Feb. 20, 1923. 1,446,388

E. LUDORF

MACHINE GUN

Filed May 13, 1921

Fig.1.

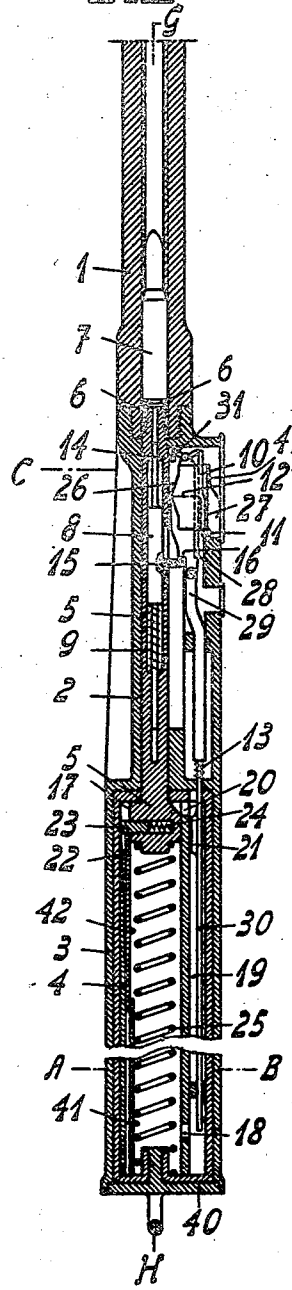


Fig.2.

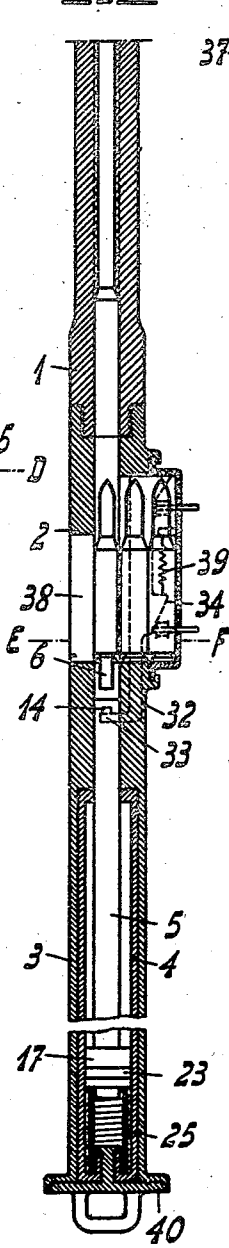


Fig.5.

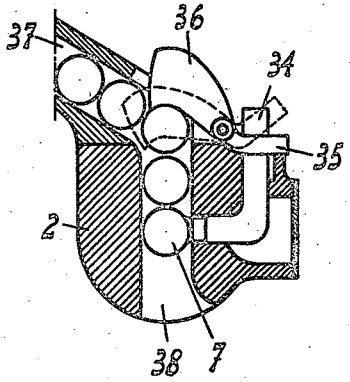


Fig.4.

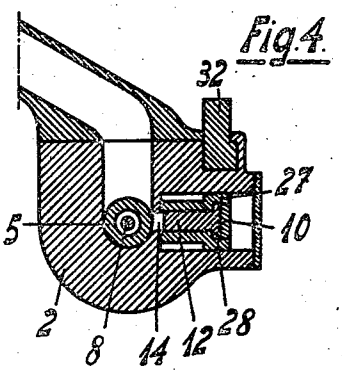
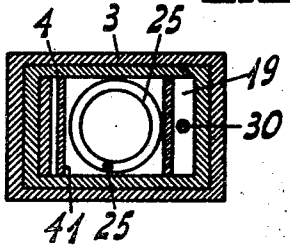


Fig.3.



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UNITED STATES PATENT OFFICE.

ERNST LUDORF, OF BERNE, SWITZERLAND.

MACHINE GUN.

Application filed May 13, 1921. Serial No. 469,275.

To all whom it may concern:

Be it known that I, ERNST LUDORF, a citizen of the German Republic, residing at Berne, Effingerstrasse No. 6a, Switzerland, have invented new and useful Improvements in Machine Guns, of which the following is a description.

The present invention relates to an automatic machine gun.

One object of the invention is to provide a machine gun of very greatly simplified construction in which the number of working parts is very small, the gun being thoroughly efficient in operation and of very light weight.

A further object of the invention consists in the provision of means to damp the recoil in such a manner that the initial speed of the projectiles leaving the muzzle of the gun is the same in vertical or horizontal position of the gun.

Another object of the invention consists in providing a fluid brake of an improved construction which is of light weight and very compact.

A further object of the invention consists in the provision of means to feed the projectiles positively into the gun.

With these and other objects in view the invention resides in the parts and combination of parts hereinafter described and particularly set forth in the claims appended hereto.

In the drawings which form a part of this specification:

Fig. 1 is a partial sectional elevation of an automatic machine gun, the breech casing being closed.

Fig. 2 is a partial sectional elevation of the gun showing a section on line G—H of Fig. 1, the breech case being open.

Fig. 3 is a section on line A—B of Fig. 1 showing the breech casing with the fluid brake.

Fig. 4 is a section on line C—D of Fig. 1 showing the fluid brake.

Fig. 5 is a section on line E—F of Fig. 2 showing the device for positively feeding the projectiles.

