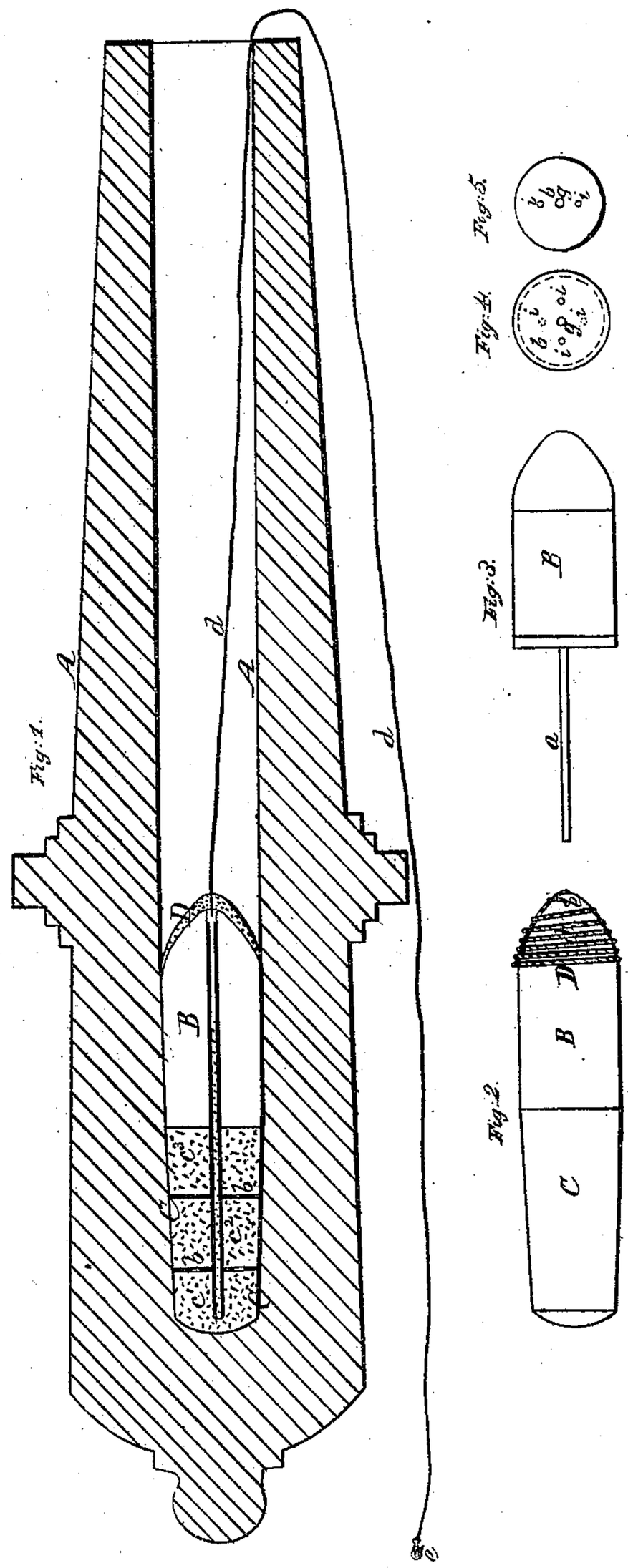
O. LUGO.

Cartridge.

No 49,773. Patented Sept. 5, 1865.



Witnesses:

A. Wilcox

Geo. W. Reed,

Inventor

Ozapio Lugo

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IMPROVEMENT IN PROJECTILES FOR ORDNANCE.

Specification forming part of Letters Patent No. **49,773**, dated September 5, 1865.

To all whom it may concern:

Be it known that I, ORAZIO LUGO, of the city, county, and State of New York, have invented certain new and useful Improvements in the Arrangement of and Mode of Igniting the Charge in Ordnance; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings.

The objects of my invention are, first, to dispense with the vent in ordnance; second, to reduce both the recoil of and the danger of bursting the gun; third, to obtain greater range, as well as greater accuracy with smooth-bore guns; fourth, to reduce the weight and cost of ordnance, and to dispense with the re-enforces and costly materials in its manufacture; fifth, to enable spiked guns to be used without removing the spikes; sixth, to insure a more perfect combustion of the powder; seventh, to increase the rapidity of firing and reduce the frequency of sponging or cleaning the gun.

