No. 836,167. PATENTED NOV. 20, 1906.

G. E. WITHERELL.

FIRING MECHANISM FOR FIREARMS.

APPLICATION FILED MAY 24, 1902.

Fig. 1

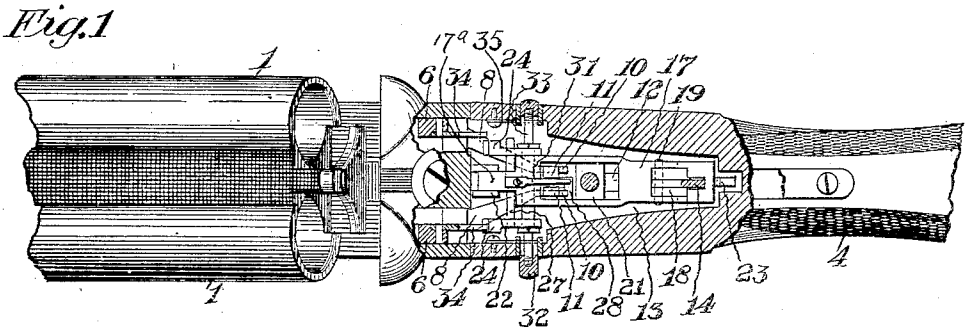


Fig. 2

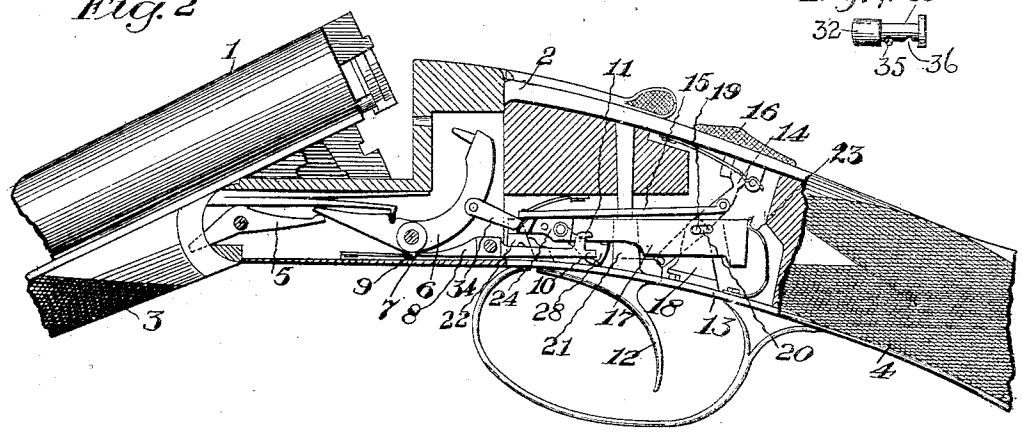


Fig. 7

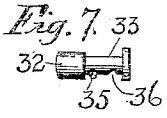


Fig. 3

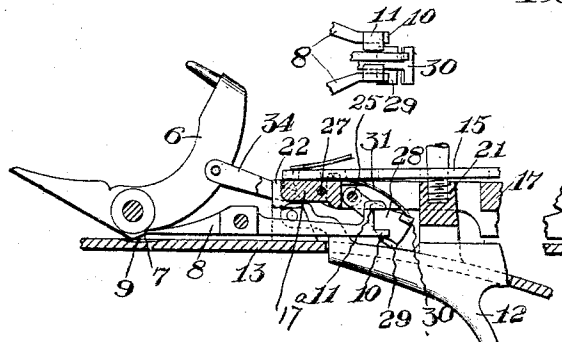


Fig. 4

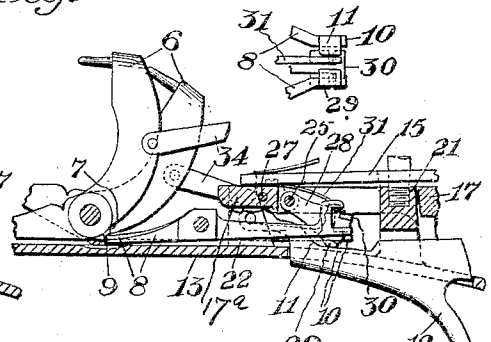


Fig. 5

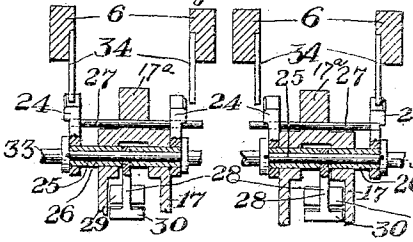
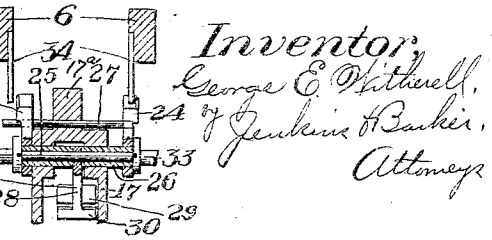