The machine gun comprises a barrel 1 and a breech casing 2, the rear portion 3 of which is of rectangular cross-section. In the said portion 3, the cylinder 4 is housed which has rectangular cross-section and which is secured in its position by a screw 40. In the casing 2 the breech bolt 5 is slidably mounted which carries at its front end the extractor 6 for the extraction of the empty cartridge cases 7. In the bore of the breech bolt 5 the firing pin 8 is slidably mounted which is pressed forward by a spring 9 lodged in the said bore. The rear end of the breech bolt 5 forms a piston 17 fitting the cylinder 4. On the piston 17 a plate 42 is fastened which is slidably guided between a plate 41 and a wall of the cylinder 4. A spring 25 arranged within the cylinder 4 tends to throw the breech bolt forward into the position shown in Fig. 1. The piston 17 is provided with a cross-slot 24 in which a slide 23 is arranged. A spring arranged within said cross slot presses the slide 23 against a slanting wall 22 of the casing 4, the cross area of the cylinder being somewhat less at the rear end. The cylinder 4 is filled with a suitable fluid, for instance with glycerine, which fluid is forced out through an opening 18 of the cylinder 4 as soon as the breech bolt recoils. The fluid flows into a chamber 19 which communicates with the cylinder 4 by means of the bores 18 and 20 arranged at both ends of the cylinder 4 on different sides of the piston 17. Over the bore 20 a plate 21 is placed which is fixed to a rod 30. The rod 30 is slidably mounted in the casing 4; a spring 13 acting on said rod 30 tends to close the said bore 20. To the front end 29 of the rod 30 a slide 12 is linked. The slide 12 is movably arranged in a guide 27; it slides over a plate 10 and is guided by ribs 28. The plate 10 is hinged at 11 and serves as a stop for the slide 12. The guide 27 is rotatably mounted on the pivotal bolt 11 of the breech casing; it is moreover provided with cam faces 26 projecting into the path of a lug 14 forming part of the breech bolt 5. The slide 12 is provided with a nose 16 serving as a stop for a lug 15 of the firing pin 8. On the guide 27 a double armed lever 31 is journalled one arm of which projects in the path of the lug 14 of the breech bolt 5, the other arm abutting on the plate 10 in such a manner that the plate 10 is pressed down against the action of a spring 45 if the breech bolt is thrown into firing position, whereby the plate 10 frees the slide 12. The spring 13 throws the rod 30 with the slide 12 forward; the

firing pin 8 being released is thrown forward by the spring 9 and fires the cartridge 7 which has been inserted in the chamber of the barrel 1. After firing the cartridge the breech bolt 5 recoils, the rearward movement of the breech bolt being braked by the piston 17 which forces the liquid of the cylinder 4 through bore 18 into chamber 19 and from the chamber 19 through the bore 20 into the cylinder 4. By the rearward movement of the piston 17 the spring 25 is compressed, the slide 12 which rests on the lug 14 is brought back to its initial position, until it falls behind the stop plate 10. The spring 13 is compressed and slide 21 frees the bore 20, allowing the fluid to flow freely into the cylinder 4. The lug 14 of the breech bolt passes over the cam faces 26 of the guide 27 which swings about bolt 11. After the lug 14 has passed over the guide 27 the spring 45 presses the plate 10 against the slide 12 locking the same. As soon as the projectile has left the barrel the spring 25 pushes the breech bolt 5 forward. A new cartridge is inserted into the chamber. The lug 14 passes over the cam faces 26 of the guide 27 and strikes against lever 31, the plate 10 releases the slide 12 and the rod 30, which are thrown forward freeing the firing pin which fires the cartridge. The spring 25 has not to stand a very great strain as the effect of the recoil is transferred mainly to the fluid.

The device to feed the cartridge comprises a slide 32 having an arm 33 slidably mounted in the breech casing and projecting with its free end into the path of the lug 14. If the breech bolt 5 moves rearwardly the slide 32 takes part in this movement. The slide 32 is provided with cams 34 adapted to swing a double armed lever 35, 36 about its pivot. The arm 36 pushes cartridges 7 which are fed by a channel 37 into the slot 38 one by one into said barrel chamber in front of the breech bolt 5. The empty cartridge case is thrown out through the slot 38. The slide 32 is brought back to its initial position by a spring suitably arranged.

To insert the first cartridge the nut 40 is unscrewed, the cylinder 4 with the breech bolt 5 is withdrawn and the one cartridge inserted through the channel 37.

The slide 21 frees the bore 20 only after the cartridge has been fired, thus the fluid has to withstand the gas pressure.

I wish to point out that various changes may be made without departing from the spirit of my invention.

What I claim and wish to secure by Letters Patent is:—

1. A machine gun of the kind hereinbefore referred to having a barrel, a breech casing, a breech bolt slidably arranged in said breech casing, a cylinder co-axial to said breech bolt, a piston on said breech bolt slidable in said cylinder, a fluid within said cylinder, said cylinder having openings beyond the limits of the movement of the piston, a slide governing one of said openings and operating means for said slide, said operating means actuated by the breech bolt to open and close said opening.

2. A machine gun of the kind hereinbefore referred to having a barrel, a breech casing, a breech bolt slidably arranged in said breech casing, a cylinder co-axial to said breech bolt, a piston on said breech bolt slidable in said cylinder, a fluid within said cylinder, said cylinder having openings beyond the limits of movement of the piston, said cylinder and piston having rectangular cross-section, the cross-section decreasing gradually, a slide in said piston, and a spring acting on said slide to progressively brake the rearward movement of the piston.

3. A machine gun of the kind hereinbefore referred to having a barrel, a breech casing, a breech bolt slidably arranged in said breech casing, a cylinder co-axial to said breech bolt, a piston on said breech bolt slidable in said cylinder, a fluid within said cylinder, said cylinder having openings beyond the limits of movement of the piston, a slide governing one of said openings, a lug on the breech bolt co-acting with said slide, and means for automatically disconnecting said slide from the breech bolt.

In witness whereof I affix my signature.

ERNST LUDORF.