J. D. RUSS.

SINGLE TRIGGER MECHANISM.

APPLICATION FILED SEPT. 13, 1906.

914,516.

Patented Mar. 9, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

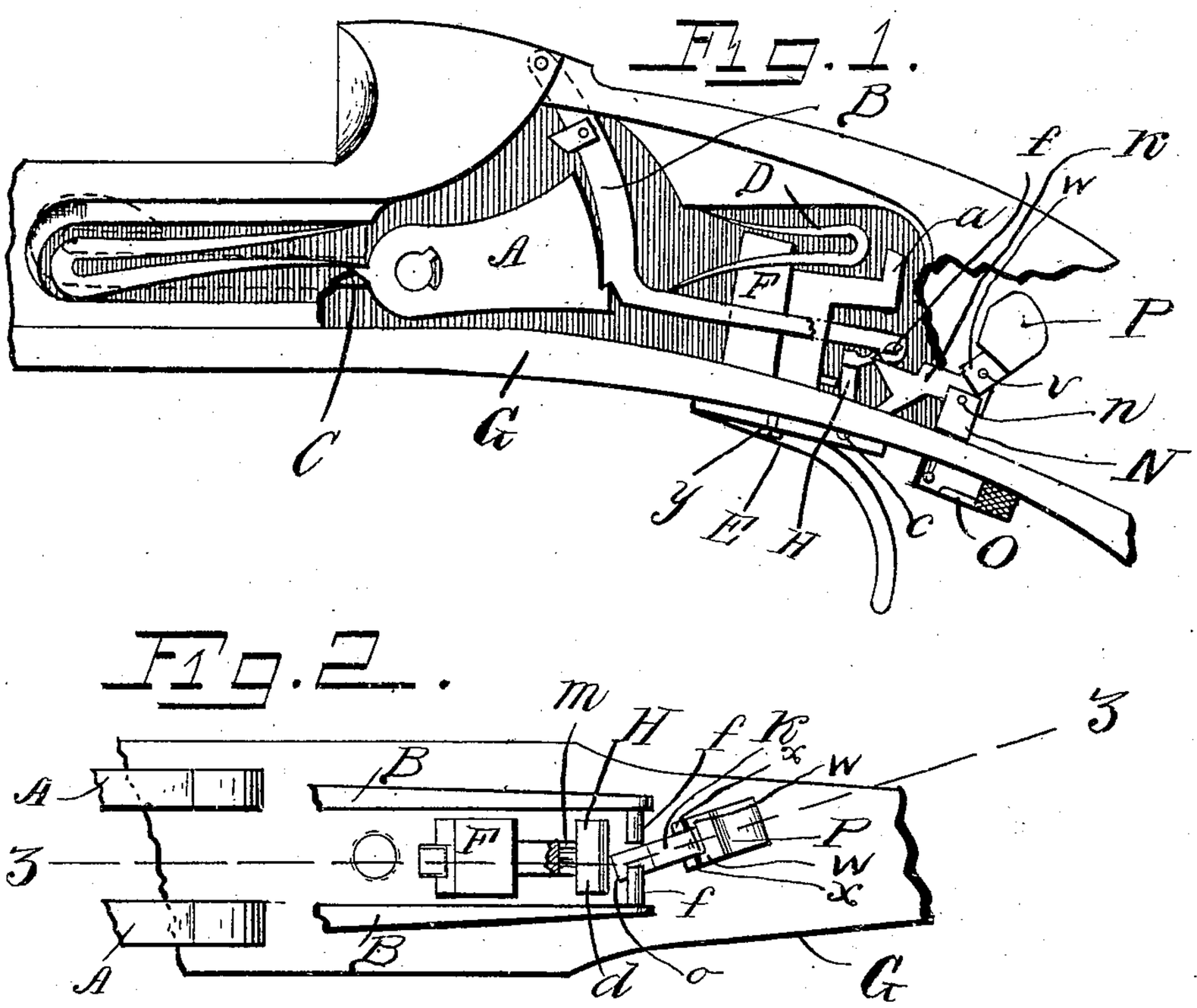
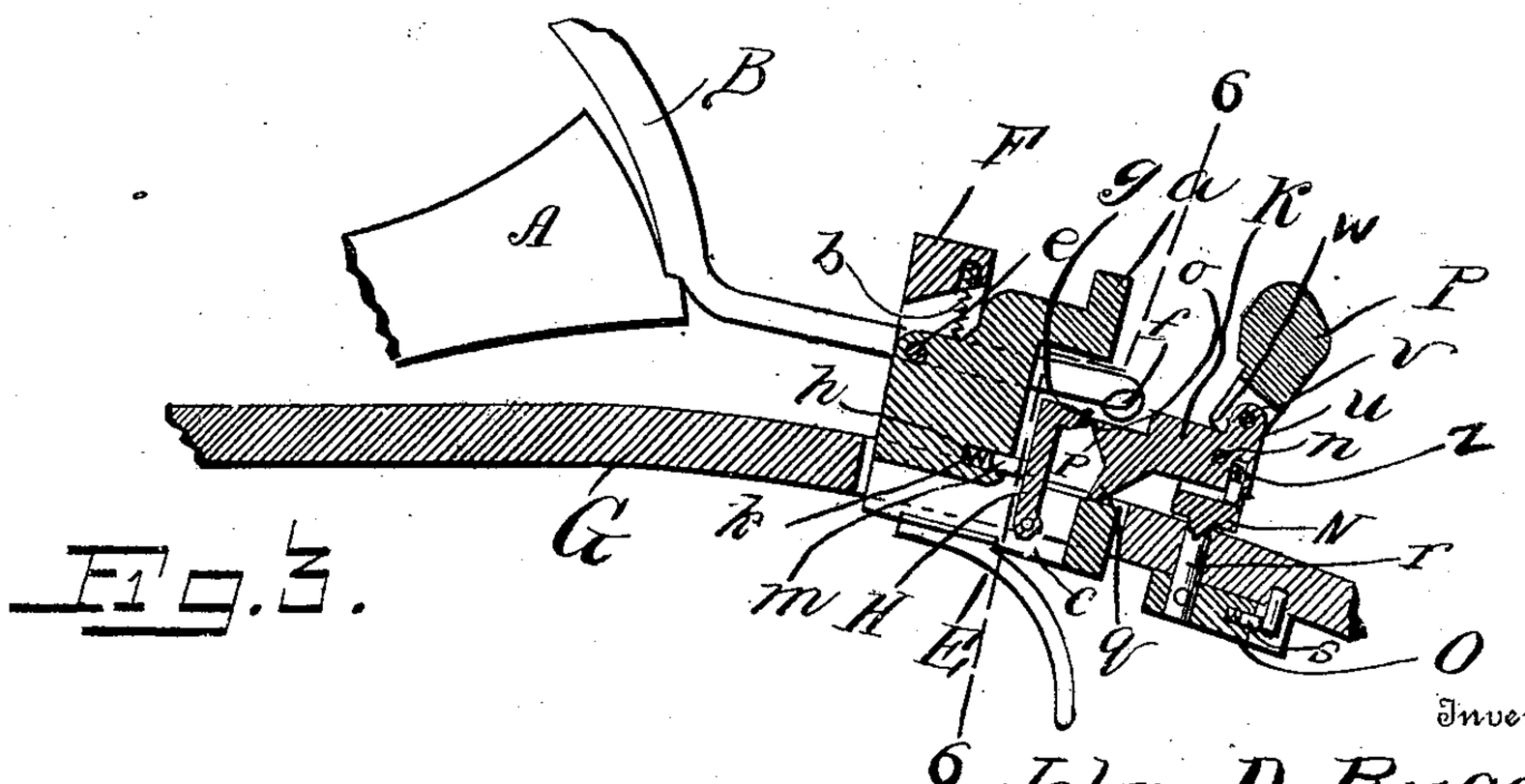


