Nov. 3, 1931. L. STIENNON 1,830,212

TRIGGER MECHANISM FOR FIREARMS

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Fig. 9.

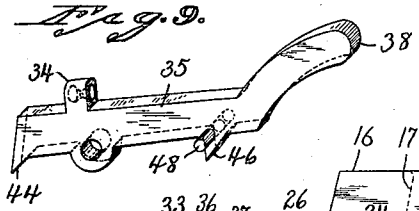


Fig. 10.

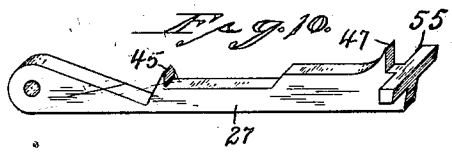


Fig. 1.

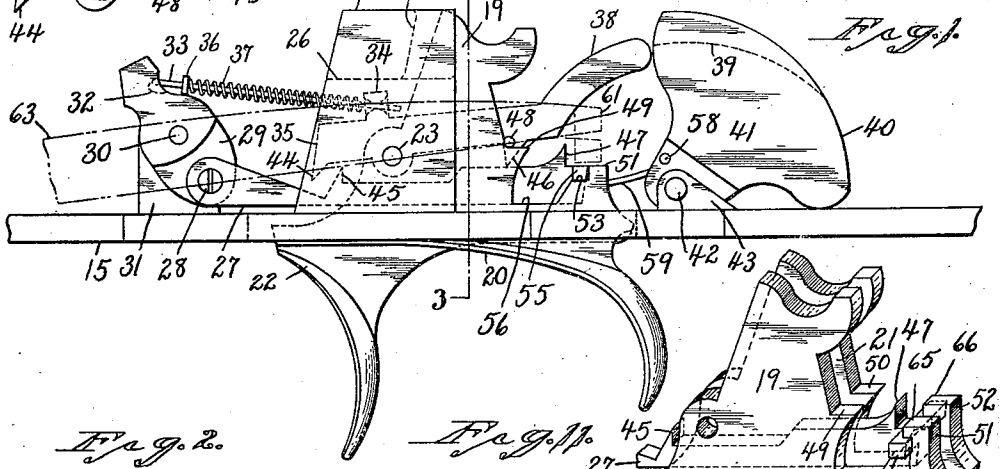


Fig. 2.

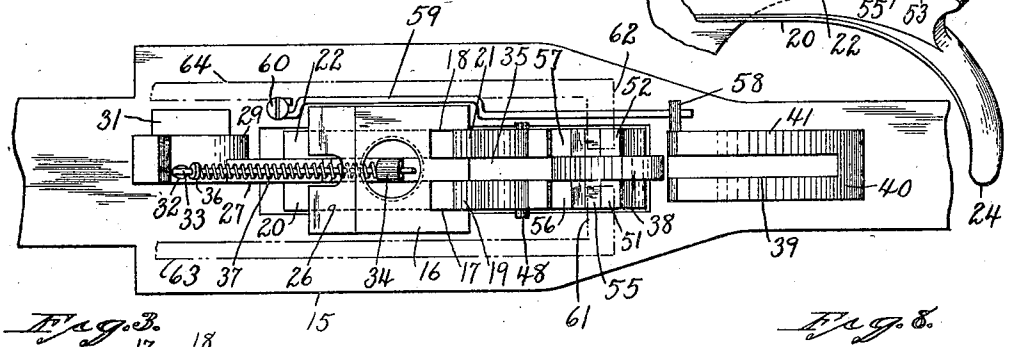


Fig. 11.

Fig. 3.

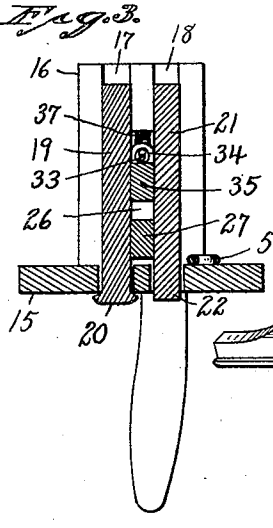


Fig. 7.

