

No. 794,852.

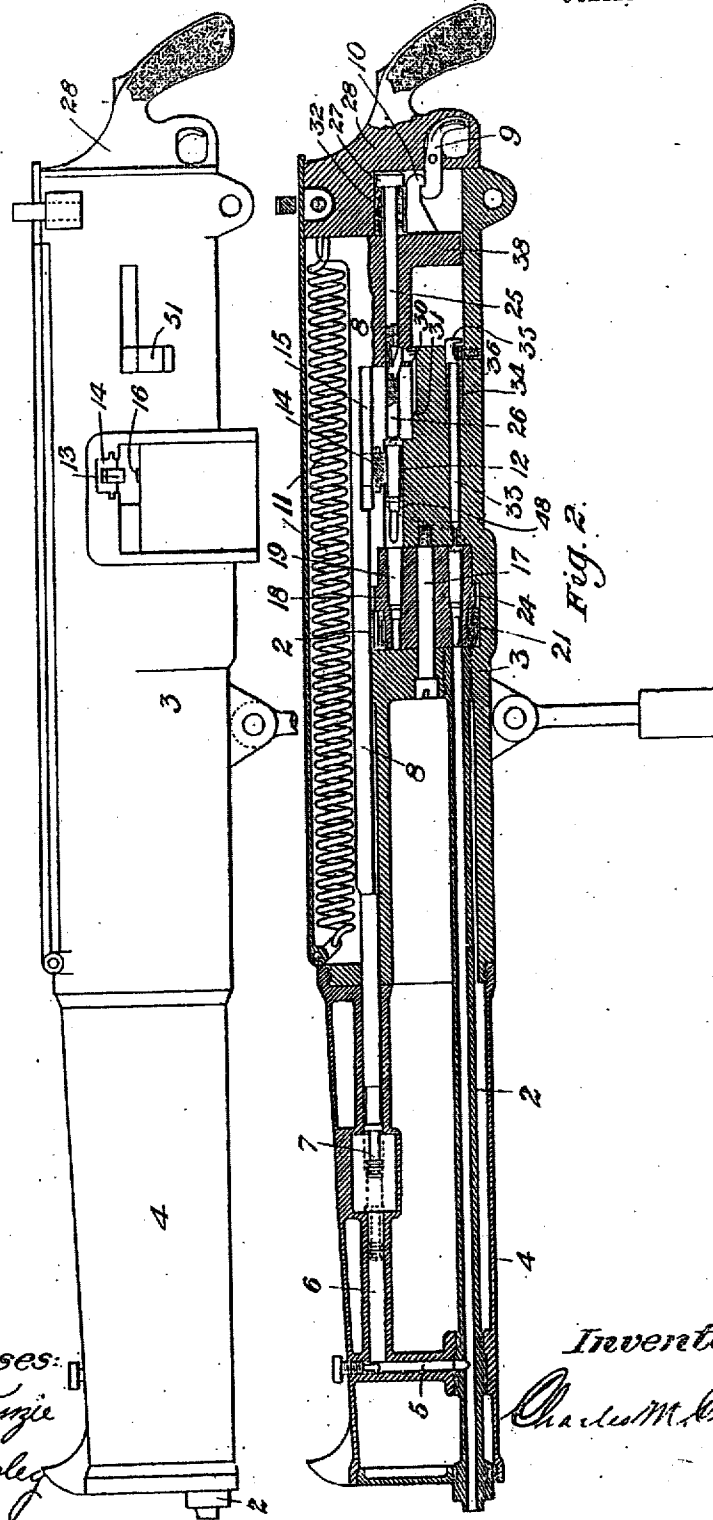
PATENTED JULY 18, 1905.

C. M. CLARKE.
RAPID FIRE GUN.

APPLICATION FILED NOV. 20, 1903.

5 SHEETS—SHEET 1.

Fig. 1.