Fig. 6



Witnesses:

Geo. B. Rowley

Emma P. Coffin

Inventor,

George E. Witherell,

by Jenkins & Barker,

Attorneys

UNITED STATES PATENT OFFICE.

GEORGE E. WITHERELL, OF HARTFORD, CONNECTICUT, ASSIGNOR TO REMINGTON ARMS COMPANY, OF ILION, NEW YORK, A CORPORATION OF NEW YORK.

FIRING MECHANISM FOR FIREARMS.

No. 836,167. Specification of Letters Patent. Patented Nov. 20, 1906.

Application filed May 24, 1902. Serial No. 108,828.

To all whom it may concern:

Be it known that I, GEORGE E. WITHERELL, a citizen of the United States, and a resident of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Firing Mechanism for Firearms, of which the following is a full, clear, and exact description, whereby any one skilled in the art can make and use the same.

My invention relates to that class of firearms in which a plural number of hammers are employed and which may be released for the discharge of the gun by the operation of a single trigger; and the objects of my invention are to produce a device of this class in which the coupling mechanism shall be simple in construction, positive in operation, and little liable to get out of order, and also to provide means for preventing the accidental discharge of the gun.

One form of device by the use of which these objects may be attained is illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of a portion of the stock and the rear end of the barrels of a double-barrel shotgun, the gun being broken down and parts broken away to show construction. Fig. 2 is a side view of the same, showing the gun cocked. Fig. 3 is a detail view, on enlarged scale, in side elevation, of a portion of a gun embodying my invention and showing the firing mechanism and also showing in plan the rear portions of the sears and coupler, the gun being cocked. Fig. 4 is a like view, but showing the parts at the time of release of the left-hand hammer from engagement with the sear and in the plan view with the coupler at the forward limit of its play. Fig. 5 is a detail view, in longitudnial section, through the forward end of the coupler-slide and in cross-section through the hammers on a plane passing through the axes of the coupler and carrier-pins, showing the manner of mounting the coupler-shift in the slide and with the parts in position to initially fire the left-hand barrel. Fig. 6 is a like view with the parts in position to initially fire the right-hand barrel. Fig. 7 is a detail view of the coupler-shift looking from the rear of the gun.

In the accompanying drawings the numeral 1 denotes the barrels, 2 the frame, 3 the fore-end, and 4 the stock, of a double-barrel shotgun, the barrel being pivoted to the frame in a manner common to devices of this class. Cocking-levers 5 are pivoted in the frame, with one end of each lever underlying the front end of a hammer 6. Each of the hammers 6 is provided with a notch 7 for engagement with the end of a sear 8, there being a cocking-lever, hammer, and sear appurtenant to each of the barrels of the gun and all the parts above described, with the exceptions hereinafter noted, being constructed and arranged in a manner well known to this class of guns. The usual springs and other appurtenances to these parts of course are to be considered as used in connection with said parts. The hammer 6 is provided adjacent to the notch 7 with a cam 9, acting in connection with the sear for a purpose to be hereinafter described. The sear 8 is pivoted in the frame and projects backward and inward, its sear-tail having at its rear end a direct catch 10 and a longer laterally-extending coupler-catch 11. The direct catch extends backward, and the longer coupler-catch extends laterally of the sear-tail. The trigger 12 is mounted in the trigger-plate 13 in the usual manner, and the usual devices, comprising a safety-rocker 14, a safety-bar 15, and a safety-slide 16, are employed for the purpose of locking the trigger to prevent the accidental discharge of the gun.

A coupler-slide 17 is suitably mounted in any convenient manner appurtenant to the hammers and sears. In the device herein illustrated this coupler-slide is made in the form of a frame, the rear part having a depthwise opening, into which the safety supporting-stud 18 extends. A guide-pin 19 extends laterally from the safety supporting-stud into guide-slots 20, formed in the sides of the coupler-slide.

