May 3, 1927. 1,626,867

C. A. NELSON

FIREARM

Filed June 12, 1920 2 Sheets-Sheet 1

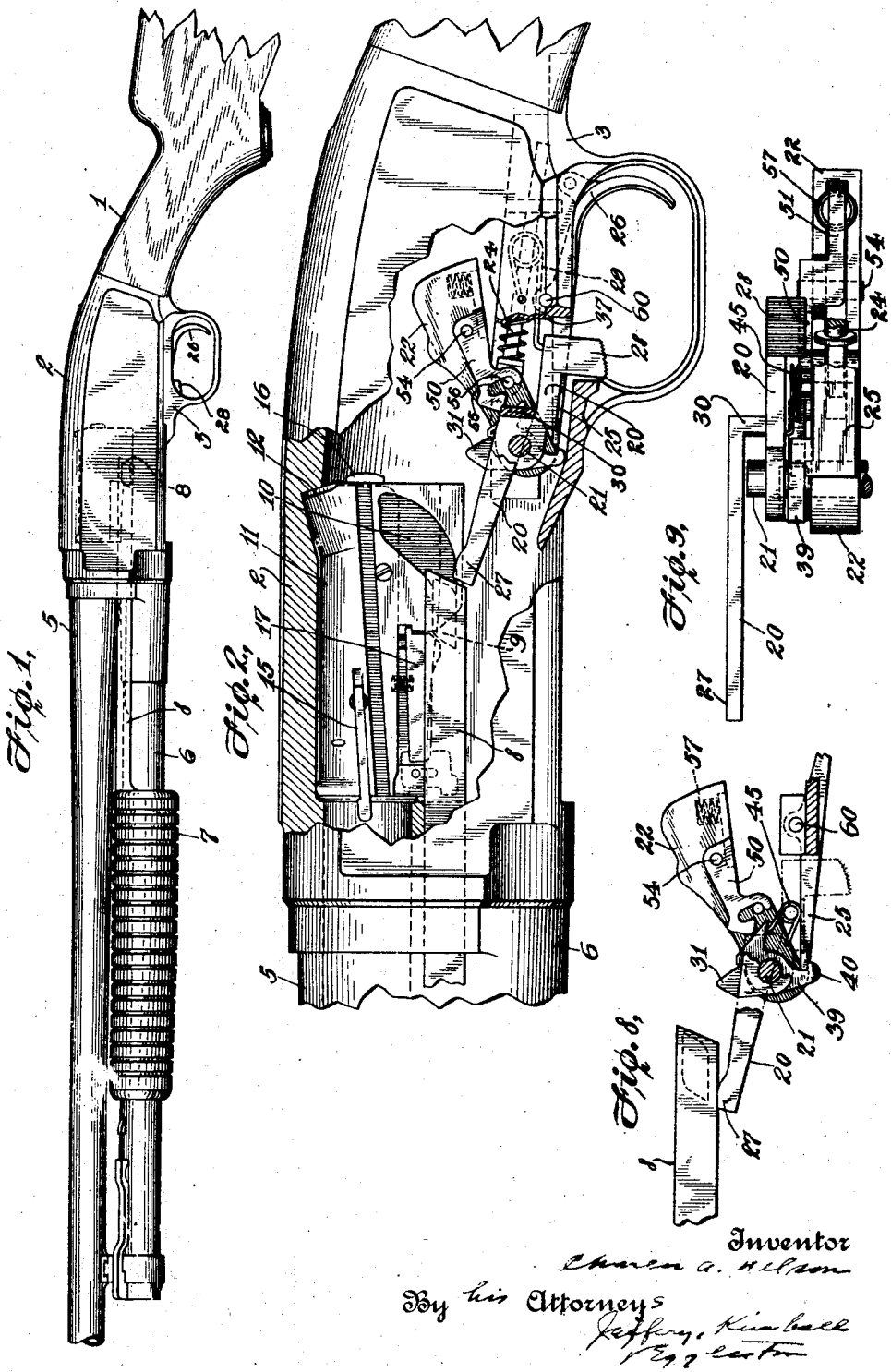


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

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Filed June 12, 1920 2 Sheets-Sheet 2

