No. 863,770. PATENTED AUG. 20, 1907.

W. J. WHITING.

AUTOMATIC FIREARM.

APPLICATION FILED FEB. 16, 1906.

3 SHEETS—SHEET 1.

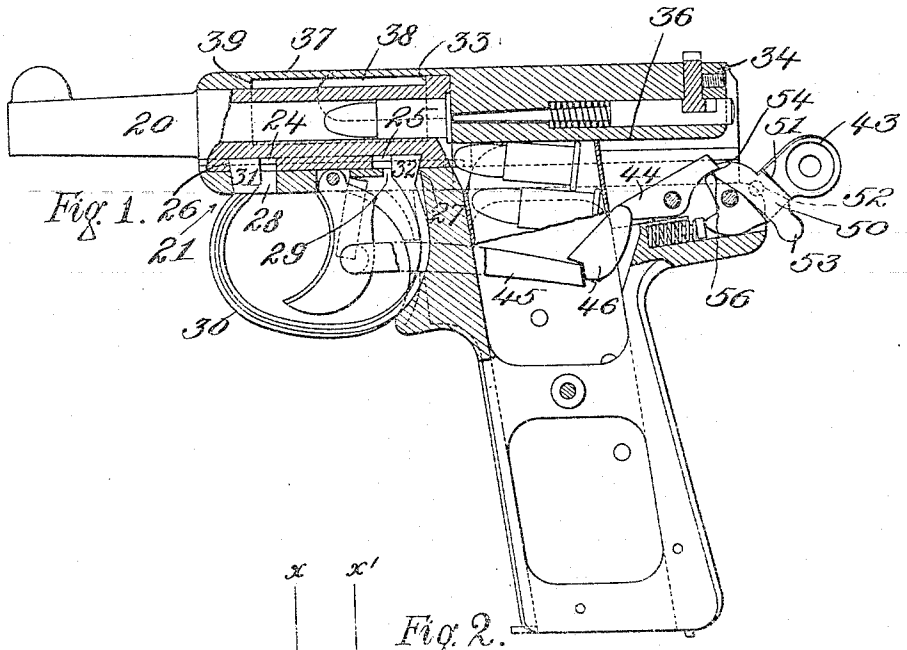


Fig. 1.

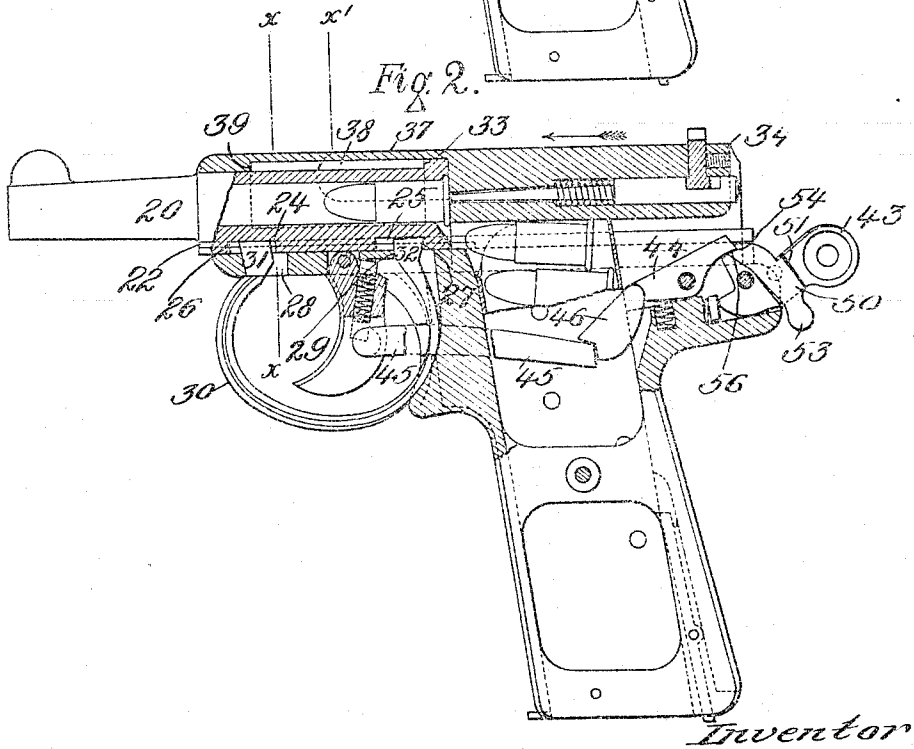


Fig. 2.