Fig. 2.

Fig. 3.



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2 SHEETS—SHEET 2.

FIG. 4.

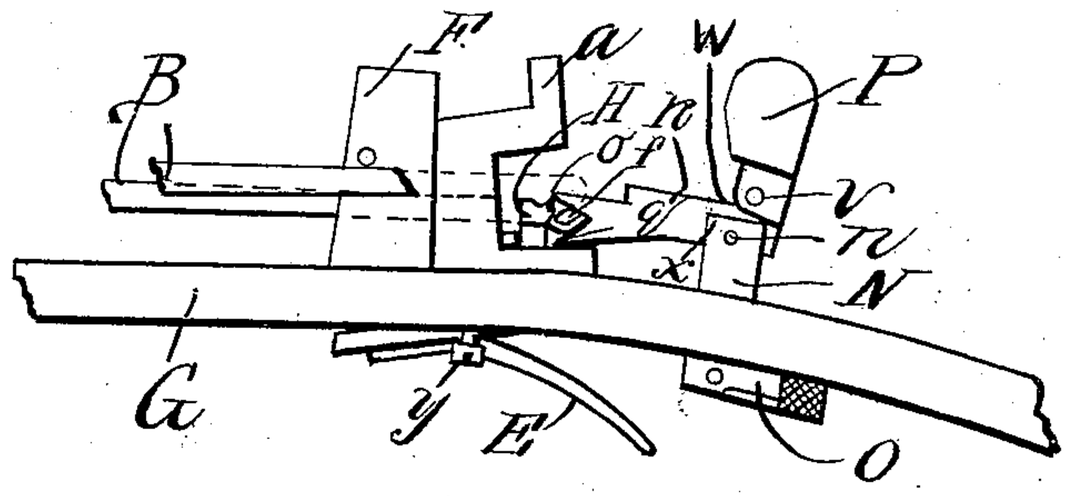


FIG. 5.

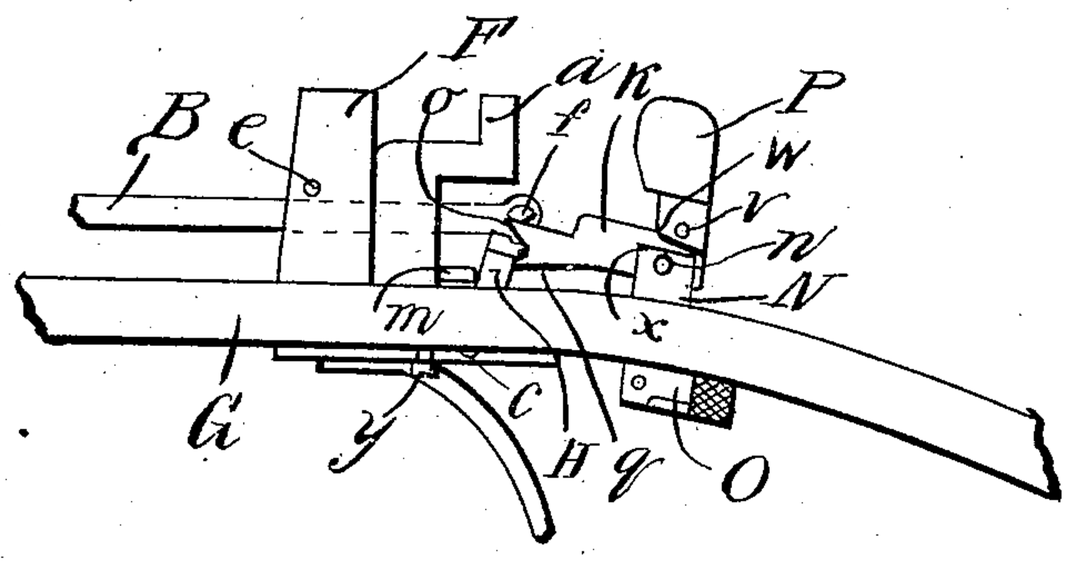


FIG. 6.

