

[54] FIRING MECHANISM IN DOUBLE-BARREL GUNS	825,550	7/1906	Murphy.....	42/42 R
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[76] Inventor: Olof Torgny Heurlén, Sandasvagen 4, 191 45 Sollentuna, Sweden	2,664,658	1/1954	Bjorklund .....	42/1 Y
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June 7, 1971 Sweden..... 7388/71

[52] U.S. Cl. .... 42/1 Y, 42/42 R

[51] Int. Cl. .... F41c 27/10, F41c 19/00

[58] Field of Search..... 42/1 Y, 42 R

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[57] **ABSTRACT**

A firing mechanism in double-barrel guns is provided, the firing mechanism including a single trigger which can be moved generally laterally by the marksman's finger between alternate firing portions, for selectively firing either barrel. Also, a key-operated lock means is provided for locking the movable trigger in a non-firing, safety position..

**8 Claims, 9 Drawing Figures**

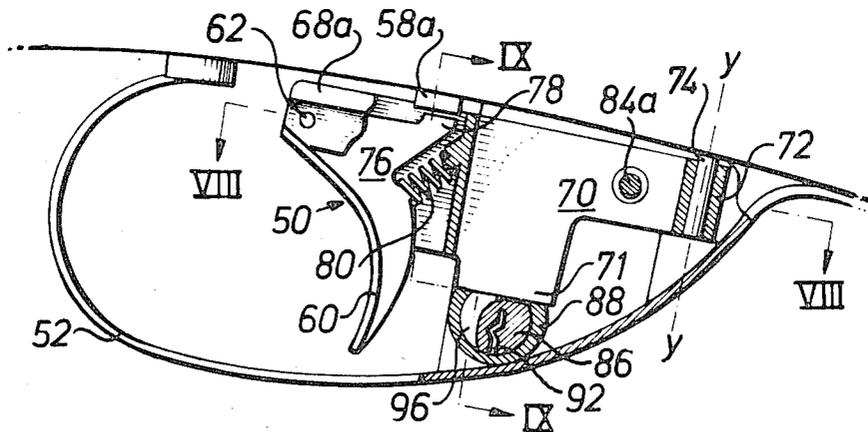


Fig. 1

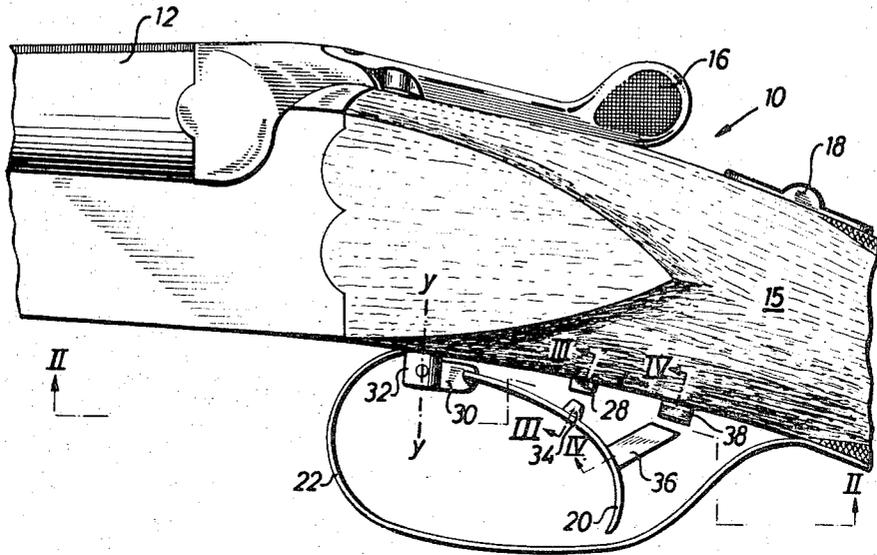


Fig. 2

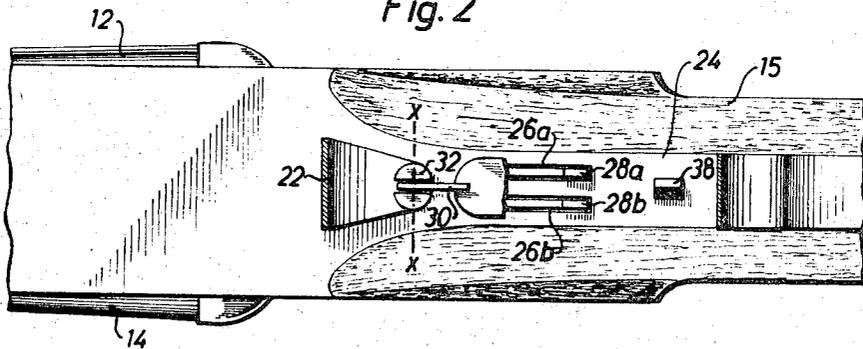


Fig. 3

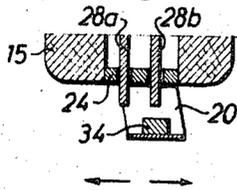
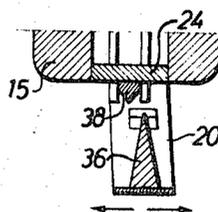
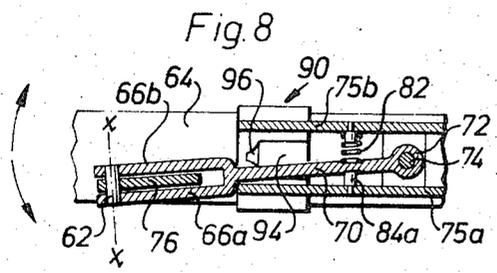
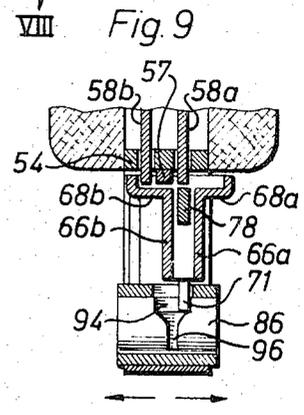
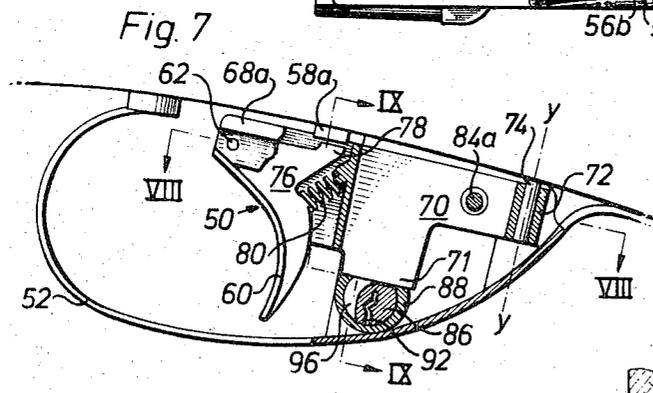
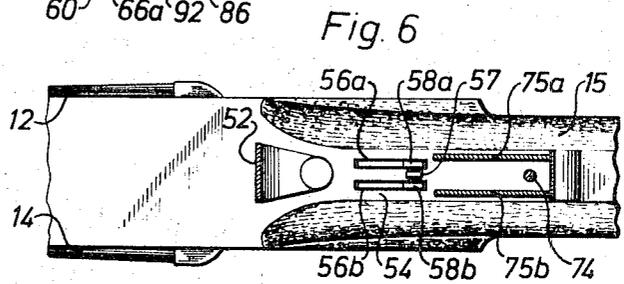
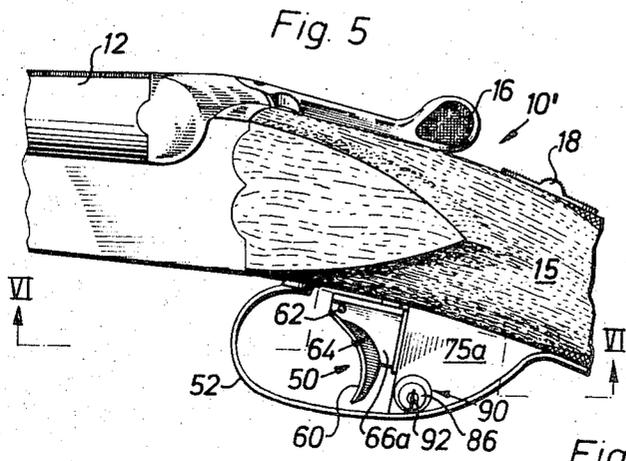


