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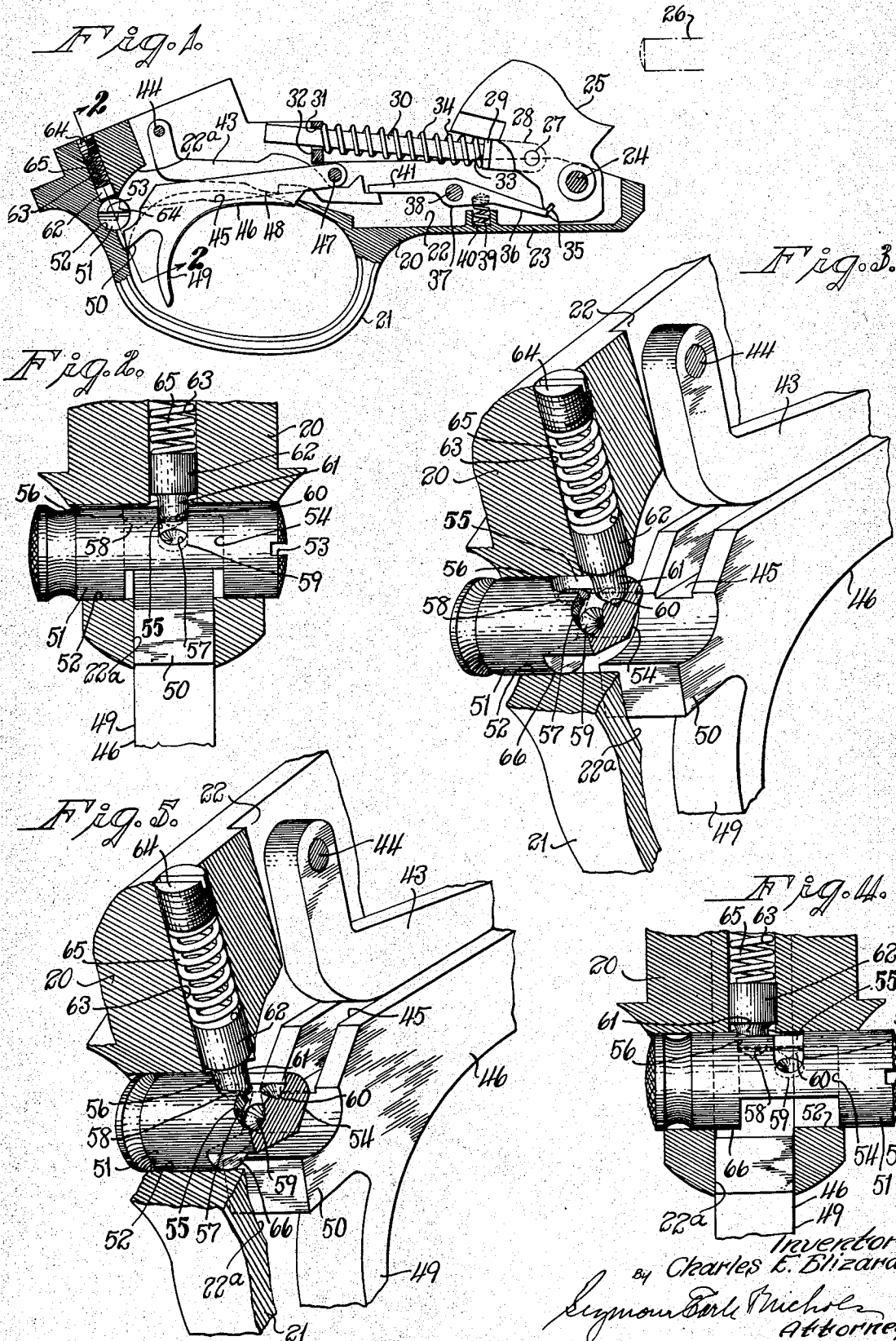
C. E. BLIZARD

