K. HEINEMANN.

TRIGGER MECHANISM OF MACHINE GUNS.

APPLICATION FILED JAN. 16, 1907.

905,071. **Patented Nov. 24, 1908.**

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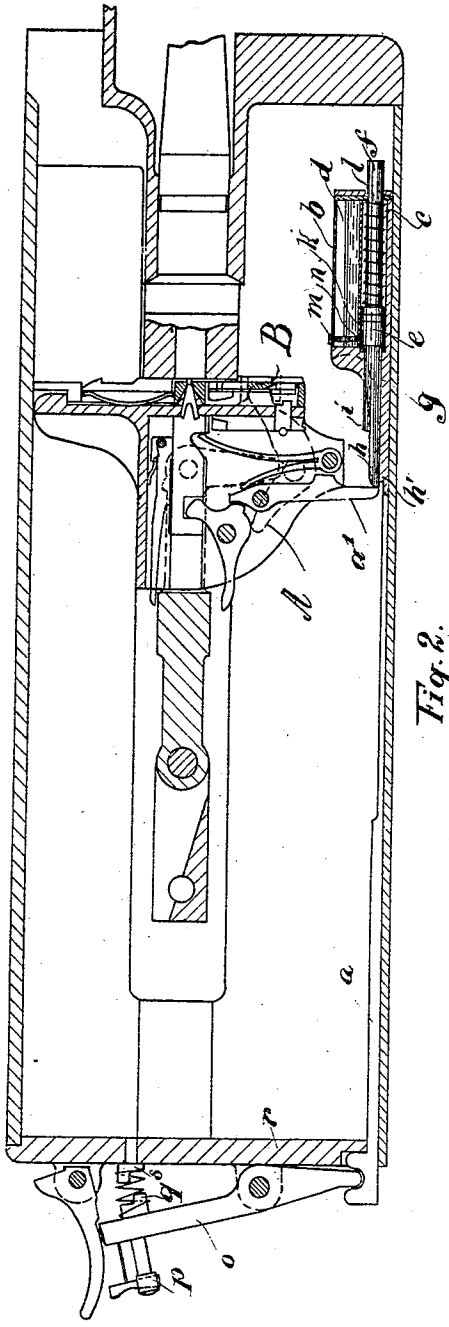


Fig. 1.

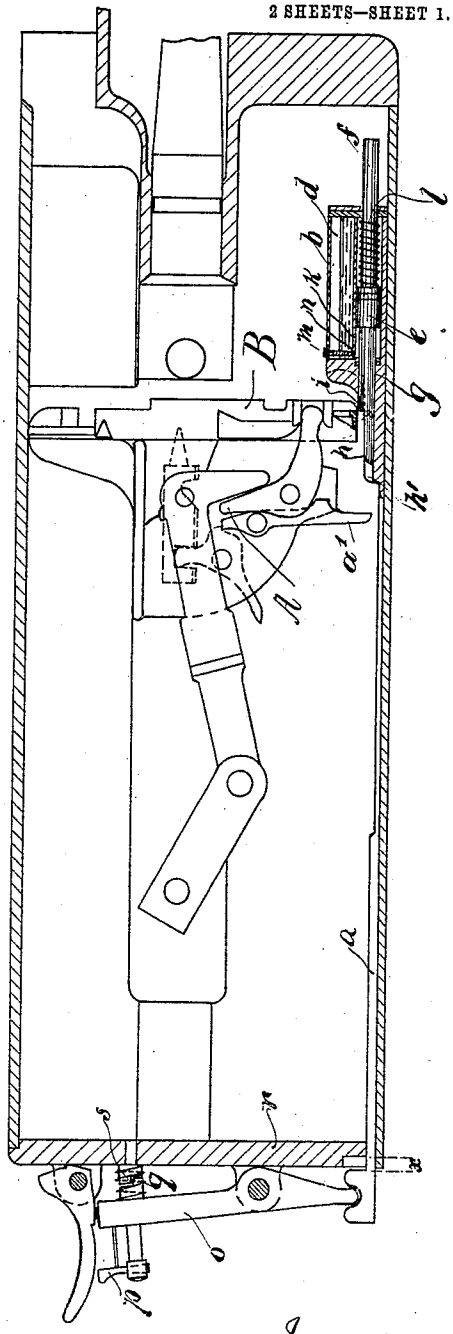


Fig. 2.

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2 SHEETS—SHEET 2.

Fig. 4.

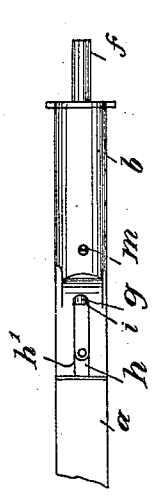


Fig. 5.

