The present invention generally relates to a novel and improved safety for guns and more particularly to such a safety incorporated into firearms normally fired with the butt end of the stock resting against the forward surface of the shoulder. The safety of the present invention is automatically engaged so that it is rendered effective, whenever the firearm or gun is removed from the shoulder-engageing firing position thereby rendering the firing mechanism inoperative whenever the gun is not in the firing position against the shoulder. As soon as the gun is placed in proper firing position, that is, with the butt end of the stock engaging the shoulder, the safety device of the present invention will be rendered inoperative and the firing mechanism of the gun will be rendered effective so that the gun may be fired in the usual manner.

While shoulder fired weapons such as shotguns, rifles and the like are normally provided with safety devices which prevent operation of the trigger when the safety is in its operative position, such devices require that the person carrying or using the gun manually move the safety to its operative position when the gun is not being fired and manually move the safety to its inoperative position when the gun is ready to be fired. Since this requires the person using the gun to manually manipulate the safety, it quite often occurs that the safety is not moved to an operative position when the gun is not being fired due to the user of the gun inadvertently forgetting to actuate the safety to its operative position or perhaps feeling that it is not necessary to move the safety to an operative position since the gun will be again used in the relatively near future. Failure to move the normally provided safety to an operative position results in frequent accidental discharge of guns with the consequent danger to persons in the near vicinity.

Accordingly, one of the primary objects of the present invention is to provide a safety device which will automatically become operative when the gun is removed from its shoulder firing position thereby preventing the trigger mechanism from being moved rearwardly when the gun is not disposed against the shoulder of the person holding the gun. Conversely, as soon as the gun is placed in proper position with the butt end of the stock against the shoulder, the safety device is automatically rendered inoperative thereby enabling the trigger mechanism to be actuated in the conventional manner. Thus, regardless of what the conditions are or when the gun is next expected to be fired, as soon as the gun is removed from its firing position away from the shoulder, the safety of the present invention is automatically rendered effective for preventing the gun from being fired by accidentally moving the trigger mechanism.

Another object of the present invention is to provide a safety device including structural features which enable it to be securely locked in operative position when the gun is not in its area of use, for example, when transporting the gun in an automobile, placing the gun in a storage area or the like thereby eliminating any possibility of the safety mechanism being rendered ineffective by the butt end of the gun coming into engagement with a supporting surface or the like.

Still another feature of the present invention is to provide a safety device associated with the trigger engaging mechanism includes a projecting element oriented centrally in the normally concave surface of the butt plate on the end of the stock so that even if the gun is placed on a generally flat supporting surface, the safety device of the present invention will remain in an operative position.

Yet another important object of the present invention is to provide a safety for guns which is simple in construction, easy to install in existing guns with very little modification thereof, effective for its purposes and relatively inexpensive to manufacture while still being foolproof and long lasting.

These objects together with other objects and advantages which will become subsequently apparent reside in the details of the construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a side elevational view of a portion of the gun with areas thereof broken away illustrating the orientation of the safety of the present invention;

FIGURE 2 is an enlarged sectional view of the rotatable safety member and its relationship to the trigger and the mechanism for operating the safety member;

FIGURE 3 is a detailed sectional view taken substantially upon a plane passing along section line 3-3 of FIGURE 2 illustrating further structural details of the rotatable safety member and its relationship to the trigger;

FIGURE 4 is a perspective view of the rotatable safety member;

FIGURE 5 is a detailed sectional view illustrating the structure of the actuating member and its relationship to the act of the gun; and

FIGURE 6 is a plan view of the construction of FIGURE 5.

Referring now specifically to the drawings, the numeral 10 generally designates a gun of any suitable character such as a conventional shotgun having a pump action or the like. The details of the gun are not illustrated except for the stock 12, the trigger guard 14, the trigger 16, and a receiver or breech 18 which receives the firing mechanism such as the firing pin, sear and the like. As is well known, the trigger mechanism including the guard 14 will drop out of the receiver or breech 18 when two transverse pins 20 are removed and the stock 16 is detached from the receiver 18 by virtue of removing the conventional elongated securing screw (not shown).

The trigger 16 is pivotally supported by a transverse pin 22 and includes a projection 24 on the rear surface thereof for reception in a socket 26 formed in the periphery of a cylindrical safety member 28. The safety member 28 is also provided with a notch 30 in the opposite surface thereof from the socket 26 and an abutment area 32 is formed between the socket 26 and the notch 30. When the safety member 28 is in operative position, the abutment surface 32 is in alignment with the projection 24 on the trigger 16 thereby preventing rearward movement of the trigger 16 about pivot pin 12. However, when the safety member 28 is rotated to a position so that the abutment 32 is below the projection 24, the socket 26 will be aligned with the projection 24 thereby receiving the projection 24 when the trigger 16 is pulled rearwardly thereby enabling the trigger 16 to be pivoted rearwardly about pivot pin 22. FIGURE 2 of the drawings illustrates the abutment 32 engaged with the projection 24 and by rotating the safety member 28 in a clockwise direction as illustrated in FIGURE 2, the safety member may be moved to an inoperative position since the projection 24 would then pass above the abutment 32 and be received within the socket 26 thus enabling the firing mechanism to be operated in the conventional manner.

