

R. E. JEFFERY.  
AUTOMATIC GUN.  
APPLICATION FILED JULY 14, 1908.

929,596.

Patented July 27, 1909.  
3 SHEETS—SHEET 1.

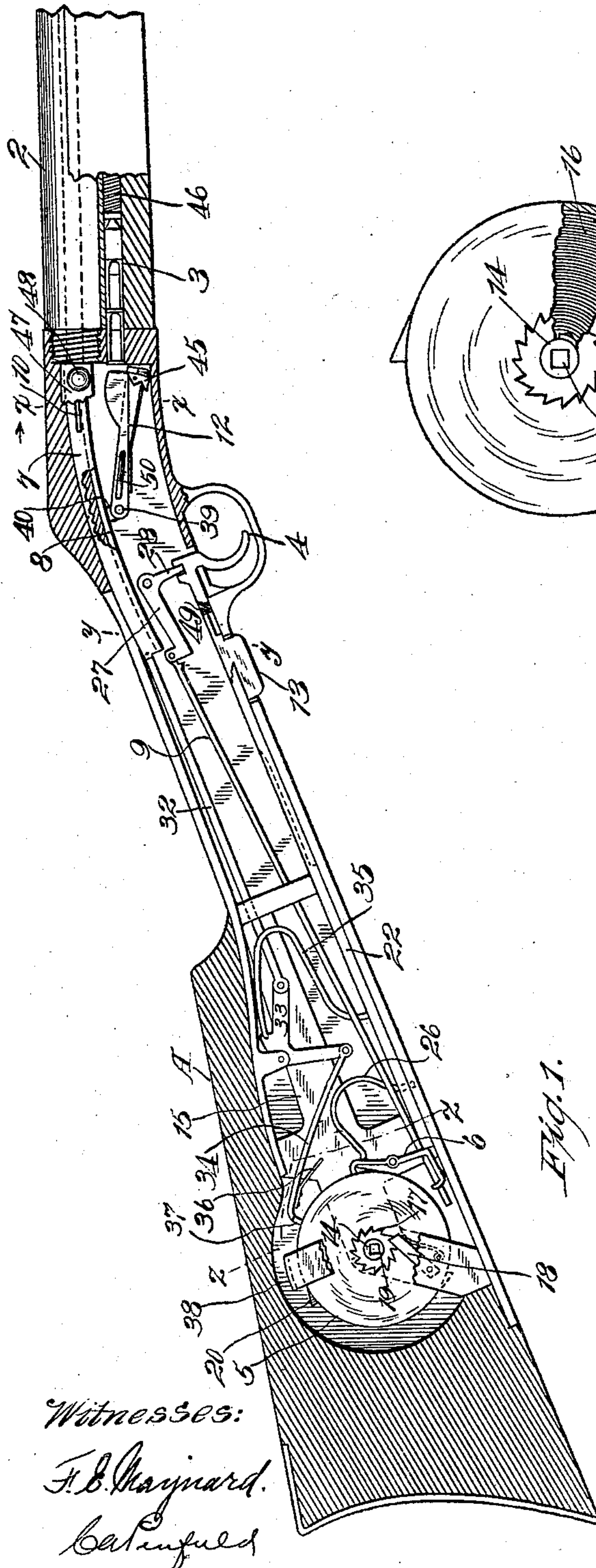


Fig. 1.

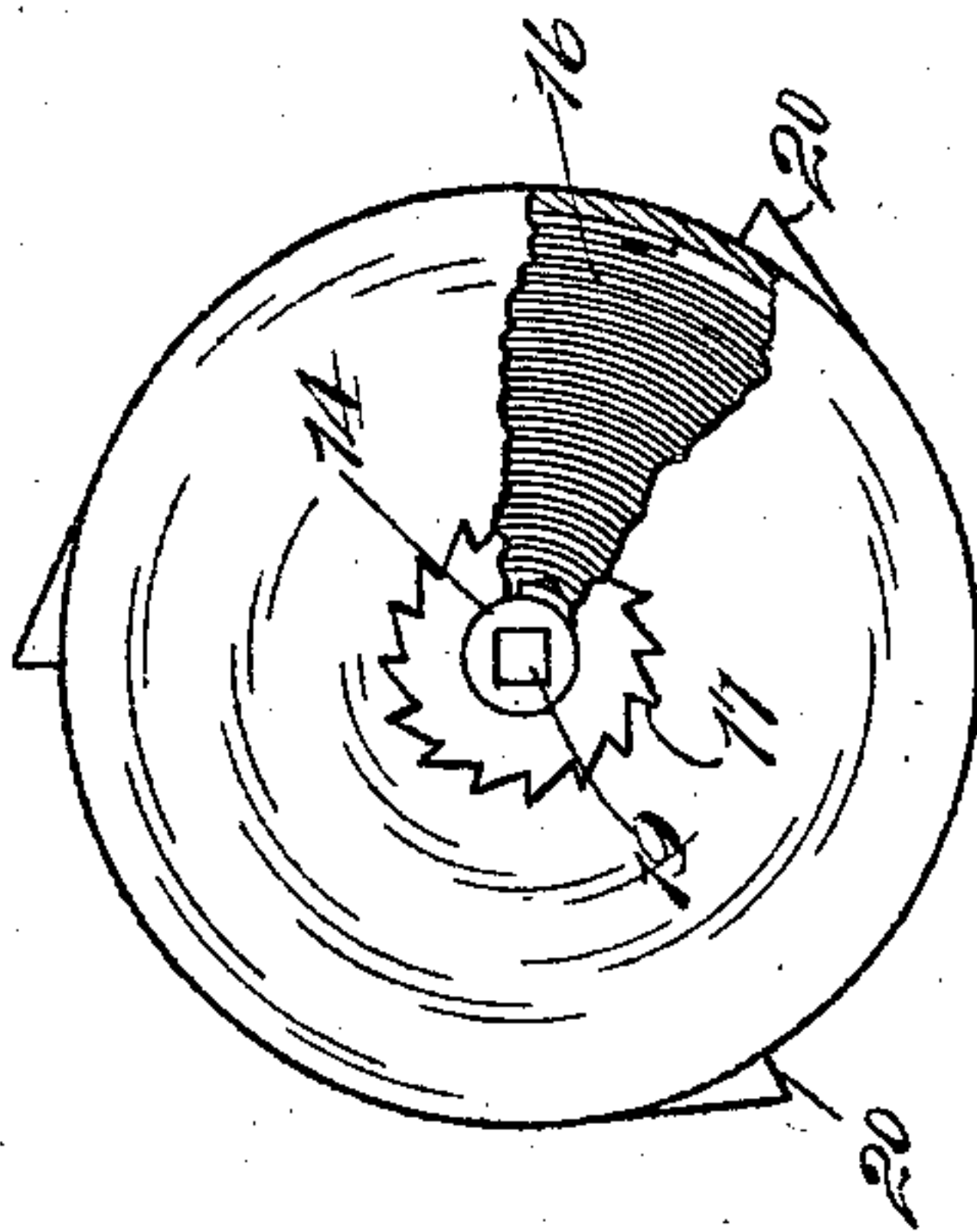


Fig. 3.

