W. J. WHITING.

MAGAZINE SMALL ARM.

APPLICATION FILED JAN. 27, 1914.

1,121,437.

Patented Dec. 15, 1914.

3 SHEETS—SHEET 1.

Fig. 1.

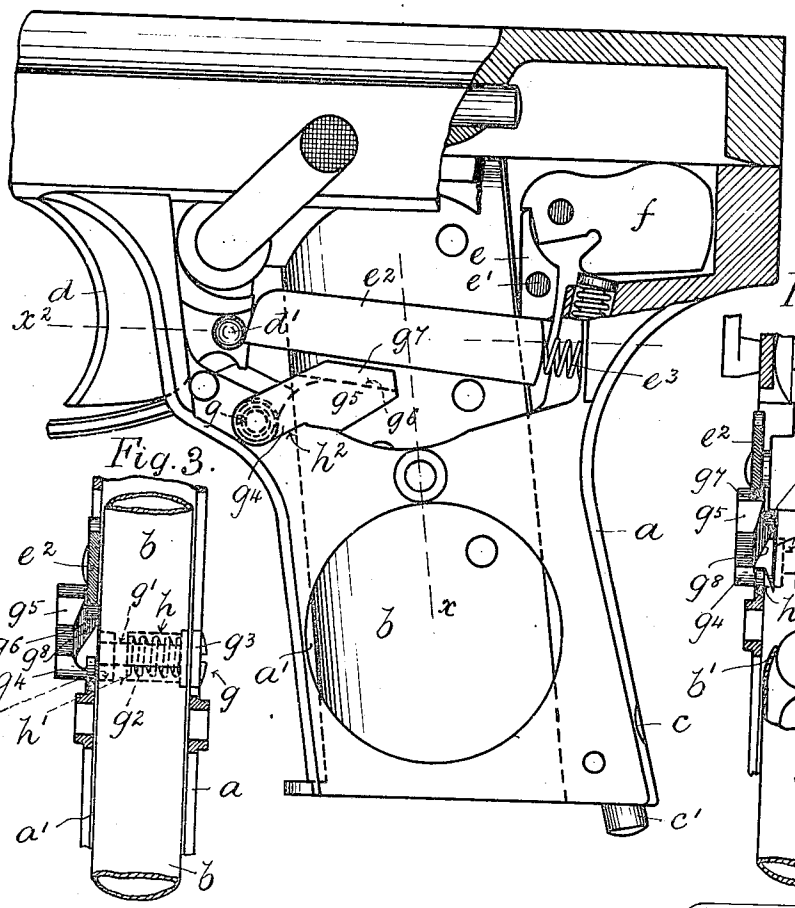


Fig. 3.

Fig. 4.

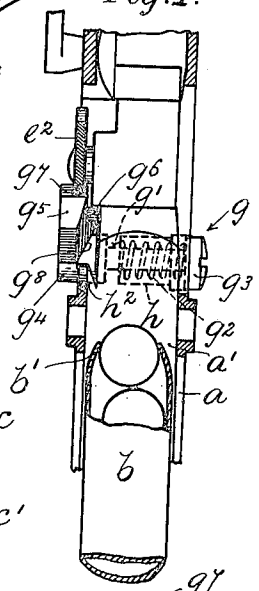


Fig. 5.

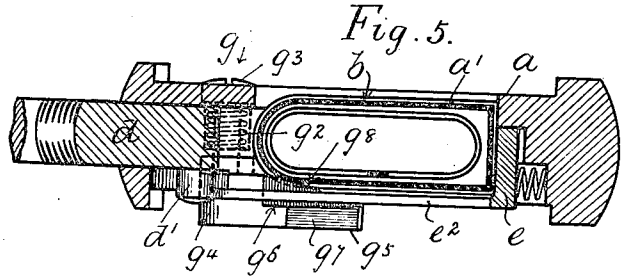
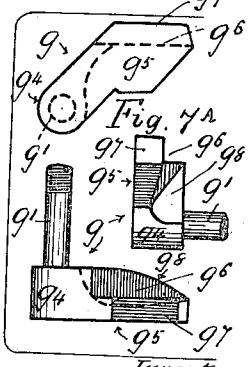


Fig. 7.