WITNESSES

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3 SHEETS—SHEET 2.

Fig. 3.

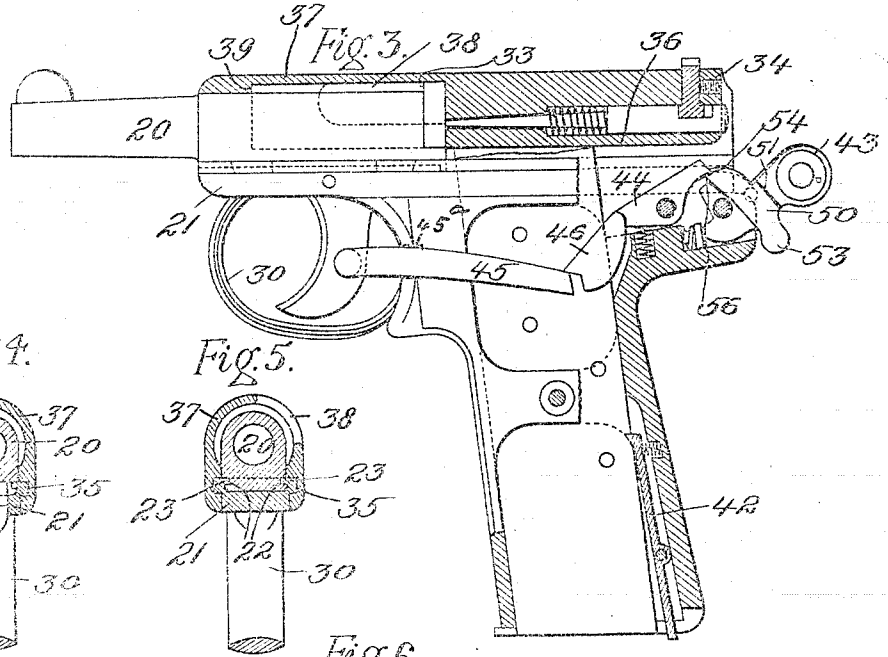
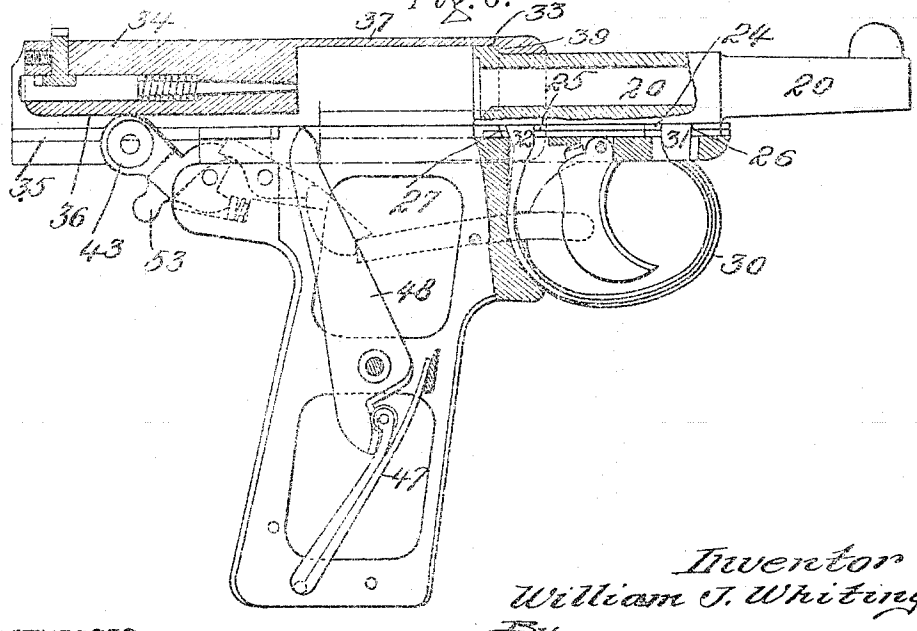


Fig. 4.

Fig. 5.

Fig. 6.



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3 SHEETS—SHEET 3.

Fig. 7.

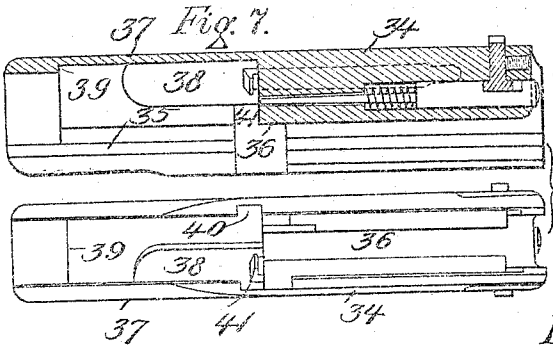


Fig. 8.