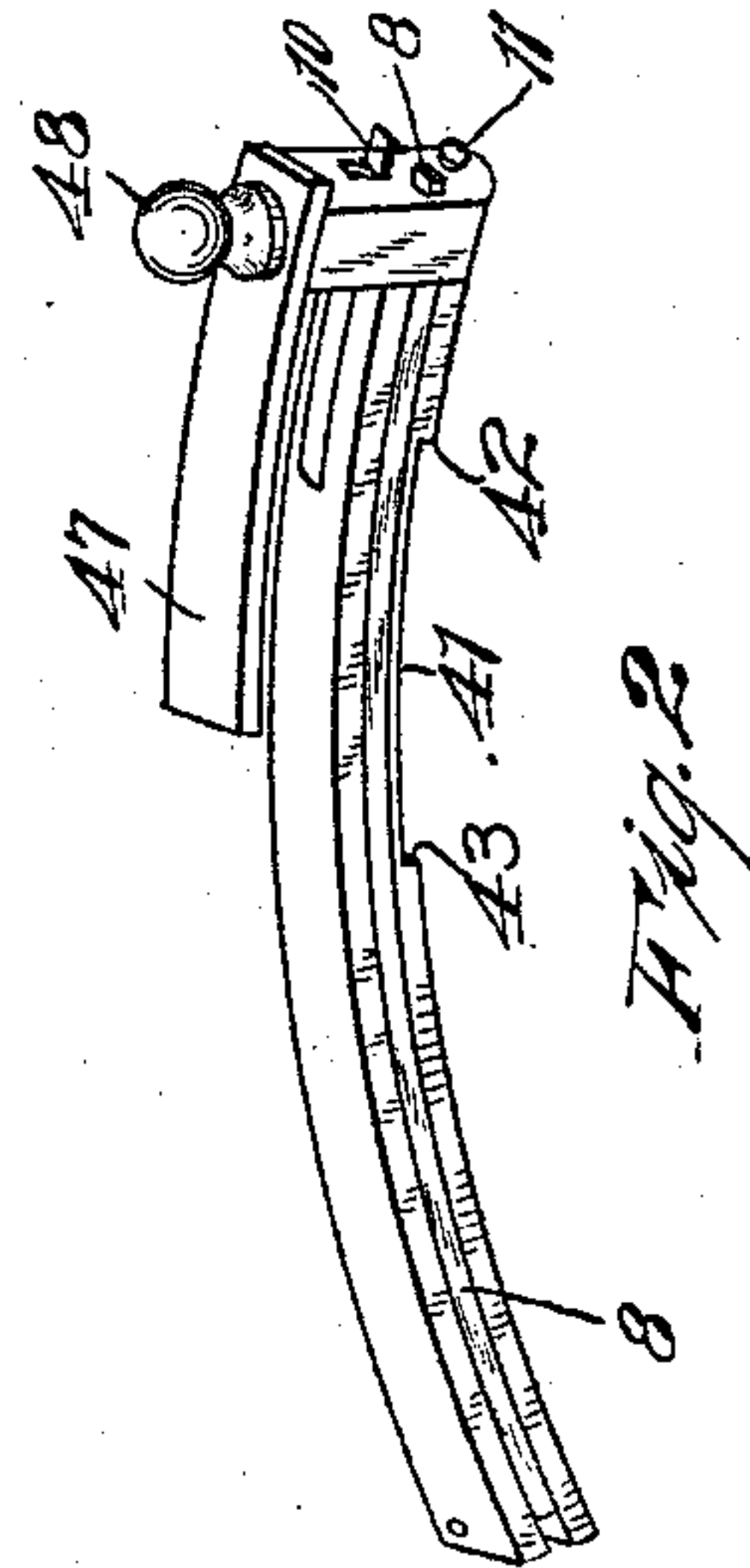


Fig. 2.

Witnesses:  
F. B. Maynard.  
C. B. Maynard.

Inventor:  
Richard E. Jeffery;  
By Geo. H. Strong,  
Att'y.

