April 26, 1932. C. C. LOOMIS 1,855,403

FIREARM

Filed Sept. 11, 1930

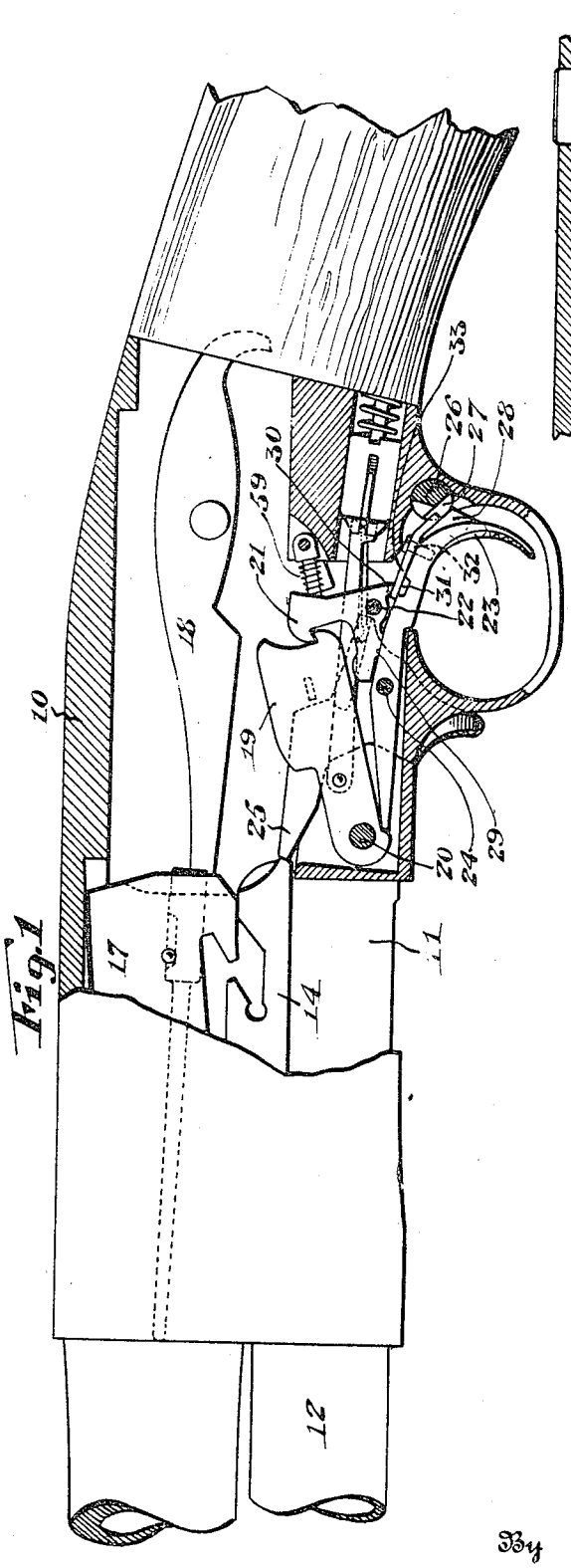

Fig. 1

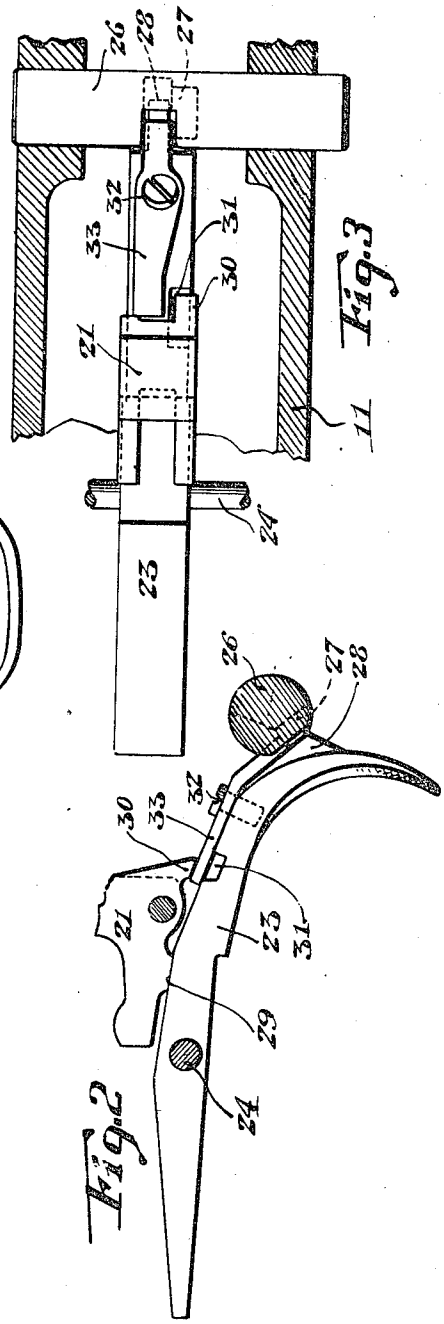

Fig. 2

Fig. 3

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UNITED STATES PATENT OFFICE

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FIREARM

Application filed September 11, 1930. Serial No. 481,276.

This invention relates to firearms, and particularly to a safety mechanism for firearms. For the purpose of illustration, the invention has been shown in the drawings and will be herein described as applied to a firearm of the type illustrated in my pending application, Serial No. 135,583, filed September 15, 1926, or my Patent No. 1,763,714, June 17, 1930, but it is to be understood that the invention is of general application, and not limited to these particular firearms.

In guns of this type, shells or cartridges are stored in a tubular magazine extending longitudinally beneath the barrel, and are transferred one at a time to the chamber, and the shell in the chamber is fired by the impact therewith of a firing pin driven forward by a blow from a pivoted hammer, which is held in cocked position by the engagement with a notch therein of the nose of a sear integral with the trigger.

When the gun has been fired, the functions of unlocking and retracting the breech block, ejecting the empty shell, cocking the hammer, transferring a fresh shell from the magazine to the chamber, and advancing and locking the breech block, are all performed by reciprocating an action bar attached to the forearm, the movement of the action bar and forearm being first rearward, then forward to initial position. Since guns of this type are fired from the shoulder, and are usually held against the shoulder by means of the forearm, it is necessary that the action bar be locked against rearward movement when the gun is in ready-to-fire condition. To this end, an action bar lock is provided, and a control device therefor, associated with the hammer, prevents retraction of the action bar while the hammer is cocked, unless the lock is released by manipulation of an extending finger piece.

