

Nov. 24, 1964

K. R. LEWIS

3,157,958

HAMMER SAFETY FOR FIRE ARMS

Filed Feb. 27, 1963

2 Sheets-Sheet 1

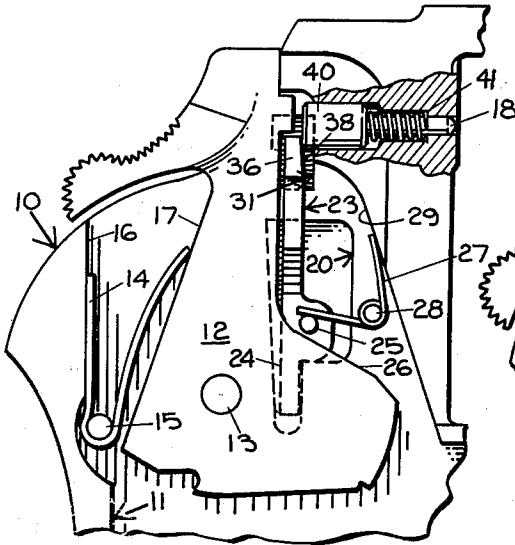


FIG. 1

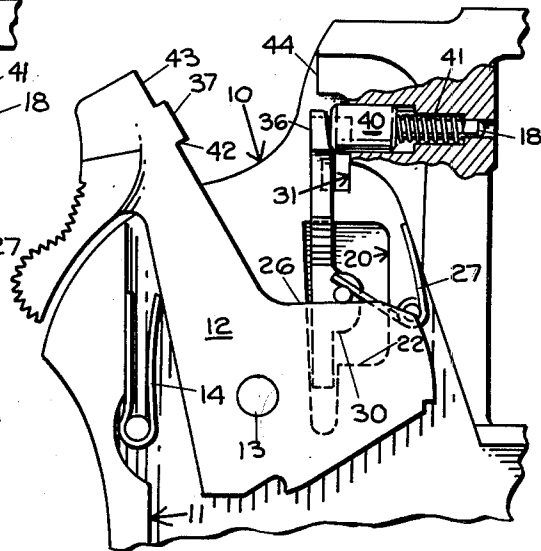


FIG. 2

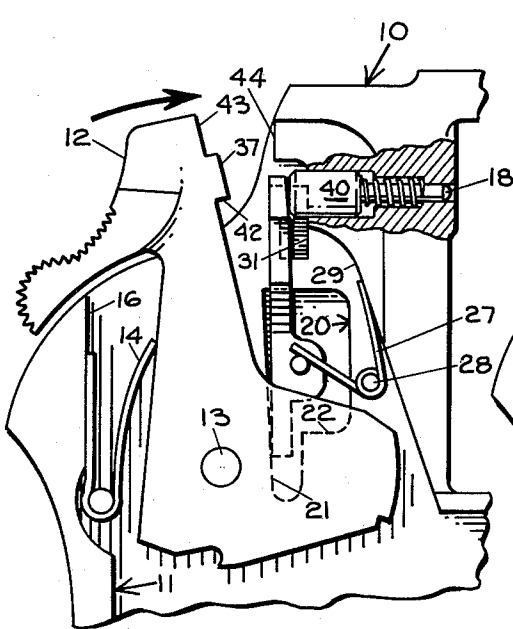


FIG. 3

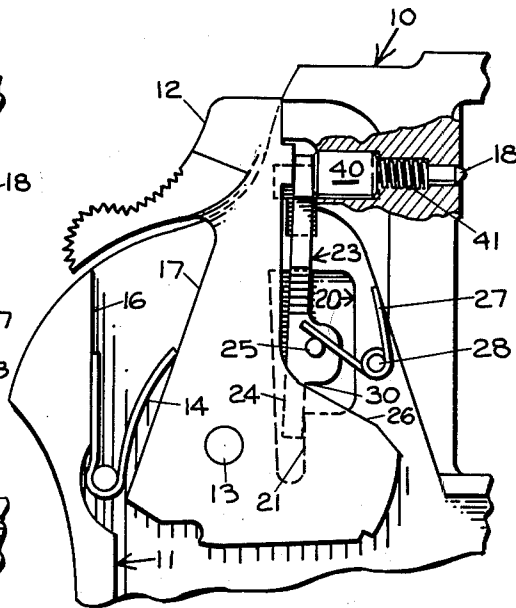


FIG. 4

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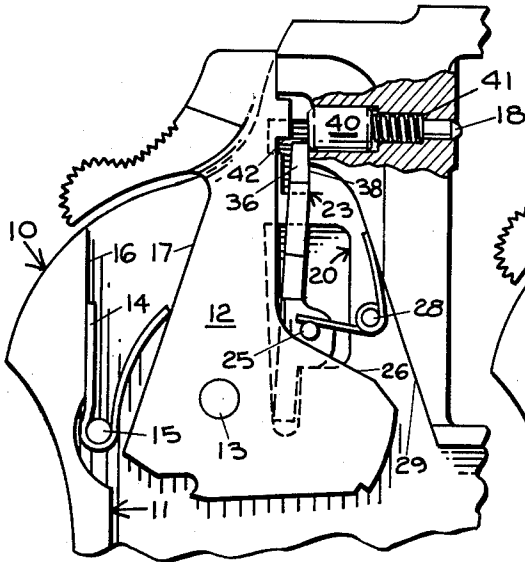


FIG. 5