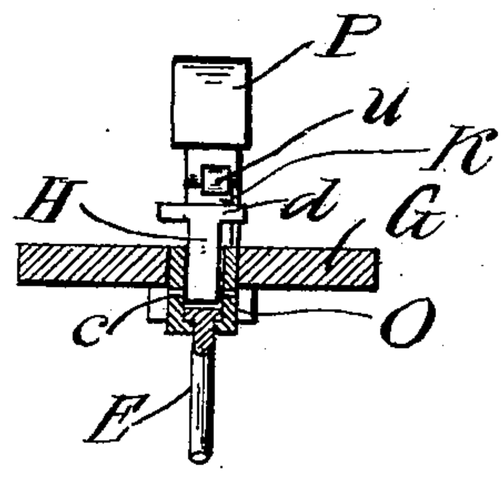
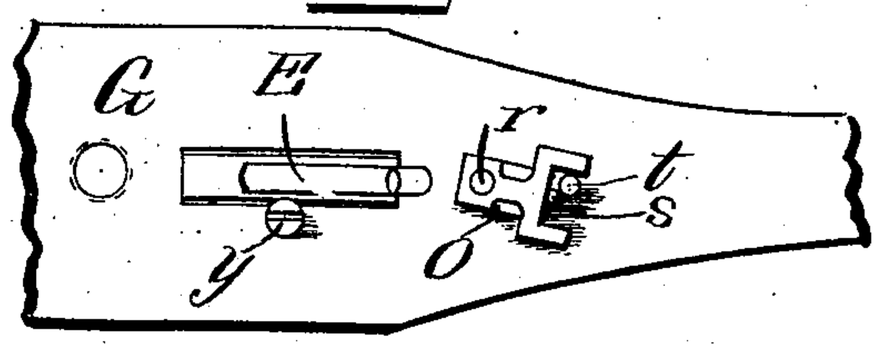


FIG. 7.



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UNITED STATES PATENT OFFICE.

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SINGLE-TRIGGER MECHANISM.

No. 914,516. Specification of Letters Patent. Patented March 9, 1909.

Application filed September 13, 1906. Serial No. 334,554.

To all whom it may concern:

Be it known that I, JOHN D. RUSS, a citizen of the United States, residing at Spencer, in the county of Roane and State of West Virginia, have invented certain new and useful Improvements in Single-Trigger Mechanisms; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to double barrel firearms, and more particularly to single trigger mechanism therefor.

In general, the object of the invention is to present a mechanism characterized by simplicity of construction and reliability of action.

To this general end, one of the aims of the invention is to render the trigger mechanism self setting, that is to say to dispense with special means for bringing about setting of the trigger mechanism. This is accomplished by causing the trigger mechanism to be set by one of the essential elements of the gun lock, namely the pair of hammer sears. It is to be understood that it is the regular arrangement in double barrel guns to have the hammer sears raisable to release the hammers and depressible, when the hammers are cocked, to engage and hold these elements, the depression of the sears being suitably effected through the agency of springs. Since it is my idea to render my trigger mechanism readily applicable to ordinary types of double barrel firearms, I have adopted this general arrangement of hammers and sears, and the setting of the trigger mechanism is effected by the sears during their downward movement under the actuation of their springs. However, it is to be understood that my invention is independent of any particular construction of sears and hammers, and that the broad idea now being considered is to bring about the setting of the trigger mechanism through the sears simultaneously with the cocking action. In further explanation of the principles involved in this phase of my invention, it may be mentioned that there are preferably two distinct releasing members for the two sears, a first and a second releasing member, for bringing about first and second discharge, respectively. In view of this condition, it has been found advisable to cause the sears, or a sear, to act upon the first releasing member during setting action, and to cause said member in turn to set the second releasing member, thus constituting the initial member both a setting and a releasing member. In set position, the second releasing member is in advance of releasing position, to which it is moved after release of the first sear, while it seems preferable that the first releasing member at the time referred to shall be in releasing position with reference to one of the sears.

Not only does the first releasing member serve to set the second releasing member, but also to retain said second member in set position, thus constituting a detent. Moreover the first releasing member is a selective member, being capable of occupying releasing position with reference to either of the sears as desired; and, for this reason, it may be noted, it is desirable to make the second releasing member a double member, that is, when it moves to releasing position it is capable of releasing either of the sears not released by the first member. While I consider a distinct advance and a great gain in simplicity to embody in the one element, the first releasing member, the several functions noted, yet it will be noted that I regard the setting function of this member as not peculiarly or essentially dependent upon its other functions. Thus, I regard it as equally novel to constitute a sear-releasing member, or a detent member of the nature described, as a setting member, irrespective of whether the first is also a detent or the second adapted to bring about sear-release. In this connection, it may be pointed out that the first releasing member of the present invention is a development of the ideas disclosed in my former applications, Serial No. 236,322, filed Dec. 10, 1904, and Serial No. 255,756, filed April 15, 1905. In the first of these, the detent for the releasing member served as a detent and nothing more. In the second, it became also a releasing member, and not only a releasing member but a selective releasing member. In this connection, therefore, the present invention constitutes a further step beyond the prior inventions, in that the setting function is added to the member under discussion.

