

March 4, 1924.

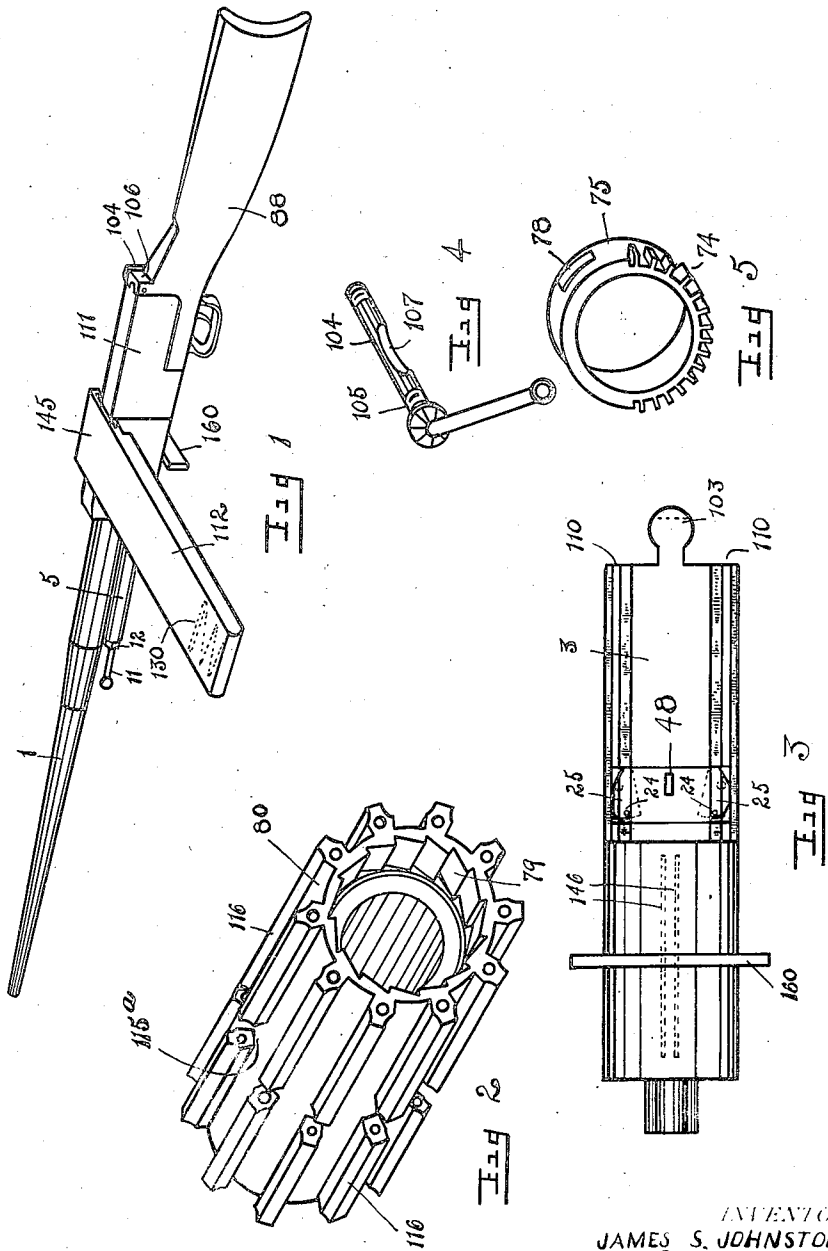
1,485,460

J. S. JOHNSTON

MACHINE GUN

Filed April 3, 1917

3 Sheets-Sheet 1



INVENTOR.
JAMES S. JOHNSTON
BY *Thomas L. Wilder*
ATTORNEY.

March 4, 1924.