The tang-stud 21 projects upward into another depthwise opening through the coupler-slide, and the forward end of said slide fits between the two branches of the trigger-supporting stud 22. These parts—the safety supporting-stud, guide pin and slots, tang-stud, and trigger-supporting stud—form the mount for the coupler-slide, on which it has a free lengthwise movement except as controlled by the coupler-slide spring 23, which

normally holds the coupler-slide at the forward limit of its play, determined by the engagement of the pin 19 with the rear wall of the slot in which said pin is located.

The coupler-carrier is mounted on the forward end of the coupler-slide. This carrier consists of two side parts or coupler-controllers 24, lying outside of the coupler-slide 17 and joined by a coupler-pin 25 and carrier-sleeves 26, to which it is secured. A carrier-pin 27 is secured to a forward-projecting part 17^a from the coupler-slide and projects through openings in each of the side parts 24 of the coupler-carrier, which openings are of a size to permit free lateral play of the side parts 24 upon the carrier-pin 27.

The carrier-sleeves 26 fit loosely within openings of the side parts of the coupler-slide, and a coupler 28 is mounted on the coupler-pin 25 between the inner ends of the carrier-sleeves. It will be noted that this construction forms a means whereby the coupler-carrier has a lateral movement upon the carrier-pin 27, secured to the forward projection from the coupler-slide, and that the sleeves move freely within the side parts of the coupler-slide.

The pin 27 projects into the openings in the side parts 24 of the coupler-carrier to an extent to be always engaged in each of said openings, the pin 27 and the openings in the side parts of the coupler-slide in which the sleeves 26 freely slide forming, in fact, guides for the coupler-carrier in its lateral movements.

The coupler 28 is pivotally mounted on the coupler-pin 25 and has a direct trip 29 and a coupler-trip 30. There are two direct trips and two coupler-trips located one on each side of the coupler and appurtenant to each of the sears located on the opposite sides of the coupler. The direct trip extends for some distance lengthwise of the coupler, and the coupler-trip is narrower than the direct trip. The coupler-spring 31 holds the coupler in its normal position of rest against the trigger 12.

It is to be understood that in the above description the duplicate parts required for operation in connection with both of the barrels are of similar construction except as to form, to adapt the part to either the right or left hand side or barrel of the gun and that where a part applicable to one barrel has been described the description applies equally to the part applicable to the other barrel.

A coupler-shift 32 is located on each side and projects through the sides of the gun-frame. This consists of a coupler-shift proper, which is slidable in the opening through the frame and to each of which is secured a shifter-stud 33. Each of these studs has a broadened head, so that it rests against the side part or coupler-controller 24 of the carrier without regard to the position of the latter, but is not secured thereto. This affords a means of shifting the coupler-carrier and imparting to it lateral movement for the purpose of determining at the will of the operator which barrel shall be fired first.

Each hammer 6 has an arm 34, each located with respect to a coupler-controller, and the latter are so located that but one can be operated upon by an arm at a time. The cams 9 on each of the hammers 6 are so formed that each cam will engage the forward end of a sear when the hammer is down and, holding this end of the sear downward, will raise the opposite end of the sear slightly. This end of the sear will be raised to such extent that the upward movement of the coupler 28 will not affect a sear appurtenant to that barrel which has been fired in the previous movement of the coupler. By this construction each pull of the trigger raises the coupler and a single sear only, so that there is practically the same pull on the trigger required at each discharge of the gun—that is, the force required to operate the trigger is not varied, but is maintained constant. The operation of the device is as follows:

The hammers being uncocked, as after the discharge of both barrels of the gun, the rear end of the barrels are released by means of a top lever and the gun broken down, each barrel is loaded, and the rear ends of the barrels again swung into place and locked. The cocking-levers operate to throw each of the hammers backward, in which position they are engaged and held by the sears in the usual manner. This backward movement of the hammers has caused one of the arms to engage one of the coupler-controllers, and this forces the coupler-slide, together with the coupler, backward to the rearward limit of their play and as shown in Fig. 3 of the drawings. It may now be determined which barrel shall be fired first and the shifter-stud moved to effect this result. The stud may, if required, be moved to effect the desired result before the gun is broken down. It may be assumed that the stud is in position to fire the left-hand barrel and it is desired to fire the right-hand barrel. The stud projecting on the left-hand side of the gun is pressed inward, projecting the stud on the right-hand side outward. In this movement, before the coupler-controller 24 on the left-hand side has been disengaged from the arm 34, the coupler-controller on the right-hand side will have engaged the arm from the hammer on the right-hand side of the gun. The projecting shifter-stud 33 on the right-hand side of the gun indicates that the right-hand barrel will now be first fired on the pull of the trigger 12. The trigger now being pulled, the direct trip 29 on the lower right-hand side of the coupler 28 engages with the direct catch 10 on the lower