2,225,583

SAFETY DEVICE FOR THE FIRING MECHANISMS OF FIREARMS

Filed Jan. 31, 1940

2 Sheets-Sheet 1



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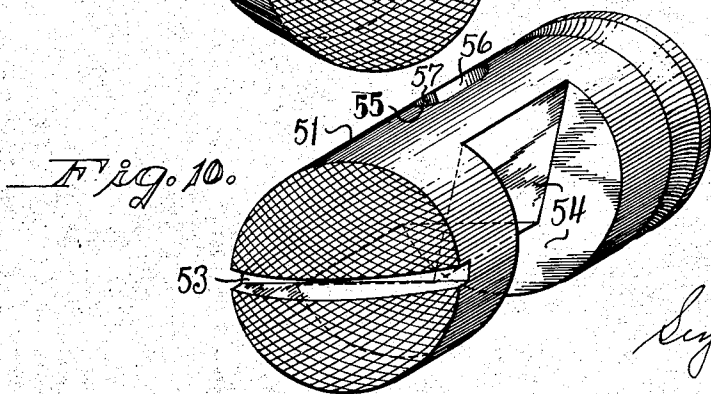
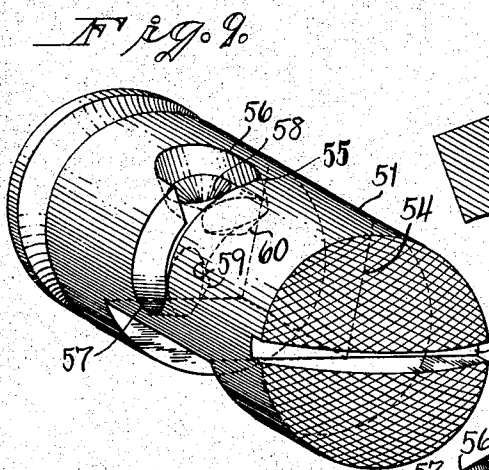
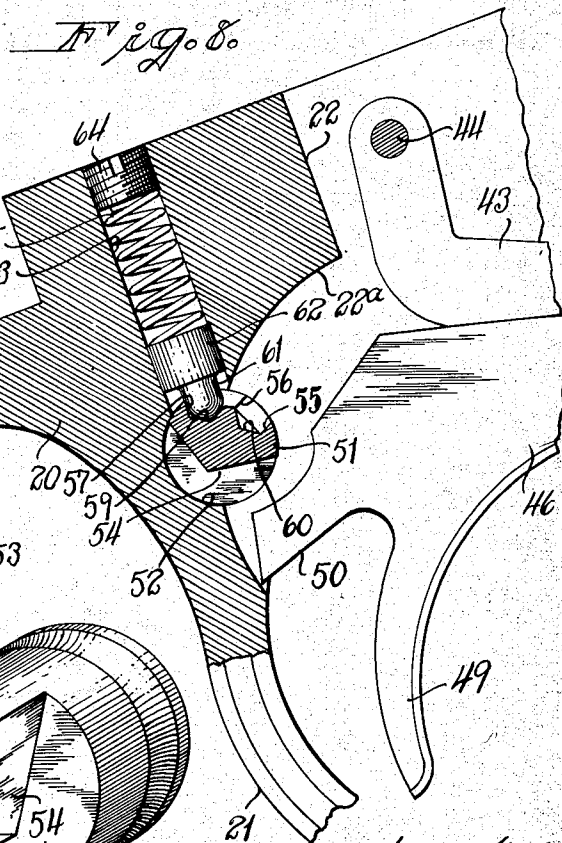
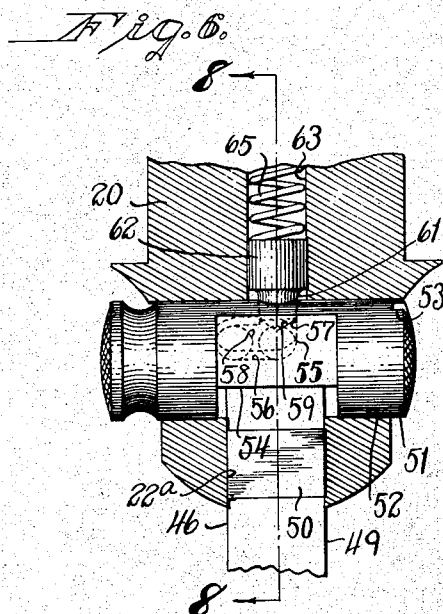
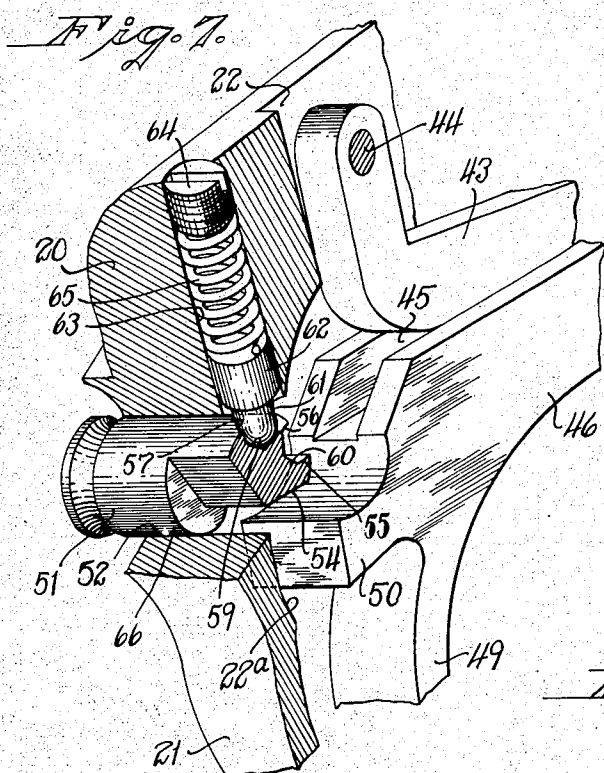
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2 Sheets-Sheet 2



