

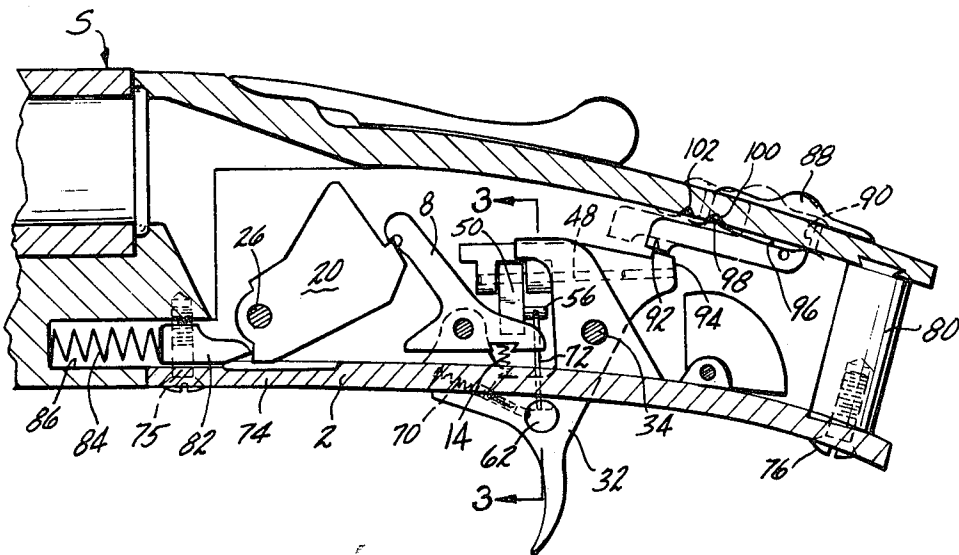
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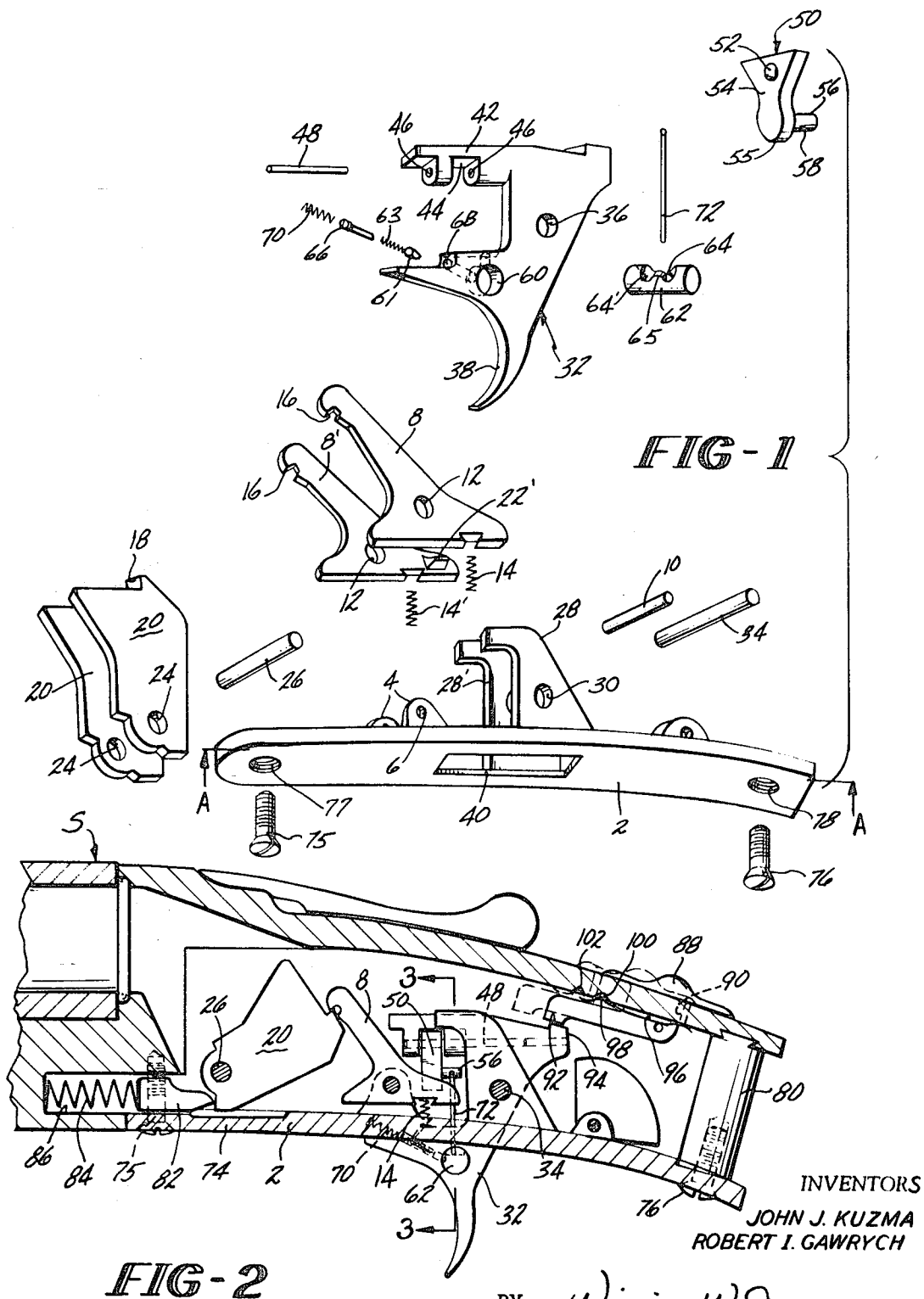
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[54] **SINGLE SELECTIVE TRIGGER SYSTEM FOR DOUBLE BARREL FIREARMS**
2 Claims, 7 Drawing Figs.
[52] U.S. Cl. 42/42
[51] Int. Cl. F41c 19/00
[50] Field of Search. 42/42