It is likewise desirable that means be provided for preventing the fall of the hammer until the action bar has been fully advanced, thereby closing the breech and locking the breech block. The hammer is concealed in the receiver, and in order to cock the hammer it is necessary to fully operate the action. If the hammer can be moved forward as the action is closed by holding the trigger depressed or by other manipulation, the hammer can be cocked only by again operating the action and thereby ejecting the unfired shell in the chamber.

Moreover, if the hammer can be released to move forward when the breech block is not closed and locked, there is danger that a shell or cartridge may be fired with the breech block in this condition, with serious injury to the mechanism or the shooter, or both. Such a misfunctioning must be positively prevented.

Another accidental discharge of a firearm which, while a comparatively rare occurrence, is, nevertheless, undesirable, may be occasioned by striking a sharp blow upon the receiver or upon some particular part of the receiver. Most modern firearms are provided with a manipulative safety device which in one position prevents the discharge of the arm by the usual pressure upon the trigger. These devices may engage either with the hammer or the trigger. In the event that they engage the hammer, the trigger is free to be moved but its movement does not cause the hammer to fall, the hammer being held by the safety device. In such constructions, however, it sometimes happens that the safety device permits a sufficient movement of the hammer to prevent its re-engagement by the trigger (or the sear) so that if the trigger has once been depressed with the safe "on" a subsequent movement of the safe to "off" position will effect the fall of the hammer.

