March 4, 1930. R. F. HUDSON 1,749,137

MACHINE GUN

Original Filed Feb. 28, 1923 5 Sheets-Sheet 1

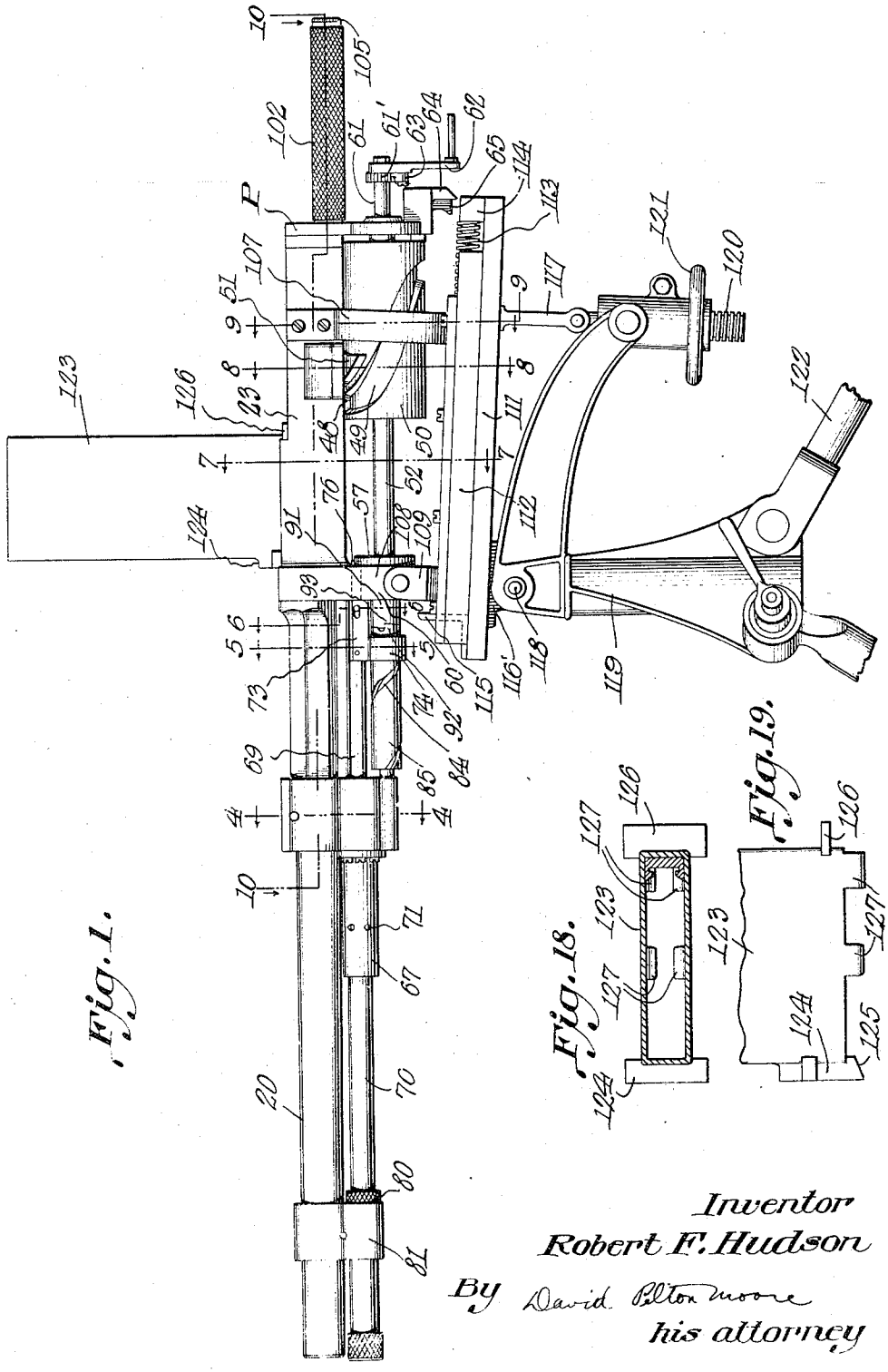


Fig. 1.

Fig. 18.

Fig. 19.

Inventor
Robert F. Hudson
By David Bolton Moore
his attorney

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MACHINE GUN

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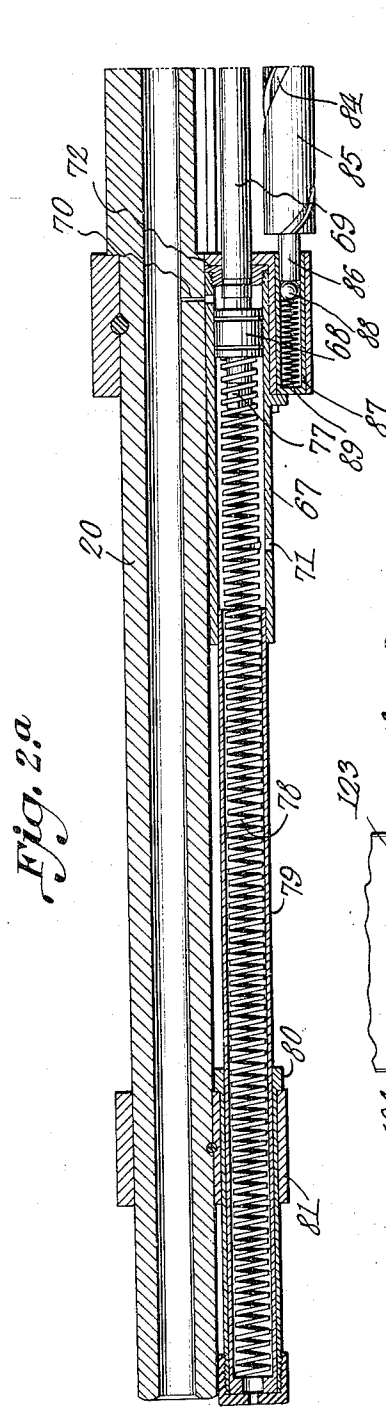


Fig. 2a.

