United States Patent

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[54] **FIRING PIN SAFETY MECHANISM**
5 Claims, 2 Drawing Figs.

[52] **U.S. Cl.** ..... **42/70 F**
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[50] **Field of Search** ..... 42/70 F, 70 R, 69 A, 69 B

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ABSTRACT: A firing pin having a transverse groove is secured in a locked position by a spring-loaded thrust member moveable transversely to the firing pin through the groove. The thrust member is also provided with a transverse groove through which the firing pin moves when disengaged. An inclined surface on the thrust member adjacent the groove cams against an inclined surface on a rear edge of the firing pin groove to move the firing pin rearwardly and secure the firing pin against movement. The thrust member is actuated by a locking slide slideably mounted on the exterior of the firearm.

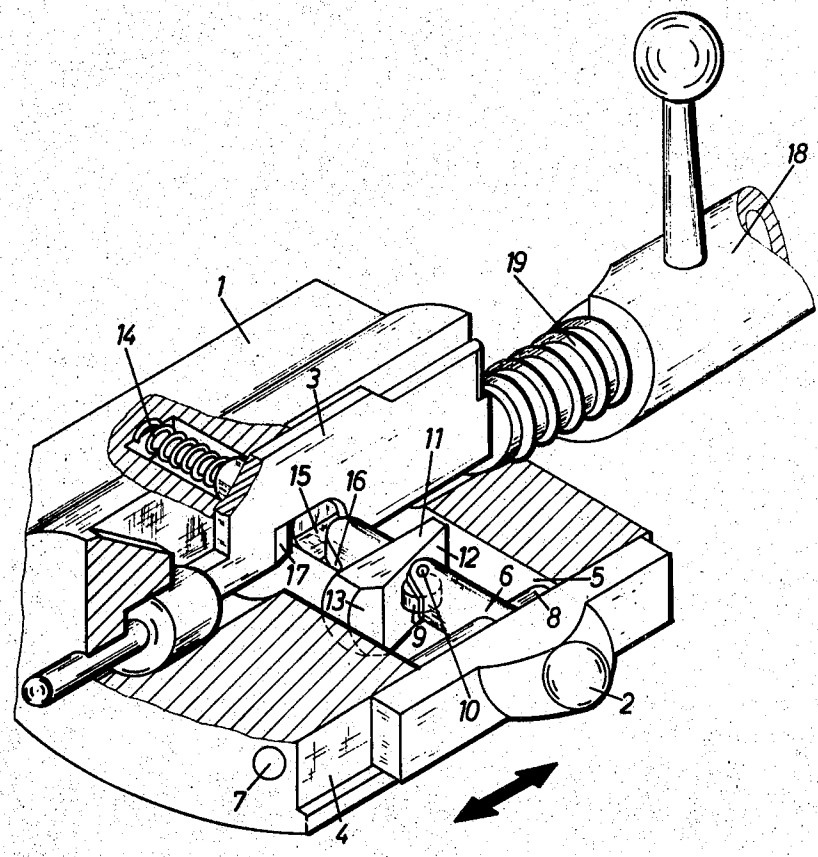


Fig. 2

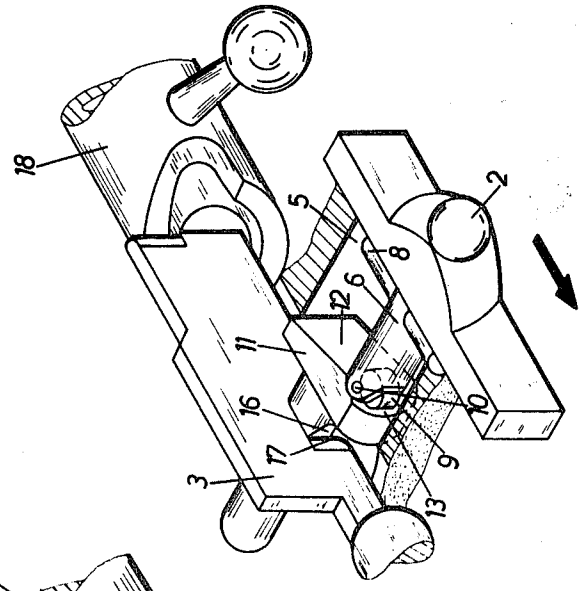
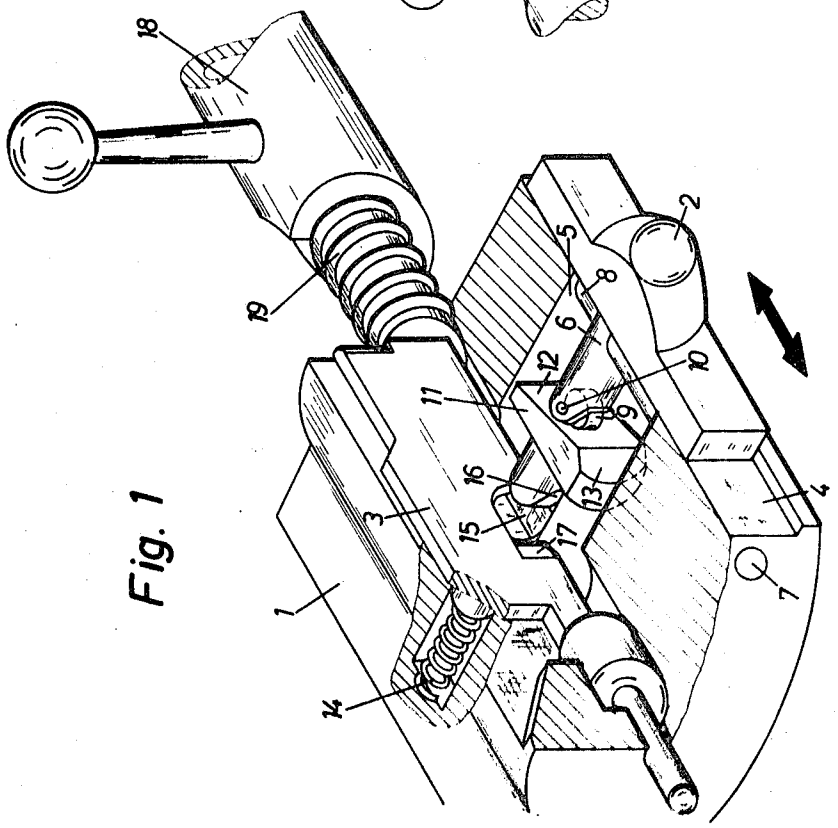


Fig. 1



INVENTOR:

FIRING PIN SAFETY MECHANISM

The present invention relates to a safety mechanism for firearms, more particularly, to a firing pin safety mechanism.

A commonly known form of safety mechanism for firing pins comprises a pivotable operating lever actuated from the exterior of the firearm and connected to a shaft having a locking surface which projects into the path of the firing pin, when in the locked position, to secure the firing pin against movement and prevent the firing pin from contacting the cartridge percussion cap.

Another known form of a safety mechanism for a firing pin comprises a horizontally positioned shaft in the forward position of the firearm and having a safety or operating handle projecting laterally outwardly of the firearm. In the disengaged position of the safety mechanism, the outer end of the handle acts upon a ratchet lever movable transversely with respect to the axis of the firing pin and the trigger. A leaf spring usually acts against the ratchet lever and the handle acts against the force exerted by this leaf spring. When the safety handle is moved to the locking position the ratchet lever is actuated to position a shoulder in front of a lug on the trigger so that the trigger is secured against movement.

Through experience it has been found that such safety mechanisms having rotating or pivoting levers are disadvantageous since the operation of the external handle becomes awkward when a telescopic sight is mounted upon the firearm. The presence of the operating handle as described above actually prevents mounting of a telescopic sight in a position flat upon the firearm. It is therefore the principle object of the present invention to provide a novel and improved firing pin safety mechanism for firearms.