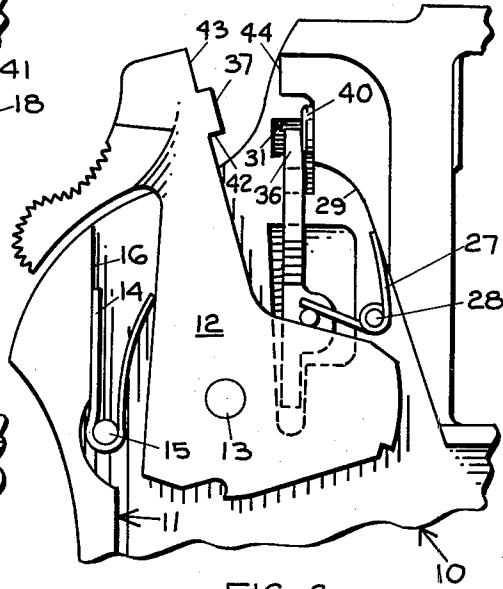


FIG. 6

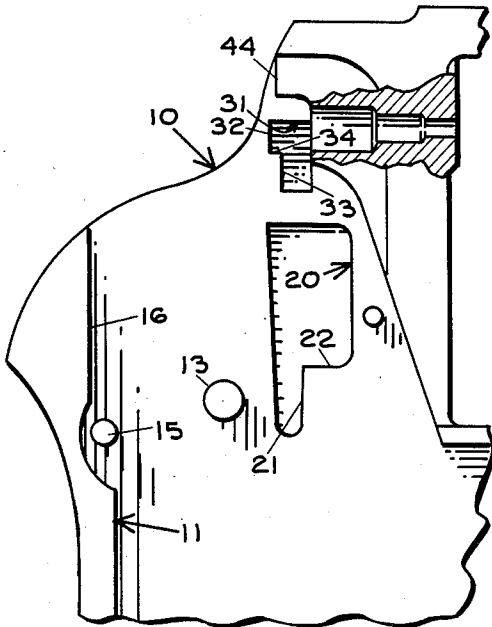


FIG. 7

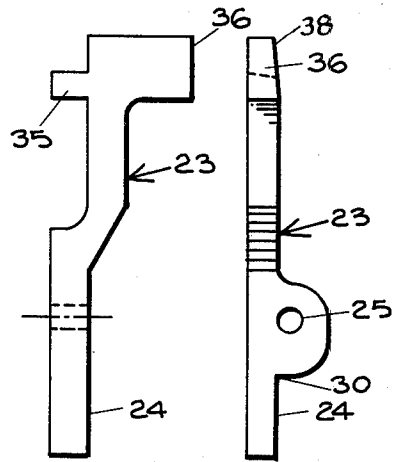


FIG. 8

FIG. 9

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3,157,958

## HAMMER SAFETY FOR FIRE ARMS

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8 Claims. (Cl. 42—70)

This invention relates to fire arms and is more particularly directed to a safety mechanism of the fire arm.

