No. 683,240. Patented Sept. 24, 1901.

F. ALESSI.

MACHINE GUN.

(Application filed Jan. 21, 1901.)

(No Model.) 3 Sheets—Sheet 1.

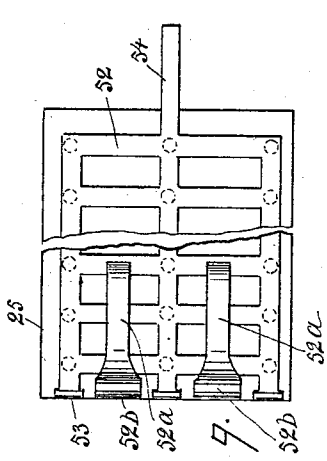


Fig. 9.

Fig. 7.

WITNESSES

Chas. Stewart

Louis A. Gudice

Federico Alessi
INVENTOR

BY Edgar Tate & Co
ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C

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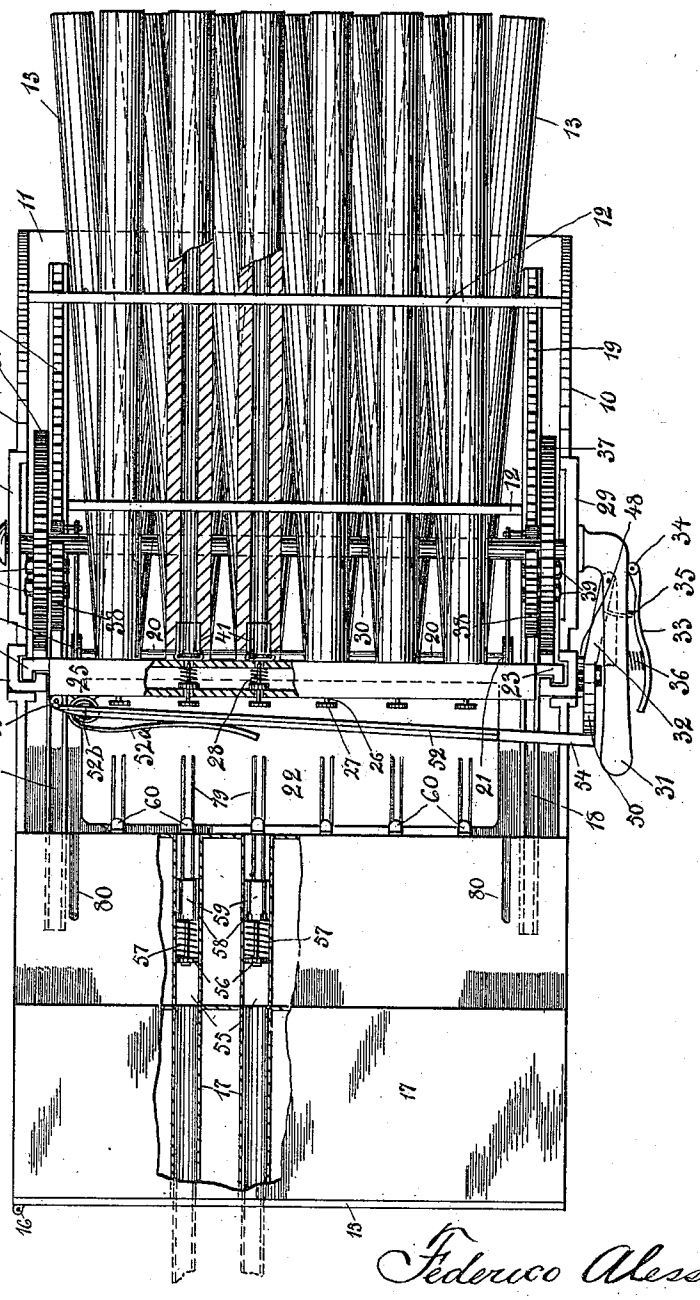


Fig. 2.

WITNESSES

F. A. Stewart

Louis A. Guidice

Federico Alessi

INVENTOR

BY Edgar Tate & Co

ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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(No Model.) 3 Sheets—Sheet 3.

Fig. 3.