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ABSTRACT: A trigger system for double barrel firearms having a pair of hammers and a single trigger, a selector actuated by the trigger and operable to release only one of the hammers from its cocked position while permitting the other hammer to remain undisturbed in its cocked position. The selector then being operable to release the other hammer from its cocked position upon a second actuation of the trigger.





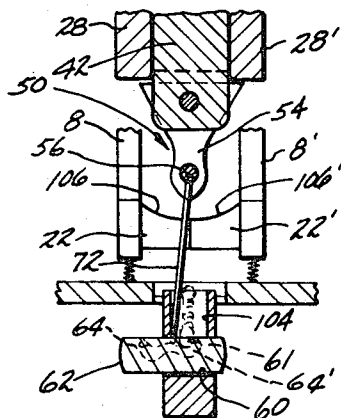


FIG-3

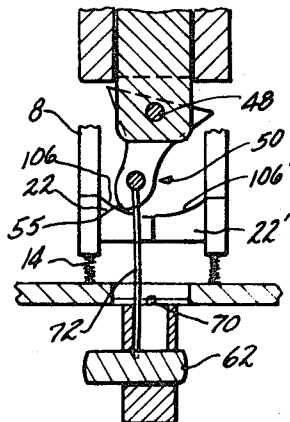


FIG-4

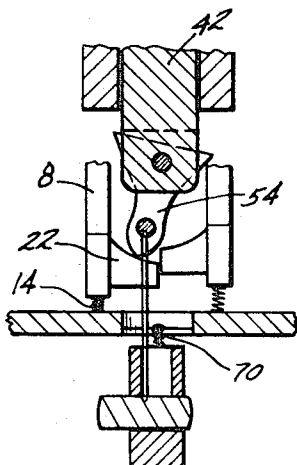


FIG-5

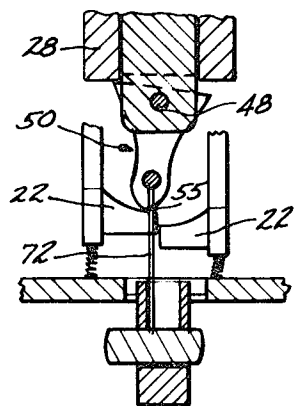


FIG-6

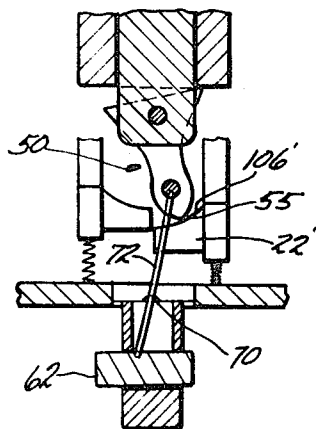


FIG-7

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SINGLE SELECTIVE TRIGGER SYSTEM FOR DOUBLE BARREL FIREARMS

This invention pertains to a trigger system for a double barrel firearm employing a pair of hammers, one hammer being operable to fire a cartridge from each barrel. The system utilizes a pair of hammer sears and a single trigger, there being a selector member connected to the trigger and actuated thereby, which selector is operable to disconnect one from its respective hammer while permitting the other sear to restrain the other hammer, thereby firing one of the cartridges in the firearm. The selector is then operable to disconnect the other sear from the other hammer to fire the other cartridge in the firearm.

It is, of course, known to the prior art to form a firearm with a plurality of barrels, each of which accommodates a cartridge or shell to be fired therefrom. A double barrel shotgun is a prime example of such a firearm. Many of the double barrel shotguns of the prior art are constructed with a pair of triggers, each of which is operative to release an associated hammer to fire one of the shells in the gun. There are many drawbacks inherent to the use of two triggers in a double barrel shotgun, such drawbacks including the safety of two triggers, the cost of manufacturing a system with two triggers, and the complexity of a system having two triggers, to name a few.

It is also known in the prior art to equip a double barrel shotgun with a single trigger which is operative to fire one of the shells in the gun at a time. The single trigger, double barrel trigger mechanisms of the prior art are, however, structures which permit undesirable preliminary trigger travel to occur before the selector engages the sear to be acted upon. Another disadvantage attendant to the prior art mechanisms concerns the undesirable and dangerous possibility that both barrels of the gun can be fired simultaneously should the selector be improperly positioned before firing.

