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FIREARM.

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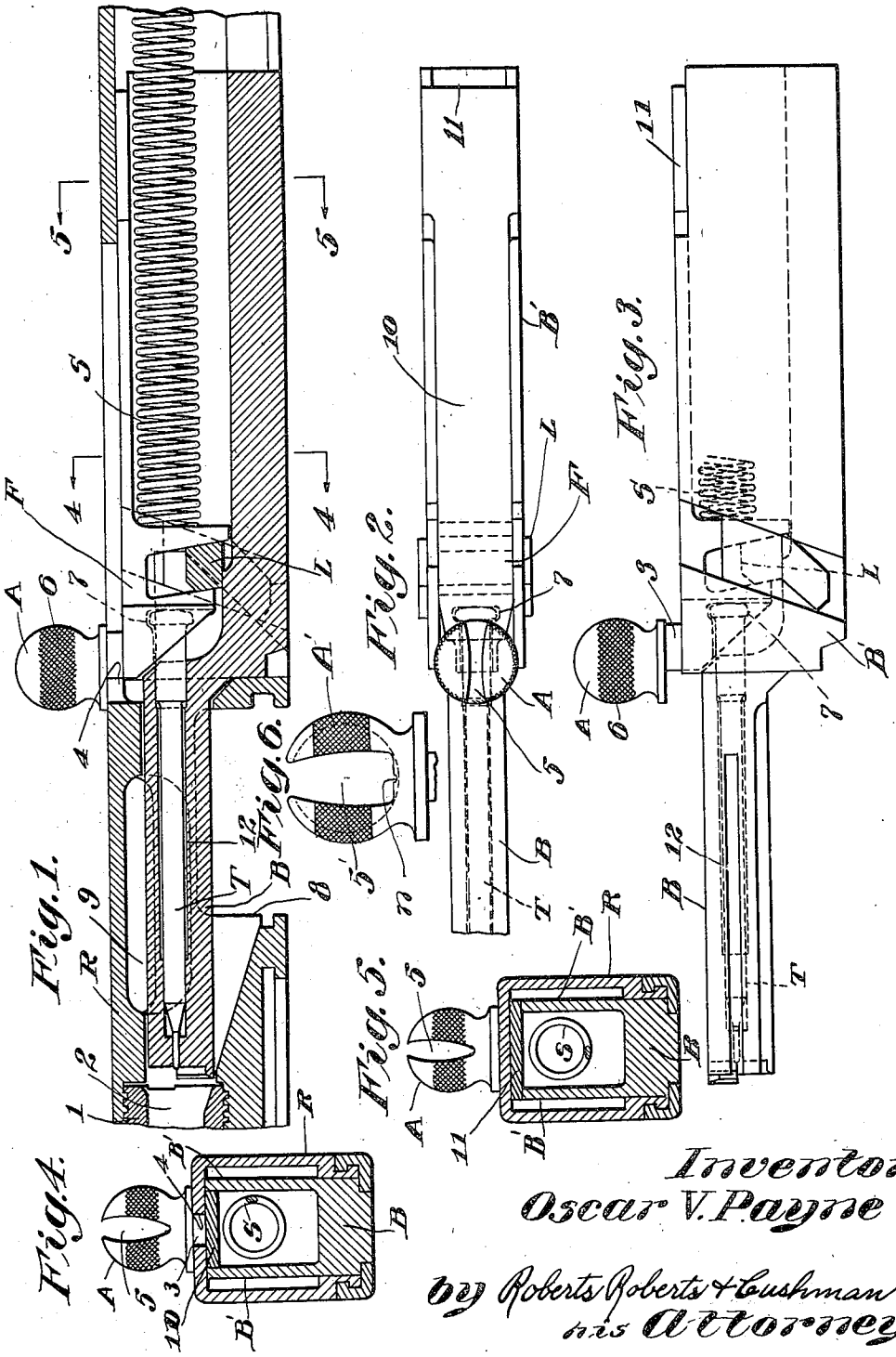
1,338,866. Patented May 4, 1920.



