

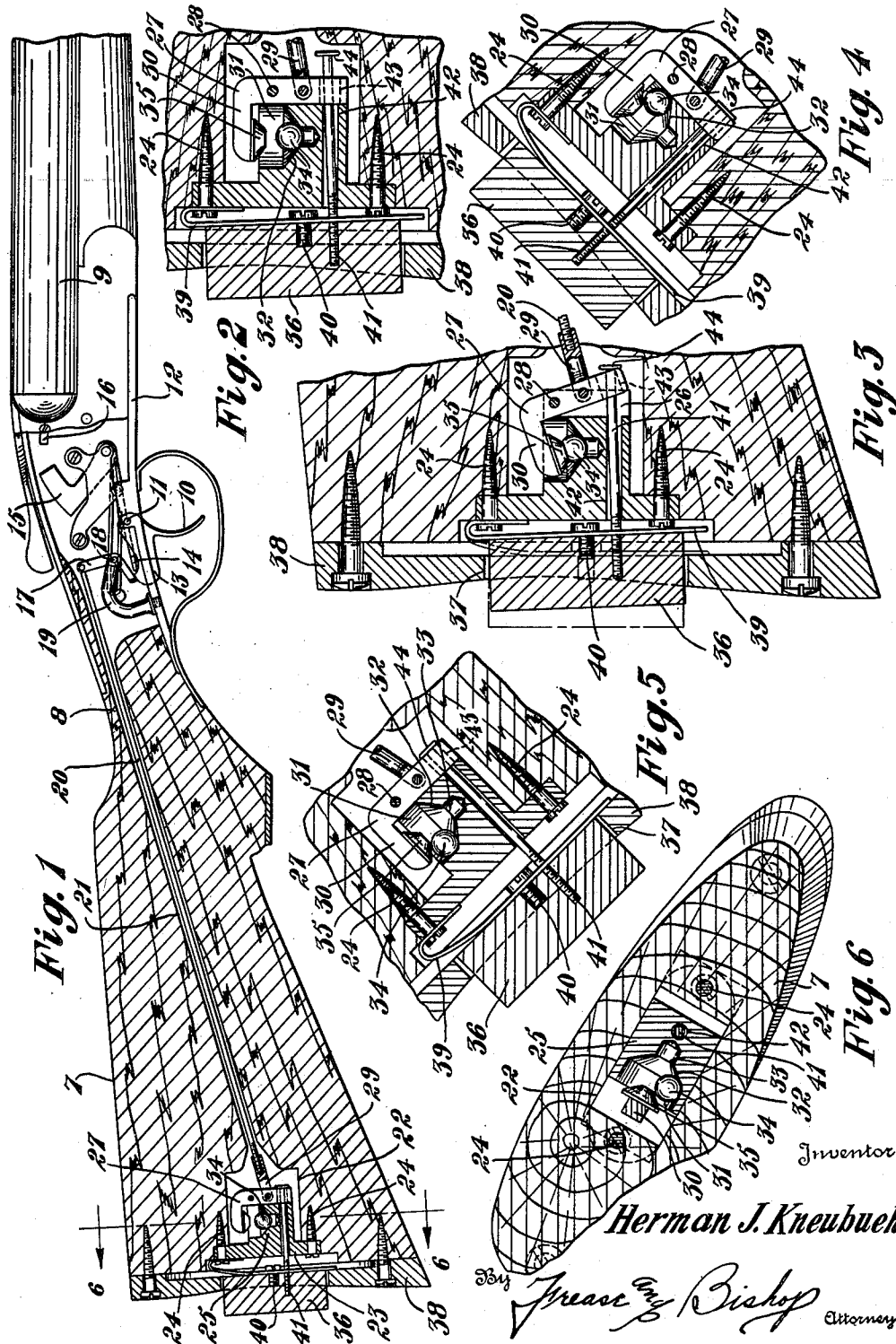
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SAFETY MECHANISM FOR FIREARMS

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SAFETY MECHANISM FOR FIREARMS

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7 Claims. (Cl. 42-70)

The invention relates to safety mechanism for preventing accidental discharge of firearms, such as rifles, shot guns and the like.