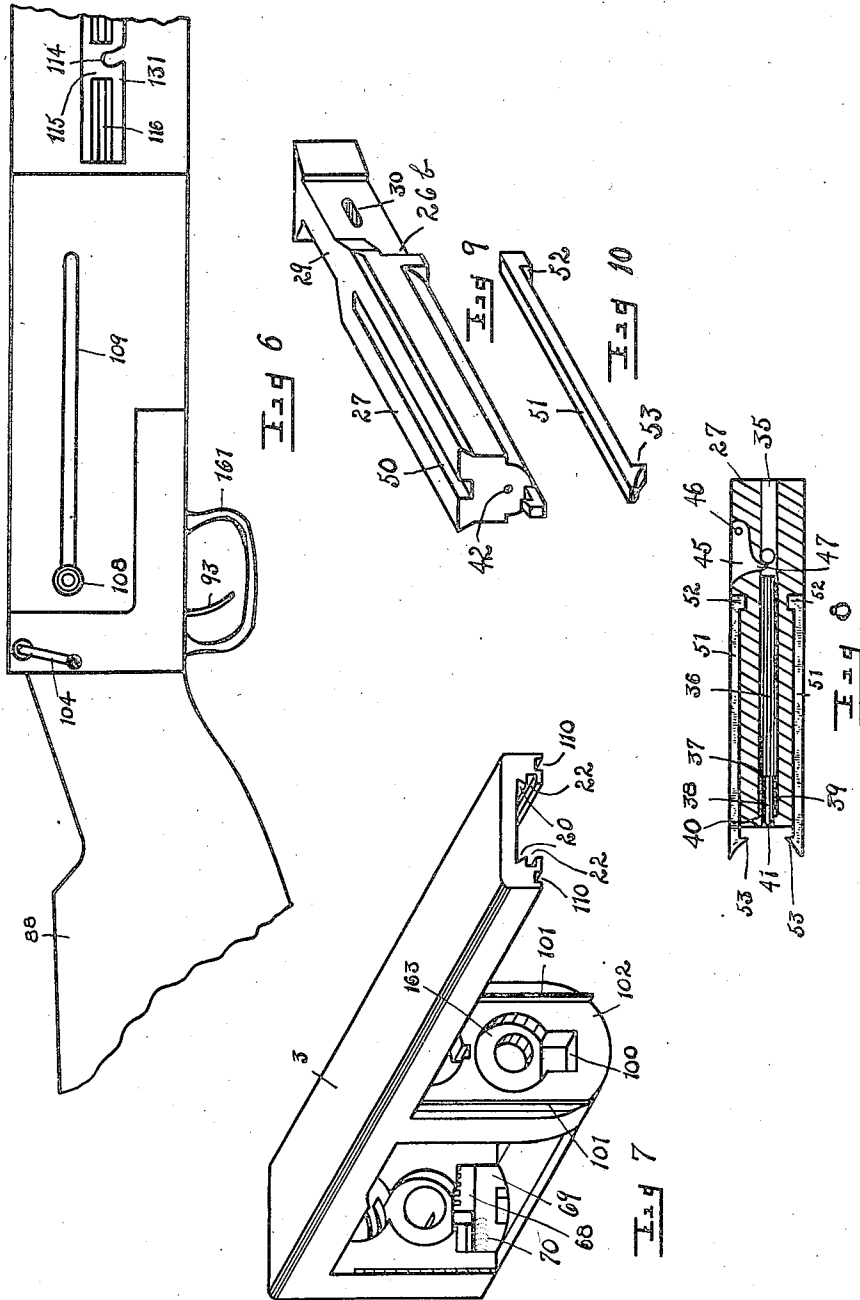
1,485,460

J. S. JOHNSTON

MACHINE GUN

Filed April 3, 1917

3 Sheets-Sheet 2



INVENTOR.
JAMES S. JOHNSTON
BY *Thomas L. Wilder*
ATTORNEY.

March 4, 1924.