Fig. 4





## FIRING MECHANISM IN DOUBLE-BARREL GUNS

This is a division, of application Ser. No. 308,250, filed Nov. 20, 1972, now abandoned.

The present invention relates to double-barrel guns or rifles, particularly double-barrel shotguns, such as used in hunting and relates more specifically to an improved firing mechanism for such guns.

As is well known, the most usual type of hunting rifle is the conventional hammerless double-barrel shotgun used with buck shot ammunition. In the majority of cases, a separate trigger is provided for each barrel of the gun, one trigger being located slightly in front of the other. Thus, when firing two shots in sequence, the finger of the marksman must be moved from one trigger to the other, which implies a slight loss in time. The time lost in moving the firing finger from one trigger to the other is particularly accentuated in guns provided with so-called pistol grips on the butt of the gun, i.e., a special arrangement provided for guiding and supporting the hand of the marksman, since the pistol grip presents an obstacle to the finger movement. To reduce this loss in time, certain types of double-barrel shotguns have been provided with a firing mechanism served by one single trigger only, a re-setting means being arranged by means of which trigger action can be directed from one barrel to the other. It is doubtful, however, whether the time gained with this arrangement in comparison with the arrangement of double triggers is sufficient to render such arrangements fully satisfactory in the case of rapid firing sequences.

The object of the invention is to provide a novel and improved firing mechanism in double-barrel shotguns which enables both barrels of the gun to be discharged, one after the other, in the fastest possible sequence, by means of a single trigger. A further object of the invention is to provide a simple, extra safety device against unintentional firing of the gun, in addition to the conventional safety device of the gun. A further object of the invention is to provide the gun with a key-operated lock, which renders it impossible to fire the gun until the lock is released.

These and other objects are obtained and the aforementioned disadvantages are eliminated with the firing mechanism of the present invention.

The invention will now be described in more detail with reference to a number of embodiments thereof illustrated in the accompanying drawings in which

FIG. 1 is a side view of the central portion of a conventional double-barrel shotgun provided with a firing mechanism constructed in accordance with the invention.

FIG. 2 illustrates the same portion seen from the plane marked with the line II—II in FIG. 1, partly in section.

FIGS. 3 and 4 are detail sectional views taken through the lines III—III and IV—IV respectively in FIG. 1.

FIG. 5 is a view corresponding to the view in FIG. 1 but in smaller scale and illustrating a second embodiment of the firing mechanism according to the invention.

FIG. 6 illustrates the portion of the gun illustrated in FIG. 5, seen from the plane marked with the line VI—VI in said figure, partly in section.

FIG. 7 is a detail view, partly in section, of a modified embodiment of the firing mechanism according to the

invention, with certain external portions of the mechanism removed to illustrate the construction of the mechanism more clearly.

FIG. 8 is a detail section view taken along line VIII—VIII in FIG. 7, and FIG. 9 is a detail sectional view taken along the line IX—IX in FIG. 7.

For the sake of clarity, FIGS. 7-9 are drawn in larger scale than FIGS. 5 and 6.