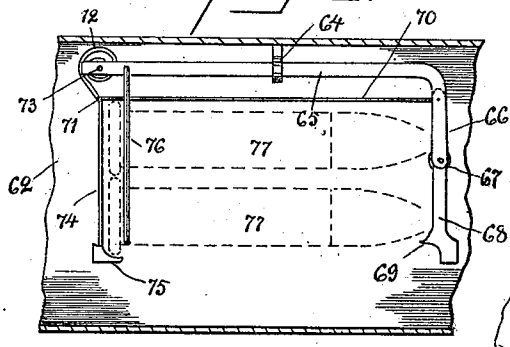


Fig. 4.

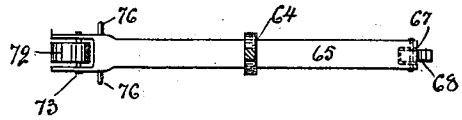


Fig. 7.

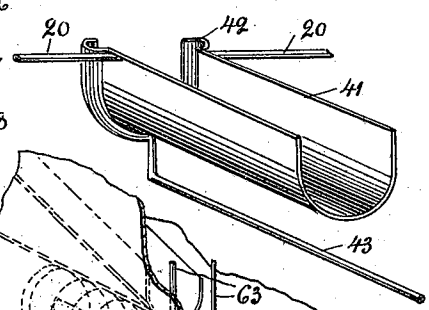


Fig. 8.

Fig. 5.

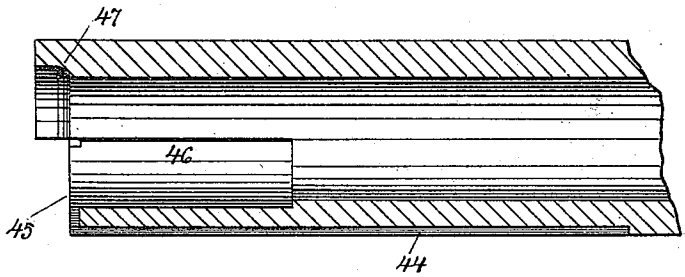
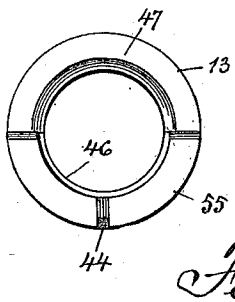


Fig. 6.



WITNESSES

F. A. Stuart

Louis A. Goodrich

Federico Alessi

INVENTOR

BY Edgar Tate & Co

ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FEDERICO ALESSI, OF NEW YORK, N. Y.

MACHINE-GUN.

SPECIFICATION forming part of Letters Patent No. 683,240, dated September 24, 1901.

Application filed January 21, 1901. Serial No. 44,021. (No model.)

To all whom it may concern:

Be it known that I, FEDERICO ALESSI, a subject of the King of Italy, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Machine-Guns, of which the following is a full and complete specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to machine-guns; and the object thereof is to provide an improved gun of this class which is simple in construction and operation and by means of which a maximum number of projectiles may be fired or discharged in a minimum space of time, a further object being to provide a gun of the class specified which may be quickly and easily operated; and with these and other objects in view the invention consists in a machine-gun constructed as hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which the separate parts of my improvement are designated by the same reference characters in each of the views, and in which—

Figure 1 is a sectional side view of a gun constructed according to my invention and showing the parts in the position they assume in the operation of loading the gun, the gun-carriage being not shown; Fig. 2, a sectional plan view of the gun and showing the parts in the position they assume when the gun is loaded and ready to be fired; Fig. 3, a side view of a detail of the construction partly in section; Fig. 4, a plan view of a detail of the construction; Fig. 5, a longitudinal section of a part of one of the barrels of the gun; Fig. 6, an end view thereof; Figs. 7 and 8, perspective views of details of the construction, Fig. 8 being partly in section; and Fig. 9, a back view of the casing which holds the firing-pins and the hammer for operating said pins.

In the practice of my invention I provide a casing or frame consisting of side plates 10, a bottom plate 11, and transverse plates or supports 12, in which the barrels 13 are secured, and said barrels 13 are arranged, as shown in the drawings, in three horizontal sets or series, the upper set or series being directed forwardly, the second set or series being turned at an angle to the left, and the third set or series at an angle to the right.