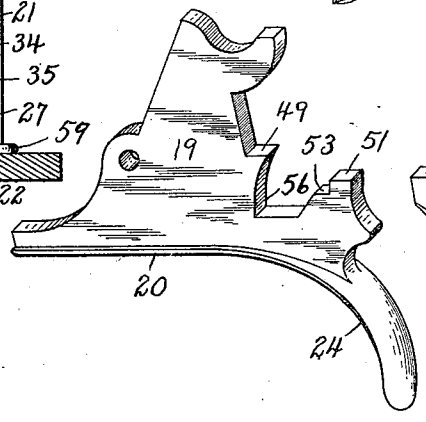
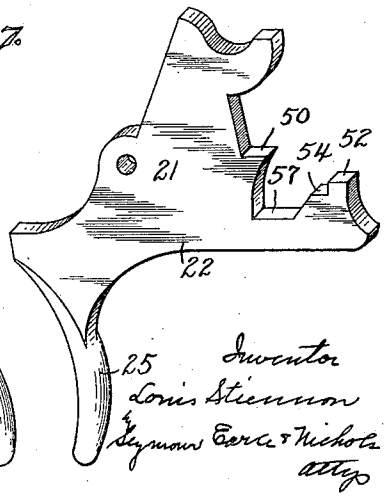


Fig. 8.



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TRIGGER MECHANISM FOR FIREARMS

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Fig. 4.

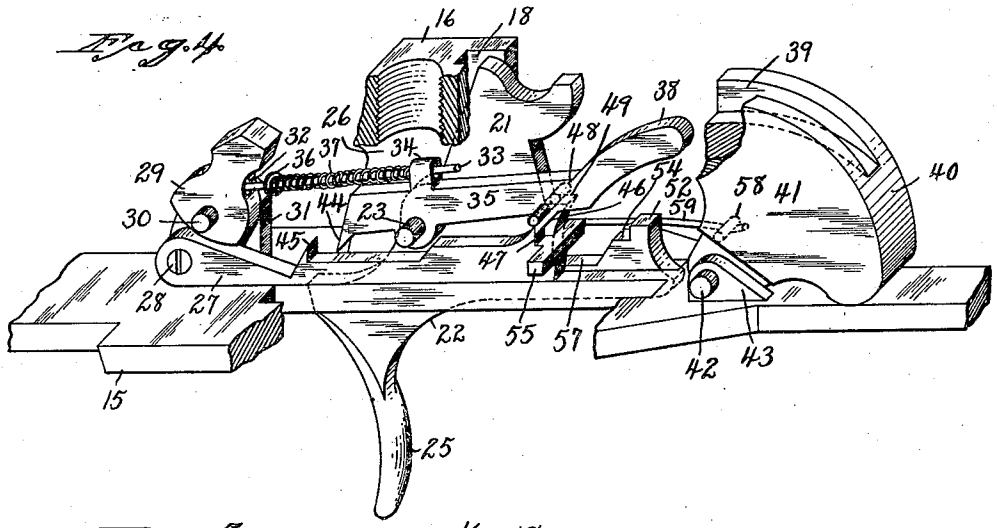


Fig. 5.