More particularly, the invention relates to a safety device for preventing accidental discharge of firearms in all positions except normal shooting position preferably with pressure applied to the butt end of the gun stock, as by holding it against the shoulder.

The safety devices which are provided on most modern firearms include a hand or finger member located on the exterior of the gun stock, usually on or adjacent to the grip portion thereof, which member requires actuation by the user for locking or releasing the trigger or hammer of the gun. The user of the gun often forgets to actuate this type of safety device, especially in times of excitement, or the device is apt to be moved accidentally by contact with the body or some extraneous object, as when the gun is dragged or pulled through a fence or through underbrush, under which conditions the trigger may be accidentally pulled and cause serious or fatal injury to the person carrying the gun or to others in the vicinity.

Other prior safety devices have required merely pressure on the butt of the gun stock to release the trigger or hammer for firing, such pressure being normally applied when the stock is brought to the shoulder of the user, but pressure is frequently accidentally applied to the butt of the gun stock when the gun is rested on the ground or pressed or bumped against various objects, so that the gun may be discharged accidentally in a number of positions other than the normal shooting position.

In my prior application Serial No. 219,375, filed July 15, 1938, matured in Patent No. 2,198,824, dated April 30, 1940, I disclosed a gravity actuated pendulum device for making operative connection between a movable butt plate and a trigger latch to release the latch when the gun is in normal shooting position, and for preventing such connection in certain other positions.

However, such pendulum device and all other prior safety devices to my knowledge requiring movement of a butt member to release a safety trigger latch, do not prevent discharge of the firearm in all positions other than the normal shooting position.

Moreover, it is very important not only that the safety mechanism prevent accidental discharge of the gun in positions other than the normal shooting position, but that the safety

mechanism be absolutely certain to release the firing mechanism when the gun is brought to normal shooting position; otherwise a hunter may fail to make an opportune shot which has required many hours of trailing or searching.

In all prior devices having gravity actuated safety mechanisms it is possible under certain conditions to prevent release of the safety mechanism even in normal shooting position of the firearm, as for example by quickly moving or throwing the gun to normal shooting position and pulling the trigger before gravity has had time to actuate the safety mechanism, in which event the gun does not fire.

It is therefore a general object of the present invention to provide a safety mechanism for firearms which prevents discharge of the firearm in all positions except normal shooting position.

Another object is to provide a safety mechanism for firearms which requires pressure on the butt of the gun stock with the firearm in normal shooting position, before it can be discharged by pulling the trigger.

A further object is to provide trigger locking mechanism at the butt end of a firearm adapted for always releasing said trigger immediately when pressure is applied to said butt end in normal shooting position of the firearm.

Another object is to provide a safety mechanism which automatically prevents discharge of the firearm in all positions unless pressure is applied to the butt end of the gun stock.

A further object is to provide improved ball means freely movable by gravity for releasing the trigger locking mechanism in normal shooting position of a firearm and for locking said mechanism in all other positions of the firearm.

A still further object is to provide a safety mechanism at the butt end of a firearm, so constructed and arranged that jars, shocks or impacts imparted to said butt end are not transmitted to any material extent to the safety mechanism or the firing mechanism.

And finally, it is an object of the present invention to incorporate all of the foregoing objectives in a simple and inexpensively made device, which is efficient and fully reliable in operation, and which is easily applicable to substantially all firearms having stocks.

These and other objects are accomplished by the parts, improvements, combinations, and arrangements comprising the present invention, which is hereinafter described and which is defined in the appended claims.

In general, the invention includes a latch rod movable by the trigger of a firearm and extending through the stock into the butt end thereof where it connects with a locking lever, there being preferably a spring pressed butt member normally holding said lever and movable by pressure to release the same, and a ball movable by gravity in a socket for locking said lever in all positions except the normal shooting position of the firearm.