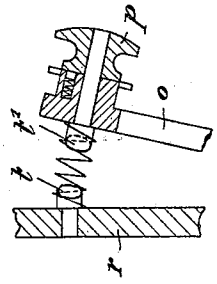
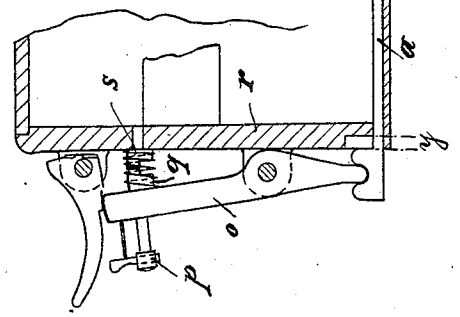


Fig. 3.



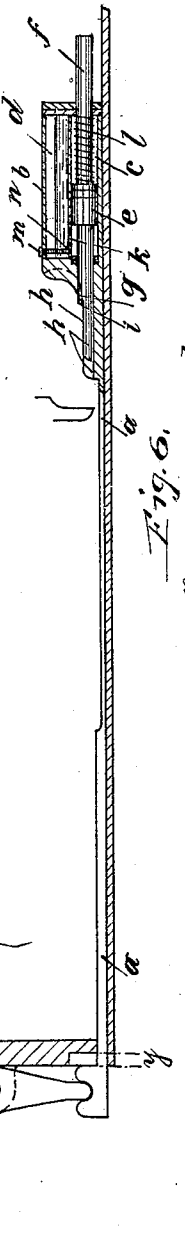
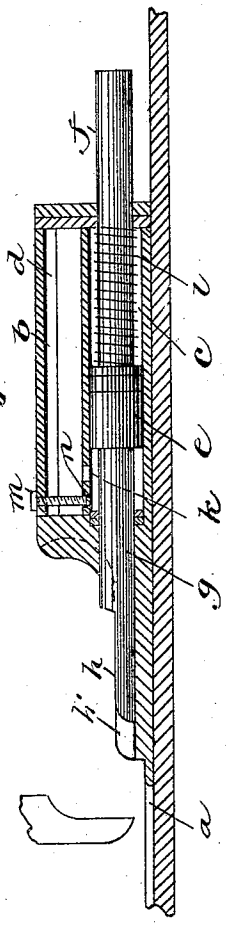


Fig. 6.



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UNITED STATES PATENT OFFICE.

KARL HEINEMANN, OF BERLIN, GERMANY, ASSIGNOR TO DEUTSCHE WAFFEN- UND MUNITIONSFABRIKEN, OF BERLIN, GERMANY.

TRIGGER MECHANISM OF MACHINE-GUNS.

No. 905,071. Specification of Letters Patent. Patented Nov. 24, 1908.

Application filed January 16, 1907. Serial No. 352,662.

To all whom it may concern:

Be it known that I, KARL HEINEMANN, master, residing at No. 30 Gotzkowsky-strasse, in Berlin, Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Trigger Mechanism of Machine-Guns, of which the following is the specification.

This invention relates to a device for regulating the number of shots fired in unit time by a machine gun, while the shooting is in progress, so that if the gun is constructed for example to fire 400 shots per minute it shall be possible to regulate the mechanism so that the rate of firing shall be only 200 shots per minute.

In the accompanying drawing, representing an embodiment of the invention, Figure 1 illustrates the gun in longitudinal section, the parts being in the normal position; Fig. 2 is a similar view in firing position, the invention being in operative position; Fig. 3 is a fragmentary view, with the invention inoperative, the firing being at normal rate; Fig. 4 is a part plan of Fig. 3; and Fig. 5 is a sectional view of a detail in a modified construction; and Fig. 6 is an enlarged view of the delay action cylinder.

The trigger rod *a* of the machine gun carries, in known manner, a projection h^1 acting as a trigger, and is moved longitudinally by a lever *o* carried by the handle *r* of the gun. When the rod *a* has its extreme left hand position the breech A, in moving forward, brings the sear a^1 against the projection h^1, thus releasing the sear and firing the gun.

According to this invention, the trigger rod *a* has also at its forward end a casing *b* in which there are two cylinders *c d* communicating with each other through a large opening *k* and a small opening *n*. In the cylinder *c* slides a piston *e*, the piston rod *f* of which is surrounded by a helical compression spring *l*. On the side opposite to the piston rod, the piston is extended in reduced section as a rod *g* which carries at its end a second supplemental trigger or trip *h*, and somewhat in front of this the projection *i* for setting the trip. This projection is engaged by the cartridge carrier B when the trigger rod is in its retracted position so that the piston is pushed forward and then returns into its original position in which the sear strikes against the trip and fires the gun. The cylinder *d* is filled with glycerin or some other suitable liquid, which when the piston is moved forward, passes behind it through the opening *k* in the cylinder *c*.

