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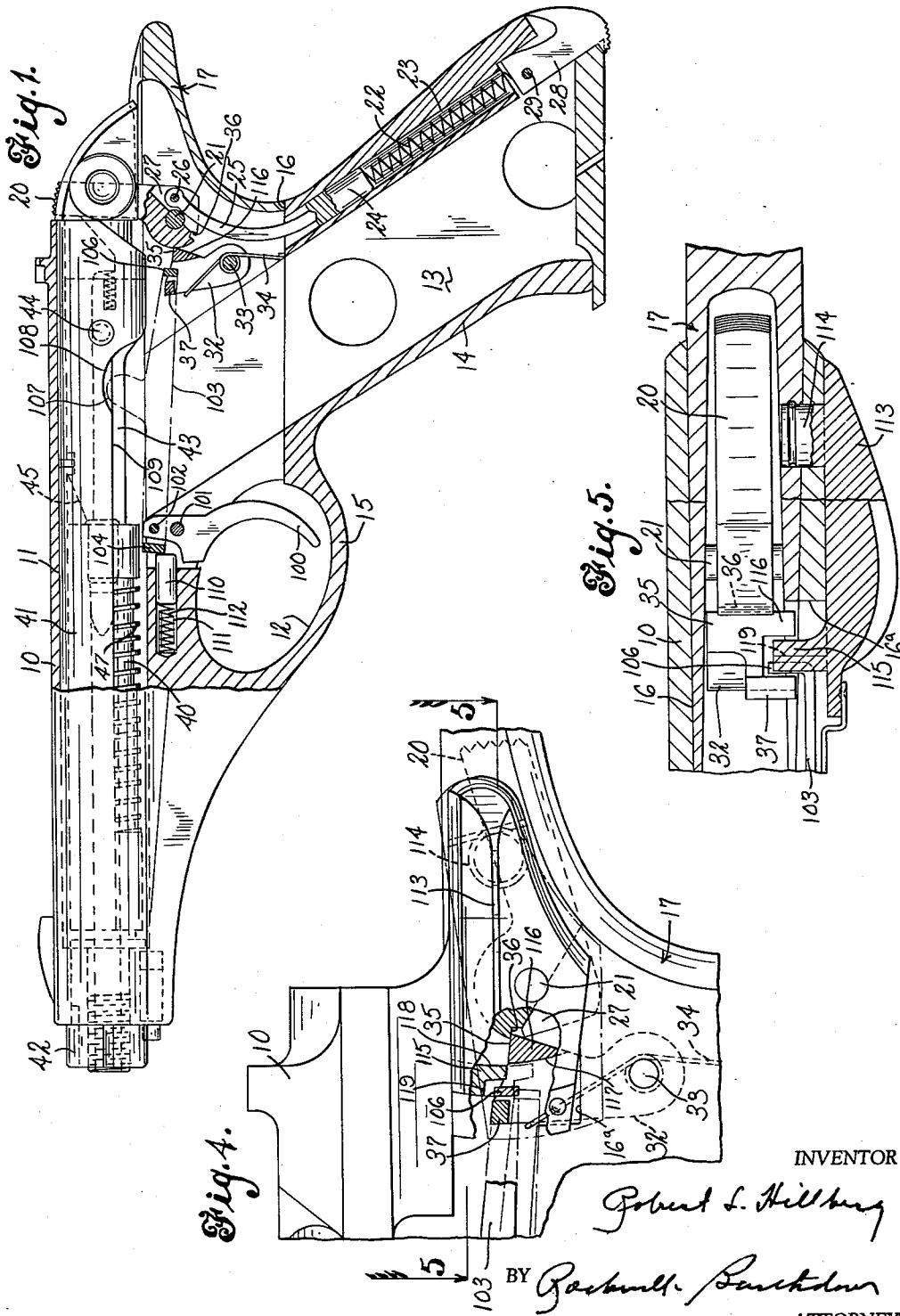
R. L. HILLBERG