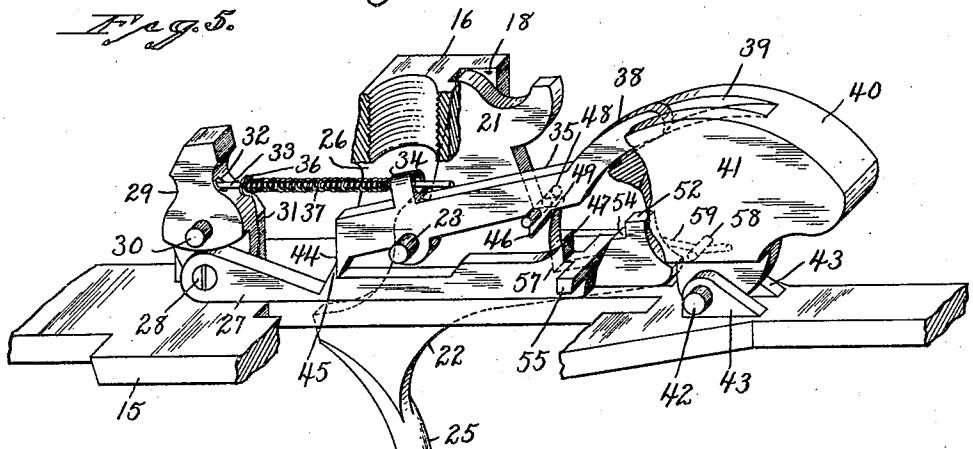
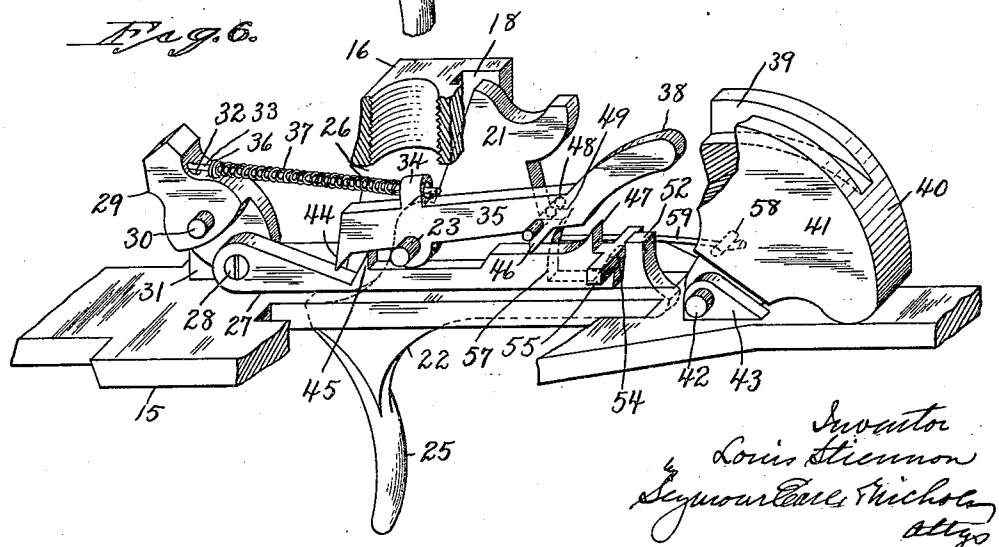


Fig. 6.



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Patented Nov. 3, 1931 1,830,212

UNITED STATES PATENT OFFICE

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TRIGGER-MECHANISM FOR FIREARMS

Application filed April 10, 1929, Serial No. 354,088, and in Belgium August 22, 1928.

My invention relates to an improved trigger-mechanism primarily designed for multiple-barrel arms but not so limited, the object being to provide a trigger-mechanism in which one trigger controls more than one barrel and is characterized by fewness of parts, compactness of organization, certainty of operation, durability in use, and convenience of operation.

With these ends in view, my invention consists in a trigger-mechanism having certain details of construction and combinations of parts as will be hereinafter described and particularly pointed out in the claims.

In the accompanying drawings:

Fig. 1 is a view in side elevation of one form which a trigger-mechanism embodying my invention may assume, the sears of the firearm being shown by broken lines, the ends of the trigger-plate being broken away, and the parts of the mechanism being shown in their uncocked positions;

Fig. 2 is a plan view thereof;

Fig. 3 is a view thereof in transverse section on the line 3—3 of Fig. 1;

Fig. 4 is a broken perspective view of the mechanism partly in section, the left-hand trigger being removed and the parts being shown in their cocked positions;

Fig. 5 is a corresponding view with the parts shown in their intermediate positions as the result of the discharge of one barrel;

Fig. 6 is a corresponding view of the parts shown in their final or uncocked positions;

Fig. 7 is a detached perspective view of the left-hand trigger;

Fig. 8 is a corresponding view of the right-hand trigger;

Fig. 9 is a detached perspective view of the pivotal latch;

Fig. 10 is a corresponding view of the sliding-coupler; and

Fig. 11 is a broken detached perspective view of one of the modified forms which the two triggers may assume, together with the sliding-coupler with which they co-act.

For the illustration of my improved trigger-mechanism I have shown an embodiment of it designed for use in conjunction with a double-barreled firearm having two sears, the said mechanism being provided with two triggers, whereby one trigger may fire both barrels consecutively in the order "right—left" and the other trigger may fire both barrels consecutively in the order "left—right" in conjunction with a pivotal inertia-weight to nullify what is known as the "involuntary trigger-pull" of the user consequent upon the discharge and recoil of the arm.

