

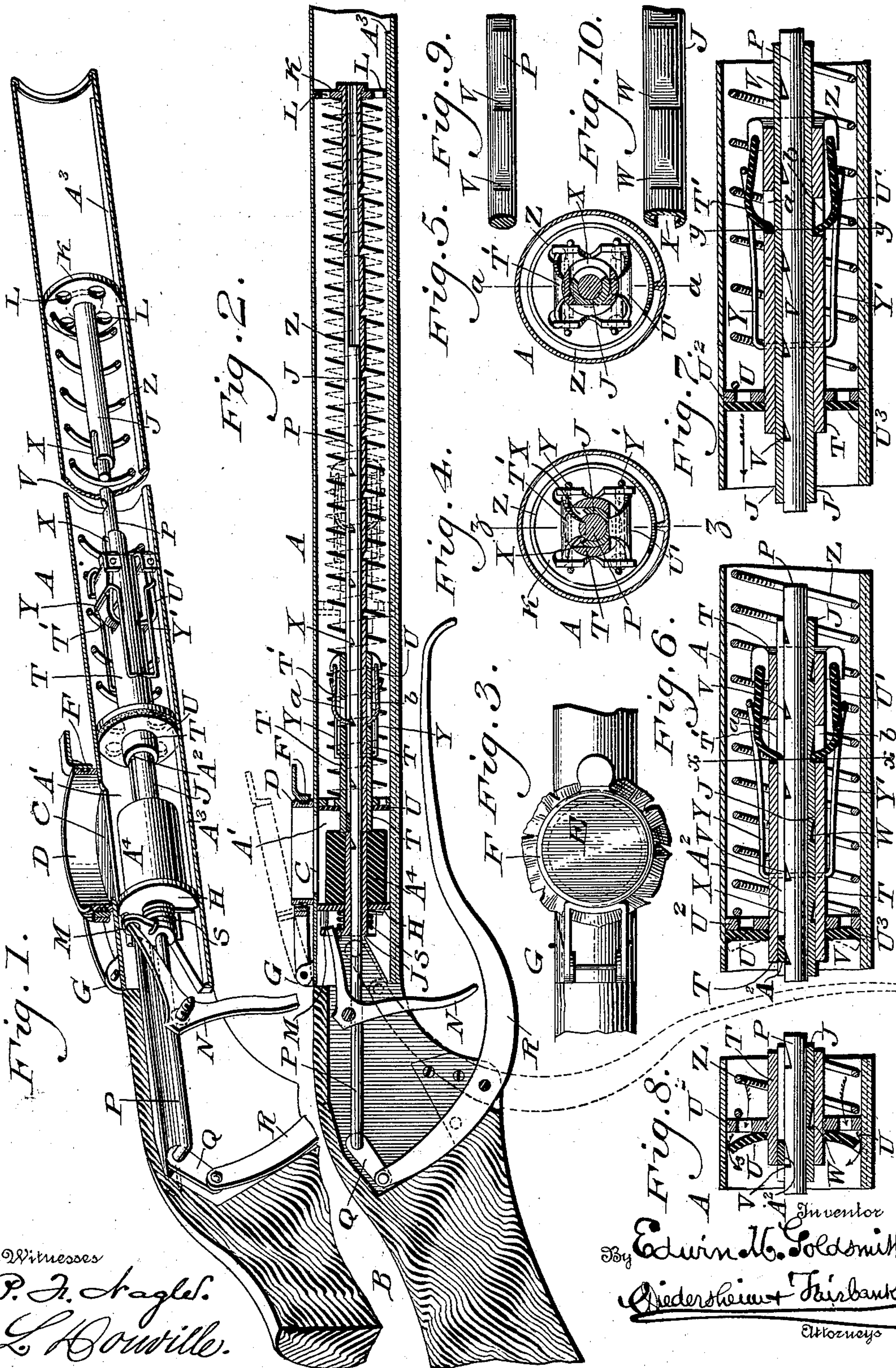
E. M. GOLDSMITH.