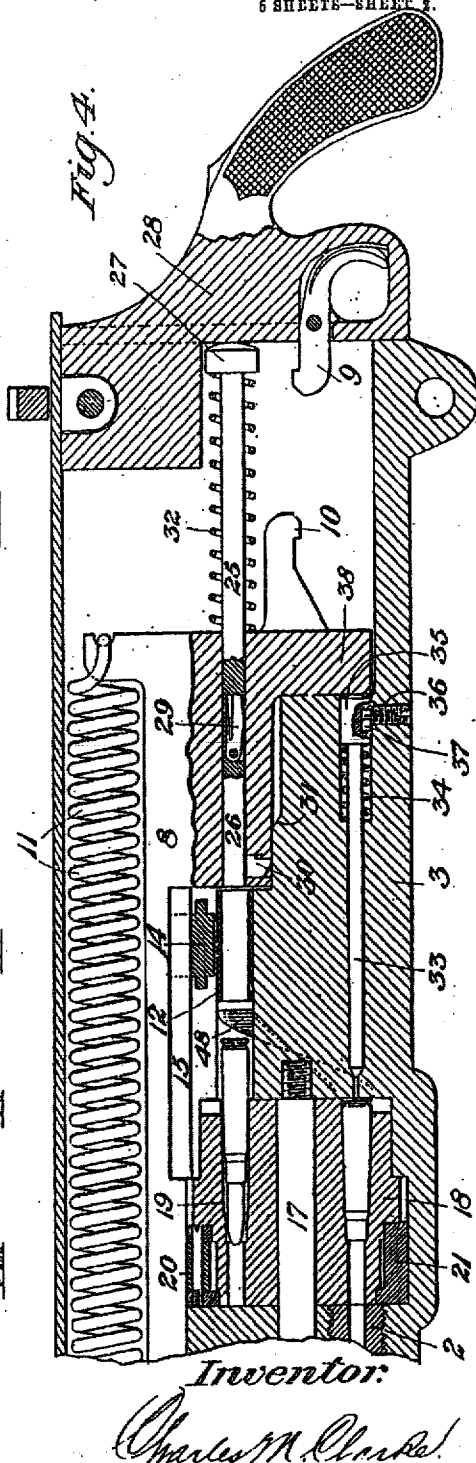
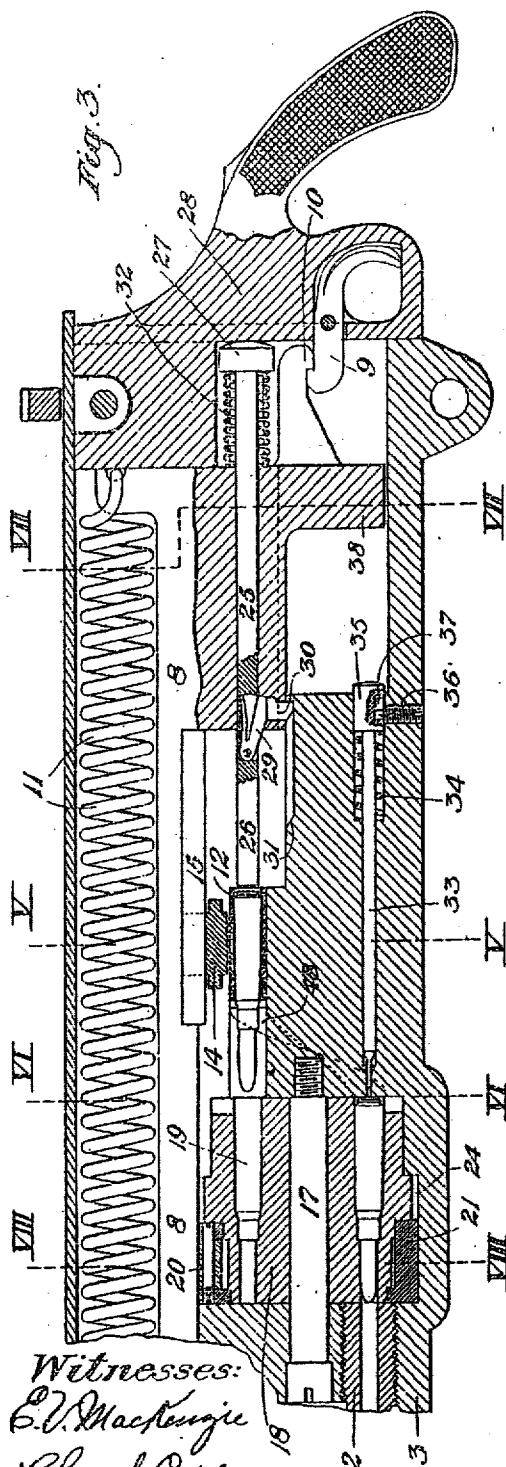
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APPLICATION FILED NOV. 28, 1903.