side of the sear appurtenant to the right-hand barrel of the gun. The direct trip 29 on the lower left-hand side of the coupler 28, owing to the position of the coupler at the right-hand extremity of its lateral sliding movement, is in such position that it will not engage with the sear appurtenant to the left-hand barrel. As the trigger is pulled and the parts engaged as above described the right-hand sear 8 is released from the right-hand hammer 6, and the latter is forced downward under the force of its spring, discharging the right-hand barrel. The arm 34 of the right-hand hammer having now moved out of the way, the coupler-slide 17 moves forward under the impulse of the coupler-slide 23 and is located opposite the arm of the left-hand hammer. This movement of the coupler-slide carries the coupler-carrier and the coupler into such position that the upward movement of the coupler will cause the coupler-trip 30, located on the upper left-hand side of the coupler, to engage the coupler-catch 11, located on the upper side of the sear appurtenant to the left-hand barrel. This raises said sear, disengaging the hammer and allowing it to be forced forward by its spring, thus discharging the left-hand barrel. It will be noted that during this operation the sear appurtenant to the right-hand hammer by engagement with the cam 9 has remained lifted, so that the movement of the coupler has not disturbed it.

The coupler-slide is of considerable weight, and the slide is so mounted as to be freely movable lengthwise on its mount, except as restrained by the coupler-slide spring. The object of this construction is to prevent the unintentional or premature discharge of a second barrel immediately following the discharge of the first. As the gun is initially discharged the recoil acts against the yielding shoulder of the user and also the resistance of the user to such recoil, and this causes what is known as a "counter-recoil." This counter-recoil occurs before pressure on the trigger can be removed, and unless some device is employed to prevent the movement of the trigger or of the sears a second discharge will immediately follow that of the first.

In the device within described the inertia of the coupler-slide owing to its considerable weight is not quickly overcome, and in the counter-recoil all parts of the gun except the coupler-slide move forward. This leaves the coupler-slide and the coupler in such position at the instant following the initial discharge that should the pressure of the finger cause the trigger to be pulled the upward movement of the coupler caused by the second pull on the trigger will affect only the sear appurtenant to the barrel which has just been discharged, the coupler-slide remaining in its rearward position during this counter-recoil and not being in position so that the coupler can act on the sear of the opposite barrel.

My invention is shown and described herein in connection with a gun having a single trigger; but it will be understood that the invention may be applied to a gun having a plural number of triggers without the exercise of any more than mere mechanical skill, and I do not limit my invention to the exact embodiment illustrated herein, as it is obvious that this embodiment may be departed from to a considerable extent and yet remain within the limits of the invention.

A special advantage resides in the construction of the coupler-carrier, in connection with the arms from the hammers, whereby the carrier is locked against lateral movement after the discharge of a single barrel. For instance, as illustrated in Fig. 4, the left-hand sear having been tripped and the left-hand hammer 6 having been thrown forward, the coupler-slide also moves forward under the impulse of its spring. This places the coupler-controller 24 appurtenant to the right-hand hammer 6 opposite the arm 34 on said hammer, so that any lateral movement of the carrier will be prevented by said arm.

It is often desirable, as in trap-shooting, to load and fire a single barrel only, and in such instances it is essential that the coupler-carrier shall be maintained against lateral movement, so that the same barrel shall be discharged at every pull of the trigger. This result is obtained by the mechanism above described, and the user need not pay special attention to the position of the studs 33, as there will be little danger of accidentally shifting the carrier, which for the greater part of the time is absolutely locked against lateral movement.