PNEUMATIC GUN.

(Application filed Dec. 15, 1899.)

(No Model.)

2 Sheets—Sheet 1.



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No. 657,344.

E. M. GOLDSMITH.
PNEUMATIC GUN.

Patented Sept. 4, 1900.

(Application filed Dec. 15, 1899.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 11.

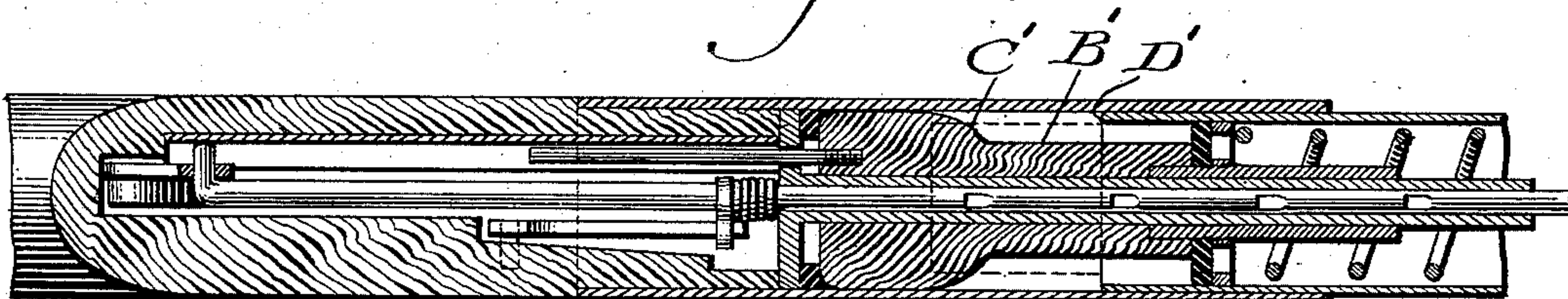


Fig. 12.

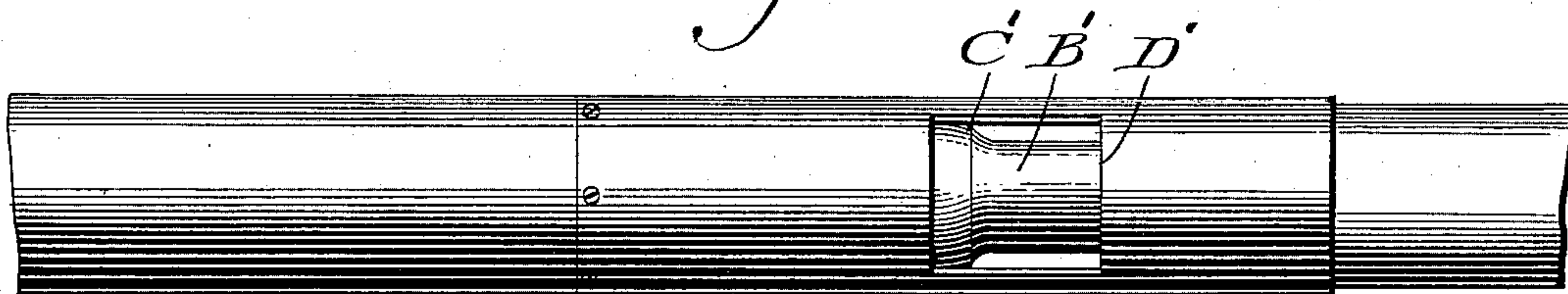
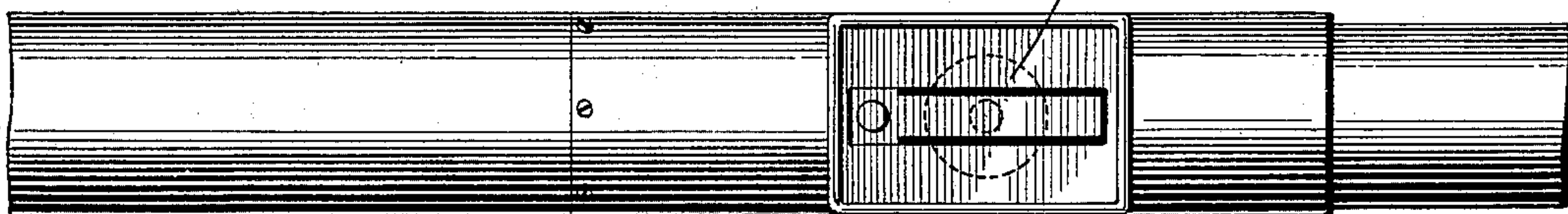