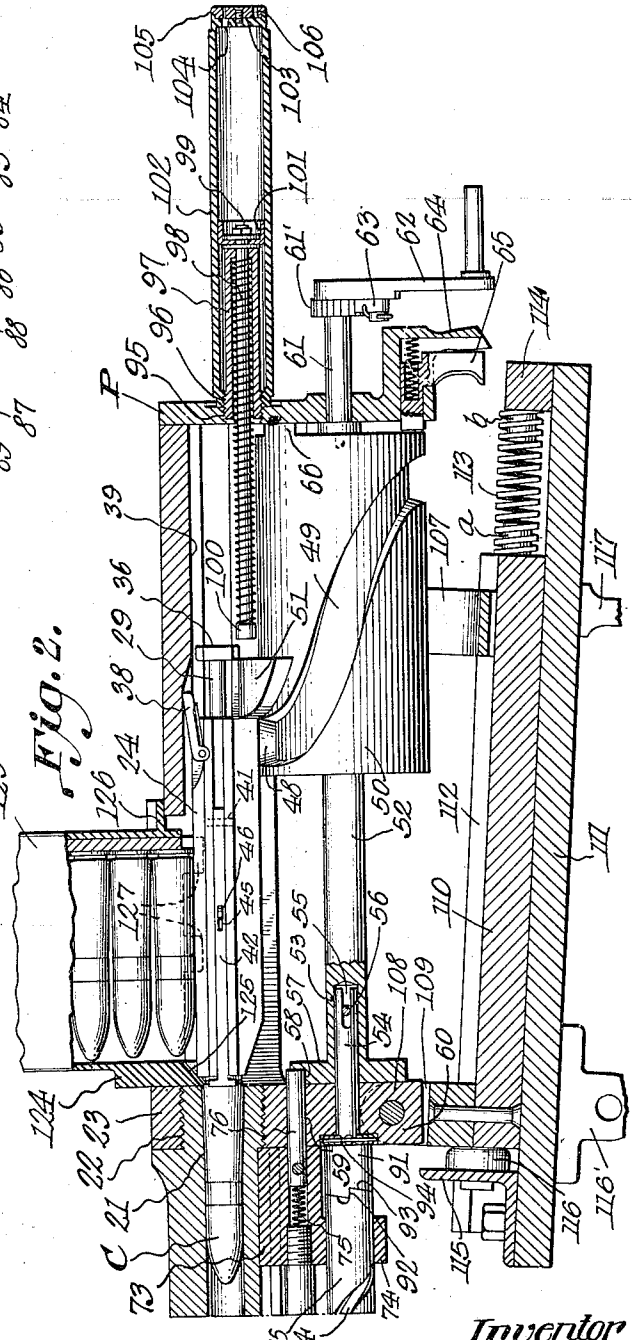


Fig. 2.

Inventor
Robert F. Hudson

By David Belton Moore
his attorney

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MACHINE GUN

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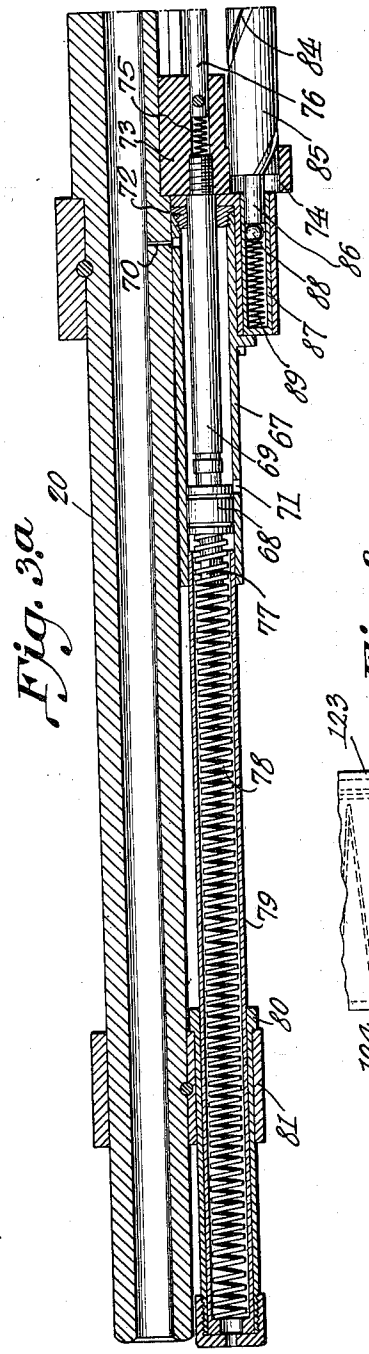


Fig. 3a.

