C. F. LEFEVER.

POP GUN.

APPLICATION FILED SEPT. 18, 1916.

1,240,990. Patented Sept. 25, 1917.

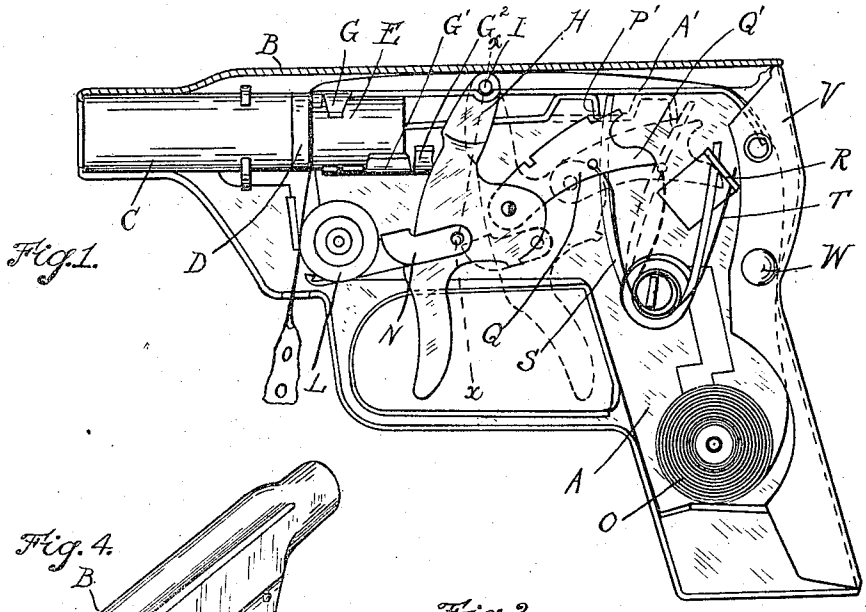


Fig. 1.

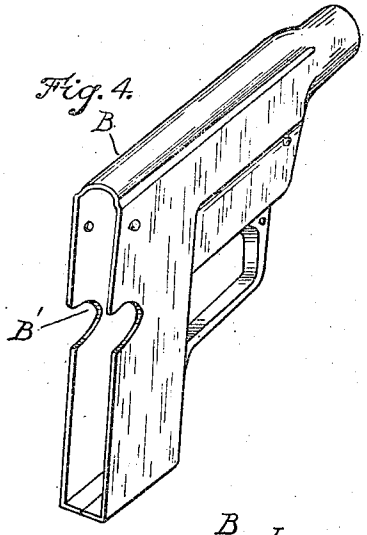


Fig. 4.

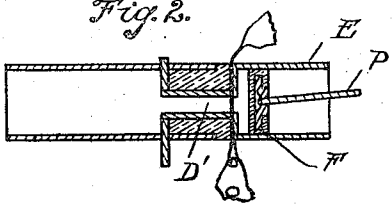


Fig. 2.

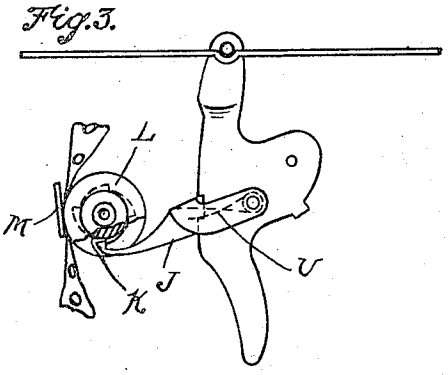


Fig. 3.

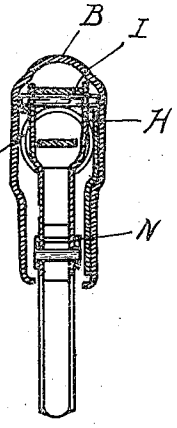


Fig. 5.

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POP-GUN.

1,240,990. Specification of Letters Patent. Patented Sept. 25, 1917.

Application filed September 18, 1916. Serial No. 120,763.

To all whom it may concern:

Be it known that I, CHARLES F. LEFEVER, a citizen of the United States of America, residing at Plymouth, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Pop-Guns, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to guns of that type in which a report is produced by the pneumatic rupturing of paper or other thin diaphragm. It is the primary object of the invention to obtain an automatic construction or repeater, with which a succession of shots may be fired without readjustment. It is a further object to accomplish the entire function through the actuation of the trigger. With these objects in view the invention comprises the novel construction as hereinafter set forth.

