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SAFETY MECHANISM FOR FIREARMS

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1 Claim. (Cl. 42-70)

This invention relates to a firearm and more particularly to a novel safety mechanism for a firearm of the bolt action type.

In bolt action rifles of the upturn and pullback type, it is desirable to incorporate into the gun a safety mechanism which not only can lock the trigger but also can lock the bolt. The former is desirable to prevent accidental firing while the latter is desirable to prevent accidental release of the bolt.

An object of this invention is a safety mechanism for a bolt action rifle which is simple and economical in construction and adapted for use upon a gun of the upturn and pullback type. A further object of this invention is a novel safety mechanism which operates both upon the trigger and upon the bolt so as to completely lock the gun. A still further object of this invention is to provide a novel safety mechanism which permits movement of the bolt while the trigger is locked thereby enabling safe unloading of the gun. Another object of this invention is to provide a novel safety mechanism which cams the cocking shoulder of the trigger against the engaging sear surface of the sear. Other objects will become apparent to those skilled in the art upon reading the following detailed description and accompanying drawings in which,

Figure 1 is a partial right side view of a bolt action rifle showing an embodiment of the safety mechanism of this invention as it appears in a "fully on" position, that is, when both the bolt and the trigger are locked,

Figure 2 is a broken right side perspective view of the rifle showing the safety mechanism and its spring detent,

Figure 3 shows a partial left side view of the bolt action rifle shown in Figure 1 but in which the safety mechanism is in a "partially on" position, that is, locks only the trigger,

Figure 4 is a partial left side view of the rifle shown in Figure 3 showing the safety mechanism in an "off" position, and

Figure 5 is a perspective view of the disassembled safety of this invention.

The illustration in the accompanying drawings show the use of the safety mechanism of this invention in a bolt action rifle of the so-called upturn and pullback type. This name is applied because the bolt is withdrawn from the chamber by grasping the operating handle, turning it up and pulling it back. This type of gun generally consists of a receiver 11 of tubular shape having sliding channels on its inner surface to form a bolt receiving passage. It also has an upward facing load and ejection opening 13. A barrel 14 is threaded to the front or muzzle end of the receiver, said barrel having a chamber section at its breech end.

A sliding cylindrical bolt 15 having sliding and locking lugs thereon is contained within the bolt receiving passage of the receiver. Operating handle 16 extends sidewise from said bolt. The bolt consists of a tubular

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casing 17 in which is contained a firing pin 18, spring loaded by a firing pin spring 19. Threaded into the rear end of the tubular casing 17 is a bolt sleeve 20 through which the firing pin extends rearwardly. Extending downwardly from the rear end portion of the firing pin is a sear engaging lug 21 which acts as a cocking shoulder for engagement by a sear 22. Sear 22 pivots about sear pin 23 to enable release of the firing pin if it is cocked (as shown). The sear is normally held against the sear engaging lug of the firing pin by sear spring 24.

Extending downwardly from the receiver is a support member 25 which acts to support a trigger 26, a bolt release 27 and a safety 28. The trigger and the bolt release lock are pivoted for rotation about trigger pin 29 while the safety is pivoted for rotation about safety pin 30.

The trigger 26 consists of sheet metal stock having a rearwardly extending lug 31 upon which a trigger pin spring 32 rests in a normally compressed state. A downwardly extending adjustable guide rod 33, adjusted to avoid contact with the rear lug 31 of the trigger pin guides the spring 32 in its operation. Extending forwardly in the trigger and engaging the sear is a cocking shoulder 34. This shoulder contracts the sear 22 at its shoulder 35 and blocks counterclockwise (Fig. 1) movement of the sear until the trigger is pulled rearwardly. When the trigger 26 is pulled rearwardly (to the left as viewed in Fig. 1) the shoulders 34 and 35 slip past one another and become unblocked thus freeing the sear to rotate counterclockwise (Fig. 1) about sear pin 23. The sear spring 24 comprises a flat leaf having a laterally projecting lug (not shown) which engages the sear as at 24a. The sear spring 24 is suitably mounted in the body of the rifle so that it normally tends to cause the sear 22 to rotate in a clockwise direction as viewed in Fig. 1. In spite of the urging of the sear 22 in a clockwise direction by the sear spring, the force of the firing pin spring 19 is dominant and is sufficient to cause the bolt 15 to move to the right when the sear is in the unblocked condition. During the course of the motion of the bolt 15 to the right the lug 21 of the bolt rides over the sear 22 and cams it downwardly in a counterclockwise direction about the sear pin.