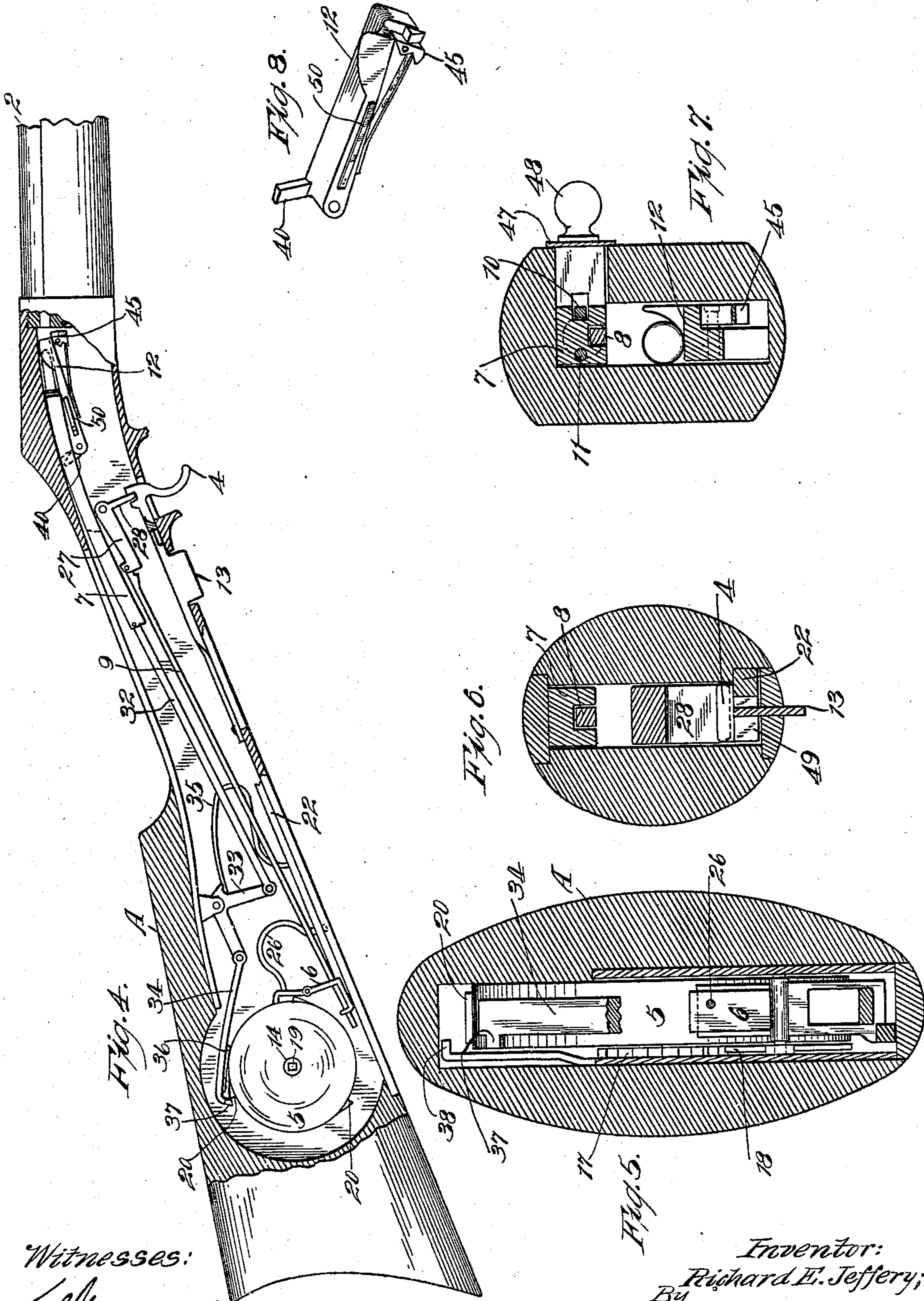
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Witnesses:

G. E. Maynard.  
C. E. Maynard.

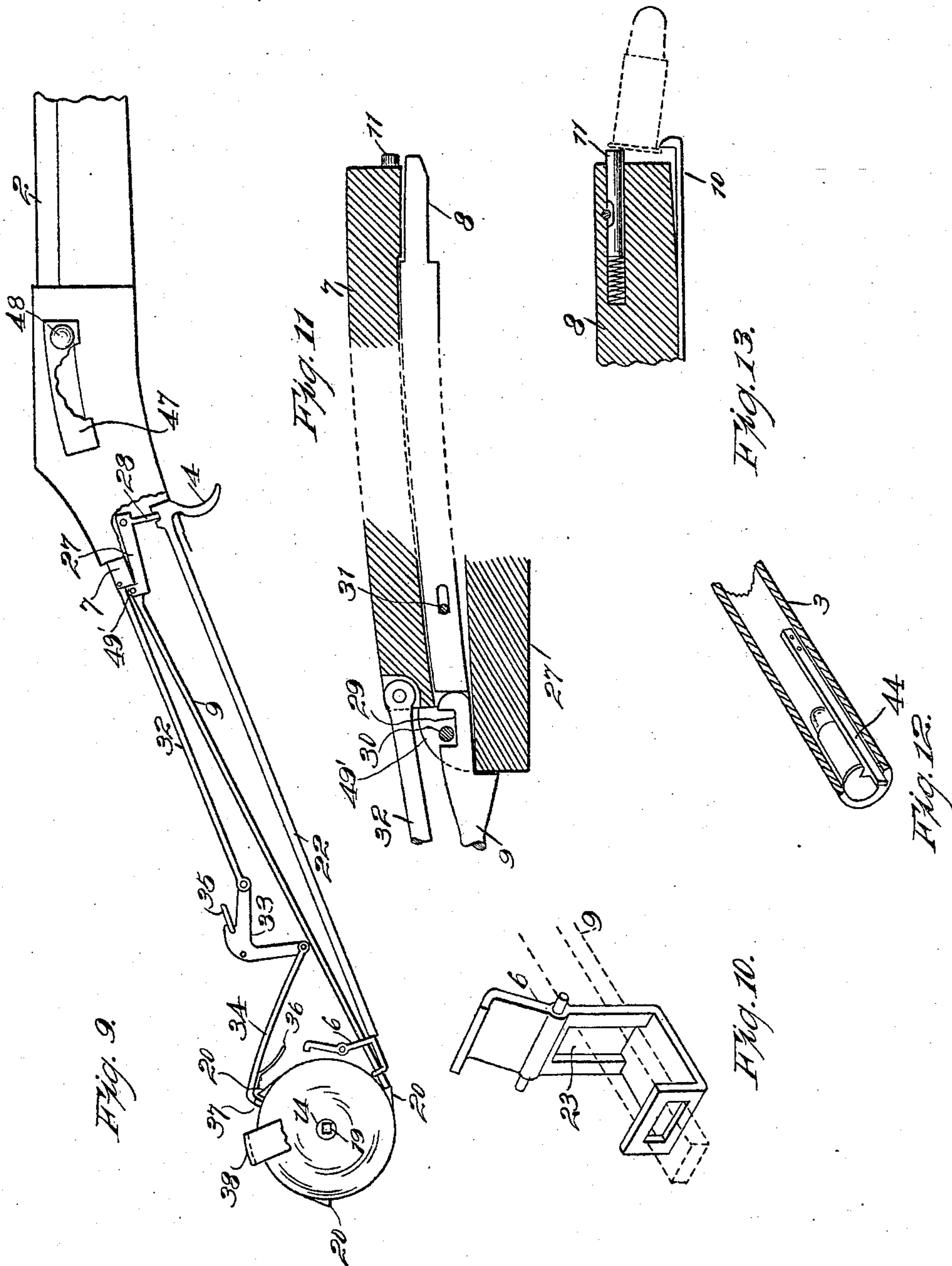
Inventor:  
Richard E. Jeffery;  
By Geo. H. Strong.  
Atty



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3 SHEETS—SHEET 3.