In the drawings:

Figure 1 is a side elevation of a piston embodying my invention, the outside casing being in longitudinal section;

Fig. 2 is a longitudinal section showing the paper-rupturing mechanism;

Fig. 3 is an elevation of the paper feed mechanism;

Fig. 4 is a perspective view of the outer casing removed; and

Fig. 5 is a cross section on line x—x Fig. 1.

While my improvements are applicable to various types of gun, I have illustrated the same in connection with a pistol, in which A is a frame preferably formed of pressed sheet-metal and upon which all of the operating mechanism is mounted. This frame is adapted for insertion in an outer casing B, also preferably formed of pressed sheet-metal and inclosing all of the mechanism with the exception of the projecting trigger. C is a barrel mounted on the forward end of the frame and providing a seat D for receiving the paper and having a central aperture D′ for the discharge of the ruptured section. E is a cylinder in which the air is compressed, said cylinder and seat D being relatively movable, and together constituting a clamp for the paper in one position of adjustment. Either of the members may be actuated to effect the clamping and unclamping of the paper, but as shown the cylinder is the movable member and is actuated through the medium of the piston F therein. Thus the cylinder E is slidably mounted on the frame A by suitable means, such as the bent flanges G G′ on said frame embracing the cylinder. Movement is also limited by a stop G^2 at the rear end of the cylinder, while forward movement is limited by the seat D. The friction of the piston F is sufficient to actuate the cylinder and thus each rearward stroke of the piston will retract the cylinder from the seat D, unclamping the paper; while each forward stroke will press the cylinder against the seat to effect the clamping.

As each time the gun is fired, a section of the paper is ruptured, it is necessary to feed a new section of paper across the seat D before each shot. This is automatically accomplished by a feeding mechanism which is actuated by the trigger, the specific construction shown being as follows: H is a trigger pivotally mounted at I upon the frame and projecting downward therefrom and outward through the inclosing casing B. Secured to this trigger is a pawl J, which operatively engages a ratchet wheel K upon a feed wheel L. The latter is provided with a facing of rubber or other material having a high coefficient of friction and bears against the paper strip, which is held in engagement therewith by a flange M preferably struck up from the frame A. A dog N, preferably integral with the pawl J, normally bears against the periphery of the wheel L and holds the same from movement, but upon the actuation of the trigger, this dog releases the wheel and subsequently the pawl J actuates the ratchet wheel K to rotate the wheel and feed the paper strip. Sufficient lost motion is provided between the pawl and the ratchet wheel to permit an initial movement of the trigger, which through the mechanism about to be described retracts the cylinder E, unclamping the paper on the seat D. Thus, by using a continuous paper strip, which may be fed from a roll O mounted on the frame, preferably in the handle portion thereof, a new section of paper may be registered with the seat upon each actuation of the trigger.

To produce the report, there must be a quick compression of air to a high enough pressure for rupturing the paper. This compression is preferably accomplished by a spring actuation of the piston F, the spring

being compressed by the operation of the trigger and finally released to perform its function. As shown, the piston F is provided with an operating shank P, which is guided by engagement with a flange A′ on the frame A, and is also provided with a hooked portion P′ for engagement with the sear. The sear Q is in the form of a pawl pivotally attached to the trigger H and is so arranged that when said trigger is retracted, said pawl will engage with the hook P′, forcing the shank P backward along the guide A′, thereby withdrawing the cylinder E from the seat D and subsequently moving the piston F rearward in the cylinder. The sear is released upon the final movement of the trigger by a trip mechanism, comprising a flange R on the frame engaging a portion of the sear and deflecting it lateraly, so as to withdraw its engagement with the hook P′. S is a spring for actuating the piston in a forward direction, said spring being secured to the frame and bearing against the rear end of the shank P. There is also a spring T for yieldably holding the sear in engagement with the hook P′ and a spring U for holding the pawl J in engagement with the ratchet wheel K.

In operation the paper from the roll O is drawn around suitable guides to the seat D and across the latter to the feed roll L. When thus arranged, each time the trigger is pulled the initial movement thereof, operating through the sear Q and shank P will retract the cylinder E, releasing the clamping action. A further movement of the trigger will engage the pawl J with the ratchet wheel K and will rotate said wheel to feed the paper strip, withdrawing the ruptured section from the seat and moving an imperforate section across the same. At the same time the movement of the trigger will retract the piston F, thereby compressing the spring S. Finally the engagement of the portion Q′ of the sear with the flange R will trip or release the sear, permitting the stored power in the spring S to quickly force the piston F forward. The initial forward movement of the piston will frictionally actuate the cylinder to clamp the same against the seat D, and the succeeding movement of the piston will develop a high pneumatic pressure sufficient to rupture the paper and to eject the torn section thereof through the aperture D′. It will be understood that this operation may be repeated as often and as fast as the trigger can be actuated, while the used end of the paper strip will be fed downward and may be torn off from time to time.