UNITED STATES PATENT OFFICE.

OSCAR V. PAYNE, OF CLEVELAND, OHIO, ASSIGNOR TO AUTO-ORDNANCE CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

FIREARM.

1,338,866. Specification of Letters Patent. Patented May 4, 1920.

Application filed December 5, 1919. Serial No. 342,699.

To all whom it may concern:

Be it known that I, OSCAR V. PAYNE, a citizen of the United States, and resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented new and useful Improvements in Firearms, of which the following is a specification.

This invention relates broadly to firearms, such as pistols, rifles, machine guns, shot guns, etc., although it is described herein in connection with the type of firearm disclosed in my prior application for patent, Serial No. 282,642, filed March 14, 1919. This disclosure is not to be taken as a limitation to its use in such type of gun alone, as it is obviously of broad application to various types of firearms.

Heretofore, one of the serious faults in gun design has been the failure to secure symmetry of conformation and consequent equality of distribution of weight and of thrust about the longitudinal axis of the piece. This failure renders the gun more difficult to aim and results in frequent breakages due to asymmetric stresses. When the lack of symmetry appears in reciprocating parts its deleterious effect is very much increased. The lack of balance in weight of these reciprocating parts carries the resultant of the thrust due to the movement of the parts, out of the line of the longitudinal axis of the piece. This eccentrically operating thrust creates a lateral component tending to turn the gun and to cause the parts to chatter and ultimately break. And this eccentric component of the thrust is particularly marked in machine guns and other rapid-fire guns where the reciprocation takes place at a rapid rate.

In guns heretofore used, this eccentric component has resulted in a marked jump of the gun which makes it practically impossible in operation to hold them directed so that successive shots strike the same portion of the target. This has the result of creating inaccuracy of fire and consequent waste of ammunition. Furthermore in cases where the gun is designed with a part thereof to contact with the operator when firing, this jump is very fatiguing to the operator, which results in further inaccuracy.

It is an object of this invention to make all reciprocating parts symmetrical about a vertical plane passing through the longitudinal axis of the piece and thus to eliminate all lateral thrust due to the movement of these reciprocating parts.

One element which has heretofore militated against the accomplishment of this object has been the fact that it has been deemed necessary to locate the actuator for the firing mechanism to one side of the line of sight. This necessity has been removed under the present invention as the actuator has been grooved or slotted to act as a rear sight and has been placed directly in the line of sight and in the vertical plane passing through the longitudinal axis of the gun.

Although I have shown and described the combined actuator and rear sight only as a knurled knob with a slot therein, it is obvious that it may take any suitable form for use as a rear sight within the broad scope of the appended claims.

The reciprocation of the firing mechanism, when a gun of the type shown is in action, is so rapid as not to be substantially visible to the eye. Moreover, since the motion is entirely in the line of sight the visibility of the target is never impaired by the motion.

If the combined actuator and sight is applied to a gun of a type where the actuator in operation is moved laterally or rotated about the axis of the piece, the temporary movement of the sight out of line would be normally immaterial as in such arms it is ordinarily impractical to maintain the line of sight while operating the bolt. Or any objection to such movement of the combined sight and actuator might be obviated by having a fixed rear sight on the gun, the slot in the actuator serving to prevent the actuator from interfering with the line of sight. In this case the function of the actuator as a sight would be secondary but the symmetry about the longitudinal axis of the piece would be maintained.

A further object of the invention is so to form the firing member that a portion thereof serves to close the slot through which the actuator stem projects, to make this portion of the member symmetrical and to guide it so that it moves without vibration.

Further objects of the invention and other results accomplished thereby will appear as the disclosure proceeds.

In the accompanying drawings—

Figure 1 is a longitudinal sectional view partly in elevation showing the breech mechanism of a gun;

Fig. 2 is a plan view showing the breech block and the firing member, a portion of the breech block being broken away;

Fig. 3 is a side elevation of the breech mechanism;

Fig. 4 is a section on line 4—4 of Fig. 1;

Fig. 5 is a section on line 5—5 of Fig. 1; and

Fig. 6 is a detail view of a modified sight.

