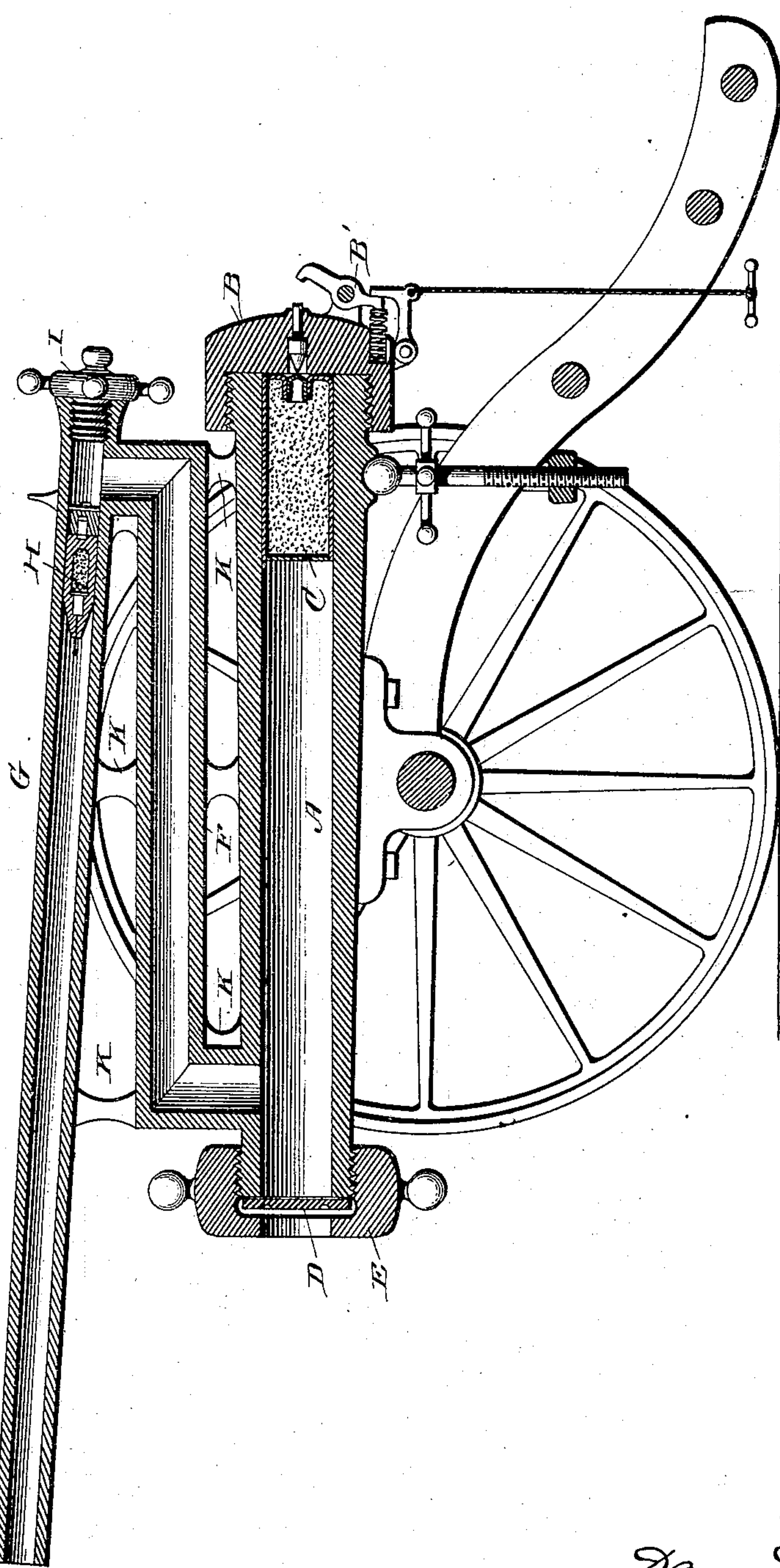


(No Model.)

D. DUDLEY.
PNEUMATIC GUN.

No. 407,476.

Patented July 23, 1889.



Witnesses

Wm. J. Spidner
Albert Spidner

Inventor

Dana Dudley
By his Attorney *Wm. J. Spidner*

UNITED STATES PATENT OFFICE.

