

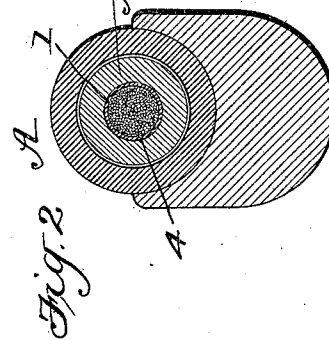
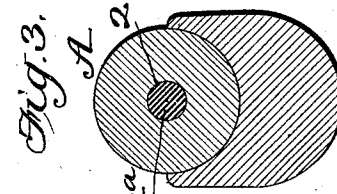
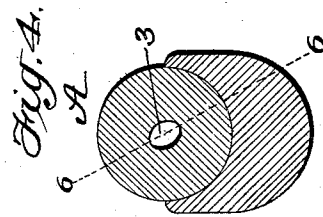
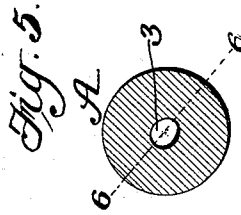
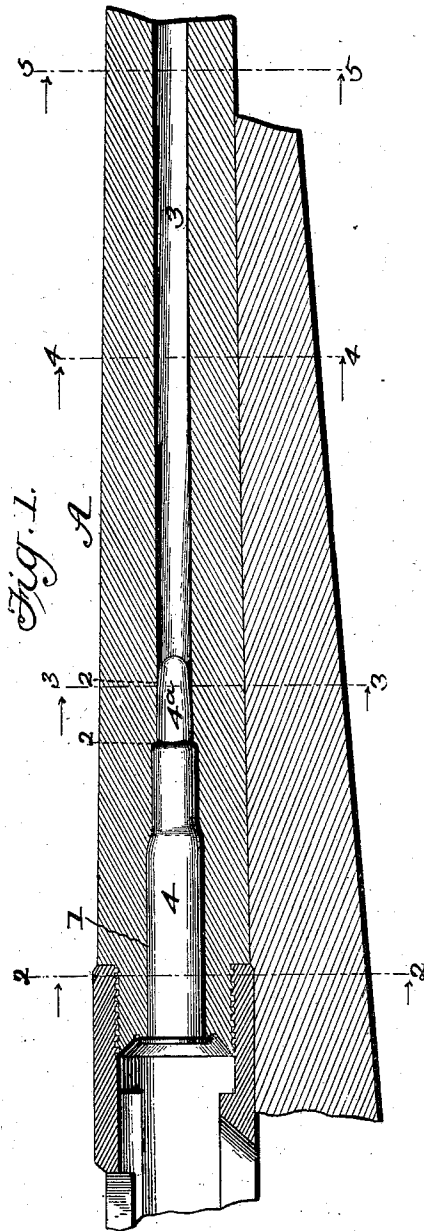
No. 694,833.

Patented Mar. 4, 1902.

W. F. COLE.
GUN BARREL.

(Application filed July 16, 1901.)

(No Model.)



WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLIAM F. COLE, OF WACO, TEXAS.

GUN-BARREL.

SPECIFICATION forming part of Letters Patent No. 694,833, dated March 4, 1902.

Application filed July 16, 1901. Serial No. 68,459. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. COLE, a citizen of the United States, and a resident of Waco, in the county of McLennan and State of Texas, have made certain new and useful Improvements in Firearms, of which the following is a specification.

It is well known to experts in gunnery that a flat trajectory depends mainly upon the explosive force of the charge, the weight and rapidity of rotation of the projectile, and the friction or resistance encountered by the latter in traversing the gun-bore. It is also well known that the higher the force of the charge and the greater the pitch of the rifling the more liable is the projectile, more especially in small firearms, to ride or cross the rifling or grooves, so that no rotation is imparted to it, and if, to meet this condition, the pitch of the rifling be reduced the rapidity of rotation is necessarily lessened and with a corresponding tendency to impairment of the trajectory. In brief, the intimate relation of the explosive force to the twist of the rifling forbids increase of either beyond a certain limit. Besides this, increase of twist results directly in increase of friction. In fact, a smooth or unrifled bore is the ideal one in this regard. Attempts have been made to secure the desired end by use of a gun having a smooth and twisted bore. Thus in one case a gun was provided with a bore which was cylindrical at the breech, the remainder being elliptical, without twist, and the longer axis of the ellipse being horizontal throughout, with the purpose of scattering a shot charge. In another case a gun was provided with a smooth and elliptical bore twisted throughout and the projectile was of corresponding shape. In the course of experiment in this line I produced a projectile specially adapted for guns of the type indicated, the same being the subject of United States Patent No. 671,877. The result obtained by such invention has been satisfactory to a certain degree; but in the course of extended and further experiments I have discovered that a far better result may be attained in small arms, not merely in trajectory, but in economy or cost of production as well, by means of a gun constructed as here-

inafter described, and illustrated in accompanying drawings, in which—

Figure 1 is a longitudinal section of a portion of small firearm of the Lee type. Fig. 2 is a cross-section on line 2 2 of Fig. 1. Fig. 3 is a cross-section on line 3 3 of Fig. 1. Fig. 4 is a cross-section on line 4 4 of Fig. 1. Fig. 5 is a cross-section on line 5 5 of Fig. 1.