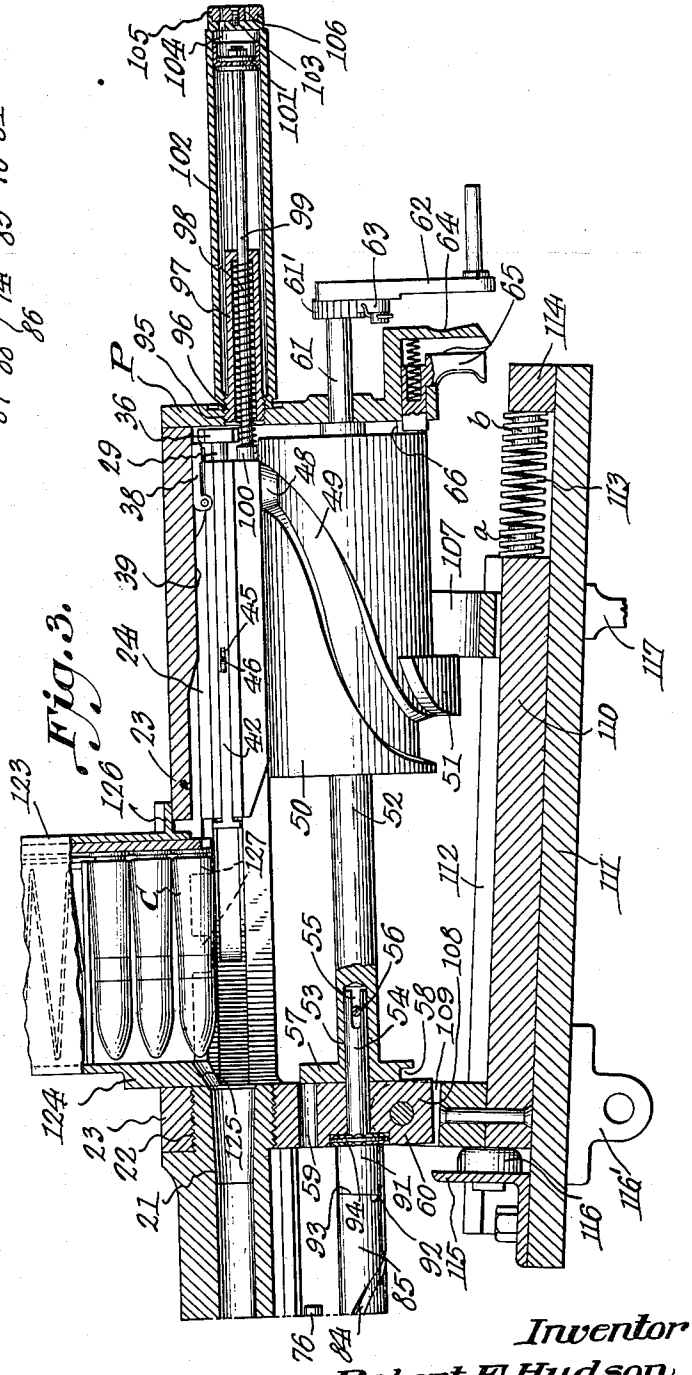


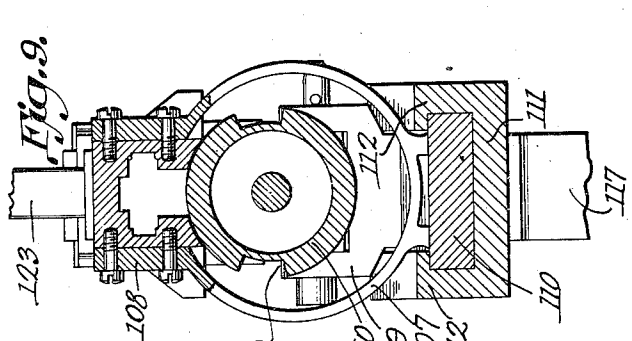
Fig. 3.

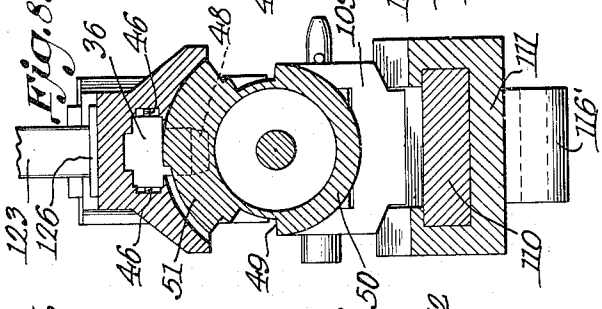
Inventor
Robert F. Hudson
By David Pelton Moore
his attorney

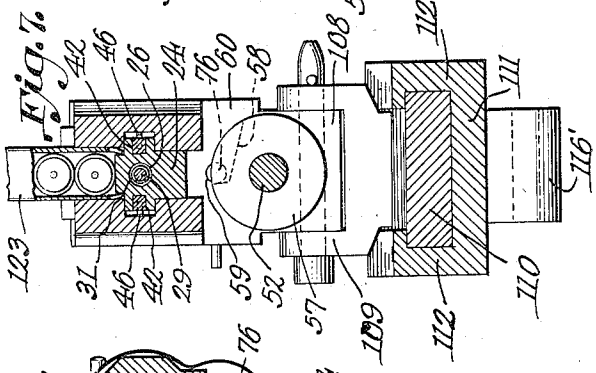
March 4, 1930. R. F. HUDSON 1,749,137

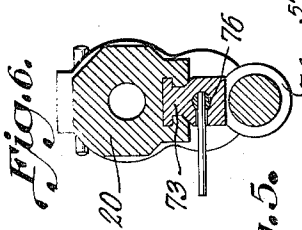
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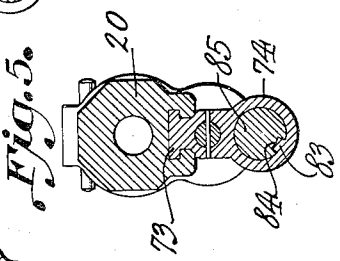
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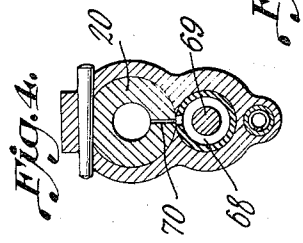


