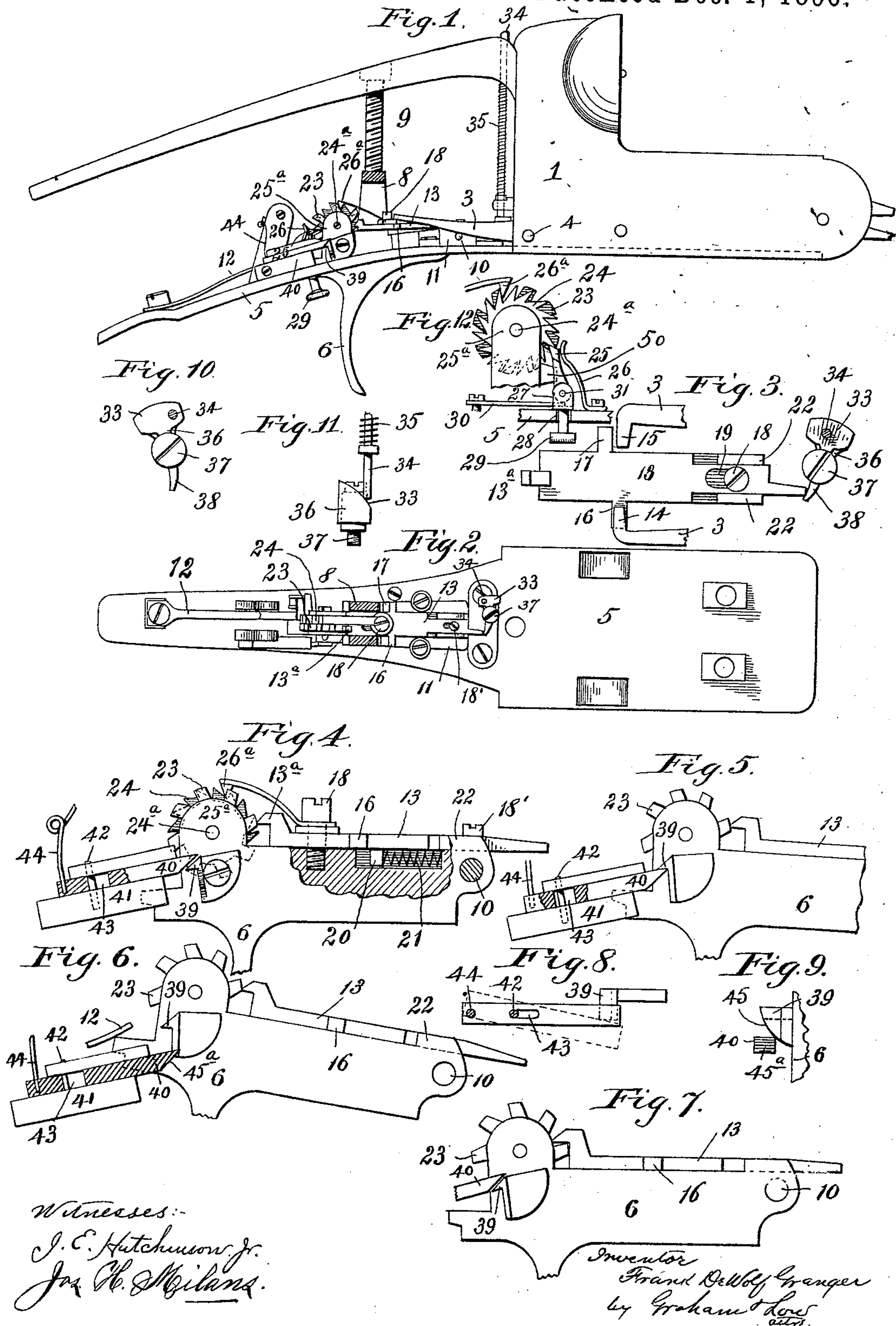


(No Model.)

F. D. GRANGER.  
SINGLE TRIGGER LOCK FOR DOUBLE BARREL GUNS.  
No. 572,480.

Patented Dec. 1, 1896.