The safety member 28 in the present embodiment is retained in a transversely extending aperture 34 which conventionally receives the manually operated safety for such a gun by virtue of a setscrew 36 having a reduced axial extension 38 on the inner end thereof received in the notch 30 which will
preclude axial movement of the safety member 23 but enable limited rotational movement thereof between the operative and inoperative positions as defined by the axial extension of the pin 38 engaging the bottom end of the notch 30. The peripheral surface of the safety member 23 in the area opposite from the socket 26 and the notch 30 is provided with a plurality of longitudinal gear teeth 49 in meshing engagement with an elongated rack gear 42 slidable in a passageway 44 formed in the upper rear end portion of the trigger carrier assembly 46. The upper edge surface of the rack gear 42 is provided with a longitudinal recess 48 receiving a set screw 50 for guiding and limiting the movement of the rack gear 42 in relation to the safety 28. A lock setscrew 52 is provided for retaining the set screw 50 in position.

The end portion of the rack gear 42 remote from the rotatable safety 28 is somewhat enlarged as at 44 and receives a compression coil spring 56 there around which engages the rear surface of the trigger carrier 46. The other end of the spring 56 engages a transverse pin 58 which connects the larger portion 54 of the rack gear 42 with an elongated operating rod 60 received in the hollow interior 62 of the stock 12. The hollow interior 62 is conventional and it is through this hollow interior that the stock securing screw is also accessible. The rear or butt end of the stock 12 is provided with a removable U-shaped saddle 92. This retains the actuating member 70 in alignment with the rod 60 and also enables rearward movement of the rod 60 in relation to the actuating member 70 and the U-shaped saddle 92. The retaining member 70 in relation to the rod 60 thereby eliminating any possibility of the actuating member 70 causing discomfort during firing of the gun due to recoil of the gun against the shoulder.

The saddle 92 is secured to the actuating member by transverse pins or fasteners 104 and the side walls of the saddle 92 are provided with centrally disposed tunnel-like projections 106 each of which receives a coil compression spring 108 having one end engaging the inner end of the tunnel 106 and the other end engaging the butt plate 64 on opposite sides of the aperture 68 thereby enabling outward movement of the actuating member 70 sufficient to enable the lockout pin 78 to effectively engage the notch 88. It is pointed out that the pin 58 which connects the rack gear with the operating rod 60 not only is a pivot pin but may provide a limited amount of lost motion to enable the actuating member 70 to move outwardly slightly and also to enable some initial inward movement of the actuating member 70 before the rack gear 42 and safety 28 are actuated or moved to an inoperative position.

When the lockout pin 78 is in the position of FIGURE 2 of the gun in shoulder firing position, said operating mechanism including means for returning the actuating member 70 to the rearward position and engaging the actuating member 70 in relation to the rod 60 of the gun. This retarding mechanism includes the pin 58 engaging the rod 60 and also actuating member 70 and the U-shaped saddle 92. This retains the actuating member 70 in alignment with the rod 60 and also enables rearward movement of the rod 60 in relation to the actuating member 70, thereby eliminating any possibility of the actuating member 70 causing discomfort during firing of the gun due to recoil of the gun against the shoulder.
member, operating mechanism and safety member into operative position with the safety member in position for engagement with the trigger when the butt plate is removed from the shoulder, said safety member being in the form of a rotatable cylindrical member disposed transversely behind the trigger, said operating mechanism including a longitudinally movable member, gear teeth means interconnecting the rotatable cylindrical member and the longitudinally movable member for rotating the cylindrical member in response to longitudinal movement of the longitudinal member, said cylindrical member having a pocket therein for receiving a projection on the trigger when the safety member is in an operative position thereby enabling the trigger to be operated in the usual manner, the rotation of said safety member bringing a portion of the periphery thereof into registry with the projection on the trigger thereby forming an abutment for preventing rearward movement of the trigger when the safety member is rotated to an operative position.

2. The structure as defined in claim 1 wherein said longitudinally movable member is connected to an elongated operating rod extending through a passageway in the stock, said actuating member including a plate extending through the butt plate on the stock and having the inner end thereof connected with the rear end of the operating rod, said operating mechanism including a coil spring associated with the longitudinally movable member for moving the actuating member to an outwardly projected position thereby assuring that the safety member will be oriented in the operative position whenever the actuating member has no pressure exerted thereon.

3. The structure as defined in claim 2 together with a lockout pin mounted on said actuating member whereby the actuating member may be manually pulled outwardly slightly beyond its normal position so that the actuating member may extend outwardly and engage with a stationary guide plate attached to the butt plate for preventing inward movement of the actuating member thereby lockingly retaining the safety member in operative position.

4. The structure as defined in claim 3 wherein said guide plate includes an upwardly flared inner portion for guiding movement of the lockout pin during its normal operation.

5. The structure as defined in claim 4 wherein the rear end of the operating rod includes an upturned end portion, a U-shaped saddle attached to said actuating member and straddling the upturned end of the operating rod, and spring means interconnecting the operating rod and the actuating member to provide a spring cushion in the connection between the operating rod and the actuating member thereby eliminating transmittal of recoil forces through the operating rod to the actuating member.

6. The structure as defined in claim 5 wherein said spring means includes a pair of springs received in sockets in the actuating member and engaging notches which are transversely flat in the upstanding end of the actuating rod and actuating member in aligned relation.

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