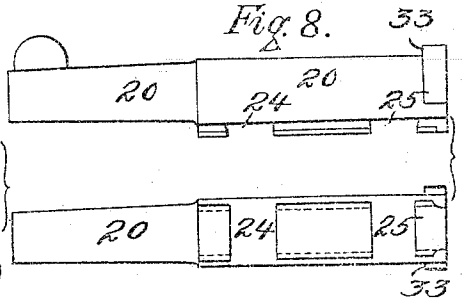


Fig. 9.

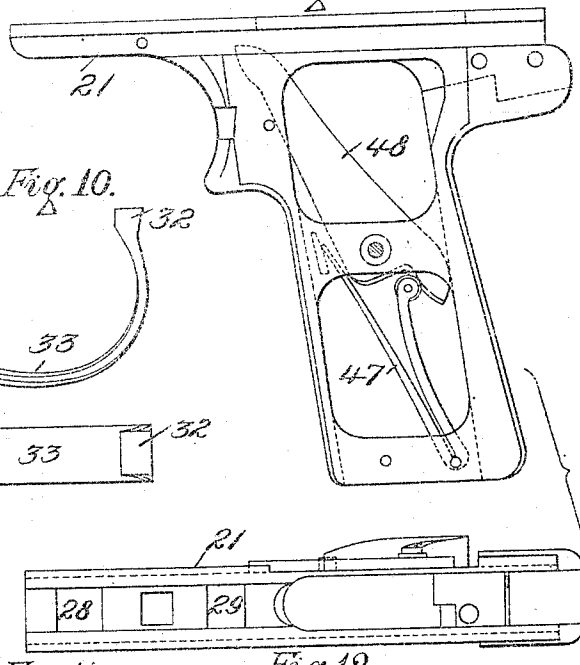


Fig. 10.

Fig. 11.

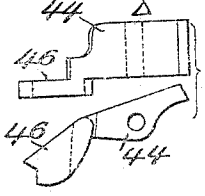


Fig. 12.

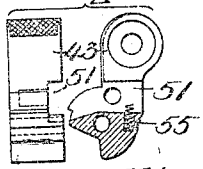
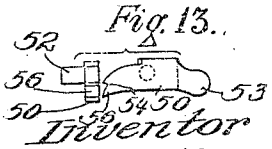


Fig. 13.



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UNITED STATES PATENT OFFICE.

WILLIAM JOHN WHITING, OF HANDSWORTH, NEAR BIRMINGHAM, ENGLAND.

AUTOMATIC FIREARM.

No. 863,770. Specification of Letters Patent. Patented Aug. 20, 1907.

Application filed February 16, 1906. Serial No. 301,432.

To all whom it may concern:

Be it known that I, WILLIAM JOHN WHITING, a subject of the King of Great Britain, residing at 53 Douglas road, Handsworth, near Birmingham, England, have invented certain new and useful Improvements in Automatic Firearms, of which the following is a specification.

This invention has relation to automatic pistols and other automatic fire-arms of the solid or non-sliding barrel type in which the various operations involved in the firing of a shot and the re-loading of the arm, viz., the opening of the breech after a discharge, the extraction and ejection of the spent cartridge shell, the cocking of the hammer, the insertion of a live cartridge from the magazine into the barrel, and the re-closing of the breech, are performed automatically by the movements of a traversing breech slide which is driven backwards by the recoil energy developed by the discharge of a cartridge and then forwardly under the influence of a spring which was rendered active by the initial or rearward movement of the said slide.

The principal objects of the present invention are to simplify the general construction of such automatic fire arms, and to provide a simple but effective safety device for locking the hammer at half-cock when the arm is not in use.

In applying the invention to an automatic pistol, the non-sliding barrel is mounted upon the frame or body and is detachably secured thereto by means of a trigger-guard which is of a spring construction and is adapted to serve both as a locking device or fastening for the said barrel and also as a buffer device for cushioning the backward and forward movements of the reciprocating breech-slide which is adapted to traverse upon a platform or table surmounting a handle or grip containing the detachable magazine, and is connected with a return spring fitted inside the frame through the medium of a long arm or lever fulcrumed to the said frame and having one end engaged with the said slide while the other end has a bearing against one of the limbs of the return-spring, the arrangement being such that when the breech-slide is forced rearwardly by the recoil from a discharge, the lever makes an angular movement and thereby compresses the spring which then re-acts to move the lever in the opposite direction and drive the breech-slide forward into its closed position.