Witnesses

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3 SHEETS—SHEET 2.

Fig. 2.

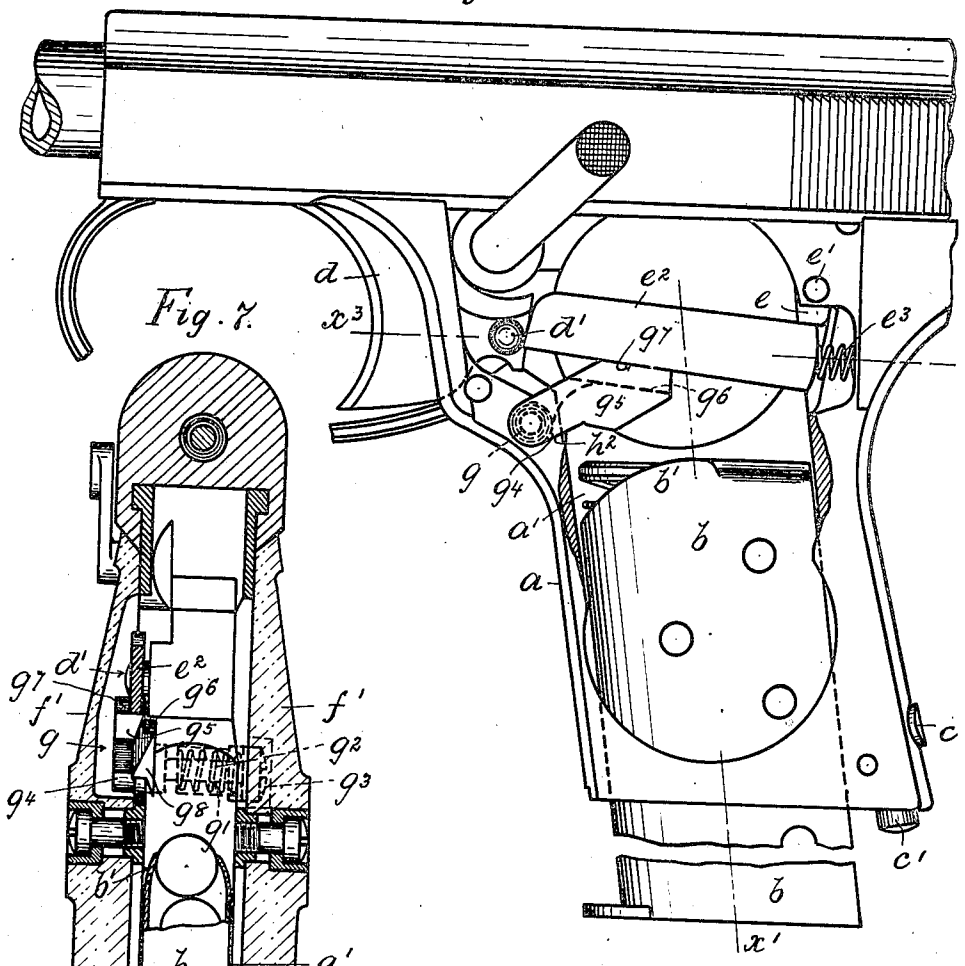
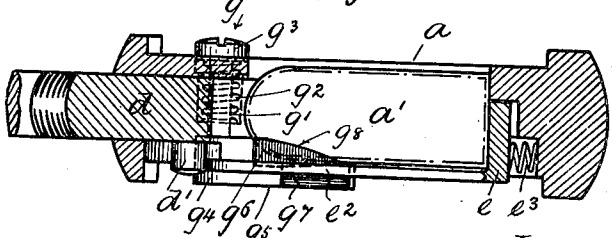


Fig. 7.

Fig. 6.



Witnesses

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3 SHEETS—SHEET 3.