In the accompanying drawing in which a preferred embodiment of the invention is shown by way of example,

Figure 1 is a fragmentary longitudinal view of a shot gun in normal shooting position and embodying the improved safety mechanism, the gun stock being shown in section and the gun barrel in elevation;

Fig. 2 is an enlarged fragmentary sectional view similar to a portion of the view in Fig. 1, showing the butt member pressed inwardly of the gun stock;

Fig. 3 is a similar view showing the position of the safety mechanism when the butt member is pressed inwardly and the trigger is pulled;

Fig. 4 is an enlarged fragmentary sectional view similar to a portion of Fig. 1, showing the position of the safety mechanism when the barrel of the gun is tilted downwardly;

Fig. 5 is a similar view when the barrel of the gun is tilted upwardly; and

Fig. 6 is an enlarged fragmentary sectional view taken on line 6—6, Fig. 1 with the gun stock turned or rotated about its longitudinal axis.

Similar numerals refer to similar parts throughout the several views of the drawing.

In the drawing the improved safety mechanism is shown by way of example as applied to a single barrel shot gun, but it will be understood that the invention may be applied to a double barrel shot gun or to other firearms, without departing from the scope of the invention defined in the appended claims.

As shown in Fig. 1, the shot gun includes a stock 7 having a grip portion 8 and a barrel 9 mounted thereon. The trigger 10 is preferably mounted at the under side of the grip portion 8 in a usual manner, and is pivoted at 11 on the trigger mounting plate 12. The trigger is provided with a rearwardly extending ear portion 13 which reacts upwardly against the sear 14 to trip the hammer 15 for striking the firing pin 16 to discharge the gun in a usual manner.

The ear portion 13 of the trigger is adapted to movably engage one end of a latch lever 17 which is pivoted intermediate its ends at 18 on a curved post 19 secured to the mounting plate 12. The upper end of said latch lever 17 is pivotally connected to a latch rod 20 extending rearwardly through a passage 21 in the stock 7 and terminating at the butt end of said stock.

Thus when the trigger 10 is pulled to fire the gun the ear portion 13 of the trigger actuates the latch 17 to move the latch rod 20 in a forward direction with respect to the gun stock 7, and the trigger cannot be pulled to fire the gun without moving the latch rod 20.

The rear end of the latch rod 20 extends into and terminates in an opening 22 in the butt end of the gun stock, in which opening the improved mechanism is located for preventing movement of the latch rod in all positions of the gun except normal shooting position such as illustrated in Fig. 1. The mechanism for locking or preventing

movement of the latch rod preferably includes a metal plate 23 secured in the gun stock as by screws 24 and having a block portion 25 extending forwardly into the opening 22. The block portion 25 preferably has a slotted flange 26 (Fig. 3) on which an L-shaped locking lever 27 is pivoted intermediate its ends at 28.

Preferably the lever 27 has a connecting sleeve 29 pivotally attached thereto adjacent the pivot 28 and the end of the latch rod 20 is adapted to be screwed into the sleeve 29 for connecting the latch rod and locking lever. The upper portion 30 of the locking lever 27 extends rearwardly and terminates over the center of a socket 31 formed in the block portion 25. The socket 31 is upwardly open in normal shooting position as in Fig. 1 and has downwardly inwardly tapering walls 32 which may be conical as shown and tapered or converged toward a ball seat 33 at the bottom of the socket.

A ball 34 is freely movable by gravity in the socket 31, and is adapted to rest on the ball seat 33 when the gun is in normal shooting position, as shown in Figs. 1, 2 and 3, to provide a clearance between the ball and the concave ball-engaging piece 35 on the upper end 30 of the lever 27.

