W. H. SQUIRE.

GAS OPERATED GUN.

APPLICATION FILED APR. 8, 1912.

1,082,916.

Patented Dec. 30, 1913.

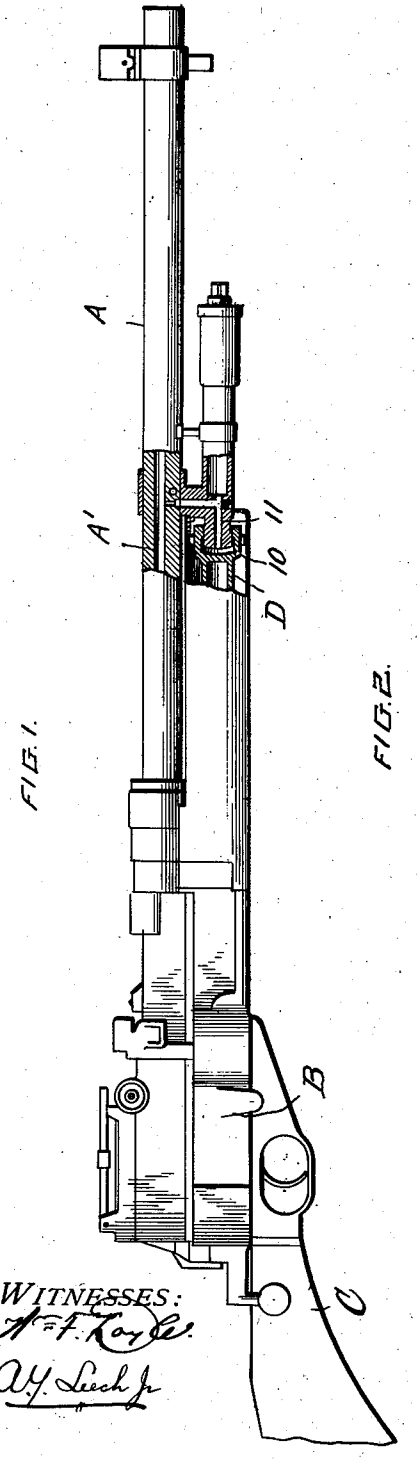


FIG. 1.

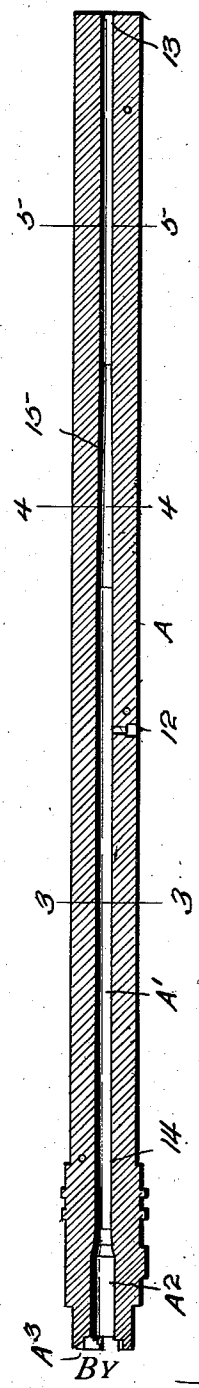


FIG. 2.



FIG. 5.

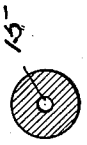


FIG. 4.

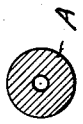


FIG. 3.

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GAS-OPERATED GUN.

1,082,916. Specification of Letters Patent. Patented Dec. 30, 1913.

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To all whom it may concern:

Be it known that I, WILLIAM H. SQUIRE, a citizen of the United States, and residing in St. Denis, Seine, France, have invented a new and useful Improvement in Gas-Operated Guns, of which the following is a specification.

My invention relates to improvements in gas-operated guns in which a portion of the powder-gas is utilized for operating the gun, and more particularly to that type of gas-operated gun described in U. S. Letters Patent No. 861,939, granted to L. V. Benet and H. A. Mercie July 30, 1907. This class of guns is operated by allowing a portion of the powder-gas to escape through an orifice in the barrel and then impinge against a movable element of the breech actuating mechanism. When service ammunition is used in firing guns of this type the resistance offered by the metal bullet in its passage through the rifled bore of a service barrel is ample to force the necessary powder-gas through the gas orifice to effect the operation of the breech mechanism; but when practice ammunition is employed with a service barrel the resistance offered to the passage of the powder-gas through the bore is insufficient to force the necessary powder-gas through the gas orifice to effect the successful operation of the gun.

Various devices have been used to force the required gas through the gas orifice, when employing practice ammunition provided with wooden bullets in connection with a service barrel, as for instance a fixture attached to the muzzle of the barrel, said fixture including a plug provided with a hole smaller in diameter than the bore of the barrel and alined with the latter so that the wooden bullet on entering the relatively small hole of the plug will choke the bore and offer enough resistance to the powder-gas to force a sufficient quantity of the latter through the gas-orifice to operate the gun. The results thus obtained have been unsatisfactory for the reason that in order to obtain sufficient gas pressure to operate the gun, the hole in the plug must be small and the erosive action of the hot gases and wooden bullets forced through this small hole soon detroys the plug, and in case the hole becomes clogged, destruction of the entire fixture results. The use of service barrels in firing practice ammunition in guns of this type is also objectionable owing to the fact that deterioration of the wooden projectiles on the sharp corners at the entrance to the ammunition chamber of the barrel causes frequent stoppages and in addition it is frequently necessary to dismount and clean the entire mechanism of the gun because of the accumulation of splinters in same.