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 Invention
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UNITED STATES PATENT OFFICE

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SAFETY DEVICE FOR THE FIRING MECHANISMS OF FIREARMS

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Application January 31, 1940, Serial No. 316,499

11 Claims. (Cl. 42—70)

The present invention relates to improvements in safety devices, and more particularly to safety devices whereby the firing mechanisms of firearms may be locked or rendered ineffective to thus guard against the accidental or unintentional discharge of the firearm of which the device may form a feature.

It very often happens that a user of a firearm, especially when engaged in a shooting match requiring the firing at a suddenly-appearing and fast-moving target, is very much concerned for fear that the safety device of the firearm being used has been shifted into its non-firing or "safe" position, either unintentionally by the user or by the mischievous or malicious action of a competitor. Many shooters have, therefore, entirely removed the safety device from their firearms in order to guard against having their firearms ineffective when the shooter is called upon to fire at a suddenly-appearing and fast-moving target.

The present invention, as will be apparent from the following considered in conjunction with the accompanying drawings, is directed at a construction and arrangement of parts whereby a safety device may be locked in a position whereby it interposes no interference with the discharge of the firearm.

One of the objects of the present invention is to provide a superior safety device for the firing mechanism of a firearm which may be rapidly and conveniently locked in its so-called "firing" position wherein it does not in any way interfere with the normal functioning of the firing mechanism of the firearm in which it is embodied.

A further object of the present invention is to provide a superior device of the character referred to which is low in cost for manufacture and reliable and effective in its action.

A further object of the present invention is to provide a superior safety device for the firing mechanism of a firearm in which the movement required to lock the safety device is of a different nature than that required to normally shift it from and into either its so-called "safe" position or its so-called "firing" position, to thus minimize the possibility of confusion.

Still another object of the present invention is to provide a superior safety device of the character referred to, wherein the manipulation of a single member will effect the holding of the firing mechanism of the firearm against normal operation, effect the release of such firing mechanism for normal operation, and which will se-

curely lock the safety device in a position of non-interference with the firing mechanism.

With the above and other objects in view, as will appear to those skilled in the art from the present disclosure, this invention includes all features in the said disclosure which are novel over the prior art and which are not claimed in any separate application.