Fig. 8.

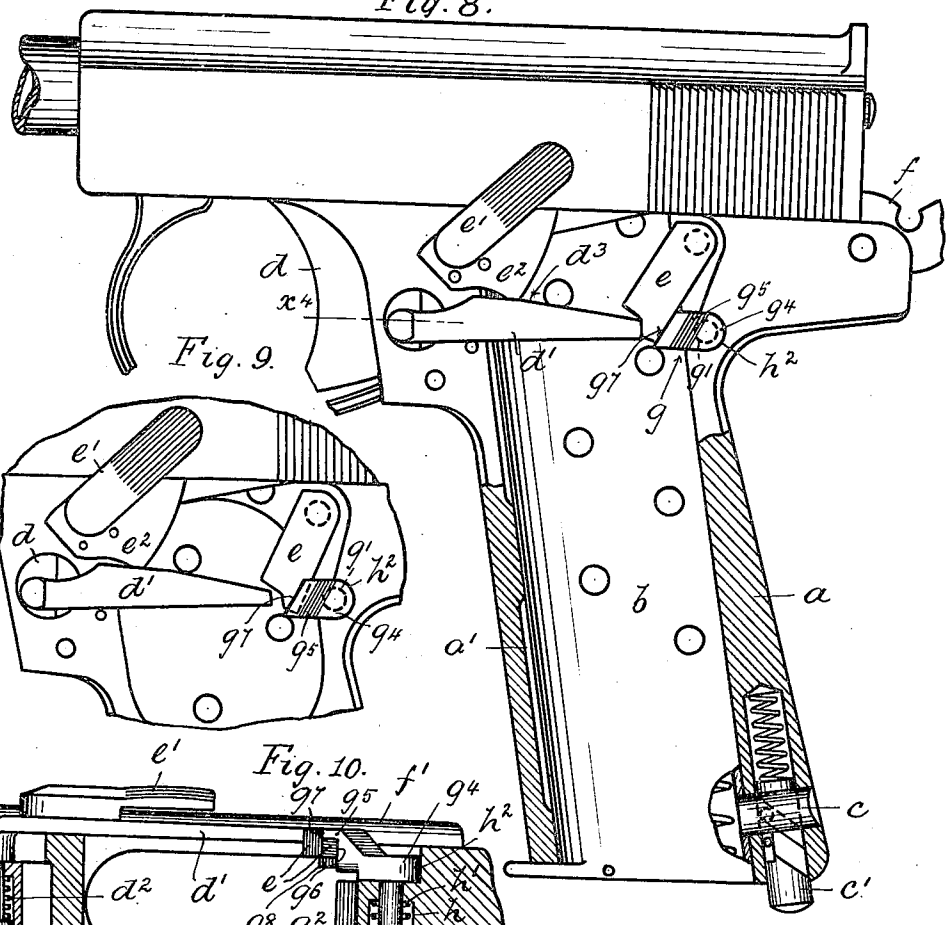
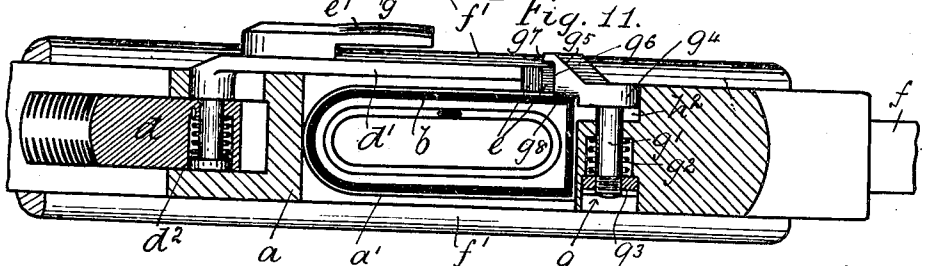


Fig. 9.

Fig. 10.

Fig. 11.



Witnesses

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MAGAZINE SMALL-ARM.