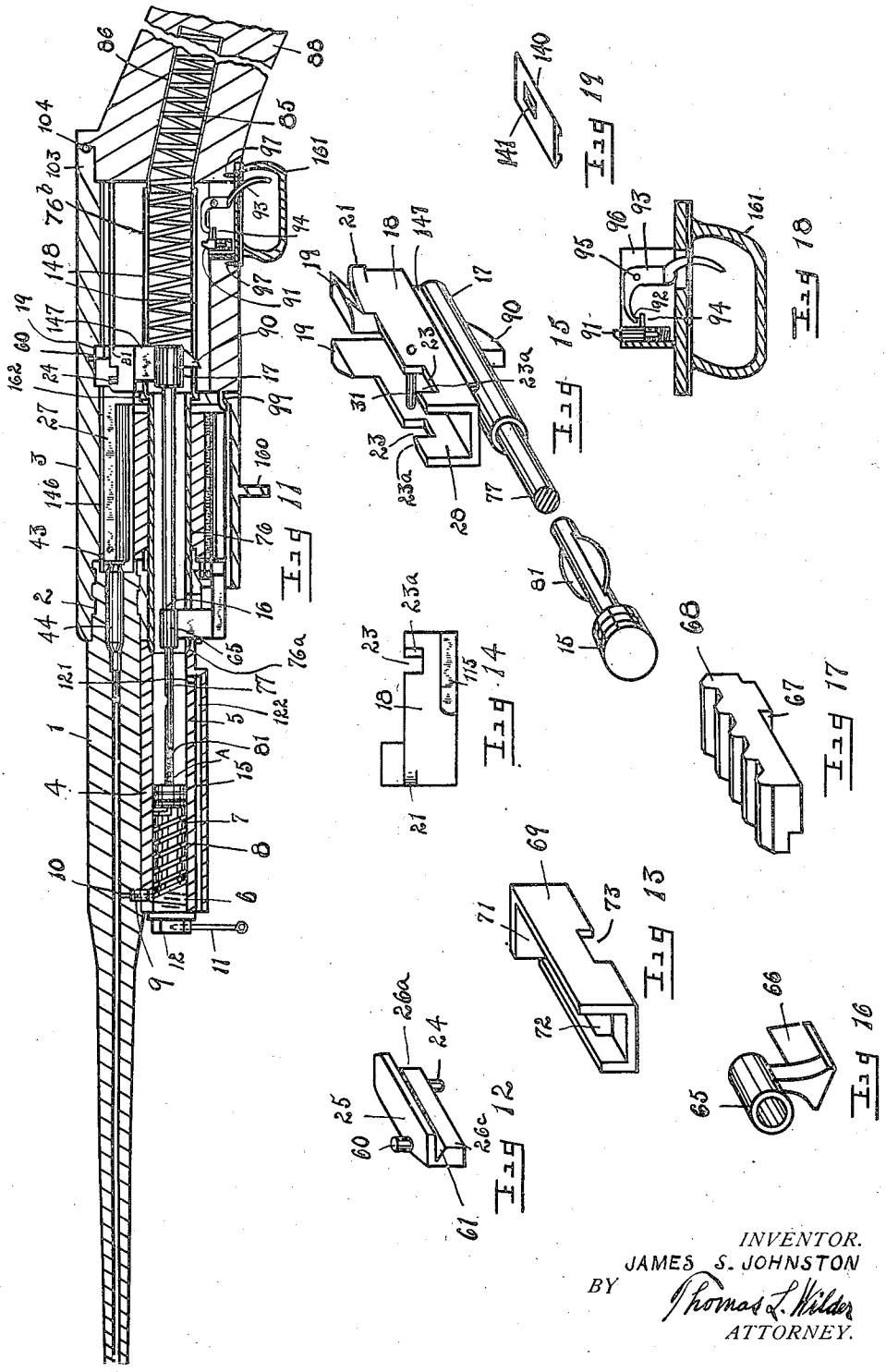
1,485,460

J. S. JOHNSTON

MACHINE GUN

Filed April 3, 1917

3 Sheets-Sheet 3



INVENTOR.
JAMES S. JOHNSTON
BY *Thomas L. Wilder*
ATTORNEY.

UNITED STATES PATENT OFFICE.

JAMES S. JOHNSTON, OF UTICA, NEW YORK.

MACHINE GUN.

Application filed April 3, 1917. Serial No. 159,533.

To all whom it may concern:

Be it known that I, JAMES S. JOHNSTON, a citizen of the United States, residing at Utica, in the county of Oneida and State
5 of New York, have invented certain new and useful Improvements in Machine Guns, of which the following is a specification, reference being had therein to the accompanying drawing.

10 My invention relates to a machine gun and I declare the following to be a full, clear, concise and exact description thereof sufficient to enable anyone skilled in the art to which it appertains to make and use the
15 same, reference being had to the accompanying drawings in which like reference characters refer to like parts throughout the specification.

20 The object of the invention is to provide a machine gun that will be of simple construction and efficient in operation. To this end the gun embodies few parts to lessen the opportunity of the mechanism getting out of order, fouling or clogging.

25 Furthermore, the pieces are arranged to fit together in such a manner that no screws are employed. The gun, therefore, may be taken apart without the use of any tool or instrument.

30 Moreover, the gun is equipped with an automatic mechanism for loading and firing the cartridges, which are fed automatically from a magazine into the cartridge carrier of the gun.

35 The gun may be used as a rapid firer or as a single shooter by throwing in or out of connection the gas chamber, and can be shot either from the shoulder of a person or from its disposition upon a tripod.