The trigger system of this invention utilizes a pair of hammers which are pivotally mounted in the receiver of the firearm, and which are spring-biased toward a fired position. A pair of sear members are pivotally mounted in the receiver and are operative to engage and detain the hammers in a cocked position, each sear being paired with an associated hammer. The hammers are independently movable with respect to each other, and the sears are independently movable with respect to each other. The sears are spring-biased into engagement with the hammers. A single trigger is pivotally mounted on a trigger housing in the receiver, and a safety is mounted on the receiver and movable into and out of engagement with the trigger. A selector element is pivotally mounted on the trigger, the selector being movable between two positions, a first position wherein the selector can be moved against a first one of the sears to pivot the latter out of engagement with its respective hammer when the trigger is pulled, and a second position wherein the selector can be moved against the other of the sears to pivot the latter out of engagement with its respective hammer when the trigger is again pulled. The selector is formed so as to contact only one sear at a time. A button is slidably mounted on the trigger and is linked to the selector by means of a semiflexible spring wire, whereby movement of the button is translated into pivotal movement of the selector, thus the button is operative to position the selector over one or the other of the sears. The button is detented into one of two possible positions wherein the wire is always disposed to one side or the other of the pivot point of the selector. Thus the wire always exerts a force on the selector tending to pivot the latter over one of the sears. The sears are formed with laterally extending lugs which extend toward each other and which terminate in substantially the same plane so that there is substantially no gap between the lugs. The upper surface of each of the lugs is arcuate to correspond to the arc traced by the tip of the selector as the latter is pivoted on the trigger. The trigger is spring biased so that the selector is always urged toward the sear lugs, thus when the safety is off, the selector is always urged into contact with one of the sear lugs. The absence of a gap between the sear lugs

permits the selector to move smoothly from one sear lug to the other without risk of becoming jammed between the sear lugs. The latter condition is undesirable because both barrels of the gun would fire simultaneously were the trigger pulled while such a condition existed.

It is, therefore, an object of this invention to provide a trigger system for a multibarreled firearm having a plurality of hammers, a plurality of sears, and a single trigger.

It is a further object of this invention to provide a trigger mechanism of the character described having a single movable selector element for interconnecting the trigger and the sears so that when the trigger is pulled only one of the sears is affected.

It is another object of this invention to provide a trigger mechanism of the character described wherein the sears are formed with adjacent lugs having arcuate selector-contacting surfaces, and which sear lugs include immediately adjacent terminal faces.

