J. C. STURGEON.

AUTOMATIC GUN CARTRIDGE SUPPLY AND FEED MECHANISM.

APPLICATION FILED FEB. 9, 1917.

Patented Jan. 7, 1919.

1,290,851.

2 SHEETS—SHEET 1.

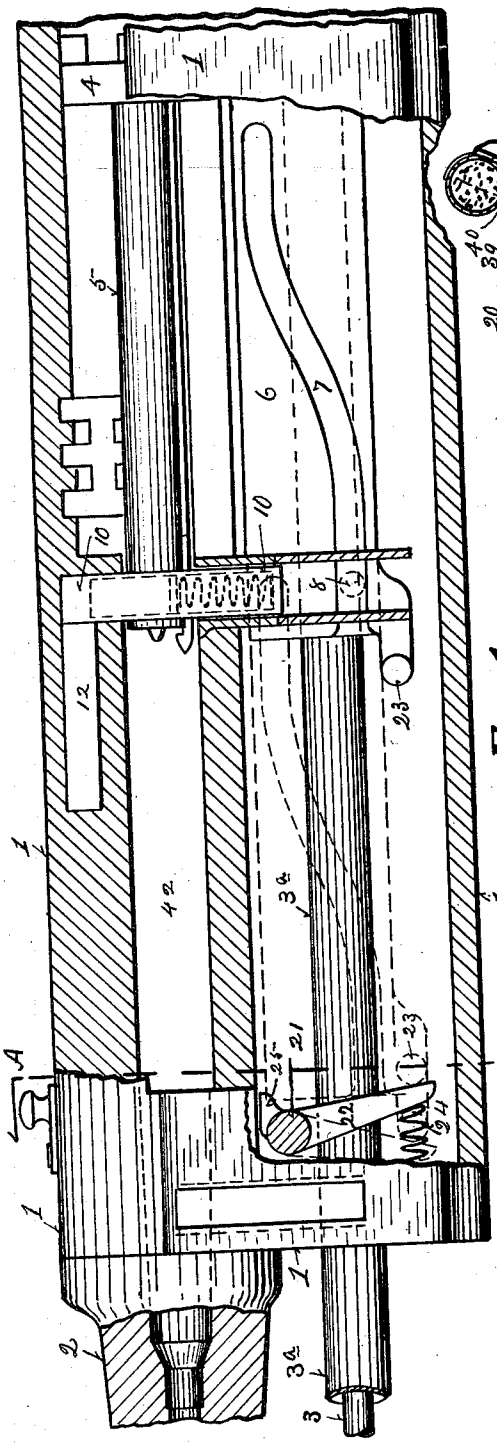


Fig-1

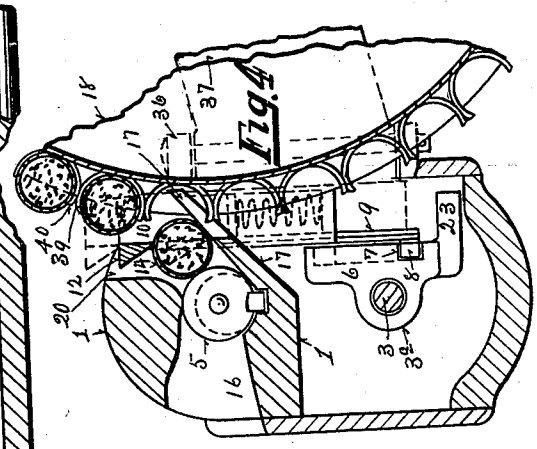


Fig-4

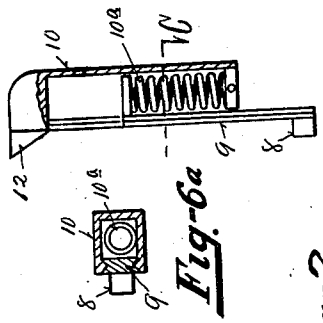


Fig-6a

Fig-6

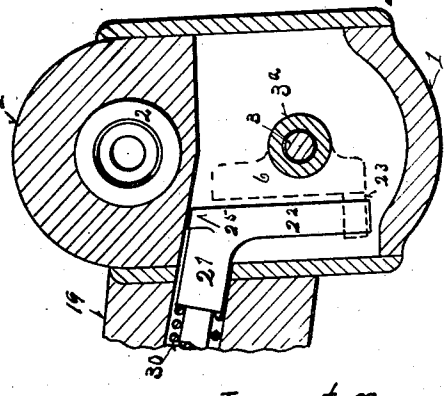


Fig-2.