# UNITED STATES PATENT OFFICE.

FRANK D. GRANGER, OF NEW YORK, N. Y.

## SINGLE-TRIGGER LOCK FOR DOUBLE-BARREL GUNS.

SPECIFICATION forming part of Letters Patent No. 572,480, dated December 1, 1896.

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*To all whom it may concern:*

Be it known that I, FRANK D. GRANGER, a citizen of the United States of America, residing at New York city, county and State of New York, have invented a certain new and useful Single-Trigger Lock for Firearms, of which the following is a specification.

My invention relates to single-trigger locks for firearms, and especially for double-barreled shotguns, and has for its object to provide a new mechanism through which a single trigger may be employed to fire either of a plurality of barrels and which is characterized by simplicity of construction and directness and accuracy in operation. With such mechanism I may and preferably do combine and employ devices whereby jar-off—that is to say, the unintentional discharge of the second barrel when the first is fired—is effectually prevented.

With such objects in view the invention consists in the parts and combinations thereof hereinafter set forth and claimed.

In order to make the invention more clearly understood, I have shown in the accompanying drawings means for carrying it into practical effect without limiting it in its useful applications to the particular constructions which, for the sake of illustration, I have delineated.

In said drawings, Figure 1 is a side view, partly in section, of a gun-lock embodying my invention. Fig. 2 is a plan view, partly in section, of the same. Fig. 3 is a plan view of the sear-plate on a larger scale. Figs. 4 to 7 are side views of the principal parts of the mechanism, showing it in different positions. Figs. 8 and 9 are plan and front views of a means for preventing jar-off. Fig. 10 is a plan view of the indicator-actuating means, showing it in a different position from that illustrated in Fig. 3. Fig. 11 is a side view of the same. Fig. 12 is a side view of the ratchet and actuating-pawl.

Referring to the drawings, in which is illustrated only so much of a gun as is necessary to an understanding of my invention, 1 indicates the breech or frame, containing the hammers, their actuating-springs, and cocking mechanism, of any usual or improved character, not necessary to be further described. The sears, by which the hammers are held

cocked in a well-known manner and by the movement of which the hammers may be released and the gun discharged, are shown at 3 pivoted within the frame on a transverse pin or pins 4.

5 is the lock-plate, adapted to be attached to the frame and carrying the trigger 6 and sear-operating mechanism hereinafter described.

8 is the bridge, attached to or formed with the lock-plate and connected with the frame by a screw 9.

The trigger 6 is pivoted at 10 in a bracket 11, attached to the lock-plate, and is controlled by a spring 12 in the usual manner.

The sear-operating plate or device is shown at 13. It is movably mounted on the trigger, and the plate and rear ends of the sears are so shaped relative to each other that when the plate is in one position the movement of the trigger will cause the plate to engage one sear and when it is in another position it will be caused to engage another sear. Various shapes of the sears and plate will effect this result. I prefer but do not limit myself to that shown, in which the sears are formed with inwardly-extending arms 14 15 and the plate with lateral projections 16 17.

The movement of the sear-plate is most conveniently a direct longitudinal reciprocation, to which end it is confined upon the trigger by a guide screw or screws 18 18', passing through a slot 19 in the plate, and is further guided by flanges 22 on the trigger. The plate 13 is normally pressed in one direction, for instance, backward, by a spring 21, contained in the trigger and engaging a projection 20 on the plate, Fig. 4. In the other direction the plate may be actuated by any suitable device, but my invention comprises a new means for this purpose.