In this embodiment of my invention, the trigger-plate 15 is provided about midway of its length with an integral upstanding mounting-block 16 formed with longitudinal slots 17 and 18 which extend downward through the plate 15. The said slot 17 receives the plate-like body-portion 19 of the left-hand trigger 20, while the slot 18 receives the body-portion 21 of the right-hand trigger 22, these triggers being hung upon a transverse pivot-pin 23 extending transversely through the said mounting-block 16. The said triggers (Figs. 7 and 8) are so formed that the finger-piece 24 of the left-hand trigger 20 is located substantially in line with and directly back of the finger-piece 25 of the right-hand trigger 22 with sufficient space between them for the ready insertion of the trigger-finger of the user of the arm.

The mounting-block 16 is also formed with a longitudinal passage 26 located between the slots 17 and 18 aforesaid and extending from front to rear through the block but not downward through the trigger-plate 15. The lower portion of the said passage 26 receives a reciprocating sear-coupler 27, the ends of which project therefrom, as shown. The foreward end of the said sear-coupler 27 is pivotally connected by a pin 28 with the lower end of an operating-lever 29 rocking upon a stud 30 in the upper end of an integral lug 31 upstanding from the trigger-plate 15 toward the forward end thereof.

The rear face of the upper end of the rocking operating-lever 29 is formed with a socket 32 for the reception of the rounded forward end of a guide-rod 33 having its rear end passed through and sliding in a perforation in an abutment-lug 34 upstanding from the forward end of a pivotal latch 35 located in

the upper portion of the said passage 26 and pivotally mounted upon the transverse pivot-pin 23 aforesaid.

The said guide-rod 33 is formed near its forward end with an abutment-collar 36 against the rear face of which a helical operating-spring 37, encircling the rod, impinges, the rear end of the said spring abutting against the forward face of the abutment-lug 34 aforesaid. The rear end of the said latch 35 is formed with an upturned arcuate arm 38 adapted to enter a peripheral groove 39 in the cylindrically-contoured outer face 40 of a pivotal inertia-weight 41 which rocks at its lower end upon a transverse pin 42 passing through a pair of integral upstanding ears 43—43 formed upon the upper face of the trigger-plate 15 toward the rear end thereof.

At its forward end, the latch 35 is provided with a depending rearwardly-beveled tooth 44 co-acting with a complementary upstanding tooth 45 formed upon the sear-coupler 27 toward the forward end thereof. The said latch 35 is also provided, toward its rear end, with a depending tooth 46 co-acting with a complementary upstanding tooth 47 near the rear end of the said sear-coupler 27.

The said latch 35 is provided at a point to the rear of the transverse pivot-pin 23 upon which it rocks, with a transverse lifting-pin 48 projecting equally on either side of it, its respective projecting ends normally resting upon latch-lifting shoulders 49 and 50 respectively formed upon the left- and right-hand triggers 20 and 22, so that when either of the said triggers is pulled rearwardly, the rear end of the latch 35 will be correspondingly lifted.

The left-hand trigger 20 is formed with a sear-lifting nose 51 while the right-hand trigger is formed with a corresponding sear-lifting nose 52. Directly in front of the sear-lifting nose 51, aforesaid, the left-hand trigger 20 is formed with a coupler-lifting shoulder 53, while a corresponding coupler-lifting shoulder 54 is formed directly in front of the sear-lifting nose 52 of the right-hand trigger 22.

The coupler-lifting shoulders 53 and 54, just described, receive the left- and right-hand ends of a transverse coupler-lifting bar 55 located at the extreme rear end of the sear-coupler 27 so that when the said coupler is at the limit of its rearward position, the respective ends of the coupler-bar 55 thereof will overlie the coupler-lifting shoulders 53 and 54, whereby a rearward pull upon either of the two triggers 20 and 22 will lift the rear end of the sear-coupler 17.