1,121,437. Specification of Letters Patent. Patented Dec. 15, 1914.

Application filed January 27, 1914. Serial No. 814,744.

To all whom it may concern:

Be it known that I, WILLIAM JOHN WHITING, a subject of the King of Great Britain, and a resident of 111 Antrobus road, Handsworth, Birmingham, England, director of public company, have invented new and useful Improvements in Magazine Small-Arms, of which the following is a specification.

This invention has reference to safety mechanism for small-arms of the detachable-magazine type, wherein the safety device is held in an inoperative position by the magazine when the latter is in place in the arm but automatically and directly engages with and locks a member of the firing mechanism when the said magazine is withdrawn.

The present invention consists in improved safety-mechanism of the magazine-controlled type, wherein the automatic locking of the firing mechanism is effected, when the magazine is removed, by a spring-influenced bolt which is devoid of association or connection with any external part of the arm and is preferably entirely inclosed in the frame or body of the said arm so that it cannot be either directly or indirectly actuated or influenced by the user of the arm except through the medium of the detachable magazine. This bolt is adapted to effect the locking of the said firing mechanism by directly engaging either with the sear or with a sear-operating member that crosses the side of the magazine chamber.

The invention will first be described in its application to automatic pistols of the type in which the detachable magazine is contained in a chamber in the handle or grip of the arm, while the trigger is arranged in front of the said grip and is adapted to operate a sear in the rear part of the pistol through a member which extends from said sear across one side of the said magazine-chamber, and is engaged, at its front end, by the trigger.

Figure 1 of the accompanying drawings represents, partly in side elevation and partly in section, an automatic pistol of the above-mentioned type, which is fitted with an auxiliary safety device adapted to act upon the sear of the firing mechanism in accordance with one form of my said invention. In this view, the side plate of the handle or grip is removed to disclose the arrangement of the said firing mechanism and of the inclosed safety device, while the several parts are shown in the positions they respectively assume when the hammer is cocked and the magazine is fastened (by a separate or independent catch) within its chamber in the grip or handle. Fig. 2 is a view, similar to Fig. 1, but showing the magazine partially withdrawn and the firing mechanism locked by the engagement of the magazine-controlled safety device under the sear extension. Fig. 3 is a partial vertical section of Fig. 1 on the dotted line x. Fig. 4 is another partial vertical section, but taken on the dotted line x' Fig. 2. Fig. 5 is a horizontal section of the pistol on the dotted line x^2 Fig. 1 looking upward and showing the position in which the safety bolt is held by the magazine when the latter is fastened in the magazine chamber. Fig. 6 is another horizontal section, but taken on the dotted line x^3 Fig. 2 to show the position which the safety-bolt automatically assumes with respect to the sear extension when the magazine is withdrawn. Fig. 7 is a vertical section, similar to Fig. 4, but showing also the side plates (which inclose and conceal the safety device) attached to the frame of the pistol-grip or handle. Fig. 7^A shows detail views of the safety-bolt separately. Fig. 8 is a part-sectional side elevation of a modification, the several parts being shown in the positions which they assume when the hammer is cocked and the magazine secured in the magazine chamber. Fig. 9 is an enlarged, fragmental detail of Fig. 8, but showing the positions which the parts of the firing mechanism assume after the trigger has been pulled and the magazine is in position. Fig. 10 is a horizontal section on the dotted line x^4, Fig. 8, looking upward. Fig. 11 is a sectional view similar to Fig. 10, but showing the position assumed by the safety device when the magazine is withdrawn.

The same letters of reference indicate corresponding parts in the said Figs. 1 to 7.

In the pistol shown in these figures, the handle or grip a of the frame is formed with a chamber a' for the reception of the detachable magazine b, which is secured in the said chamber by a spring latch c whose disengagement is effected mainly through a release push-piece c'.