As illustrated in Fig. 1, the trigger H and the pawl or sear Q together constitute a toggle lever, which in the normal position of the trigger is in bent or angular relation. When the trigger is pulled this toggle will be straightened and consequently the power of the leverage is progresisvely increased. This will compensate for the increased tension of the spring, as the piston is retracted and will diminish the power required to actuate the trigger in the final portion of its movement.

As has been stated, all of the mechanism is mounted upon the frame A, which is insertible in the outer casing B. For convenience in assembly, this outer casing is formed open at the rear end and the opening is closed by a rear wall secured to the frame A. As shown, the rear wall is formed of a member V of U-shaped cross section, the flanges of the U fitting inside of the side flanges of the casing B. A headed brace pin W reinforces this U-shaped member, and the casing B is cut away at B′ to receive this headed pin. Thus, to disengage the casing the headed pin will be grasped and the frame withdrawn.

What I claim as my invention is:

1. In a gun of the character described, the combination of a seat for the paper strip, clamping means, a strip-feeding roll, a trigger, a pawl actuated by the trigger for rotating said roll, an air compression cylinder, a piston therein, a piston shank for actuating the same, a pawl operated by the trigger for engaging said shank to retract the same and to constitute the sear, a spring for actuating the piston in the reverse direction, a trip for releasing said pawl or sear at the completion of its rearward movement, and means actuated by the trigger for unclamping the paper strip.

2. In a gun, the combination with a seat for the paper, a paper feeding roll, a trigger, a pawl connected to said trigger for actuating said roll, an air compression cylinder, a piston therein, a shank for said piston, a pawl connected to said trigger for engaging said shank to actuate the same rearward and constituting a sear, a spring for actuating the piston in the forward direction, a trip for releasing said pawl or sear at the completion of the rearward movement of said trigger, and means actuated by the piston respectively in its rearward and forward movement for unclamping and clamping the strip upon its seat.

3. In a gun of the character described, a frame, a seat for the paper strip, means for clamping the paper on said seat, an air compression cylinder, strip feeding means, a trigger, and mechanism actuated by said trigger for operating said clamping means, feeding means and air compressing means, all of said parts being mounted on said frame and a detachable casing for inclosing said parts, said frame being provided with a U-shaped rear wall, a headed brace pin passing through the sides of said U-shaped wall and said casing being open at

one end and having portions cut-away at the sides thereof at their rear edges for receiving the heads of said brace pin.

4. In a gun, the combination with a trigger, of a spring compressed by a movement of said trigger, and a toggle lever connection between said trigger and spring for increasing the power of the leverage as the resistance of the spring increases.

5. In a gun, the combination with a trigger, of an air compression cylinder, a coöperating piston, a spring for relatively moving said cylinder and piston to compress the air therein, and a toggle lever actuated by said trigger for compressing the spring, with increasing power as the resistance increases.

6. In a gun, the combination with the trigger, of an air compression cylinder and coöperating piston, a spring for relatively moving said cylinder and piston to compress air, a toggle lever actuated by the trigger for tensioning the spring with increased power as the resistance increases, and a trip for disengaging said toggle at the completion of the movement of the trigger to release the stored power of the spring.

7. A pistol, comprising a frame, operating mechanism mounted thereon including a trigger for actuating the same, an outer casing including barrel and handle open at its rear end to receive said frame and operating mechanism, and a rear wall on said frame for closing said opening.

8. A pistol, comprising a frame, an operating mechanism mounted thereon, including a trigger for actuating the same, an outer casing including barrel, trigger-guard and handle, said casing being open at the rear to receive said frame and operating mechanism, and a closure for said opening secured to said frame.

9. In a gun of the character described, the combination with a seat across which a paper strip is fed, of feeding means for said strip, a relatively movable cylinder and a relatively movable piston therein, said cylinder and piston coöperating to clamp said strip upon its seat, a trigger, and connecting mechanism for unclamping and feeding said strip upon movement of said piston and cylinder in one direction and for re-clamping and compressing air to rupture said strip upon movement of said piston and cylinder in the opposite direction.

10. In a gun, the combination with a trigger, of a spring compressed by a movement of said trigger, and connecting means between said trigger and spring for increasing the power of the leverage as the resistance of the spring increases.

In testimony whereof I affix my signature.

CHARLES F. LEFEVER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."