

While we have described a specific embodiment of the invention in the best form known to us, it will nevertheless be understood that this is purely exemplary, and that changes in construction, arrangement and combination of the parts, substitution of materials and equivalents, mechanical or otherwise, may be made without departing from the spirit of the invention as defined in the appended claims, wherein,

We claim:

1. In an arm of the character described, a cocking device comprising a slide having a longitudinal body provided at its forward end with a handle extending through and slidably fitted in a longitudinal slot formed in the side of a breech bolt housing of said arm, said forward end being formed for engagement with the forwardly facing part of a breech bolt of said arm, said longitudinal body having a longitudinal bore extension from its rear end to slidably receive an extensible member, means within said longitudinal body to limit the movement of said extensible member within said longitudinal body and yielding means positioned in said bore for resilient engagement of said extensible member with said longitudinal body, said extensible member and longitudinal body slidable together and parallel with said breech bolt housing to effect cocking of said bolt.

2. In a machine gun having a breech bolt housing in which the breech bolt is reciprocable

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therein, said housing provided with a longitudinal slot, a cocking device comprising a slide having a longitudinal body formed at its forward end with a handle and a lug disposed in opposite direction to said handle, said handle extending through and slidably fitted in said longitudinal slot, said lug adapted to engage the forwardly facing part of said breech bolt, a longitudinal bore starting from the rear end of said body and extending into it to slidably receive an extensible bar member, means within said body to limit the movement of said bar within said body and spring means positioned in said bore for resilient engagement of said bar with said body, said bar and said body movable together and parallel with said bolt to effect cocking of said bolt, said spring returning said bar and body to pre-cocking position.

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