The bolt release 27 is also of sheet metal stock having an upwardly extending member 36 which extends through a slot in the receiver 11 and into the slide passage of the front lug of the bolt to prevent complete removal of the bolt. This bolt release is normally kept in a bolt engaging position by spring plunger 37 which spring loads against an upward extending arm of the bolt release 27.

Directly beneath the load and ejection opening 13 of receiver 11 is magazine 38 of the box type. Within said magazine is contained magazine spring 39, spring loading a magazine follower 40 upwardly. Resting upon said follower is cartridge 41. Additional cartridges may be stored within said magazine, if desired.

The safety 28 of this invention is affixed to the lower end of support member 25. As shown in unassembled relationship in Figure 5, it consists of sheet metal stock folded over at its lower end 51 to form an uneven armed U-shaped member. A hole 52 is drilled through said members to receive safety pin 30, thereby producing a journal bearing for said safety. The short arm 53 of the inverted U-shaped member has a forwardly extending stop member 54 which engages the trigger when assembled upon the gun. The long arm 62 of the U-shaped member has a much larger forwardly extending locking lug 55 extending from the lower portion of said arm up through a slot in the receiver. Its tip 56 en-

gages a notch 57 in the bolt when said bolt is in battery position. In an unlocked position it extends to a point below the notch 57. The long arm of the U-shaped member also contains a vertical slot 58 through which leaf spring 59 extends. The lower end of the leaf spring is shaped to encircle the safety pin 30 while the upper end contains a lug 60 which engages a flat on the receiver in which three depressions are formed. Engagement of the lug 60 and the left depression (Fig. 2) represents the position in which the bolt and the trigger are blocked while engagement of the lug 60 with the middle depression represents the position of the safety in which the bolt is free to be opened and the trigger alone is latched or blocked. When the safety is in the right-hand position shown in Fig. 2 (with the lug 60 in engagement with a depression which is not visible) both the trigger and the bolt are unlocked. A ratchet mechanism for controlling the position of the safety thereby results. Topping the long arm 62 of the U-shaped member is a finger piece 61 having ridges therein for frictional engagement with the thumb of the shooter.

The receiver assembly is affixed to a gun stock 70 by means of trigger guard plate 71 through which bolts 72, 73 and 74 extend and are threaded into the receiver.

To operate the gun, the shooter first loads the gun by opening the action. This is performed by lifting up on the operating handle 16 and pulling back the bolt 15 until its forward locking lug is stopped by the bolt engaging arm 36 of the bolt release 27. Cartridges are then inserted through the load opening 13 of the receiver into the magazine 38. The bolt is then rammed home and in so doing, the top cartridge in the magazine is driven into the chamber section of the barrel 14. The rear of the cartridge contained in the chamber, designated C in Figure 1, is supported by the cartridge seat face 80 of the bolt and its rim is engaged by a spring biased extractor 81 which protrudes partly across the cartridge seat face. The operating handle is then turned downwardly to cock the firing pin through engagement of the downward extending lug 21 of the firing pin 18 with the sear 22. This sear is normally held in an upward position by the sear spring 24.

At this time, it is generally the practice to operate the safety. It is placed in a fully "on" position by pulling the finger piece 61 of the safety completely toward the rear. Lug 60 "snaps" into the several depressions on the flat of the side wall of the receiver. In its rear-most position both the bolt 20 and the trigger 26 are locked by the safety—the bolt by reason of safety tip 56 engaging notch 57, and the trigger by reason of stop member 54 wedging the cocking shoulder 34 of the trigger against the sear shoulder 35 of the sear. A completely safe transportable gun is thereby enabled. Any jar against the trigger or against the operating handle will not cause firing or accidental opening of the bolt because both the pin and the bolt are locked.

Should one desire to unlock the bolt while retaining the trigger in its safety position as generally required when unloading the gun, the finger piece 61 of the safety is moved forwardly until the safety lug "snaps" into a center notch. In this condition the bolt can be operated in the normal fashion but the trigger cannot be pulled because it engages nose 54 of the safety 28. The bolt has been unlocked because the safety tip 56 has been disengaged from notch 57 of the bolt.

Complete forward movement of the finger piece 61 completely releases the bolt and trigger. The gun may then be fired by pulling the trigger. In such instance, the safety tip 56 is out of engagement with the notch 57 of the bolt and the stop member 54 is opposite a groove 82 in the trigger (see Figure 4).