FIG. 1 illustrates diagrammatically and in side view the central portion of a hammerless double-barrel shotgun 10 in which the firing mechanism of the present invention is accommodated. With the exception of the firing mechanism according to the invention, the weapon is of conventional design and comprises two barrels 12 and 14 so arranged in relation to the wooden stock 15 of the gun enclosing the gun opening and firing mechanism so as to be capable of being broken open. The barrels are locked in position relative to the stock by means of a catch 16 which is operated in a known manner externally of the gun, and behind which a safety catch 18 of known construction is arranged. The stock 15 merges rearwardly into the gun butt, which is not disclosed in detail. A trigger 20 constructed in accordance with the invention and enclosed by a cover plate 24 attached to a trigger guard 22 is arranged on the under surface of the stock.

As previously mentioned the trigger mechanism is of the conventional hammerless type and will not be described in detail, since it does not form part of the present invention. Arranged in the cover plate 24 (FIG. 2) are two grooves 26a and 26b, and in the conventional trigger system there extends through said grooves two operating tongues journalled inwardly of the cover plate 24 and each connected with its respective trigger, the triggers being located in side by side relationship but one slightly behind the other. According to the present invention, however, the tongues are not connected with any external triggers, but are reduced to two outwardly projecting tongues 28a and 28b. The tongues merge with conventionally constructed elements located inwardly of the cover plate and connected with and journalled in the firing mechanism in a manner such that when either tongue 28a or 28b is pressed into its groove, i.e. upwardly as seen in FIG. 1, the associated portion of the mechanism is released and the barrel located on that side of the gun is fired.

The essence of the invention resides in the fact that one single trigger 20 is used to activate both of the firing tongues 28a and 28b, it being ensured that only one of the tongues can possibly be actuated at any one time by means of the trigger. The trigger 20 comprises mainly a suitably curved bar, attached at its forward end to the cover plate 24 adjacent the front attachment point of the trigger guard 22, the trigger being shaped so as to conform to the index finger of the marksman, to facilitate gripping of the trigger.

In accordance with the invention, the trigger 20 is mounted so that in addition to being pivotally movable in the normal manner around the axis marked with X—X in FIG. 2, it can also be pivotally moved horizontally around an axis marked Y—Y in FIG. 1. It will readily be perceived, that the illustrated movement pattern of the trigger can be obtained in a variety of ways, and FIGS. 1-4 illustrate a first proposal for obtaining such a movement pattern, which implies that the trigger is joined with a vertical post or transfer member 30, which is pivotally joined to an attachment pin 32. The

pin can, in turn, be pivotally mounted to the cover plate 24 or, as is more simple, the post 30, which joins the actual trigger 20 with the attachment pin 32, may be resiliently sprung to an extent whereby it permits the trigger to be swung laterally to the desired degree. Further, the portion of the trigger adjacent the point where the trigger is joined to the gun may be made of a resilient material which permits movement of the trigger around said axes.

Attached to the upper surface of the trigger 20 is a shoulder 34 arranged to alternately actuate either one of the firing tongues 28a and 28b, depending on whether the trigger is moved to the left or the right, as shown by the arrows in FIGS. 3 and 4. Thus, the trigger 20 and the post 30 and attachment pin 32 may be adjusted so as to normally take the position illustrated in the last mentioned Figures, i.e. with the shoulder 34 located opposite the firing tongue 28b, i.e. in a position ready for firing the right-hand barrel of the gun. The trigger is also suitably spring-biased towards its neutral or rest position in a manner not shown, so that a small spring pressure must be overcome when firing in order to move the shoulder 34 to the selected firing tongue 28a or 28b. As previously mentioned, the manner in which the trigger 20 is mounted is only diagrammatically illustrated, and a large number of structural embodiments are possible. One such alternative embodiment requiring the trigger to be sprung in its entirety, so that all movements of the trigger necessary for firing the gun must be effected against the action of a small spring pressure.