When the lever is moved into the position shown in Fig. 3 the trigger rod *a*, and with it the casing *b*, the piston *e*, and piston rod *g* are drawn backwards to a certain extent *y* and when the cartridge carrier B moves forwards in the known manner, it engages the projection *i* and the liquid flows behind the piston *e*. When the cartridge carrier B is lifted in the known manner and becomes disengaged from projection *i*, the piston *e* is pressed back again by the spring *l*, and the liquid returns to the cylinder *d*. As, however, the opening *k* is soon closed by the returning piston, the glycerin can only pass through the opening *n*, the size of which may be varied by means of the set screw *m*. The passage of the glycerin through this small opening *m* retards the return movement of the piston and the substitute trigger or trip *h*, so that the latter arrives in its working position later, that is to say only later strikes the sear a^1 and fires the gun. Since this retardation of the movement of the trigger follows every shot, a less rapid firing of the machine gun is the result.

On the lever *o* is a handle, knob *p* or the like, which carries at the end which is nearer to the frame *r* a projection *q*. Opposite this projection there is another projection *s* on the frame *r*. By turning the handle *p* the projection *q* can be placed in such a position that when the lever *o* is moved, the projection *q* misses the projection *s* (Fig. 2) or engages it. (Fig. 3). In the former case it is possible to draw back the trigger rod as far as usual, for instance, to an extent *x*, when the projection h^1, as the cartridge carrier B advances, strikes the sear a^1 and fires the gun before the second projection *h*, the movement of which is retarded by the glycerin, has returned far enough to have any effect. In this case the gun fires the normal number of shots. By varying the position of the knob *p* it is thus possible to throw out of operation the brake cylinder.

When the projection *q* engages the projection *s*, (Fig. 3) the trigger rod is drawn

back to a smaller extent y so that the sear does not engage the projection h^1 or only engages it to such an extent that firing cannot occur. It is then the projection h which fires the gun as the former returns.

In Fig. 5 instead of the projections q s, inclined surfaces t t^1 are provided normally displaced through an angle of 180° to each other, so that it is possible, according to the position in which the handle p is placed gradually to increase the retardation of the return of the trip.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is:—

1. In a machine gun, the combination, with the firing mechanism, of a movable trip to release the same, said trip being actuated by the forward movement of the parts subject to recoil, and a delay action device arranged to retard the movement of the trip to reduce the normal speed of firing.

2. In a machine gun, the combination, with the firing mechanism, of a movable trip to release the same, said trip being actuated by the forward movement of the part subject to recoil, and a delay action device comprising a fluid brake arranged to retard the movement of the trip to reduce the normal speed of firing.

3. In a machine gun, the combination, with the firing mechanism, of a movable trip to release the same, said trip being actuated by the forward movement of the parts subject to recoil, a delay action device comprising a fluid brake arranged to retard the movement of the trip to reduce the normal speed of firing, and means to hold the brake out of operation.

4. In a machine gun, the combination, with the firing mechanism, of a movable trip, means actuated by the forward movement of the parts subject to recoil to retract the trip, a spring forcing the trip forward to release the firing mechanism, and an adjustable fluid brake to retard the movement of the trip to reduce the normal speed of firing.

5. In a machine gun, the combination, with the firing mechanism, of a movable trip to release the same, a fluid cylinder, a piston movable therein and connected with the trip, means actuated by the forward movement of the parts subject to recoil to retract the piston and trip, and a spring to return the same, the cylinder having ports to permit the gradual displacement of the fluid from before the piston to retard the movement of the trip to reduce the normal speed of firing.

6. In a machine gun, the combination, with the firing mechanism, of a trip to release the same, a fluid cylinder, a piston movable therein and coupled with the trip, the piston arranged to be engaged and retracted by the forwardly moving parts of the gun mechanism under counter recoil, a spring to return the piston and trip, ports to permit the gradual displacement of the fluid from before the piston, and means to regulate the flow through the ports.

7. In a machine gun, the combination, with the firing mechanism, a trigger arranged to automatically release the same, and means for bringing said trigger into and out of operation at will, of a trip arranged to be substituted for the trigger, and a delay action device to retard the movement of the trip to reduce the normal speed of firing.