In the accompanying drawings, in which certain modes of carrying out the present invention are shown for illustrative purposes:

Fig. 1 is a view partly in side elevation and partly in vertical central-longitudinal section of the trigger-plate unit of a firearm in which is incorporated a firing mechanism and a safety device embodying the present invention;

Fig. 2 is a broken transverse sectional view taken on the line 2—2 of Fig. 1 but on a larger scale and showing the safety-slide in its "normal firing-position";

Fig. 3 is a fragmentary perspective view of the rear portion of the parts shown in Fig. 1, with the trigger-plate and the safety-slide shown partly in section, and with the said safety-slide shown in its "normal firing-position";

Fig. 4 is a broken transverse sectional view corresponding to Fig. 2 but showing the safety-slide shifted into its "safe" position;

Fig. 5 is a fragmentary perspective view corresponding to Fig. 3 but showing the safety-slide shifted into its "safe" position;

Fig. 6 is a broken transverse sectional view corresponding to Figs. 2 and 4 save that the safety-slide is shown moved into its "locked firing-position";

Fig. 7 is a fragmentary perspective view corresponding to Figs. 3 and 5 save that the safety-slide is shown shifted into its "locked firing-position";

Fig. 8 is a broken view in vertical central-longitudinal section of the rear portion of the assembly shown in Fig. 1 and taken on the line 8—8 of Fig. 6;

Fig. 9 is a perspective view of the safety-slide detached and viewing the same mainly from the rear; and

Fig. 10 is a similar view but viewing the safety-slide mainly from the front.

In the accompanying drawings a safety device constructed in accordance with the present invention is shown as organized with a trigger-plate 20 which may form a feature of any suitable type of firearm, which latter does not require detailed illustration or description herein. The said trigger-plate is formed with a usual

integral loop-like trigger-guard 21 and with a central-longitudinal mechanism-receiving channel 22 opening upwardly through the upper surface of the trigger-plate substantially throughout the major portion of the length thereof and at its rear end intersecting the space circumscribed by the loop-like trigger-guard 21. The forward portion of the said mechanism-receiving channel 22 is closed at its lower end by a bottom-wall 23 formed integral with the trigger-plate 20.

Extending transversely across the forward portion of the mechanism-receiving channel 22 and the trigger-plate 20, is a pivot-pin 24 upon which is pivoted a hammer 25, the upper portion of the forward face of which is adapted to strike a firing-plunger or other suitable firing-member which is indicated by the broken lines 26 in Fig. 1.

Pivotaly connected by means of a pivot-pin 27 to the rear portion of the hammer 25 is the forward or head-end 28 of a rocking and reciprocating hammer-actuating plunger generally designated by the reference character 29. The said plunger 29 also includes a rearwardly-extending cylindrically-contoured shank 30 freely movable in a passage 31 formed in a bridge portion 32 extending across the mechanism-receiving channel 22 in the trigger-plate 20 about midway the length thereof and forming a rigid feature of the said trigger-plate. Thrusting forwardly against a rearwardly-facing thrust-shoulder 33 formed on the plunger 29 at the junction of the head-end 28 and the shank 30 thereof, is the forward end of a helical hammer-spring 34 encircling the said shank 30 and pressing at its rear end against the front face of the bridge portion 32 of the trigger-plate 20. As thus arranged, the hammer-spring 34 exerts a constant effort to swing the hammer 25 in a clockwise direction to cause the same to strike the firing-plunger 26 (Fig. 1).

In its lower portion the hammer 25 is formed with a cocking-abutment 35 which is releasably engageable by the forward face of a sear-nose 36 constituting the forwardly-extending arm of a pivotal sear 37. The said sear 37 is located in the mechanism-receiving channel 22 of the trigger-plate 20 and is pivotally mounted therein about midway of its length upon a pivot-pin 38 extending transversely across the said channel 22. Pressing upwardly upon the sear-nose 36 of the sear 37 so as to yieldingly hold the said sear-nose in position for engagement with the cocking-abutment 35 of the hammer 25, is a helical sear-spring 39 seated at its lower end in an upwardly-opening spring-pocket 40 formed in the upper surface of the bottom-wall 23 of the trigger-plate 20, as is shown in Fig. 1.