The firing mechanism comprises a trigger

d and a hammer f, which is pivoted in the rear of the frame, and is associated with a sear e that is pivoted at e' and carries a rigid extension e^2 which projects forwardly across the side of the magazine chamber a'. The said sear e, e^2 is influenced by a sear-spring e^3 whereby, when the arm is cocked, the front end of the extension e^2 is held in engagement with a laterally yielding contact stud d' that is mounted in the side of the trigger d; the arrangement being such that on the said trigger being pulled when the magazine is in its normal position (as in Fig. 1), the stud d' trips the sear e, e^2 and so releases the hammer.

Proceeding now to describe the magazine-controlled safety device which constitutes the present invention; this is fitted within the frame or body of the pistol, immediately below the sear extension e^2 and is entirely inclosed when the side plates f' are attached to the grip a. It consists of a transversely-disposed bolt g, which is located in a shouldered recess h in the frame, and whose stem g' is surrounded by a spring g^2 having one abutment against the shoulder h' of the said recess h and its other abutment against a collar g^3 that is screwed or otherwise attached to the extremity of the said stem g'. The head g^4 of this bolt is fitted within an open-sided seat h^2 on the firing mechanism side of the frame; this seat being so shaped that while it admits of the bolt sliding transversely to the frame in both directions, it secures the same against angular displacement and holds the sear-locking portion g^5 thereof in its proper relationship to the sear-extension e^2 in both positions of the safety device. The said sear-locking portion g^5 is positioned below the sear-extension e^2, and is cut away on its inner side to provide a clearance g^6 which registers with the said extension when the safety device is held in its inoperative position by the magazine, and is of sufficient depth to permit said extension to make its hammer-releasing movement when actuated by the trigger while the effective part g^7 of the sear-locking portion g^5 is beveled to correspond to the inclined bottom edge of the sear-extension and is adapted to fit closely underneath the same and so prevent its disengagement from the cocked hammer when the safety device assumes its operative position on the magazine being withdrawn. The inner side of the portion g^5 is also formed with a shoulder or cam g^8 that projects laterally into the magazine-chamber a' in the grip a when the safety-device is in its operative or sear-locking position (see Fig. 4) and against which the upper end of the magazine impinges during its insertion into the chamber a', and thereby imparts to the said bolt an outward lateral motion for removing the part g^7 from underneath the sear-extension and so releasing the firing mechanism. With such an arrangement, when the chamber a' contains no magazine, the safety bolt is held by its spring in its effective or operative position as shown in Figs. 2, 4, 6 and 7, in which the part g^7 of the said bolt engages closely underneath the sear-extension so that the latter is locked against angular movement and therefore cannot be tripped in order to release the hammer by the actuation of the trigger. In this position also, the cam or projection g^8 of the bolt lies inside the magazine-chamber a' (see Figs. 6 and 7) so that on the magazine being inserted and pushed home into the said chamber, the curved lip or extension b' at its upper end contacts with and wipes past the said cam and thereby imparts an outward lateral movement to the safety bolt. By this motion, the part g^7 of the said bolt is shifted from under the sear-extension and the clearance g^6 is brought into register therewith as shown in Fig. 3, so that the firing mechanism is freed and can be actuated for discharging the arm on the trigger being pulled, while simultaneously the safety-bolt spring is compressed and rendered active for automatically restoring the device to its sear-locking position when the magazine is withdrawn.

When the magazine is fully home in its chamber and is locked therein by the magazine latch c, its flat side bears against the inner face of the safety-bolt head (see Fig. 3) and the said magazine functions to positively retain the said bolt in its inoperative position and to hold the bolt-spring in compressed condition. But as soon as, during its removal, the magazine is withdrawn clear of the inwardly-projecting cam g^8, the bolt-spring is released and immediately functions to give a lateral inward movement to the said bolt in order to reëngage the part g^7 under the sear-extension and thus automatically locking the firing mechanism.

A magazine-controlled safety-bolt, similar to that above described, may also be applied for automatically locking the firing mechanism of pistols and other firearms of the type in which the sear is actuated by a bar that is pivoted to the trigger and extends across one side of the magazine-chamber into engagement with the tail of the said sear. This locking action may be provided for by adapting the bolt to engage directly behind the sear itself when the magazine is withdrawn, or the said bolt may be arranged to engage under the pivoted sear-tripping bar.