Figure 1 of the accompanying drawings represents a longitudinal vertical section of an automatic magazine pistol constructed and arranged in accordance with my invention. This view shows the several parts in the positions they assume when the breech slide is stationary or at rest in its closed position and when the pistol is loaded and the hammer placed at full-cock ready for firing. Fig. 2 is a similar longitudinal section to that represented in Fig. 1 but it shows the breech slide at the end of the forward or closing movement which it makes under the influence of its return spring and illustrates how this movement is buffered by the spring trigger guard. Fig. 3 is another sectional view of the pistol, but represents the fixed barrel in elevation. Figs. 4 and 5 represent two cross sections of the pistol taken respectively upon the dotted lines x and x^1. Fig. 6 represents another longitudinal section of the pistol, showing the opposite side to that which is represented in Figs. 1, 2 and 3 and illustrating how the spring trigger guard is utilized as a spring buffer stop for arresting the rearward movement of the breech-slide under the action of the recoil following a discharge. This view also illustrates the arrangement of the breech-slide return spring and lever whereby the said slide is returned to its normal position after each discharge. Fig. 7 shows a longitudinal section and an underside plan of the breech-slides separately. Fig. 8 shows a side elevation and an underside plan of the fixed barrel separately. Fig. 9 shows the body of the pistol in elevation and plan and Fig. 10 shows like views of the spring trigger guard while Figs. 11, 12 and 13 show the different parts of the lock mechanism separated or dis-assembled from one another. Figs. 14 and 15 are sectional side elevations, showing the safety device, and Figs. 16 and 17 are top plans of the same.

The same reference numerals indicate corresponding parts in the several figures of the drawings.

The barrel 20 is mounted upon the fore part of the body 21 of the pistol and its base is longitudinally grooved at 22 upon the opposite sides and is adapted to slide from the front into a channel or recess formed in the top of the said body and having internal guide-ribs 23, which engage with the said grooves 22 in the barrel base. To provide for the locking of the barrel to the body by means of a spring trigger-guard, the front and rearward ends of the underside of the base are formed with a pair of notches or recesses 24 and 25 and the forward edge of the front recess and the rearward edge of the back one are suitably undercut at 26, 27 respectively while corresponding openings or gaps 28, 29 are cut through the bottom of the body to coincide or register with the said recesses when the barrel is in its normal position. The trigger guard 30 is made from a bow or loop of spring steel and the ends thereof are formed with lumps or hook-like interlocking pieces 31, 32 adapted to engage respectively with the undercut recesses 24, 25 in the barrel base. When this locking guard is detached from the pistol, its ends spring apart or become separated to a greater distance than that which separates the undercut edges 26, 27 of the re-

cesses but when the said ends are forced towards one another they may then be inserted or introduced respectively through the bottom openings in the platform and into the recesses in the barrel base, when, by the tendency of the said ends to spring apart, they are retained in engagement with the undercut recesses and thus the positive locking of the barrel is effected, although by forcing one or other of the hook-like ends out of its engagement, the guard can be removed and then the barrel is free to be detached from the body. The spring guard is also utilized as a buffering device for cushioning the impact of the reciprocating breech slide at the ends of its opening and closing movements, and to provide for this the openings in the body are made larger than the locking ends of the guard so as to admit of one or other of the said ends yielding or having some longitudinal play therein, and this enables the barrel to move with the yielding end either in a forward direction when it is struck by the breech slide on the latter coming to its closed position as represented in Fig. 1, or in a rearward direction under the influence of the impact or blow which is delivered by the said slide against a suitable stop 33 on the barrel when the slide is fully opened as represented in Fig. 6. This arrangement effectually cushions the reciprocating parts and prevents the pistol being damaged by the shocks or concussion set up by the firing operations.

The breech-slide 34 is mounted so as to slide upon the after part of the body whose external guide ribs engage with corresponding channels 35 on the opposite inner sides of the base of the said slide, which is fitted, as usual with a firing pin and extractor, while its under side is formed with a hammer cocking and locking rib 36 adapted to act upon the hammer and cock the same during its rearward movement, and to force the uppermost cartridge from the magazine (which is contained within the grip of the pistol) into the chamber of the barrel during its forward or closing movement. At the front end, this slide is extended into a hood or cover 37 which telescopes over the after part of the fixed or relatively stationary barrel when the pistol is closed and is provided upon one side with a gap or opening 38 wherethrough the spent cartridge shell is ejected during the opening movement.

