(No Model.)

L. GATHMANN.

METHOD OF LOADING ORDNANCE.

No. 445,399. Patented Jan. 27, 1891.

Fig. 1

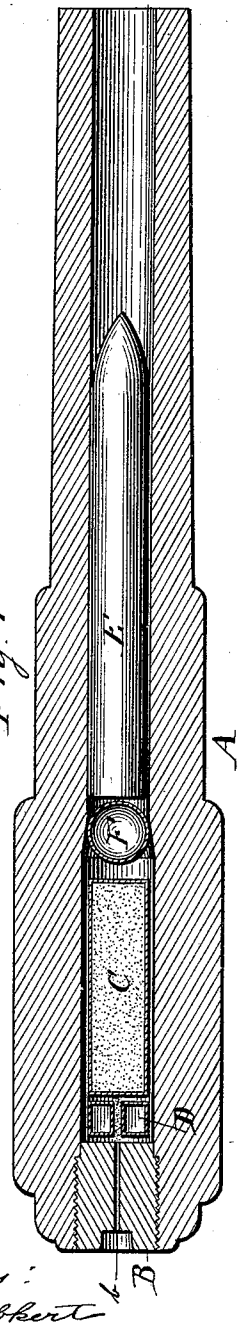
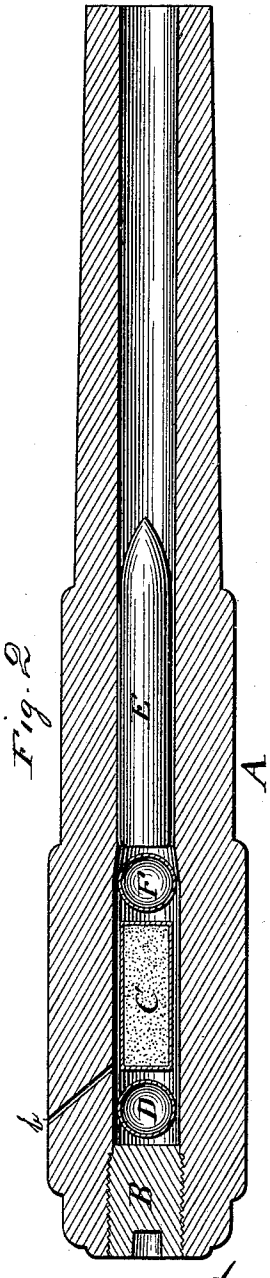


Fig. 2



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UNITED STATES PATENT OFFICE.

LOUIS GATHMANN, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE GATHMANN ORDNANCE COMPANY, OF SAME PLACE.

METHOD OF LOADING ORDNANCE.

SPECIFICATION forming part of Letters Patent No. 445,399, dated January 27, 1891.

Application filed May 8, 1890. Serial No. 351,097. (No model.)

To all whom it may concern:

Be it known that I, LOUIS GATHMANN, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Methods of Loading Ordnance, of which the following is a specification, reference being had therein to the accompanying drawings.

This my invention relates to methods of loading ordnance, with the object in view of keeping the cannon cool during firing. It being well known from experience that with firing a heavy gun its inner portions are heated very rapidly, expanding the metal proportional to the degree of heat produced, and thereby increasing the strain upon the outer metal to the utmost and often beyond the elastic limit thereof, the bursting of heavy ordnance, whether cast, forged, or built up of rings, must be attributed more to the irregular expansion of the metal than to the pressure excited by the powder explosion. This expansion from heat will take place in a longitudinal as well as in a transverse direction, and thus a heavy gun becoming rapidly heated around its bore, while the exterior portions thereof are only slowly heated, will produce such an enormous tensile strain upon the outer portion that if the metal is hard and does not possess the required degree of elasticity for elongation it will fracture even without the assistance of the pressure from the powder explosion. Metal thus strained beyond its elastic limit will not contract again to its former dimensions, and therefore with each such expansion the diameter of the gun will be increased, and a gun thus weakened from frequent strains beyond the elastic limits of the metal by unequal expansions cannot withstand the powder-pressure. It is also a well-known fact that the erosive action of the powder-gases on the heated metal is much greater than when the metal is kept cool.

In Letters Patent of the United States No. 424,970, issued to me on April 8, 1890, I have already described and claimed the use of concentrated carbonic-acid gas in loading heavy ordnance, such gas by its sudden expansion following the firing of the gun, and by the low temperature produced from such expansion will counteract the heat generated from the powder explosion. In this patent I only claimed the interposition of carbonic-acid gas between the powder-chamber and projectile, more with the object of cooling the projectile, while the object of my present invention is to keep cool the ordnance itself during continuous firing, and with this object in view my invention consists in inserting behind the powder-cartridge one or more vessels or shells containing a compressed non-combustible gas—such as carbonic-acid gas—that with firing will be liberated to expand, and by its expansion will cool the bore of the gun its entire length, all as will be more fully hereinafter described and specifically claimed.

In the accompanying drawings, Figure 1 represents a longitudinal section of a breech-loading gun arranged with the touch-hole through the breech-block, and Fig. 2 a similar section of a gun with the touch-hole through the body of the gun, both showing my improved method of loading.

Corresponding letters of reference, in the several figures of the drawings, designate like parts.

A denotes the gun, which may be of any usual construction and provided with breech-block B. The touch-hole *b* may either be through the center of breech-block B, as in Fig. 1, or a touch-hole *a* may be bored through the body of the gun.

C is the powder-cartridge, and D a hermetic shell filled with compressed or liquified gas placed between this cartridge C and the breech-block B. When the touch-hole *b* is in the breech-block, as in Fig. 1, a ring-shaped shell D, or a series of shells, may be inserted, that will provide an opening through the center, as a continuation of the touch-hole *b*, toward the cartridge C.

E is the projectile, and between this projectile and the powder-cartridge is inserted another shell F, containing compressed gas. These shells D and F may be spherical or any other desirable shape.

When firing the gun, the powder, with being exploded to shoot off the projectile, will first further compress the shells D, which then, as soon as released from the powder-pressure, will burst by the recoil from the compressed interior gases, setting these gases free to expand into the bore of the gun, and producing

by its sudden expansion an intense cold, that will counteract and neutralize the heat transmitted to the interior of the gun by the powder explosion. It will thus be readily seen, with the bursting of shell or shells D the powder-chamber is cooled as well as the bore of the gun.

What I claim is—

1. The method of loading cannon by interposing a body of compressed gases between the powder-cartridge and breech-block, substantially as set forth.

2. The method of loading cannon by interposing between the powder-cartridge and breech-block and between the powder-cartridge and projectile a body of compressed gases, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

LOUIS GATHMANN.

Witnesses:

WILLIAM H. LOTZ,

OTTO LUEBKERT.