To prevent either of the two triggers 20 and 22 from lifting the rear end of the sear-coupler 27 except when the same is in its rearmost position with its coupler-lifting bar 26 overlying the shoulders 53 and 54 of the respective triggers, the left-hand trigger is formed with a deep clearance-notch 56, while the right-hand trigger is formed with a corresponding clearance-notch 57.

For the purpose of normally holding the pivotal inertia-weight 41 in its rearwardly-rocked inoperative position, I provide the same near its lower end with a laterally-offsetting pin 58, the underside of which is engaged with the free rear end of a spring 59 secured at its forward end to the upper face of the trigger-plate 15 by a screw 60. This spring 59 exerts a constant lifting effort on the pin 58 with the effect of urging the pivotal inertia-weight 41 into its rearwardly-rocked or inoperative position.

The unitary trigger-mechanism carried by the trigger-plate 15, as above described, is adapted to be applied to a double-barreled gun of standard construction in such manner that when the mechanism of the gun is operated to cock the same, some element of the gun-mechanism will act to force the upper end of the operating-lever 29 rearwardly against the tension of the operating-spring 37, whereby the parts will assume the positions shown in Fig. 4. The effect of rocking the upper end of the lever 29 from front to rear will be to draw the sear-coupler 27 forward to the limit of its forward movement, whereby its tooth 47 will be engaged with the forward face of the depending tooth 46 of the latch 35. At such time the ends of the coupler-lifting bar 55 of the said coupler will lie in the clearance-notches 56 and 57 of the left- and right-hand triggers 20 and 22 respectively. When the described unitary trigger-mechanism is installed in the arm, the sear-lifting noses 51 and 52 of the two triggers will respectively lie directly under and close to the inturned fingers 61 and 62 of the left- and right-hand sears 63 and 64, respectively, of the gun-structure, which may be of any standard construction.

Now with the parts of my improved trigger-mechanism in the positions in which they are shown in Fig. 4, the user of the arm will elect which of the two barrels of the arm is to be first fired and engage his trigger-finger upon the trigger of that barrel. Assuming that he has elected to fire the right-hand barrel first, he engages his trigger-finger with the finger-piece 25 of the right-hand trigger 22 and pulls rearwardly thereupon, whereby the sear-lifting nose 52 of the right-hand trigger 22 acts upon the finger 62 of the right-hand sear 64 to lift the same and release the firing-mechanism of the right-hand barrel. Concurrently with the operation of the right-hand trigger 22, as described, its latch-lifting shoulder 50 engages the projecting right-hand end of the transverse latch-lifting pin 48 of the latch 35, the rear end of which is thus lifted and its forward end depressed to the position shown in Fig. 5, whereby its tooth 46 will be lifted out

of engagement with the tooth 47 of the sear-coupler and whereby the tooth 44 at its forward end will be depressed into the path of the upstanding tooth 45 of the sear-coupler 27. As soon as the tooth 46 of the latch 35 is cleared from the tooth 47 of the sear-coupler 27, the latter is moved rearwardly into the position in which it is shown in Fig. 5 by the operating-spring 37 acting through the operating-lever 29, the sear-coupler being arrested in this intermediate position by the engagement of its upstanding tooth 45 with the forward face of the depending tooth 44 of the latch 35.

Immediately following the lifting of the right-hand sear 64 and the release and rearward movement of the coupler 35 into its intermediate position (Fig. 5), the recoil of the arm under the discharge of the right-hand barrel causes the pivotal inertia-weight 41 to swing forwardly with respect to the trigger-plate 15, from the position in which it is shown in Fig. 4 into the position shown in Fig. 5, in which it partially underlies the arcuate arm 38 of the latch 35.

A further effect of the recoil, due to the discharge of the right-hand barrel, is to move the right-hand trigger 22 rearwardly away from the trigger-finger of the user, thereby occasioning what is, in effect, a relaxation of the trigger-finger from the trigger. This phenomenon is known in the art as "the involuntary relaxation." Upon the cessation of the recoil, the muscular elasticity of the user's hand causes the trigger-finger to resume its interrupted pressure upon the right-hand trigger, thus occasioning the phenomenon known in the art as "the involuntary pull," which, as will be hereinafter shown, would if not nullified, occasion the involuntary discharge of the left-hand barrel in rapid succession after that of the right-hand barrel.