It will be perceived that an important condition for the operational safety of the trigger thus described is that the shoulder 34 can not be brought unintentionally to actuate both the firing tongues 28a and 28b at the same time. That this can not take place is ensured by means of the present invention, owing to the fact that the trigger 20 is provided with a guide post 36, preferably mounted slightly behind the shoulder 34, when seen in the firing direction, and arranged to co-act with a small guide prism 38 mounted on the cover plate 24, the guide prism 38 being provided with a pointed top portion, as illustrated in FIG. 4. When firing the gun, the guide post 36 is able to engage the prism 38 on one side or the other of the top portion thereof, wherewith a camming effect is obtained with the interaction of the two members, so that the shoulder 34 is forced to engage one of the tongues 28a, 28b, and with which it is impossible to obtain simultaneous firing engagement with said two elements.

As will be described hereinafter, to aforementioned guide post and prism can be constructed in a manner such that in addition to preventing both barrels of the gun being discharged simultaneously, they also provide an additional safety mechanism against firing of the gun in general. Moreover, a key-operated lock can be embodied so as to secure the trigger in its safety position. An embodiment of the invention including such means will now be described with reference to FIGS. 5-9.

The double-barrel shotgun 10' illustrated in FIG. 5 is substantially the same as the shotgun 10 previously described, and thus has two barrels 12 and 14 which are mounted in a wooden stock 15 in a manner to permit the gun to be broken in the normal way, and which are capable of being latched in position relative to the stock by means of a catch 16 located in front of the conventional safety device 18 of the gun. With the illus-

trated embodiment of FIGS. 5-9, there is arranged on the lower surface of the stock a modified trigger 50 enclosed by a trigger guard 52 attached to a cover plate 54. The cover plate is provided with two grooves 56a and 56b through which extend two inwardly mounted operating tongues, the ends of which are provided with two outwardly projecting noses 58a and 58b. As with the aforescribed embodiment, the noses 58a and 58b co-act with the inner parts of the firing mechanism, which is of conventional design in other respects, so that when either of the noses 58a or 58b are pressed in their respective grooves, i.e. upwardly in FIG. 9 the associated portion of the mechanism is released and the barrel located on that side of the gun is discharged.

As with the aforescribed embodiment of the invention, both barrels of the gun are discharged by means of one single trigger 50, which can be caused to alternately actuate the two firing noses 58a and 58b of the operating tongues, wherewith it is ensured that only one of the noses can be activated at any one time.

The trigger 50 comprises a finger bar 60 mounted at the upper end, the forward end thereof mounted on a pin 62 arranged in a pivotable leverlike housing 64. The housing 64 mainly comprises two parallel, vertically extending side pieces 66a and 66b, which are joined to the rear thereof with a common web member 70. The web member is provided at the rear end thereof with a small vertically extending journal sleeve 72 mounted on a bearing pin 74 securely attached to the cover plate 54. As evident from FIG. 7, the finger bar 60 is provided with a back portion 76, which is provided at the top thereof, slightly behind the journaling point of the finger bar at 62, with an abutment 78. A light spring 80 is inserted between guide shoulders on the back portion 76 and on the front end of the web member 70 of the housing 64 as illustrated in FIG. 7. Thus, the finger bar 60 is held by the spring 80 yieldingly in its normal position, illustrated in FIGS. 5 and 7, and can be swung counter-clockwise by the finger of the marksman, as shown in FIG. 7, against the action of the spring. Extending between the rear portion of the trigger guard 52 and the cover plate 54 are two side walls 75a and 75b, which together with the trigger guard and the cover plate form a housing which accommodates the rear portion of the trigger 50, i.e. the web member 70.