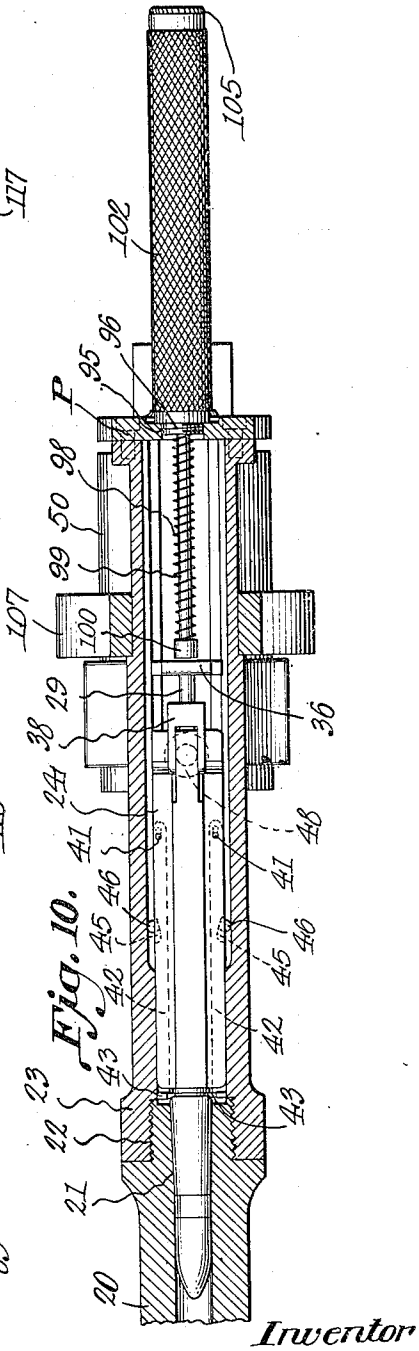










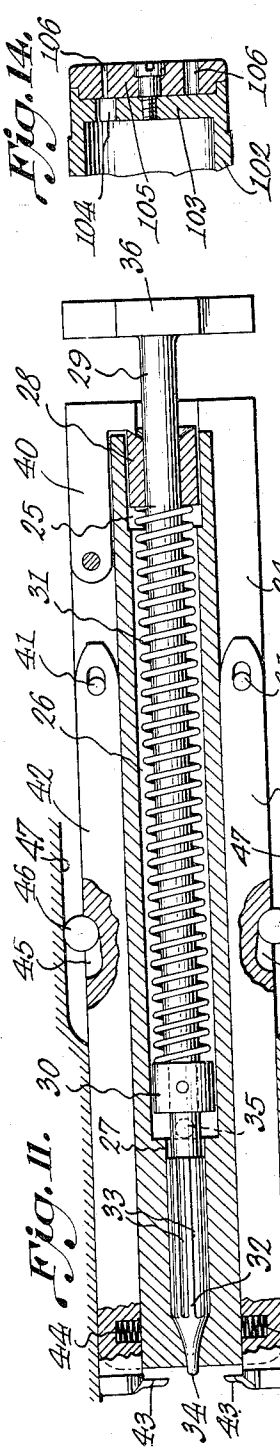


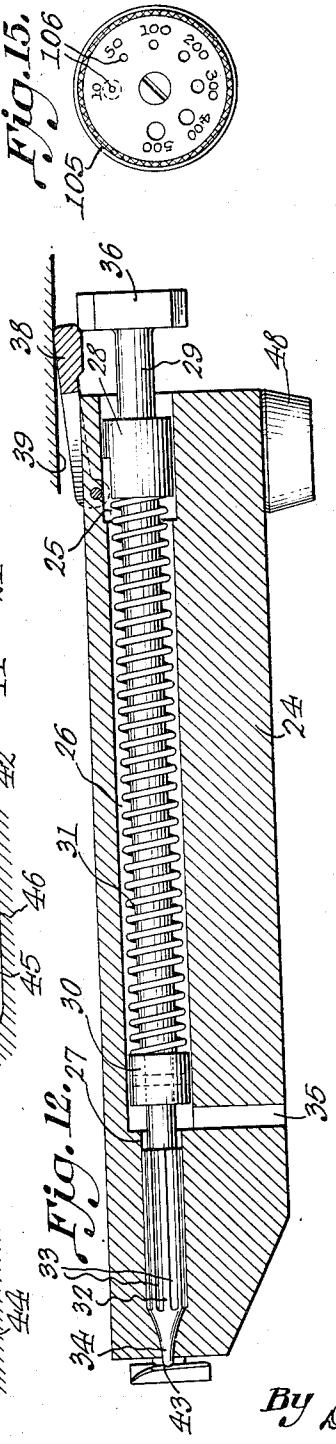
Inventor
Robert F. Hudson
By David Pelton Moore
his attorney

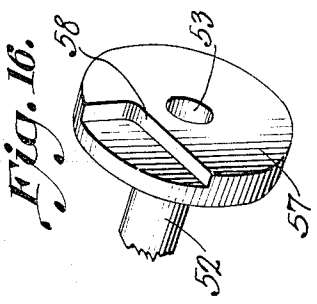
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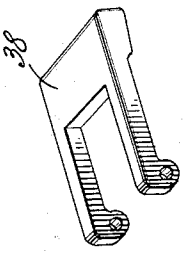
MACHINE GUN

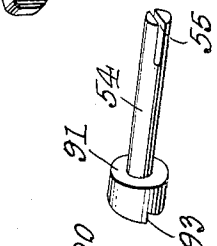
Original Filed Feb. 28, 1923 5 Sheets-Sheet 5

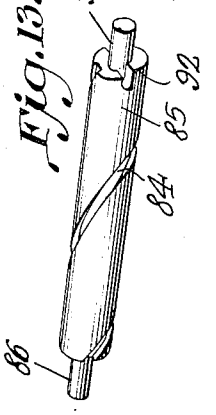












Inventor
Robert F. Hudson
By David Pelton Moore
his attorney

Patented Mar. 4, 1930 1,749,137

UNITED STATES PATENT OFFICE

ROBERT F. HUDSON, OF RICHMOND, VIRGINIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO AUTOMATIC GUNS, INC., OF WASHINGTON, DISTRICT OF COLUMBIA, A CORPORATION OF DELAWARE

MACHINE GUN

Application filed February 28, 1923, Serial No. 621,824. Renewed February 28, 1927.

This invention relates to improvements in machine guns, one object of the invention being the provision of a gun of this character which may be operated as a single shot mechanically operated gun, or which can be automatically operated for intermittent or continuous firing.

A further object of this invention is the provision of a machine gun in which gas and spring actuated means are employed to operate the breech block to insert a cartridge, set and release the sear, extract and expel the shell.

A still further object of this invention is the provision of adjustable means at will to regulate at will the speed at which the gun will operate continuously automatic, thus providing in a gun of this type a wide range of speed from a comparatively slow to an exceedingly rapid firing gun.

A still further and very important object of this invention is the provision of a machine gun the particular construction of which permits of its type being made in various sizes such as 30 and 50 calibre, 20 and 37 millimetres, without changing the general construction, except that the parts are made heavier, but yet not so heavy as the usual guns of these sizes, particularly of the latter two above mentioned.

In the accompanying drawings:—

Figure 1 is a side elevation of the complete machine gun, with the lower portion of the tripod not shown.

Figures 2 and 2ª read together illustrates a longitudinal section through the gun, with a cartridge in the breech of the barrel just previous to the release of the sear.

Figures 3 and 3ª read together illustrates a similar section to Figures 2 and 2ª with the breech block in retracted position, the spring of the automatic means retracted, and just previous to the insertion and firing of the next cartridge.

Figure 4 is a section taken on line 4—4 of Figure 1.

Figure 5 is a section on line 5—5 of Figure 1.

Figure 6 is a section on line 6—6 of Figure 1.

Figure 7 is a section on line 7—7 of Figure 1.

Figure 8 is a section of line 8—8 of Figure 1.

Figure 9 is a section of line 9—9 of Figure 1.

Figure 10 is a section on line 10—10 of Figure 1.

Figure 11 is an enlarged longitudinal sectional view of the breech block showing the complete firing pin or sear, and the cartridge grips and actuator.

Figure 12 is a similar view taken at right angles to that of Figure 11.

Figure 13 is a detail perspective view of the spiral cam and ratchet or clutch actuator for the main rotary cam.

Figures 14 and 15 are detail views of the dial and speed adjusting device.

Figure 16 is a detail perspective view of the disk member of the locking device.

Figure 17 is a perspective view of the firing pin lock.

Figures 18 and 19 are detail views of the cartridge magazine.

Referring to the drawings, the numeral 20 designates the barrel, which is provided with the chamber 21 and the threaded portion 22 by means of which it is attached to the receiver 23, which is open top and bottom, and sealed at the rear by the plate P. Mounted for reciprocation in a straight line movement with the receiver is the breech block 24, which as shown in Figures 11 and 12, is bored to provide the chambers 25, 26 and 27 of varying diameters and to receive the abutment member 28 held removably in place by means of the pivoted catch 40. The rod 29 slides within this block and carries the abutment 30 for the spring 31, which tends to propel the firing pin 32 to project its cap engaging end. The body portion of the firing pin is grooved as at 33, so that should the cap burst and gas pressure be released in the direction of the breech block the gas will escape through these grooves and the port 35. This is a very important feature. Upon the outer end of the pin 29 is the head 36, by means of which as will presently appear the firing pin is retracted and "set", the U-shaped lock 38 is

provided during the retraction of the breech block to engage the wall 39 of the receiver and engage the inner edge of the head 36 and hold the pin against forward movement and with the fulminating cap engaging end 34 retracted within the block, so that there is no chance of the same accidentally engaging the cap to prematurely explode the same. It also permits the employment of a single member or sear 29, instead of a two sectioned one, the forward section of which is "set back" by a light spring in the usual way. The cartridge holder and extractor consists of the two strips 42, each one of which is mounted in a groove upon diametrically opposite sides of the breech block and pivoted at 41, so that the rim engaging terminals 43 will be permitted the necessary movement to and from each other to engage and release the cartridge or its shell, the spring 44 acting to release the same, while the roller 46, mounted in the inclined recesses 45 and cooperating with the adjacent portions 47 of the receiver during the movement of the block operate to press the strips 42 toward each other and hold the same in such position when inserting and holding a cartridge in the breech of the barrel, withdrawing the same and until the releasing point, at which time the rollers permit the springs 44 to act and release the shell, which falls by gravity. As the block is started forward, the next cartridge is permitted to drop between the rim engaging lugs 43, which are then moved into gripping position.