When the parts of the trigger-mechanism are in the positions shown in Fig. 5, the described "involuntary relaxation," by momentarily releasing the right-hand trigger 22, permits its latch-lifting shoulder 50 to fall away from the latch-lifting pin 48. The rear end of the latch 35 would now move downwardly under the urge of the operating-spring 37 but for the fact that the arcuate arm 38 of the latch is now supoprted by the bottom of the groove 39 of the pivotal inertia-weight 41 and is held therein by the tension of the said spring 37, which occasions sufficient friction between the bottom edge of the arm 38 and the bottom surface of the groove 39 to retain the pivotal inertia-weight 41 in the position of Fig. 5 against the urge of its own spring 59, until the described "involuntary pull" raises the arcuate arm 38 out of engagement with the weight 41, whereupon its spring 59 asserts itself and swings the inertia-weight 41 back to its inoperative position, as shown in Fig. 6. The user of the arm then intentionally releases the rearward pull of his trigger-finger upon the right-hand trigger 22, whereupon the rear end of the latch 35 rocks downwardly under the urge of the operating-spring 37, into the position shown in Fig. 6. At the same time its forward end is lifted, thereby disengaging its tooth 44 from the tooth 45 of the sear-coupler 27, thus permitting the operating-spring 37 to act through the operating-lever 29 to force the coupler 27 rearward to the limit of its rearward travel, as shown in Fig. 6, in which position the sear-coupling bar 55 thereof overlies the coupler-lifting shoulders 53 and 54 of the triggers 20 and 22 and also underlies the forward half of the inwardly-turned fingers 61 and 62 respectively of the sears 63 and 64.

Now should the user of the arm desire to fire the left-hand barrel, a pull on either trigger will cause the lifting of the sear-coupling bar 55 of the sear-coupler 27, with the effect of lifting the inturned finger 61 of the left-hand sear 63, thus causing the discharge of the left-hand barrel.

A similar cycle of operations as just above described, will occur if the user of the arm elects to fire the left-hand barrel first by operating the left-hand trigger 20 first.

It will be seen from the foregoing description of an operative cycle of my improved mechanism that its longitudinally-reciprocatable sear-coupler has three positions ascribed to it, namely, a retired or inoperative position, an intermediate position also inoperative, and a sear-coupling position, and that it is detained by the latch in its retired and intermediate positions, the said latch being held against rocking clockwise and permitting the sear-coupler to move from its intermediate into its sear-coupling position by the pivotal inertia-weight which, on account of its pivotal character, will not foul or stick but invariably function as described.

It will thus be seen, also, that by means of my improved trigger-mechanism one trigger may be utilized to fire both barrels consecutively in the order "right—left" and the other trigger may be utilized to fire both barrels consecutively in the order "left—right" and, furthermore, that when either barrel has been fired by a pull on the appropriate trigger, a second intentional pull on either trigger will fire the other barrel. Furtheremore, it will be seen that the unintentional firing of a second barrel, due to "the involuntary pull," is obviated by the presence in my improved mechanism of the pivotal intertia-weight.

In the construction above described, the transverse bar 55 at the rear end of the coupler 27 makes direct contact at its respective ends with the inturned-fingers 61 and 62 of the sears 63 and 64 when the coupler 27 is rocked on its pivot.

In the modified construction shown by Fig. 11, the sear-lifting noses 51 and 52 of the respective triggers 20 and 22 are forwardly extended respectively at 65 and 66 to form hooks which overlie the upper face of the respective ends of the transverse bar 55 of the sliding-coupler 27 when the same is in its rearmost position.

It follows from this construction that while the said transverse bar 55 makes no direct contact with the inwardly-turned fingers 61 and 62 of the sears 63 and 64, when one trigger is pulled the other trigger will be lifted and vice versa, thereby causing the sear of the unfired barrel to be lifted directly by the hooked sear-lifting nose of its complementary trigger, whereas in the construction of Figs. 1 to 10 inclusive, when the sliding coupler 27 is moved to the limit of its rearward movement, its transverse bar 55 acted directly upon the sear of the remaining unfired barrel to directly actuate such sear, while in my modified construction the sear of the unfired barrel is lifted by the hooked nose of its trigger, since both triggers are compelled to move concurrently when the sear-coupler is in its rearmost position.