The particular embodiment of the invention chosen for the purpose of illustration comprises a receiver R having a feed opening 8 and an ejection opening 9, a barrel 1, having a firing chamber 2, a breech block B, a firing member F, an actuator A for said firing member, a spring S to control the breech mechanism, and a striker T. The firing member and breech block are movably interlocked by the lock L as described in my aforesaid application.

The actuator is integrally joined to the firing member by the neck 3, which operates in the slot 4 formed in the upper side of the receiver. The actuator has a notch or slot 5 formed longitudinally therethrough; and has a portion of its surface knurled as shown at 6, in order to facilitate its manual operation.

The striker is joined to the firing member by means of an enlarged head fitting into a shouldered recess 7 in the firing member. This simple connection is certain in operation and yet readily permits rapid assembly and separation of the parts.

The striker is generally cylindrical in shape and operates in a similar shaped opening 12 in the forward portion of the breech block. In my previous application above referred to, I have illustrated and described a structure in which the striker and firing member were integral and in which the striker was rectangular in cross-section and operated in a similar slot in the breech block. In certain guns the structure shown herein has been found more desirable in that it is less liable to bind or break, may be more easily and cheaply manufactured, and also because it greatly facilitates assembly of the parts.

The firing member has an extended rear flat portion 10 which terminates in the flat tail 11. As shown in Fig. 4 the flat portion 10 of the firing member operates between the upwardly extending arms B′ of the rear portion of the breech block, which portion is U-shaped in cross-section, while as shown in Fig. 5, the flat tail 11 of the firing member bears on top of the arms B′ which are cut away at the rear an amount equivalent to the thickness of the tail 11. As is clearly shown in both Figs. 1 and 4, the portions 10 and 11 serve to close the slot 4 and effectively prevent foreign matter from entering the receiver through the slots.

In the operation of the gun the ammunition is fed up through the opening 8. To start firing, the actuator A is retracted against the spring S. The actuator is directly connected with the firing member F which is thereby retracted, carrying with it the breech block B to which it is movably interlocked by the lock L. The functioning of the lock is fully described in my prior application above referred to and, since it forms no part of the present invention, it need not be more particularly described herein. It may be stated, however, that the lock in its action causes a relative movement between the breech block B and the firing member F with its striker T, the movement being such that the striker is retracted in the rearward motion of the assembly and is forced forward into firing position as the assembly reaches forward position and as the lock moves downwardly into locked position.

After the actuator is retracted, it is released and the firing assembly moves forward under impulse of the spring S, the breech block carries a cartridge ahead of it and forces it into the firing chamber 2. Simultaneously with the locking of the mechanism, the lock L permits the striker T to fire the cartridge. The reaction due to the explosion of the propelling charge carries the firing assembly to the rear and the action is automatically continued.

Any known form of trigger mechanism may be used in connection with the firing member to limit the rapidity of fire or to render fire semi-automatic. A preferred form of trigger mechanism has been shown in my prior application Serial No. 297,282, filed May 15, 1919, but it is no part of the present invention and need not be shown or described herein.

The modification in Fig. 6 comprises a combined actuator and sight A′ having a larger sight opening 5′ and a small notch *n* in the base of the opening, thus illustrating the possibility of affording more precise sighting facility if desired.

It will be observed that all parts of the structure shown are symmetrical about the vertical plane passing through the longitu-

dinal axis of the piece. The actuator is located in that plane and the opening therein is adapted for use as a rear sight. All motion of the actuator is in the line of sight so that it will not affect its use as such. This is especially true since in the normal use of sights the eye is not focused on the rear sight. The movement of the actuator is fully guided by its bearing on the outer part of the receiver, and by the bearing of the tail of the firing member against the under surface of the upper part of the receiver and against the arms and on top of the arms of the breech block. Its movement therefore is smooth and substantially without vibration.