The conventional fire arms and in particular revolvers, are provided with a block or similar mechanism that prevents a hammer from firing a cartridge that is in the firing chamber until the hammer has first been fully and properly cocked. Should the hammer be struck or released by any other means while in a neutral, down or unfired condition, the block prevents the hammer from firing the cartridge. This system works well and is fool-proof when installed properly in the fire arm. In the event this type of safety has not been installed properly or not at all in the gun, the fire arm can operate and be fired in the normal manner but the handler of the gun may not be cognizant of the fact that the gun is functioning without the benefit of the safety. He is, therefore, not alerted to the dangerous condition that exists. If the block is left out of the conventional revolvers, for instance, a person, who does not have knowledge of this condition, will carry and handle the gun with confidence and the feeling of safety. However, even with the hammer down, an accidental discharge of the fire arm can result with the consequence of possible serious injury being inflicted.

The present invention contemplates providing a safety which in effect connects the hammer with the firing pin when the fire arm is to be fired. In other words, when the hammer has been properly cocked, upon its release, the firing pin is struck by the hammer to fire the cartridge in the firing chamber. Without the presence of applicant's hammer safety or if improperly installed in the fire arm, the release of the hammer will not fire the cartridge. Also, when properly installed in the gun if the hammer is not fully cocked, the cartridge in the firing chamber cannot be fired.

Therefore, a principal object of the present invention is to provide a fire arm with a hammer safety which will prevent the accidental firing of the fire arm.

Another object of the present invention is to provide a fire arm with a safety which must be present in the fire arm and properly installed therein in order to permit the gun to fire a cartridge.

A further object of the present invention is to provide a fire arm with a hammer safety which connects the hammer and the firing pin to fire a cartridge in the fire chamber whereby the gun cannot be fired if the safety has not been installed or if improperly installed in the fire arm.

A still further object of the present invention is to provide a fire arm with a hammer safety to prevent the accidental firing of the gun when in a neutral, down or unfired condition.

A still further object of the present invention is to provide a hammer safety for fire arms which is simple in construction and operation and most effective to permit the firing of the gun when positioned properly therein and will prevent the firing of the gun if not installed in the gun or the accidental firing of the gun when not properly cocked for firing.

With these and other objects in view, the invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings forming a part of this specification, with the understanding, however, that the invention is not confined to any strict conformity with the showing of the

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drawings but may be changed or modified so long as such changes or modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawings:

FIGURE 1 is a fragmentary side elevational view of a revolver shown with the side plate removed and partially broken away with the hammer shown in the neutral position.

FIGURE 2 is a similar view showing the hammer fully and properly cocked.

FIGURE 3 is a similar view showing the hammer travelling in the direction to fire a cartridge.

FIGURE 4 is a similar view showing the hammer at the moment of firing.

FIGURE 5 is a similar view showing the hammer safely at a moment after firing.

FIGURE 6 is a similar view showing the position of the various parts of the firing mechanism when the hammer is only partially cocked.

FIGURE 7 is a fragmentary side elevational view of the gun frame with the mechanism removed.

FIGURE 8 is a side elevational view of the hammer safety.

FIGURE 9 is a front elevational view thereof.

Referring to the drawings wherein like numerals are used to designate similar parts throughout the several views, the numeral 10 refers to the gun frame showing only that portion sufficiently to illustrate my invention. The fire arm shown and described herein is a revolver only for the purpose of illustrating my invention which can be used as a safety on appropriate fire arm. The frame 10 is provided with a cavity 11 in which a hammer 12 is pivotally mounted as at 13. A main leaf spring 14 held in position by a pin 15 is provided with leg portions which bear against an end wall 16 of the frame cavity 11 and an edge wall 17 of the hammer 12 to yieldingly urge the pivotal movement of the hammer 12 in the direction of a firing pin 18.

Within the cavity 11 is a further cavity 20 hollowed out of the wall of the frame 10 having a depending finger portion 21 and a ledge portion 22. A safety member 23 which is slidably positioned along the cavity 20 is provided with an off-set leg portion 24 whose lower end is slidably positioned in the finger portion 21. A pin 25 secured to the upper portion of the leg 24 of the safety 23 rests on and slides along a ledge portion 26 of the hammer 12. An L-shaped spring 27 is secured at its mid-portion to a pin 28 with arm portions bearing against an edge wall 29 of the frame cavity 11 and against the pin 25 to urge the safety 23 to slide downwardly in the cavity 20 and to maintain the pin 25 in contact relation with the ledge 26 of the hammer 12. It can be seen that upon swinging the hammer on its pivot pin 13, the ledge portion 26 of the hammer 12 will swing in an upward direction carrying the pin 25 and causing the safety member 23 to slide upwardly.