Accordingly, when the firearm is in the normal shooting position of Fig. 1, a pull on the trigger 10 will move the latch rod 20 forwardly and the lever 27 will swing about its pivot 28 to the position shown in Fig. 3 in which the ball-engaging piece 35 engages the ball 34 resting on the ball seat 33.

The ball 34 and socket 31, together with the locking lever 27, latch rod 20 and latch lever 17, may be termed latch means for the firing mechanism; or trigger locking means for releasing the trigger only when the gun is in normal shooting position.

Preferably, a movable butt plate is provided for normally holding the locking lever 27 against movement, so that pressure on the butt member is required before the locking lever 27 can be moved in firing the gun in any position including the normal shooting position of Fig. 1.

The movable butt member may comprise a block 36 movable in an opening 37 in the butt plate 38. Movement of the butt member 36 inwardly of the gun stock is yieldingly resisted preferably by a spring plate 39 secured to the butt member as by a screw 40 and secured at its upper end to the metal plate 23 by one of the screws 24. A rod 41 for normally holding the locking member 27 against movement is screwed through the spring plate 39 into the butt member and extends slidably through a hole 42 in the block portion 25 and through an aperture 43 in the lower end of the locking lever 27. The rod 41 has at its forward end an enlarged head 44 for engaging the forward surface of the locking lever.

Thus the spring plate 39 normally urges the rod 41 rearwardly to engage the head 44 thereof with the lower end of the locking lever 27 to yieldingly hold the same in the position of Fig. 1, so that even in normal shooting position a pull on the trigger 10 cannot move the latch rod 20 to fire the gun without also moving the rod 41 against the resistance of the spring plate 39, which resistance is almost impossible to overcome by the pull of a finger on the trigger, because this resistance is added to the resistance of the usual springs in the firing mechanism restraining the trigger.

When the butt member 36 is pressed inwardly of the stock, as by being held against the shoulder, the head 44 of the rod 41 is moved forwardly as shown in Fig. 2, so that when the trigger is pulled in normal shooting position the latch rod 20 can move the locking lever 27 to the position shown in Fig. 3, and such movement of the latch rod permits pulling the trigger 10 to fire the gun.

Since the ball 34 is freely movable in the socket 31, if the gun barrel is tilted downwardly so that the parts assume a position such as shown in Fig. 4, the ball rolls by gravity into a wedging position between the ball-engaging piece 35 on the locking lever and the tapered wall 32 at the front of the socket, with the result that the gun cannot be fired by pulling the trigger even though the butt member 36 is pressed inwardly. The same condition exists when the gun barrel is tilted upwardly so that the parts are in a position such as shown in Fig. 5, in which position the ball rolls by gravity to the rear of the socket 31 and is wedgably engaged between the ball-engaging piece 35 and the tapered wall 32.

The same condition again exists when the gun is turned or rotated about its longitudinal axis, as by laying the gun down on its side, so that the parts assume a position such as shown in Fig. 6, wherein the ball rolls by gravity to become wedgably engaged between the ball-engaging piece 35 and the tapered wall 32 at the side of the socket 31.

Accordingly, the improved safety mechanism including the ball 34 rolling in socket 31 positively prevents discharge of the firearm in all positions except normal shooting position such as shown in Fig. 1, although the gun barrel can be tilted upwardly or downwardly from the horizontal within a normal shooting range before the ball rolls from its seat 33 and prevents movement of the latch rod and firing movement of the trigger.

The improved safety mechanism is absolutely certain to release the firing mechanism when the gun is brought to normal shooting position against the shoulder under any and all conditions, because when the gun is pressed against the shoulder the movable butt member 36 releases the locking lever 27, and during the fraction of a second required for aiming the gun, the ball 34 has ample time to roll by gravity onto its seat 33 and permit firing by pulling the trigger.

The improved safety mechanism is durable and not materially affected by jars or shocks imparted to the butt end of the gun because such shocks are absorbed largely by the gun stock and are not transmitted to the working parts of the safety mechanism or the firing mechanism.