It is, therefore, the object of my invention to provide means whereby practice ammunition may be utilized in firing a gas-operated gun and which will obviate the defects previously noted and enable the use of muzzle fixtures to be dispensed with.

Broadly speaking my invention resides in the provision of a practice barrel adapted for detachable association with a gas-operated gun of the type referred to, in lieu of the ordinary service barrel, and which is so constructed and arranged that the passage of powder-gas through the bore thereof will be sufficiently resisted at a point forward of and relatively near the gas orifice to assure the certainty of action of the gun.

In describing the invention in detail reference will be made to the accompanying drawings wherein like characters of reference denote corresponding parts in the several views, and in which:

Figure 1 is a side elevation of a gas-operated gun having my improved practice barrel associated therewith, a part of the gun being shown in section and the outer end of the stock removed; Fig. 2, a longitudinal section of the practice barrel, same being detached from the gun and on an enlarged scale; Fig. 3, a section on the line 3—3 of Fig. 2; Fig. 4, a section on the line 4—4 of Fig. 2; and Fig. 5, a section on the line 5—5 of Fig. 2.

In the drawings my improved practice barrel is indicated generally at A and is shown in Fig. 1 associated with a gas-operated gun of the type described in U. S. Letters Patent No. 861,939. This gun includes in addition to the barrel A, a receiver B and stock C. Supported by the receiver B and stock C is the usual breech closure mechanism, firing mechanism, feed mechanism and extracting mechanism all of which are fully described in U. S. Letters Patent No. 861,939 and will hereinafter be termed in their combined relation the breech mechanism of the gun. The gun further includes a reciprocating actuator D guided in the receiver parallel to and below the barrel

and so constructed and arranged that the reciprocation thereof will operate the various elements of the breech mechanism of the gun in correct sequence.

To effect the reciprocation of the actuator D the same is provided with a cup-shaped forward extremity 10 disposed in operative relation to the discharge end of a gas nozzle 11 supported from the barrel A and communicating with the bore of the latter through the medium of a gas orifice 12 drilled in the barrel. When the bullet in its passage through the bore has passed the gas orifice 12 a portion of the powder-gas issues from the nozzle 11 and impinging in the cup-shaped forward extremity of the actuator throws it to the rear. The actuator spring compressed by the actuator in its rearward movement then returns the actuator to its initial position.

The barrel A is provided with a smooth bore A^1 which terminates at the breech end of the barrel in an ammunition chamber A^2, while the adjacent end of the barrel is provided with an inclined ammunition guide face A^3. The muzzle extremity 13 of the bore is of less diameter than the chamber extremity 14, the diameter of the latter being determined by the caliber of the practice ammunition to be employed. These two diameters of the bore are joined by an intermediate tapered portion 15, the major end of which is disposed forward of and relatively near the gas orifice 12. The difference in diameter between the muzzle and chamber extremities of the bore may be varied as may also the position of the tapered portion 15 and the muzzle extremity 13 relatively to the gas orifice 12, it being essential only that the tapered portion 15 and muzzle extremity 13 of the bore be located forward of the gas orifice. The correct diameter of the muzzle extremity 13 of the bore and the position of the tapered portion 15 and the muzzle extremity 13 relatively to the gas orifice are both determined by experiment with the particular practice ammunition to be employed.

In the use of the barrel with wooden bullets the relatively large diameter of the bore at the muzzle extremity and the fact that the bore is smooth allows free passage of the bullets so that there is no clogging or erosion, while positioning the choked portion of the bore near the gas orifice results in the passage of sufficient gas through the gas orifice to assure certainty of automatic action.

As my practice barrel is used exclusively for practice ammunition the sharp corners at the entrance to the ammunition chamber A^2 are removed and the annoying and frequent stoppages due to splinters from wooden bullets thereby avoided. In addition the inclined face A^3 which guides the point of the bullet is carried well forward into the chamber A^2 to avoid splintering of bullets in the operation of loading.

Accidental firing of service ammunition in the practice barrel may be effectively provided against by altering the exterior aspect thereof in such manner that mistaking it for a service barrel would be improbable. Further provision against accidental firing of service ammunition may be made by giving practice bullets a special form and chambering the practice barrel accordingly so that it will be impossible to feed the service ammunition into the chamber of the practice barrel.

Besides assuring certainty of automatic action of the gun and dispensing with the use of muzzle fixtures in the firing of practice ammunition, my practice barrel also effects an economy in service barrels which will be reserved for service ammunition exclusively with resultant increase in life when relieved of the erosion incident to the use of practice ammunition.

I claim:

A practice ammunition barrel for a gas operated fire-arm having a cartridge chamber at one end and a smooth bore throughout, said bore having a predetermined portion thereof from the cartridge chamber forward of constant maximum diameter, a predetermined portion inwardly from the muzzle of constant minimum diameter, and a tapered portion connecting the maximum and minimum diameter portions, and said barrel further having a gas orifice communicating with the portion of the bore having a maximum diameter.

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

WILLIAM H. SQUIRE.

Witnesses:

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