

Muzzle-Loading Ordnance

Patented Dec. 1, 1868.

Fing. I

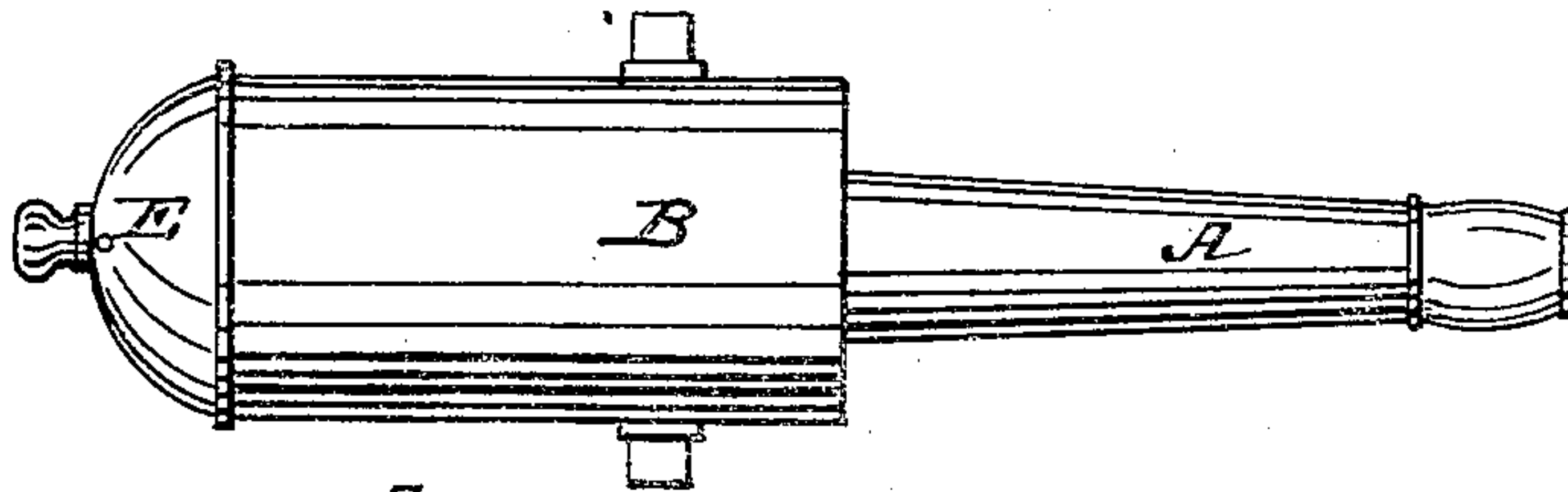


Fig. 2

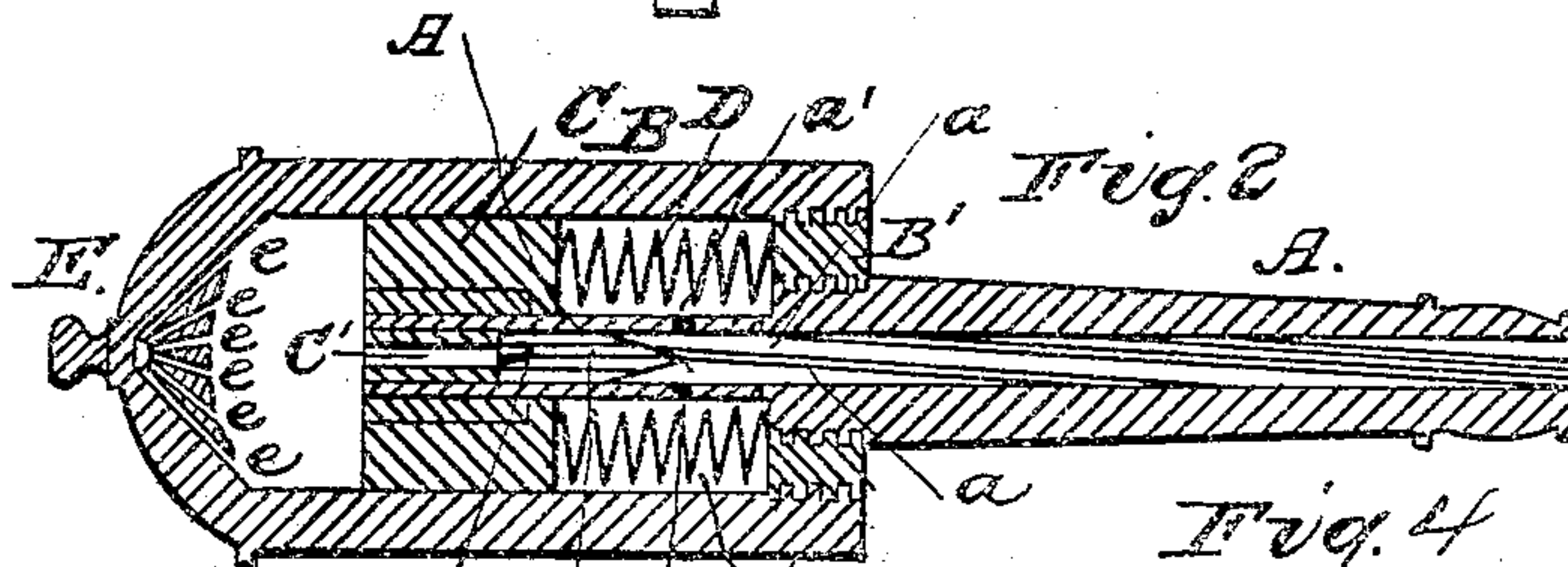


Fig. 4

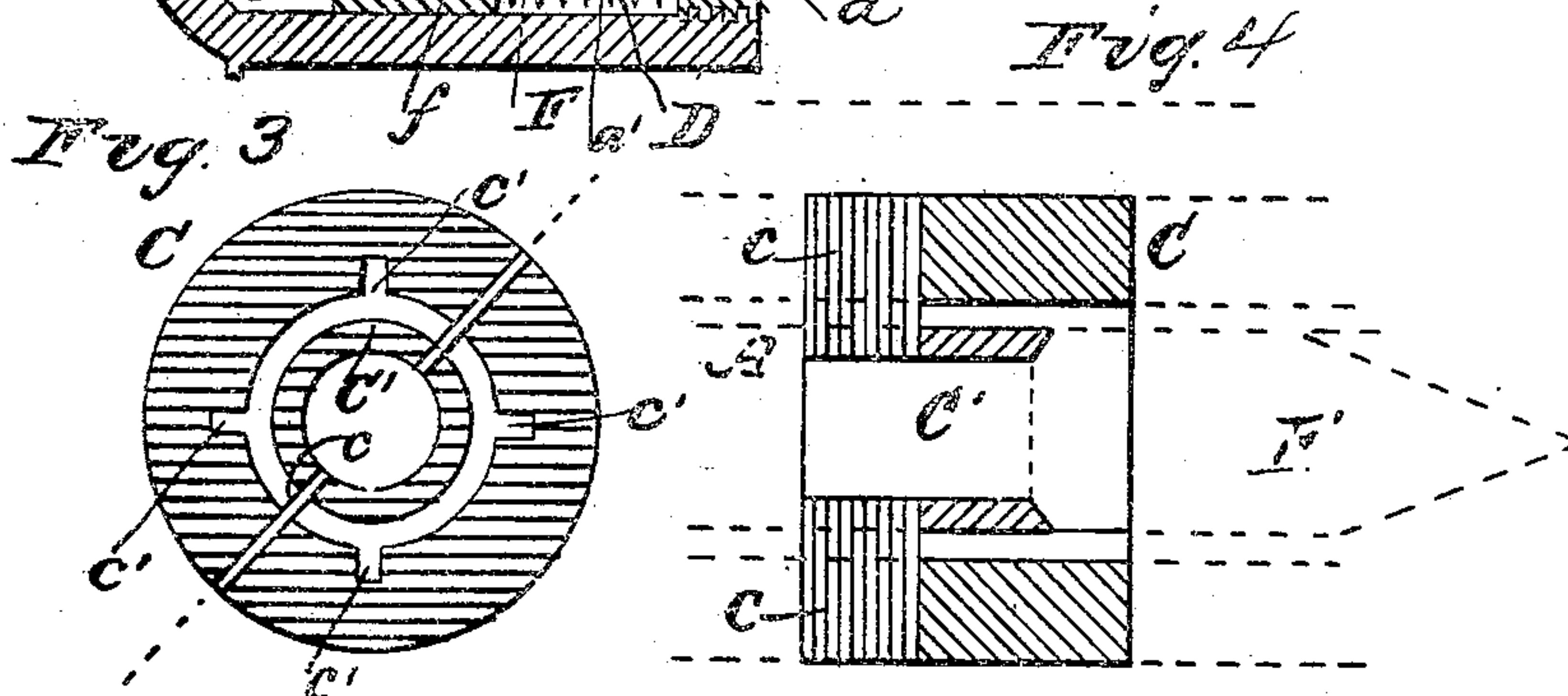


Fig 5

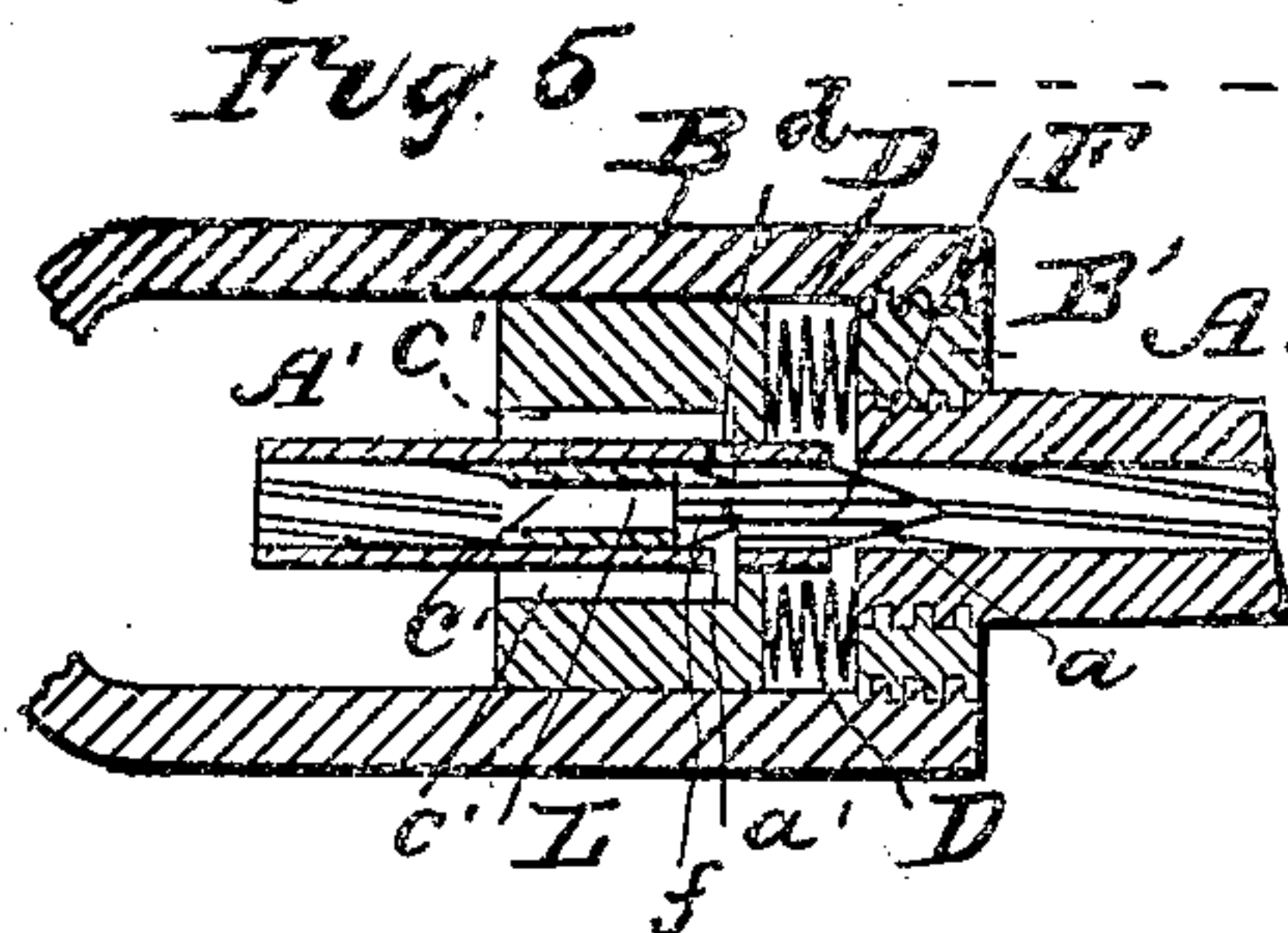


Fig. 6



Jacob Henry
Louis Bradley

Onorio Obregon

United States Patent Office.

ONOFRIO ABBRUZZO, OF NEW YORK, N. Y.

Letters Patent No. 84,525, dated December 1, 1868; antedated November 20, 1868.

IMPROVEMENT IN ORDNANCE AND OTHER FIRE-ARMS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, ONOFRIO ABBRUZZO, at present resident of city, county, and State of New York, a native of St. Margherita Belice, in Sicily, and Kingdom of Italy, have invented a new and useful Improvement in Fire-Arms; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, which are made a part of this specification.