In addition to its forwardly-extending sear-nose 36, the sear 37 is formed with a rearwardly-projecting arm 41 having its rear portion normally resting upon an upwardly-facing actuating-abutment formed at the forward end of a pivotal transmitting-member 43. The upper rear portion of the transmitting-member 43 just referred to is mounted for pivotal movement upon a pivot-pin 44 extending transversely across the upper rear portion of the mechanism-receiving channel 22 in the trigger-plate 20.

The main portion of the transmitting-member 43 extends in and through a longitudinal channel 45 formed in a trigger 46 and opening through the under face of the said trigger adjacent the forward end thereof. The said trigger is mounted

at its forward end for pivotal movement in the mechanism-receiving channel 22 in the trigger-plate 20, by means of a transverse pivot-pin 47 as is shown in Fig. 1. The bottom wall of the channel 45 in the trigger 46 is adapted to engage with a transmitting-lug 48 depending from the transmitting-member 43 about midway the length thereof.

The trigger 46 is provided at its rear with a rearwardly-and-downwardly-curved finger-piece 49 projecting into position for engagement by the finger of a marksman inserted through the trigger-guard 21. The said trigger 46 is also formed with a rearwardly-extending integral stop-finger 50 which is adapted to cooperate with a safety-slide 51, in a manner as will hereinafter appear.

The safety-slide 51 above referred to is of cylindrical form generally, and is mounted for both reciprocation and oscillation in a cylindrically-contoured guideway 52 extending transversely across the trigger-plate 20 adjacent the rear portion of the trigger-guard 21 and adjacent the stop-finger 50 of the trigger 46. The forward portion of the transverse guideway 52 intersects or "breaks through," so to speak, a continuation 22a of the mechanism-receiving channel 22 and which opens into the space enclosed by the trigger-guard and the adjacent portions of the trigger-plate 20 proper, as is especially well apparent in Fig. 8.

Each of the respective opposite ends of the safety-slide 51 is preferably knurled or otherwise roughened to provide an anti-slip surface for the finger of the user of the firearm in which the present invention is incorporated, and one of the said ends is formed with a diametrical slot or kerf 53 designed for the reception of a coin or screwdriver in a manner and for the purpose as will hereinafter appear. About midway between its respective opposite ends, the safety-slide 51 is formed with a clearance-notch 54 which is slightly wider than the width of the stop-finger 50 of the trigger 46, and which is adapted to freely receive the said stop-finger when the safety-slide 51 is in all save one of its three different positions, as will hereinafter appear.

The safety-slide 51 is adapted to assume three different positions as will more fully appear from the following, one normal position (Figs. 2 and 3) in which the safety-slide permits the free unhindered operation of the trigger 46 to effect the release of the hammer 25 and which position, for convenience of description, will be referred to herein as the "normal firing position," and from which position the safety-slide is readily shiftable by an axial movement thereof.

Another position which the safety-slide 51 may assume, is a position in which it permits the free movement of the trigger 46 but from which it cannot be readily shifted save by a special unlocking movement of the said safety-slide. This latter position will, for convenience of description, be designated as the "locked firing position" and it is the position in which the said safety-slide is shown in Figs. 6, 7 and 8.

The third position into which the safety-slide 51 is adapted to be moved, is one in which its clearance-notch 54 is moved out of full registration with the stop-finger 50 of the trigger 46, and in which position the said safety-slide prevents the normal full releasing movement of the trigger 46, as is illustrated in Figs. 4 and 5. The position of the safety-slide 51 as just referred to, will,

for the convenience of description, be herein designated as the "safe position."

In the portion of its periphery which is substantially opposite the clearance-notch 54, the safety-slide 51 is formed with an L-shaped groove generally designated by the reference character 55. The said L-shaped groove includes one arm 56 which extends in substantial parallelism with the longitudinal axis of the safety-slide and a second arm 57 extending in a circumferential direction, as is especially well shown in Fig. 9. Adjacent the outer end of the arm 56 of the slot 55, the bottom wall thereof is formed with a conical detent-pocket 58. The bottom wall at the outer end of the arm 57 of the L-shaped slot 55 is, in turn, formed with a conical detent-pocket 59. At the junction of the respective arms 56 and 57, the bottom wall of the L-shaped slot 55 is formed with a conical detent 60.