Thus, in its entirety the moveable trigger 50 comprises the finger bar 60 which is actuated directly by the finger of the marksman and which is journalled at 62 in the housing 64 (the journal axis being shown with X-X in FIG. 8), which in turn is pivotally mounted at 74 at the rear end thereof around a substantially vertical axis (marked with y-y in FIG. 7) relative to the stationary housing 75. It will readily be perceived that when actuated by the finger of the marksman, the trigger in its entirety can be swung around the axis y-y from side to side, as illustrated with arrows in FIGS. 8 and 9. The trigger can hence be moved selectively to positions such that the abutment 78 on the back portion 76 of the finger bar is located opposite either one of the outwardly projecting noses 58a or 58b. Thus, when the finger bar 60 is swung counter-clockwise, as viewed in FIG. 5, and, as happens when firing the gun, the nose 58a or 58b located opposite the abutment 78 on the back portion 76 of the finger bar is pressed in, and the associated barrel is discharged. The other barrel can then be immediately discharged by moving the

trigger in its entirety, i.e. the finger bar 60 together with the housing 64, and bringing the abutment 78 to actuate the corresponding nose 58a or 58b cooperating with the firing mechanism of said other barrel.

As illustrated in FIGS. 6 and 9, a stationary shoulder 57 is mounted on the cover plate 54 between the movable noses 58a and 58b forming part of the inner firing mechanism. As will be particularly clear from FIG. 9, the abutment 78 on the finger bar 60 must therefore pass the intermediate shoulder 57 when moving from one firing position to the other, and the two noses 58a and 58b can thus not be actuated at one and the same time. Further, as mentioned in the foregoing, the gun can also be provided with a safety device additional to the conventional safety device actuated by the safety catch 18, as described hereinafter.

As illustrated in FIG. 9, the vertical side pieces 66a and 66b of the housing 64 are curved outwardly at the top thereof to form shield portions 68a and 68b respectively of L-shaped profile, to form a small chamber which accommodates and protects the abutments 57 and 58.

Different rest or neutral positions can be arranged as desired for movement of the trigger 50 in the horizontal plane, i.e. about the axis y—y. FIG. 8 illustrates diagrammatically an embodiment in which the trigger is yieldingly held in an outer position by means of a small guide spring 82 arranged on one side of the web member 70, the spring urging the web member, and thus also the trigger in its entirety, towards a shoulder 84a mounted on the opposite side of the web member. In this way, the trigger is normally held in a rest position, in which it is able to fire one barrel without being moved laterally, in the illustrated case the left barrel, and with which in order to fire the right barrel, the trigger must be moved in its entirety to the right side. The arrangement with the guide spring 82 and the shoulder 84a may, of course, be reversed, so that instead the trigger is arranged, if so desired, to be located in its rest position ready for firing the right barrel. In accordance with one important feature of the invention, however, the rest or neutral position of the trigger may be selected so that the trigger lies centrally of the two firing positions, i.e. so that the abutment portion 78 of the trigger is located opposite the stationary shoulder 57. Thus in order to fire the gun, the trigger must be moved intentionally to one side or the other, wherewith the neutral position of the trigger implies a safety position, in which actuation of the finger bar 60 will only cause abutment portion 78 of the trigger to strike the stationary shoulder 57. In this way there is obtained an additional safety means against unintentional firing, should the conventional safety catch 18 be unintentionally left inoperative. This additional safety device is of so much more value since it is always operative and automatically operates as soon as the trigger is released.

As aforementioned, the trigger of the present invention can be locked in its safety position by means of a key, and to this end the illustrated embodiment is provided with a cylinder type locking means 90, which comprises in a known manner a locking cylinder 86 journaled in a small casing 88 mounted transversely in relation to the trigger guard 52 between the side walls 75a and 75b of the trigger housing 75, as shown in FIGS. 5, 7, 8 and 9. The locking cylinder 86 is provided in a conventional manner with a number of locking pegs (not shown) capable of being actuated by a key,

