Nov. 12, 1929. J. DESTREE 1,735,160

AUTOMATIC FIREARM

Filed April 13, 1927

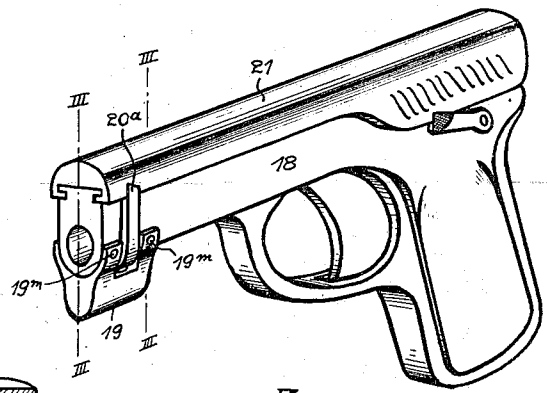

Fig. 2

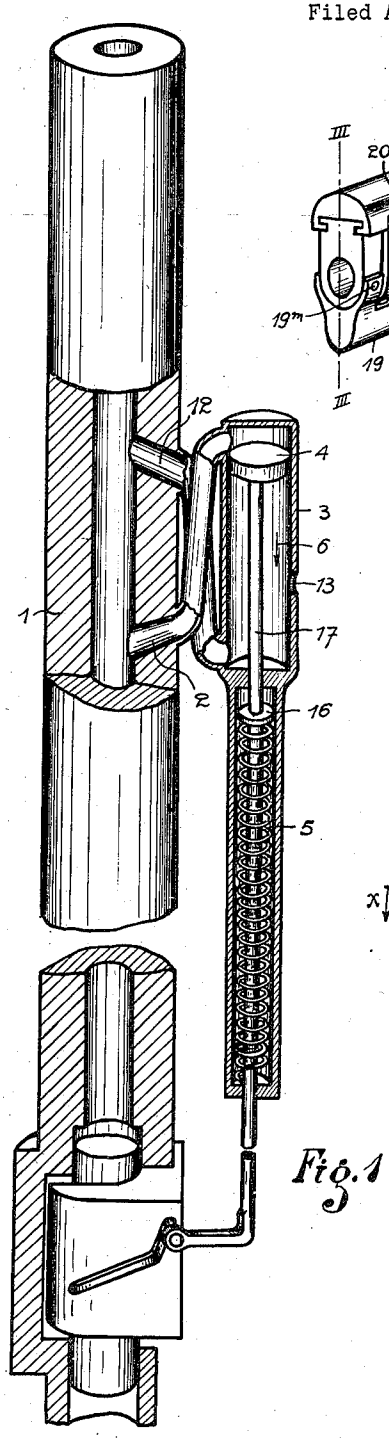

Fig. 1

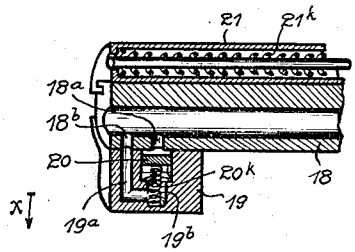

Fig. 3

Inventor
J. Destree
by Fitzsimmons & Co.
Attys

Patented Nov. 12, 1929 1,735,160

UNITED STATES PATENT OFFICE

JOSEPH DESTREE, OF BRUSSELS, BELGIUM

AUTOMATIC FIREARM

Application filed April 13, 1927, Serial No. 183,542, and in Belgium January 11, 1927.

The present invention relates to an automatic fire arm in which the pressure of the gases which discharge the bullets is employed for producing the displacement of a member taking part in the operation of the fire arm.

This member may be the breech block, or a bolt on the latter, or any other member.

The invention relates to an arrangement which, in spite of the sudden action of the gases, permits comparatively gentle movements the amplitude of which is easily adjustable to be communicated to the said member.

The invention consists essentially in employing the gases themselves for exerting a braking action on the movement which they produce, this result being attained in employing the gases themselves for exerting braking action on the movement which they have produced immediately that the member is put into motion.

In my other specification No. 183,541, of even date an arrangement is described which is similar to the present one but in which the motive action of the gases is transmitted through the medium of a fairly powerful spring in order to produce by its expansion the various automatic operations.

The present invention is based on the observation of the fact that the nature of the adjustment which can be obtained by the opposing action of the gases themselves even when the passages of the gases are of fairly large section is such that it is in no way indispensable to oppose, in addition to the motive action of the gases, a spring which acts as a damping and intermediate device. It has previously been known to construct apparatuses in which the braking gases impinge upon the face of the braking mechanism in the cylinder containing the motive gases, after which such motive gases are already considerably retarded. Such admission of the braking gases is in addition effected at the end of the stroke of the member in a manner that itself displaces it at a very great speed during the greater part of the stroke, promoting a shock upon the parts which are related thereto.

The present invention provides in particular for the construction of a fire arm in which the breech is opened and the cartridge case ejected by means of a mechanism actuated by a piston upon which the gases produced by the combustion of the powder are made to act the reverse operations being effected by the expansion of one or several springs compressed by the action of the gases.

To this end, according to the invention, the gas is admitted through a fairly large orifice permitting the gases to pass away rapidly during the return stroke of the piston, the movement of the latter being checked during its forward stroke well before it reaches the end of the stroke by admitting the gases on to its other face through a fairly large aperture situated, relatively to the first one, on the outlet side of the barrel.

The invention also provides a means for reducing the braking action by forming holes in the cylinder containing the piston, these holes being formed on the side on which the braking action is produced and leading to the atmosphere.