The bore of the gun-barrel A is distinguished by the following characteristics: It is enlarged and cylindrical in the breech proper, 1, (see Fig. 2,) also cylindrical in the reduced throat, which extends from 2 to 2, (see Fig. 1,) while the remainder 3 of the bore is smooth, but elliptical and twisted, as illustrated by Figs. 1, 4, and 5. Thus the cylindrical portion 1 is adapted to receive the ordinary ball-cartridge 4, (shown inserted in Figs. 1 and 2,) and the slightly-tapered front portion 4^a of the elongated projectile fits closely in the reduced portion or throat extending from 2 to 2, Fig. 1. The throat thus intervenes between the breech proper, 1, and the elliptical part 3 and merges gradually into the latter. The twist of said part 3 is greater than that ordinarily given to rifled small arms and is uniform throughout, as illustrated by the inclination of the dotted line 6 in Figs. 4 and 5. The projectile passes immediately from the cylindrical throat 2 2 into the elliptical bore 3, whereby it is compressed and transformed transversely correspondingly, it becoming elliptical in cross-section and receiving a uniform twist. Thus while the greater resistance and friction of the usual rifling is avoided the greater pitch or twist of the bore 3 imparts a very rapid rotation to the projectile, which the form of the latter assists in maintaining after it has left the gun, with the result that a flat trajectory or one of minimum curvature is obtained. The gun is thus practically a combination of the best features of two systems—the cylindrical and elliptical. By it I am enabled to use fixed ammunition of the ordinary cylindrical kind, whether the projectiles be of soft metal or mantled, a powder charge of unusual amount and of the highest explosive quality compatible with safety to the gun may be employed; also, a projectile of unusual weight, if desired.

In brief, my invention secured the following

advantages: The cartridge-chamber proper being cylindrical is the simplest and strongest form which could be desired. The bore being smooth, it is the simplest and most durable, so that the life of the gun is increased. By use of the elliptical twisted bore the rotation or twist of the projectile can be increased over guns of the usual type. As the projectile cannot ride or strip, as projectiles often do in the ordinary type of rifles under high pressure, the effectiveness of range and penetration is increased. The weight of the projectile and size of powder charge may be increased beyond that of the guns of the usual type—say to at least twenty per cent. for each—thereby securing higher velocity, greater penetration, and consequently greater range and effectiveness, a result which the form given to the projectile in traversing the bore promotes.

It will be seen that my combination of a cylindrical and elliptical bores or bore-sections, whereby the gun is adapted for the fixed ammunition in ordinary use, is rendered practicable by the union or blending of the two bores or bore-sections by means of the throat 2 2, where the elongated projectile rests when the cartridge is fully inserted. As before intimated, other inventors as well as myself had previously considered it necessary to employ an elliptical projectile in an elliptical bore, which continued and perfected experiments have demonstrated to be unsatisfactory and impracticable chiefly owing to the difficulty of inserting the cartridge with a twisting or rotary movement to pre-

vent jamming. The plan was also objectionable for economical reasons.

It is to be understood that my improvement is applicable to all variations of shells or powder-cases whether having a uniform diameter or a differential one, as shown in the drawings.

What I claim is—

1. A barrel for small firearms, having a bore which is smooth throughout, and cylindrical in the breech and throat, whereby it is adapted for reception of an ordinary ball-cartridge, and elliptical and uniformly twisted in the remaining or outer portion to receive the projectile and give a rotary motion there- to as shown and described.

2. A barrel for small firearms having a smooth bore which is enlarged in the breech, and cylindrical in both breech and throat, the remainder of the bore being elliptical and having a uniform twist as shown and for the purpose specified.

3. A barrel for small firearms having an enlarged cylindrical breech-bore adapted for a ball-cartridge, an elliptical and twisted smooth front bore to receive the projectile and give a rotary motion thereto, and an intervening portion or throat which is reduced and cylindrical and serves to blend or merge the cylindrical part with the elliptical one, whereby the gun is adapted for use of fixed ammunition of the ordinary cylindrical type, in the manner described.

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Witnesses:

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