Witnesses:  
J. E. Maynard.  
C. R. Ruffel.

Inventor:  
Richard E. Jeffery;  
By Geo. H. Strong  
Att'y.



# UNITED STATES PATENT OFFICE.

RICHARD E. JEFFERY, OF PIEDMONT, CALIFORNIA.

## AUTOMATIC GUN.

No. 929,596.

Specification of Letters Patent.

Patented July 27, 1909.

Application filed July 14, 1908. Serial No. 443,410.

*To all whom it may concern:*

Be it known that I, RICHARD E. JEFFERY, a citizen of the United States, residing at Piedmont, in the county of Alameda and State of California, have invented new and useful Improvements in Automatic Guns, of which the following is a specification.

My invention relates to automatic firearms.

The invention is applicable alike to rifles, shot-guns, or other firearms.

All automatic guns of which I have knowledge depend primarily for their action either on the recoil or on the action of the gases generated during discharge. These recoil or gas-actuated guns are open to various objections, chief among which is that where the automatic feature of the gun depends on recoil, that part of the force of the charge which should go to impelling the projectile is used up in resetting the gun ready for the next shot. Also, the gases are forced back into the breech mechanism, and after a few rounds the gun must be entirely taken apart and cleaned. Furthermore, such guns do not permit the use of cartridges of different length, because in such guns the charge must be carefully regulated so as to produce the right recoil or generate the right compression.

The object of my invention is to overcome these several difficulties, and in short, provide a gun adapted to shoot at least three different lengths of cartridge of the same caliber; also to place the automatic mechanism entirely under the control of the trigger, so that the automatic action will not operate while the explosion is going on, and not until the trigger is released, when it ejects the empty shell and reloads the gun.

The invention also comprehends an automatic safety catch which is put in and out of commission when the hand is placed to pull the trigger, and means are provided whereby the trigger cannot be pulled if the breech-block is not forward and in proper place and locked.

The invention consists of the parts and the construction and combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a section of a gun, with parts in position to fire. Fig. 2 is a perspective of the breech-block. Fig. 3 is an elevation of the hammer, partly in section. Fig. 4 shows

the parts in loading position. Fig. 5 is a section on line  $z-z$  Fig. 1. Fig. 6 is a section on line  $y-y$  Fig. 1. Fig. 7 is a section on line  $x-x$  Fig. 1. Fig. 8 is a perspective of the elevator. Fig. 9 is a diagrammatic view, showing parts in firing position. Fig. 10 is a perspective view of the sear. Fig. 11 is an enlarged view of the breech-block and co-acting members. Fig. 12 is a perspective of the magazine latch. Fig. 13 is a detail of the extractor and ejector.

In the embodiment of the invention as actually practiced, I have shown it as applied to a rifle, in which A represents the stock, 2 the barrel, 3 the magazine, 4 the trigger, 5 the hammer, 6 the sear, 7 the breech-block, 8 the firing-pin, 9 the firing-pin extension or coupler, 10 the extractor, 11 the ejector, 12 the cartridge elevator, and 13 the safety catch for the trigger. The relationship of these several devices, and the manner of their coördinate action, will now be described.

The butt of the stock is suitably chambered to accommodate the hammer 5 and the other parts. The hammer 5 is here shown in the form of a hollow rotary member turning on a hub or axle 14 suitably journaled in the metal frame portion 15 of the gun. A coiled spring 16 has one end secured to the hammer member 5 and the other end to the hub 14. The hub carries a ratchet 17 engaged by a spring pawl or click 18 which will allow the hub to turn only in one direction, for the purpose of winding up the spring. The spring is wound up by any suitable means, as, for example, the key inserted into a polygonal opening 19 in the hub; the hammer being held against rotation during winding, and at other times except while firing and resetting the gun, by means of the sear 6 engaging one or the other of the lugs or projections 20 on the hammer. The sear 6 is pivoted in the gun frame, and has its lower end slotted and bent so as loosely to support and carry the lower end of the firing-pin coupler 9. There are preferably three of the projections 20 arranged circumferentially of the hammer 5, and each one of these projections is engaged in succession by the sear; and the latter is so fashioned and disposed that whenever the sear is rocked to release a projection 20 it will carry the lower end of the firing-pin coupler 9 into the path of the next succeeding projection 20, so that the hammer, act-



ing on the impulse of the spring, will strike a blow on the firing-pin coupler 9 and thereby impart, as will shortly be explained, a sharp blow on the end of the firing-pin 8 to cause the latter to discharge the cartridge if the gun is loaded. The sear 6 is operated from the trigger 4, and simultaneously with the pulling of the trigger, the firing-pin coupler 9 which is normally out of the range of action of both the hammer and the firing-pin is lifted into line with the firing-pin, so that the force of the hammer may be transmitted to the firing-pin 8. The trigger 4 is rigid with a long arm or rod 22 arranged inside the gun frame and extending back adjacent to the lower end of the sear 6. The trigger, instead of having a pivoting movement, is pulled back to slide the bar 22, to cause it to push back on the sear and release the latter from the hammer. The trigger is returned to normal initial position by means of a spring 35 and connections hereinafter to be described. As shown in Fig. 10 the lower end of the sear is substantially U-shaped and double-slotted to pass the coupler 9; the front slot 23 being elongated to allow free play for the coupler rod. Thus pulling on the trigger and rocking the sear to release the hammer, lifts the lower end of the coupler 9 and carries it into the path of the next succeeding lug 20. A spring 26 acts on the sear to press the latter normally into the path of a lug 20, so as to hold the hammer under the tension of its spring 16. Just prior to the release of the hammer from the sear, the front end of the firing-pin coupler 9 is carried into line with the firing-pin 8; the breech-block 7 being forward in locked firing position. This lifting of the forward end of the coupler 9 and alining it with the firing-pin is done through the medium of a bell-crank lever 27 fulcrumed at its angle and having one arm 28 engaging a notch in the trigger. The front end of the firing-pin coupler 9 is carried loose by the other arm of the bell-crank 27. As shown in enlarged detail in Fig. 11, the coupler 9 fits in a slot in the end of the lever 27, and the coupler has a notch 29 to accommodate a guide pin 30; this guide pin holding the coupler 9 in place, at the same time allowing a limited lengthwise reciprocating motion of the coupler 9, consistent with the motion of the firing-pin 8, which latter is held in place in a slot in the under side of the breech-block 7 by suitable means, as the guide pins 31.