Springs 35 are located on each side of the inner wall of the frame, each of these springs being adapted to engage notches 36 in the shifter-stud 33. This spring forms a detent to hold each of the shifter-studs at the outer or inner limit of its play, and the coupler-carrier is thus held at either limit of its sidewise movement. It will be noted that there are two of these notches 36 in each of the shifter-studs 33, one of which studs is shown in Fig. 7 of the drawings, it being understood that the other stud is formed in the same manner.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a multibarrel firearm having a plural number of hammers and a plural number of sears and their appurtenant parts, a trigger, a connection between the trigger and sears to initially operate either sear, and an elastically-operated slide engaging said connection for temporarily preventing the operation of the connection with a sear on the backward movement of the trigger.

2. In a multibarrel firearm having a plural

number of hammers and a plural number of sears and their appurtenant parts, a trigger, a connection mounted independently of the trigger and connecting the trigger and sears to initially operate either sear, means located outside of the piece for operating said connection, and elastically-controlled means engaging said connection for temporarily preventing its automatic operation.

3. In a multibarrel firearm having a plural number of hammers and a plural number of sears and their appurtenant parts, a trigger, means for connecting the trigger to initially operate either sear, and means engaging said connection for temporarily preventing its operation.

4. In a multibarrel firearm having a plural number of hammers and a plural number of sears and their appurtenant parts, an elastically-operated slide, a trigger, and a connection loosely mounted on the slide to connect the trigger and sear, and to temporarily disconnect the trigger with one of said parts in the backward movement of the slide.

5. In a multibarrel firearm having a plural number of hammers and a plural number of sears and their appurtenant parts, an elastically-operated slide, a trigger, a laterally-movable connection between the trigger and sear and mounted on the slide to temporarily disconnect the trigger with one of said parts in the backward movement of the slide.

6. In a multibarrel firearm having a plural number of hammers and a plural number of sears and their appurtenant parts, an elastically-operated slide, a coupler loosely mounted on the slide to initially engage a sear, but to be temporarily held in an inoperative position with respect to the other sear in the backward movement of the slide, and a trigger for operating the coupler.

7. In a double-barrel firearm having a hammer and a sear and their appurtenant parts appurtenant to each barrel, a direct and a coupler catch located on each sear, a coupler having a direct trip and a coupler-trip to engage either sear and forming a connection between the trigger and either sear, means for shifting the coupler to engage either sear, and the trigger.

8. In a multibarrel firearm having a plural number of hammers and a plural number of sears and their appurtenant parts, a direct catch and a coupler-catch located on each sear, a coupler having a direct trip and a coupler-trip on each side to engage the sears, means for shifting the coupler to engage either sear, and a trigger adapted to operate the coupler.

9. In a multibarrel firearm having a plural number of hammers and a plural number of sears and their appurtenant parts, a direct catch and a coupler-catch mounted on each sear, an elastically-influenced slide, a coupler pivoted on the slide and having direct trips and coupler-trips to engage either sear, means for shifting the coupler laterally, and a trigger adapted to operate the coupler.

10. In a double-barrel firearm, in combination, a hammer appurtenant to each barrel, a cam projection on each hammer, a sear appurtenant to each hammer, a trigger, a coupler to connect the trigger and either sear, a slide bearing the coupler, means for moving the coupler laterally on said slide, and a controller on the slide to engage each cam projection from the hammer.

11. In a double-barrel firearm, a hammer appurtenant to each barrel, a cam projection from each hammer, a sear appurtenant to each hammer, a trigger, a coupler to connect the trigger and the sears, a slide bearing said coupler, a coupler-carrier laterally movable on said slide and having controllers to engage the projection from either hammer.

12. In a double-barrel firearm, a hammer appurtenant to each barrel, a cam projection from each hammer, a sear appurtenant to each hammer, a trigger, a coupler to connect the trigger and the sears, a slide bearing said coupler, a coupler-carrier laterally movable on said slide and having controllers to engage the projection from either hammer, and a shifter-stud projecting from each side of the carrier and to the outside of the piece.

13. In a firearm having a plural number of hammers and a plural number of sears with their appurtenant parts, a trigger, a coupler for connecting the trigger and sears, and means for holding a sear out of the path of movement of said coupler.

14. In a multibarrel firearm having a plural number of barrels and a plural number of sears and their appurtenant parts, a direct catch and a coupler-catch located on each sear, a coupler having a direct trip and a coupler-trip, a trigger, and means for holding a sear out of the path of movement of a trip on the coupler.

GEORGE E. WITHERELL.

Witnesses:
ERNEST R. SEWARD,
ARTHUR B. JENKINS.