40 The objects will be understood by referring to the drawings, in which:

Fig. 1 is a perspective view of the gun;

Fig. 2 is an enlarged detail view of the cartridge carrier employed;

45 Fig. 3 is an enlarged detail view of the casing that carries the cartridge carrier, showing a plan view thereof and of certain pawls connected therewith;

50 Fig. 4 is an enlarged detail view of a screw bolt employed;

Fig. 5 is an enlarged detail view of a sector gear, showing a perspective thereof;

Fig. 6 is an enlarged fragmentary view of the side of the gun on which the cartridges are ejected; 55

Fig. 7 is an enlarged perspective view of the casing that contains the cartridge carrier;

Fig. 8 is an enlarged detail view of the breech bolt, showing a central vertical section thereof; 60

Fig. 9 is an enlarged detail view of the breech bolt, showing a perspective thereof;

Fig. 10 is an enlarged detail view of a member used for extracting the cartridges 65 from the barrel chamber;

Fig. 11 is an enlarged vertical section of the gun, showing parts broken away;

Fig. 12 is an enlarged detail view of a pawl used for locking the breech bolt in 70 closed position;

Fig. 13 is an enlarged detail view of a casing used for holding a gear rack employed;

Fig. 14 is an enlarged side elevation of a 75 U shaped member employed;

Fig. 15 is an enlarged detail view, showing a perspective of the member illustrated in Fig. 14 and of parts connected therewith; 80

Fig. 16 is an enlarged perspective view of a sleeve and tooth used in connection with turning the cartridge carrier;

Fig. 17 is an enlarged detail view, showing a perspective of a rack used in connection 85 with turning the cartridge carrier;

Fig. 18 is an enlarged detail view of the trigger and immediate parts.

Fig. 19 is a detail view of a plate used with the trigger mechanism to keep dust 90 from entering the interior of the gun.

Referring more particularly to the drawings, the barrel —1— is threaded into the correspondingly threaded socket 2 of the casing 3 of the gun. The under surface of 95 the barrel —1— is recessed with bevel sides for the reception of the tenon 4 of the gas tube 5. The gas tube 5 is hollow to form a chamber and is screw threaded at its outer end for the mounting of the threaded portion 100 of the gas delayer 7 which has a spiral peripheral groove 8 that is adapted to delay the progress of the gas from the point where it enters the groove 8 to where it

leaves as described in my application Serial No. 132,248 filed Nov. 20, 1916. The gas enters the groove through the conduit made in the screw 9 that is mounted into the barrel

5 —1—. The conduit of the screw 9 alines with the conduit 10 formed in the barrel —1—. Inasmuch, as the end of the conduit of the groove 8 alines with the conduit of the screw 9, the turning of the gas delayer
10 7 by means of the handle 11, will throw these respective openings more or less out of alinement and thereby control the quantity of gas that enters the groove 8. The handle 11 is swiveled to the split end of the nut 12
15 integral with the delayer 7. At the opposite end of the gas delayer 7, the gas will come in contact with and force back the piston 15 and piston rod 77 which is shouldered at 16 and formed with a collar 17.
20 The collar 17 is connected in an integral manner with the U shaped actuating member 18. This member 18 has the tenons 19—19 with beveled sides adapted to slide along the beveled rabbets 20—20 and with
25 the lateral teeth or wings 21—21 adapted to slide along the rabbets 22—22. The forward sides of the member 18 are reduced in height and provided with the recesses 23—23 which are intended for the projection therethrough, at the proper instant, of
30 the depending studs 24—24 formed integral with the pawls 25—25 for a purpose to be hereinafter described.

The pawls 25 are disposed opposite each
35 other in a counter sunk recess formed in the under surface of the casing 3 and have beveled recesses 61 to aline with the beveled recesses 20 of the casing 3. The pawls 25 are adapted to revolve upon their pivots 60,
40 which are housed in apertures in the casing 3, into the dotted line position illustrated in Fig. 3, when the lateral teeth 21 come in contact with the ends 26^c thereof. In this dotted line position the pawls 25 are dis-
45 posed with their forward ends 26^a in engagement with the shoulders 26^b of the breech bolt 27, whereby to lock said bolt 27 in closed position.