In order that the breech block may be positively reciprocated, the antifrictional stud 48 fits within the spiral or cam groove 49 of the actuating cylinder 50, which in turn is provided with the sear or firing pin setting cam 51 the rear edge of the latter engaging the head 36 just as the breech block has delivered the cartridge C within the breech of the barrel, and retracting the firing pin against its propelling spring and then releasing the same to explode the cap, the stud 48 then being in the extremest forward portion of its cam groove, which is so shaped as to permit movement enough to the cylinder 50 to accomplish this result.

The shaft 52 is fast to the cylinder and rotates therewith, and its socket 53 receives the short shaft 54 which is caused to rotate with the shaft 52 through the coupling 55 and 56. A locking disk 57 is carried by the shaft 52 and is provided with the lock receiving recess 58, the same when aligned with the opening 59 being adapted to receive the lock 76, as will presently appear. This opening 59 is formed in the lug 60.

At the rear face of the operating cylinder 50 is a shaft 61, journaled in the cap or plate P, and has keyed or pinned thereto the ratchet 61, which through the pawl 63, permits the operating manual handle or crank 62 to be connected to manually rotate the cylinder 50.

Projecting from the plate P is the guard 64, for the spring projected trigger 65, which abuts the lug 66 of the cylinder 50 to prevent the same from rotating or being rotated.

Mounted under the barrel is a cylinder 67 for the reception of the gas propelled plunger or piston 68, the same being connected to the piston rod 69, so that the gas of explosion will enter through the port 70 into the cylinder 67 to the rear of the piston, propel the piston forward and exhaust through the port 71.

The rod 69 slides through the removable head 72 and is connected to the block 73, whose apertured lug 74 surrounds the actuating cylinder 85 so that its actuating lug 83 slides in the spiral groove 84, the purpose of which will presently appear. The locking pin 76 is mounted for slight cushioned sliding movement and is carried by the block 73, the spring 75 providing the cushion so that when the lock is projected with force rearwardly through the opening 59 and against the adjacent face of the disk 57, the lock will be cushioned until the recess 58 is positioned to receive the lock, and should the last cartridge have been exploded, this lock will then hold the shaft 52 and consequently the cylinder 50 from further rotation.

The projecting end 77 of the rod 69, fits within the rear end of the spring compression 78, mounted in the tubular casing 79, which is properly supported at its forward end through the short tube 80 and the strap 81 carried by the barrel, the apertured cap sealing the outer end and abutting the outer end of the spring, so that when the piston 68 is propelled forwardly as shown in Figure 3ª, the spring 78 will be compressed and the block 73 will be moved from the rear position (Fig. 3ª) of Figure 2 to the present position. When this action took place the lug 83 moving in its groove 84 caused the cylinder 85 to rotate so that the clutch composed of the shouldered and cam faces 92 and 93 rode over each other without moving the shaft 54, which is connected to the head 91, but the instant that the gas was released through the port 71, the piston was placed under the action of the compressed spring 78, which then moved the piston rearwardly and consequently the block 73, whose lug 83 riding in the groove 84 as shown in Figure 5 rotated the cylinder in the opposite direction so that the clutch 92 93 engaged and the shaft 54 and cylinder 50 were rotated to retract the breech bolt, withdraw and release the shell, move the breech block forward to engage the next cartridge and insert it within the breech of the barrel, the firing pin being again set and released, so that the actuation will continue. The short shaft 90 is fitted in the head 91 for free rotation so that the head 91 acts as a journal therefor, and a ball bearing 94

is mounted to antifrictionally receive the thrust of the head 91.

In order to provide a means whereby the firing may be speeded up or retarded, there is mounted upon the plate P, in the threaded opening 95, the head 96 of the spring holding chamber or tubular member 97, so that the spring 98 may be properly housed. The piston rod 99 slides in the member 97, and has the spring mounted thereon to normally project the breech block engaging head 100 into engagement with the breech block, while the piston 101 moves in the cylinder 102, removably attached to the member 97. This cylinder 102 also acts as a handle by means of which the gun may be moved in aiming. By this means a spring and air cushion is provided to check the rearward movement of the breech block, and it has been found in practice that by providing the air check and an adjustable means for regulating the escape of air from the rear of the piston during the rearward movement thereof, that the action of the breech block, and consequently the speed of firing may be regulated. This is accomplished by providing the port 104 in the cap 103, and attaching for rotation the dialed disk 105, having the graduated ports 106, the detailed construction of which is clearly shown in Figures 14 and 15.

In order to mount this gun in such a manner as to absorb the recoil and steady the same for accuracy, and this has been accomplished with a 20 mm. gun in practice, the strap 107, and attaching member 108 are carried by the receiver. The member 108 is attached to the lugs 109 which are in turn fast to the reciprocating mount 110, to whose rear end the strap 107 is attached. This mount is fitted in the guide 111 having the grooved walls 112, and is cushioned in its rearward movement by the springs 113, held in place by the strip 114, and the studs *a* and *b*. The forward movement of the mount 110 is limited by the strip 115 and the cushioning studs 116. The support 111 is attached to a tripod by means of the pivoting member 116′ and the arm 117, which engage respectively the support 119 and the adjusting screw 120 of the tripod mount 122, the wheel 121 being employed to tilt the mount and elevate or lower the gun.

The magazine 123 is a rectangular casing, having the cartridge guiding member 124 with the guide 125 at its under face and as shown in Figures 2 and 3 disposed to guide the bullet end of the cartridge into the breech of the barrel as the breech block engages the rim and proceeds to grip the same and push the cartridge forwardly. The rest 126 engages the receiver at the rear of its upper opening so that the magazine is sufficiently supported to permit the operation of the gun and the successive feeding of the cartridges. In order to hold the cartridges in the magazine and against accidental movement, the two pairs of resilient clips 127 are employed.