8. In a machine gun, the combination, with the firing mechanism, and a trigger arranged to automatically release the same, of a trip arranged to be substituted for the trigger to release the firing mechanism, a delay action device comprising a fluid cylinder, a piston movable therein and coupled with the trip, a projection moving with the piston and arranged to be engaged and retracted by the advancing cartridge carrier, a spring to return the piston and trip when released by the cartridge carrier, ports to permit the gradual displacement of the fluid from before the piston, means to regulate the flow of the fluid through the ports, and means for shifting the delay action device and trip bodily relative to the firing mechanism.

9. In a machine gun, the combination, with the firing mechanism, means arranged to automatically release the same to produce a normal rate of firing, of substitute releasing means, and means to effect the substitution to secure a different rate of firing.

10. In a machine gun, the combination, with the firing mechanism, and means to automatically release the same to produce a normal speed of firing, of substitute releasing means, and means to regulate the substitute means to vary the speed of firing.

11. In a machine gun, the combination, with firing mechanism, means to automatically release the same to produce a normal rate of firing, of substitute releasing means, means to effect the substitution, and means to regulate the substitute means to vary the speed of firing.

12. In a machine gun having a recoiling barrel, firing mechanism, a sear moving with the recoiling parts, and a trigger arranged in the path of the sear to engage and actuate the same, of a trip arranged to be substituted for the trigger, and means to vary the time at which the trip engages the sear.

13. In a machine gun, the combination, with the firing mechanism, of a fluid cylin-

der, a piston movable therein, a trip carried by the piston rod, means to retract the piston and trip, and means to return the same into operative position to release the firing mechanism.

14. In a machine gun, the combination, with firing mechanism, a fluid cylinder, a piston therein, a trip connected with the piston and arranged when reciprocated to release the firing mechanism, means actuated by the counter recoil to move the piston and trip in one direction, and automatic means to move the same in the opposite direction.

15. In a machine gun, the combination, with the firing mechanism, a trigger to automatically release the same to produce a normal speed of firing, a stop to regulate the extent of movement of the trigger to vary the speed of automatic firing, and means to vary the point at which the stop becomes effective.

16. In a machine gun, the combination, with the firing mechanism, a trigger arranged to automatically release the firing mechanism to produce a normal speed of automatic firing, a projection connected to the trigger, a stop to regulate the movement of the projection and through it the trigger to vary the speed of firing, and means to bring the projection into and out of operative relation to the stop.

17. In a machine gun, the combination, with the firing mechanism, a trigger arranged to automatically release the firing mechanism to produce a normal speed of automatic firing, a handle connected to the trigger, an unsymmetrical projection on the handle, a stop arranged to oppose the projection to regulate the movement of the handle and through it the trigger to vary the speed of firing, the projection and stop shiftable angularly to each other to vary the point at which the stop becomes effective.

18. In a machine gun, the combination, with the firing mechanism, a trigger to automatically release the same to produce a normal speed of firing, a handle connected to the trigger, a projection on the handle, and an unsymmetrical stop arranged to oppose the projection on the handle to limit the movement of the handle to vary the speed of firing, the projection and stop being one rotatable relative to the other to vary the point at which the stop becomes effective.

19. In a machine gun, the combination, with the firing mechanism, and a delay action device arranged to act thereon to reduce the normal speed of firing, a trigger arranged to automatically release the firing mechanism, a stop arranged to limit the movement of the trigger, and means to bring the stop into and out of its operative position to vary the time of release of the firing mechanism.

20. In a machine gun, the combination, with the firing mechanism, of a movable trip to release the same, a casing containing a fluid cylinder and a chamber, the cylinder and chamber communicating near one end by a port, a piston in the cylinder and moving with the trip, means actuated by the counter recoil to move the piston toward the isolated end of the cylinder, yielding means to return the piston in the opposite direction displacing the fluid from before the piston into the chamber and bringing the trip into position to release the firing mechanism, and means to throttle the flow of the fluid through the port.

21. In a machine gun, the combination, with the firing mechanism, of a movable trip to release the same, a casing containing a fluid cylinder and a chamber, the cylinder and chamber communicating near one end by two ports of dissimilar size, means to control the smaller port, a piston in the cylinder having its rod secured to the trip, means moving with the recoiling parts of the gun in counter recoil to engage the piston rod and move the same with the piston toward the closed end of the cylinder, a spring to return the piston in the opposite direction displacing the fluid from before the piston through the ports into the chamber and bringing the trip into position to release the firing mechanism, and means to displace the casing bodily together with its contents.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

KARL HEINEMANN.

Witnesses:

WOLDEMAR HAUPT,

HENRY HASPER.