6 SHEETS—SHEET 2.



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6 SHEETS—SHEET 3.

Fig. 5.

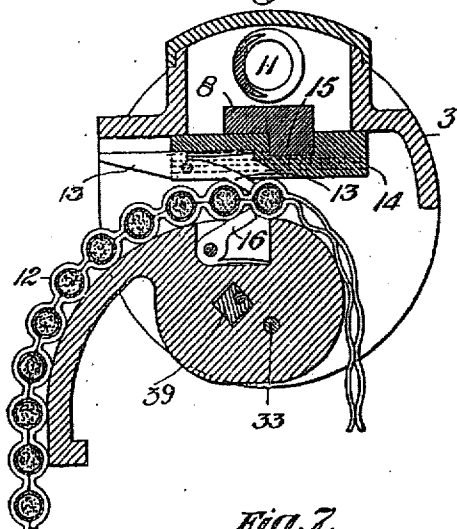


Fig. 6.

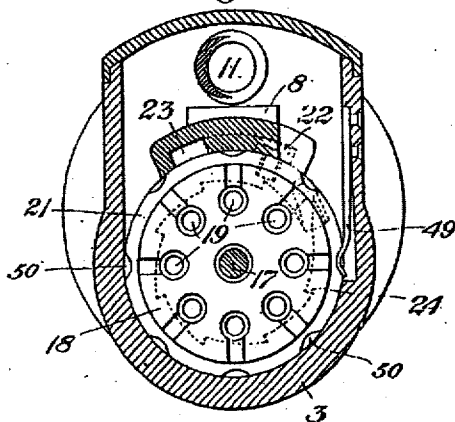


Fig. 7.

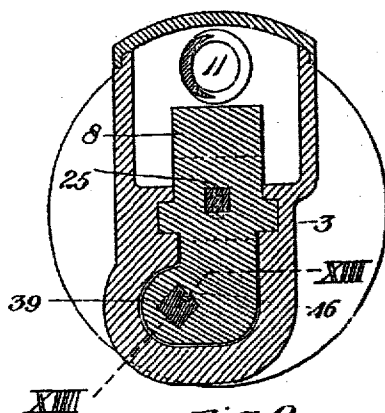


Fig. 8.

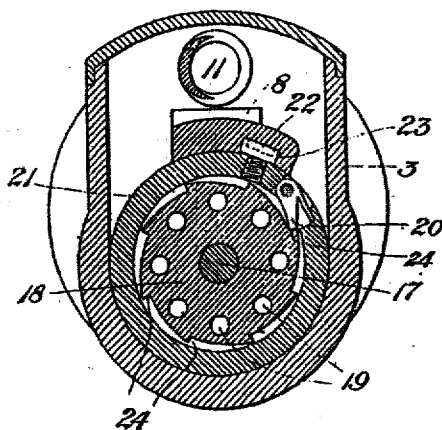


Fig. 9.

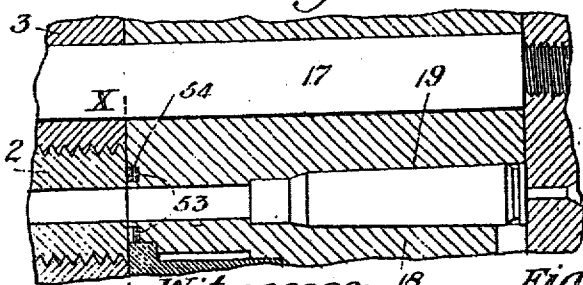
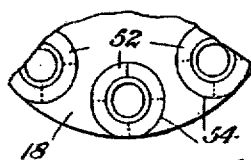
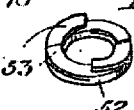


Fig. 10.



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Fig. 11.