Moreover, the improved safety mechanism is extremely simple and inexpensive to construct, fully reliable in operation, and is easily applied to substantially all standard firearms.

I claim:

1. Safety mechanism for a firearm having a trigger and a stock, a latch movably engaged with said trigger, a latch rod connected at one end to said latch and extending through the stock, a locking lever pivotally mounted in the butt end of said stock and connected to the other end of said latch rod, a movable spring-pressed butt member releasably connected to one end of said locking lever for yieldingly holding said latch rod against movement, walls forming a conical normally vertically disposed downwardly converging socket adjacent the other end of said locking

lever and having a ball seat at its lower end, and a ball in said socket spaced from said other end of said locking lever when normally resting on said ball seat, said ball being freely movable by gravity and arranged to be wedgably engaged between the socket wall and said other end of said locking lever in all positions of the firearm except normal shooting position.

2. Safety mechanism for a firearm having a firing mechanism and a stock, a latch rod movably engaged at one end with said firing mechanism and extending through the stock, a locking lever pivotally mounted in the butt end of the stock and connected to the other end of said latch rod, a movable butt member releasably connected to one end of said locking lever for holding said latch rod against movement, walls forming a conical normally vertically disposed downwardly converging socket adjacent the other end of said locking lever and having a ball seat at its lower end, and a ball in said socket spaced from said other end of the locking lever when normally resting on said ball seat, said ball being freely movable by gravity and arranged to be wedgably engaged between the socket wall and said other end of the locking lever in all positions of the firearm except normal shooting position.

3. Safety mechanism for a firearm having a firing mechanism and a stock, including a latch rod movably engaged with said firing mechanism and extending through the stock, a locking lever pivotally mounted in the butt end of said stock and connected to said latch rod, a butt member movably mounted in said stock and releasably connected to one end of said locking lever, walls forming a conical normally vertically disposed downwardly converging socket adjacent the other end of said locking lever, and a ball freely movable by gravity in said socket and arranged to rest in said converging socket in spaced relation to said other end of the locking lever in normal shooting position and to be wedgably engaged between said other end of the locking lever and the tapered socket wall in all other positions.

4. Safety mechanism for a firearm having a firing mechanism and a stock, including a latch rod movably engaged with said firing mechanism and extending through said stock, a butt member movably mounted in said stock and releasably connected to said latch rod for normally holding the same against movement, walls forming a conical normally vertically disposed downwardly converging socket in the butt end of said stock, and a ball freely movable by gravity within said socket and arranged independently of said butt member to prevent movement of said latch rod in all positions of the firearm except normal shooting position.

5. Safety mechanism for a firearm having a firing mechanism and a stock, including a latch rod movably engaged with said firing mechanism and extending through said stock, a locking lever in the butt end of said stock connected to said latch rod, walls forming a conical normally vertically disposed downwardly converging socket in the butt end of said stock, and a ball freely movable by gravity in said socket for engaging said locking lever to prevent movement of said latch rod in all positions of the firearm except normal shooting position.

6. Safety mechanism for a firearm having a firing mechanism, including latch means engaging the firing mechanism, walls forming a conical normally vertically disposed downwardly converging socket having a ball seat adjacent

one end of the latch means, and a ball freely movable by gravity in said socket and arranged to rest in said ball seat in spaced relation to said latch means when the firearm is in normal shooting position and to move into wedging engagement between the latch means and the socket wall in all other positions of the firearm.

7. Safety mechanism for a firearm having a firing mechanism, including latch means movably engaging the firing mechanism, walls forming a conical socket adjacent the latch means

and having a ball seat at one end, said socket being vertically disposed and downwardly converging when the firearm is in normal shooting position, and a ball freely movable by gravity in said socket and arranged to rest in said ball seat in spaced relation to said latch means when the firearm is in normal shooting position and to move into wedging engagement between the latch means and the socket wall in all other positions of the firearm.

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