In the pistol shown in Figs. 8 to 11, a' is the magazine-chamber in the grip a of the frame, b is the detachable magazine and c, c' the magazine-latch.

The firing mechanism comprises a trigger d, a sear-tripping bar d' pivoted on the trigger, a sear e and a hammer f; the said

bar d' which extends across one side of the magazine-chamber a' being influenced by a spring d^2 whereby its rear end is normally maintained in engagement with the tail of the sear as shown in Fig. 8. This firing mechanism is associated with a hand-controlled safety device comprising an external lever e' and a cam e^2, and when the said device is placed in the firing position the inclined upper edge d^3 of the sear tripping bar is held in contact with the said cam e^2 so that on the trigger being pulled for actuating the sear-tripping bar d', the incline d^3 is made to ride under the cam e^2, with the result that after having tripped the sear, the said bar is depressed and its rear end is held clear of the sear tail by the said cam e^2 until the finger pressure on the trigger is relieved, whereupon the said bar is lifted back into engagement with the said sear-tail by its spring d^2. But when the hand-controlled safety is shifted into its "safe" position by means of the external lever e', the cam then depresses the bar d' and holds its rear end clear of the sear tail so that if the trigger should be pulled when the hammer is cocked, the said bar merely makes an idle movement without tripping the sear from its engagement with the said hammer.

The auxiliary and magazine-controlled safety device (which is fitted in the frame of the pistol immediately behind the upper part of the chamber a' and is entirely inclosed by the side-plates f' of the grip a) consists of a transversely disposed bolt g, which is located at the back of the sear e in the shouldered recess h in the frame, the stem g' of this bolt being surrounded by a spring g^2 having one abutment against the shoulder h' of the said recess h and its other abutment against a collar g^3 that is screwed or otherwise attached to the extremity of the said stem g'. The head g^4 of the bolt is fitted within an open-sided seat h^2 on the firing mechanism side of the frame; this seat being so shaped that while it admits of the bolt sliding transversely to the frame in both directions, it secures the head g^4 against angular displacement and holds the sear-locking portion g^5 thereof in its proper relationship to the sear in both positions of the safety device. The said sear-locking portion g^5 is cut away on its inner side to provide a clearance g^6 which registers with the sear when the safety device is held in its inoperative position by the magazine, and is of sufficient depth to admit of the said sear making its hammer-releasing movement when actuated by its tripping bar, while the effective part g^7 of the said locking portion is beveled to correspond to the inclined back edge of the sear and is adapted to fit closely behind the said sear and prevent its disengagement from the cocked hammer when the safety device assumes its operative position on the magazine being withdrawn.

The inner side of the locking portion g^5 is also formed with a shoulder or cam g^8 that projects laterally into the magazine-chamber a' in the grip a when the safety-device is in its operative or sear-locking position, and against which the upper end of the magazine impinges during its insertion into the chamber a' and thereby imparts to the said bolt an outward lateral motion for removing the part g^7 from behind the sear and so releasing the firing mechanism. With such an arrangement, when the chamber a' contains no magazine, the safety bolt is held by its spring in its effective or operative position as shown in Figs. 8 and 10, in which the part g^7 of the said bolt engages closely behind the sear so that the latter is blocked against angular movement in the rearward direction and therefore cannot be tripped out of its engagement with the cocked hammer by the actuation of the trigger and sear-tripping bar. In this position also, the cam or projection g^8 of the bolt lies inside the magazine-chamber a' so that on the magazine being inserted and pushed home into the said chamber, a curved lip or extension at its upper end contacts with and wipes past the said cam and thereby imparts an outward lateral movement to the safety bolt. By this motion, the part g^7 of the said bolt is disengaged from the sear and the clearance g^6 is brought into register therewith so that the firing mechanism is freed and can be actuated for discharging the arm on the trigger being pulled while simultaneously the safety-bolt spring is compressed and rendered active for automatically restoring the device to its sear-locking position when the magazine is withdrawn.