Pulling the trigger releases the sear 22 which pivots about its sear pin 23 by the force of the firing pin spring 19 acting through the firing pin lug 21. The firing pin 18 is driven into the igniter of the cartridge C by the firing pin spring 19 and bullet is ejected from the muzzle of the gun.

After firing, the cartridge case C is extracted from the chamber by lifting the operating handle 16 and pulling it rearwardly. By so doing, the extractor 81 grips the rim of the cartridge case pulling it rearwardly. An ejector within the bolt housing pushes forward through an orifice in the cartridge seat face thereby causing the cartridge to pivot around the extractor as it clears the forward portion of the load and ejection opening 13 of the receiver 11. The fired cartridge case is thereby ejected. The gun is reloaded by forward movement of the bolt to drive another cartridge contained in the magazine into the chamber section of the barrel. The action of the gun may then be repeated as described above.

Obviously, certain modifications are possible, for example: the ratchet mechanism of the safety may be of different design. A projection instead of the leaf spring from the long arm of the U-shaped member may be used to engage the staggered depressions in the flat on the receiver wall. One might also employ a ratchet mechanism at the bearing section of the safety. Another obvious variation could be in the bearing section of the safety. It could be a solid journal having appropriate arms extending therefrom to act as a stop member and a bolt engaging tip. In the gun itself many modifications can obviously be made without changing the operation of the safety. Here again, these should not deter from the scope of the described safety and its use.

The inventions having thus been described what is desired to be secured by Letters Patent is as follows:

In a bolt action firearm including a bolt, a slidable firing pin, a trigger and a receiver, a safety device pivotally mounted upon the receiver, said device comprising a metallic, U-shaped member formed with a locking lug and a stop, said lug and said stop being directly engageable with the bolt and with the trigger respectively for locking the bolt and for blocking the operation of the trigger, said safety device being rotatable to a first position wherein the bolt and the trigger are both locked, said safety device being rotatable to a second position wherein the trigger only is locked and leaf spring means mounted upon the safety device and cooperating with the receiver for locking the safety device selectively in either of said two positions.

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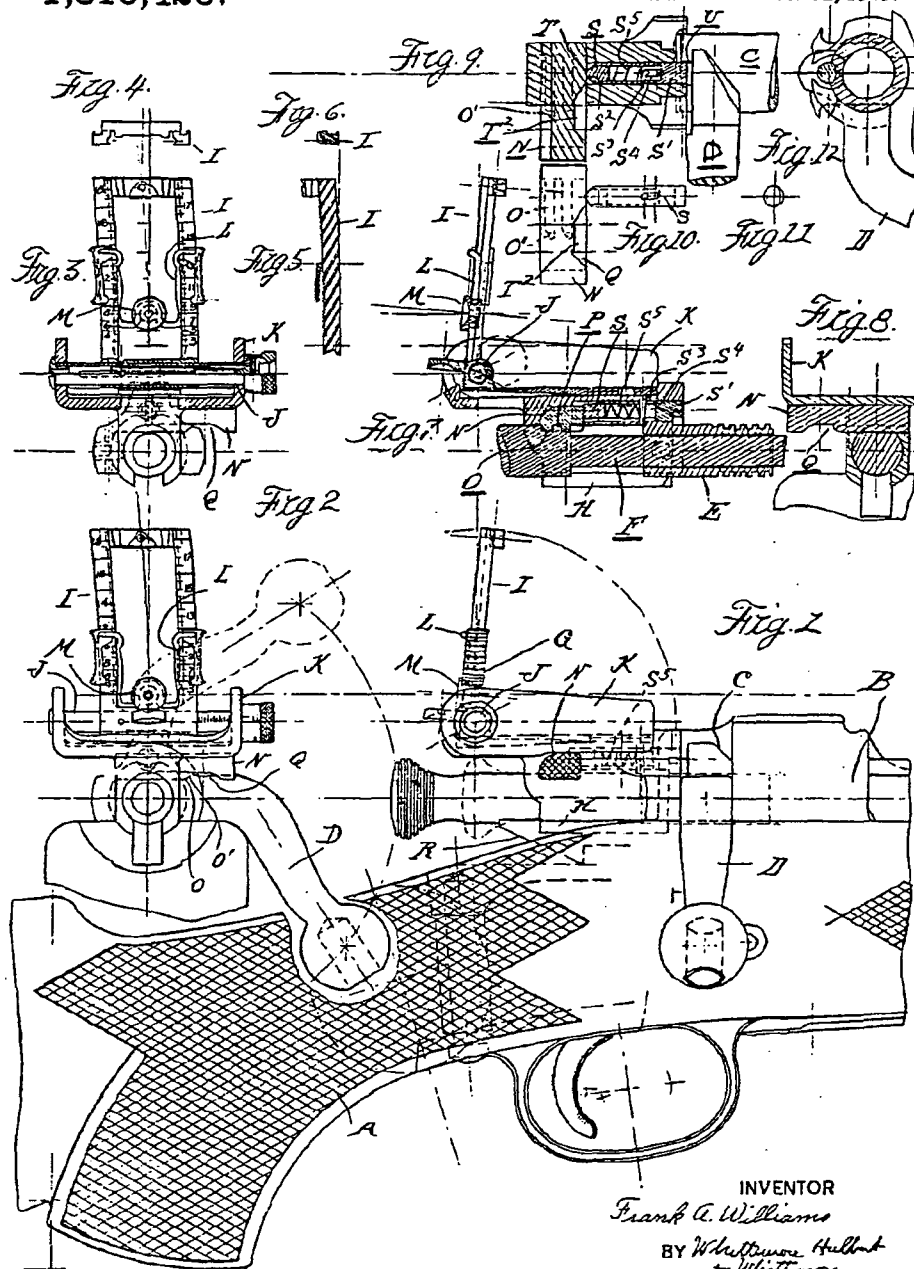
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OLIN
3-POSITION
SAFETY