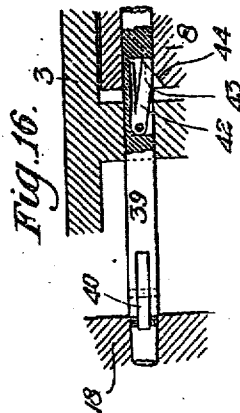
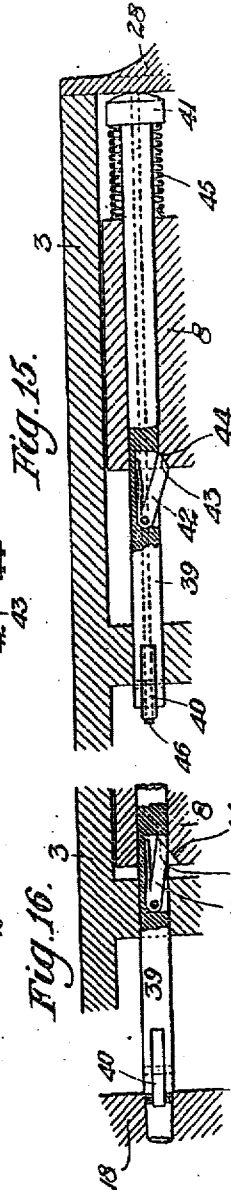
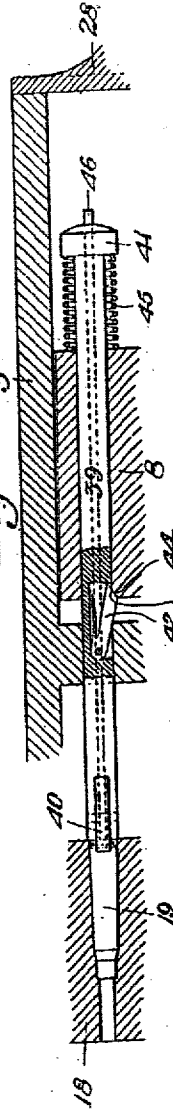
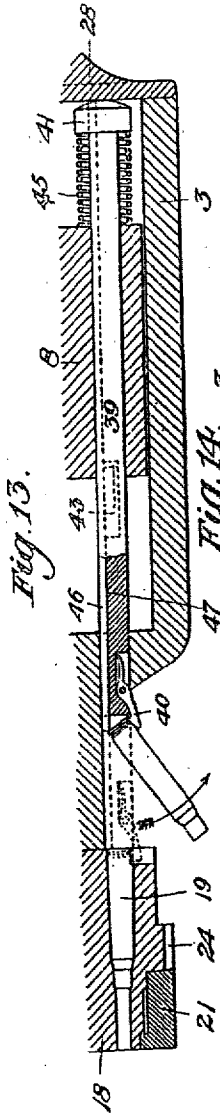
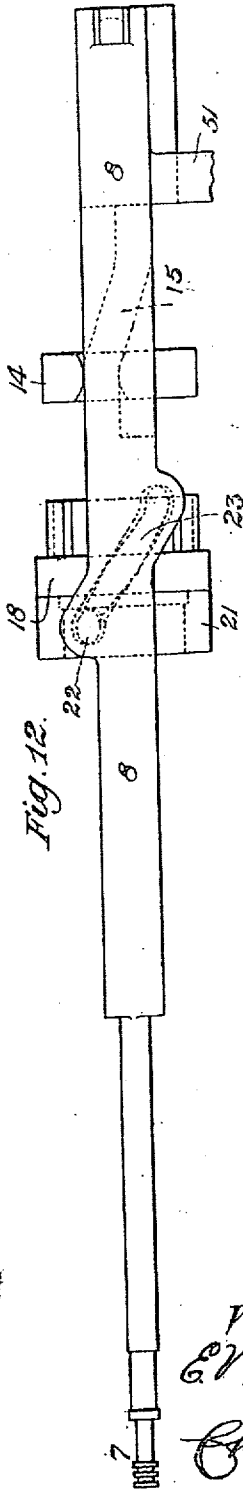
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RAPID FIRE GUN.
APPLICATION FILED NOV. 28, 1903.