The safety member 23 is provided with a lower wall portion 30 which rests on the lower ledge 22 of the cavity 20 when the hammer 12 is down in its neutral position as shown by FIGURES 1 and 5. At this time the safety 23 is resting on the ledge 22 of the cavity 20 and the pin 25 of the safety member 23 is not in contact relation with the ledge 26 of the hammer 12 but is in spaced coplanar relation thereto, whereby upon movement of hammer 12 the ledge 22 will abut against the pin 25 to carry it upwardly as is explained in detail hereinafter.

At the upper portion of the main cavity 11 there is a relatively small cavity 31 hollowed out of the wall of the frame 10. The cavity 31 is provided with vertical restraining walls 32 and 33 joined by a horizontal ledge 34.

At the upper portion of the safety member 23 is a dog 35 which is received by the cavity 31 and an impact portion 36 which is adapted to be struck on one side by a lip 37 of the hammer 12 when the revolver is fired. The other side or face 38 of the safety impact portion 36 is slightly tapered so as to be thinner at its upper portion and is adapted to be engaged by the hammer end 40 of the firing pin 18. A coil spring 41 encircling the firing pin 18 biases the firing pin 18 to yieldingly urge the hammer end 40 into contact relation with the impact member 36 of the safety 23.

When the fire arm 10 is in its neutral and uncocked condition, the hammer 12 will be in its down position as shown by FIGURE 1. The leg portion 24 of the safety 23 will be found in the lower portion of the finger 21 of the cavity 20 with the lower wall 30 of the safety 23 resting on the ledge 22 of the cavity 20 by virtue of the sear spring 27 bearing downwardly on the pin 25. The firing pin coil spring 41 causes the firing pin 18 to slide rearwardly toward the hammer 12 with the hammer end 40 of the firing pin 18 bearing against the tapered face 38 of the impact member 36. This forces the dog 35 of the safety member 23 to bear against the vertical restraining wall 33 of the upper cavity 31. A lower surface 42 of the hammer lip 37 lies above and in close proximity to the impact member 36 of the safety 23. The upper portion 43 of the hammer 12 above the lip 37 engages an abutment 44 on the gun frame 10 preventing further pivotal movement of the hammer 12 toward the firing pin 18. Obviously, the hammer lip 37 cannot under these conditions reach or contact the firing pin head 40 that must be struck in order to actuate the firing pin 18 to fire a cartridge.

In order to fire the gun 10 the hammer 12 must be swung and pivoted rearwardly to its completely cocked position as shown by FIGURE 2. As the hammer 12 is pivoted about the pin 13, the ledge 26 of the hammer 12 engages the pin 25 lifting it and the safety member 23 vertically. The leg portion 24 of the safety member 23 slides along the leg portion 21 of the cavity 20 while the dog 35 of the safety member 23 slides upwardly along the restraining wall 33 of the cavity 31 causing the impact member 36 to slide upwardly in contact with the firing pin head 40. At the precise moment the hammer 12 is fully cocked, and not before, the hammer 12 assumes the position shown by FIGURE 2 as the dog 35 will have arrived at the position of the horizontal ledge 34 of the cavity 31. Since the dog 35 is now free of the restraining wall 33, the spring 41 of the firing pin head 40 exerting a rearward force against the impact member 36 of the safety 23 will cause the upper end of the safety 23 to slide rearwardly. The dog 35 of the safety 23 will now slide along the ledge 34 of the cavity 31 until the dog 35 engages the upper restraining wall 32 of the cavity 31 and is maintained there by the rearward force of the firing pin head 40. The impact member 36 of the safety 23 is now in alignment with the firing pin head 40 and as shown by FIGURE 2 is ready for firing.