The rearward movement of the combined breech slide and hood is limited, and the detachment of this part from the body is prevented by the stop collar 33 on the breech end of the barrel coöperating with an internal abutment 39 at the forward end of the hood. The inside of the said hood is of cylindrical form and the stop collar fits closely therein, but in order to admit of the separation or detachment of the two parts after they have been slid collectively off the body, suitable gaps or gates may be formed at 40, 41 on the opposite sides of the hood adjacent to its junction with the breech slide and when the collar is brought coincident with these gaps, the barrel can be dropped out or removed.

The detachable magazine is secured within the hollow handle of the body by a suitable catch 42 and one side of the upper end of same with an ear or projection against which the rim of the spent cartridge shell impinges on being withdrawn from the barrel-chamber by the extractor and is thereby tipped and ejected through the opening in the side of the breech hood.

The hammer 43 and its main spring and the sear 44 and sear-spring are mounted in the body or frame at the back of the magazine chamber and the sear is actuated by a trigger disposed forwards of the said chamber through the medium of a curved bar 45 which is pivoted at its front end to the said trigger, which extends through a recess 45^a formed in an offset on the handle while its after end is adapted to engage—when the hammer is at full-cock—with a tail or extension 46 depending from the front of the sear, whose nose takes into a full-cock bent in the hub of the hammer. The extension 46 is adapted to be tilted so that it will be moved out of the path of the bar 45 when the latter is forced inwardly by the trigger. Such tilting is had when the hammer is moved to a position of half cock so that no engagement can be had between the bar 45 and the extension 46 to actuate the hammer. To provide further non-actuating of the hammer, the bar 46 during the rearward movement of the trigger has its free end cammed away from the extension 45 such cam action being had owing to the curved form of the bar 45 in connection with the wall of the recess 45^a.

47 is the breech-slide return spring and 48 is the lever which transmits the effort of said spring (which is compressed by the rearward movement of the said slide) for the purpose of giving the forward or closing movement.

In connection with the firing mechanism, I propose to employ a safety device which, on being operated by the shooter when the hammer is at full cock, allows the said hammer to be disengaged from the sear and lowered by the hammer-spring into a half-cock position and locks it there, so that it is impossible for the pistol to be discharged until the hammer has been pulled back again to full-cock. Thus the side of the hammer is cut away to provide a recess 51 in which is arranged a small safety arm or lever 50 independently pivoted upon the hammer at 52 and having a limited angular movement therein, the normal position of the said arm being that in which its upper edge abuts against the top of the recess and is retained there by a suitably-applied spring 55 (see Fig. 12).

One end of the lever is extended beyond the back of the hammer to serve as a "thumb-piece" whereby it is actuated when it is desired to permit the hammer to move into the half-cock position while the part which is forward of the pivot and lies against the side of the hammer hub, is formed with a half-cock notch or "bent" 54 which, when the hammer is at full cock and the lever is in its normal and uninfluencing position, approximately coincides with the full-cock notch or "bent" (57).

In addition to the half-cock bent 54, the forward extremity of the safety lever is also formed with a cam-like part 56 which comes below the said bent 54 and lies underneath the nose of the sear when the latter is in engagement with the full-cock bent, so that when the thumb-piece end of the lever is depressed, this part 56 acts cam-wise on the sear and lifts the nose of the latter out of the full-cock bent without however disturbing its engagement with the half-cock bent 54 of the said lever, and on being thus released, the hammer is impelled forward alone, or independently of the safety lever, to an extent equal to the play or relative angular movement which the said lever is designed to make within its recess 51. Finally the hammer and lever become wedged together by the lower edge of the latter

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coming against the bottom edge of the said recess 51 and their tendency to move forward together under the influence of the hammer-spring is prevented by the engagement of the sear in the half-cock bent of the safety lever.