It is another object of the present invention to provide a firing pin safety mechanism actuated by an external slide mounted on the outer surface of the firearm.

It is an additional object of the present invention to provide a firing pin safety mechanism having an operating handle which occupies a minimum of space and is positioned to provide a minimum of interference with attachments to the firearm.

According to one aspect of the present invention a firing pin safety mechanism for firearms may comprise a firing pin mounted for longitudinal movement within the firearm and being provided with a transverse groove. A rear edge of the firing pin groove has an inclined surface. A spring-loaded thrust member is moveable transversely to the firing pin through the firing pin groove. The thrust member also has a transverse groove through which the firing pin moves when the safety mechanism is disengaged. An inclined surface is on the thrust member adjacent its groove so as to be engageable with the firing pin inclined surface. The thrust member is urged by a spring into the disengaged position where the grooves are aligned and the firing pin is free to move. Means operable exteriorly of the firearm are provided for moving the thrust member against the action of its spring so that the inclined surfaces are brought into engagement whereby the firing pin is cammed rearwardly and secured against movement.

Other objects and advantages of the present invention will be apparent upon reference to the accompanying description when taken in conjunction with the following drawings, which are exemplary, wherein;

FIG. 1 is a perspective view of the firing pin safety mechanism according to the present invention in the disengaged position with a portion of the breech being cut away for purposes of clarity; and

FIG. 2 is a perspective view similar to that of FIG. 1 and showing the cocked firing pin secured in the locked position.

Proceeding next to the drawings wherein like reference symbols indicate the same parts throughout the various views a specific embodiment of the present invention will be described in detail.

As may be seen in FIGS. 1 and 2 the central portion of a breech member 1 has a locking slide 2 positioned laterally outwardly thereof and slideable on the exterior surface. The slide is displaceable in a longitudinal direction as indicated by the double-ended arrow and parallel with a firing pin 3 also moveably mounted within the breech member. The locking slide is positioned upon a slide guide 4 on the exterior face of the breech member arranged outwardly of a recess 5 within the breech member. A longitudinal shaft 6 extends from the locking slide 2 into the recess 5 and is securely attached to the locking slide so as to be moveable therewith. A bore 7 extends through the breech member and has a cylindrical pin 8 seated therein which passes through the recess 5 and through a transverse opening formed in the shaft 6. cam follower roller 9 is journaled at the end of the shaft 6 by a pin 10. The roller 9 is constantly in engagement with a thrust member 11 urged outwardly against the roller 9 by means of a compression spring 14. The thrust member 11 is formed with two intersecting inclined surfaces 12 and 13 upon which the roller 9 bears. The roller 9 slides along the inclined surfaces 12 and 13 in response to the linear displacement of the locking slide 2 to which the roller is attached by means of the shaft 6. The inclined surfaces are constantly urged outwardly into contact with the roller 9 by means of the spring 14.

The thrust member 11 is positioned transversely to the firing pin 3 and is guided for lateral displacement within the recess 5. The shaft portion of the thrust member is provided with a transverse guide groove 15 through which the firing pin passes when the safety mechanism is in the disengaged position. An inclined surface 16 is also provided on the shaft adjacent the guide groove 15.

In a similar manner the lower edge of the firing pin 3 is provided with a transverse groove through which the shaft portion of the thrust member passes. A rear edge of the groove is provided with an inclined surface 17 which is engageable with the thrust member inclined surface 16 when the safety mechanism is moved to the locking or secured position.

The construction as described above employing the roller 9 moveable against inclined surfaces 12 and 13 together with a double slide guide structure comprised of the cylindrical pin 8 and the slide guide 4 considerably facilitates manipulation of the locking slide 2 by the person handling the firearm.