Fig. 3,

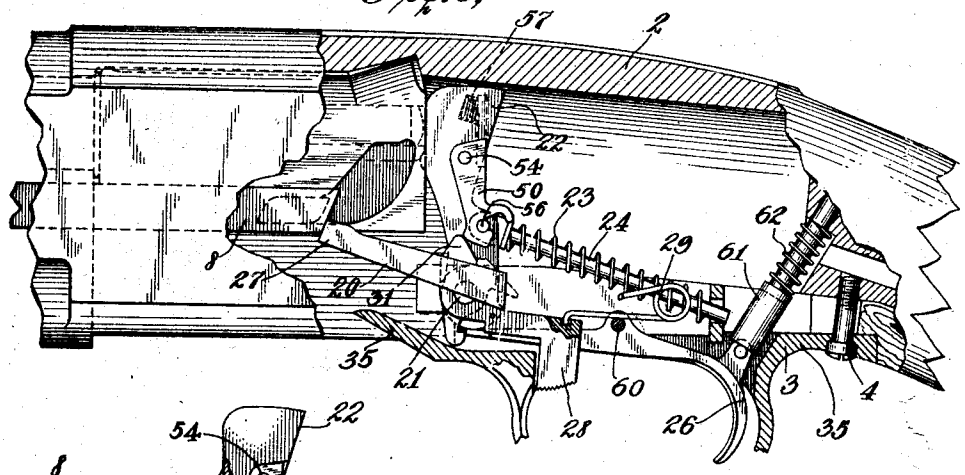


Fig. 4,

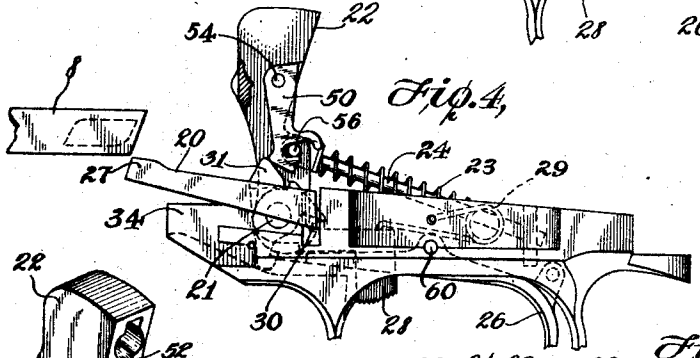


Fig. 11,

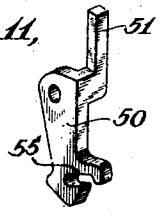


Fig. 10,

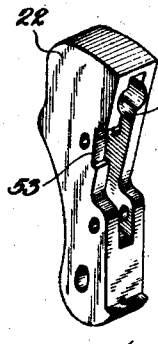


Fig. 5,

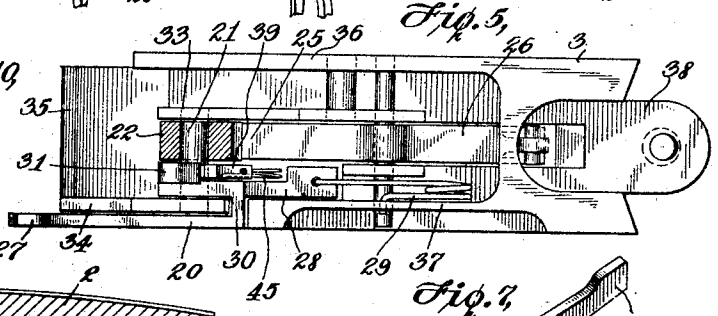


Fig. 6,

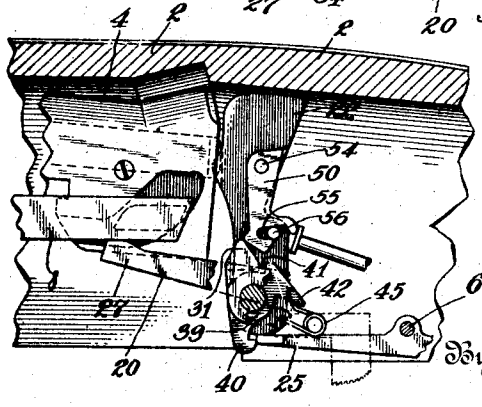


Fig. 7,

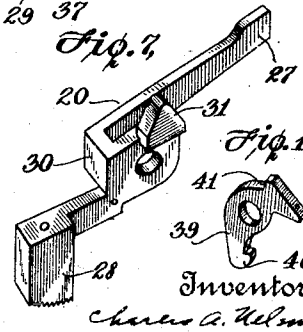


Fig. 12,

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Patented May 3, 1927. 1,626,867

UNITED STATES PATENT OFFICE.