The levering forward of the sear by the safety lever simultaneously tilts the tail or hanging extension 46 rearwardly into a position in which it lies clear of the actuating bar 46 and positively retains the said sear in this position so that it cannot be acted upon or disengaged from the hammer-locking safety device should the trigger be pulled while the hammer is being held in the half-cock position. The sear is tilted and its tail moved out of the way of the actuating bar 45 by reason of the difference in depth of the full and half cock notches in the hammer, that is to say, by reason of the bottom of the half cock notch being farther from the pivotal center of the hammer than that of the full cock notch, which results in the nose of the sear being raised and its tail depressed and thrown backward when the hammer moves from full-cocked to half-cocked position. The discharge from the half-cock is prevented, not because the push-bar cannot act upon the sear tail on the latter beng tilted when acted upon by the safety, but is due solely to the fact that the safety is capable of making only a limited angular movement in its recess in the side of the hammer so that when the hammer is impelled forwards by its spring after the safety device has levered the sear out of the full cock hammer bent, the said safety lever and hammer become wedged together by the lower edge of the latter coming against the bottom edge of the recess 51, and the safety is absolutely incapable of making an independent angular movement in either direction until the hammer is drawn back to full cock. Further, the nose of the sear is never out of engagement with the bent 54 in the safety and therefore, when the hammer and safety are wedged together, the sear is locked with them and cannot be tilted to disengage its nose from the said bent 54 even by the application of considerable effort to the hanging tail.

There is no half-cock bent in the hammer itself and the hammer is only held in the half-cock position by the engagement of the sear with the bent of the safety which is wedged to the said hammer. On the other hand, when the gun is at full cock, the bents of the safety and hammer are in register and both engaged by the sear-nose and to discharge the gun, the sear is tilted and simultaneously disengaged from the bents of hammer and safety which then move forward together.

No stop is employed to limit the range of motion of the push-bar, but as a matter of fact, the push-bar is pivoted to the trigger and a part of the frame is made to serve as a cam and to act upon the said bar in such a manner that after it has been moved by the trigger a certain distance it becomes influenced by the said cam like part of the frame and is constrained to make a downward angular movement which causes it to slip the sear-tail and avoid exerting any positive pressure thereon when in its half-cock position or after the sear has been actuated for discharging the pistol.

The drawing or forcing of the hammer back to its full cock position automatically restores all parts of firing and safety mechanism to their normal positions.

Having fully described my invention, what I desire to claim and secure by Letters Patent is:—

1. In an automatic firearm a detachable barrel, and a trigger-guard constituting means for locking the barrel to the body of the arm.

2. An automatic firearm comprising a stationary barrel, a reciprocatory breech slide, and a resilient trigger-guard constituting a buffer for cushioning the reciprocatory movement of the breech-slide.

3. An automatic firearm, comprising an arm-body having openings, a barrel having recesses, a reciprocatory breech-slide, and a resilient trigger-guard extending through said openings and interlocking with said recesses in the barrel for retaining the barrel upon the arm-body, interlocking parts of the said guard constituting a buffer for cushioning the movements of the breech-slide.

4. In an automatic firearm, the combination with firing mechanism embodying a sear and a hammer, of a safety device mounted in a recess formed in the side of the hammer and having a limited angular movement in said recess whereby when the safety device is depressed the hammer and safety device are wedged together by the hammer-spring and the sear is engaged with the safety device.

5. In an automatic firearm, the combination with the firing mechanism embodying a sear and a hammer, of a safety lever mounted in a recess formed in the hammer and adapted when operated to disengage the sear from the full-cock bent of the hammer, to be engaged by the sear for locking the hammer in a half-cock position and to move the sear from the influence of the trigger mechanism of the firearm.

6. In an automatic firearm, the combination with the firing mechanism thereof, of a safety lever mounted so as to be capable of a limited independent movement within a recess in the hammer and serving as a means for disengaging the sear from the full-cock bent in the hammer, after which it is itself engaged by the sear and locks the hammer in the half-cock position, and further removing and retaining the sear out of the influence of the trigger mechanism.

7. In an automatic firearm, means for locking the hammer in a half-cock position and also placing and positively retaining the sear out of the range of the operating bar of the trigger mechanism, said means comprising a safety lever which is mounted so as to be capable of a limited independent movement within a recess in the side of the hammer and provided with a half-cock bent which when the hammer is at full-cock and the lever is in its normal uninfluencing position approximately coincides with the full-cock bent in the hammer hub and is engaged by the sear which also lies in the full-cock bent of the hammer hub; the said lever also having a cam-like part 56 adapted, on the lever being operated, to tilt the sear so as to disengage the same from the full-cock bent and allow the hammer to be moved forward by its spring to the extent to which it is capable of moving independently of the safety-lever, the collective movement of hammer and lever being then prevented by the engagement of the sear in the half-cock bent of the lever whereby all the parts are locked, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM JOHN WHITING.

Witnesses:
HENRY SKERRETT,
HENRY NORTON SKERRETT.