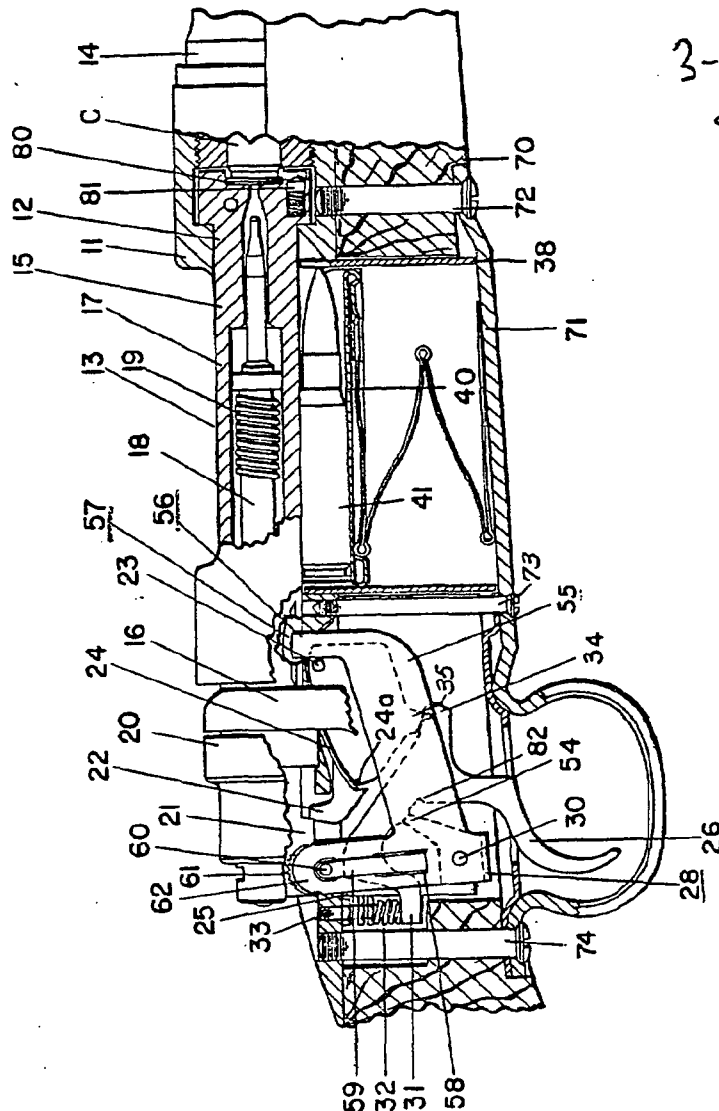
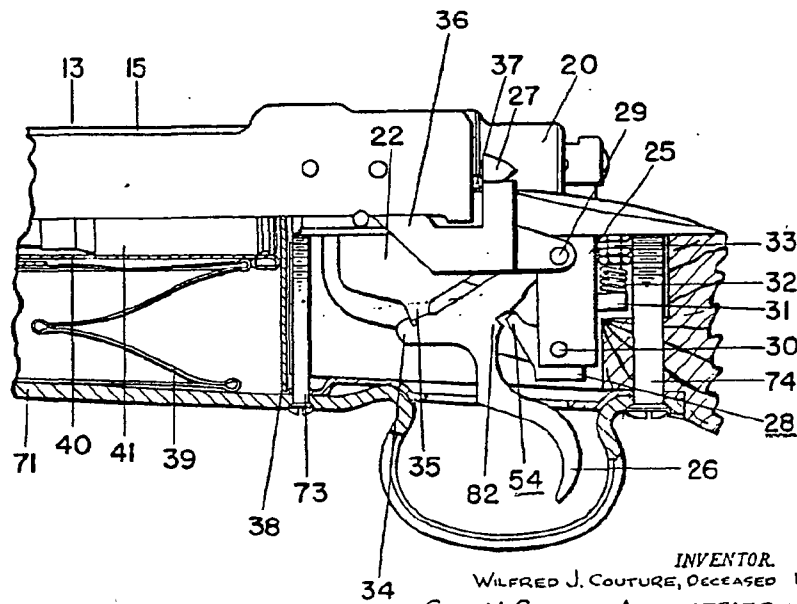
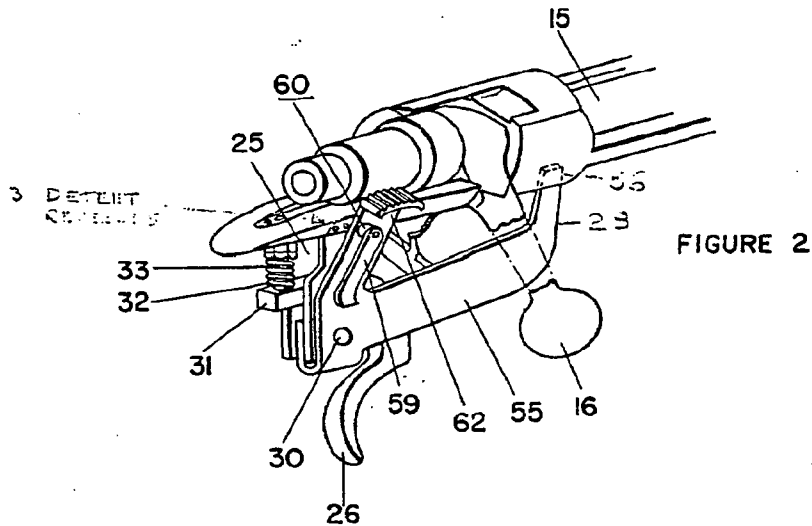