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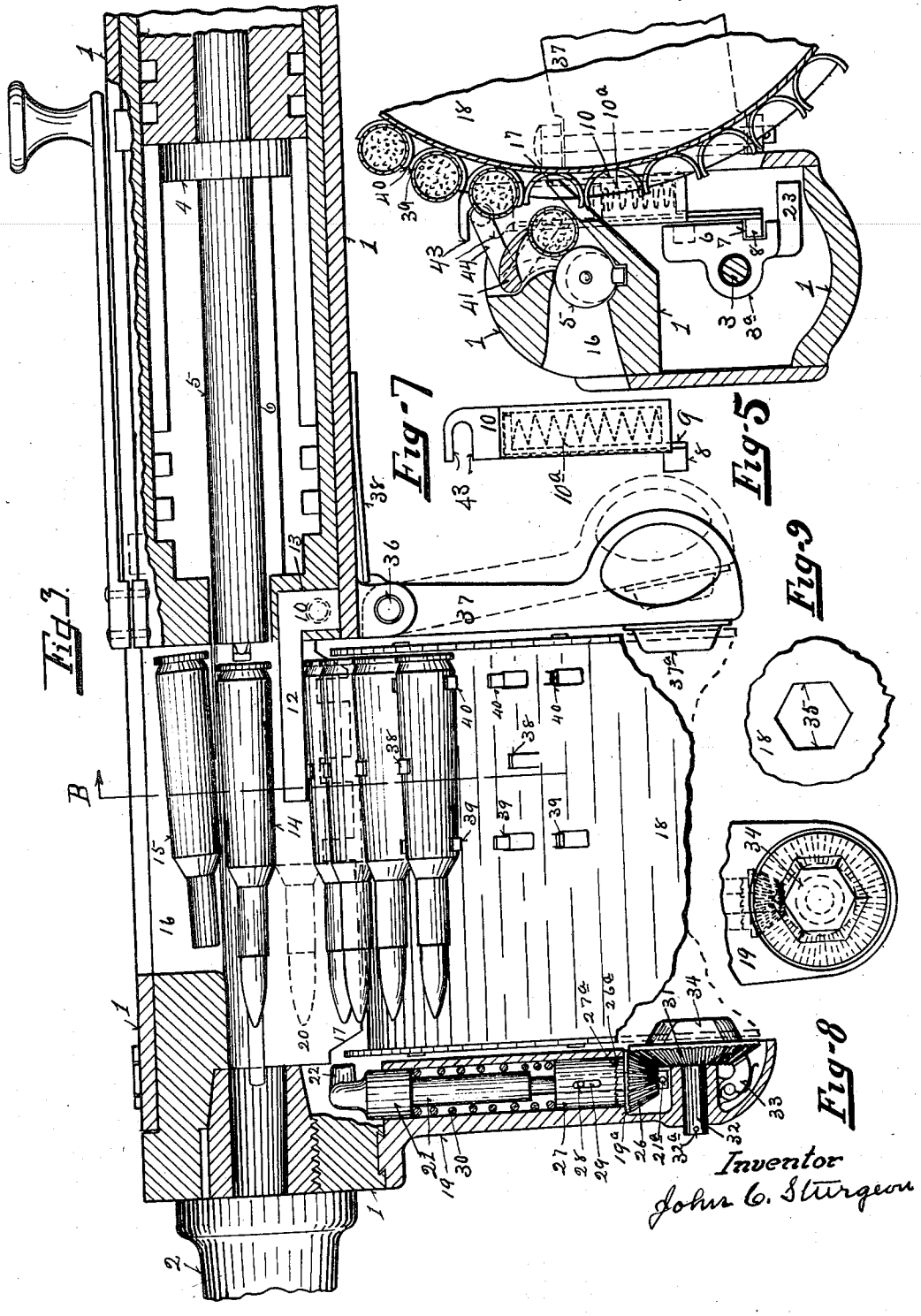


Fig-3.

Fig-7

Fig-5

Fig-9

Fig-8

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AUTOMATIC GUN-CARTRIDGE SUPPLY AND FEED MECHANISM.

1,290,851. Specification of Letters Patent. Patented Jan. 7, 1919.

Application filed February 9, 1917. Serial No. 147,627.

To all whom it may concern:

Be it known that I, JOHN C. STURGEON, a citizen of the United States, residing at Erie, in the county of Erie, and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Gun-Cartridge Supply and Feed Mechanism; 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, forming part of this specification.