Each of the detent-pockets 58, 59 and 60 is adapted to receive in turn the spherically-contoured inner end of a detent-nose 61 having substantially-cylindrical side-walls and extending downwardly from the underside of a detent-plunger 62. The said detent-plunger is adapted to reciprocate in a passage 63 which at its lower end intersects the transverse guideway 52 of the safety-slide 51 and which extends upwardly at a slightly-rearwardly-inclined angle through the upper face of the trigger-plate 20. Threaded into the upper end of the passage 63 is a retaining-screw 64 against the under face of which presses the upper end of a helical detent-spring 65. The lower end of the detent-spring 65, just referred to, presses against the upper face of the detent-plunger 62 and serves to yieldingly seat the spherically-contoured lower end of the detent-nose 61 into whichever one of the three detent-pockets 58, 59 or 60 happens at the time to be in registration with the said detent-nose.

When, as is shown in Figs. 2 and 3, the detent-nose 61 of the detent-plunger 62 is seated in the detent-pocket 60 of the safety-slide 51, the said safety-slide will be in its normal firing-position in which its clearance-notch 54 is in full registration with the stop-finger 50 of the trigger 46. Under these conditions a rearward draft exerted upon the finger-piece 49 of the trigger 46 will swing the same about the pivot-pin 47 to a degree sufficient to elevate the stop-finger 50 into the clearance-notch 54 in the safety-slide 51. This movement will cause the bottom wall of the channel 45 in the trigger 46 to engage with and lift the transmitting-lug 48 of the transmitting-member 43. When the transmitting-lug 48 is lifted as just described, the entire transmitting-member 43 will be swung in a counter-clockwise direction (Fig. 1) about its pivot-pin 44 and will thereby rock the sear 37 in a clockwise direction to disengage the sear-nose 36 from the cocking-abutment 35 of the hammer 25. When the sear-nose 36 is disengaged as just described the hammer-spring 34 will assert itself and cause the said hammer 25 to swing rapidly in a clockwise direction about its pivot-pin 24 to strike the firing-plunger 26 in a manner common in firearms, to effect the discharge of the firearm of which it forms a feature.

Should it be desired to render the firearm safe by blocking the normal free action of the trigger 46 or other member of the firing mechanism, the safety-slide 51 may be pressed axially from left to right to cause the detent-nose 61 of the detent-plunger 62 to ride out of the detent-pocket 60 in the said safety-slide and into the detent-

pocket 58 thereof as is shown in Figs. 4 and 5. This axial shifting of the safety-slide 51 will also shift the clearance-notch 54 of the safety-slide out of full registration with the stop-finger 50 of the trigger 46 and will interpose a portion 66 of the said safety-slide into the path of movement of the said stop-finger 50. The portion 66 of the safety-slide partakes in external dimensions of the full diameter of the said safety-slide so that but a very slight movement of the trigger 46 (insufficient to release the hammer 25) may take place before the said trigger is brought to a positive halt by the engagement of the stop-finger 50 with the under face of the portion 66 of the safety-slide 51.

When the safety-slide 51 is in its normal firing-position as indicated in Figs. 2 and 3 of the drawings, it is possible for the said safety-slide to become inadvertently shifted into its safe position as indicated in Figs. 4 and 5. Such inadvertent shifting of the safety-slide would render inoperative the firearm in which it is incorporated and the marksman, when expecting to fire at a fast moving target, would find that the firearm is useless at such time. To guard against such a happening as has just been referred to, the marksman may, by inserting a coin or the like in the kerf 53 of the safety-slide 51, rotate the said safety-slide in a clockwise direction from the position in which it is shown in Figs. 2 and 3 into the position in which it is shown in Figs. 6, 7 and 8. This turning movement of the safety-slide 51 will bring the detent-pocket 59 adjacent the outer end of the peripherally-extending arm 57 of the L-shaped groove 55, into registration with the detent-nose 61 of the detent-plunger 60. When the slide is in the position now being discussed it may be readily reversely turned but is prevented from being shifted from left to right into its safe position shown in Figs. 4 and 5 owing to the depth of the left side-wall of the arm 57. Thus, the safety-slide 51 is locked against being reciprocated inadvertently into its safe position.