Operation

Assuming that the gun has its parts in the position as shown in Figures 3–3ª, the trigger has engaged the lug 66 and the cylinder 50 cannot be moved. The trigger is released, and as the spring 78 is under compression the piston 68 is moved rearwardly and the cylinders 85 and 50 are moved, and during this movement, the breech block is moved forwardly to engage a cartridge C, the rollers 46 having closed the strips 42, and caused the rim of the cartridge to have been gripped. The block continues to move the cartridge whose bullet engages the guide 125 and enters the breech of the barrel, where it is seated, and sealed, the cam 51 then engaging the head 36, setting and releasing the sear, at which instant the cartridge is exploded, and the gas therefrom behind the bullet enters the port 70 and chamber 67 to propel the piston 68 forwardly. This action again compresses the spring, the action will continue just as long as the trigger 65 is retracted and the cartridges are fed from the magazine.

Should a "miss fire" happen, the lock 76 being in the opening 59 will then seat in the recess 58 and lock the disk 57 and the cylinder 50 against further movement, thus guarding against this dangerous action in a machine gun.

In first starting the gun, the trigger is retracted, and as the spring 78 is not compressed, the crank 62 is manipulated to rotate the cylinder 50 and project the breech block and cock and release the sear. After the first cartridge is exploded in this manner the operation can be then continued as a single shot by pulling and releasing the trigger, as an intermittent automatic by intermittently retracting and releasing the trigger and as a continuous automatic by retracting and holding the trigger.

The present gun is so constructed, due to the rotary cam that operates the breech block and also sets and releases the firing pin or sear, that there is caused what is termed a "delayed action" just after the cartridge is exploded by the release of the firing pin, and this delayed action permits of the easy extraction of the spent or fired cartridge and also eliminates the heavy shocks on the mechanisms due to attempts to extract during the period of high pressure which is the case with guns of the conventional type with direct action of the mechanism which begins to extract almost instantly after the cartridge is fired.

What I claim, as new, is:—

1. A machine gun including a barrel, a receiver, a breech block mounted for slidable movement within the receiver, a firing pin

carried by the breech-block, a rotatable member disposed at the rear of the receiver, cooperative means carried by the breech-block, and the rotatable member, for retracting and projecting the breech-block, cooperative means carried by the firing pin and also the said rotatable member whereby the firing pin is retracted and released at the closing operation of the breech-block, and a spring actuated and gas released locking device for locking the rotary member against rotation should a cartridge fail to explode when operated upon by the firing pin.

2. A machine gun including a barrel, a receiver, a breech block mounted for slidable movement within the receiver, a firing pin carried by the breech block, a rotatable member disposed at the rear of the receiver, cooperative means carried by the breech-block and the rotatable member for retracting and projecting the breech-block, cooperative means carried by the firing pin and by the said rotatable member whereby the firing pin is retracted and released at the closing operation of the breech-block, said receiver being open upon opposite sides adjacent the breech of the barrel, and means for delivering a cartridge from above, means carried in the forward end of the breech-block for gripping the base of the cartridge whereby the cartridge is held during the movement forward, the explosion thereof and released at the final retracting movement of the breech-block.

3. A machine gun including a barrel, a receiver mounted adjacent the breech thereof and provided with a forward chamber open at opposite sides, one side being the cartridge entrance and the other side being the shell outlet, a slidingly mounted breech block for closing the receiver mounted for movement to and from the breech of the barrel, a spring actuated firing pin carried thereby, a rotatable cylinder mounted in the receiver and provided with a cam groove in the surface thereof, means carried by the breech block and disposed in the grooves whereby the rotation of the cylinder moves the breech block to and from the breech of the barrel producing a momentary halt of the breech at the closing of the breech of the barrel, and cooperative means carried by the cylinder and the firing pin whereby the firing pin is retracted and released during said momentary halting of the breech block.

4. A machine gun including a barrel, a receiver mounted adjacent the breech thereof and provided with a forward chamber open at opposite sides, one side being the cartridge entrance and the other side being the shell outlet, a slidingly mounted breech block for closing the receiver mounted for movement to and from the breech of the barrel, a spring actuated firing pin carried thereby, a rotatable cylinder mounted in the receiver and provided with a cam groove in the surface thereof, means carried by the breech block and disposed in the groove whereby the rotation of the cylinder moves the breech block to and from the breech of the barrel producing a momentary halt of the breech at the closing of the breech of the barrel, cooperative means carried by the cylinder and the firing pin whereby the firing pin is retracted and released during said momentary halting of the breech block, and means carried in the forward end of the breech block for gripping the base of the cartridge whereby the cartridge is held during the movement forward, the explosion thereof, and released at the final retracting movement of the breech block.

5. A machine gun including a receiver, a barrel, a breech block mounted in the receiver, a rotatable cylinder also mounted in the receiver, cooperative means carried by the breech block and cylinder for reciprocating the breech block due to the rotation of said cylinder, and gas and spring actuated means disposed adjacent to the barrel and operably connected to rotate said cylinder.

6. A machine gun including a receiver, a barrel, a breech block mounted in the receiver, a rotatable cylinder also mounted in the receiver, cooperative means carried by the breech block and cylinder for reciprocating the breech block due to the rotation of said cylinder, gas and spring actuated means disposed adjacent to the barrel and operably connected to rotate said cylinder, and manual means for operating said cylinder.

7. A machine gun including a receiver, a barrel, a breech block mounted in the receiver, a rotatable cylinder also mounted in the receiver, cooperative means carried by the breech block and the cylinder for reciprocating the breech block due to the rotation of said cylinder, gas and spring actuated means disposed adjacent to the barrel and operably connected to rotate said cylinder, and cooperating locking means for locking the cylinder against rotation at the final shot or at a misfire.

8. A machine gun including a receiver, a barrel, a breech block mounted in the receiver, a rotatable cylinder also mounted in the receiver, cooperative means carried by the breech block and cylinder for reciprocating the breech block due to the rotation of the cylinder, gas and spring actuated means disposed adjacent to the barrel and operably connected to rotate said cylinder, manual means for operating the cylinder, and cooperating locking means for locking the cylinder against rotation at the final shot or after a misfire.

9. A machine gun including a receiver, a barrel, a breech block mounted in the receiver, a rotatable cylinder also mounted in the receiver, cooperative means carried by

the breech block and the cylinder for reciprocating the breech block due to the rotation of the cylinder, gas and spring actuated means disposed adjacent the barrel and operably connected to rotate said cylinder, and a cartridge nose elevating means operated by the cylinder.

10. A machine gun including a receiver, a barrel, a breech block mounted in the receiver, a rotatable cylinder also mounted in the receiver, cooperative means carried by the breech block and cylinder for reciprocating the breech block due to the rotation of the cylinder, gas and spring actuated means disposed adjacent the barrel and operably connected to rotate said cylinder, and a reciprocating cartridge nose elevating means operated by the cylinder.