The breech-block is mounted to slide back and forth in suitable guideways in the breech. Its rear end is pivotally connected with the link 32 which extends back to and connects to one arm of a bell-crank 33 fulcrumed at its angle. The other arm of the bell-crank connects with a pawl 34 which has a hooked end to bear on the periphery

of the hammer 5 and to be engaged at suitable intervals by one or other of the lugs 20, and thereby operate the breech-block for the purpose of ejecting the empty shell and reloading the piece. A stiff spring 35 which is approximately ogee in outline acts on the bell-crank 33 normally to throw the breech-block forward into locked firing position, and at the same time to draw the pawl 34 forward into position to be engaged by the particular lug 20 which is released from the sear when the trigger is pulled. By referring to Fig. 1, it will be seen that if the trigger is pulled and the sear 6 released from its lug 20, assuming the hammer spring 16 to be wound up, this particular lug 20 will catch the hooked end of the pawl 34 and carry the same along with it for a portion of a revolution, thereby rocking the bell-crank 33 and retracting the breech-block. In order to release the pawl 34 from the lug 20 at the proper instant, I provide suitable means, as a small leaf spring 36 on the under side of pawl 34, which will engage the periphery of the hammer and compress the spring 36 as the pawl 34 is drawn rearward, as shown in Fig. 3; the tendency of the spring 36 all the time being, while under compression, to push the pawl 34 radially outward from the hammer and disengage the pawl from the lug 20. This disengagement, however, is prevented until the proper instant by suitable means, as the lateral projections 37 on the pawl 34 traveling underneath the overhanging rigid guard 38. The guard 38 is so positioned with respect to the projection 37, and desired limit of lengthwise movement of pawl 34, that this projection 37 will come underneath the guard 38 before the leaf spring 36 is placed on tension; but the tension of this spring increases as the pawl 34 is drawn to the rearward, and at just the instant the projection 37 rides out from underneath the guard 38, the spring 36 will act to push the pawl 34 radially outward from the hammer, thereby releasing the pawl from the lug 20 and allowing the spring 35 to act to throw the breech-block forward and return the pawl 34 to initial position.

The cartridge elevator 12 is operated automatically by the breech-block. As shown in Fig. 1, this elevator is pivoted in the breech at 39 and has an arm 40 adjacent to its pivot 39 projecting up into a recess 41 in one side of the breech-block 7. The slot 41 is of such length that the breech-block will have a considerable lengthwise movement independent of the pivotal movement of the elevator, which latter is operated to carry a shell up into the breech in line with the bore by the front wall 42 of the recess striking the arm 40 on the rearward movement of the breech-block. Later, when the breech-block is thrown forward under the action



of the spring 35, the rear wall 43 of recess 41 engages the arm 40 and throws the elevator down again into position to receive a cartridge from the magazine 3.

5 The magazine 3 may be of any desired or approved type adapted to contain any number of shells, and which latter are pushed back on to the elevator by spring tension, or any other suitable means. The  
10 shells are normally prevented from entering the chamber in the breech by suitable means, as a laterally acting spring catch 44 which is adapted to engage the rim of a cartridge. This spring catch 44 is operated  
15 to release the shell by means of a pivoted spring-actuated wedge member 45 at the front end of the elevator 12. This wedge member 45, as shown in detail in Fig. 8, is adapted when the elevator is lifted to  
20 carry a cartridge into the breech, to turn on its pivot and ride free backward over the end of the catch 44, Fig. 12; but when the elevator is thrown down again by reason of the end wall 43 of the breech-block hitting the arm 40, the wedge end of the member 45 will ride inside of the catch 44 and push the latter outward, so as to allow a shell which is in the magazine to be pushed  
25 back into the elevator by reason of the tension of the spring 46 in the magazine. The downward inclination of the elevator acts as a brake to the too rapid entry of the fresh shell into the breech, and the size of the releasing wedge 45 is of such small proportions that it quickly releases the catch  
30 44 and allows the latter to swing back on to the cartridge which is being pushed out of the magazine, and thus intercept the rim of the next succeeding cartridge in the magazine; the tension of the spring 46 being  
35 sufficient to insure (and it always has in the actual practice of my invention) the pushing back of the released cartridge into the breech and on to the elevator. When  
40 the breech-block is next retracted, the empty shell in the gun is drawn outward by the spring extractor 10. During the time that the shell is in the barrel, the ejector 11 is under the compression of its spring; but as  
45 soon as the shell is drawn out of the firing chamber so that its front end is no longer supported, the ejector 11 acts expansively to flip the shell outward through an opening in the side of the breech. This opening  
50 is normally closed by a slide 47 having a finger-hold 48 which screws through the slide and into the breech-block. The slide and breech-block move in unison, so that when the breech-block is forward the opening in the breech will be closed. As soon  
55 as the empty shell is ejected, the front wall 42 of slot 41 in the breech-block strikes the arm 40 and thereby carries the cartridge which is on the elevator upward into line  
60 with the bore of the gun. On the forward

movement of the breech-block this fresh cartridge is carried home into the chamber, and the elevator returned to its normal depressed position.

The safety catch 13 projects through a 70 slot in the under side of the grip of the gun-stock and just rearward of the trigger and in suitable position to be engaged and pushed upward by the second finger when in the act of firing. The safety is spring- 75 actuated and engages a shoulder 49 in one side of the trigger, and normally prevents the latter and its rod 22 from being pushed back so as to trip the sear.