3,060,810

SEAR MECHANISM DISCONNECTED BY BREECH BLOCK MOTION

Original Filed July 1, 1954

2 Sheets-Sheet 1



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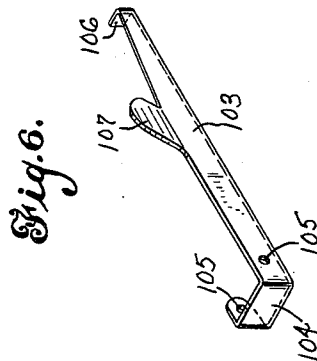
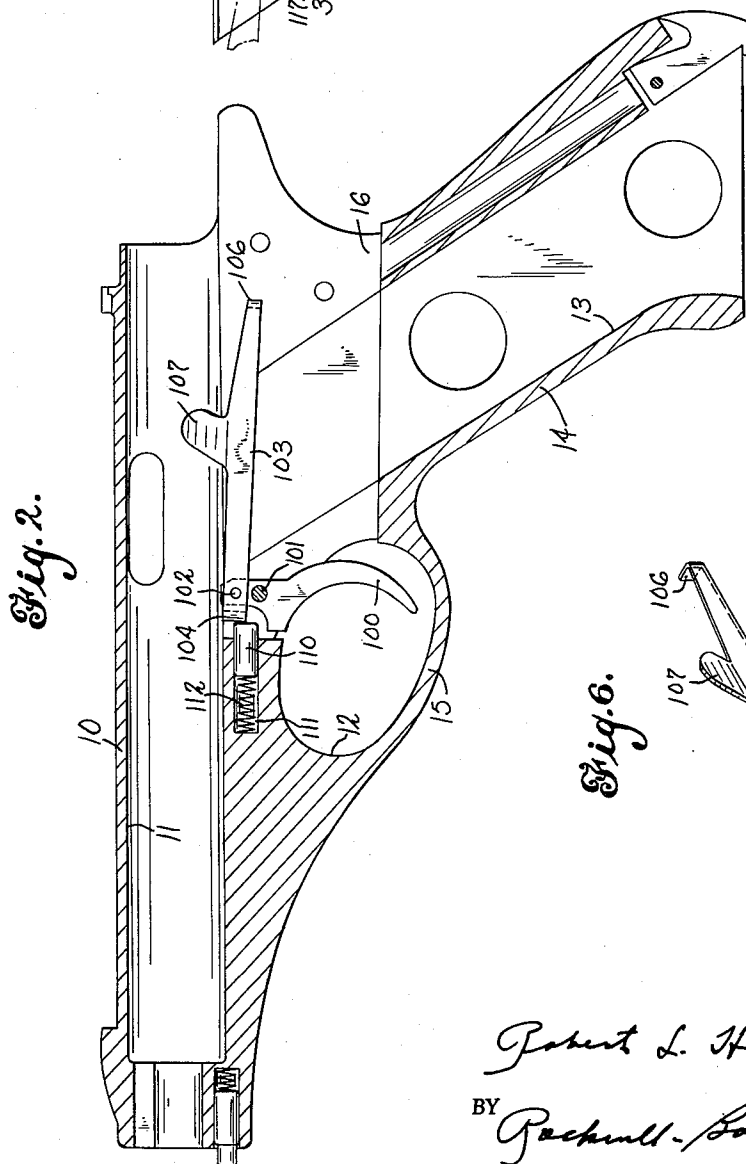
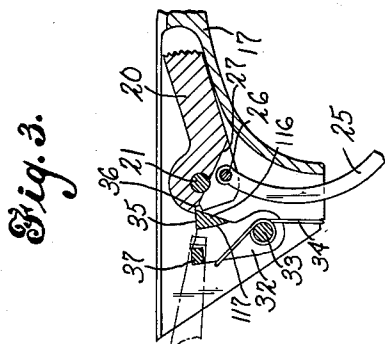
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3,060,810

SEAR MECHANISM DISCONNECTED BY BREECH BLOCK MOTION

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Original application July 1, 1954, Ser. No. 440,601.
Divided and this application June 22, 1959, Ser. No.
822,116

5 Claims. (Cl. 89—145)

This invention relates to a pistol and more particularly to one of the automatic loading type wherein the discharge of the pistol will serve to eject the spent shell and to move a loaded cartridge from the magazine into the chamber in position for subsequent firing of the gun. The present application is a division of my application, Serial No. 440,601, filed July 1, 1954, now abandoned.

The present application relates particularly to the action mechanism of the firearm and its cooperation with the bolt and a sleeve reciprocable in the frame of the gun to which the bolt is connected. As illustrated, the main frame of the pistol is provided with an opening in which may be inserted and secured an auxiliary frame carrying the hammer, the hammer spring and the sear. The trigger is pivoted in the main frame and a sear bar is connected to the trigger and extends rearwardly therefrom to engage the sear and release it from the hammer so that the latter may be moved by its spring to strike the firing pin.