The frame or casing in which the barrels 13 are secured is extended backwardly to form a supplemental casing 14, having a rear door 15, which is hinged at 16, and said supplemental casing 14 is divided into vertically-arranged compartments or subdivisions, each of which is provided with a vertically-arranged series of cartridge-box cases 17, one cartridge-box case 17 being provided for each gun-barrel.

Arranged in and secured to the bottom of the main frame or casing and adjacent to the opposite sides thereof are tracks or ways 18, and in each of these tracks or ways is placed a rack-bar 19, and said rack-bars are connected with an open-work frame 20, which is preferably provided at its rear end and at the corners thereof with wheels or rollers 21, which rest on the bottom of the main frame, and said bottom of the main frame beneath the frame 20, which is longitudinally movable, is open, as shown at 22 in Fig. 2. The main frame is also provided at the breech end of the gun and at the opposite sides of the main frame with vertically-movable rack-bars 23, which are placed in vertically-arranged guides 24, formed with or connected with the sides 10 of the main frame, and these rack-bars carry at their upper ends a breech-block 25, which is secured thereto or connected therewith in any desired manner, and in which are placed the firing-pins 26, which project through the rear walls of the firing-pin casing and are provided with heads 27, and these firing-pins equal in number the barrels 13 and are arranged both in horizontal and in vertical series, and in their normal position they are projected backwardly, as shown in Fig. 1, by springs 28, mounted thereon, and the front wall of the breech-block casing is provided with an opening for each of said pins.

The sides or side walls 10 of the main casing are extended outwardly near the rear ends thereof, as shown at 29 in Fig. 2, and passing therethrough is a shaft 30, provided at the right-hand end thereof with a crank-lever 31, in the inner side of which is pivoted a dog 32, which is connected with a catch-lever 33, piv-

oted to the outside of the crank-lever 31, as shown at 34, by a pin or similar device 35, which passes through said crank-lever, and between the free end of the crank-lever 31 and the catch-lever 33 is placed a spring 36. The shaft 30 is provided adjacent to each end and within the opposite sides of the main casing with a gear-wheel 37, and these gear-wheels 37 operate, in connection with the rack-bars 23, so as to raise and lower the breech-block 25, and said shaft is also provided inside of said gear-wheels 37 with segmental gears 38, and the gear-wheels 37 and segmental gears 38 are connected by bolts 39, passing through slots 40 in said wheels and by means of which the position of the segmental gears with reference to said wheels may be adjusted, as desired, and said segmental gears 38 operate, in connection with the rack-bars 19, to move the frame 20 longitudinally. The longitudinally-movable frame 20, for the purposes of this description, will be called the "cartridge receiver" frame, and this frame is provided with a plurality of cartridge-receivers 41, which equal in number the barrels 13 and which are segmental in cross-section and provided with a segmental groove-head 42, adapted to receive the crowns of the cartridge, and one of these cartridge-receivers is shown in detail in Fig. 7, together with a portion of the frame 20, with which they are connected, and each of these cartridge-receivers is provided with an angular arm or rod 43, which is connected with the grooved head and which projects forwardly parallel with the bottom of said receiver, and these arms or rods 43 are adapted to enter corresponding spaces 44, with which the bottom of the breech end of each barrel is provided, and the breech end of each barrel is also cut out transversely of the bottom portion thereof, as shown at 45 in Fig. 5, so as to form a segmental space adapted to receive the head 42 of the corresponding cartridge-receiver 41, and each barrel is also provided with a longitudinal segmental space 46, adapted to receive the cartridge-receiver itself, and each barrel is also provided in the breech end thereof with a segmental recess 47, adapted to receive the crown of the cartridge which is held by the segmental grooved head 42 of the cartridge-receiver when the cartridge is dropped into said receiver, as hereinafter described.

At the right-hand side of the machine and rearwardly of the crank-lever 31 is a U-shaped bracket 48, in which is pivoted a firing-dog 49, provided at its free end with a backwardly-directed inclined head 50, and secured in the bracket 48 is a spring 51, which normally holds the firing-dog in position shown in Fig. 1, and said firing-dog is adapted to be operated by the dog 32, which is pivoted to the crank-lever 31.