When the hammer 12 has been released for firing from the position shown by FIGURE 2 whether by the action of a trigger or releasing the hammer by one's thumb, the hammer 12 will now pivot on the pin 13 in a forwardly direction by virtue of the hammer spring 14. Immediately the ledge 26 of the hammer 12 will swing downwardly away from the pin 25 of the safety 23 and permit the L-shaped spring 27 to exert all of its force in a downward direction against the pin 25 as shown by FIGURE 3. This downward force of the spring 27 in addition to the rearward force of the firing pin spring 41 causes the firing pin head 40 to bear rearwardly against the impact member 36 and the dog 35 to remain on the horizontal ledge 34 against the vertical restraining wall 32 in the cavity 31. The safety 23 remains suspended in this position until the hammer lip 37 engages the impact member 36 of the safety 23. Since the impact member

36 and the firing pin head 40 are in contact relation, both of these members are driven forwardly, the dog 35 sliding off the ledge 34 while the firing pin 18 strikes a cartridge to fire it. At the moment of firing the various parts assume the position shown by FIGURE 4. The upper portion 43 of the hammer 12 now comes to rest against the abutment 44 of the gun frame 10. The L-shaped spring 27 which is exerting a downward force on the pin 25 combines with the tapering face 38 of the impact member 36 to cause the safety 23 to slide downwardly, the finger cavity 21 guiding the leg portion 24 in a vertical direction and causing the safety 23 to slide vertically until the lower wall 30 of the safety 23 engages the ledge 22 of the cavity 20 as shown by FIGURE 5. The impact member 36 now lies below the lower surface 42 of the hammer lip 37 and the firing pin spring 41 causes the firing pin 18 and the impact member 36 to slide rearwardly until the dog 35 engages the restraining wall 33 of the cavity 31 to assume the neutral position as shown by FIGURE 1.

It is seen that the impact member 36 must be maintained in alignment with the head 40 of the firing pin 18 in order that a cartridge may be fired. As described hereinabove, and shown by FIGURE 2, the impact member 36 can be brought into and maintained in alignment only when the hammer 12 has been fully and completely cocked. If the hammer 12 is only partially cocked as shown by FIGURE 6, the safety 23 is not elevated sufficiently to permit the dog to rise above the restraining wall 33 and engage the upper restraining wall 32 in order that the dog 35 can be seated during the firing cycle of operation and be in the path of the lip 37 of the hammer 12. With the hammer 12 only partially cocked and the dog 35 bearing against the restraining wall 33 of the cavity 31, upon the release of the hammer 12, the sear-like spring 27 will exert a downward force on the pin 25. Since there is nothing in the path of the dog 35 to prevent the safety 23 from sliding downwardly, as soon as the incompletely cocked hammer 12 is released and commences to pivot on its pin 13 in the direction of the firing pin 18, the ledge 26 will swing downwardly leaving the pin 25 and the safety 23 unsupported. The spring 27 will force the safety 23 to slide downwardly at the same instant that the hammer 12 begins to swing toward the firing pin 18. As the hammer 12 arrives at the firing position, the impact member 36 of the safety 23 will be out of alignment with the lip 37 of the hammer 12 and below the lower surface 42 of the hammer lip 37 as shown by FIGURE 1. The upper end 43 of the hammer 12 will now strike the abutment 44 of the gun frame 10 and come to rest thereagainst without having contacted the impact member 36 of the safety 23 nor caused the firing pin 18 to be actuated.

It can be readily noted from the above discussion taken with the accompanying drawings that the gun 10 cannot be fired until the hammer 12 has been fully and properly cocked. Consequently, the gun 10 cannot be fired inadvertently upon releasing the hammer 12 after being partially cocked or by hitting the hammer 12 when in a neutral or semicocked position. Also, in the event a person assembling the gun after cleaning same, etc., fails to replace the safety 23 in the gun 10, the gun 10 cannot fire a cartridge even though the gun hammer can be cocked into its proper firing position or the gun itself appears outwardly to be in condition for firing.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In a fire arm having a frame, a hammer pivotally mounted on said frame, a firing pin mounted on said frame and actuated by said hammer, abutment means mounted on said frame and engaging said hammer preventing said hammer from contacting said firing pin, a safety member movably mounted on said frame, means mounted on said safety member cooperatively engaging said hammer for movably positioning said safety mem-

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ber into alignment with said firing pin upon the cocking of said hammer in a prescribed manner, and cooperative holding means mounted on said safety member and said frame and retaining said safety member in alignment with said firing pin until said firing pin has been actuated.