A sleeve is reciprocably mounted in the frame of the gun, which sleeve embraces the barrel. This sleeve is provided with means, herein illustrated as a recess, to engage a part of the sear bar and cam the latter to an inoperative position, or position in which it is disengaged from the sear, upon the run out of the bolt or the movement of the latter rearwardly, which movement is effected automatically upon the firing of the gun as more clearly described in the parent application heretofore referred to.

One object of the present invention is to provide a pistol of the character described above having an improved action mechanism which may be economically manufactured and which will be positive in operation.

Still another object of my invention is to provide a pistol of the type described having an improved action mechanism and an improved safety mechanism, both of which are constructed of a minimum number of parts and which are so coordinated to give a maximum of safety in operation.

To these and other ends the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the accompanying drawings:

FIG. 1 is a side elevation view partly broken away and partly in section of a pistol embodying my improvements;

FIG. 2 is a sectional view of the frame of the pistol showing the trigger and sear bar connected thereto;

FIG. 3 is a sectional view of the auxiliary or action frame detached from the main frame with the hammer and sear pivoted thereon;

FIG. 4 is an enlarged detail elevational view of the rear portion of the gun, some parts being broken away to show the interior mechanism;

FIG. 5 is a sectional view on line 5—5 of FIG. 4; and

FIG. 6 is a perspective view of the sear bar.

To illustrate a preferred embodiment of my invention I have shown in the drawings a pistol of the automatic loading type comprising a frame 10 having a cylindrical opening 11 at its upper portion for reception of a barrel and sleeve assembly which will be hereinafter referred to. The frame is also provided with a trigger opening 12 and a magazine opening 13.

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The magazine opening is provided in the handle portion 14 of the frame and it opens downwardly through the lower end of the handle to permit the magazine to be received therein. A trigger guard 15 herein shown as formed integrally with the frame is provided for the trigger. Between the handle portion 14 and the upper cylindrical opening 11 the frame is provided with a rearwardly opening chamber or recess 16 within which may be suitably secured the action frame or auxiliary frame 17 shown more especially in FIG. 3.

A hammer 20 is pivoted at 21 in the action frame 17 (FIGS. 1 and 3), this hammer being urged in a counterclockwise direction about its pivot or toward a firing position by a spring 22 mounted in a bore 23 in the handle of the frame. The spring 22 acts at its upper end against a plunger 24 which in turn acts against a curved link 25 pivoted at 26 to the hammer at a point rearwardly of the pivot 21. It may be noted that the upper end of this link lies within a slot 27 formed at the lower rear edge of the hammer and the pivot points 21 and 26 are so disposed that the spring will urge the hammer to the position shown in FIG. 1.

At its lower end the spring 23 reacts against a catch or latch member 28 pivoted at 29 to the handle and ordinarily maintains this latch in a position to hold the magazine (not shown) in place.

Also mounted in the action frame 17 is the sear member 32 pivoted to the frame at 33 and urged in a clockwise direction about its pivot by the spring 34. The end of the upper arm of this spring is turned laterally and engages the forward edge of the sear member while the other arm of the spring is also turned laterally and engages the lower portion of the action frame. The sear member 32 is provided with a sear shoulder 35 adapted to engage a notch 36 in the lower surface of the hammer so as to hold the latter in cocked position against the tension of the spring 22, this position being shown in FIG. 3. The sear member is also provided with a lug 37 which, as will be hereinafter explained, is engaged by the sear bar when the trigger is pulled to disengage the sear from the hammer and permit the hammer spring to move the hammer toward firing position. It may here be noted that the auxiliary or action frame 17 when assembled into the main frame through the rearwardly facing opening into the chamber 16 is secured in place by the pivot pins 21 and 33 which form the pivots for the hammer and sear member respectively.