The breech-block 25 is provided with a spring-operated hammer 52, which is hinged to the left-hand side thereof, as shown at 53, and is operated by strong springs 52^a, secured to the casing at 52^b, as shown in Fig. 9, and said hammer consists of a framework provided at the free side, or at the right-hand side, with a projecting arm 54, and said hammer is adapted to operate in connection with each and all of the heads 27 of the firing-pins 26 and to force said firing-pins forwardly in the operation of firing the gun, as hereinafter described.

The supplemental casing 14 rearwardly of the main casing is provided with a plurality of spaces 55, equaling in number the barrels of the gun and arranged in direct lines therewith and each of which is provided with a transverse partition 56, through which passes a spring-operated pin 57, with the forward end of which is connected a semitubular slide 58, with the head of which is connected a plate 59, which moves backwardly with the slide 58, and said slides 58 are operated, as hereinafter described, by the cartridge-receivers 41, connected with the frame 20, and over the front end of each of the spaces 55 is pivoted a dog 60, and these dogs, when the frame 20 is moved backwardly in the operation of reloading the gun, remove the empty cartridges from the receivers 41.

Directly over each of the spaces 55, in which the slides 58 are placed, is a downwardly and forwardly inclined support 61, and these supports 61 form the bottoms of the cartridge-box cases 17, and each of these cartridge-box cases 17 is adapted to receive a cartridge-box 62, which is similar in form thereto and in which the cartridges are placed or stored for the purpose of loading the gun, and at the forward end of the downwardly-inclined supports 61 the side walls of the cartridge-box cases 17 are provided with inwardly and upwardly directed fingers 63, as clearly shown in Figs. 1 and 8.

The cartridge-boxes 62 are each provided with a plurality of cartridge-holders which are connected with the top wall thereof, as shown at 64 in Figs. 1 and 3, and these cartridge-holders are provided with a horizontal top bar 65, passed through the support at 64 or connected therewith in any desired manner, and each of said holders, except the rear one, consists of said top bar 65, which is provided at its forward end with a downwardly-directed extension 66, with which is pivotally connected at 67 a hanger 68, provided at its lower end with a backwardly-directed hook 69 and with the upper end of which is pivotally connected a horizontal rod 70, the rear end of which is connected at 71 with a spiral spring 72, secured to the rear end of the bar 65 at 73 and provided with a downwardly-directed extension 74, having at its lower end a forwardly-directed shoe 75, and said horizontal top bar 65 is also provided adjacent to its rear end with two downwardly-directed fingers 76; and in practice the cartridges 77 are placed between the fingers 76 and are held there by the crowns of said cartridges 77, which bear on said fingers, the forward

ends of said cartridges being also supported by the hanger 68, and the crown of said cartridges, or the shells thereof, being supplementally supported by the shoe 75 at the lower ends of the extension 74 of the spring 72. The two foremost cartridge-holders in the cartridge-boxes 62, as shown at 61, are designed to hold but two cartridges, while the two rearmost cartridges are designed to hold four; but it will be apparent that the depths of these cartridge-boxes may be made greater, if desired, and the holders may be so formed as to receive more cartridges. The rearmost cartridge-holder is formed somewhat differently from the others, a stationary depending bar or finger 78 being substituted for the fingers 76, and the spring 72, the extension 74 thereof, and the shoe 75, connected with said extension, and in practice each of the holders in each of the boxes 62 is filled with cartridges, the first two holders at the forward end in Fig. 1 only being shown as provided with cartridges. When all the holders have been filled with cartridges, it will be seen that the cartridges in each holder are held therein by the cartridges in the holder rearwardly thereof, which press upon the extension 74 of the spring 72 and hold the shoes 75 under the crowns of the cartridges and prevent them from dropping down, the forward ends or pointed ends of the cartridges being held by the hooks, dogs, or projections 69 of the hanger 68. In practice the cartridges are also placed in the bottom of each box below the holders, as shown in Fig. 1, and in the operation of successively loading the gun the forward cartridge in the bottom of each box first passes out and each successive cartridge in the bottom of the box follows, after which all the cartridges in the rear holder successively drop into the bottom of the box and slide downwardly and forwardly, and when all the cartridges have left the rear holder the spring-arm 74 of the next holder springs backwardly and the cartridges in said holder are released and successively dropped into the bottom of the box and moved forwardly and downwardly into the slide 58. When all the cartridge-holders are full, the hanger 68 of each holder bears on the spring-arm 74 of the holder in front of it and holds the corresponding shoe 75 in the position shown in Fig. 3, and at the front end of the box 62 in Fig. 1, when the rear holder is empty, the arms 74 of the holder in front of it springs backwardly and allows the cartridges to drop, as hereinbefore described, and this is true of each of the holders in succession.