5 SHEETS—SHEET 4.



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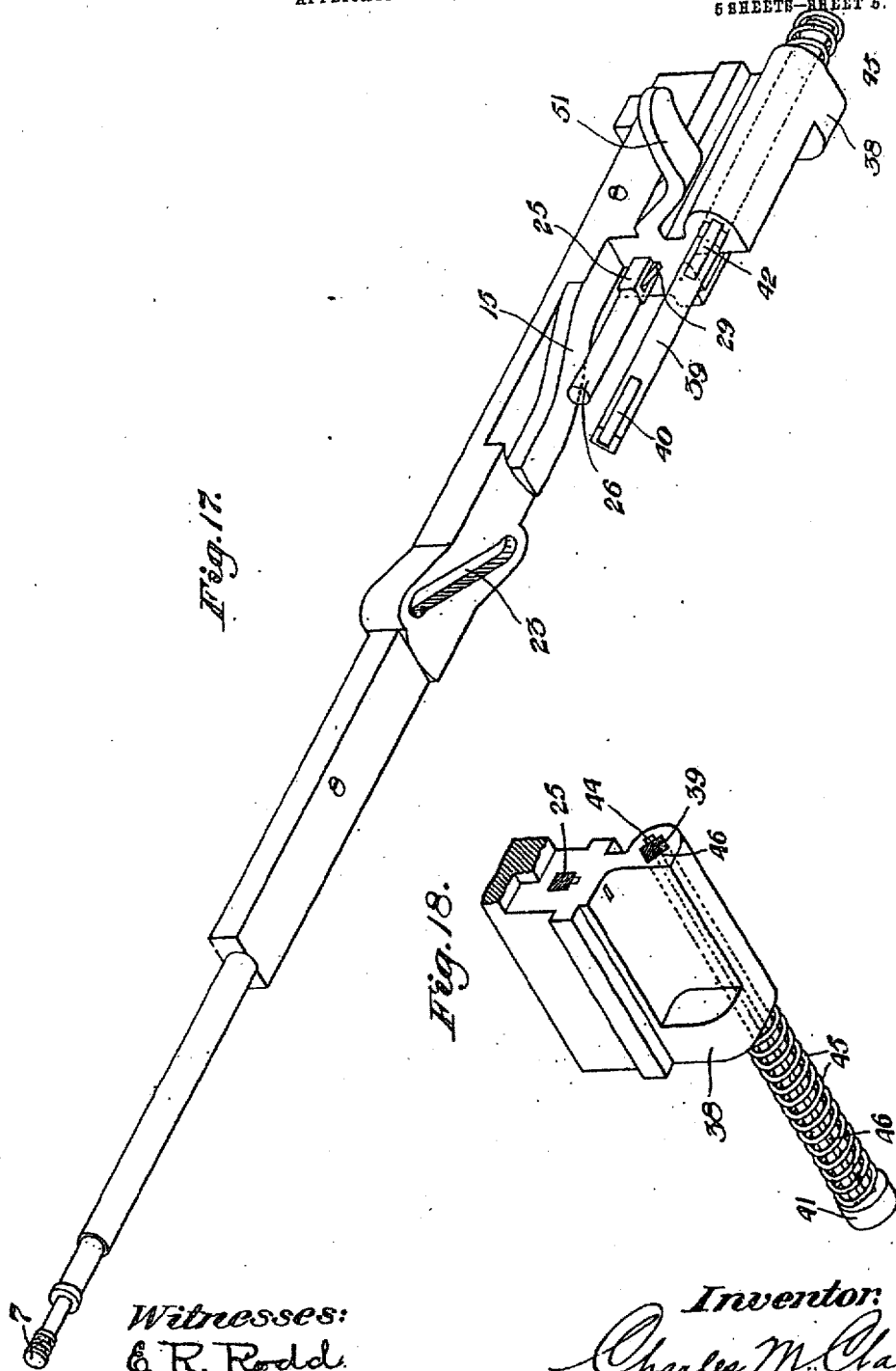
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APPLICATION FILED NOV. 28, 1903.

5 SHEETS—SHEET 5.



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Inventor:
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UNITED STATES PATENT OFFICE.

CHARLES M. CLARKE, OF PITTSBURG, PENNSYLVANIA.

RAPID-FIRE GUN.

SPECIFICATION forming part of Letters Patent No. 794,852, dated July 18, 1905.

Application filed November 28, 1903. Serial No. 182,067.

To all whom it may concern:

Be it known that CHARLES M. CLARKE, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Rapid-Fire Guns, of which the following is a specification, reference being had therein to the accompanying drawings, forming part of this specification.