It is still another object of this invention to provide a trigger mechanism of the character described wherein the trigger is spring biased so that the selector is always urged toward the sear lugs thereby eliminating preliminary trigger travel when the gun is fired.

These and other objects and advantages of this invention will become more readily apparent from the following detailed description and accompanying drawings, in which:

FIG. 1 is an exploded view in perspective of the various components making up the trigger assembly of this invention;

FIG. 2 is a side sectional view of a portion of a double barrel shotgun incorporating the trigger assembly of this invention, the view being taken along line A-A of FIG. 1, and showing the hammers restrained in their cocked positions by the sears;

FIG. 3 is a vertical sectional view taken along line 3-3 of FIG. 2 with certain parts omitted for clarity, and showing the manner in which the selector is mounted on the trigger and the selector button is linked by the spring wire to the selector;

FIG. 4 is a vertical sectional view similar to FIG. 3, but showing the selector pivoted by the spring wire and the selector button into a position wherein the selector will contact only one of the sears when the trigger is pulled;

FIG. 5 is a vertical sectional view similar to FIG. 4, but showing the positions of the selector and sear when the trigger is pulled;

FIG. 6 is a vertical sectional view similar to FIGS. 3-5, but showing the selector as the latter is moved upwardly by the sear which has been released from engagement with the hammer, and showing the selector pivoting toward the second sear; and

FIG. 7 is a vertical sectional view similar to FIG. 6 but showing the selector having been fully pivoted over the second sear and having been moved into contact with the second sear lug by the trigger spring.

Referring now to FIG. 1, an exploded view in perspective is shown of the trigger assembly of this invention. The trigger assembly includes a trigger housing 2 having a first pair of up-standing ears 4 having aligned apertures 6. A pair of searing members 8 and 8' are pivotally mounted on the ears 4 by means of a pin 10 which extends through the apertures 6 and cooperating apertures 12 on the sears 8 and 8'. Spring members 14 and 14' engage each of the sears 8 and 8' and the trigger housing 2, and serve to bias the sears 8 and 8' in a counterclockwise direction about the pin 10. Each sear 8 and 8' has a hook 16 which is operative to engage a shoulder 18 formed on each of a pair of hammers 20. The sears 8 and 8' also are formed with a pair of laterally extending lugs 22 and 22' (only one of which is shown) which extend toward each other, and the purpose of which will be more fully explained hereinafter. The hammers 20 each include an aperture 24 to receive a pin 26 about which the hammers 20 are pivotally mounted, the pin 26 also being mounted in the receiver of the gun (not shown).

The trigger housing 2 also includes a second pair of up-standing generally L-shaped ears 28 and 28' having aligned

apertures 30. A trigger member 32 is pivotally mounted on and between the ears 28 and 28' by means of a pin 34 which extends through the apertures 30 and through an aperture 36 in the trigger 32. The trigger 32 includes a curved finger-engaging portion 38 which extends through an opening 40 in the trigger housing 2. The trigger 32 is formed with an upper forwardly directed extension 42 which is slotted at 44. A pair of aligned apertures 46 are disposed on either side of the slot 44 to receive a pin 48. A selector 50 is disposed in the slot 44 and is pivotally mounted on the pin 48 which extends through an aperture 52 in the selector. The selector 50 also includes a downwardly dependent finger 54 having a generally pointed tip 55 thereon, and a rearwardly extending post 56 having an aperture 58 therein.

An aperture 60 is formed in the trigger 32 to slidably receive a selector button 62. The selector button 62 includes a detent slot which includes a pair of offset depressions 64 and 64' separated by a raised ridge 65. A second aperture 68 is disposed in the trigger 32, the second aperture 68 intersecting the aperture 60. A detent 61 is slidably mounted in the aperture 68, the detent being biased by a spring 63 into engagement with one or the other of the detent slot depressions 64 and 64'. It is thus apparent that the selector button 62 will always be off to one side or the other of the trigger 32 since the detent will not ride on the ridge 65, but will seat only in one of the depressions 64 or 64'. The spring 63 is retained in the aperture 68 by means of a screw 66 which is threaded into the aperture 68. A spring 70 is mounted on the protruding head of the screw 66 on one end and engages the side of the trigger housing aperture 40 on the other end, the spring 70 serving to bias the trigger 32 in a counterclockwise direction about the pin 34. The selector button 62 is secured to a semiflexible spring wire 72. The spring wire 72 is also fitted into the aperture 58 in the selector post 56, thus the spring wire 72 links the selector button 62 to the selector 50.

