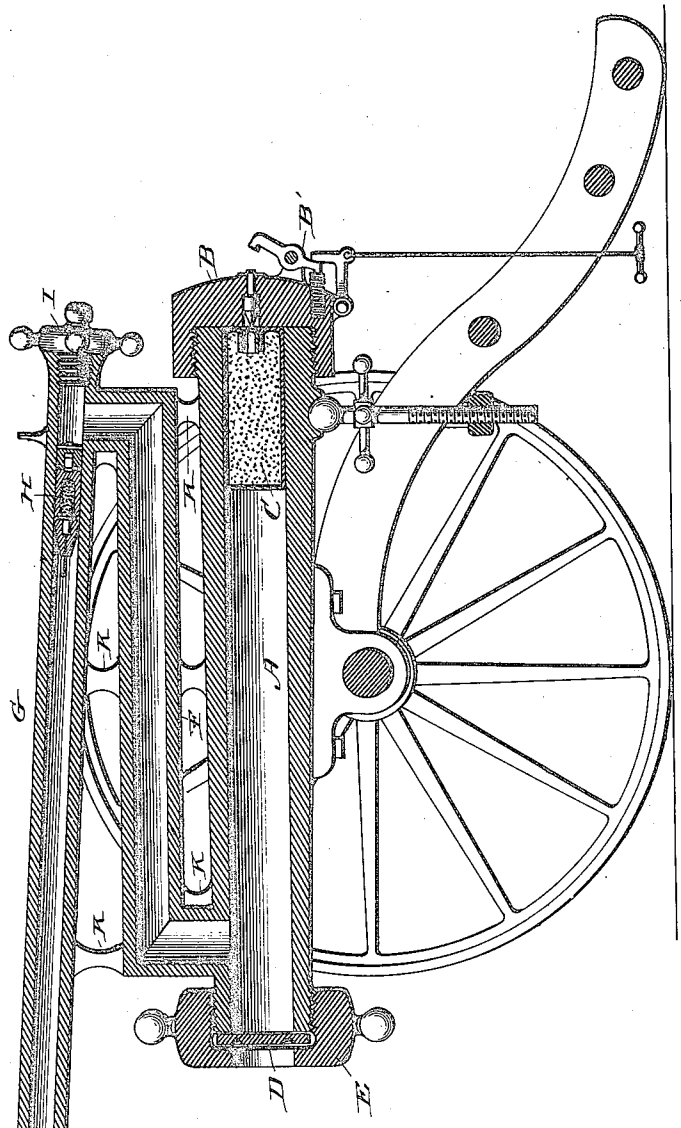
(No Model.)

D. DUDLEY.

METHOD OF COMPRESSING AIR FOR PNEUMATIC GUNS.

No. 407,474. Patented July 23, 1889.



Witnesses
Wm. J. Speidel.
Albert F. Speidel.

Inventor
Dana Dudley
By his Attorney Woodbury & Lowery

UNITED STATES PATENT OFFICE.

DANA DUDLEY, OF LYNN, MASSACHUSETTS, ASSIGNOR TO THE HOTCHKISS ORDNANCE COMPANY, (LIMITED,) OF LONDON, ENGLAND.

METHOD OF COMPRESSING AIR FOR PNEUMATIC GUNS.

SPECIFICATION forming part of Letters Patent No. 407,474, dated July 23, 1889.

Application filed April 26, 1889. Serial No. 308,654. (No model.)

To all whom it may concern:

Be it known that I, DANA DUDLEY, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented a new and useful Improvement in the Process of Compressing Air for Pneumatic Guns, of which the following is a specification.

My novel process of compressing air for pneumatic guns consists in compressing air in a suitable chamber by means of an explosive which is ignited therein, the air-pressure produced by the explosive being communicated by suitable means to a projectile contained in a tube or barrel.

In the accompanying drawing I have illustrated my invention as applied to a pneumatic gun of the class described and claimed in my application, Serial No. 308,656, filed April 29, 1889, in which the compression is produced by the direct action of the explosion upon the contained air; but it may also be applied in the form shown in my application, Serial No. 308,655, filed April 29, 1889, in which the compression is effected indirectly through the agency of a piston driven by the explosion.

In the accompanying drawing, which is a vertical cross-section of a pneumatic gun of the class above referred to, A is the air-compression chamber, having a removable breech-piece B, of well-known construction, and provided with the firing mechanism B′.

C is the explosive.

D is a diaphragm of metal or other suitable material closing the end of the explosion-chamber and held in place by means of the cap E E, which screws onto and partly over the end of the air-compression chamber A. This diaphragm D, when thus secured in place, tightly closing the chamber A, acts as a pressure safety-valve, the resistance of the diaphragm providing one means for determining the degree of pressure that can be produced within the chamber.

F F is an air-tube open at both ends, which connects the compression-chamber A with the barrel G of the air-gun in the rear of the projectile H, as shown.

I is the breech-piece, removable for the purpose of inserting the projectile. K K are braces to hold the parts together.

The gun having been loaded, as shown in the drawing, with the projectile in barrel G forward of the entrance of the air-tube and the explosive in chamber A, the breech-pieces B and I are closed and diaphragm D firmly secured in place. On the explosion of the explosive C by means of the primer B′, or in any other well-known way, the contained air is at once greatly compressed, and this pressure, communicated through tube F to the rear of the projectile in barrel G, discharging the gun.

A gun of the following dimensions will give good results, illustrating the application of my process to a pneumatic gun, in which the diameter of the bore proper (barrel G) is one and one-half inch; length, eighty-four inches; diameter of air-tube (tube F) is two inches; length, forty inches; diameter of air-compression chamber A is three inches; length, thirty-eight inches; weight of projectile is two pounds; of powder-charge, eight ounces; and the resistance of plate D to blowing out, forty-five pounds per square inch.

I do not limit myself to the use of air alone as the elastic agent in performing the work, as I may use gas or gases of greater or less density without departing from the spirit of my invention.

The essence of my invention consists in the production of an air-pressure by means of an explosive, which air-pressure I may afterward utilize in discharging a projectile.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The method of discharging a pneumatic gun, which consists in compressing air in a suitable chamber by means of the explosion of an explosive therein, and communicating the air-pressure thus produced to the base of a projectile in another chamber uninterruptedly connected therewith, substantially as and for the purpose described.

2. The method of discharging a pneumatic gun, which consists in compressing air in a suitable chamber by exploding an explosive

therein, and causing the compressed air so produced to act uninterruptedly upon a projectile in a gun-barrel connected therewith to expel the same, substantially as described.

3. The method of discharging projectiles by means of the explosion of an explosive in an air-chamber, which consists in interposing a confined body of air uninterruptedly between the projectile and such explosive, and then exploding the explosive in said chamber, whereby high pressure is developed and the projectile discharged, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

DANA DUDLEY.

Witnesses:
HOWARD PARSONS ELWELL,
GEORGE J. CARR.