I claim:

1. In a double-barreled firearm, the combination with the two triggers thereof, firing-mechanisms for the respective barrels, connecting-means constructed and arranged to connect the respective triggers with the said firing-mechanisms in such manner that one trigger may be used to effect the firing of both barrels consecutively in the order "right—left" and the other trigger may fire both barrels consecutively in the order "left—right"; the said means comprising a reciprocating sear-coupler, a pivotal latch co-acting therewith to control the movement thereof into its sear-coupling position, and a pivotal inertia-weight mounted in the gun-structure with capacity for forward swinging movement with respect thereto under the recoil of the arm and co-acting with the said pivotal latch to nullify the "involuntary pull" upon either of the said triggers.

2. In a double-barreled firearm, the combination with firing-mechanisms for the respective barrels, of a trigger, and connecting-means constructed and arranged to connect the said trigger with the said firing-mechanisms in such manner that the trigger may be used to effect the firing of both barrels consecutively, the said connecting-means comprising a longitudinally-reciprocatable spring-pressed sear-coupler and a pivotal double-nose latch controlling the same and in turn controlled by the said trigger to permit the coupler to successively move into its intermediate and final positions.

3. In a double-barreled firearm, the combination with the two triggers thereof, of firing-mechanisms for the respective barrels, connecting-means constructed and arranged to connect the respective triggers with the said firing-mechanisms in such manner that one trigger may be used to effect the firing of both barrels consecutively in the order "right—left" and the other trigger may fire both barrels consecutively in the order "left—right," the said connecting-means comprising a longitudinally-reciprocatable spring-pressed sear-coupler and a pivotal double-nose latch controlling the same and controlled in turn by either of the said triggers to permit the coupler to successively move into its intermediate and sear-coupling positions.

4. In a double-barreled firearm, the combination with the two triggers thereof, of firing-mechanisms for the respective barrels, connecting-means constructed and arranged to connect the respective triggers with the said firing-mechanisms in such manner that one trigger may be used to effect the firing of both barrels consecutively in the order "right—left" and the other trigger may fire both barrels consecutively in the order "left—right;" the said means comprising a reciprocating sear-coupler and a pivotal latch co-acting therewith to control the movement thereof into its sear-coupling position, and common spring-means actuating the said sear-coupler and latch.

5. In a double-barreled firearm, the combination with the two triggers thereof, of firing-mechanisms for the respective barrels, connecting-means constructed and arranged to connect the respective triggers with the said firing-mechanisms in such manner that one trigger may be used to effect the firing of both barrels consecutively in the order "right—left" and the other trigger may fire both barrels consecutively in the order "left—right"; the said means comprising a reciprocating sear-coupler and a pivotal latch co-acting therewith to control the movement thereof into its sear-coupling position, and spring-means having the three-fold function of actuating the sear-coupler and latch and also to return either trigger to its forward position when released.

6. In a double-barreled firearm, the combination with two sears, two triggers, a longitudinally-reciprocatable sear-coupler, a latch therefor, a pivotal inertia-weight mounted in the firearm-structure with capacity for forward swinging movement with respect thereto and co-acting with the said latch when the arm recoils to nullify the "involuntary pull," and spring-means to return the said weight to its retired position.

7. In a double-barreled firearm, the combination with two sears, two triggers, a sear-coupler, a latch therefor, a pivotal inertia-weight mounted in the firearm-structure with capacity for forward swinging movement with respect thereto and co-acting with the said latch when the arm recoils to nullify

the "involuntary pull" upon either of the said triggers, spring-means to return the said weight to its retired position, and friction-means between the latch and weight for holding the latter in its operative position.

8. In a double-barreled firearm, the combination with the two triggers thereof, of firing-mechanisms for the respective barrels, connecting-means constructed and arranged to connect the respective triggers with the said firing-mechanisms in such manner that one trigger may be used to effect the firing of both barrels consecutively in the order "right—left" and the other trigger may fire both barrels consecutively in the order "left—right"; the said means comprising a reciprocating sear-coupler and a pivotal latch co-acting therewith to control the movement thereof into its sear-coupling position, the said sear-coupler and latch being each provided with two teeth for co-action in holding the spring-pressed sear-coupler in its retired and intermediate positions.