The chamber 28 of the member 18 is
50 formed for the reception of the reduced portion 29 of the bolt 27, which is provided with an elongated recess 30 through which projects a pin 31 mounted in the member 18, whereby the member 18 is given a cer-
55 tain limited amount of longitudinal movement independent of the bolt 27, in order that the beveled sides 23^a may push back the depending studs 24 and hence the pawls 25 into normal position, as illustrated in full
60 lines in Fig. 3. The pawls 25 being thus pushed back will unlock the bolt 27 and thereby permit said bolt 27 and the member 18 with its connected parts to move back-
ward simultaneously.

65 The bolt 27 has a cylindrical recess 35 to

receive the firing pin 36 which is shouldered at 37 to form a reduced part 38 about which is disposed a coiled spring 39 that lies between the shoulders 37 of the pin 36 and the shoulder 40 of the recess 35. The point-
70 ed end 41 of the firing pin 36 is adapted to be projected forward, at the proper instant, through the aperture 42 in the bolt 27 to strike the primer 43 of the cartridge 44 to
75 explode the same. The firing pin 36 is moved forward, at the proper instant, by the pin 31 which is carried by the member 18. It is held from moving forward until such time by the safety lock 45 which is
80 pivoted at 46 to the bolt 27 and provided with a detent or tooth 47 that normally hangs just in front of the pin 31. A recess 48 formed in the under surface of the casing 3 permits the forward end of the lock 45 to
85 be elevated under pressure of the pin 31, to allow for the escape there past of the pin 31, whereby the same will come in contact with the end of the firing pin 36 to push said pin forward against the tension of the coiled
90 spring 39. The grooves or recesses 50—50 are formed in the bolt 27 for the disposition of the cartridge holding members 51—51. The inner ends 52 of the members 51 are enlarged to fit into corresponding recesses,
95 whereby to hold said members 51 in longitudinal position on said bolt 27. The free ends of the members 51 are formed with overhanging jaws 53 adapted to engage the
100 groove between the primer 43 and the shell of the cartridge 44. The length of the members 51 will give a certain amount of resiliency thereto, to permit the jaws 53 to snap over the edge of the primer 43 to secure the cartridge 44 for extraction. The
105 said cartridge is released from the jaws 53 by rolling out laterally therefrom.

The piston rod 77 is split at A, whereby the piston rod and connected parts may be moved to the rear independent of the piston
110 15. The joint is made by forming one end into a cone and the other end into a complementary recess whereby the ends will center themselves, when they come together. The reduced portion of the piston rod 77 has
115 mounted thereon in a loose manner a sleeve 65 integral with a depending hanger supporting a tooth or wedge 66 which rests against the depending lug 67 of the gear rack 68 adapted to slide in the casing 69 dis-
120 posed in a recess in the forward end of the casing 3. The gear rack 68 is held normally to the right side of the casing 69 by a coiled spring 70 and is forced to the left side by the projection of the tooth 66 between the
125 lug 67 and the side 71 of the casing 69, which is provided with the openings 72 and 73 for the purpose.

The rack 68 is in mesh with the sector gear 74 of the ring 75 which is mounted to turn independently upon the hollow 130

tube 76. The hollow tube 76 is beveled at its forward end 76^a to fit snugly into the adjacent end of the gas tube 5 which is mounted to the barrel —1— by a mortise and tenon joint, as stated. The end 76^a of the tube 76 is fitted to the gas tube 5 after the barrel —1— has been mounted to the socket 2, whereby to lock said barrel —1— in assembled position. The tube 76 has an enlarged part 76^b with a collar 162 that fits into an annular recess 163 formed in the end wall 102 of the casing 3. The extended portion of the ring 75 is provided with a spring tooth 78 having one end mounted in a counter sunk recess in the periphery of said ring 75 and the other end free to engage the teeth 79 formed in the forward end of the cartridge carrier 80 mounted to turn upon the tube 76. The transverse movement of the rack 68 under force of the tooth 66 and against the tension of the spring 70 will rotate the sector gear 74 and by means of the spring tooth 78 the cartridge carrier 80, whereby to dispose a cartridge 44 into loading position to be pushed into its chamber in the barrel —1—. As the sector gear 74 revolves in the reverse direction, the spring tooth 78 will ride past the teeth 79 and produce no rotation of the cartridge carrier 80. The tooth 66 is actuated or projected inward to move the rack 68 one way by contact of the disk 81, which fits loosely in a suitable recess in the piston rod 77, with the sleeve 65. This occurs when the piston 15 is forced to the rear by the gases of explosion. The disk 81 is located a sufficient distance forward on the piston rod 77, so as not to contact with the sleeve 65 before the proper time to move the same the required distance. The tooth 66 is actuated in the reverse direction, whereby to unlock the cartridge carrier 80 by contact of the shoulder 16 with the sleeve 65 and their movement in unison, which occurs when the piston rod 77 moves forward under pressure of the coiled spring 85 housed in the enlarged part 76^b of the tube 76. The tube 86 makes a joint with the shouldered recess formed in the end of the tube 76^b. Tube 86 is housed in a recess formed in the stock 88 of the gun.