Within the opening 11 in the frame is secured the barrel 40 which is embraced within a substantially semi-cylindrical sleeve 41 reciprocably mounted in the opening 11. The barrel is suitably secured against movement by a nut 42 threaded on the end thereof which projects from the frame as explained in my prior application referred to and which forms no part of the present invention. Within the rear end of the reciprocable sleeve 41 is secured the bolt 43 by a transverse pin 44 and a striker, shown in dotted lines at 45, is slidably mounted in the bolt and projects slightly from the rear end thereof so as to be engaged by the hammer 20, as shown in FIG. 1. As will be understood, when a cartridge is fired the bolt 43 together with the sleeve 41 will be blown rearwardly, this movement serving to rotate the hammer in a clockwise direction about its pivot 21 so as to move it from the firing position shown in FIG. 1 to the cocked position shown in FIG. 3.

A trigger 100 is pivoted at 101 to the frame and pivoted to the trigger at 102 is a sear bar 103 shown more especially in FIGS. 2 and 6. This sear bar is provided with a U-shaped portion 104 at its forward end and openings 105 are provided in opposite walls of this portion for the reception of the pin 102. At its rearward end this mem-

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ber is provided with a laterally turned lug 106 adapted to lie rearwardly of the lug 37, as shown in FIGS. 1 and 3, so that upon counterclockwise movement of the trigger about its pivot the sear will be swung forwardly or in a counterclockwise direction to disengage its shoulder 35 from the hammer and release the latter.

In order that the pistol be semi-automatic, that is, in order that it fire only once upon each pulling of the trigger, it is necessary to provide means for disconnecting the sear bar from the sear after a shot has been fired. For this purpose the sear bar is provided with an upstanding lug 107 at an intermediate portion thereof, the outer end of which lug is displaced outwardly to some extent from the body of the sear bar so as to lie in a recess 108 (FIG. 1) in the lower surface of the sleeve 41. When the sleeve is in its forward position, as shown in FIG. 1, the upper edge of the lug 107 will lie within the recess 108, thus permitting the sear bar to stand in its upper position shown in FIG. 2 and in dotted lines in FIG. 1. However, when the gun is fired and the bolt and sleeve are moved rearwardly by the recoil, the upper edge of the lug 107 will be engaged by the straight surface or longitudinal edge 109 of the sleeve and the rear end of the sear bar will be cammed downwardly to the position shown in dotted lines in FIG. 4 where it is no longer in engagement with the lug 37 of the sear member and, therefore, the latter may be moved rearwardly by its spring 34 to engage in the recess or notch 36 of the hammer. After the sear has engaged the recess or notch, and prior to releasing the trigger, the lug 106 of the cam bar 103 cannot return to the firing position because of its engagement with the lower surface of the sear lug 37. Consequently, the trigger has to be released before the gun can be refired.

Normally the trigger is held in its forward position and the sear bar at its upper position (that is in position to engage rearwardly of the lug 37) by a plunger 110 mounted in a recess 111 in the frame and urged rearwardly by a spring 112, the plunger being urged into engagement with the forward face of the U-shaped end 104 of the sear bar. As the plunger engages the sear bar above the pivot point 101 of the trigger, it will urge the latter in a clockwise direction or toward a forward position and, as the plunger engages the sear bar below the pivot 102, it will tend to rock the rear end of the sear bar upwardly so as to urge it into a position behind the lug 37, as shown in FIGS. 1 and 3.

A safety mechanism is provided, as shown more especially in FIGS. 4 and 5. This mechanism comprises a manually operable member 113 pivoted at 114 on the frame, this member being provided at its forward end with a locking finger 115 which extends into the frame through an opening 164. The sear member 32 is provided adjacent its rear end with a locking lug 116, shown more especially in FIG. 4, this lug being adjacent the rear end of the sear member in spaced relation to the lug 37 so that the lug 106 on the sear bar as well as the finger 115 upon the member 113 can enter the space between these lugs. The forward portion of the lug 116 is of arcuate shape, as shown at 117, this arc having its center coincident with that of the pivot 114 when the sear 32 is in the locked position, and the rear face of the finger 115 is similarly curved, as shown at 118.

When the member 113 is moved downwardly from its normal or full-line position shown in FIG. 4 to its dotted-line position shown in this figure, the finger 115 will be moved in front of the lug 116, as shown in dotted lines so as to lock the sear against forward movement in a counterclockwise direction or movement in a direction to release the hammer. At the same time a shoulder 119 on the finger 115 will engage the lug 106 of the sear bar 103 and move the sear bar downwardly so that it will no longer be in position to exert a pull upon the sear. Thus when the safety is "on" and the trigger is pulled, there will be no strain upon the sear bar or sear as the sear bar

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will merely move forwardly without engagement with the sear.