This invention relates to automatic fire-arms and particularly to improvements in the cartridge supply and feeding mechanism thereof, and means for actuating the same.

One object of this invention is to construct a detachable cylindrical cartridge supply device having clips on its periphery to hold cartridges removably therein so they may be readily detached by the feeding mechanism of the arm.

Another object of this invention is to provide mechanism acting upon the cylindrical cartridge supply device to intermittently rotate it so as to remove one cartridge from the clips thereon at each forward movement thereof, and means for moving such cartridge in front of the bolt at the end of its backward traverse, thereby expelling the spent shell of the previously fired cartridge.

Another object of this invention is the construction and arrangement of the parts of the mechanism so that they can be quickly removed from and be replaced in the frame of the arm.

Another feature of this invention consists substantially in the structure of the parts and their combination and coöperation in the arm, with the other mechanism thereof, as hereinafter described.

These and other features of my invention are hereinafter fully set forth and described, and illustrated in the accompanying drawings, in which:—

Figure 1 is a side view of a portion of the frame of the arm partially in central vertical section and partially in elevation.

Fig. 2, is a transverse vertical section of the same on the line A in Fig. 1 looking in the direction of the arrow.

Fig. 3, is a horizontal view of a portion of the frame of the arm, in general section on the line of the bore of the arm, with other parts including a section of the cartridge supply device in plan view.

Fig. 4, is a transverse section of the same on the line B in Fig. 3, looking in the direction of the arrow.

Fig. 5, is a transverse section showing a modified construction of the cartridge moving mechanism, on the same line B in Fig. 3, looking in the direction of the arrow.

Fig. 6, is a vertical section showing a view of the cartridge moving mechanism as embodied in Figs. 3 and 4.

Fig. 6^a, is a cross section of the same on the line C in Fig. 6.

Fig. 7, is a view in elevation of a part of the cartridge moving mechanism embodied in the modified construction thereof shown in Fig. 5.

Fig. 8, is a side view in elevation of the outer end of one of the arms supporting the cartridge supply device.

Fig. 9, is a section of the central part of one end of the cartridge supply device showing the opening therein fitting upon the part shown in Fig. 8.

In these drawings 1 indicates a section of the frame of the arm, 2 a section of the barrel, 3 and 3^a the rod and tube connecting a gas cylinder under the forward end of the barrel (not shown), with the bolt locking mechanism 4 of the arm, and 5 the breech-bolt of the arm secured to the bolt-locking mechanism 4, all of which parts are shown and described in applications for Letters Patent previously filed by me, and therefore not deemed novel features of this invention.

To the tube 3^a under the breech-bolt 5 I secure a flat vertical cam-carrier 6 extending substantially from the bolt-locking mechanism 4 to the front end of the breech-bolt 5; and in this cam-carrier 6 I make a cam-slot 7 adapted to be engaged by a stud 8 on a vertically movable part 9 which forms part of the vertically movable cartridge mover 9—10 (see Fig. 6) moving up and down in a slot 13 in the frame 1 of the arm. This element 9—10 is provided at its upper end with a forwardly extending arm 12 adapted to engage an incoming cartridge (see Figs. 3 and 4) and when the bolt 5 is fully retracted move the cartridge 14 in front of the end of the bolt 5 and in so doing, force the spent cartridge shell 15 out through the discharge

opening 16 in the side of the frame 1. This action is accomplished by the spiral spring 10^a being compressed by the action of the cam-slot 7 acting on the part 9 during the rearward traverse, in unison with the bolt 5, of the cam-slot 7, while the cartridge 14 rests between the inclined lip 17 and the backwardly moving breech-bolt 5 as shown in Fig. 4; and when the bolt reaches its rearmost traverse, the spring 10^a acts to force the arm 12 downward and thereby forces the cartridge 14 in front of the bolt, as illustrated in Fig. 4.

The inclined lip 17 is secured to the frame 1 below the path 42 of the bolt 5 and extends outwardly and upwardly in the path of incoming cartridges carried on the periphery of a cartridge supply device 18 hereinafter more fully described, and removes cartridges from the clips on the periphery of said cartridge supply device (as shown in Fig. 4).