The piston rod 77 is held in cocked position and against the tension of the coiled spring 85 by the tooth 90 depending from the collar 17 and adapted to ride over and be engaged by the far side of the spring actuated dog or sear 91. The sear 91 is depressed, whereby to release the tooth 90 by pressure of the end 92 of the trigger 93 upon the lug 94 formed integral with the sear 91. The trigger is fulcrumed at 95 to the casing 96 held in place in the stock 88 by the screws 97. A plate 140 having a recess 141 for the projection therethrough of the trigger 93 is mounted to slide in the beveled grooves formed on the under side of the trigger cas-

ing 96, whereby to prevent the entrance of dust to the interior parts of the mechanism.

The stock 88 is recessed for the reception of the tube 76 and to provide a way for the movement of the member 18 and tooth 90. Said stock is held in assembled position by the tooth 99 that is projected through a recess 100 formed in the rear end wall of the casing 3; by the bars 101 beveled on one side and formed integral with the end wall 102 of the casing 3 to fit into corresponding recesses in the stock 88; and by the tongue 103 that has an end concave recess adapted to receive the convex part of the bolt 104 which is threaded at 105 to engage the threads of an aperture made in the bifurcated portion 106 of the stock 88. When the bolt 104 is screwed home, its convex portion 106 will fit within the concave orifice of the tongue 103 to lock the parts in position and when turned out the hollow portion 107 will lie opposite the concave aperture to release the parts. The end of the bolt 104 is threaded for the reception of a nut countersunk in the outer surface of the stock 88 and adapted to prevent the complete withdrawal of the bolt 104.

A handle 108 is intended to be inserted through a slot 109 in the side of the stock 88 to engage a recess 115 formed in the member 18, whereby to pull said member and connected parts to the rear in cocked position.

The rabbets 110—110 are made for the reception of the upper edges of the side plates 111—111 of the metal portion of the stock 88.

The cartridges 44 are fed into the cartridge carrier 80 through a correspondingly shaped aperture in the side of the casing 3 from the magazine 112 that is provided with a spring pressed follower 130 and are ejected from the carrier 80 by means of a finger 114 integral with the opposite side of the casing 3, which side has an aperture 131 for the purpose. The free end of the finger 114 projects into the pathway 115^a made in the peripheral flanges 116 that support the cartridges 44.

The magazine 112 has an extended arm 145 with a mortise adapted to be slid in a longitudinal manner over the tenon formed by the lateral projections on the upper edges of the casing 3.

The cartridges 44 are guided into the chamber in the barrel —1— by the rails 146—146 depending from the inner upper surface of the casing 3.

The enlarged part 76^b of tube 76 has longitudinal recesses 148 diametrically opposite for the passage of the tooth 90 and the part 147 of the member 18.

The operation of the gun is effected by first pulling back, by means of the handle 108, the member 18 and connected parts, that is the bolt 27 and piston rod 77, the

piston 15 will not be moved. As the piston rod 77 moves towards the rear, the disk 81 will upon reaching the sleeve 65 carry the same along together with the tooth 66, which will in turn actuate the gear rack 68 transversely to thereby rotate the sector gear 74 and hence the cartridge carrier 80, so as to bring the next cartridge 44 into loading position.

Immediately the trigger 93 is actuated to lower the sear 91 and free the depending tooth 90, the piston rod 77 and parts connected therewith, the member 18, the bolt 27 and piston 15 will rush forward under the pressure of the spring 85. When the bolt 27 starts forward, it will push thereahead, the cartridge 44 into its chamber in the barrel —1—. Immediately the cartridge 44 reaches its ultimate destination in said chamber, the overhanging jaws 53, which continue with the breech bolt 27 and actuating member 18 to move forward a short distance, will snap over the primer 43 and secure the cartridge 44 for extraction. Likewise, as the bolt 27 reaches its forward position, the safety lock 45 will have moved opposite the recess 48 in the casing 3 and be free to turn on its pivot 46 under the pressure of the pin 31 carried by the member 18. The pin 31 will go forward with the member 18 the length of the slot 30 in the bolt 27 after said bolt has come to rest, whereby, after pushing away the end of the safety lock 45, to make contact with the adjacent end of the firing pin 36 to urge the same forward against the tension of the spring 39 to explode the cartridge 44.