The chief object of this invention is to increase the speed and force of projectiles, by causing the explosive force of the charge to act upon a piston sliding upon the barrel, and connected with and imparting its motion to a device moving within the barrel, and serving, in conjunction with the gas that acts directly upon the main portion of the base, to project the ball with increased power and effect.

In the drawings—

Figure 1 is a side elevation of a cannon embodying my invention.

Figure 2 is a central longitudinal section thereof.

Figure 3 is a rear-end elevation, on an enlarged scale, of the piston and its appendages.

Figure 4 is a diagram, illustrating the operation of my invention.

Figure 5 is a sectional elevation of a portion of the gun, showing the piston in the position which is the limit of its forward motion.

Figure 6 is a view of a ball intended to be employed in connection with my improved fire-arm.

Similar letters of reference indicate corresponding parts in the different figures.

A may represent a barrel, whose bore may be smooth or rifled.

The barrel A projects forward from a cylindrical chamber, B, to whose removable head, B', it may be securely connected by a screw-joint, as shown.

That portion, A', of the barrel A, which is enclosed within the chamber B, is concentric with the latter, and said enclosed portion being (as will be presently understood) subjected to no injurious strain, may be of considerably smaller external diameter than the outward-projecting portion A of the barrel, as represented.

C is a metallic annulus, or what may be called a cylindrical, axially-perforated piston, the same being fitted to slide upon the part A' of the barrel, and of suitable size to transversely fill the space between the part A' and the interior surface of the chamber B.

C' is a tube, held concentrically within the piston C by the metallic straps c or other rigid connections, which compel the piston and tube to move together the same as if they were a single solid piece.

The tube C' moves within the part A' of the barrel, while the piston C moves upon it, as before explained.

The part A' of the barrel has longitudinal slits, to accommodate the connecting-pieces c, which are thus

allowed to freely partake of the motions of the piston C and tube C'.

Any desired number of connecting-pieces c may be employed, and the slits in the barrel A' must, of course, correspond in number therewith.

D D are springs, which have a constant tendency to draw the piston C and its appurtenances to the forward end of the chamber B, where they are held by said springs when the gun is not charged.

The rear end of the part A' of the barrel occupies a suitable position in advance of the rear end of chamber B, to afford room for the charge of powder in the intervening space.

a a a' are small apertures in the part A' of the barrel, near the forward end thereof.

c' c' c' are longitudinal grooves or ducts, extending from the rear end of the piston C nearly to the forward end thereof, as shown in fig. 5.