FIGURE 1

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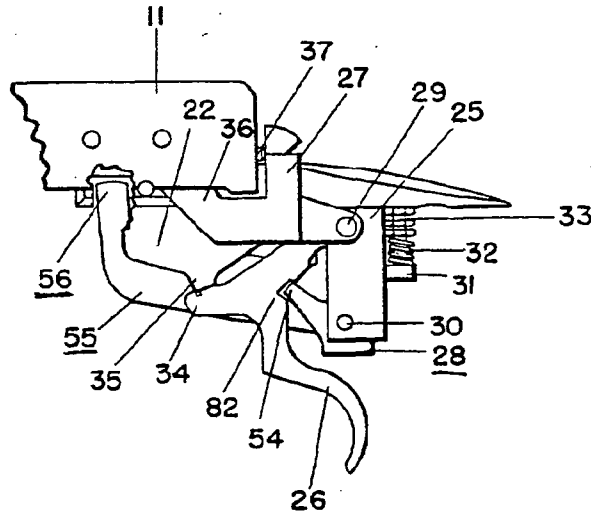


FIGURE 4

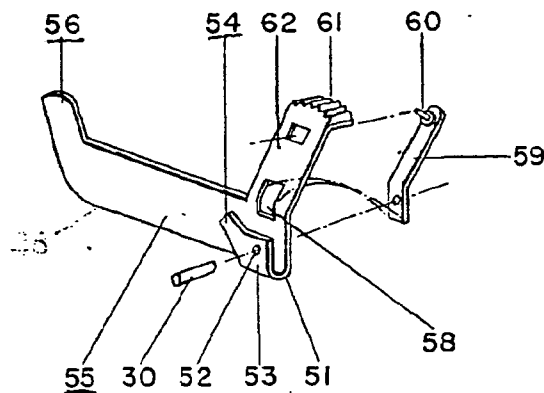


FIGURE 5

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