I claim:

1. In a gun, a receiver, a breech block having laterally spaced upper surfaces fitting in said receiver, and a firing member movable relative to said breech block, a broad tail on the firing member bearing on both the spaced upper surfaces of the breech block.

2. In a gun, a receiver, a breech block having laterally spaced upper surfaces fitting in said receiver, and a firing member symmetrical about the vertical longitudinal axis of the gun and movable relative to said breech block, a broad tail on the firing member bearing on both the spaced upper surfaces of the breech block.

3. In a gun, a receiver, a breech block having laterally spaced upper surfaces fitting in said receiver, and a firing member movable relative to said breech block, an actuator for said member extending outward through a slot in the receiver, a broad tail on the firing member bearing on both the spaced upper surfaces of the breech block, and normally covering the slot in the receiver.

4. In a gun, a receiver, a breech block U-shaped in cross-section slidable in said receiver, a firing member movable in said breech block, a broad tail on the rear of the firing member bearing on both arms of the U-shaped breech block.

5. In a gun, a receiver, a breech block U-shaped in cross-section slidable in said receiver, a firing member movable in said breech block, a broad tail on the rear of the firing member bearing on both arms of the U-shaped breech block, said firing member being symmetrical about the vertical longitudinal axis of the gun.

6. In a gun, a receiver, a breech block U-shaped in cross-section seated in said receiver, a firing member movable in said breech block, an actuator for said breech block adapted to be used as a sight, a broad tail on the rear of the firing member bearing on both arms of the U-shaped breech block to steady said actuator.

7. In a gun, a receiver, a breech block U-shaped in cross-section seated in said receiver, a firing member movable in said breech block, an actuator for said breech block adapted to be used as a sight, a broad tail on the rear of the firing member bearing on both arms of the U-shaped breech block to steady said actuator, said firing member and actuator being symmetrical about the vertical longitudinal axis of the gun.

8. In a gun, a receiver, a breech block U-shaped in cross-section seated in said receiver, a firing member movable in said breech block, an actuator for said firing member extending outward through a slot in said receiver, said firing member and actuator being symmetrical about the vertical plane passing through the axis of the gun.

9. In a gun, a receiver, a breech block U-shaped in cross-section seated in said receiver, a firing member, an actuator for said firing member extending outward through a slot in said receiver, a broad tail on said firing member, said tail bearing on both arms of the U-shaped breech block and normally covering the slot on the receiver.

10. In a gun, a receiver, a breech block U-shaped in cross-section seated in said receiver, a firing member, an actuator for said firing member extending outward through a slot in said receiver, a broad tail on said firing member, said tail bearing on both arms of the U-shaped breech block and normally covering the slot on the receiver, said firing member and actuator being symmetrical about the vertical plane passing through the longitudinal axis of the gun.

11. In a gun, a receiver, a breech block U-shaped in cross-section seated in said receiver, a firing member, an actuator for said firing member extending outward through a slot in said receiver, a broad tail on said firing member, said tail bearing on both arms of the U-shaped breech block and normally covering the slot on the receiver, said firing member and actuator being symmetrical about the vertical plane passing through the longitudinal axis of the gun, and said actuator being adapted to be used as a sight.

12. In a gun, a receiver, a breech block in said receiver, the rearward portion of said breech block being U-shaped in cross-section, a firing member movable in the hollow of said breech block, an actuator for said firing member extending through a slot in said receiver, a broad tail on the rear of the firing member normally covering the slot and bearing on both arms of the U-shaped breech block, said firing member being symmetrical about the vertical longitudinal axis of the gun.

13. In a gun, a receiver, a breech block in said receiver, the rearward portion of said

breech block being U-shaped in cross section, a firing member movable in the hollow of said breech block, an actuator for said firing member extending through a slot in said receiver, said actuator being adapted to be used as a sight, a broad tail on the rear of the firing member normally covering the slot and bearing on both arms of the U-shaped breech block, said firing member being symmetrical about the vertical longitudinal axis of the gun.

Signed by me at Cleveland, Ohio, this 25th day of November, 1919.

OSCAR V. PAYNE.