These grooves are ranged around the central opening of the piston C, as shown in fig. 3.

E is the main touch-hole, which, instead of igniting the powder at one point only, is provided with a series of radiating channels, e, which, by igniting the powder at many points, effect its complete explosion, and prevent any portion of the powder from being blown out in an unconsumed state.

In fig. 5, the part A' is shown as rifled throughout, merely to indicate that it is a continuation of the barrel A. If the gun be rifled, the lands and grooves need not extend further back than the point from which the projectile receives its initial impulse.

The projectile F, (see fig. 6,) has peripheral triangular cavities, f, for a purpose to be explained.

The operation is as follows:

Before the charge is inserted, the piston C and its tube C' are held forward by the springs D, as shown in fig. 5.

The powder may be supplied at the breech, or through the barrel A A'; hence the invention is applicable to both breech-loaders and muzzle-loaders; but, in either case, the projectile F is introduced at the front of the barrel, and rammed home after the manner of charging the ordinary muzzle-loaders.

It will be seen that the piston C, being held forward by the springs D, ample space is left at the rear of the piston to receive the powder.

The powder having been introduced into chamber B, behind piston C, is gathered and compressed into a compact body in the act of ramming the projectile; for, as the projectile is forced backward in the part A', it comes in contact with the tube C', and carries the latter, together with the attached piston C, to the position shown in fig. 2, the friction between the projectile and barrel being sufficient to maintain the parts in the relative positions therein represented.

When the charge is ignited, the projectile is acted upon, not only by the gas, which has access directly to its

base through the open rear end of A', but by the force which is due to the expansion of the gas against the opposing surface of the piston C, because the consequent forward motion of the piston C impels the tube C' forward within the barrel A', and against the projectile F, thus adding to the force and velocity with which the same is projected from the gun.

When the forward motion of the piston C brings the ducts *c'* into communication with the aperture *a'*, the expanding gas has access to the cavities *f* of the projectile F, and the force with which the latter is impelled is then increased by as much as is due to the additional opposing surface of the forward walls of the cavities *f*.

As soon as the projectile has passed forward of the apertures *a*, the expanding gas passes from the barrel into the chamber B, in front of the piston C, and the pressure being thus equalized at its opposite sides, the forcible impact of the piston against front of B cannot occur.

The moving parts within the chamber B may be suitably packed, to confine the gases to the appropriate spaces.

The device above described is the preferred form of my invention, because, under this construction, I bring the piston and projectile so closely together as to avoid any undue prolongation of the gun. A solid piston or disk, moving behind the projectile, and impelling the latter, through the medium of a rod passing into the barrel, would necessarily involve a cylinder (B) of much greater length than the one here shown. I, nevertheless, wish it distinctly understood that I do not limit myself to the form herein shown, to the form

just alluded to, or to any other specific form, the scope of the invention being regarded as embracing anything in the nature of a piston or impelling-device to enlarge the surface acted upon by and increase the effect of the powder.

The invention is designed for application to fire-arms generally. It increases the effective power of a given charge of powder and enables a ball to be projected with much greater velocity and force than can be done with fire-arms heretofore devised.

The surface of the piston C, which is opposed to the powder, may be as large as desired, the impelling effect upon the piston being proportionate thereto.

Having thus described my invention,

What I claim as herein, and desire to secure by Letters Patent, is—

1. The provision, in a fire-arm, of a piston, C, confined within a gun, which shall afford increased surface for the expanding gases to act upon, and which shall impel the projectile when the discharge takes place, substantially as described.

2. The combination of the connected piston C and tube C' with the slit barrel A', substantially as and for purpose set forth.

3. The apertures *a a'*, in combination with the piston C and a projectile, F, constructed and operating in the manner and for the purpose explained.

4. The springs D, in combination with the piston C, substantially as and for the purpose explained.

ONOFRIO ABRUZZO.

Witnesses:

JACOB HENRY,
LOUIS BRODNAG.