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FIREARM.

Application filed June 12, 1920. Serial No. 388,458.

My invention relates to repeating firearms, and particularly to those in which a reciprocating action bar adjacent the barrel operates the reloading mechanism. The object of my invention is to improve the safety devices which prevent the firing of a cartridge until the gun is fully locked up for firing. To this end, I provide an action bar lock having improved actuating means, an improved lock for the trigger mechanism, and improved means for controlling the latter lock, these several factors constituting features of my invention independently and in combination as will later appear. The invention also comprehends the structure and relative arrangement of the various parts and combinations and sub-combinations thereof looking toward simplicity and compactness of the arm.

In the accompanying two sheets of drawings which illustrate the preferred form of my invention, Fig. 1 is an elevation of a part of the repeating firearm in which the invention is embodied. Fig. 2 is an elevation of the receiver portion of the arm broken away to show the interior; the parts are in the positions they assume when the gun is ready for firing. Fig. 3, similar to Fig. 2 shows the parts in their positions at the instant of firing. Fig. 4 is an elevation of the action bar and parts adjacent the hammer in position for re-loading. Fig. 5 is a plan view of the mechanism adjacent the hammer, the hammer being in section and its spring mechanism omitted, and Fig. 6 is a detail of the lock mechanism at the beginning of the opening movement of the gun, the action bar lock being broken away. Fig. 7 is a perspective view of the action bar lock. Fig. 8 shows the parts of Fig. 6 in a later position. Fig. 9 is a bottom plan of the hammer pivot assembly. Figs. 10, 11 and 12 are perspectives of the hammer, the presser on hammer, and the trigger lock respectively.

The repeating firearm shown comprises the usual stock 1 and receiver 2, and the usual trigger guard plate 3 held in place by the screw 4 at the rear of the guard and suitable shoulders at its forward end, the barrel 5, magazine tube 6, action handle 7 carried by the magazine tube, and its action bar 8. The gun is shown as of the take-down type but this is immaterial. The action bar 8 extends rearwardly from the action handle 7 and within the receiver 3 is provided with a lateral lug 9 adapted to ride in a slot 10 in the breech-bolt 11; this slot 10 comprises a horizontal portion (occupied by the lug 9 in Fig. 2) and a portion extending both upwardly and rearwardly therefrom, so arranged that the lug 9 co-acting therewith will operate the breech-bolt in the well known manner, first lowering the rear end of the bolt to withdraw the recoil shoulder 12 from its co-operating notch in the receiver 2 and thereafter sliding the bolt to the rear, and vice versa, returning it to the position of Fig. 2. The breech-bolt 11 carries the usual cartridge extractors 15, one on each side, contains the firing pin 16 and is provided with a member 17 serving as an action bar retainer and cartridge cut-off. This retainer is disclosed and claimed in a co-pending application; its purpose is to prevent the withdrawal of the action bar 8 from the bolt slot for take-down except when the trigger has been pulled, and it also controls the passage of cartridges from the magazine 6 to the receiver for transport to the chamber.

The action bar lock 20 which prevents the firing of a cartridge while the gun is partly open is pivoted on the same pivot 21 which carries the hammer 22. This lock is for obstructing rearward movement of the bar and also serves to unlock the trigger for firing, as presently explained. The hammer (Fig. 10) is actuated by hammer spring 23 carried by the plunger 24, and is provided at its base with the usual cocking shoulder engaging the forward end 25 of the trigger 26; it is cocked by the breech-bolt as the latter retreats and rides over it for this purpose. The hammer pivot pin 21 is supported in and between two upstanding ribs or plates 33 and 34 on trigger guard 35, plate 34, being at the side of the guard and embraced by the parts 27, 30 and 31 of lock 20, so that its arm 27 may be in the plane of the action bar and its lug 31 in a plane adjacent to the hammer for operation thereby as presently described. The other two upstanding plates 36 and 37 are the trigger guard sides. The trigger guard also carries the abutment for the hammer spring 23 and the guide for its plunger 24 as shown in Figs. 3 and 4, and the forward end of the guard is supported by engagement with appropriate shoulders on the walls of the receiver while tang 38 (Fig.