Fig. 13.



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UNITED STATES PATENT OFFICE.

EDWIN M. GOLDSMITH, OF PHILADELPHIA, PENNSYLVANIA.

PNEUMATIC GUN.

SPECIFICATION forming part of Letters Patent No. 657,344, dated September 4, 1900.

Application filed December 15, 1899. Serial No. 740,382. (No model.)

To all whom it may concern:

Be it known that I, EDWIN M. GOLDSMITH, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Pneumatic Guns, which improvement is fully set forth in the following specification and accompanying drawings.

My invention consists of a pneumatic gun adapted to burst a temporary covering of the air-chamber thereof and cause a report, after the order of an explosive firearm or other sound.

Figure 1 represents a longitudinal sectional view in perspective of a pneumatic gun embodying my invention. Fig. 2 represents a longitudinal section thereof. Fig. 3 represents a top view of a portion thereof. Fig. 4 represents a transverse section on line *x x*, Fig. 6. Fig. 5 represents a transverse section on line *y y*, Fig. 7. Fig. 6 represents a longitudinal section on line *z z*, Fig. 4. Fig. 7 represents a longitudinal section on line *a a*, Fig. 5. Fig. 8 represents a longitudinal section of a portion, showing mainly the piston of the gun. Fig. 9 represents a top plan view of part of the plunger of the gun. Fig. 10 represents a bottom plan of the sleeve of the gun. Fig. 11 represents a longitudinal section of another form of my invention. Fig. 12 represents a top or plan view thereof. Fig. 13 represents a top or plan view of another form of the invention.

Similar letters of reference indicate corresponding parts in the figures.

Referring to the drawings, A designates the barrel of the gun, and B the stock thereof.

C designates an opening in said barrel leading to the pneumatic or air chamber A', near the breech end thereof, around which opening rises the collar D, on which a piece E of paper or other pliable and readily-broken material is adapted to be placed, the same being firmly held by the band F, which is hinged to the barrel, as at G, and adapted to embrace the portion of the piece E on said collar, as most clearly shown in Fig. 3. Within the barrel, rearward of said opening C, is the rigidly-held diaphragm H, in the center of which is mounted thereon the rear end of the sleeve J, which extends through the barrel A, toward the muzzle thereof, and

has its front end mounted in the center of the diaphragm K, which is rigidly held within the barrel and provided with ports L for the admission of air into the barrel, it being noticed that the sleeve J is rotatable in said diaphragms H and K. The rear end of said sleeve, which is behind the diaphragm H, has a crank-arm M connected therewith, the same being slotted and freely receiving one limb of the trigger N, whereby by pressing the latter a lowering motion is communicated to the arm M and the sleeve is accordingly rotated.

P designates a plunger or traveling rod which passes freely through the sleeve J and has its rear end connected by link Q with the upper or inner end of the hand-lever R, the latter being mounted on the stock B and having its lower limb outside of the latter for operative purposes.

S designates a spring which is connected with the rear end of the sleeve J and a fixed part adjacent thereto for returning said sleeve to its normal position after having been rotated by the trigger N.