the bit of which is passed through a key groove 92 in the cylinder. A centre portion of the cylinder is free from locking pegs, and is instead provided with two peripherally extending recesses, mutually at substantially right angles to each other, one of said recesses, 94, being broader than the other, 96, wherewith as illustrated in FIGS. 7-9, either the broad or the narrow recess can be turned upwardly by rotating the cylinder with the key. Hence, a lower portion 71 of the web member 70 on the trigger housing 64 constantly extends into the upwardly turned recess and if, as illustrated in FIG. 9, the portion 71 projects into the broader recess 94, the trigger is free to swing to the maximum extent laterally between the firing positions. On the other hand, when the cylinder is turned through 90° clockwise, as seen in FIG. 7, the narrow recess 96 faces upwardly and engages the portion 71 in its centre position, in which the trigger abutment 78 will strike the stationary safety shoulder 57 when an attempt is made to fire the gun. Thus, in this particular instance it is impossible to fire the gun unless the lock cylinder is first rotated with the key. It will be obvious herefrom, that this arrangement affords a valuable safety measure against unauthorized use of the gun.

The invention is not restricted to the illustrated embodiments, but can be modified within the scope of the following claims. Thus, the trigger housing or holder 64 pivotally arranged around the vertical axis y—y can, instead, be constructed for movement laterally by means of a system of parallel links, such that the trigger is able to move in a parallel movement pattern without being turned in the horizontal plane. Further, the key-operated lock has been described by way of example only, and alternative constructions for fixing the movable trigger in its neutral or safety position lie within the scope of all skilled in the art.

I claim:

1. In a double-barrel gun having a pair of independently and selectively actuated striker mechanisms each having a striker associated with a respective one of the barrels, each striker associated with a respective one of the barrels, each striker mechanism including a release element assessable from the underside of the gun and arranged when released to actuate the associated striker, and a single trigger mechanism for alternately actuating said release elements by being movable laterally between the two elements for individually and selectively actuating same, comprising the improvement wherein:

said trigger mechanism includes a finger member adapted to be engaged by the finger of a marksman and means mounting said finger member on said gun for movement laterally thereof between first and second operative positions permitting selective and independent actuation of said strikers, said finger member also being positionable in an inoperative position spaced from said first and second positions, said finger member being incapable of activating said release elements when in said inoperative position; and

releasable lock means mounted on said gun and coacting with said trigger mechanism for locking said finger member in said inoperative position.

2. A gun according to claim 1, wherein said lock means includes a key-operated lock device mounted on said gun and coacting with said trigger mechanism for

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permitting said finger member to be locked in said inoperative position.

3. A gun according to claim 2, wherein said inoperative position is located substantially centrally between said first and second operative positions, and said release elements being laterally spaced a sufficient distance so that activation of said finger member when in said inoperative position results in an impact portion thereof not engaging either of said release elements.

4. A gun according to claim 2, wherein the locking device comprises a casing fixedly mounted on the gun and a key-operated locking cylinder rotatably journaled in said casing and movable between a released and a locked position, said locking cylinder when in said locked position coacting with said trigger mechanism for fixedly holding said finger member in said inoperative position.

5. A gun according to claim 1, wherein said trigger mechanism includes a holder mounted on said gun for swinging movement about a substantially vertical axis, said finger member being pivotally mounted on said

holder for swinging movement about a substantially horizontal axis, whereby said holder is swingably moveable between said first and second operative positions, and said lock means coacting with said holder for selectively fixing same in said inoperative position.

6. A gun according to claim 5, wherein said lock means comprises a key-operated locking device having a key-operated locking member rotatably supported on said gun and movable between a released position and a locked position, said rotatable locking member when in said locked position coacting with said holder for fixedly maintaining same in said inoperative position.

7. A gun according to claim 6, wherein said inoperative position is located centrally between said first and second operative positions.

8. A gun according to claim 7, wherein said locking device includes a casing fixedly secured to said gun and extending transversely of said gun, said rotatable locking member being rotatably journaled in said casing.

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