5) supports the rear end of the guard being provided with a screw hole for the screw 4. The trigger lock is a simple flat plate 39 provided with a hook 40 to engage a suitable part of the trigger mechanism, and is journalled on the hammer pivot between the hammer and the action bar-lock 20 and in the plane of the lateral lug 31 on the lock 20 so that it may be operated thereby as later described. Trigger 26 is journalled on pin 60 in the walls 36, 33 and 37 of the trigger guard and its plunger 61 carrying its spring 62 bears on the rear end of the trigger to force its forward end 25 upward into the hammer notch when the hammer 22 is cocked (Fig. 2). It may be noted at this point that this assembly is a simple compact one and that the action bar-lock 20 is firmly emplaced both with respect to the action bar 8 which it controls and with respect to the hammer 22 which governs its position, while the action bar-lock, hammer, trigger mechanism lock and the trigger-mechanism, are removable as a unit from the receiver by the release of the trigger guard.

The action bar-lock 20 is shown in perspective in Fig. 7. The action bar lock I propose to operate by two springs, one for moving it to action-bar-obstructing or firing position, and the other, which is put under tension by the firing of the gun, for moving it in the other direction against the constant pressure of the first spring, although in so far as the lock cooperates with various other parts such particular operating means are not altogether necessary as will be apparent later. In the gun shown, the first of these springs is marked 29, being fixed to an adjacent wall 37 of the trigger guard pressing downwardly on the rear end 28 of the lock (Figs. 3 and 5) so as to raise the forward end toward the path of the action bar 8. In the normal use of the gun, this arm 27 bears against the lower edge of the action bar until the latter has reached the limit of its forward movement when it snaps over the end and takes the position shown in Fig. 2 in which it obstructs rearward movement of the action bar, that is to say, prevents opening of the breech. The angle of the contacting surfaces of the bar and lock and the direction of the thrust are arranged so that rearward pull on the action handle 7 tends to hold the lock in locking position. The lock is displaced from this position automatically as the result of firing the gun, and it may also be displaced manually for which purpose its rear end 28 extending through the trigger guard is formed as a thumb piece. The automatic unlocking of the lock 20 is effected by the pressure of the other operating spring 57, which I term the presser spring and which is made effective by the act of firing the gun or pulling the trigger. This spring is located in a recess 52 in the hammer (Fig. 10) and acts on a small lever or presser 50 which is pivoted on the hammer itself, at 54. The lower end of this lever is adapted to strike the offset lug 31 on lock 20 whenever the hammer strikes the firing pin and thereby either moves (unlocks) the lock 20 or yields thereto according as to whether the end of the action bar is free from, or engaged with, the end of the lock. If the lock is unrestrained by the action bar it is immediately unlocked by the act of firing, and the breech can then be opened, but if the shooter is pulling rearwardly on the action handle at the moment of firing (the usual condition), the end thrust restrains movement of the action lock and under that condition the lever 50 yields to the lock, but maintains a pressure on it in the direction to unlock it by virtue of its spring 57. Either the firing recoil or a subsequent forward movement of the action handle by the shooter will serve to disengage the action bar from the lock, and permit the presser 50 by virtue of its spring 57, which has greater tension than spring 29, to turn the lock out of the path of the action bar. The presser 50 then holds the lock open while the action bar 25 is moved rearwardly to reload and recock the gun and does not release it until the hammer is partially back, see Fig. 6, and the action bar overlies the arm 27, whereupon the said arm bears again on the underside of the action bar ready to snap over its end when the gun has been loaded and the breech again fully closed (through Fig. 8 to Fig. 2). The slot and pin connection 55 and 56 between the hammer and lower end of presser 50, suitably limits the range of movement of the presser under the action above described. Through the action of the two springs 29 and 57 therefore the action bar lock 20 is actuated to its locking position immediately the gun is ready for firing and maintained there until the gun is fired when it is actuated out of this position to allow reloading, and in coaction with the engagement of the bar with the lock above the pivot 21 the unlocking of the bar is delayed sufficiently to permit firing of the cartridge even if the latter somewhat hangs fire. The accidental opening of the gun in the midst of firing is therefore prevented. In so far as the hammer serves as the actuator for the bar lock 20, it is apparent that other forms of firing means may be utilized for the same purpose.