From the foregoing it will be seen that by means of the present invention the safety-slide may be reciprocated into and out of a safe position and a normal firing-position, but that when desired a turning movement in a clockwise direction of the said safety-slide will effectively lock the safety-slide against being inadvertently reciprocated into its safe position. The unlocking of the safety-slide 51 may, however, be effected conveniently by the deliberate act of turning the said safety-slide in a counter-clockwise direction to restore it to its normal position in which it may be reciprocated back and forth into and out of its safe position and its normal firing-position.

The invention may be carried out in other specific ways than those herein set forth without departing from the spirit and essential characteristics of the invention, and the present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive, and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.

I claim:

1. A firearm structure including in combination: a firing mechanism; a safety-member mounted for movement back and forth longitudinally of itself and back and forth in a direction transversely of itself into and out of position to be engaged by a portion of the said firing-

- mechanism to prevent the normal operation thereof; detent-means constructed and arranged to yieldingly hold the said safety-member against both longitudinal and transverse movement; and locking-means for holding the said safety-member in a given one of its positions.
- 5 2. A firearm structure including in combination: a firing mechanism; a safety-member mounted for reciprocation and oscillation and having a portion movable into and out of position to be engaged by a portion of the said firing mechanism to prevent the normal operation thereof; detent-means constructed and arranged to yieldingly hold the said safety-member against
- 10 both turning movement and reciprocating movement; and locking-means having a portion movable by the oscillating movement of the said safety-member into and out of position and to lock the said safety-member in a given one of its positions.
- 15 3. A firearm structure including in combination: a firing mechanism; a cylindrically-contoured safety-slide mounted for reciprocation and oscillation into and out of position to be engaged by a portion of the said firing mechanism to prevent the normal operation thereof; detent-means constructed and arranged to yieldingly hold the said cylindrically-contoured safety-slide against both turning movement and reciprocating
- 20 movement; and locking-means having a portion movable by the oscillating movement of the said cylindrically-contoured safety-slide into and out of position to lock the said cylindrically-contoured safety-slide in a given one of its positions.
- 25 4. A firearm structure including in combination: a firing mechanism; a safety-member mounted in the firearm structure with capacity for longitudinal reciprocation and transverse turning movement and provided with a clearance-notch movable into and out of registration with a portion of the said firing mechanism to respectively free the said firing mechanism for
- 30 normal operation and to lock the same against normal operation; detent-means constructed and arranged to yieldingly hold the said safety-member against both turning movement and reciprocating movement; and locking-means having a portion movable by the oscillating movement of the said safety-member into and out of position
- 35 to lock the said safety-member in a given one of its positions.
- 40 5. A firearm structure including in combination: a firing mechanism; a safety-member mounted in the firearm structure with capacity for longitudinal reciprocation and transverse turning movement and provided with a clearance-notch movable into and out of registration with a portion of the said firing mechanism to respectively free the said firing mechanism for
- 45 normal operation and to lock the same against normal operation; detent-means constructed and arranged to yieldingly hold the said safety-member against both turning movement and reciprocating movement; and locking-means having a portion facing crosswise of the longitudinal axis of the said safety-member and movable by the oscillating movement of the said safety-member into and out of position to lock the said safety-member against longitudinal reciprocation.
- 50 6. A firearm structure including in combination: a firing mechanism; a safety-member mounted in the firearm structure with capacity for longitudinal reciprocation and transverse oscillation and having a portion movable into and
- 55 out of position to be engaged by a portion of the said firing mechanism to prevent the normal operation thereof, the said safety-member being formed with a substantially-L-shaped slot one arm of which extends in substantial parallelism with the longitudinal axis of the safety-member and the other arm of which slot extends substantially transversely thereof; and a member carried by the firearm structure and projecting into the L-shaped slot thereof to restrict the reciprocating and oscillating movements of the said safety-member.
- 60 7. A firearm structure including in combination: a firing mechanism; a safety-member mounted in the firearm structure with capacity for longitudinal reciprocation and transverse turning movement and provided with a clearance-notch movable into and out of registration with a portion of the said firing mechanism to respectively free the said firing mechanism for normal operation and to lock the same against normal operation, the said safety-member being formed with a substantially-L-shaped slot having one arm extending in substantial parallelism with the longitudinal axis of the safety-member and having the other arm of the said slot extending transversely thereof; and a member carried by the firearm structure and projecting into the substantially-L-shaped slot thereof to restrict the reciprocating and oscillating movements of the said safety-member.
- 65 8. A firearm structure including in combination: a firing mechanism; a safety-member mounted in the firearm structure with capacity for longitudinal reciprocation and transverse oscillation and having a portion movable into and out of position to be engaged by a portion of the said firing mechanism to prevent the normal operation thereof, the said safety-member being formed with a substantially-L-shaped slot, one arm of which extends in substantial parallelism with the longitudinal axis of the safety-member and the other arm of which slot extends transversely thereof, the said safety-member also being formed in the bottom of the substantially-L-shaped slot therein with three detent-pockets, one of which is located at the junction point of the two arms of the said slot and the other two detent-pockets being respectively located adjacent the outer ends of each of the respective arms thereof; and a spring-pressed detent projecting into the substantially-L-shaped slot in the said safety-member into position to be sequentially engaged with the three detent-pockets therein as the said safety-member is moved.
- 70 9. A firearm structure including in combination: a firing mechanism; a safety-member mounted in the firearm structure with capacity for longitudinal reciprocation and transverse turning movement and provided with a clearance-notch movable into and out of registration with a portion of the said firing mechanism to respectively free the said firing mechanism for normal operation and to lock the same against normal operation, the said safety-member being formed with a substantially-L-shaped slot having one arm extending in substantial parallelism with the longitudinal axis of the safety-member and having the other arm of the said slot extending transversely thereof, the said substantially-L-shaped slot being formed in its bottom wall with three detent-pockets, one of which is located at the junction point of the two arms of the said slot and the other two detent-pockets being respectively located adjacent the outer ends of each of the respective arms thereof; and a spring-
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pressed detent projecting into the substantially-L-shaped slot in the said safety-member into position to be sequentially engaged with the three detent-pockets therein as the said safety-member is moved.

