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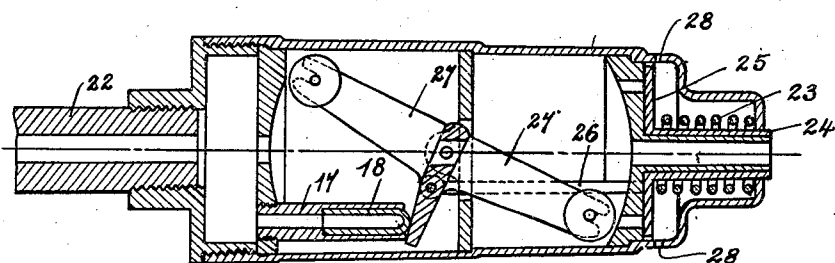
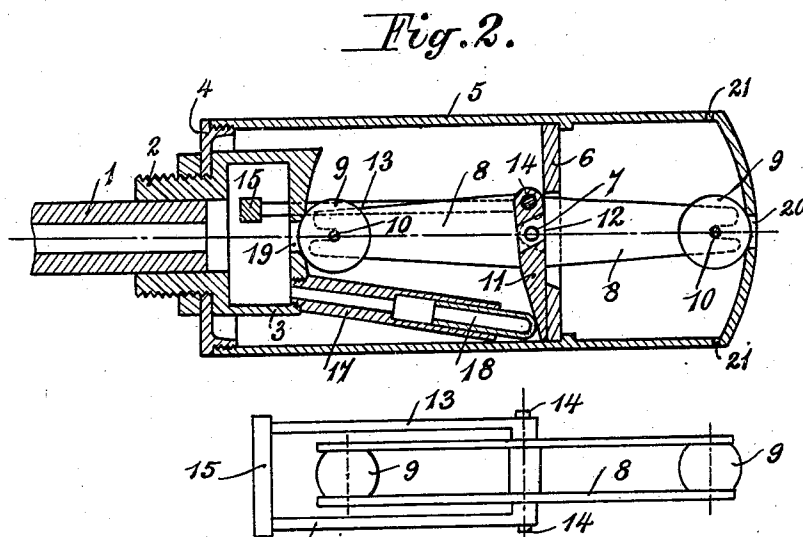
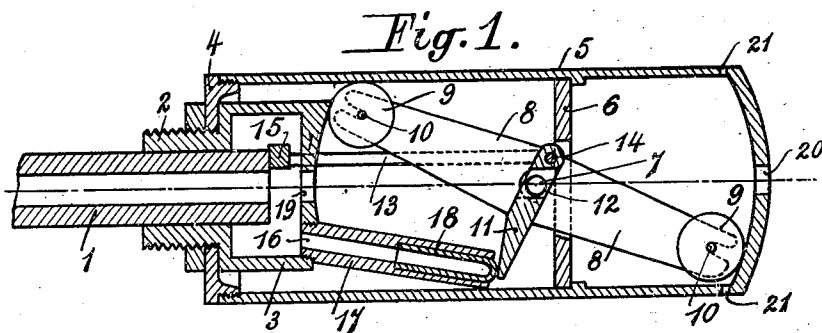
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1,763,287

DAMPING APPARATUS FOR THE PREVENTION OF NOISE, FLAMES,
AND RECOIL IN FIREARMS OF THE AUTOMATIC TYPE

Filed Nov. 29, 1927

2 Sheets-Sheet 1



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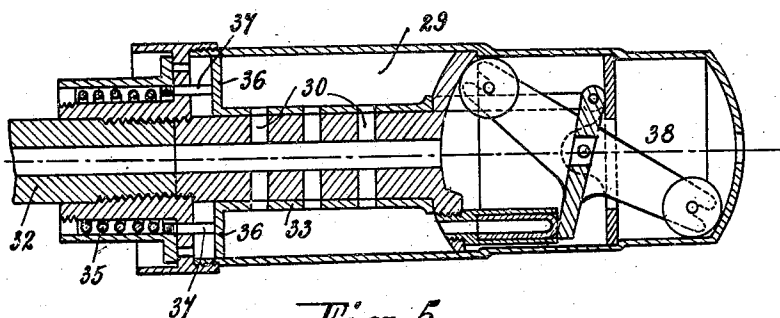


Fig. 5.

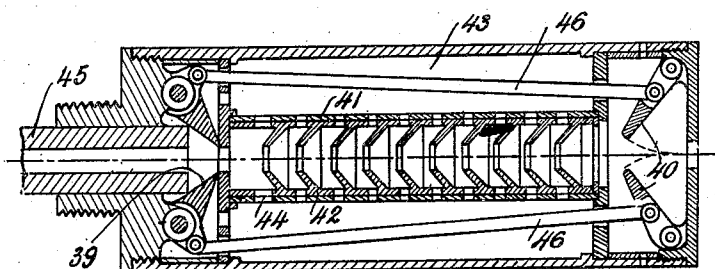


Fig. 6.