In this firing position of the bolt 27, the same will be locked against the back pressure of the gases by the pawls 25, which will have been moved into the dotted line position illustrated in Fig. 3, whereby to permit the ends 26^a to brace against the shoulders 26^b of the bolt 27 to hold said bolt in closed position.

Immediately the explosion has occurred, the gases will force the charge along the barrel —1— and will expand, in the rear thereof, into the gas delayer 7 and gas chamber through the proper conduits to thereby force the piston 15 and connected parts towards cocked position. In this evolution of parts, the member 18 intermediately connected to said piston rod 77 will move backward a short distance through the length of slot 30 before the bolt 27 commences to move and thereby permit the beveled sides 23^a of said member 18 to make contact with the studs 24 to force the pawls 25 into normal position, as illustrated in full lines Fig. 3. The piston rod 77 continuing to move backward, the tooth 90 will ride over the spring actuated sear 91 and become engaged thereby to lock the parts in cocked position.

Just before the piston rod 77 reaches this

cocked position, the disk 81 will make contact with the collar 65 that will in turn cause the tooth 66 to move in unison therewith to actuate the rack 68, the sector gear 74 and the cartridge carrier 80, whereby the spent cartridge 44 will be carried laterally from the overhanging jaws 53 and a new cartridge 44 moved into loading position. The spent cartridge will in time be ejected from the carrier 80 out through aperture 131 in the side of the casing 3 by the finger 114.

By holding the finger on the trigger 93, the gun will continue to shoot automatically until all the cartridges 44 in the magazine 112 are exhausted.

The quantity of gas that enters the delayer 7 can be regulated by turning the handle 11, or can be entirely cut off, whereby to effect a hand operated bolt gun.

The port 121 and conduit 122 are formed for the escape of the gas in a given direction, when the piston 15 reaches its rear-most position.

When the stock 88 is assembled to the gun, the same will abut against the collar 162 of the tube 76 and force the same forward into the annular recess 163 of the end wall 102 of the casing, whereby to urge the tapered end 76^a of the tube 76 forward into the gas chamber to completely lock all the parts of the gun.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a machine gun having a gas chamber, a barrel, a cartridge carrier, a gear rack movable transversely of said gun, means connecting said gear rack with the gas chamber, whereby to cause the gases of explosion to move said gear rack to revolve the cartridge carrier, to feed cartridges to a location opposite said barrel, and a removable magazine for feeding cartridges to said carrier.

2. In a machine gun having a gas chamber, a barrel, a cartridge carrier, a gear rack movable transversely of said gun for revolving said cartridge carrier, whereby to feed cartridges to a location opposite said barrel, and means connecting said gear rack with the gas chamber, whereby to cause the gases of explosion to actuate said gear rack.

3. In a machine gun, a barrel, a cartridge carrier, a gas chamber, a piston and rod in said chamber, a sleeve holding a wedge slidingly mounted upon said piston rod, a rack, adapted to be moved by said wedge a ring having a sector gear in mesh with said rack, and having a tooth for engaging the cartridge carrier, and means permitting the gases to enter said gas chamber, whereby to revolve the cartridge carrier to feed the cartridges into loading position.

4. In a machine gun, a barrel, a rotary

cartridge carrier, a gas chamber, a piston in said gas chamber, a sleeve holding a wedge mounted upon said piston, a gear rack adapted to be actuated by said wedge, a sector gear in mesh with the teeth of said gear rack and having a spring tooth adapted to revolve said cartridge carrier, and means permitting the gases to enter said gas chamber, whereby to actuate said piston.

5. In a machine gun, a barrel, a rotary cartridge carrier having teeth formed thereon, members on said carrier for guiding the cartridges into firing position, a gas chamber, a piston in said gas chamber, and a wedge slidably mounted relative to said piston and adapted to indirectly engage said teeth on the carrier, whereby to revolve said cartridge carrier to dispose a cartridge into loading position.