10. A firearm structure including in combination: a trigger-plate provided with a loop-like trigger-guard and with a transverse cylindrical-contoured guideway communicating laterally with the space within the trigger-guard of the said trigger-plate; a trigger carried by the said trigger-plate and having a portion extended into the loop-like trigger-guard thereof; a cylindrical-contoured safety-slide mounted in the transverse guideway in the said trigger-plate with capacity for both reciprocation and oscillation therein and having a portion movable into and out of position to be engaged by a portion of the said trigger to prevent the normal operation thereof; and locking-means having a portion shiftable by the oscillating movement of the said cylindrically-contoured safety-slide into and out of position to lock the said safety-slide in a given one of its positions.

tion: a trigger-plate provided with a loop-like trigger-guard and with a transverse cylindrical-contoured guideway communicating laterally with the space within the trigger-guard of the said trigger-plate; a trigger carried by the said trigger-plate and having a portion extended into the loop-like trigger-guard thereof; a cylindrical-contoured safety-slide mounted in the transverse guideway in the said trigger-plate with capacity for both reciprocation and oscillation therein and having a portion movable into and out of position to be engaged by a portion of the said trigger to respectively prevent and permit the normal operation thereof, the said safety-slide being formed with a substantially-L-shaped slot having one arm extending in substantial parallelism with the longitudinal axis of the safety-slide and the other arm of which extends substantially transverse thereof; and a member carried by the said trigger-plate and projecting into the L-shaped slot in the said safety-slide to limit both the oscillating and reciprocating movements of the said safety-slide.

11. A firearm structure including in combina-

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