Encircling the sleeve J is the tubular stem T of the piston U, the latter when in normal position occupying the front of the chamber A'. In said stem are openings *a* and *b*, through which pass, respectively, the noses of the dog T' and check-pawl U', said dog and pawl being mounted on said stem, the nose of the dog T' being adapted to enter either of the recesses V in the plunger P, while the nose of the check-pawl U' is adapted to enter either of the recesses W in the sleeve J, it being noticed that the sleeve J has in it a longitudinal slot X, whereby the nose portion of the dog T' may pass through the same to reach the respective notch V of the plunger P and permit the longitudinal motions of said nose portion of the dog in said slot. The dog and pawl are held in operative position by means of the springs Y Y', which bear against the same and are affixed to a proper portion of the plunger-stem T. The front of the pneumatic chamber is closed by the piston U, which, as will be seen in Figs. 1, 2, 6, and 8, consists of a perforated head U² and a pliable flap U³, said piston being firmly connected with the stem T and movable therewith, it now being noticed that air primarily enters

the barrel through the front diaphragm K, and when the piston is operated in one direction said air passes through the head U², the flap U³ then opening, and enters the pneumatic chamber A'. In the other direction of the piston the flap closes and prevents the escape of the air forward of the piston.

Z designates a spring for forcibly returning the piston to its first position, the same bearing at one end against said piston and at the other end against the diaphragm K as a fixed point.

In order to prevent the escape of air through the slot X when the sleeve J passes through the piston U, there is placed in said slot between the piston-stem T and the plunger P the filling-piece A², which closes said slot, without, however, interfering with the rotary motion of the plunger. In order to prevent any possible rotary motion of the piston and its connected parts, together with the diaphragm K, the bore of the barrel is provided with the longitudinally-extending tongue A³, which enters grooves in said piston and diaphragm, the effect of which is evident.

A⁴ designates a buffer or cushion which is placed on the rear portion of the sleeve J, so as to abut against the diaphragm H, it receiving the impact of the piston or piston-stem when the latter is impelled to its normal position by the action of the spring Z, so as to ease the stoppage of the piston and prevent injury to the parts subjected to blows or concussion.

The operation is as follows: The piece E of paper or other pliable material is placed on the collar D and the band F thrown thereover, so as to hold the same firmly on said collar and tightly close the opening C. The lever R is now operated, whereby the plunger P is advanced, and one of its notches engages with the nose of the dog T', whereby the piston-stem is advanced and the piston U accordingly moved with it, air thus being directed into the pneumatic chamber A'. The lever R may be again operated, thus rendering the advance of the piston to the required extent better than if accomplished by one stroke. Intermediate of the motions of the lever R the tendency of the piston to return, due to the pressure of the spring Z, is prevented by the engagement of the check-pawl U' with the adjacent notch W in the sleeve J, as will be most apparent in Fig. 6. The trigger N is now operated, whereby rotary motion is imparted to the sleeve J, and as the latter rotates the noses of the dog T' and the pawl U' are removed from the recesses which they occupied and placed upon the unrecessed portions of the sleeve J, (see Figs. 5 and 7,) and hence cannot engage with either of the respective recesses. Consequently the piston now being controlled by the spring Z is forcibly impelled to its normal position, thus compressing the air in the pneumatic chamber A', and as the closure E of the opening C is weak it is unable to endure said pressure and so bursts,

producing a sound after the manner of an explosion or a report of a firearm. Owing to the spring S the sleeve J returns to its normal position, when the recesses V and W are again placed in the paths of the dog T' and pawl U', after which the lever R may be again operated to cause the admission of air into the chamber A', a fresh piece, such as E, being applied over the opening C and secured as before, when the gun is ready for another operation. As the front diaphragm K is immovable and the piston returns to the breech in the operation of the gun, it is impossible to discharge a projectile from the barrel. Hence the gun is not of a dangerous nature and becomes practically harmless in the hands of children or others.

In Fig. 11 the rear end of the sleeve has connected with it the head B', which is formed with the shoulder C', adapted to cover the wall at the forward end of the opening D' in the barrel as a temporary closure for the air-chamber, whereby when the piston is released said head is forcibly impelled to the rear, thus uncovering said opening D' and causing the air to escape forcibly from the barrel, thereby producing the report.