2. In a fire arm having a frame, a hammer pivotally mounted on said frame, a firing pin mounted on said frame and actuated by said hammer, abutment means mounted on said frame and engaged by said hammer to prevent said hammer from engaging said firing pin, means mounted on said hammer and swinging upon pivotal movement of said hammer, a safety member movably mounted on said frame, engaging means mounted on said safety member and engaging said swinging means for moving said safety member into alignment with said firing pin upon the cocking of said hammer in a prescribed manner, holding means mounted on said safety member and cooperatively engaging said frame for retaining said safety member in said aligned position, and resilient means operatively connected to said firing pin and assisting said safety member in moving away from said aligned position upon actuation of said firing pin by said hammer.

3. In a fire arm having a frame, a hammer pivotally mounted on said frame, a firing pin mounted on said frame and actuated by said hammer, abutment means mounted in said frame and engaged by said hammer to arrest said hammer in spaced relation to said firing pin, ledge means mounted on said hammer, a safety member slidably positioned on said frame, pin means mounted on said safety member and engaging said ledge means for sliding said safety member adjacent said firing pin upon the pivotal movement of said hammer, said frame having a substantially horizontal ledge portion in proximity of said safety member, dog means mounted on said safety member and seated on said ledge portion and retained in said position adjacent said firing pin for actuation of said firing pin upon the cocking of said hammer in a prescribed manner, and resilient means operatively connected to said safety means for sliding said safety member away from said position adjacent to said firing pin upon actuation of said firing pin by said hammer.

4. In a fire arm having a frame, a hammer pivotally mounted on said frame, a firing pin mounted in alignment with said hammer, spring means urging said firing pin in the direction of said hammer, ledge means mounted on said hammer and swinging in a substantially vertical direction upon the pivotal movement of said hammer, abutment means mounted on said frame and engaged by said hammer to arrest said hammer a prescribed distance from said firing pin, a safety member slidably positioned on said frame, an impact portion mounted on said safety member in contact relation but out of alignment with said firing pin, said impact portion being substantially greater in thickness than said prescribed distance, pin means mounted on said safety member and engaging said ledge means for sliding said connecting portion of said safety member into alignment with said firing pin upon the pivotal movement of said hammer, said frame having a substantially horizontal ledge portion in proximity of said firing pin, dog means mounted on said safety member and seated on said cavity ledge portion with said impact portion retained by said firing pin in said aligned position with said firing pin upon the cocking of said hammer in a prescribed manner, and resilient means operatively connected to said safety member for sliding said impact portion away from said aligned position with said firing pin upon actuation of said firing pin by said hammer as said dog means is moved from said cavity ledge portion.

5. In a fire arm having a frame, a hammer pivotally mounted on said frame, a firing pin mounted in alignment with said hammer, spring means urging said firing pin in the direction of said hammer, ledge means mounted on said hammer and swinging in a substantially vertical direction upon the pivotal movement of said hammer, abutment means mounted on said frame and engaged by said hammer to arrest said hammer a prescribed distance

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from said firing pin, a safety member slidably positioned on said frame, an impact portion mounted on said safety member in contact relation but out of alignment with said firing pin, said impact portion being substantially greater in thickness than said prescribed distance, pin means mounted on said safety member and engaging said ledge means for sliding said impact portion of said safety member into alignment with said firing pin upon the pivotal movement of said hammer, said frame having a cavity in proximity of said firing pin, said cavity having an upper and a lower restraining wall and a ledge portion joining said restraining walls, dog means mounted on said safety member and seated on said cavity ledge portion with said impact portion retained by said firing pin in said aligned position with said firing pin upon the cocking of said hammer in a prescribed manner, and resilient means operatively connected to said safety member for sliding said impact portion away from said aligned position with said firing pin upon actuation of said firing pin by said hammer as said dog means is moved from said cavity ledge portion and said firing pin spring means forces said dog means into contact relation with said lower restraining wall of said cavity.

6. In a fire arm having a frame, a hammer pivotally mounted on said frame, a lip portion mounted on said hammer, said lip portion having a bottom wall, a firing pin mounted on said frame in alignment with said lip portion, spring means urging said firing pin in the direction of said hammer, ledge means mounted on said hammer and swinging in a substantially vertical direction upon the pivotal movement of said hammer, abutment means mounted on said frame and engaged by said hammer to arrest said lip portion a prescribed distance from said firing pin, a safety member slidably positioned on said frame, an impact portion mounted on said safety member in contact relation but out of alignment with said firing pin, said impact portion being substantially greater in thickness than said prescribed distance, pin means mounted on said safety member and engaging said ledge means for sliding said impact portion of said safety member into alignment with said firing pin upon the pivotal movement of said hammer, said frame having a cavity in proximity of said firing pin, said cavity having an upper and a lower restraining wall and a ledge portion joining said restraining walls, dog means mounted on said safety member and seated on said cavity ledge portion and said impact portion retained by said firing pin in said aligned position with said firing pin upon the cocking of said hammer in a prescribed manner, and resilient means operatively connected to said safety member for sliding said impact portion away from said aligned position with said firing pin upon actuation of said firing pin by said lip portion as said dog means is moved from said cavity ledge portion and said firing pin spring means forces said dog means into contact relation with said lower restraining wall of said cavity and below said lower wall of said lip portion of said hammer.