On the side of the frame 1 I secure the arm 19 at the front end of the cartridge inlet opening 20 in the frame. In this arm 19 there is mounted a rock-shaft 21 on the inner end of which there is a downwardly projecting arm 22 adapted to be engaged by a stud 23 on the forward end of the cam-plate 6 and moved forward against the spring 24 as shown by dotted lines in Fig. 1; the rearward movement of the arm 22 being limited by the lip 25 contacting with the under side of the frame. On the outer end of the shaft 21 there is a bevel pinion 26, and in the rear thereof a sliding sleeve 27 connected with shaft 21 by a stud 28 operating in a slot 29 therein, and behind the sleeve 27 there is a spiral spring 30 acting against the sleeve 27; the outer end of the sleeve 27 being provided with ratchet teeth 27^a which engage like teeth 26^a on the bevel pinion 26.

Through the shaft 21 at the outer end of the bevel pinion 26 there is a stud-pin 21^a which prevents the withdrawal of the shaft 21 from the pinion 26, and a shoulder 19^a on the arm 19 contacts with the rear of the pinion 26 and prevents the withdrawal of the shaft 21 from its bearings in the arm 19 until the pin 21^a is removed, when the shaft 21 and all of its constituent parts can be withdrawn through the frame and replaced at will.

In the inner face of the outer end of the arm 19 there is mounted a bevel gear 31 preferably by a stud 32 thereon projecting through the arm 19, and being held in place by a stud-pin 32^a so as to retain the gear 31 in mesh with the pinion 26 which actuates it. In the end of the arm 19 there is a spring actuated dog 33 engaging the teeth of the gear 31 so as to prevent any backward movement thereof as the ratchet teeth 26^a and 27^a operate in response to the backward oscillation of the shaft 21 hereinbefore referred to. On the outer face of the bevel gear 31 there is a tapered hexagon extension 34 adapted to receive a like hexagon opening 35 in the end of the cartridge supply device 18 clearly shown in Fig. 9, whereby the rotation of the gear 31 operates to rotate the cartridge supply device 18 as hereinafter set forth.

At the rear end of the cartridge inlet opening 20 in the frame, I pivot to the side of the frame, preferably on ears 36 a laterally projecting arm 37 adapted to be held in its normal position (as shown in full lines in Fig. 3) by a spring 38 on the frame 1 acting thereon, so that it can be moved back to admit of the insertion and removal of the cartridge supply device 18 as shown in dotted lines in Fig. 3.

On the inner face of the outer end of the arm 37 there is a conical stud 37^a adapted to enter a central opening in the end of the cylindrical cartridge supply device and together with the hexagon stud 34 operate as bearings therefor.

The cartridge supply device 18, hereinbefore referred to, is cylindrical in shape and is preferably made of thin sheet metal with a central hexagon opening 35 in one end, and a round opening in the other, forming bearings on which the cartridge supply device is rotated as hereinbefore described. On the periphery of the cartridge supply device 18 I preferably stamp out cartridge clips 38—39 and 40 which are so bent outward as to grasp and removably retain cartridges therein, as shown in Figs. 4 and 5, from which clips the cartridges are one by one removed as the cartridge supply device is rotated so as to move the cartridges down on the inclined lip 17 as illustrated in Fig. 4.

In Figs. 5 and 7 I show a modified construction of the cartridge moving device shown in Figs. 1, 3, 4 and 6. In this modification all of the parts are the same as hereinbefore described, except that in this modification the cartridge mover 41 is pivoted in the frame 1 above the bolt opening 42 therein, as clearly shown in Fig. 5; and the upper end of the part 10 is provided with a bifurcated extension 43 which engages a stud on the arm 44 so that the downward and upward movement of the parts 9 and 10 and the action of the spring 10^a operate to move the pivoted cartridge mover 41 up and down with substantially the same effect as that caused by the arm 12 in the construction hereinbefore described.

I have thus shown and described my improved automatic fire-arm mechanism so as to enable others skilled in the art to which this invention appertains, to construct and utilize the same. I do not, however, confine myself to the exact construction, form and arrangement of the parts thereof, as

many of these can be modified and varied without departing from the spirit of my invention.

Therefore what I claim as new and desire to secure by Letters Patent is:—

1. In a gun, a frame having a cartridge inlet at one side, and a cartridge outlet at the opposite side thereof, a cylindrical cartridge carrier revoluble past the cartridge inlet opening, clips on the periphery thereof to removably hold cartridges, a reciprocating cartridge moving mechanism operating in said opening and cam and spring mechanism for moving it.

2. In a gun, a frame having a cartridge inlet opening at one side thereof, a cartridge carrier operating intermittently in front of and parallel with the cartridge inlet opening, clips thereon to removably hold cartridges, means for removing cartridges from said clips into the cartridge inlet opening, a vertically operating cartridge mover engaging cartridges in said opening after their removal from the carrier clips, and means for moving it downwardly to force the cartridges in front of the breech-bolt.