The operation of the gun is as follows: 80 The spring 16 of the hammer is wound up; the sear 6 preventing the hammer from turning and the ratchet 17 holding the spring under tension. Assuming a shell to be in the magazine and one to be in the firing 85 chamber, and the breech-block forward in firing position, the gun is discharged by pushing up on the safety 13 and pulling on the trigger. When the trigger is pulled the arm 28 is rocked to cause the lever 27 to lift 90 and aline the front end of the coupler 9 with the firing-pin 8. If for any reason the breech-block is not thrown forward into locked firing position, the hook-shaped end 49' on the lever 27 will not be able to pass up 95 behind the breech-block, and will prevent the trigger from being pulled at all. If the breech-block, however, is forward in operative position the trigger may be pulled, alining the front end of the coupler 9 in the 100 manner described; at the same time the trigger bar 22 will push back on the sear 6, rocking the latter to release the hammer, and carrying the lower end of the coupler into the path of the next succeeding lug 20. The 105 hammer, through this last-mentioned lug 20, acting under the tension of its spring 16, will impart a sharp blow on the coupler 9, and thence to the firing-pin 8 to explode the cartridge. So long as the finger is on the 110 trigger, and the coupler in the path of a lug 20, the breech-block will be forward in normal locked position, and the hammer held against further rotation. The moment, however, that the pressure on the trigger is released, the coupler 9 will drop down, freeing 115 itself from its lug 20, and the hammer will start to turn. The lug 20 which had previously been released by the sear 6 will thereupon catch the pawl 34 and carry the latter 120 rearward with it to retract the breech-block and eject the shell and lift the elevator 12 into loading position. The moment, though, that the lateral projection 37 on the pawl 34 rides out from underneath the guard 38, the 125 leaf spring 36 throws the pawl 34 upward and the spring 35 returns the breech-block into normal forward position and rams a shell home into the chamber, at the same time throwing the cartridge elevator 12 down- 130



ward and taking a fresh shell from the magazine. There are preferably three projections 20 carried by the hammer, and they are so positioned that as the pawl 34 is released from one lug the sear 6 will catch another, and when the sear 6 is released from that lug, by means of the trigger, as previously described, the other lug on the hammer will act on the coupler 9 to discharge the piece.

From the foregoing it will be seen that I do not depend in any measure on kick or recoil to operate my gun. The automatic action is entirely under the control of the operator at all times, and the rapidity of fire simply depends on how fast the trigger is worked. One may pull the trigger and discharge the piece, and so long as the pressure of the finger remains on the trigger the empty shell will remain in the gun; but the instant the pressure is released on the trigger, the mainspring in the hammer will automatically operate the internal mechanism to eject the empty shell and then reload the piece, provided there are any shells in the magazine. All that is necessary is occasionally to wind up the mainspring 16.

It is manifest that various changes in details of construction of the various parts of the operating mechanism may be made without departing from the principle here involved, and I do not wish to be considered as limiting myself to the particular means or arrangement herein shown and described.

For the purpose of holding the elevator 12 in its upper position while the breech-block 7 is propelled forward, any suitable form of brake may be used, and as here shown consists of a simple spring 50 secured to one side of the elevator 12, and projecting therefrom to bear against the inside wall of the breech.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. In a gun, the combination with complementary firing mechanism, and a trigger mechanism, of a spring actuated rotary hammer having a sear adapted to be released by the trigger mechanism.

2. In a gun, the combination of a breech-block, a firing-pin carried by the breech-block, a spring-actuated rotary hammer, a sear, a trigger, and mechanism actuated by the hammer for imparting reciprocable movement to the breech-block.

3. In a gun, the combination of a spring-actuated rotary hammer, a firing-pin coupler normally out of operative position with respect to the hammer, a trigger, a sear, and means operative by the sear for placing the firing-pin coupler in operative position.

4. In a gun, the combination of a spring-actuated rotary hammer, a sliding breech-block, a sliding firing-pin carried by the breech-block, mechanism operated by the

hammer for actuating the breech-block in one direction, means for operating the breech-block in the other direction, a sear, a trigger, and a coupler supported by the sear and operative by the trigger to place the firing-pin in operative position with respect to the hammer.

5. An automatic gun having in combination, a firing mechanism, a trigger mechanism, and an intermediate spring actuated rotary hammer.

6. In an automatic gun, the combination of a slidable breech-block, a firing-pin, a trigger, and spring-actuated mechanism including a spring actuated rotary hammer controlled by the trigger for automatically operating the breech-block and the firing-pin.

7. In an automatic gun, the combination of a slidable breech-block, a firing-pin carried thereby, a cartridge elevator operated by the breech-block, a trigger, and spring-actuated mechanism including a rotary hammer for operating the breech-block and firing-pin.

8. In an automatic gun, the combination of a slidable breech-block, a firing-pin carried thereby, a cartridge elevator operated by the breech-block, a trigger, and spring-actuated mechanism for operating the breech-block and firing-pin, said spring-actuated mechanism including a rotary hammer, and means for connecting the hammer with the slidable breech block.

9. In a gun, the combination of a reciprocating breech-block, a firing-pin carried thereby, a rotary spring-actuated hammer, a sear, a trigger, mechanism actuated by the hammer for retracting the breech-block, means for returning the breech block to closed position, means for holding the breech-block in normal forward position, and a member interposable between the hammer and firing-pin to transmit motion to the firing-pin from the hammer.

10. In a gun, the combination of a reciprocating breech-block, a firing-pin carried thereby, a rotary spring-actuated hammer, a sear, a trigger, mechanism actuated by the hammer for retracting the breech-block, means for returning the breech block to closed position, means for holding the breech-block in normal forward position, and a member interposable between the hammer and firing-pin to transmit motion to the firing-pin from the hammer, said member being partly supported by the sear.

11. In a gun, the combination of a reciprocating breech-block, a firing-pin carried thereby, a rotary spring-actuated hammer, a sear, a trigger, mechanism actuated by the hammer for retracting the breech-block, means for returning the breech block to closed position, means for holding the breech-block in normal forward position, a member interposable between the hammer and firing-pin



to transmit motion to the firing-pin from the hammer, said member being partly supported by the sear, and means operative by the trigger for interposing said member between the hammer and firing-pin.

12. In an automatic gun, the combination of a spring-actuated rotary hammer, a sear, a trigger for operating the sear, a firing-pin, and a firing pin coupler operative on by the hammer.

13. In an automatic gun, the combination of a spring-actuated rotary hammer, a sear, a trigger for operating the sear, a firing-pin, and a coupler operable by the trigger and interposable between the hammer and firing-pin.