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DAMPING APPARATUS FOR THE PREVENTION OF NOISE, FLAMES, AND RECOIL IN FIREARMS OF THE AUTOMATIC TYPE

Application filed November 29, 1927, Serial No. 236,414, and in France April 27, 1927.

My invention relates to a damping apparatus for the prevention of noise, flames and recoil in fire-arms of the automatic type. The said apparatus is disposed on the end of the gun barrel, and the gas from the combustion of the powder at each shot is retained for the major part within the apparatus by means of a pivoted shutter.

The appended drawings show by way of example five different embodiments of the invention.

Fig. 1 is a longitudinal section of the first form of construction in the open position and before the shot is fired, and

Fig. 2 is a like view showing the closed position after the shot has been fired.

The said apparatus is supposed to be employed upon a machine gun of the recoil type.

1 is the gun barrel; a cylinder 2 comprises an outer screwthreaded part which is screwed into the radiator of the machine gun, and at the other end of the cylinder is formed a chamber 3 which is termed the gas collecting chamber.

The gun barrel extends loosely through the said cylinder and opens into the said gas chamber 3. The cylinder 2 is tightly screwed into the disk 4 which closes the rear end of the cylinder 5. In the cylinder 5 is disposed a transverse wall 6 carrying the pivot axle 7 upon which is mounted a rocking arm 8 adapted to pivot upon said axle. At the respective ends of the arm are mounted the balls 9 which are provided with side axles engaging slots in said arm. Upon the said arm is disposed the transverse plate 11 situated at an angle with the center line of the apparatus and pierced with an aperture 12 for the passage of the projectile. At the respective sides of the said rocking arm are disposed the two links 13 which are pivotally mounted on the said arm at 14 at the front ends; the rear ends enter the gas chamber 3 and are cross-connected by the bar 15. In the gas chamber is formed an eccentric aperture into which is fitted a conduit 17 in which is movable a piston 18.

Upon the trajectory, the said gas chamber is pierced with an orifice 19 for the passage

of the projectile, and a like aperture 20 is formed in the outer wall of the apparatus.

When the shot is fired, the projectile traverses the apparatus and the gas which follows it will be partially dispersed in the interior of the chamber 3 and will enter the conduit 17; by means of the piston 18 said gas will actuate the arm 8 through the medium of the plate 11; said arm will turn upon its axle 7, and the balls 9 thus close the apertures 19 and 20, so that the gas expanding in the cylinder 5 can only escape through special exit orifices, and since the gas pressure is small, this discharge will take place without noise. Only a small quantity of gas will directly follow the projectile through the aperture 20 before the apparatus is closed.

Another small quantity of gas which has remained in the chamber 3 will proceed into the gun barrel and will escape at the breech end when the cartridge case is expelled. Due to the small quantity and low pressure of this gas, it will offer no prejudice to the gunner.

After each shot, the gun barrel will recoil, so that the links 13 are released and the apparatus is closed.

Before the next shot, the barrel returns to the front and drives forward the said links by means of the cross bar 15, and the apparatus is thus opened.

Fig. 3 is a plan view of the said rocking arm, together with the links, cross-piece and balls.

Fig. 4 is a lengthwise section of the second form of construction, the apparatus being fitted upon a machine gun having a stationary barrel 22. The closing arrangement is substantially the same as in the first construction.

The difference consists in the fact that the opening is controlled by a spring 23 actuating a cylinder 24 terminating in a shoulder 25 adapted to drive the two links 26; these latter which are connected with the said rocking arm will effect the opening of the apparatus. The opening cannot take place before the reduction of the pressure resulting from the leakage of the gas through the

special apertures 28. It is obvious that the device will be opened too quickly if the apertures 28 are too large, and that it will not be opened before the next shot, if the said apertures are too small. The total diameter of the exit apertures is determined by calculation and experiment.

Fig. 5 shows a longitudinal section of the third form of construction, in which the apparatus is mounted upon a machine gun with stationary barrel. It differs from the second form only by the fact that the gas chamber 29 is longer than before; it is filled with gas by means of special orifices 30 formed in the internal cylinder 31 in line with the barrel 32; said cylinder may be given a small internal diameter provided it will afford free passage for the projectile or its diameter may be made larger for the insertion of a set of funnel-shaped disks by which the gas is directed towards the peripheral orifices.

After each shot, the gas will traverse said orifices, filling the said gas chamber and actuating the outer cylinder 33 provided with orifices corresponding to those of the inner cylinder 31. When in motion, the said outer cylinder closes the orifices of the inner cylinder, and the gas inclosed in the said gas chamber can only escape through special interstices and orifices. The total diameter of the orifices should be sufficient to assure the equilibrium between the internal pressure of the chamber 29 and the pressure in the cylinder 34 as soon as the apparatus is closed.

The said apparatus is opened by the spring 35 which will act when the pressure falls in the said gas chamber due to the leakage of gas. The opening action is controlled by means of a disk or shoulder 36 provided with pins 37 impelling the cylinder 33 which actuates the rocking arm 38 in a manner analogous to the action of the machine gun of the recoil type equipped with the first-mentioned apparatus.