3. In a gun, a frame having a cartridge inlet at one side thereof, a reciprocating breech-bolt, gas actuated mechanism for moving the breech-bolt in one direction and a spiral spring for moving it in the opposite direction, a vertically reciprocating cartridge moving arm adapted to be lowered into the cartridge inlet opening and engage and move a cartridge therein in front of the breech-bolt, a telescopic support for said cartridge moving arm, a spring in said support, and a cam under the breech-bolt engaging the lower section of the arm support.

4. In a gun, a frame having cartridge inlet and outlet openings therein, a reciprocating breech-bolt operating between said openings, a cartridge carrier operating opposite and parallel to said inlet opening, means in said inlet opening for removing cartridges from said carrier, a reciprocating cartridge moving mechanism operating in said inlet opening to move the cartridges removed from the carrier in front of the breech-bolt and thereby eject the spent cartridge through the outlet opening, and cam mechanism engaging and operating said cartridge moving mechanism.

5. In a gun, a frame having a cartridge inlet opening, a breech-bolt mounted in the frame and reciprocating in said inlet opening, a cartridge carrier movable past said inlet opening for delivering cartridges thereto, a cartridge moving mechanism operating in said inlet opening between the carrier and the breech-bolt to move cartridges in front of the breech-bolt, a cam under the breech-bolt, a stud on the cartridge moving mechanism engaging said cam, and a spiral spring between the stud element and the cartridge engaging element of said cartridge moving mechanism.

6. In a gun, a frame having a cartridge inlet opening therein, a cartridge supply device operating to deliver cartridges thereto, a reciprocating cartridge moving device operating in said inlet opening comprising substantially upper and lower sections, a spring between said sections, a stud on the lower section, a reciprocating cam engaging said stud, and means on the upper section for engaging cartridges in the inlet opening.

7. In a gun, a frame having cartridge inlet and outlet openings at opposite sides thereof, a cartridge supply device operating to deliver cartridges thereto, means in said inlet opening for removing cartridges from the supply device, a vertically reciprocating cartridge moving device operating in said opening and adapted to engage cartridges received from the cartridge supply device and move them in front of the breech-bolt, a reciprocating cam under the breech-bolt, and a stud on the cartridge moving device engaging said cam.

8. In a gun, a frame having cartridge inlet and outlet openings therein, a reciprocating breech-bolt mounted in the frame, a rotating cartridge supply device operating in the entrance to said inlet opening, clips on the periphery thereof for removably securing cartridges thereto, means for intermittently rotating said supply device, means in the inlet opening for removing cartridges from the clips on said supply device, a reciprocating cartridge moving mechanism operating to move the cartridges in front of the breech-bolt after they are detached from the cartridge supply device, and a cam under the breech-bolt engaging and operating the cartridge moving mechanism.

9. In a gun, a frame having cartridge inlet and outlet openings therein, laterally projecting arms at each end of the cartridge inlet opening adapted to support a cylindrical rotatable cartridge supply device, mechanism in one of said arms engaging said rotatable cartridge supply device, and mechanism in the gun frame for intermittently operating said mechanism.

10. In a gun, a frame, laterally projecting arms on one side thereof, a rock-shaft mounted in one of said arms communicating with and actuating a bevel gear mounted in the inner face of the outer end of said arm, and means on the inner face of said gear to engage and actuate a rotatable cartridge supply device, and means for actuating said rock-shaft.

11. In a gun, a frame, a reciprocating breech-bolt mounted therein, means for reciprocating said breech-bolt, arms on the side of the frame adapted to support a rotatable cartridge supply device mounted between them, mechanism mounted in one of

said arms engaging and rotating said cartridge supply device, and reciprocating elements in the frame engaging and operating the mechanism mounted in said arm.

12. In a gun, a frame, a reciprocating breech-bolt operating therein, a cam-carrier having a cam-slot therein mounted under the breech-bolt reciprocating in unison therewith, a laterally projecting stud on the front end of said cam-carrier, a vertically reciprocating cartridge mover engaged and operated by said cam-slot, laterally projecting arms on the frame adapted to support a rotatable cartridge supply device, a rock-shaft in one of said arms, operating mechanism engaging and rotating said cartridge supply device, and an arm on said rock-shaft engaging the stud on the reciprocating cam-carrier.

In testimony whereof I affix my signature.

JOHN C. STURGEON.