14. In an automatic gun, the combination of a spring-actuated rotary hammer, a sear, a trigger for operating the sear, a firing-pin, and a coupler operable by the trigger and interposable between the hammer and firing-pin, said coupler having one end supported by the sear.

15. In an automatic gun, the combination of a spring-actuated rotary hammer, a sear, a trigger for operating the sear, a breech-block, means engageable by the hammer to actuate the breech-block, a firing pin, a firing-pin coupler, and means operable by the trigger for interposing the coupler between the hammer and the firing-pin.

16. In an automatic gun, the combination of a spring-actuated rotary hammer, a sear, a trigger having a sliding action to release the sear, a firing pin, and a firing pin coupler actuated by the hammer when the sear is released.

17. In an automatic gun, the combination of a spring-actuated rotary hammer, a sear, a trigger, a firing-pin, and means cooperating with the trigger for operating the firing-pin on the release of the hammer.

18. In an automatic gun, the combination of a spring-actuated rotary hammer, a sear, a trigger, a firing-pin, means cooperating with the trigger for operating the firing-pin on the release of the hammer, and a self-locking safety catch for the trigger.

19. In an automatic gun, the combination of a spring-actuated rotary hammer having peripheral projections, a pivoted sear engageable with the projections on said hammer, means for maintaining the sear normally in the path of said projections, a trigger for operating the sear, a firing-pin, and means cooperating with the trigger for actuating the firing-pin on the release of the hammer.

20. In an automatic gun, the combination of a spring-actuated rotary hammer having peripheral projections, a pivoted sear engageable with the projections on said hammer, means for maintaining the sear normally in the path of said projections, a trigger for operating the sear, a sliding breech-

block, a firing-pin slidable in the breech-block, means operable by the hammer for actuating the breech-block, means for returning the breech block to normal position and means operated by the trigger for transmitting the force of the blow of the hammer, when the latter is released, to the firing-pin.

21. In an automatic gun, the combination of a spring-actuated rotary hammer having peripheral projections, a pivoted sear engageable with the projections on said hammer, means for maintaining the sear normally in the path of said projections, a trigger for operating the sear, a sliding breech-block, a firing-pin slidable in the breech-block, means operable by the hammer for actuating the breech-block, means for returning the breech block to normal position and means operated by the trigger for transmitting the force of the blow of the hammer, when the latter is released, to the firing-pin, said last-named means including a coupler normally out of engagement with the firing-pin.

22. In an automatic gun, the combination of a spring-actuated rotary hammer having peripheral projections, a pivoted sear engageable with the projections on said hammer, means for maintaining the sear normally in the path of said projections, a trigger for operating the sear, a sliding breech-block, a firing pin slidable in the breech-block, means operable by the hammer for actuating the breech-block, means for returning the breech-block to normal position and means operated by the trigger for transmitting the force of the blow of the hammer, when the latter is released, to the firing-pin, said last-named means including a coupler normally out of engagement with the firing-pin, one end of said coupler being carried by the sear and movable into the range of action of a projection on the hammer when the sear is released.

23. In an automatic gun, the combination of a spring-actuated rotary hammer having peripheral projections, a sear engageable with said projections, a sliding breech-block, a firing-pin carried by the breech-block, means engageable by the projections on the hammer to retract the breech-block, independent means for throwing the breech-block forward, a trigger, and mechanism operative by the trigger for transmitting the action of the hammer to the firing-pin on the release of the sear.

24. In an automatic gun, the combination of a spring-actuated rotary hammer having peripheral projections, a sear engageable with said projections, a sliding breech-block, a firing-pin carried by the breech-block, means engageable by the projections on the hammer to retract the breech-block, independent means for throwing the breech-block forward, a trigger, and mechanism



operative by the trigger for transmitting the action of the hammer to the firing-pin on the release of the sear, said last-mentioned mechanism including a coupler having one end supported by the sear and normally out of the path of action of said projections on the hammer and movable into the path of said projections on the release of the sear.

25. In an automatic gun, the combination of a spring-actuated rotary hammer having peripheral projections, a sear engageable with said projections, a sliding breech-block, a firing-pin carried by the breech-block, means engageable by the projections on the hammer to retract the breech-block, independent means for throwing the breech-block forward, a trigger, and mechanism operative by the trigger for transmitting the action of the hammer to the firing-pin on the release of the sear, said last-mentioned mechanism including a coupler having one end supported by the sear and normally out of the path of action of said projections on the hammer and movable into the path of said projections on the release of the sear, the opposite end of said coupler mounted on a movable part and movable, and said coupler engageable only with the firing-pin when the breech-block is in forward locked position.

26. In an automatic gun, the combination of a spring-actuated rotary hammer having peripheral projections, a spring-actuated sear engageable with said projections, a trigger for operating the sear, a sliding breech-block, a firing-pin carried by the breech-block, mechanism operative by the hammer to retract the breech-block, a spring for returning the breech-block to forward locked position, and a coupler supported in part by the sear and operative by the trigger to transmit action from the hammer to the firing-pin.

27. In an automatic gun, the combination of a spring-actuated rotary hammer having peripheral projections, a spring-actuated sear engageable with said projections, a trigger for operating the sear, a sliding breech-block, a firing-pin carried by the breech-block, mechanism operative by the hammer to retract the breech-block, a spring for returning the breech-block to forward locked position, a coupler supported in part by the sear and operative by the trigger to transmit action from the hammer to the firing-pin, and a safety catch engageable with the trigger.

28. In an automatic gun, the combination of a spring-actuated rotary hammer having peripheral projections, a spring-actuated sear engageable with said projections, a trigger for operating the sear, a sliding breech-block, a firing-pin carried by the breech-block, mechanism operative by the hammer

to retract the breech-block, a spring for returning the breech-block to forward locked position, a coupler supported in part by the sear and operative by the trigger to transmit action from the hammer to the firing-pin, and a safety catch engageable with the trigger, said safety catch comprising a spring member having a portion to extend through the gun grip just behind the trigger.

29. In an automatic gun, the combination of a rotary hammer having peripheral projections, a spring-actuated sear, a trigger, a sliding breech-block, a firing-pin carried by the breech-block, connections with the breech-block including a pawl engageable by the projections on the hammer to retract the breech-block, and a spring to move the breech-block in the opposite direction.