In another type of safety device, the movement of the trigger is blocked. If the mechanism comprises a sear intermediate the trigger and the hammer, a sharp blow upon some part of the receiver may cause a rocking movement of the sear, notwithstanding the trigger cannot be moved, and the gun may thus be accidentally discharged.

It is an object of the present invention to provide, in conjunction with a trigger blocking safety, a device for positively holding the sear in engagement with the hammer at the time the movement of the trigger is blocked.

It is a further object of the invention to provide a sear movement blocking device which is operated by a trigger engaging safety member.

It is a further object of the invention to provide a sear blocking device which is associated with the trigger in such a manner as to become effective when the trigger is locked against movement.

With these and other incidental objects in view, the invention consists in the novel mechanisms and constructions a representative embodiment of which is illustrated in the accompanying drawings.

In the drawings:

Fig. 1 is a fragmentary longitudinal side elevation, partly in section, of a firearm embodying one form of the invention.

Fig. 2 is an enlarged detail view in side elevation of parts of the mechanism shown in Fig. 1.

Fig. 3 is a detail sectional plan view of a part of the mechanism shown in Fig. 1.

The fire control mechanism is housed in a receiver or frame 10 having a bottom opening 11 through which the fresh shells are inserted into the magazine 12 and the empty shell cases are ejected. Slidably mounted in the sides of the frame is an action bar slide 14, adapted for connection to an action bar associated with the usual forearm (not shown). The action bar slide 14 is thus adapted to be reciprocated by manipulation of the forearm, and the reciprocation of the action bar controls the operations incident to ejecting the empty shell case from the chamber and feeding the fresh shell from the magazine to the chamber in the manner which will be hereinafter described. The breech block is identified by numeral 17. One form of "carrier" for the transfer of cartridges from the magazine entrance to the chamber entrance is shown at 18, but the carrier may take other forms, such for example as that shown in my Patent No. 1,763,714.

The fire control mechanism comprises a hammer 19, pivoted at 20, a hammer engaging sear 21, pivoted at 22, a trigger 23, pivoted at 24, and an action bar lock 25 provided with an extending finger piece. A cross-bolt safety 26 is provided with a cut-out 27 which, in one position of the cross-bolt 26, receives a ledge 28 on the trigger, which ledge in other positions of the bolt 26 is engaged by the side of the bolt and blocks movement of the trigger. The mechanism thus far described may be similar in construction and operation with that described in the aforementioned application, Serial No. 135,582.

It will be noted that in this construction the sear 21 may be rocked counter-clockwise (Fig. 1) about its pivot 22, and thereby become disengaged from the hammer, notwithstanding movement of the trigger is blocked by the cross-bolt safety 26. The sear is held in hammer engaging position partly by its friction with the hammer and partly by the light spring 59. If the rear end of the trigger guard is struck a sharp blow both the hammer and the sear tend to rock counter-clockwise about their pivots. A very slight movement of the hammer would remove the friction between the hammer shoulder and the sear notch, leaving the sear pressed into hammer engaging position only by spring 59. If the force of the blow is sufficient, the sear may be rocked against the compression of said spring and the hammer disengaged. The possibility of this misoperation is, of course, remote but the present invention provides means for positively holding the sear in hammer engaging position at all times when the trigger is locked, thereby rendering the gun absolutely safe.

The illustrative embodiment of mechanism for this purpose, shown in the drawings, is as follows: The sear, which contacts with the trigger for operation thereby at 29, forward from its pivot, is provided at the rear of its pivot with a surface facing the trigger, which may take the form of a foot 30, adapted, when the sear is rocked by depressing the trigger, to be received in a notch 31 in the trigger. By interposing a suitable device, controlled by the cross-bolt 26, between the trigger and the rearward part of the sear, the sear as well as the trigger can be controlled by the cross-bolt. The mechanism for this purpose may be as follows: Pivoted in any convenient position, for example at 32 upon the trigger 23, is a sear locking lever 33, the forward end of which extends beneath the foot 30 and preferably bridges the notch 31, its forward end overlying the trigger in front of this notch. The rearward end of lever 33 overlies the ledge 28 on the trigger and extends into the cut-out 27 in the cross-bolt 26. An additional cut 34 is made in the cross-bolt, above the cut 27, to receive the end of lever 33 when the trigger is depressed. When the cross-bolt 26 is in the position shown in Fig. 3, the forward end of lever 33 is clear of the foot 30 on the sear and cut-out 27 stands opposite the ledge 28. Thus, the arm can be fired by depressing the trigger. When the cross-bolt is shifted to the right from this position, not only is the cut-out 27 taken out of the path of movement of the ledge 28 but lever 33 is rocked on its pivot 32 by reason of its engagement with the sides of cut-out 27 and its forward end is interposed between the foot 30 and the notch 31, thereby positively locking the sear in engagement with the hammer. As long as the cross-bolt safety 26 remains in this position, the sear cannot be disengaged from the hammer by shocks, blows, or any other disturbance in or upon any part of the receiver.