23 is a star or toothed wheel mounted on an axis 24<sup>a</sup> in ears 25<sup>a</sup>, formed on the trigger, and situated in proximity to the plate 13. The teeth of the wheel 23 are shaped in any desired manner to engage and thrust forward the plate 13 into the position shown in Fig. 4, and are so placed that when a tooth is not opposite or in engagement with the plate the latter is received between the teeth as it is pressed backward by the spring 21, and thus permitted to assume its other position. (Seen



in Fig. 7.) The wheel may engage the end of the plate 13 directly, but preferably a tooth 13<sup>a</sup> thereon. The wheel 23 may be actuated in any convenient manner, which in the construction shown is effected by a fixed pawl or pawls acting on the wheel as the latter is moved bodily by the oscillation of the trigger. I prefer, instead of arranging the pawl to act directly on the toothed wheel, to form or attach a special ratchet-wheel 24 with or to the toothed wheel or its axis, with the teeth of which ratchet such pawl may engage. The pawl is shown at 25, mounted on the lock-plate and controlled by a spring 26, Fig. 12. When the trigger is pulled, one of the projections 16 17 will be under and operate its sear. As the wheel 23 is at the same time carried bodily upward relative to the pawl 25 the latter will take a new tooth on the ratchet, and as the trigger is returned to place by the spring 12 will turn the ratchet and toothed wheel one space and change the position of the sear-plate. The ratchet is caught and held in place, so that it will not turn while the trigger is being pulled, by a retaining pawl or dog 26<sup>a</sup> of any suitable kind. It being necessary to provide means for actuating the sear-plate 13 independently of the trigger, so as to allow the same sear to be successively operated and the same barrel to be successively discharged, I have adapted the pawl 25 to perform this function by arranging it to be moved relative to the ratchet 24. To this end the lower portion of the pawl is constructed as a slide 27, movable inward and outward in a bearing 28 in or on the lock-plate and having an external handle or button 29, by which it may be operated, Fig. 12. This slide is controlled and normally pressed downward or outward by a spring 30. The upper portion of the pawl or pawl proper is pivoted at 31 to said slide and is pressed toward the ratchet by the spring 26. By pressing upward on the button 29 the ratchet and toothed wheel will be moved one space and the sear-plate shifted from that position in which it will discharge the right barrel to the position in which it will discharge the left, or vice versa.

While an indicating device to show which barrel the parts are in position to fire is not necessary to the use of the invention thus far described, it is convenient, and I have devised such an indicator especially adapted for coöperation with my new sear-plate.

33 is a cam-surface arranged to move or to be moved with or by the sear-plate 13, upon which surface rests an indicator-pin 34, mounted to slide vertically in the gun, the upper end of which pin projects from or may be visible above the breech and which is pressed downward by a spring 35. When this pin is most elevated by the position of the cam-surface 33 and accompanying position of the sear-plate, it will show that the parts are in place to fire a certain barrel, say the left, and when by a change of position of

the sear-plate and cam-surface 33 the spring 35 is allowed to depress the indicator-pin, the latter will show that the right barrel is about to be discharged. So long as the change of position of the said cam-surface accompanies that of the sear-plate the particular means for actuating the former are not of the essence of my invention, which includes any suitable means for that purpose. In the construction illustrated the cam-surface 33 is formed on a lever 36, pivoted at 37 on the lock-plate, and having an arm 38, which bears against the sear-plate 13 and is pressed against the same by the downward pressure of the indicator-pin on the cam-surface. The forward movement of the sear-plate thus elevates the indicator-pin above the breech, while its rearward movement permits it to be retracted within the same.

In the use of single trigger-guns a practical difficulty has been met with in the so-called "jar-off" (unintentional discharge) of the second barrel upon the firing of the first. The cause of jar-off has not been fully understood. According to my observation and experiment it appears that upon the discharge of the first barrel the recoil of the gun will move the trigger backward from the finger and relieve the trigger of the finger-pressure, whereupon the trigger will return to its normal position, at the same time shifting the parts into position for the discharge of the second barrel. Following this first recoil is a secondary recoil or reaction of the gun forward from the shoulder which, before the finger can be removed from the trigger, will bring a second and hard pressure and pull of the finger upon the trigger sufficient to cause a secondary movement of the same and the discharge of the second barrel. In practice the above series of movements or operations are involuntary and so rapid that the reports of the two barrels are almost simultaneous. This further feature of my invention consists in means whereby the secondary movement of the trigger will be without effect or will only serve to complete that change of position of the parts which is a necessary preliminary to the firing of the second barrel, leaving for a further trigger-movement the actual discharge of such barrel. This feature of invention consists in means whereby the trigger or toothed wheel or sear-actuating device is or are prevented either from moving sufficiently far in discharging the gun for the return of the trigger at the time of the first recoil to effect the aforesaid change in the position of the parts or to prevent any return of the trigger until after the secondary pull of the same.