The slides 58 are provided with forwardly-directed fingers or guides 79, and the front of the supplemental casing 14 is provided with longitudinal slots or openings 80, adapted to receive the parts or members of the movable frame 20 as it is forced backwardly in the operation of the gun, as hereinafter described.

The operation of loading and discharging the gun will be readily understood from the foregoing description when taken in connection with the accompanying drawings and the following statement thereof. Suppose the frame 20 to be at the limit of its forward movement and the breech-block 25 at the bottom of its movement. The crank-lever 31 is then turned backwardly in the direction of the arrow *a* in Fig. 1. In this operation the breech-block 25 first moves upwardly and the frame 20 is then moved backwardly, the cartridge-receivers 41 are forced backwardly into the spaces 55 and strike the slides 58 and force them backwardly, and the plates 59 move backwardly with said slides, and at this time the cartridges drop down into the receivers 41, the forward movement of the cartridges before they drop into the receivers being limited by the fingers 63, which strike against the crown of the cartridges. The object of the slides 58 and the plates 59 connected therewith is to prevent the cartridges from dropping into the spaces 55 before the receivers 41 are in position to receive them, and each of said slides is provided at its rear end with a circular head, as clearly shown in Figs. 1 and 8. When the cartridges have thus been deposited in the receivers 41, the crank-lever 31 is turned in the direction of the arrow *b* in Fig. 1 until it assumes the position shown in Fig. 2 or has turned through about three-quarters of a circle, and during this movement of said crank-lever the frame 20 has been forced forwardly until the receivers 41 enter the ends of the barrels 13 of the gun and the breech-block 25 is lowered into position. In this position of the parts the hammer 52 is forced backwardly, and at the very bottom movement of the breech-block 25 the arm 54 of the hammer passes below the head 50 of the dog 49 and the springs 52^a force the hammer forwardly, so that it strikes the heads of the firing-pins, which are also forced forwardly and the gun is discharged, as will be readily understood. In the reverse movement of the lever 31 the frame 20 is again moved backwardly and the pivoted dogs 60 operate to remove the empty shells from the receivers 41, it being understood that the breech-block again rises into the position shown in Fig. 1, and when the frame 20 reaches the limit of its backward movement the operation hereinbefore described is repeated and the receivers 41 are again filled with cartridges, after which the movement of the crank-lever 31 is again reversed, the frame 20 moves forwardly, the breech-block 25 downwardly, and the gun is again discharged, as hereinbefore described. This operation may be repeated as often as desired, and it will be apparent that the cartridge-boxes 62 may be removed and replaced by others as often as the cartridges are discharged therefrom.

The main frame is also provided transversely of the rear portion thereof with a top plate 10^a, at the rear edge of which is a ver-

tically-arranged shield 10^b, which protects the breech-block and also the operators of the gun to an extent; and my improved gun may be mounted on any suitable support, either a stationery support, gun-carriage, or any other device, and may be so mounted as to be turned both in a horizontal and a vertical plane in order that the operation thereof may be made as effective as possible; but these mountings form no part of this invention and are therefore not shown and described.

It will be apparent that the breech-block 25 must move upwardly clear of all the barrels of the gun before the frame 20 can begin its rearward movement, and it is also apparent that the dog 32 must be moved from the rear of the hammer-operating cam 50 in order to release the hammer-arm 54 before any vertical movement can be given to the breech-block 25, and during the closing part of the movement of the breech-block the dog 32 and its operating-lever 33 must be released in order that said dog 32 may again come behind the hammer-cam 50 and throw it into operative relation with the hammer-arm 54.

My invention is not limited to the exact construction of the various parts thereof as herein shown and described, and I reserve the right to make all such alterations therein as fairly come within the scope of my invention.