9. A trigger-mechanism of the character described having a trigger, a sear-coupler, a latch co-acting therewith and a single spring acting upon the said trigger, sear-coupler and latch for moving each of the said parts in one direction.

10. In a double-barreled firearm, the combination with the two triggers thereof, of firing-mechanisms for the respective barrels, a longitudinally-movable sear-coupler having retired, intermediate, and sear-coupling positions in which latter position it is operable by either of the said triggers, a latch controlled by either of the said triggers and co-acting with the said sear-coupler for successively holding it in its fully-retired and intermediate positions, a pivotal inertia-weight mounted in the gun-structure with capacity for forward swinging-movement with respect thereto under the recoil of the arm to engage the said latch and cause the same to hold the sear-coupler in its intermediate position, whereby an "involuntary pull" upon either of the said triggers is nullified.

11. In a double-barreled firearm, the combination with the two triggers thereof, of firing-mechanism for the respective barrels, a longitudinally-movable sear-coupler having retired, intermediate, and sear-coupling positions in which latter position it is operable by either of the said triggers, a latch controlled by either of the said triggers and co-acting with the said sear-coupler for successively holding it in its retired and intermediate positions, a pivotal inertia-weight mounted in the gun-structure with capacity for forward swinging-movement with respect thereto under the recoil of the arm to engage the said latch and cause the same to hold the said sear-coupler in its intermediate position, whereby an "involuntary pull" upon either of the said triggers is nullified, and a spring acting through the said latch to frictionally engage the same with the said weight when the rearward draft upon either of the said triggers is released.

12. A unitary trigger-mechanism for double-barreled firearms, consisting of a trigger-plate, a mounting-block upstanding therefrom and having two complementary longitudinal slots, two triggers respectively having their body-portions located in the said slots and pivotally mounted in the said mounting-block, a longitudinally-recoprocatable sear-coupler located in the said block between the said triggers, a pivotal latch also located between the said triggers at a point above the said sear-coupler, a pivotal inertia-weight mounted upon the trigger-plate with capacity for forward swinging movement with respect thereto under the recoil of the arm to co-act with the said latch to cause the same to restrain the coupler from moving into its sear-coupling position.

13. A double-barreled firearm having a firing mechanism including a trigger for each of the respective barrels thereof; retirable connecting means adapted to connect together portions of the firing mechanism of each barrel for concurrent operation by the trigger of either thereof; a spring normally urging the said connecting means into operative position; and a pivotal inertia-weight mounted in the firearm-structure so as to be swung relatively with respect thereto by the recoil of the firearm and positioned to prevent when so swung the movement of the said connecting means into operative position.

14. In a selective double-trigger mechanism for multiple-barrel firearms, the combination with a pair of sears; of a pair of triggers, each adapted to independently operate its complementary sear; and a sear-actuator adapted to operate either of said sears and movable for such purpose by either one of the two said triggers without moving the other trigger.

15. In a selective double-trigger mechanism for multiple-barrel firearms, the combination with a pair of sears; of a pair of triggers, each adapted to independently operate its complementary sear; and a reciprocating sear-actuator having active and retired positions and adapted when in its active position to operate either of the said sears and movable for the latter purpose by either one of the two said triggers without moving the other trigger.

16. In a selective double-trigger mechanism for double-barrel firearms, the combination with a pair of firing-mechanisms including the respective sears thereof; of a shiftable sear-actuator; of a pair of triggers, each adapted to actuate its complementary sear independently of the said sear-actuator for releasing one firing-mechanism, and each adapted to move the said sear-actuator to cause the

same to release the other of the said firing-mechanisms through the intermediary of the sear thereof.

17. In a selective double-trigger mechanism for double-barrel firearms, the combination with a pair of firing-mechanisms including the respective sears thereof; of a shiftable sear-actuator adapted to directly operate the said sears; and a pair of triggers each adapted to actuate its complementary sear independently of the said sear-actuator and of the other trigger for releasing one firing-mechanism, and each adapted to move the said sear-actuator to cause the same to release the other of the said firing-mechanisms through the intermediary of the sear thereof.

In testimony whereof, I have signed this specification.

LOUIS STIENNON.