11. A machine gun including a receiver, a barrel, a breech block mounted in the receiver, a rotatable cylinder also mounted in the receiver cooperative means carried by the breech block and the cylinder for reciprocating the breech block due to the rotation of the cylinder, gas and spring actuated means disposed adjacent the barrel and operably connected to rotate said cylinder, and a cushion disposed in the rearward path of the breech block.

12. A machine gun including a receiver, a barrel, a breech block mounted in the receiver, a rotatable cylinder also mounted in the receiver, cooperative means carried by the breech block and cylinder for reciprocating the breech block due to the rotation of the cylinder, gas and spring actuated means disposed adjacent the barrel and operably connected to rotate said cylinder, and an adjustable cushion disposed in the rearward path of the breech block.

13. A machine gun including a receiver, a barrel, a breech block mounted in the receiver, a rotatable cylinder also mounted in the receiver, cooperative means carried by the breech block and cylinder for reciprocating the breech block due to the rotation of the cylinder, a tube disposed parallel to the barrel and having a cylinder at one end in communication with the bore of the barrel to receive discharged gas from the barrel, a spring returned plunger mounted in the cylinder and tube, a rotatable member operated by the reciprocation of the plunger, and clutch means for connecting and disconnecting the latter from the rotatable cylinder, whereby the cylinder is not in operation when the plunger is operated by the gas, and is rotated when operated by the spring.

14. A machine gun including a receiver, a barrel, a breech block mounted in the receiver, a rotatable cylinder also mounted in the receiver, cooperative means carried by the breech block and cylinder for reciprocating the breech block due to the rotation of the cylinder, a tube disposed parallel to the barrel and having a cylinder at one end in communication with the bore of the barrel to receive discharged gas from the barrel, a spring returned plunger mounted in the cylinder and the tube, a rotatable member operated by the reciprocation of the plunger, clutch means for connecting and disconnecting the latter from the rotatable cylinder whereby the cylinder is not in operation when the plunger is operated by the gas and is rotated when operated by the spring, and cooperative locking means carried by the cylinder and plunger operative after the last cartridge is fired or after a misfire takes place.

15. A machine gun including a receiver, a barrel, a breech block mounted in the receiver, a rotatable cylinder also mounted in the receiver, cooperative means carried by the breech block and the cylinder for reciprocating the breech block due to the rotation of the cylinder, gas and spring actuated means disposed adjacent the barrel and operably connected to rotate said cylinder, cooperating locking means for locking the cylinder against rotation at the final shot or after a misfire, and manually operated means for releasing the cylinder.

16. A machine gun including a receiver, a barrel, a breech block mounted in the receiver, a rotatable cylinder also mounted in the receiver, cooperative means carried by the breech block and the cylinder for reciprocating the breech block due to the rotation of the cylinder, a tube disposed in parallel to the barrel and having a cylinder at one end in communication with the bore of the barrel to receive discharged gas from the barrel, a spring returned plunger mounted in the cylinder and tube, a rotatable member operated by the reciprocation of the plunger, clutch means for connecting and disconnecting the latter from the rotatable cylinder whereby the cylinder is not in operation when the plunger is operated by the gas and is rotated when operated by the spring, and manually operated means for releasing the cylinder.

17. A machine gun including a receiver, a barrel, a breech block mounted in the receiver, a rotatable cylinder also mounted in the receiver, cooperative means carried by the breech block and cylinder for reciprocating the breech block due to the rotation of the cylinder, a tube disposed in parallel to the barrel and having a cylinder at one end in communication with the bore of the barrel to receive the discharged gas from the barrel, a spring returned plunger mounted in the cylinder and tube, a rotatable member operated by the reciprocation of the plunger, clutch means for connecting and disconnecting the latter from the rotatable cylinder whereby the cylinder is not in operation when the plunger is operated by the gas and is rotated when operated by the spring, cooperative locking means carried by the cylinder and

plunger operative after the last cartridge is fired or a misfire takes place, and manually operated means for releasing the cylinder.

18. In a machine gun including a barrel, a receiver, a breech block in the receiver mounted for movement to and from the breech of the barrel, a spring actuated firing pin carried thereby, a rotatable cylinder in the receiver, means to rotate the cylinder, cooperating means between the receiver and the cylinder whereby the rotation of the cylinder moves the breech block to and from the breech and to produce a momentary halt of the block at the breech, cooperative means between the cylinder and the firing pin whereby the same is retracted during the rotation of the cylinder and released during the halt of the breech block to fire the gun, and means to cushion the recoil of the gun at firing.

19. In a machine gun including a receiver, a barrel, a breech block mounted in the receiver, a rotatable cylinder also mounted in the receiver, cooperative means carried by the breech block and cylinder for reciprocating the breech block due to the rotation of the cylinder, a tube disposed parallel to the barrel and in communication with the bore of the barrel to receive discharged gas from the barrel, a spring returned plunger mounted in the tube and adapted to be forced toward the muzzle of the gun to compress the spring, a rotatable member operated by the return of the plunger under spring tension, and a clutch means for connecting and disconnecting the latter from the rotating cylinder.

20. A machine gun including a receiver, a barrel, a breech block mounted in the receiver, a rotatable cylinder also mounted in the receiver, cooperative means between the breech block and cylinder for reciprocating the breech block due to the rotation of the cylinder, a tube disposed parallel to the barrel and in communication with the bore of the barrel, a spring returned plunger mounted in the tube and adapted to be forced toward the muzzle of the gun to compress the spring and to counteract the powder reaction exerted in a rearward direction on discharge of the gun by directing the working powder pressure in a forward direction toward the muzzle.

21. In a machine gun including a receiver, a barrel, a breech block mounted in the receiver, a rotatable cylinder also mounted in the receiver, cooperative means carried by the breech block and cylinder for reciprocating the breech block due to the rotation of the cylinder, a tube disposed parallel to the barrel and in communication with the bore of the barrel to receive discharged gas from the barrel, a spring returned plunger mounted in the tube and adapted to be forced toward the muzzle of the gun to counteract the powder reaction exerted in a rearward direction on discharge of the gun by directing the working powder pressure against the spring returned plunger to force it in a forward direction toward the muzzle, and means to rotate the cylinder.

22. In a machine gun including a firing pin, means for positioning cartridges to be struck by said firing pin, means for operating said firing pin, a locking device for preventing operation of said firing pin operating means, a spring for actuating said locking device, and means whereby the locking device will be released by gas from a subsequent explosion.

23. A machine gun comprising a receiver, a barrel, a breech block mounted in the receiver, a rotatable cylinder also mounted in the receiver, cooperative means carried by the breech block and cylinder for causing the reciprocation of the breech block by the rotation of the cylinder, a device disposed adjacent the barrel and operatively connected to rotate said cylinder, a gas compressed spring for operating said device, and mechanical means for operating the cylinder.