In the applications referred to, there was disclosed a stop, the function of which was to temporarily arrest the parts in their movement to second releasing position, the object

being to give the second, involuntary, pull upon the trigger sufficient time to occur before the parts were in such relation that a premature discharge would ensue. This safeguard is also embodied in the present invention; and, in consonance with the general aim of simplifying the construction, the sears themselves are relied upon to bring about the arresting of the second releasing member before it travels to releasing position. In the present invention, as well as in the former two, the releasing member is held in such intermediate arrested position as long as it is maintained at or above a certain elevation above the trigger plate, the member escaping from the stop when it falls to its normal plane. It follows that there may be some slight danger of the member dropping sufficiently to pass beneath the stop, before the involuntary pull occcurs. In this case, of course, a premature discharge would result. As a further safeguard, therefore, looking toward increased reliability of action, recoil-operated means is provided according to the present invention, so that, when the second releasing member is in releasing position, should there be sufficient kick to cause an involuntary pull upon the trigger, this same kick will be sufficient to cause the recoil-operated means to re-set said second member in advance of releasing position, thus preventing release of the second sear.

The foregoing, as well as other, features of the invention will be more fully understood as the specification proceeds.

In the drawings: Figure 1 is a side elevation of a form of trigger mechanism embodying the principles of my invention, the parts being shown in set, or first releasing, position; Fig. 2 is a plan view of the essential parts as shown in Fig. 1, the region *a* being among the parts omitted for the sake of greater clearness; Fig. 3 is a vertical, longitudinal section on the line 3—3, Fig. 2; Fig. 4 is a side elevation, showing the parts at the moment of release of the first, in this instance, the left-hand, sear; Fig. 5 is a similar view, illustrating the parts in second releasing position, the left-hand sear being omitted; Fig. 6 is a vertical, transverse section on the line 6—6, Fig. 3; and Fig. 7 is a fragmentary bottom plan of the trigger plate.

Referring to these drawings for illustration of one embodiment of the underlying principles already discussed, it being remembered that these principles and not the specific embodiment constitute the invention: A indicates the hammers, and B the hammer sears, the hammers and sears being related in a well-known manner not necessary to describe.

C is a usual form of cocking lever, operated by the breaking of the gun.

D is one of the sear springs that force the sears down into detaining engagement with the hammers, when the latter are cocked. It will be obvious that any usual or preferred form of hammers and sears may be employed. It is desirable, however, to provide means whereby each sear will be held elevated after the release of its hammer. This means is the same as that shown in my application, Serial No. 255,756, already referred to, and consists of beveled lugs mounted on the sears in position to be engaged by the backs of the hammers during firing action.

E is a finger-trigger-piece pivoted at *e* to a post F rising from the trigger-plate G. This piece is shown as being provided with a rearward and upward extension *a*, which may coöperate with any desirable form of safety, or may be omitted, as desired. A spring *b* serves to force the finger-trigger-piece normally downward. Pivoted on a transverse axis *c* to the finger-trigger-piece is the second releasing member H, conveniently formed in T-shape. The cross-bar *d* of the T-shaped releasing member extends transversely of the lock chamber, and is of a length to be received between the two hammer sears but to underlie simultaneously their two inturned tails *f*. Extending longitudinally of the rear face of the cross-bar *d* is a groove *g*, whose function will be touched on later. Housed in a rearward-opening barrel *h* in the finger-trigger-piece is a spring *k* and a plunger *m*, the latter contacting with the stem portion of the T-shaped second releasing member H, for the purpose of forcing the latter to the rear.

The first releasing member is designated by K. It is pivoted toward its rear end on transverse axis *n* to a post N, and at its forward end is provided with a detaining lip *o* adapted to coöperate with the groove *g* already referred to. Extending rearward and downward from this detaining lip is a setting incline *p*, again to be alluded to. Extending forward and downward from this inclined region is a second lip *q*, which overlies the same portion of the finger-trigger-piece to which the second releasing member is pivoted for longitudinal movement in the lock chamber. A spring *z* maintains the lip *q* normally in contact with the finger-trigger-piece, but is not strong enough to overcome the tension of the spring *k*.