When the magazine is fully home in its chamber and is locked therein by the magazine latch c, its flat side bears against the inner face of the safety-bolt head and the said magazine functions to positively retain the said bolt in its inoperative position and to hold the bolt-spring in compressed condition. But when, during its removal, the magazine is withdrawn below the plane of the bolt, the bolt-spring is released and immediately functions to give a lateral movement to the said bolt in order to reëngage the part g^7 behind the sear and thus automatically lock the firing mechanism.

In the further modification of my invention in which the magazine-controlled safety device is adapted to act upon the sear-tripping bar for the purpose of so locking the same that it cannot (so long as the magazine is not in position) operate to trip the sear when finger-pressure is applied to the trigger, the spring-influenced bolt constituting

the said safety device is fitted transversely in the frame, in front of the magazine-chamber and is constructed and arranged in a similar manner to the sear-locking bolt already described with reference to Figs. 8 to 11, except that the head of the said bolt occupies a horizontal position in a plane below the sear-tripping bar and is so arranged that, when the magazine is in place, one side of the said magazine contacts with the cam or projection on the inner face of the bolt-head and thus maintains the clearance underneath the tripping bar so as to allow the latter to make its prescribed sear-releasing movement when the trigger is pulled, whereas on the magazine being withdrawn, the bolt is automatically shifted over by its spring and the locking portion of the bolt-head is brought under the tripping bar. The said bar is thus confined or wedged between the head of the bolt and the cam of a hand-operated safety device (similar to the device marked e^2 in Figs. 8 to 11) and cannot then be actuated for releasing the sear by the application of finger pressure to the trigger, and, as in the previously described arrangement, the lock on the firing mechanism is released when the top of the magazine, during its upward movement within the grip chamber, strikes against the cam or projection and thereby forces the bolt outward in opposition to its spring.

If desired, and especially in small arms wherein the sear-tripping bar is not associated with a hand-operated safety device, the head of the magazine-controlled safety-bolt may be arranged so that (on being moved by its spring into its effective position when the magazine is withdrawn) it engages within a recess or notch in the tripping bar and so positively locks the same.

In each of the pistols shown in the drawings, the automatic or self-engaging safety device, together with the firing mechanism on which it acts, is completely inclosed within the frame, and as it is therefore inaccessible to the user of the arm, it cannot be put out of action or disengaged from the firing mechanism in any way except by the movement which it derives from the magazine during the completion of the introduction of the said magazine into its chamber. It consequently follows that should an unfired cartridge be left in the barrel of the pistol when the magazine is withdrawn, it is impossible for this cartridge to be discharged until the magazine has been reintroduced.

The application of the invention to other pistols and small arms having detachable magazines differs in no essential respect from its application as herein described to automatic pistols of the types shown in the drawings.

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

1. In an automatic pistol, or like small-arm, the combination, with the firing mechanism and the magazine; of a movable safety-bolt located directly adjacent the sear and having a head engageable by the magazine when the latter is in place in its chamber, said head being shifted, consequent upon such engagement, out of the path of the sear, to permit actuation of the firing mechanism; and a spring for moving the said head into engagement with said sear when said magazine is withdrawn, to lock said firing mechanism against actuation.

2. In an automatic pistol, or like small-arm, the combination, with the firing mechanism and the magazine; of a laterally-movable safety-bolt located directly adjacent the sear and engageable by the magazine when the latter is in place in its chamber, said bolt being shifted, consequent upon such engagement, out of the path of the sear, to permit actuation of the firing mechanism; and a spring for moving said bolt into engagement with said sear when said magazine is withdrawn, to lock said firing mechanism against actuation.