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

1. A machine-gun, comprising a main frame in which the barrels are mounted, a supplemental frame connected therewith, a vertically-movable breech-block mounted between said frames and adjacent to the ends of the barrels of the gun and provided with firing-pins, a longitudinally-movable cartridge-receiver frame adapted to move in the supplemental frame, and provided with cartridge-receivers, means for feeding cartridges into said receivers, a spring-operated hammer connected with the breech-block casing, a dog adapted to operate said hammer, and a shaft mounted transversely of the main frame and adapted to operate the vertically-movable breech-block, the longitudinally-movable cartridge-receiver frame and said dog, and means for feeding cartridges into the receivers of the cartridge-receiver frame, substantially as shown and described.

2. In a machine-gun, a main frame in which the barrels are mounted, a vertically-movable breech-block provided with firing-pins and having rack-bars, a longitudinally-movable cartridge-receiver frame adapted to feed the cartridge into the barrels and provided with rack-bars, means for feeding the cartridges into the receivers of the cartridge-receiver frame, and a shaft mounted transversely of the main frame, and provided with gears for operating said rack-bars, substantially as shown and described.

3. In a machine-gun, a main frame in which the barrels are mounted, a vertically-movable breech-block having firing-pins provided with rack-bars, a longitudinally-movable cartridge-receiver frame adapted to feed the cartridge into the barrels and provided with rack-bars, means for feeding the cartridges into the receivers of the cartridge-receiver frame, and a shaft mounted transversely of the main frame, and provided with gears for operating said rack-bars, said breech-block being also provided with a spring-operated hammer, and means for operating the same, substantially as shown and described.

4. In a machine-gun, a frame in which the barrels are mounted, a vertically-movable breech-block having firing-pins provided with vertical rack-bars, and a spring-operated hammer, a longitudinally-movable cartridge-receiver frame provided with horizontal rack-bars, a spring-operated firing-dog pivoted at one side of the frame, a shaft passing through said frame, and provided with gears for operating the rack-bars of the breech-block and the rack-bars of the cartridge-receiver frame, said shaft being provided with a crank-lever, and a spring-operated dog for actuating the firing-dog, substantially as shown and described.

5. In a machine-gun, a frame in which the barrels are mounted; a supplemental frame rearwardly thereof, a longitudinally-movable cartridge-receiver frame, provided with cartridge-receivers, and adapted to feed the same into the barrels of the gun, pivoted dogs supported rearwardly of the cartridge-receiver frame and adapted to remove the empty cartridges from said frame, and means for feeding the cartridges into the receivers of the cartridge-receiver frame, substantially as shown and described.

6. In a machine-gun, a casing having longitudinal spaces 55 formed therein, a longitudinally-movable spring-operated slide in each of said spaces, an upwardly and backwardly inclined support arranged over said slide, casings for receiving cartridge-boxes arranged over said support, and means for feeding the cartridges successively from said boxes, substantially as shown and described.

7. A machine-gun comprising a main frame in which the barrels are placed, and having a backwardly-directed extension or supplemental frame, said supplemental frame being provided with cartridge-box casings adapted to receive cartridge-boxes, a vertically-movable breech-block at the end of the main frame, means for feeding the cartridges into the barrels of the gun, and means for operating the breech-block and for discharging the cartridges, substantially as shown and described.

8. In a machine-gun a main frame in which the barrels are placed, a vertically-movable breech-block at the end of the main frame and provided with firing-pins, a longitudinally-movable cartridge-receiver frame at

the rear of the main frame and provided with rack-bars, said breech-block being also provided with rack-bars, a shaft provided adjacent to each end with a circular gear and a segmental gear adjustably connected with each of said circular gears, said circular gears and segmental gears being adapted to operate in connection with the rack-bars of the breech-block and with the rack-bars of the longitudinally-movable frame, substantially as shown and described.

9. In a machine-gun, a main frame in which the barrels are mounted, a vertically-movable breech-block at the end of said frame and provided with firing-pins, a supplemental frame arranged rearwardly of the main frame a longitudinally-movable cartridge-receiver frame mounted in said supplemental frame and adapted to feed the cartridge into the barrel, devices for feeding the cartridges into the receivers of said frame, and means for operating the breech-block and supplemental frame, substantially as shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of the subscribing witnesses, this 15th day of January, 1901.

FEDERICO ALESSI.

Witnesses:
F. A. STEWART,
M. K. LOWERRE.