It should be borne in mind that the foregoing description and the drawings have been prepared merely as an illustration of a typical form of an invention which may be embodied in many other forms all falling within the scope of the appended claims.

What is claimed is:

1. In a firearm, a trigger, a sear, a safety member adapted to lock said trigger, and a sear lock operated by said safety member and moved thereby to effective position.

2. In a firearm, a trigger, a sear, a safety device adapted to lock said trigger, and a sear lock positively moved by said safety device both to an effective position and to an ineffective position.

3. In a firearm, a trigger, a sear, a safety member adapted to lock said trigger, and a sear lock comprising an element positively moved in two directions by said safety member.

4. In a firearm, a trigger, a sear, a safety member adapted to lock said trigger, and a sear lock comprising a pivoted lever in engagement with said safety member.

5. In a firearm, a trigger, a sear, a safety member adapted to lock said trigger, and a sear lock actuated by said safety member and adapted to be interposed between said trigger and said sear.

6. In a firearm, a trigger, a sear, and a sear lock rendered effective by being interposed between said sear and said trigger.

7. In a firearm, a trigger, a sear, and a sear lock comprising an element pivoted on the trigger.

8. In a firearm, a trigger, a sear, and a sear lock comprising a pivoted lever adapted to be interposed between said sear and said trigger.

9. In a firearm, a trigger, a sear, a safety member adapted to lock said trigger, and a sear lock comprising an element in engagement with said safety member and adapted to be interposed thereby between said sear and said trigger.

10. In a firearm, a trigger, a sear, a safety member adapted to lock said trigger, and a sear lock comprising an element pivoted on the trigger and actuated by said safety member.

11. In a firearm, a trigger, a sear, a safety member adapted to lock said trigger, and a sear lock comprising an element pivoted on the trigger, actuated by said safety member, and adapted to be interposed thereby between said sear and said trigger.

12. In a firearm, a firing hammer, a hammer engaging sear comprising a foot, a sear actuating trigger comprising a notch adapted to receive said foot when said trigger is depressed, and a manipulative device adapted to be interposed between said foot and said notch.

13. In a firearm, a firing hammer, a trigger, a pivoted hammer engaging sear having an operative contact with said trigger at one side of its pivot and a part extending toward said trigger on the opposite side of said pivot, and a sear locking member adapted to be interposed between said trigger and said extending part of the sear.

14. In a firearm, a firing hammer, a hammer engaging sear, a sear actuating trigger, a cross-bolt safety member, and a sear locking member comprising a lever pivoted on said trigger and actuated by said cross-bolt safety member.

15. In a firearm, a firing hammer, a hammer engaging sear, a sear actuating trigger, a cross-bolt safety member, and a sear locking member positively moved in two directions by said cross-bolt safety member.

16. In a firearm, a firing hammer, a hammer engaging sear, a sear actuating trigger, a cross-bolt safety member, and a sear locking member comprising an element engaged by said cross-bolt safety member and adapted to be shifted into effective position by movement of said cross-bolt.

17. In a firearm, a firing hammer, a hammer engaging sear, a sear actuating trigger, a cross-bolt safety member, and a sear locking member adapted to be positively moved both to effective position and to ineffective position by said cross-bolt safety member.

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