24. A machine gun comprising a receiver, a barrel, a breech block mounted in the receiver, a rotatable cylinder also mounted in the receiver, cooperative means carried by the breech block and cylinder for causing the reciprocation of the breech block by the rotation of the cylinder, a device disposed adjacent the barrel and operatively connected to rotate said cylinder, a gas compressed spring for operating said device, mechanical means for operating the cylinder, and means for locking the cylinder against rotation at the final shot or after a misfire.

25. A machine gun, including a receiver, a barrel, a reciprocatory breech block mounted in the receiver, rotary means for reciprocating the breech block, and gas and spring actuated means and external means for operating the rotary means.

26. A machine gun, including a receiver, a barrel, a reciprocatory breech block mounted in the receiver, rotary means for reciprocating the breech block, and gas and spring actuated means and external means for operating the rotary means, the external means being capable of operation in conjunction with or independently of said gas and spring actuated means.

27. A machine gun, including a receiver, a barrel, a reciprocatory breech block mounted in the receiver, rotary means for reciprocating the breech block, and a power storing device for operating the rotary means, said device having its power stored due to the explosion of the cartridge and actuating the rotary means with the power stored thereby.

28. A machine gun according to claim 27, characterized by the fact that the rotary means is stationary during the period of power storage.

29. A machine gun according to claim 27,

characterized by the fact that there is external means for operating the rotary means independently of or in conjunction with the power storing device.

30. A machine gun according to claim 27, characterized by the fact that there is means disposed in the path of the breech block for regulating the speed of rearward movement of the breech block.

31. A machine gun according to claim 27, characterized by the fact there is means disposed in the path of the breech block for regulating the speed of recoil thereof, that said latter means is adjustable at will to slow down or speed up the movement of the breech block and consequently the rate of fire.

32. A machine gun, including a barrel, a receiver, a reciprocatory breech block mounted in the receiver, and rotary means for reciprocating the breech block and for causing a momentary halt in the breech block during the time of the positioning of the cartridge in the barrel and firing the same.

33. A machine gun, including a barrel, a receiver, a reciprocatory breech block, a firing pin carried by the breech block, and rotary means for reciprocating the breech block and retracting and releasing the firing pin, the breech block being momentarily halted during the retracting and releasing of the firing pin.

34. A machine gun, including a barrel, a receiver, a reciprocatory breech block mounted in the receiver, a spring propelled firing pin bodily carried by the breech block, and rotary means for reciprocating the breech block and during such action to retract and release the firing pin, the breech block being momentarily halted during the operation of the firing pin, whereby a delayed action results that permits of the easy extraction of the fired cartridge.

35. A machine gun, including a barrel, a receiver, a reciprocating breech block mounted in the receiver, a rotary actuator for the breech block, a rotary operating means for said actuator, cooperating means between the latter two means whereby the actuator is operated only when the operating means is rotated in one direction, and gas set and spring returned means for rotating the actuator operating means when gas operated and for rotating the operating means when spring operated.

36. A machine gun, including a barrel, a receiver, a reciprocating breech block mounted in the receiver, a rotary actuator for the breech block, a rotary operating means for said actuator, cooperating means between the latter two means whereby the actuator is operated only when the operating means is rotated in one direction, gas set and spring returned means for rotating the actuator operating means when gas operated and for rotating the operating means when spring actuated, and external means for rotating the actuator.

37. A machine gun according to claim 35, in which there is an external means for rotating the actuator independently of or in conjunction with the rotary operating means.

38. A machine gun, including a barrel, a receiver, a reciprocating breech block mounted in the receiver, a rotary actuator for the breech block, a rotary operating means for said actuator, cooperating means between the latter two means whereby the actuator is operated only when the operating means is rotated in one direction, a plunger operated upon by the gas of explosion to rotate the operating means in non-operating direction, and a spring adapted to be compressed by the plunger and to when released return the plunger and operate the operating means in the direction to operate the actuator and reciprocate the breech block.

39. A machine gun according to claim 38, in which there is an external means for rotating the actuator independently of or in conjunction with the rotary operating means.

40. A machine gun, including a barrel, a receiver, a reciprocating breech block mounted in the receiver, a rotary breech block actuator, a rotary cylinder, cooperative means for connecting the actuator and cylinder whereby the actuator is inactive as the cylinder is rotated in one direction and is rotated thereby when the cylinder is rotated in the opposite direction, gas set and spring actuated means for rotating the cylinder, and cooperative means carried by the cylinder and the last means whereby the cylinder has rotary movement imparted thereto as the gas and spring actuated means is operated.

41. A machine gun according to claim 40, in which external means for rotating the actuator is provided.

42. A machine gun according to claim 40, in which external means for rotating the actuator independently of or in conjunction with the rotary operating means is provided.

43. A machine gun, including a barrel, a receiver, a reciprocating breech block mounted in the receiver, a rotary breech block actuator, a rotary cylinder, a one-way clutch for connecting the actuator and cylinder whereby the actuator is operated when the clutch is moved in one of two directions, gas set and spring actuated means for rotating the cylinder, and cooperative means carried by the cylinder and the last means whereby the cylinder has rotary movement imparted thereto as the gas and spring actuated means is operated.

44. A machine gun, according to claim 43 in which external means is provided also for rotating the actuator.

45. A machine gun, according to claim 43 in which there is provided external means for rotating the actuator independently of or in

conjunction with the rotary operating means.

46. A machine gun according to claim 35, in which there is provided manually actuted means for halting and releasing the actuator at will.

47. A machine gun according to claim 35, in which there is provided automatic means for halting the actuator due to a misfire or the firing of the last cartridge.

48. A machine gun, including a barrel, a receiver, a reciprocating breech block mounted in the receiver, a spring propelled firing pin carried by the breech block, a rotary cylinder mounted in the receiver, cooperative means carried by the breech block and cylinder whereby as the cylinder is rotated the breech block is reciprocated, cooperative means carried by the firing pin and the cylinder whereby the firing pin is retracted and released during the rotation of the cylinder, and means for rotating the cylinder, said last means including a gas actuated and spring returned member adjacent the barrel, and means for operably connecting the same to the breech block to reciprocate the latter only when the member is spring actuated.

49. A machine gun according to claim 48, in which the cooperative means between the firing pin and the cylinder and that between the cylinder and breech block, as the cylinder is rotating causes the breech block to close the breech of the barrel and momentarily halt during the release of the firing pin and causes the breech block to start retracting only after the discharge of the cartridge and the release of pressure in the breech of the barrel.

50. A machine gun according to claim 48, in which the operating means is a gas set and spring actuated device.

51. A machine gun according to claim 48, in which the operating means is a gas set and spring actuated means, and has a means selective at will for halting and releasing the cylinder while under the action of the spring.

In testimony whereof I affix my signature.

ROBERT F. HUDSON.