Also with this arrangement it will be noted that when the sleeve 41 is moved rearwardly upon a recoil after firing of the gun, the sear bar 103 will be moved downwardly to its dotted-line position shown in FIG. 4 so that it no longer stands rearwardly of the lug 37 upon the sear bar to permit the sear to engage the hammer and retain it in cocked position, as shown in FIG. 3, when the sleeve is returned to its forward position by the usual spring 47.

While I have shown and described one embodiment of my invention, it will be understood that it is not to be limited to all of the details shown, but is capable of modification and variation within the spirit of the invention and within the scope of the claims.

What I claim is:

1. A pistol comprising a main frame having a barrel-receiving opening therethrough, a barrel mounted in said opening, a bolt slidably mounted in said opening rearwardly of the barrel in alignment therewith for movement in a path toward and away from the barrel, a striker carried by the bolt, said main frame having a rearwardly facing opening below said first-named opening, an auxiliary frame secured in, and snugly fitting, said rearwardly facing opening, a hammer pivotally carried by said auxiliary frame in position to engage said striker, a sear pivoted to the auxiliary frame and adapted to engage the hammer to hold it in cocked position, a trigger pivoted to the main frame forwardly of the sear, a sear bar pivoted to the trigger and having a portion extending rearwardly therefrom to engage and actuate the sear, the rearwardly extending portion being displaced from the path of movement of the bolt, and means connected to the bolt to be moved rearwardly therewith having a surface for engaging said sear bar during rearward movement of the bolt to disengage the sear bar from the sear.

2. A pistol comprising a frame, a hammer pivoted to the frame and a sear cooperating with said hammer, a trigger pivoted to the frame, a sear bar connecting said trigger to the sear, said sear having a shoulder thereon, a safety lever pivoted to the frame exteriorly thereof and having a finger projecting into the frame and said finger being movable to and from a position in front of said sear shoulder to lock the sear against movement, and said finger also engaging the sear bar to move it to inoperative position with respect to the sear.

3. A pistol comprising a frame, a hammer pivoted to the frame and a sear cooperating with said hammer, a trigger pivoted to the frame, a sear bar connecting said trigger to the sear, said sear having a shoulder thereon, a safety lever pivoted to the frame exteriorly thereof and having a finger projecting into the frame and said finger being movable to and from a position in front of said sear shoulder to lock the sear against movement, said finger also engaging the sear bar to move it to inoperative position with respect to the sear, and a spring-pressed plunger mounted in the frame in position to engage said sear bar to hold the latter in position to engage the sear and urge the trigger forwardly.

4. A pistol comprising a frame, a barrel secured to the frame at its forward end, a sleeve having a portion surrounding the barrel and slidable thereon, said sleeve having a rearwardly projecting portion, a bolt secured to the rearwardly projecting portion of the sleeve for movement therewith, a striker carried by the bolt, a hammer pivoted to the frame, a sear cooperating with the hammer, a trigger, a sear bar actuated by the trigger, said sear bar being pivotally mounted at one end and being movable into and out of engagement with the sear, means biasing the sear bar into engagement with the sear, an upstanding lug on the sear bar displaced from the path of movement of the bolt but engageable with the rearwardly projecting portion of the sleeve, and a longitudinal edge surface on the sleeve engageable

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with the lug when the bolt and sleeve are moved rearwardly to cam the sear bar to a position in which it is disconnected from the sear.

5. A pistol firing mechanism for a pistol having a main frame defining the pistol handle and supporting a barrel and a bolt having a striker therein, comprising; a trigger pivotally mounted on the main frame, an auxiliary frame fixed within an opening in a portion of the main frame above the handle, a hammer pivotally connected to the auxiliary frame in a position to engage the bolt striker, a sear pivotally connected to the auxiliary frame, a lug on said sear, means supported by the auxiliary frame biasing the sear into engagement with the hammer to hold it in cocked position, a sear bar pivotally connected to the trigger, said sear bar having a lug in alignment with the lug on said sear adapted to release the sear bar upon actuation of said trigger, an upwardly extending bore in the main frame, and a coil spring supported within the bore biasing the hammer toward the striker, a safety lever pivoted to the main frame exteriorly thereof having a finger projecting into

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the main frame movable to safety and release positions, said finger when moved to the safety position engaging and moving the lug on said sear bar out of alignment with the lug on said sear to prevent engagement therebetween.

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