Fig. 6 shows the fourth form of construction and as in the case of the first form, the apparatus is mounted on machine gun of the recoil type. The said apparatus differs from the preceding by the fact that the closing means comprising the said balls are replaced by a closing device provided with clack valves. For this purpose, a pair of flaps or valves 39 is disposed at the admission end and a second and like pair is disposed at the exit end of the apparatus. Between the said valve sets is disposed a cylinder 41 provided with a set of funnel-shaped members 42 by which the gas is directed towards the chamber 43. After filling the said chamber, the gas begins to escape through the orifices 44 when the projectile has left the apparatus.

At the same time the said valves will close the apparatus at both ends, due to the action of the gas. The device is opened by the action of the barrel 45 which recoils when the

shot is fired and then returns to the normal position before the next shot, and opens the rear valves 39 which are connected with the front valves 40 by the bars 46, so that the valves 40 will be opened at the same time.

I claim:

1. In a gun silencer, a chamber mounted on the end of the gun barrel as a prolongation of the latter, a fixed outer chamber of enlarged volume enclosing said first-named chamber, the forward walls of said chambers being provided with aligned openings which permit the exit of a discharged projectile, and means for automatically obturating both of said openings after the exit of the projectile.

2. In a gun silencer, a chamber mounted on the end of the gun barrel as a prolongation of the latter, a fixed outer chamber of enlarged volume enclosing said first-named chamber, the forward walls of said chambers being provided with aligned openings which permit the exit of a discharged projectile, and means for automatically and simultaneously obturating both of said openings after the exit of the projectile.

3. In a gun silencer, a chamber mounted on the end of the gun barrel as a prolongation of the latter, a fixed outer chamber of enlarged volume enclosing said first-named chamber, the forward walls of said chambers being provided with aligned openings which permit the exit of a discharged projectile, and means for automatically obturating both of said openings after the exit of the projectile, said means comprising a pair of obturators cooperatively associated with said openings respectively.

4. In a gun silencer, a chamber mounted on the end of the gun barrel as a prolongation of the latter, a fixed outer chamber of enlarged volume enclosing said first-named chamber, the forward walls of said chambers being provided with aligned openings which permit the exit of a discharged projectile, and means for automatically and simultaneously obturating both of said openings after the exit of the projectile, said means comprising a pair of movable obturators associated with said openings respectively, and means for simultaneously controlling their operation.

5. In a gun silencer, a chamber mounted on the end of the gun barrel as a prolongation of the latter, a fixed outer chamber of enlarged volume enclosing said first-named chamber, the forward walls of said chambers being provided with aligned openings which permit the exit of a discharged projectile, and means operable by the pressure of the gas within said chambers for automatically and simultaneously obturating both of said openings after the exit of the projectile.

6. In a gun silencer, a chamber mounted on the end of the gun barrel as a prolongation

- of the latter, a fixed outer chamber of enlarged volume enclosing said first-named chamber, the forward walls of said chambers being provided with aligned openings which permit the exit of a discharged projectile, and means operable by the pressure of the gas within said chambers for automatically and simultaneously obturating both of said openings after the exit of the projectile, said means including a pair of interconnected movable obturators associated with said openings respectively.
7. In a gun silencer, a chamber mounted on the end of the gun barrel as a prolongation of the latter, a fixed outer chamber of enlarged volume enclosing said first-named chamber, the forward walls of said chambers being provided with aligned openings which permit the exit of a discharged projectile, and means operable by the pressure of the gas within said chambers for automatically and simultaneously obturating both of said openings after the exit of the projectile, said means including a pair of movable obturators associated with said openings respectively, and levers rigidly interconnecting said obturators to insure simultaneous operation thereof.
8. In a gun silencer, a chamber mounted on the end of the gun barrel as a prolongation of the latter, a fixed outer chamber of enlarged volume enclosing said first-named chamber, the forward walls of said chambers being provided with aligned openings which permit the exit of a discharged projectile, and means operable by the pressure of the gas within said chambers for automatically and simultaneously obturating and subsequently again unsealing both of said openings after the exit of the projectile.
9. In a gun silencer, a chamber mounted on the end of the gun barrel as a prolongation of the latter, a fixed outer chamber of enlarged volume enclosing said first-named chamber, the forward walls of said chambers being provided with aligned openings which permit the exit of a discharged projectile, a pair of movable obturators associated with said openings respectively, and means for automatically and simultaneously operating said obturators to seal and subsequently to again unseal both of said openings after the exit of the projectile.
10. In a gun silencer, a chamber mounted on the end of the gun barrel as a prolongation of the latter, a fixed outer chamber of enlarged volume enclosing said first-named chamber, the forward walls of said chambers being provided with aligned openings which permit the exit of a discharged projectile, means operable by the gases within said chambers for automatically obturating both of said openings after the exit of the projectile, and said outer chamber being provided with passages in constant communication with the atmosphere for permitting release of said gases."
- In testimony whereof I affix my signature.
ZYGMUNT WILMAN.
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