6. In a machine gun, a barrel, a cartridge carrier, a gas chamber, a piston and a piston rod in said gas chamber, a sector gear having a spring tooth adapted to engage said cartridge carrier, and means connecting said sector gear with said piston rod, whereby the actuation of said piston rod will revolve said cartridge carrier to dispose a cartridge into loading position.

7. In a machine gun, a barrel, a cartridge carrier, a gas chamber, a piston rod in said gas chamber, a sector gear having a spring tooth adapted to engage said cartridge carrier, a gear rack in mesh with said sector gear, and means connecting said piston rod and gear rack, whereby the actuation of said piston rod will cause the revolution of said cartridge carrier to dispose a cartridge into loading position.

8. In a machine gun, a barrel, a cartridge carrier having teeth formed integral therewith, a gear rack having teeth, a ring having teeth in mesh with the teeth on said gear rack, a wedge for actuating said gear rack, whereby to revolve said cartridge carrier, to bring a cartridge into loading position, a bolt, means for actuating said bolt, whereby to push said cartridge into said barrel, and yielding jaws on said bolt for extracting the cartridge shell from said barrel.

9. In a machine gun, a barrel, a cartridge carrier, a breech bolt, a piston and piston rod, a sleeve holding a wedge slidably mounted upon said piston rod, teeth on said cartridge carrier, a gear rack, a ring engaging said cartridge carrier and having teeth in mesh with the teeth of the gear rack, and means for actuating said wedge, whereby to revolve the cartridge carrier to dispose a cartridge into loading position.

10. In a machine gun, a barrel, a cartridge carrier, teeth formed on said carrier, a ring adapted to engage said teeth and

having other teeth, a gear rack in mesh with said teeth on said ring, a wedge adapted to make contact with said gear rack, and means for actuating said wedge, whereby to revolve the cartridge carrier to bring the cartridges into loading position.

11. In a machine gun, a barrel, a cartridge carrier having teeth formed thereon, a bolt, a gas chamber, a ring located in said cartridge carrier and having teeth, a gear rack having teeth adapted to mesh with the teeth on said cartridge carrier, a wedge adapted to engage said gear rack, means for actuating said wedge, whereby to revolve said cartridge carrier to bring a cartridge into loading position, and means for actuating said bolt, whereby to dispose said cartridges into firing position.

12. In a machine gun, a barrel, a cartridge carrier, a gas chamber, a breech bolt carrying a firing pin, an actuator, a piston rod carrying a piston movable in said gas chamber, whereby to move the actuator for reloading and firing the gun, and said piston rod being divided transversely, one end having a cone and the other a conical recess to center the rod ends and whereby said rod and connected parts may be moved to the rear independently of said piston.

13. In a machine gun having a casing, a barrel having a chamber for the disposition of a cartridge, a cartridge carrier, a breech bolt carrying a firing pin, a safety lock having a tooth, an actuating member carrying a pin adapted to be engaged by said tooth, whereby to prevent the pin in said actuating member from striking the firing pin until the parts arrive in firing position, and a recess in said casing, whereby to receive said safety lock when the parts are in firing position, whereby to allow said pin of the actuator to move forward to strike the firing pin to explode the cartridge.

14. In a machine gun, a barrel, a rotary cartridge carrier, automatic means for revolving said cartridge carrier, a bolt carrying a firing pin, a safety lock having a tooth for preventing the actuation of the firing pin to explode the cartridge until the bolt has reached a given position, and rock pawls for locking said bolt while the gun is being fired.

15. In a machine gun, a barrel, a bolt carrying a firing pin, a safety lock having a tooth for preventing the actuation of said firing pin until the bolt has arrived in given position, a cartridge carrier, a gas chamber, means, whereby said piston is adapted to rotate the cartridge carrier to dispose a cartridge into loading position, pawls for locking the bolt while the gun is being fired and teeth for actuating said pawls.

16. In a machine gun, a barrel, a bolt carrying a firing pin, a cartridge carrier,

a gas chamber, a piston in said gas chamber, means, whereby the actuation of the piston is adapted to rotate the cartridge carrier, to place a cartridge into loading position and to actuate the bolt to reload the gun, pawls for locking said bolt while the gun is being fired, and a safety lock having a tooth for preventing the actuation of the firing pin to explode the cartridge until said cartridge has reached its chamber in the barrel. 10

In testimony whereof I have affixed my signature.

JAMES S. JOHNSTON.