The trigger housing 2 is mounted in the receiver 74 of a firearm by means of a screw 75 which extends through an aperture 77 in the housing 2 and is threaded into the receiver, and by means of a screw 76 which passes through an aperture 78 in the trigger housing and is screwed into a block 80 attached to the receiver (see FIG. 2).

In FIG. 2, the trigger assembly is shown mounted in the receiver 74 of a double barrel shotgun S (only partially shown). The hammers 20 are shown in their cocked position in engagement with the sears 8 and 8'. It is noted that he springs 14 and 14' urge the sears 8 and 8' into engagement with the hammers 20. Each hammer 20 has associated therewith a follower 82 which is biased by a spring 84 disposed in a well 85 in the receiver 74. The spring biased followers 82 thus urge the hammers 20 to rotate in a counterclockwise direction about the pin 26. It is noted that the selector button 62 is disposed in a portion of the trigger 32 which extends below the trigger housing 2 so that the selector button 62 is readily accessible to the shooter.

A safety member 88 is slidably mounted on the receiver 74 and extends through a slot 90 therein. The safety 88 includes a lug 92 which is positioned against an upstanding shoulder 94 formed on the trigger 32. A blade spring 96 is connected to the safety 88, the spring 96 including a ridge 98 which is positioned for and biased into selective engagement with one of a pair of grooves 100 and 102 in the receiver 74. As shown in solid lines in FIG. 2, when the spring ridge 98 is disposed in the groove 100, the safety lug 92 is disposed against the trigger shoulder 94 and serves to prevent the trigger 32 from pivoting under the influence of the spring 70 in the counterclockwise direction about the pin 34. Thus the gun cannot be fired with the safety in this position. As shown in phantom lines in FIG. 2, when the safety 88 is slid forward through the slot 90 to bring the spring ridge 98 into the groove 102, the safety lug 92 is moved off of the trigger shoulder 94, thus the trigger 32 can be pulled to fire the gun. The spring 96, of course, tends to hold the safety 88 in whichever position it is manually placed by means of the ridge 98 and grooves 100 and 102.

Referring now to FIGS. 3-7, the manner in which the selector 50 operates is most clearly shown. In FIG. 3, the trigger assembly is shown as it appears with both hammers cocked and with the safety in its blocking position. The trigger extension 42 is sandwiched between the trigger housing ears 28 and 28' and the selector 50 extends downwardly from the extension 42. It is noted that the rigidly held extension 42 and the ears 28 and 28' tend to prevent any pivotal movement of the selector 50. The sears 8 and 8' are shown in their hammer-engaging positions and the sear lugs 22 and 22' are shown extending toward each other. The selector finger 54 is generally vertical and is positioned substantially directly above the juncture of the sear lugs 22 and 22'. It is noted that the sear lugs 22 and 22' terminate in substantially the same plane so that there is no appreciable gap between the sear lugs. The selector button 62 is moved to the left in the aperture 60 and is held in this position by the detent 61 being seated in the selector button depression 64'. The spring wire 72 imparts a pivoting moment to the selector 50 which is resisted, as previously noted, by the sears 28 and 28'. It is noted that a passage 104 is cut into the trigger 32 to permit the wire 72 to link the selector button 62 and the selector lug 56. The top surfaces 106 and 106' of the sear lugs 22 and 22' respectively are curvilinear so as to provide a smooth arcuate surface upon which the selector finger 54 can move, as will be pointed out in greater detail hereinafter.