3. In an automatic pistol, or like small-arm, the combination, with the firing mechanism and the magazine; of a laterally-movable safety-bolt wholly concealed within the frame of the arm and located directly adjacent the sear, said bolt being engageable by the magazine when the latter is in place in its chamber, and being shifted, consequent upon such engagement, out of the path of the sear, to permit actuation of the firing mechanism; and a spring for moving said bolt into engagement with said sear when said magazine is withdrawn, to lock said firing mechanism against actuation.

4. In an automatic pistol, or like small-arm, the combination, with the firing mechanism and the magazine; of a movable safety-bolt located directly adjacent the sear and having a recessed head engageable by the magazine when the latter is in place in its chamber, said head being shifted, consequent upon such engagement, to bring its recess into alinement with the sear, for permitting actuation of the firing mechanism; and a spring for moving said head in the opposite direction when the magazine is withdrawn, to bring said recess out of such alinement, for locking said firing mechanism against actuation.

5. In an automatic pistol, or like small-arm, the combination, with the firing mechanism and the magazine, the frame of said arm having a seat directly adjacent the sear; of a safety-bolt having a head which fits in said seat and is held thereby against turning, said head being engageable by the

magazine when the latter is in place in said chamber and being shifted laterally in said seat, consequent upon such engagement, out of the path of the sear, to permit actuation of the firing mechanism; and a spring for shifting said head laterally in the opposite direction in said seat into engagement with said sear when said magazine is withdrawn, to lock said firing mechanism against actuation.

6. In an automatic pistol, or like small-arm, the combination, with the firing mechanism and the magazine; of a safety-bolt located directly adjacent the sear and engageable by the magazine when the latter is in place in its chamber, said bolt being shifted, consequent upon such engagement, out of the path of the sear, to permit actuation of the firing mechanism; a spring for moving said bolt into engagement with said sear when said magazine is withdrawn, to lock said firing mechanism against actuation; and a hand-operated safety-device for moving the sear-actuating member into inoperative position with relation to the sear.

7. In an automatic pistol, or like small-arm, the combination, with the firing mechanism and the magazine; of a movable safety-device located directly adjacent the sear and engageable by the magazine when the latter is in place in its chamber, said device being shifted, consequent upon said engagement, out of the path of the sear, to permit actuation of the firing mechanism; and means for automatically moving said device into engagement with the sear when the magazine is withdrawn, to lock said firing mechanism against actuation.

8. In an automatic pistol, or like small-arm, the combination, with the firing mechanism and the magazine, the former including a pivotally-mounted sear having a forwardly-projecting, rigid extension; of a movable safety-bolt having a head which is located directly beneath the sear extension and is engageable by the magazine when the latter is in place in its chamber, said head being shifted, consequent upon such engagement, out of the path of said extension, to permit actuation of the firing mechanism; and a spring for moving the said head into engagement with said extension when said magazine is withdrawn, to lock said firing mechanism against actuation.

9. In an automatic pistol, or like small-arm, the combination, with the firing mechanism and the magazine, the former including a pivotally-mounted sear having a forwardly-projecting extension, and a trigger provided at one side with a contact stud normally engaged with the front end of the sear extension, to trip the sear when the trigger is pulled; of a movable safety-bolt having a head which is located directly beneath the sear extension and is engageable by the magazine when the latter is in place in its chamber, said head being shifted, consequent upon such engagement, out of the path of said extension, to permit said sear to be tripped; and a spring for moving the said head into engagement with said extension when said magazine is withdrawn, to lock said firing mechanism against tripping.

10. In an automatic pistol, or like small-arm, the combination, with the firing mechanism and the magazine, the former including a pivotally-mounted sear having a forwardly-projecting, rigid extension; of a movable safety-bolt having a recessed head which is located directly beneath the sear extension and is engageable by the magazine when the latter is in place in its chamber, said head being shifted, consequent upon such engagement, to bring its recess into alinement with said extension, for permitting actuation of the firing mechanism; and a spring for moving said head in the opposite direction when the magazine is withdrawn, to bring said recess out of such alinement, for locking said firing mechanism against actuation.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM JOHN WHITING.

Witnesses:
ARTHUR SADLER,
R. E. SMITH.