As may be seen in FIG. 2 the firearm is prepared for firing by pivoting a bolt handle 18 acted upon by a bolt compression spring 19 in a manner known in the art. The firing pin 3 now extends forwardly toward the direction of a cartridge in the breech. Should it be desired to lock the safety mechanism when the firearm is in the firing condition the locking slide 4 is moved rearwardly by the firer's thumb in the direction of the arrow shown in FIG. 2. The roller 9 will then move along inclined surface 12 to push the thrust member 11 toward the firing pin 3 a sufficient distance so that the inclined surface 16 of the thrust member cams against the inclined surface 17 of the firing pin to move the firing pin rearwardly and arrest the firing pin against further movement. .During this procedure the roller 9 will leave the inclined surface 12 to engage the inclined surface 13. The roller 9 will be maintained in engagement with the inclined surface 13 by the force of compression spring 14 and the firing pin will be secured and locked against movement as long as the locking slide 2 is retained in this position.

When it is desired to disengage the safety mechanism the locking slide 2 is moved by the thumb of the firer toward the right as viewed in FIG. 2. The roller 9 will then leave the inclined surface 13 and slide along the inclined surface 12. As the roller 9 rides along the inclined surface 12 the compression spring 14 will progressively urge the thrust member 11 outwardly so that the thrust member inclined surface 16 disengages from the firing pin inclined surface 17 and the firing pin 3 is free to move through the thrust member groove 15. With the firing pin in the unsecured or disengaged position the trigger can now be operated and the firing pin will move forwardly in response to the operation of the trigger to impact against the cartridge and cause a shot to be fired.

Thus it can be seen that the present invention has disclosed a simple but highly reliable safety mechanism for the firing pin of a firearm. Linear displacement of a locking slide mounted on the exterior of the firearm will move a thrust member transversely with respect to the firing pin to engage the firing pin and secure the same against movement or to disengage the firing pin so that the firing pin is free to move in response to the operation of the trigger. The disclosed safety mechanism avoids any rotating or pivoting elements and the locking slide is compact so as to occupy a minimum of space and to cause no interference with the operation of the firearm.

It is understood that this invention is susceptible to modifications in order to adapt it to different usages and conditions and, accordingly, it is desired to comprehend such modifications within the invention as may fall within the scope of the appended claims.

What is claimed is:

1. A firing pin safety mechanism for firearms comprising a firing pin mounted for longitudinal movement within the firearm and having a transverse groove therethrough, a rear edge of the groove having an inclined surface, a spring-loaded thrust member moveable transversely to said firing pin through said firing pin groove, said thrust member having a transverse groove therein to receive said firing pin, an inclined surface on said thrust member adjacent its groove engageable with said firing pin inclined surface, the spring-loaded thrust member being urged into the position wherein said grooves are aligned and said firing pin is free to move, and means operable exteriorly of the firearm for moving said spring-loaded thrust member to engage said inclined surfaces to cam the firing pin rearwardly so that the firing pin is secured against movement.

2. A firing pin safety mechanism as claimed in claim 1 and comprising means engageable with said thrust member for locking said thrust member in the position securing said firing pin against movement.

3. A firing pin safety mechanism as claimed in claim 1 wherein said thrust member has a pair of intersecting sloping surfaces on an end thereof, said thrust member moving means comprising a slideable shaft transverse to said firing pin and moveable parallel thereto, a roller on one end of the thrust member moving means engageable with said thrust member sloping surfaces, the movement of said moving means moving said roller upon said sloping surfaces to move the thrust member into the secured and disengaged positions.

4. A firing pin safety mechanism as claimed in claim 3 and comprising a locking slide connected to said moving means shaft and slideable on the exterior of the firearm.

5. A firing pin safety mechanism as claimed in claim 4 and comprising a cylindrical pin fixed within the firearm and passing through a transverse opening in said moving means shaft to define a first slide guide, and second slide guide means on the exterior of the firearm slideably supporting said locking slide thereon.