The purpose of the trigger lock is to prevent the pulling of the trigger between the time the breech-bolt, in reloading, leaves the hammer in cocked position (just prior to Fig. 8) and the time the action bar reaches its extreme forward position and comes under the control of the action bar lock (Fig. 2), and also during such time as the action bar lock may be held inoperative by means

of finger piece 28; it thus prevents an accidental fall of the hammer and the firing of a cartridge before the breech-bolt reaches firing position and while the gun is being unloaded after manual operation of lock 20. As it cooperates with the gun parts the trigger lock may assume various forms and dispositions as will appear, but for simplicity and compactness, I prefer the construction and assembly shown. Hook 40 of the plate trigger lock is adapted to swing into engagement with a lateral projection at the forward end of the trigger 26 to hold the latter in the hammer cocking notch, to prevent pulling of the trigger (Figs. 8 and 9). As action bar lock 20 turns to its locking position (Fig. 2), lug 31 thereon engages shoulder 41 on the trigger lock and turns the latter on its pivot 21 to withdraw the hook from the trigger, and thus permit the trigger to be pulled. Upon firing the turning of the action bar lock to its unlocked position (Fig. 4) as previously pointed out, withdraws lug 31 from shoulder 41 and permits the trigger lock spring 45 (Fig. 6) to turn the trigger lock back toward the trigger. Spring 45 is disposed between projection 42 on the lock and another suitable abutment, for example, that on action bar lock 20 shown. So long as the hammer is "down"—against the breech block—the trigger end is held depressed by the base of the hammer in which position the hook 40 encounters the forward end of the trigger (Fig. 6), where it remains ready to hook over the trigger end when the hammer is again cocked and the trigger rises into its notch. At such time the hook 40 (under the tension of spring 45) hooks under the trigger, there to remain until the action bar 8, in its forward movement, moves off lock 20, allowing it to turn to the position of Fig. 2 which as before stated unhooks the trigger. The manual release of the action bar lock 20 likewise will cause the trigger to become hooked to the plate 39.

It will be understood that these described embodiments are merely illustrative of my invention and that the latter is not limited thereto except as set forth in the following claims.

Claims:

1. In a firearm, the combination with firing means, an action bar, an action bar lock, and a spring urging the action bar lock toward locking position with a substantially constantly applied pressure, of a spring to move the said lock to unlocking position, said second mentioned spring being mounted to move bodily with the actuation of the firing means and to be tensioned against the action bar lock to move the latter against the tension of the first mentioned spring on the release of the firing means.

2. In a firearm, the combination with firing means, an action lock, and a spring urging the action lock toward locking position, said spring being tensioned between said lock and a fixed part of the firearm, of a second spring to move the said lock to unlocking position, said second spring being mounted on a moving part of the firing means to move with the latter and to be tensioned against the action lock and be put under increased tension on the release of the firing means.

3. In a firearm, the combination with a trigger-released hammer means, an action bar, a pivoted action bar locking means, and a spring urging the action bar locking means toward locking position, of a second spring mounted on one of said means and engaging with the other of said means to move said locking means to unlocking position, said second mentioned spring being put under increased tension and greater tension than the first mentioned spring as the hammer means descends.

4. In a firearm, the combination with a trigger-released firing member, an action bar, an action bar lock, and a spring urging the action bar lock toward locking position, of a presser and presser spring between said trigger-released firing member and said action bar lock to move said lock against the first mentioned spring, the presser spring being put under increased tension by the firing member as the latter descends.

5. In a firearm, the combination with a sliding action bar, a hammer, an action bar lock, and a spring urging the action bar lock toward locking position, of a presser movably mounted on the hammer and a spring urging said presser in one direction, said presser being so positioned that, as the hammer descends, the presser operatively engages with the action bar lock in a direction to move the presser and the action bar lock against their respective springs.