Figure 1 is a view in side elevation of my improved rapid-fire gun. Fig. 2 is a longitudinal vertical sectional view showing the gun ready to fire. Fig. 3 is a similar view of the back portion of the gun, showing the parts in firing position, on an enlarged scale. Fig. 4 is a similar view showing the actuator in its forward position, a cartridge having been fired and also projected from the belt into the revolving chambered breech. Figs. 5, 6, 7, and 8 are cross-sections on the lines V V, VI VI, VII VII, and VIII VIII of Fig. 3. Fig. 9 is an enlarged sectional detail view showing a packing device inserted, being the revolving chambered breech and the barrel. Fig. 10 is a partial end view of the revolving chambered breech on the line X X of Fig. 9, showing the packing-rings. Fig. 11 is an isometric detail view of one of the spring packing-rings. Fig. 12 is a plan view of the actuator, detached, in engagement with the revolving chambered breech and belt-feed slide. Fig. 13 is a longitudinal sectional detail view on the diagonal line XIII XIII of Fig. 7, showing the empty-shell extractor in action. Fig. 14 is a similar view at right angles to Fig. 13, showing the extractor as having engaged the flange of the shell and about to withdraw it, when the extractor-bar is immediately released backwardly by the continued forward travel of the actuator. Fig. 15 is a similar sectional view also at right angles to Fig. 13, showing the extractor-bar as having been thrown back to the limit of its travel and the actuator having followed, the spring-latch having again connected these parts, so that the bar will be again carried forward by the actuator. Fig. 16 is a similar detail view showing the extractor-bar released from connection with the actuator and just about to move backwardly under the impelling power

of its spring. Fig. 17 is an end perspective view of the actuator and portions of the assembled mechanism. Fig. 18 is a similar view, partly broken away, showing the rear end of the actuator, the view being taken from the other side.

My invention relates to that class of automatic rapid-fire guns employing belt-carried ammunition wherein the power of a portion of the gas of each discharge is utilized to actuate the operative mechanism.

The present improvement refers more particularly to the mechanism for removing the cartridges from the belt into the revolving breech, the revolving breech itself and means for intermittently actuating it, the packing devices, the firing-pin, the extractor, and the actuator by which the mechanism is operated at each discharge.

Referring to the drawings, 2 is the barrel, secured at its inner end in the case 3, extending forwardly through the interior of water-jacket 4 and projecting outwardly through the end thereof. A gas-port 5 communicates with the bore of the barrel and with a piston-chamber 6, whereby at each discharge a portion of the gas will propel the piston 7 and actuator 8 backwardly. The actuator is held back or released by trigger 9 engaging lug 10 and is impelled forwardly by a power-spring 11. The belt 12 is fed through the gun by a pawl 13, mounted in feed-slide 14, actuated transversely by cam portion 15 of the actuator, the belt being retained by lower pawl 16.

The foregoing elements of the gun do not form any part of my present invention and are similar in their construction and mode of operation to similar parts forming part of the subject-matter of Letters Patent of the United States of V. P. DeKnight, No. 709,883.

Rotatably mounted in the case on pin 17 immediately back of the barrel is the revolving breech 18, provided with a series of cartridge-chambers 19, one of which chambers is adapted at each stationary position of the breech to aline with the centrally-disposed cartridge in the belt above and another at the same time with the barrel below. The breech 18 is intermittently rotated one space—i. e. the distance between adjacent chambers—by a

pawl 20, mounted in a ring or carrier 21, provided with a roller or abutment 22 in engagement with cam-groove 23 of the actuator, the pawl engaging-teeth 24 of the breech successively. The cartridges are inserted in the uppermost chamber of the revolving breech at each operation by a thrust-pin 25, reciprocatingly mounted in the back portion of the actuator, terminating in a cylindrical forward tip 26 adapted to engage the cartridge and to push it through the belt into the chamber, the cartridge-flange being of the same diameter as the body of the kind known as "rimless."

