(No Model.)

L. GATHMANN.

METHOD OF LOADING CANNON.

No. 424,970. Patented Apr. 8, 1890.

Fig. 1

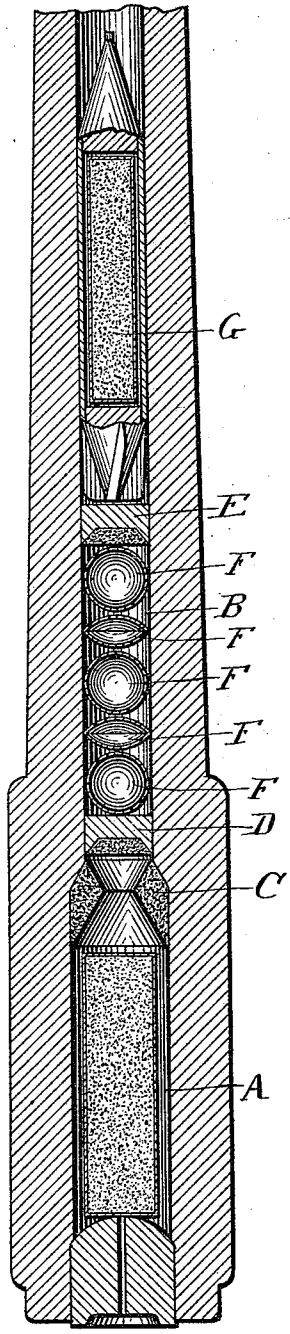


Fig. 2

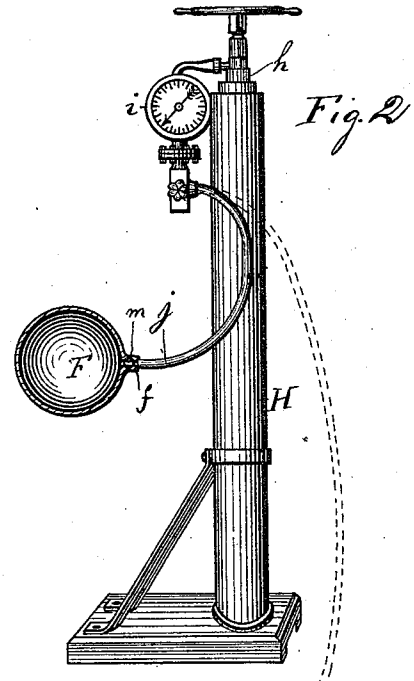
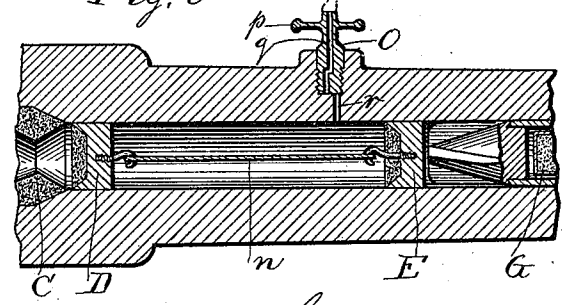


Fig. 3



Witnesses:
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UNITED STATES PATENT OFFICE.

LOUIS GATHMANN, OF CHICAGO, ILLINOIS.

METHOD OF LOADING CANNON.

SPECIFICATION forming part of Letters Patent No. 424,970, dated April 8, 1890.

Application filed September 2, 1889. Serial No. 322,734. (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 the Method of Loading Cannon, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to methods of constructing cannon and of loading the same, with the object in view of breaking and reducing the first violent shock of concussion with the discharging of the gun, and of a slowly-starting and gradually-accelerating propulsion of the projectile, so that quick explosives—such as nitro-glycerine, gun-cotton, &c.—may be employed with safety for charging the projectiles.

I have already described in my application for a patent of the United States, filed March 26, 1889, Serial No. 304,894, an obstructing-ring inserted between the powder-chamber and the barrel of the cannon bearing against a shoulder in the expanded powder-chamber to be detained from being discharged with firing, thereby to reduce the size of the escape-opening of the gases from the powder, with the object not to allow the full pressure of the exploding powder to act all at once upon the projectile, and to provide a gradual increase of the propelling force for the same. I have also described therein the interposition betwen the powder-chamber and projectile of a body of atmospheric air or gases compressed and retained in a suitable cylindrical shell or casing, which air with firing the cannon will be first further compressed, and thereby a slow-starting movement will be imparted to the projectile before the energy of the exploded powder will be brought into full action.