7. In a fire arm having a frame, a hammer pivotally mounted on said frame, a lip portion mounted on said hammer, said lip portion having a bottom wall, a firing pin mounted on said frame in alignment with said lip portion, spring means urging said firing pin in the direction of said hammer, ledge means mounted on said hammer and swinging in a substantially vertical direction upon the pivotal movement of said hammer, abutment means mounted on said frame and engaged by said hammer to arrest said hammer a prescribed distance from said firing pin, said frame having a lower cavity and an upper cavity, said upper cavity being in proximity of said firing pin and having an upper restraining wall, a lower restraining wall and a ledge joining said restraining walls, said lower cavity having a bottom wall, a safety member slidably positioned on said frame and received by said cavities, an impact portion mounted on said safety member in contact relation but out of alignment with said firing

pin, said impact portion being substantially greater in thickness than said prescribed distance, pin means mounted on said safety member and engaging said ledge means for sliding said connecting portion of said safety member into alignment with said firing pin upon the pivotal movement of said hammer, dog means mounted on said safety member and seated on said cavity ledge portion and said impact portion retained by said firing pin in said aligned position with said firing pin upon the cocking of said hammer in a prescribed manner, and resilient means operatively connected to said safety member for sliding said impact portion away from said aligned position with said firing pin upon actuation of said firing pin by said hammer as said dog means is moved from said cavity ledge portion and said firing pin spring means forces said dog means into contact relation with said lower restraining wall of said cavity below said lower wall of said lip portion of said hammer and said safety member abuts against said bottom wall of said lower cavity.

8. In a fire arm having a frame, a hammer pivotally mounted on said frame, a firing pin mounted in alignment with said hammer, spring means urging said firing pin in the direction of said hammer, ledge means mounted on said hammer and swinging in a substantially vertical direction upon the pivotal movement of said hammer, said frame having an upper and a lower cavity disposed substantially vertically, a safety member having an offset leg portion received by said lower cavity, said lower cavity having a bottom wall for receiving said leg portion and limiting the downward movement of said safety member, a pin mounted on said leg portion engaging said ledge means upon pivotal movement of said hammer and

moving said safety member in an upward direction, spring means mounted on said frame yieldingly urging said safety member in a downward direction, an impact member mounted on said safety member in alignment and contact relation with said firing pin, a dog mounted on said safety member received by said upper cavity, said upper cavity having a lower restraining wall, an upper restraining wall and a ledge joining said restraining walls, said ledge receiving said dog when said hammer has been pivoted to a desired position, a lip portion mounted on said hammer in alignment with said impact member when said dog of said safety member has been received by said cavity ledge, said lip portion having a bottom wall disposed above said impact member when said leg portion of said safety member is in contact engagement with said bottom wall of said lower cavity, and an abutment mounted on said frame arresting the pivotal movement of said hammer with said lip portion in spaced relation to said firing pin whereby said hammer cannot actuate said firing pin without said impact member being positioned between said lip portion and said firing pin.

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UNITED STATES PATENT OFFICE  
CERTIFICATE OF CORRECTION

Patent No. 3,157,958

November 24, 1964

Karl R. Lewis

It is certified that error appears in the above identified patent and that said Letters Patent are hereby corrected as shown below:

In the grant, line 2, after "Utah," insert -- as tenants in common, --. In the heading to the printed specification, line 4, after "Utah" insert -- , as tenants in common --.

Signed and sealed this 24th day of March 1970.

(SEAL)

Attest:

Edward M. Fletcher, Jr.

Attesting Officer

WILLIAM E. SCHUYLER, JR.

Commissioner of Patents

**UNITED STATES PATENT OFFICE**  
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