Referring to the drawings, and especially to Figs. 4 to 9, 39 is a projection, hook, or stop formed with or attached to and carried by the trigger. 40 is a coöperating projection or dog mounted on the lock-plate in a bearing-bracket 41 or otherwise and situated in the path which the hook 39 follows when the



trigger is pulled. One or both of said projections or stops is or are movable, so that as the trigger is pulled one may pass the other. For instance, the dog 40 may slide in the bearing 41, in which it is held and guided by a pin 42, fixed in the bearing and passing through a slot 43 in the dog, Fig. 8, being normally pressed toward the hook 39 by a spring 44. One or both of said engaging parts is or are formed with a beveled surface or surfaces 45<sup>a</sup>, so that as the trigger rises the movable part (in this instance the dog 40) may be thrust out of the path of the other part by a cam action. The dog is arranged at such height above the hook that just before or as the trigger has moved far enough to discharge one barrel the hook will have passed the dog and the latter will have been thrust under it by the spring 44, Fig. 5. The trigger will by this means be held from return or downward movement as the recoil takes place, and consequently the pawl 25 cannot shift the toothed wheel or sear-plate. When the forward reaction succeeding the recoil occurs, the secondary pressure of the finger on the trigger gives the latter a further upward movement, which now causes the pawl 25 to take a new notch on the ratchet, so that when the trigger is finally released and the toothed wheel descends the periphery of the ratchet will be arrested by the pawl and a turn of one step effected. In order that the hook 39 may now repass the dog 40, the former is made with an outer incline or bevel 45, which is carried above the dog by the complete movement of the trigger, Fig. 9. This allows the dog to be thrust forward by the spring 44 under the incline 45. When the trigger now descends, said incline will engage the dog and throw it out of line with the hook 39, (shown in dotted lines in Fig. 8,) allowing the latter to pass below the dog to its normal position. When the dog is thrown out, as above described, it turns freely on the pin 42, and the spring 44 serves not only to slide the dog forward, but to return its forward end inward into line with and above the hook.

In giving the trigger sufficient movement to carry the incline 45 above the dog 40 it may be necessary to guard against the pawl 25 taking more than one tooth on the ratchet. This may be done by providing the pawl with a stop or guard, such as projection 50, Fig. 12, on the trigger, adapted to keep the pawl out of contact with the ratchet when the latter is elevated as much as the space between two teeth.

I also obviate jar-off (retaining at the same time a short trigger-pull) by arranging the ratchet-teeth relative to those on the toothed wheel and to the throw of the trigger, so that the ratchet must act twice against the pawl 25 in order to shift the sear-plate. Thus on the first trigger-pull, which produces the discharge, the pawl 25 will take one notch. On the recoil the trigger will be released and

the toothed wheel turned one space. On the forward reaction the trigger will receive its second (involuntary and unconscious) pull, and the pawl 25 will take another notch. On the final return of the trigger the toothed wheel will be moved another space and the sear-plate completely shifted ready for firing the second barrel.

I also obviate jar-off by making the movement of the trigger necessary for firing materially less than the movement required to cause the pawl 25 to take a new notch on the ratchet, so that only by the secondary pull of the trigger will the next tooth of the ratchet be carried above the pawl. The sear-plate will consequently be shifted only after the recoil and secondary pull, and the second barrel cannot be unintentionally discharged.

My new lock, hereinbefore described, is so compact as to its mechanism that the stock does not require to be cut away and weakened, as with many other single-trigger constructions, but can be used without being practically changed from the form in which it would be employed with ordinary double-trigger locks.