30. In an automatic gun, the combination of a spring-actuated rotary hammer having peripheral projections, a sear, a trigger, a sliding breech-block, a sliding firing-pin in the breech-block, coupling means operative by the trigger and interposable between the firing-pin and hammer to transmit the action of the hammer to the firing-pin, means for retracting the breech-block, said means including a bell-crank lever, connections between the bell-crank and the breech-block, and a pawl engageable with and disengageable from the projections on the hammer for rocking the bell-crank, and means independent of the hammer for moving the breech-block in the opposite direction.

31. In an automatic gun, the combination of a rotary spring-actuated hammer having peripheral projections, a spring-actuated sear, a breech-block, means for releasing the sear, and means for retracting the breech-block, said last-named means including a bell-crank having one arm connected with the breech-block and the other arm provided with a pawl engageable with and disengageable from the projections on the hammer to rock the bell-crank in one direction, and means for rocking the bell-crank in the opposite direction.

32. In an automatic gun, the combination of a rotary spring-actuated hammer having peripheral projections, a spring-actuated sear, a breech-block, means for releasing the sear, means for retracting the breech-block, said last-named means including a bell-crank having one arm connected with the breech-block and the other arm provided with a pawl engageable with and disengageable from the projections on the hammer to rock the bell-crank in one direction, and means for rocking the bell-crank in the opposite direction, and means independent of the hammer for insuring the disengagement of said pawl from said projections.

33. In an automatic gun, the combination



of a rotary spring-actuated hammer having peripheral projections, a spring-actuated sear, a breech-block, means for releasing the sear, means for retracting the breech-block, 5 said last-named means including a bell-crank having one arm connected with the breech-block and the other arm provided with a pawl engageable with and disengageable from the projections on the hammer to rock 10 the bell-crank in one direction, and means for rocking the bell-crank in the opposite direction, and means independent of the hammer for insuring the disengagement of said pawl from said projections, said last- 15 named means including a guard acting during a portion of the travel of the pawl to hold the latter to the hammer, and a spring on the pawl acting to move the pawl outward radially of the hammer.

20 34. In an automatic gun, the combination of a breech block, a rotary hammer having peripheral projections, a spring-actuated pawl engageable with said projections, a suitably supported firing-pin, a trigger, and 25 means partly supported by the sear for imparting the action of the hammer to said firing-pin.

35. In an automatic gun, the combination of a breech block, a spring-actuated rotary 30 hammer having peripheral projections, a spring-actuated sear engageable with said projections, a trigger having a sliding part engageable with the sear to rock the latter, a firing-pin, a coupler normally disengaged 35 from the firing-pin, and means operative by the trigger for alining the coupler and firing-pin and for bringing the coupler into the range of action of a projection on the hammer when the sear is released.

40 36. In an automatic gun, the combination of a breech block, a spring-actuated rotary hammer having peripheral projections, a spring-actuated sear engageable with said 45 projections, a trigger having a sliding part engageable with the sear to rock the latter, a firing-pin, a coupler normally disengaged from the firing-pin, and means operative by the trigger for alining the coupler and 50 firing-pin and for bringing the coupler into the range of action of a projection on the hammer when the sear is released, said coupler being supported at one end by, and having a limited movement in unison with, the sear.

55 37. In an automatic gun, the combination of a breech block, a spring-actuated rotary hammer having peripheral projections, a spring-actuated sear engageable with said 60 projections, a trigger having a sliding part engageable with the sear to rock the latter, a firing-pin, a coupler normally disengaged from the firing-pin, and means operative by the trigger for alining the coupler and firing-pin and for bringing the coupler into

the range of action of a projection on the 65 hammer when the sear is released, said coupler being supported at one end by, and having a limited movement in unison with, the sear, the opposite end of the coupler being carried by a bell-crank support engageable 70 by the trigger.

38. In an automatic gun, the combination of a breech block, a spring-actuated rotary hammer having peripheral projections, a spring-actuated sear engageable with said 75 projections, a trigger having a sliding part engageable with the sear to rock the latter, a firing-pin, a coupler normally disengaged from the firing-pin, means operative by the trigger for alining the coupler and firing- 80 pin and for bringing the coupler into the range of action of a projection on the hammer when the sear is released, said coupler being supported at one end by, and having a limited movement in unison with, the sear, 85 the opposite end of the coupler being carried by a bell-crank support engageable by the trigger, and a spring safety for the trigger.

39. In an automatic gun, the combination 90 of a sliding breech-block, a firing-pin carried thereby, a bell-crank having a shoulder to engage behind the firing-pin when the breech-block is in forward position, a firing-pin coupler carried by said bell-crank, a 95 trigger for operating said bell-crank, and mechanism operated by the trigger for transmitting the blow of the hammer to the firing-pin to discharge the piece.

40. In a gun, the combination with firing 100 mechanism including a firing-pin, of a spring-actuated rotary hammer, and means for operating the hammer to deliver intermittently a succession of blows on the firing-pin while the hammer travels in the same 105 direction and without reverse movement during the intermissions of hitting the firing-pin.

41. In an automatic gun, the combination of a rotary hammer, spring winding mech- 110 anism for placing the hammer on tension, a sear, a trigger for operating the same, firing mechanism and loading mechanism, and means for discharging the piece when the trigger is pulled and for reloading the 115 piece when the trigger is released.

42. In an automatic gun, the combination of a rotary hammer, spring winding mechanism for placing the hammer on tension, said hammer capable of delivering a succes- 120 sion of impulse movements in the same direction without rewinding, means for controlling the said impulse movements of said hammer, and firing mechanism operated by the hammer during said impulse movements. 125

43. In an automatic gun, the combination of a rotary hammer, spring winding mechanism for placing the hammer on tension,



said hammer capable of delivering a succession of impulse movements in the same direction without rewinding, means for controlling the said impulse movements of said  
5 hammer, firing mechanism operated by the hammer during said impulse movements, and reloading mechanism alternating in action with the firing mechanism and also operable by said hammer.

In testimony whereof I have hereunto 10  
set my hand in presence of two subscribing witnesses.

RICHARD E. JEFFERY.

Witnesses:

CHARLES A. PENFIELD,  
CHARLES EDELMAN.