My present improvement consists in the use of a body of carbonic-acid gas under high pressure interposed between the powder-chamber and projectile, either in ball or lens shaped shells charged herewith, or between two sabots hermetically fitting the bore of the cannon and held from expanding by a rope, chain, or rod. The object of the use of carbonic acid in preference to atmospheric air or other gases is, first, that this gas is not only non-combustible, but that it also prevents combustion by excluding atmospheric air, whereby fire from the exploded powder is prevented from coming into contact with the projectile and from thereby heating the same, and, secondly, that the moment the projectile leaves the cannon and releases the carbonic-acid gas from pressure the same will expand and envelop the projectile, at the same time generating an intense coldness from such expansion that will counteract the heat from the powder-blast following, so that the projectiles not exposed to heat can be made with much lighter shells.

In the accompanying drawings, Figure 1 represents a longitudinal section of a cannon arranged and loaded according to my device; Fig. 2, an elevation of the apparatus for charging the cushioning-shells with carbonic acid, and Fig. 3 a longitudinal section of part of a cannon arranged for charging the carbonic acid into the bore of the cannon direct between two sabots.

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

A denotes the powder-chamber of the cannon, bored larger in diameter than the barrel B of the same to provide a conical shoulder *a*.

C is a ring exteriorly cylindrical, with a conical forward end to fit the bore and shoulder of the powder-chamber and with an opening conically expanded from its middle toward both ends. This ring may be made of a material that will be partly destroyed from the discharge of the powder behind it—such as paper-pulp or celluloid—which will partly burn away, thereby gradually increasing the opening for the discharge of the powder gases, when such ring C must be replaced by a new one with each reloading of the cannon; but this ring C may also be made of metal to be removable. This ring C will retard the force of the powder to spend its force upon the projectile more gradually.

D and E are metal sabots cup-shaped in their rear ends to expand by the concussion of the powder for making as near as possible air-tight joints, and thereby preventing the escape of gases past such sabots. The cup-

shaped ends of the sabots D and E, I preferably fill with paper-pulp or asbestus, and between these two sabots I place a series of light ball or lens shaped shells F, each filled with compressed carbonic-acid gas.

G is the projectile, which may be a shell of any usual construction to be filled with a quick explosive and with a percussion-fuse to explode with striking an object. The shells F are filled from a liquid carbonic-acid receiver H, as furnished by the factory that manufactures the gas, and then after purifying compresses the same into a liquefied state and fills it into these receivers H, each provided with a valve *h*, a pressure-gage *i*, and a flexible pipe *j*, which latter is coupled to the nozzle *f* of shell F in any suitable manner, and after the shell F is filled to the desired pressure (indicated by gage *i*) a valve *m* in the nozzle of the shell F is closed, and the pipe *j* is detached to be coupled with the next shell, &c. These shells F, I either make of thin metal or of a strong air-tight flexible material, in either case to be broken by the concussion from the explosion of the powder behind it, so that the carbonic-acid gas will then fill the space between the two sabots D and E.

Instead of using shells F, I also can fill the space between the two sabots E and F with carbonic-acid gas direct from the receiver H, in which case, however, the sabots E and F must fit hermetically into the bore of the cannon, and for holding them a proper distance apart and preventing their spreading from the pressure of the gas these sabots must be coupled by a wire rope, chain, or rod *n*. With this arrangement the space in the bore of the cannon between sabots D and E must be charged after loading and before firing the cannon, for which purpose I bore a socket in the side or top of the cannon in proper position, screw-threading the same for a plug O, provided with a handle *p* and with a port *q*, which, in the end of plug O, is on an eccentric position, and which, with turning the plug a partial revolution, will meet the port *r*, that leads into the bore of the cannon. The end of flexible pipe *j* will be coupled with the end of plug O to provide communication with receiver H, and then by turning such plug O for the ports *q* and *r* to communicate, carbonic-acid gas is admitted from receiver H into the space between sabots D and E of the bore of the cannon to the desired density, after which the plug O is turned again to hold the gas from escaping.

What I claim is—

1. The method of loading cannon by interposing a body of compressed carbonic-acid gas between the powder-chamber and projectile, substantially as set forth, for the purpose specified.

2. The method of loading cannon by interposing a body of compressed carbonic-acid gas between two sabots intermediate of the powder-chamber and projectile, substantially as set forth, for the purpose specified.

3. The method of loading cannon by interposing spherical or lens shaped shells filled with compressed carbonic-acid gas between two sabots intermediate of the powder-chamber and projectile, substantially as and for the purpose set forth.

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

LOUIS GATHMANN.

Witnesses:
WILLIAM H. LOTZ,
OTTO LUEBKERT.