What is claimed is—

1. In a gun-lock the combination with the trigger, and a plurality of sears, of a sliding sear-plate connected with the trigger, and means for shifting the same connected with and operated by the movement of the trigger.

2. The combination with a trigger, and a plurality of sears, of a sliding sear-plate on the trigger, a toothed wheel on the trigger engaging the plate, and means for turning the wheel.

3. The combination with a trigger, and a plurality of sears, of a sliding sear-plate on the trigger, a toothed wheel on the trigger engaging the plate, and a pawl normally stationary relative to the trigger for actuating the wheel.

4. The combination with a trigger, and a plurality of sears having lateral arms, of a sear-plate having lateral projections and sliding on the trigger, a toothed wheel on the trigger engaging the plate, and a pawl normally stationary relative to the trigger for actuating the wheel.

5. The combination, with a horizontally-sliding sear-plate, of an oscillating cam-surface, an indicator operated by said surface, and connections between said surface and the sear-plate whereby the former is shifted with the latter.

6. The combination, with a movable sear-plate, and an indicator, of a part having a cam-surface and moving transversely to the indicator and engaging the same, and a pivoted lever connected with said part and operated by the sear-plate.

7. The combination, of a trigger, a plurality of sears, mechanism whereby the latter are separately actuated by the trigger, a part having a cam-surface, an indicator operated by the same, a lever oscillating transversely



to the indicator and connected with said part, and means whereby said mechanism actuates the lever.

8. The combination, of a trigger, a plurality 5 of sears, mechanism whereby the latter are separately actuated by the trigger, a relatively stationary pawl engaging upon the return of the trigger a part of said mechanism carried by the trigger to shift said mechanism 10 from one sear to the other, and means for limiting the return of the trigger and preventing jar-off.

9. The combination, of a trigger, a plurality 15 of sears, mechanism whereby the latter are separately actuated by the trigger, a relatively stationary pawl engaging upon the return of the trigger a part of said mechanism carried by the trigger to shift said mechanism 20 from one sear to the other, and the dog 40 and hook 39 for preventing the return, downward or forward movement of the trigger when the recoil takes place.

10. The combination of a trigger, a plurality 25 of sears, mechanism whereby the latter are separately actuated by the trigger, a relatively stationary pawl engaging upon the return of the trigger a part of said mechanism carried by the trigger to shift said mechanism 30 from one sear to the other, and a dog, stop or catch which controls the trigger at the time of recoil and prevents the return, downward or forward movement of the same.

11. The combination of a trigger, a plurality 35 of sears, mechanism whereby the latter are separately actuated by the trigger, a relatively stationary pawl engaging upon the return of the trigger a part of said mechanism carried by the trigger to shift said mechanism

ism from one sear to the other, and means 40 for preventing jar-off consisting of stops or catches such as a hook and a dog, one of which is movable, situated respectively on the trigger and fixed part of the lock, a spring controlling the movable stop, and means for 45 throwing out one of said stops to permit the return, downward or forward movement of the trigger after a complete pull.

12. The combination with a trigger, of a hook on the same, a sliding and oscillating 50 dog for engaging the hook to control the trigger, a spring controlling the dog, and means on the trigger for throwing the dog out of line with the hook to permit the return of the trigger.

13. In a single-trigger lock, means for preventing jar-off, consisting of the combination 55 of a plurality of sears, mechanism for actuating said sears upon the backward movement or pull of the trigger, and a relatively stationary device or pawl engaging a part of 60 said mechanism only after the recoil of the gun, to shift the said mechanism to another sear, substantially as set forth.

14. In a single-trigger lock means for preventing jar-off consisting of a trigger and 65 sears, a sear-plate adapted to be shifted from one sear to another, a toothed wheel for shifting said plate, and a pawl arranged to take a new tooth on said wheel after the recoil and 70 on the secondary pull of the trigger.

In witness whereof I have hereunto signed my name in the presence of two witnesses.

FRANK D. GRANGER.

Witnesses:

H. N. LOW,

S. G. HOPKINS.