In another form of the invention a current of gas is employed for exerting a braking action upon a member unlocking the breech block moved by the gases themselves.

The accompanying drawings illustrate diagrammatically, by way of example, the two forms of the invention to which reference has been made above.

Figure 1 is a perspective view of a breech operating system. Figure 2 is a perspective view of a lock applied to a pistol. Figure 3 is a sectional view, in perspective, taken in the plane of the lines III—III, Figure 2.

Fig. 1 shows a perspective view of a gun barrel 1 in the wall of which have been pierced two fairly large apertures 2 and 12 communicating with the ends of a cylinder 3 containing a piston 4. When a projectile is fired, the gases force the latter out, driving this piston in the direction of the arrow 6 as soon as the projectile has passed beyond the aperture 2. When this projectile has passed beyond the aperture 12, the gases exert a braking action upon the movement of the piston.

During its movement in the direction of the arrow 6, the piston 4, through the medium

of the stop 16 mounted upon its rod 17, compresses a spring 5. At the same time the breech to which the rod 17 is connected directly is opened and the cartridge case is ejected.

When the projectile leaves the gun barrel the gases escape and the spring 5 expands, at the same time causing a cartridge to be placed in position, the breech to be closed and locked.

By means of this arrangement, the gases are rapidly expelled and yet no part is broken on account of the method of braking employed. If the action of the gases is more energetic than usual, the braking action increases proportionately.

The invention also provides for the possibility of regulating the strength of the braking action by piercing one or more holes 13 in the cylinder 3, at the side on which the gases exerting the braking action are admitted.

In the case shown in Figure 2 the invention is applied to the control of the movement of an unlocking member 20, which, when it occupies its locked position produces a connection between the barrel 18 and the breech block 21 of an automatic pistol. The said member 20 is formed by a bridge piece sliding in a direction at right angles to the axis of the barrel 18 and provided with two lugs or projections such as 20^a engaging, for producing the locking action, in corresponding notches in the breech block 21. During firing, the gases which expel the bullet produce, by engaging in the hole 18^a of the barrel 18, the displacement of the member 20 in the direction of the arrow X, the effect of which is to unlock the breech block.

The movement of the member 20 is immediately damped by a jet of gas driven in the opposite direction through an orifice 19^b in a member mounted upon the barrel by means of screws 19^m for example.

The gas is led to the orifice 19^b through a duct 19^a disposed in the axis of a second hole 18^b formed in the barrel 18. As soon as the member 20 is displaced in the direction of the arrow X, the breech block is displaced backwards under the action of the gas, compressing the recuperating spring 21^k disposed in one of the usual ways. When the gases have ceased to act upon the member 20 the latter returns into its initial position under the action of the return spring 20^k.

The inclined planes of the lugs 20^a then causes, upon the return of the breech 21 into its normal position, a displacement of the member 20 permitting it to engage in the locking notches.

What I claim is:

1. An automatic fire arm comprising a member taking place in the operation of the fire arm, means for directly conducting projectile expelling gases from the barrel to said member to effect movement of the member in one direction and means for subsequently conducting the gases directly from the barrel to said member in such manner as to act on the member in a direction to dampen the aforesaid movement of the member immediately after the initiation of such movement.

2. An automatic fire arm comprising a fixed barrel a cylinder, a plunger in this cylinder directly connected to the breech flock, means for directly conducting projectile expelling gases from one portion of the barrel to one face of the plunger for displacing the plunger rearward, and means for subsequently conducting the gases directly from another portion of the barrel to the other face of the plunger.

3. An automatic fire arm comprising a fixed barrel, a cylinder, a plunber in this cylinder directly connected to the breech block, means for conducting projectile expelling gases directly from one portion of the barrel to one face of the plunger for displacing the plunger rearward, means for subsequently conducting the gases directly from another portion of the barrel to the other face of the plunger, the said means for conducting the gases to the aforesaid faces of the plunger being such as to present a fairly large section for the passage of the gases.

4. An automatic fire arm comprising a fixed barrel, a cylinder, a plunger in this cylinder directly connected to the breech block, a passage of fairly large section extending from the barrel to the end of the cylinder opposed to the breech block, a second passage of fairly large section extending from a point of the barrel at a distance from the breech a little greater than for the first passage, to the other end of the cylinder.

5. An automatic fire arm comprising a fixed barrel, a cylinder, a plunger in this cylinder directly connected to the breech block, a passage of fairly large section extending from the barrel to the end of the cylinder opposed to the breech block, a second passage of fairly large section extending from a point of the barrel at a distance from the breech a little greater than, for the first passage, to the other end of the cylinder, holes in the cylinder near this last end for connecting this part of the cylinder with the atmosphere.

6. An automatic fire arm comprising a fixed barrel, a member normally locking the breech block by direct engagement therewith, a passage of fairly large section extending from the barrel to the face of this member on which the gases must act for unlocking the breech block, a second passage of fairly large section extending from a point of the barrel at a distance from the breech a little greater than for the first passage, to the other face of the element.

7. An automatic fire arm comprising a fixed barrel, a member normally locking the

breech block by direct engagement therewith, a passage of fairly large section extending from the barrel to the face of this member on which the gases must act for unlocking the breech block, a second passage of fairly large section extending from a point of the barrel at a distance from the breech a little greater than for the first passage, to the other face of the element, a spring soliciting the said member toward its locking position.

In testimony whereof I affix my signature.

JOSEPH DESTREE.