In Fig. 13 a reed E' is applied to the discharge-opening of the barrel, so as to produce a musical sound; but in lieu thereof I may employ a whistle or other sound-producing device, as shown by dotted lines, the same being operated by the expelled air.

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

1. In a pneumatic gun, an air-chamber at the breech thereof, an outlet for said chamber to the atmosphere, a piston, a lever for moving said piston forward of said chamber, and means for forcibly returning said piston rearwardly to said chamber, said outlet being at the breech of the barrel.

2. In a pneumatic gun, an air-chamber therein, a piston in said chamber, a lever for moving said piston forward of said chamber, a temporary covering for part of said chamber formed of material adapted to be fractured by the concussion of said air due to the return of the piston to said chamber and a trigger adapted to release said piston and means for returning the piston toward the breech.

3. A pneumatic gun having an air-chamber at the breech thereof, a piston, a lever for moving said piston forward of the breech, a trigger-rotating mechanism operated by said trigger for releasing said piston, and means for returning said trigger rearward to said chamber.

4. A pneumatic gun having an air-chamber at the breech thereof, an outlet for said chamber to the atmosphere, a collar around said outlet and a movable band exterior to said collar and concentric therewith for retaining a temporary cover over said outlet between said collar and band as described.

5. In a pneumatic gun having an air-chamber, an outlet for the latter to the atmosphere, a piston, means for moving the latter from and to said chamber, a sleeve with recesses
 5 therein, a plunger in said sleeve with recesses therein, a piston having a stem encircling said sleeve, an advancing dog, and a check-pawl on said stem adapted to enter the recesses of said sleeve and plunger respectively,
 10 means for holding said dog and pawl in said recesses, said sleeve having a longitudinally-extending slot for the nose portion of said dog, and means for rotating said sleeve, whereby the dog and pawl are removed from the sleeve
 15 and plunger and the piston is then controlled by its returning mechanism.

6. A pneumatic gun having an air-chamber, an outlet for said chamber to the atmosphere, a piston provided with a dog, a traveling rod
 20 or plunger adapted to be engaged by said dog, means for advancing said plunger from said chamber, a slotted sleeve intermediate of said plunger and the stem of said piston, means for rotating said sleeve and thereby removing
 25 said dog from engagement with said plunger, and a spring bearing against said piston for returning it to said chamber, whereby the air in the chamber is forcibly driven into the atmosphere.

30 7. A pneumatic gun having an air-chamber, an outlet for said chamber to the atmosphere, a piston in said barrel, a dog on the stem of said piston, a plunger adapted to be engaged by said dog, means for advancing said plunger
 35 and thereby advancing said piston for said chamber, a rotary sleeve fitted on said plunger and inclosed by said stem, a trigger connected with said sleeve adapted to rotate the same in one direction, a check-pawl on

the piston-stem adapted to engage said sleeve, 40 the noses of said dogs being in the path of said sleeve in the direction of the rotation of the latter, and a spring bearing against said piston to return the same to the air-chamber.

8. A pneumatic gun having an air-chamber 45 at the breech thereof, a piston, means for advancing said piston, from said chamber toward the muzzle, means for releasing said piston, means for returning said piston rearward to said chamber, and a temporary covering 50 for said chamber.

9. A pneumatic gun having an air-chamber at the breech thereof, a piston, a lever for advancing said piston, toward the muzzle, a spring to operate said piston when released 55 to return the same rearward to said chamber, and a temporary covering for part of said chamber formed of material adapted to be fractured by the concussion of the air due to the return of the piston, said chamber being 60 open to the atmosphere at the breech of the gun.

10. In a pneumatic gun, an air-chamber therein at the breech thereof, an outlet for said chamber to the atmosphere at the breech, 65 a piston in said chamber, and means for advancing said piston from said chamber, for holding it in its advanced position, for releasing it from its holding mechanism and for returning it rearwardly to the breech, and an 70 immovable support for the portion of the mechanism within the barrel at the end toward the muzzle.

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