The shank of the thrust-pin is preferably square or splined, and it is provided at its back end with a button or head 27, adapted to come on backward travel into limiting contact with the inner face of grip-block 28 or other suitable abutting face. The thrust-pin 25 is provided with a spring-latch 29, by which it is carried forward by the actuator until raised out of engagement by a wedge or movable bearing 30 upon coming into contact with cam-face 31 at about four-fifths of the forward stroke. Any other suitable means may be employed for disconnecting the thrust-pin and actuator at the proper time. A spring 32 is inserted between the back end of the actuator and head 27, by which the thrust-pin is quickly thrown back upon release of latch 29 and immediately after the cartridge has been thrust out of the belt forwardly into the breech-chamber, thus preventing interference with the pin upon rotation of the breech by the immediate backward travel of the actuator after discharge. By this construction the thrust-pin is thrown back by spring 32 before the actuator commences its back travel, and when it travels back it will compress spring 32 and cause latch 29 to become relocked, ready for the next forward engagement. The firing-pin 33 is arranged in alignment with the barrel and lowermost cartridge-chamber, and consequently with the primer of the cartridge therein. It is normally held retracted by a spring 34, bearing against head 35, its backward movement being limited by a pin 36, extending into slot 37. The cartridge is fired by a downward extension 38 of the actuator striking the firing-pin head at the limit of its forward travel. The empty cartridge-shell is extracted from the chamber at the next position of rotation beyond the firing position by means of a reciprocating extractor-bar 39, likewise mounted in the back portion of the actuator to one side of its center to conform to the position of the shell, and is provided at its forward end with a spring-controlled finger 40, adapted to engage the flange of the shell and to withdraw it from the chamber. The shank of the extractor-bar is also preferably square or splined, and it is provided at its back end with a button or head 41, adapted to come into limiting contact with the in-

ner face of grip-block 28 or other suitable abutment. The extractor-bar is provided with a pivoted spring-latch 42, having a bevel-face 43, by which the extractor-bar is carried forward by the actuator until its forward end comes into contact with the shell, when the bevel-face 43 of the latch will ride up on the corresponding bevel cam-face 44 of the actuator, when the extractor-bar and shell will be quickly thrown back by means of a spring 45, inserted between the back end of the actuator and a head or button 41 of the extractor-pin. By this construction the extractor-bar is thrown back before the actuator has completed its forward travel in the same manner as the thrust-bar, thus withdrawing the empty shell before the revolving breech is rotated by back action of the actuator and preventing interference.

A disengaging or ejecting bar 46 is slidably mounted in a slideway 47 in one side of the extractor-bar and of slightly greater length than the bar, so that upon first coming into contact with the inner face of the grip-block 28 the forward end of the ejecting-bar will strike the side of the head of the shell and throw it around and away from engagement, as shown in Fig. 13.

For the purpose of insuring the complete insertion of the cartridges in the chamber of the breech I have provided a spiral cam-face 48, corresponding to the path of travel of the cartridge and which will finally force the cartridge home before or upon reaching the firing position should the impetus of thrust-bar 26 not be sufficient to send it home.

For the purpose of preventing unnecessary movement of the rotating breech and of insuring its accurate stoppage at proper position I have provided a spring 49, adapted to engage depressions or notches 50 in the periphery of the breech corresponding in position to the cartridge-chambers. The actuator is provided with the usual pull-bar 51, extending out to one side, by which the gun may be set by hand.

For the purpose of packing or sealing the gases of explosion between the revolving breech 18 and the barrel 2, if necessary, I prefer to provide a packing device of any suitable character and have shown in Figs. 9, 10, and 11 a spring-washer 52, having resilient portions 53, either integral or attached, adapted to be seated in a corresponding recess 54 in the front face of the breech, surrounding the exit-terminal of each cartridge-chamber. If preferred, the packing may be inserted in the barrel or in both breech and barrel, and by thus making a close contacting fit it will be seen that a tight seal will always be provided to compensate for wear, thus preventing leakage of gas at the time of explosion in the case of each chamber. Other effective means may be substituted for the same purpose, if desired.

While the primary function of springs 32 and 45 is to throw the thrust-bar and extractor back quickly before the belt and revolving breech commence to move, so as to prevent interference, they will also assist the mainspring in impelling the actuator forwardly.

In constructing the gun the water-jacket may be entirely dispensed with, and it will be understood that the number of chambers in the revolving breech may be varied as desired—i. e., either more or less than eight, as shown, and that various other changes or modifications may be made by the skilled mechanic within the scope of the claims.