After the initial pull of the trigger and the release of the sear selected to be initially acted on, the first releasing member is rocked on its pivot *n*, owing to the rearward tendency of cross-bar *d* against incline *p*, said rearward tendency being effected by spring *k*. This rocking of member *k* throws the same upwardly until it abuts the previously released sear, and thus causes incline *p* to more nearly assume a relatively vertical position. The relative position of incline *p* in this position of the parts is such that upon a

second pulling of the trigger when cross-bar *d* is forced upwardly, by following the direction of incline *p*, said cross-bar will be properly guided to a position directly beneath the unreleased sear, and final movement will cause it to engage and move the sear.

The post N is capable of being swung from side to side by reason of being carried by a pivot *r* passing through the trigger plate and bearing at its lower end a thumb-lever O. The latter is provided with a spring-operated pin *s* which coöperates with a stud *t* depending from the trigger plate, to hold the post at either extreme of rotary movement. It will be seen that the lip *o* of the first releasing member underlies one or other of the sear tails *f*, according as the thumb-lever O is forced to one side or other.

The first releasing member K is shown as being provided at the rear of its pivot with an upright extension *u*, to which on a transverse axis *v* is pivoted the recoil block P. At its lower end, in front of its pivot, this block is furnished with fulcrum shoulders *w*, which work upon the tops of the cheeks *x* of the post N, between which the first releasing member is pivoted. It will be seen that the construction is such that, when the recoil block is forced forward, it exerts a powerful leverage tending to lift the rear end of the releasing member K and to depress its forward end. In order to increase the efficiency of the recoil block, its weight is massed, as shown, toward the top and front.

In order to take up what is termed the pick-up between the trigger mechanism and the sears, a screw *y* may be provided on the bottom of the trigger plate with its head bearing against the finger-trigger-piece in such manner as to maintain the latter normally at any elevation desired.

The operation of the mechanism is as follows: The parts will be understood as being in the positions shown in Fig. 5, except that both sears are raised, this being the normal position of the parts. The thumb lever on the bottom of the trigger plate is shifted to one side or the other to select the barrel which it is desired first to discharge, or this operation may be performed after the cocking and setting action. The gun is now broken, with consequent cocking of the hammers and depression of the sears, the latter by reason of the expansive force of the sear springs. But it is to be noted that the selective initial releasing member is, at the moment of cocking, immediately beneath one or other of the sears. Consequently, the downward movement of this sear brings about likewise a downward movement of the first releasing member; and this movement of the member K, by reason of its incline *p* riding along the top of the second releasing member H, forces the latter forward against the expansive force of its spring *k*, until the lip *o* of the first releasing member catches within the groove *g* in the second releasing member. The trigger mechanism is now set, with the first releasing member in releasing position with reference to one of the sears and the second releasing member in advance of both sears and held in this position by the first member. The parts are now as illustrated in Fig. 1. To fire, pressure of the finger upon the finger-trigger-piece causes the latter to force upward against the lip *q* of the first releasing member, lifting this member into releasing engagement with its sear. The same movement of the finger-trigger-piece of course lifts the second releasing member, but the latter passes upward inoperatively between the sears, and the nature of the movement is such that the detaining lip on the first releasing member is raised from engagement with the corresponding groove in the second releasing member. This member is, however, prevented from traveling immediately to the rear, since it is in engagement with the front of the sear-tail which still remains depressed. After the first voluntary pressure upon the finger-trigger-piece, the gunner's finger of course, owing to the recoil, relaxes and the releasing members of the trigger mechanism begin to fall toward the trigger-plate. This relaxation is liable to be followed by a second, involuntary pull, due to rebound; and it will be obvious that, if this involuntary pull occurs before the second releasing member falls sufficiently to clear the engaging sear-tail, this second releasing member will merely rise harmlessly between the sears, without producing discharge. The parts now pass to the positions shown in Fig. 5. It will be noted by reference to this view that the depending lip *q* of the first releasing member serves two purposes, to afford means whereby the finger-trigger-piece lifts the member and to afford a limit stop for the rearward movement of the second releasing member. The next pull raises the second releasing member, and the latter is reliably guided upward by the incline *p* until it engages liftingly with the tail of the un-released sear.