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

PNEUMATIC GUN.

SPECIFICATION forming part of Letters Patent No. 407,476, dated July 23, 1889.

Application filed April 26, 1889. Serial No. 308,656. (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 Pneumatic Guns, of which the following is a specification.

My improved gun consists in providing a separate compartment, in which the air compression is produced by an explosive, and connecting the same by suitable tubing with the gun-barrel from which the projectile is to be discharged.

The accompanying drawing, which illustrates my invention, is a vertical cross-section through my gun, showing its different parts.

A is the air-compression chamber, having a removable breech-piece B of well-known construction and provided with 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. This required degree of resistance may be attained either by variation in the thickness of the diaphragm or in its material.

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 introducing the projectile; and K K are braces to hold the parts together.

The operation of the gun is as follows: The gun having been loaded, as shown in the drawing, with the projectile in barrel G forward of the entrance of the air-tube F 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 a primer or in any

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, 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; but I do not limit myself to the dimensions here given, as each and all of them may be greatly varied without departing from the essence of my invention.

Among numerous advantages presented by my improved gun are the great simplicity and consequent cheapness of construction, the facility with which the air-pressure is produced, and the absence of any fouling of the gun-barrel due to the smoke and unburned powder.

It is evident that the explosive charge and the gun-barrel G remaining unchanged, the pressure in the latter may be regulated by varying the size of chamber A. It is also evident that while I have shown chamber A in the drawing in the shape of a tube open at both ends and with the necessary closing devices—a form which I greatly prefer because of the increased facility it affords for cleaning the chamber—I do not limit myself to the same, as the chamber may be of any convenient shape, provided always that it has means for the introduction of the explosive and for connecting it with the barrel containing the projectile. Neither do I limit myself to the particular location with respect to each other of the compression-chamber A and of the gun-barrel G. These are shown in the drawing as being in a vertical plane; but they may also be in a horizontal plane or even disconnected in every respect until the moment of firing. Neither do I limit myself to the relative sizes of the compression-chamber and of the gun-barrel, as the latter may be of larger dimensions than the former without departing from the spirit of my invention, which

consists, essentially, of a chamber adapted to contain an explosive to compress the air therein, a barrel or tube adapted to discharge a projectile, and a tube for conducting the compressed air to the barrel. Neither do I limit myself to the use of my air-compression chamber, in which the compression is produced by means of an explosive to use in combination with the particular form of air-guns shown in the drawing.

It is also obvious that other ways of firing the explosive may be used from that shown in the drawing.

I make no claim to the method of compressing the air which I employ in the gun, such method forming part of my application filed April 29, 1889, of even date herewith, Serial No. 308,654.

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

1. A pneumatic gun consisting of an air-compressing chamber adapted to contain air to be compressed by an explosive therein, a barrel to contain the projectile, means for communicating the air-pressure uninterruptedly to the projectile in the barrel, means for charging the air-compressing chamber and the barrel, and means for exploding the explosive in the air-compressing chamber, substantially as and for the purpose described.

2. The combination of chamber A, adapted to contain air to be compressed by an explosive therein, having a breech-piece B, an explosive contained in said chamber and firing mechanism, barrel G, having the breech-piece I, and tube F, uninterruptedly connecting the

air-compressing chamber and the barrel, substantially as and for the purpose set forth.

3. The combination, with a pneumatic gun having an air-compressing chamber A, adapted to contain an explosive, of a safety-valve consisting of a diaphragm D and means for holding it in place, an explosive contained in said chamber, a barrel to contain a projectile, a projectile therein, tube F, uninterruptedly connecting the air-chamber to the barrel of the gun in the rear of the projectile, and firing mechanism for exploding the explosive, substantially as set forth.

4. The combination, with a pneumatic gun, of a chamber adapted to contain air to be compressed by an explosive therein, means for exploding the explosive, and means whereby the compressed air acts uninterruptedly upon the projectile to discharge the same, substantially as described.

5. The combination of chamber A, adapted to contain air to be compressed by an explosive therein and having the breech-piece and firing mechanism for exploding the explosive, diaphragm D and cap E E, closing the explosion-chamber, barrel G, having breech-piece I, and tube F F, uninterruptedly connecting chamber A with barrel G in the rear of the projectile, substantially as and for the purpose 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.