The invention consists in the employment of a charge in front of the projectile for expelling the air from the bore of the gun before the projectile at the time the latter commences to move.

To enable others skilled in the art to apply my invention to use, I will proceed to describe it with reference to the drawings, in which—

Figure 1 is a central longitudinal section of a cannon loaded and ready for firing. Fig. 2 is an external longitudinal view of the projectile and cartridges. Fig. 3 is an external longitudinal view of the projectile with the inserted tube through which the projecting charge is fired. Figs. 4 and 5 are front views of the perforated metal disks employed to separate the several quantities of powder of different quality in the projecting charge.

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

A is the cannon, which differs from those commonly used, in having no vent and being lighter in proportion to its caliber and having no re-enforce. It is represented of smooth bore, which, in carrying out my invention, I consider preferable to rifled. B is the projectile, represented of elongated form, as I prefer that form to the spherical, though I do not consider it absolutely essential. In the center of the projectile, and extending longitudinally through it, is a hole large enough for the reception of the small tube *a*, which is inserted tightly thereinto, and is long enough to reach from the front of the projectile nearly to the bottom of the cartridge C, in which the projecting charge is contained. The case or envelope of this cartridge may be of thin metal, flannel, or other suitable material, and is divided into three compartments, c^1 c^2 c^3, by means of metal disks *b b*, the rear compartment, c^1, containing compressed gunpowder, the next one, c^2, finer gunpowder or gun-cotton, that will produce a low velocity, and the forward one still finer gunpowder or gun-cotton that will produce a higher velocity.

These disks have each a central opening, *g*, through which the tube *a* passes, and one or more perforations, *i i*, through which the fire from one compartment passes to the gunpowder or gun-cotton in the compartment in front of it.

In front of the projectile is the charge D, of gunpowder or gun-cotton, by the explosion of which the air is expelled from the bore of the gun in front of the projectile.

This charge is contained in a flannel bag or other suitable envelope of suitable form, and for convenience should be attached to the projectile.

Into the front end of the tube *a* there is inserted a friction-primer, to which is attached a cord, *d*, long enough to pass forward through the muzzle of the gun, and thence backward beyond the breech. This cord has a hook, *e*, at its extremity to attach it to the ramrod, and before and during the loading is kept coiled around the envelope of the charge D, as shown in Fig. 2, or around the front part of the projectile; and before loading the hook *e* is attached to the ramrod, so that when the ramrod is withdrawn from the gun, after ramming home the charge, the cord will be drawn out with it. After the ramrod has been withdrawn, the hook *e* is detached from it, and the end of the cord carried back beyond the breech of the gun to or by the man whose duty it is to fire. The charge D, on the front of the projectile, can be fired either by the friction primer or by a fuse put or thrown into the bore of the gun against the said charge D.

The operation is as follows:

When the friction-primer is pulled out by pulling the cord *d* it ignites the charge D, and almost at the same moment the portion of the projecting charge in the compartment c^1 of the cartridge C is fired through the tube *a*, either by the fire from the primer or that from the charge D, and immediately afterward the portions of the said charge in the compartments c^2 and c^3 are fired in succession through the holes *i i* in the disks *b b*.

The pressure of the gases produced by the explosion of the charge D in front of the projectile drives out the air from the bore of the gun as the projectile is started slowly by the firing of the portion of the projecting charge in the compartment c^1 of the cartridge C.

The gases which take the place of the air in the bore of the gun being at a very high temperature, and therefore at a lower density than air at an ordinary atmospheric temperature, offer less resistance to the projectile, and the explosion of the projecting charge will therefore act more powerfully upon the projectile and increase its range.

By the employment in the projecting charge of gunpowder or gun-cotton of different degrees of velocity of combustion, to be fired successively, as hereinbefore described, I am enabled to keep uniform, or nearly so, the pressure of the gases behind the projectile, until the latter has nearly reached the muzzle of the gun, and the effect of the charge is greatly increased.

Having thus described my invention, I will proceed to state what I claim as new and desire to secure by Letters Patent:

I claim—

The employment of a charge, D, in front of the projectile, substantially as and for the purpose herein specified.

ORAZIO LUGO.

Witnesses:
J. W. COOMBS,
GEO. W. REED.