The operation of the recoil block remains to be described. It is not impossible that the involuntary pull due to rebound might occur after the parts have assumed the positions shown in Fig. 5, when, of course, a raising of the second releasing member would produce discharge of a barrel. An involuntary pull will, however, be due to the effects of rebound, and the same effects will tend to force the recoil block forward, causing the latter to fulcrum upon its shoulders *w*, thereby raising the rear end of the first releasing member and depressing the front end. Such depression of the front end of the member causes the incline *p* to ride along the top of the second releasing member, and the latter

is consequently carried in front of the sear tails, where it is incapable of releasing them. By properly proportioning the recoil block, it may be insured that any kick which would be capable under ordinary conditions of producing an undesired discharge will necessarily result in the second releasing member being reset in advance of releasing position. It will thus be seen that there is provided recoil-operated means which counteracts the effects of recoil in producing "doubling".

What is claimed as new is:

1. In a single trigger mechanism, the combination of distinct releasing members, means for setting said members with the first in releasing position and the second in advance of such position where held, means for actuating the first releasing member to bring about hammer-release and for freeing said second releasing member to move toward releasing position, and recoil-operated means connected with the first releasing member for re-setting the second releasing member in advance of releasing position in event of involuntary pull due to recoil.

2. In a single trigger mechanism, the combination of a releasing member designed to bring about release of the second hammer, and an initial releasing member designed to bring about release of the first hammer and to set the second releasing member in advance of releasing position, and recoil-operated means for causing said initial member to effect automatic re-setting of the second releasing member in event of involuntary pull due to recoil.

3. In a single trigger mechanism, the combination of a releasing member designed to bring about second discharge, means for setting said member in advance of operative position, an initial releasing member designed to bring about first discharge, and recoil-operated means for causing said initial member to effect automatic re-setting of the second releasing member in event of involuntary pull due to recoil.

4. In a single trigger mechanism, the combination of a hammer-releasing member, means for setting said member in advance of releasing position, and recoil operated means for operating said setting means.

5. In a single trigger mechanism, the combination of a hammer releasing member, means for setting said member in advance of releasing position, and a recoil operated lever for actuating said setting means.

6. In a single trigger mechanism, the combination with hammer sears, of distinct releasing members raisable to bring about release of the sears, and means comprising an inverted V-shaped detent, carried by the first releasing member to hold the second releasing member in its normal unreleasing position, during the releasing position of the first releasing member.

7. In a single trigger mechanism, the combination with hammer sears, of distinct releasing members raisable to bring about release of the sears, means for elevating the first releasing member, and recoil operated means carried by said first releasing member for holding the second releasing member out of operative position on involuntary pull.

8. In a single trigger mechanism, the combination of distinct releasing members, means for actuating the first releasing member, and permitting the second releasing member to move toward releasing position, and means carried by said first releasing member for resetting said second releasing member in advance of releasing position in case of premature pull due to recoil.

9. In a single-trigger mechanism, the combination of a hammer-releasing member, means comprising an inverted V-shaped detent for setting said member in advance of releasing position, said means also serving to hold such member in advanced position.

10. In a single-trigger mechanism, the combination with a hammer-releasing member, movable in advance of releasing position, of an inverted V-shaped detent, arranged to effect such advance-positioning.

11. In a single-trigger mechanism, the combination with hammer sears, of distinct releasing members raisable to bring about hammer release, means for elevating the first releasing member, and a detent on said first releasing member comprising means for setting the second releasing member in advance of releasing position.

12. In a single-trigger mechanism, the combination with hammer sears, of distinct releasing members raisable to bring about hammer-release, means for elevating the first releasing member, and a forwardly projecting detent on said first releasing member comprising means for setting the second releasing member in advance of releasing position.

In testimony whereof, I affix my signature, in the presence of two subscribing witnesses.

JOHN D. RUSS.

Witnesses:
J. W. L. KYER,
L. W. GOFF.