6. In a firearm, a sliding action bar, a hammer, an action bar lock at one side of the hammer, and a spring urging the action bar lock toward locking position, of a presser pivoted on the hammer in a position to engage the action bar lock in opposition to said spring, and a spring on the hammer urging the presser toward the action bar lock, said presser spring being of greater tension than said action bar lock spring.

7. In a firearm, the combination with firing means, an action bar, and an action bar lock, of a member movably mounted on the firing means, and a spring on said firing means engaging said member whereby said member is flexibly held in a position on the firing means to engage with said action bar lock as the firing means descends, to move the action bar lock to unlocking position.

8. In a firearm, the combination with the receiver, a hammer, trigger mechanism, and

means movable as the firing mechanism reaches the firing position, of a trigger mechanism lock and means urging said lock toward locking position, said lock comprising a plate pivoted on a transverse horizontal axis at one side of the hammer and between the hammer and a side wall of the receiver, a depending part of which plate locks the trigger mechanism and another part of which plate is engaged by the first mentioned means to move the plate to unlocking position.

9. In a firearm, the combination with the receiver, a hammer, trigger mechanism therefor, a sliding action bar, and an action bar lock pivoted on a horizontal axis between the hammer and a side wall of the receiver, of a trigger mechanism lock and a spring urging said lock toward locking position, said trigger mechanism lock comprising a plate pivoted at the same side of the hammer as the action bar lock and on a horizontal pivot adjacent the latter and between the hammer and a side wall of the receiver, a depending part of which plate locks the trigger mechanism and another part of which plate is engaged by said action bar lock to move the plate against the tension of said spring, the part of the trigger mechanism which engages said depending part of the plate, engaging said plate at one side of the hammer.

10. In a firearm, the combination of a pivoted hammer, trigger mechanism, an action slide bar at one side of the firearm, an action bar lock on the hammer pivot and having a part in the path of a hammer part whereby the action bar lock is moved from its locking position by the hammer descent, a trigger mechanism lock, and a spring urging said trigger locking mechanism toward locking position, the trigger mechanism lock comprising a plate pivoted on the hammer pivot between the hammer and said action bar lock part, and provided with a depending part to lock the trigger mechanism and with a part engageable by said action bar lock part to move the trigger mechanism lock to unlocking position.

11. In a repeating firearm, the combination with its working mechanism including a pivoted hammer and the trigger mechanism, of a lock for the trigger mechanism comprising a plate independent of the other working mechanism of the arm and having a trigger-mechanism-engaging notch, said plate being held by the hammer pivot and lying in substantially a single plane and spring means for moving the lock in one direction, the lock being automatically moved in the opposite direction by the working mechanism of the gun.

12. In a firearm, the combination with a pivoted hammer, trigger mechanism, and an action bar lock on the hammer pivot, of a lock for the trigger mechanism comprising a flat plate swinging on the hammer pivot between the hammer and the action bar lock.

13. In a firearm, the combination with the receiver and a pivoted hammer and trigger mechanism therein, of a lock for the trigger mechanism comprising a swinging plate independent of the other working mechanism of the arm and having a trigger-mechanism-engaging notch, said plate being located between the hammer and a side wall of the receiver and lying entirely at one side of the hammer, a spring for the lock moving the lock in one direction and means for automatically moving the lock in the other direction as the gun mechanism is operated.

14. In a firearm, the combination with the working mechanism including a pivoted hammer and the trigger mechanism, of a lock for the trigger mechanism comprising a swinging plate hung on the hammer pivot, a spring for pressing the lock into locking position, and means through which the working mechanism of the gun swings the lock out of locking position when the fire arm is ready for firing, the trigger mechanism being sufficiently wide to engage said swinging plate at one side of the hammer.

15. In a firearm, the combination of a pivoted hammer, trigger mechanism including a trigger and a member operating therewith to engage the hammer near its pivot to hold the hammer in position ready for firing, an action slide bar, an action bar lock, a trigger mechanism lock comprising a plate pivoted on the hammer pivot and having a notch to receive said hammer-engaging member to lock the same in hammer-engaging position, and a spring urging said plate toward locking position, said member being sufficiently wide adjacent the hammer pivot to enter said notch at the side of the hammer and said action bar lock acting to withdraw the said plate from locking position by means of a lateral extension reaching from said plate to the action bar lock.

In testimony whereof, I have signed this specification.

CHARLES A. NELSON.