When the safety 88 is released, the trigger spring 70 causes the trigger to pivot in a counterclockwise direction moving the selector 50 downwardly away from the ears 28 and 28'. As the selector 50 moves downwardly it is free to pivot about the pin 48 under the influence of the spring wire 72 until it contacts the left corner of selector slot 44 on the trigger extension 42. As shown in FIG. 4, the downward and pivotal movement of the selector 50 brings the selector finger tip 55 into abutting contact with the arcuate surface 106 on the sear lug 22. The sear spring 14 is stronger than the trigger spring 70, thus the descending selector 50 stops against the sear lug 22 and is not alone able to disconnect the sear 8 from its associated hammer. As shown in FIG. 4, the gun is ready to fire the charge in the left-hand barrel. Should the shooter desire to change over to the right-hand barrel before firing, the selector button need merely be manually pushed to the right until the detent 61 seats in the selector button depression 64. This will move the spring wire 72 to the right and cause the selector 50 to pivot to the right about the pin 48. Since the sear lugs 22 and 22' terminate in substantially the same plane with no gap therebetween, and since the arcuate surfaces 106 and 106' on the respective lugs substantially coincide with the arc of the selector finger-tip 55, the latter can slide smoothly from the left sear lug 22 to the right sear lug 22'. When the trigger is pulled, the trigger extension 42 is moved downwardly thus moving the selector finger 54 down against the sear lug 22 to pivot the sear 8 downwardly as shown in FIG. 5. In this manner the left-hand sear is disengaged from the left-hand hammer while the right hand sear remains in a hammer-cocking position.

When the sear 8 is depressed as shown in FIG. 5, the spring 14 is compressed. After the finger pressure is removed from the trigger, the spring 14 urges the sear 8 upwardly as shown in FIG. 6. It is noted that, as shown in FIG. 6, as the sear lug 22 moves the selector 50 upwardly, the upper corner of the selector 50 contacts the ear 28 which causes the selector 50 to pivot to the right about the pin 48. The wire 72 does not prevent the pivotal movement of the selector 50. When the selector 50 has pivoted sufficiently, the selector fingertip 55 moves off of the sear lug 22 and falls onto the curved surface 106' of the sear lug 22'. Once the tip 55 leaves the sear lug 22, the trigger spring 70 brings the tip 55 down onto the sear lug 22', as shown in FIG. 7. It is noted that the selector button 62 does not move when the selector 50 pivots after the first shell is fired, however, the wire spring 72 is sufficiently flexible to permit the selector 50 to pivot from one sear lug to the other. As shown in FIG. 7, the mechanism is in position to fire the shell in the right-hand barrel.

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It is readily apparent from FIGS. 4 and 7 that there will be no preliminary trigger travel when the trigger is pulled since the selector is biased against the sear lugs at all times once the safety is moved to its "off" position. It is further apparent that the absence of a gap between the sear lugs, and the arcuate configuration of the selector-contacting portion of the sear lugs permits the shooter to smoothly select either of the barrels for the first shot. By detenting the selector button always to one side or the other of the pivot point of the selector, and by forming the sear lugs in the manner noted above, it is also readily apparent that the shooter cannot accidentally fire both barrels at once.

Thus the mechanism of this invention provides for the elimination of disconcerting preliminary trigger travel without the need for costly precision machining of parts. The mechanism also positively prevents accidental firing of both barrels simultaneously, while at the same time automating the sequential firing of the individual barrels.

We claim:

1. In a trigger mechanism for a double barrel firearm having first and second hammers, first and second sears to restrain respective ones of the hammers in a cocked position, a single pivotally mounted trigger, a selector pivotally mounted on the trigger, a slidable selector button, and detent means to positively hold the selector button in either of two predetermined positions; the improvement comprising:

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- a. lugs formed on each of said sears, said lugs extending toward each other and terminating in substantially the same plane, and said lugs including concave arcuate selector-contacting surfaces;
 - b. flexible means interconnecting said selector button with said selector, said flexible means being operative to impose a pivoting moment upon said selector when said selector button is in either of said predetermined positions; and
 - c. spring means contacting said trigger, said spring means being operative to bias said selector toward said lugs.
2. In a trigger mechanism for a double barrel firearm having first and second hammers, first and second sears to restrain respective ones of the hammers in a cocked position, a single pivotally mounted trigger, a selector pivotally mounted on the trigger, a movable selector button, and detent means to positively hold the selector button in either of two predetermined positions, the improvement comprising:
- a. lugs formed on each of said sears, said lugs extending toward each other and having closely adjacent terminal faces, and said lugs including concave arcuate selector-contacting surfaces; and
 - b. spring means operative to bias said selector into engagement with only one of said sear lugs.

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