The operation is as follows: A belt of cartridges is introduced across the gun and engaged by the feeding-pawl. The actuator is withdrawn by hand and manipulated until a sufficient number of cartridges have been thrust into the revolving breech, which is partially rotated at each operation, so as to bring the first cartridge around to the lowermost position. The actuator is then released by the trigger, thrusting another cartridge from the belt into the upper breech-chamber, firing the lowermost cartridge, and a part of the generated gas, acting through the by-pass port, will actuate the piston and actuator, throwing it back. In the back travel the breech is revolved one space, the belt is fed forward, bringing the next cartridge into alinement with the thrust-bar and chamber, and the shell of the exploded cartridge is extracted and thrown outwardly from the gun. If the trigger has been released, the actuator will become locked by it, ready for another operation, or if the trigger is continuously depressed the actuator will immediately be thrown forward by the power-spring and firing will continue until the ammunition of the belt is exhausted.

Having described my invention, what I claim is—

1. In a rapid-fire gun, the combination of a revolving chambered breech, a cartridge-carrying belt, means for rotating the breech and feeding the belt, and means for thrusting the cartridges into the breech, substantially as set forth.

2. In a rapid-fire gun, the combination of a revolving chambered breech, a cartridge-carrying belt, means for rotating the breech and feeding the belt, and means for thrusting the cartridges into the breech and firing them therein, substantially as set forth.

3. In a rapid-fire gun, the combination of a revolving chambered breech, a cartridge-carrying belt, means for rotating the breech and feeding the belt, means for thrusting the cartridges into the breech, and firing them therein, and means for extracting the empty shells therefrom, substantially as set forth.

4. In a rapid-fire gun, the combination of a revolving chambered breech, a barrel, a car-

tridge-carrying belt, means for rotating the breech and feeding the belt, and means for thrusting the cartridges into the breech, firing them therein when in alinement with the barrel, and for extracting the empty shells, substantially as set forth.

5. In a rapid-fire gun, the combination of a main case, a revolving chambered breech, a barrel, a gas-port communicating with the barrel, a cartridge-carrying belt, an actuator provided with a piston adapted to be operated on by the gas passing through the gas-port, and provided with means for rotating the breech and feeding the belt; and a thrust-bar, a firing-pin and an extractor actuated by the actuator, with means for impelling the actuator forwardly, substantially as set forth.

6. In a rapid-fire gun, the combination of a main case, a revolving chambered breech, a barrel, a gas-port communicating with the barrel, a cartridge-carrying belt, an actuator provided with a piston adapted to be operated on by the gas passing through the gas-port, and provided with means for rotating the breech and feeding the belt; and a thrust-bar, a firing-pin and an extractor actuated by the actuator, with means for impelling the actuator forwardly, and a releasing-trigger adapted to engage the actuator, substantially as set forth.

7. In a rapid-fire gun, an actuator provided with a thrust-bar, and means for disengaging the thrust-bar and retracting it independent of the backward movement of the actuator, substantially as set forth.

8. In a rapid-fire gun, an actuator provided with an extractor, and means for disengaging the extractor and retracting it independent of the backward movement of the actuator, substantially as set forth.

9. In a rapid-fire gun, an actuator provided with an extractor and ejecting-bar, and means for disengaging the extractor and retracting it independent of the backward movement of the actuator, substantially as set forth.

10. In a rapid-fire gun, the combination with an actuator, of a thrust-bar provided with a latch, a cam for disengaging the latch before the actuator has made its full forward travel, and a spring for retracting the thrust-bar, substantially as set forth.

11. In a rapid-fire gun, the combination with an actuator, of an extractor provided with a latch, a cam for disengaging the latch before the actuator has made its full forward travel, and a spring for retracting the extractor, substantially as set forth.

12. In a rapid-fire gun, the combination with an actuator, of an extractor provided with an ejecting-bar, and a latch, a cam for disengaging the latch before the actuator has made its full forward travel, and a spring for retracting the extractor, substantially as set forth.

13. In a rapid-fire gun, the combination with a barrel, and a revolving chambered breech, of resilient means for packing the meeting ex-

tremities of the chambers and barrel, substantially as set forth.

14. In a rapid-fire gun, the combination with a barrel, of a revolving chambered breech
5 provided with resilient packing-bearings inserted in the face of the breech, substantially as set forth.

15. In a rapid-fire gun, the combination with a barrel, of a revolving chambered breech

provided with resilient packing-washers inserted in suitable cavities around the terminals of the chambers, substantially as set forth.

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

CHARLES M. CLARKE.

Witnesses:

J. F. McKENNA,

E. V. MACKENZIE.