No. 749,519. PATENTED JAN. 12, 1904.

W. R. BENJAMIN.

AIR GUN.

APPLICATION FILED JUNE 10, 1902.

NO MODEL.

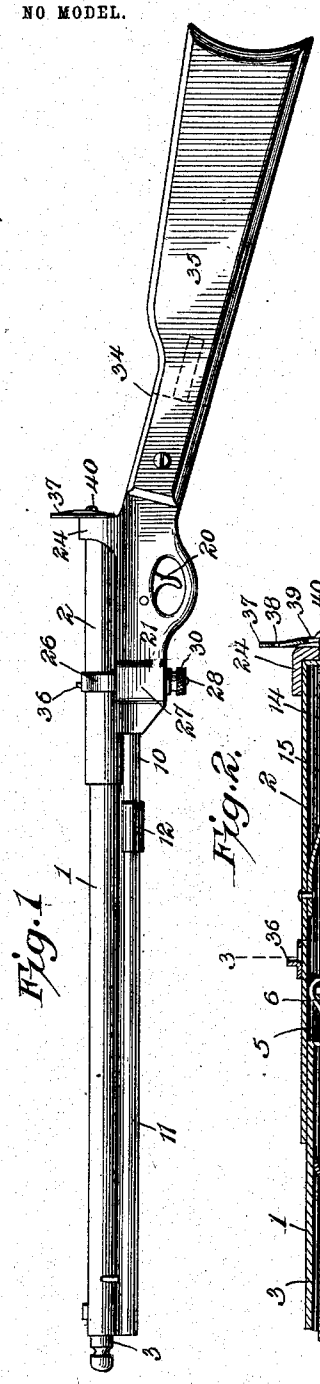


Fig. 1.

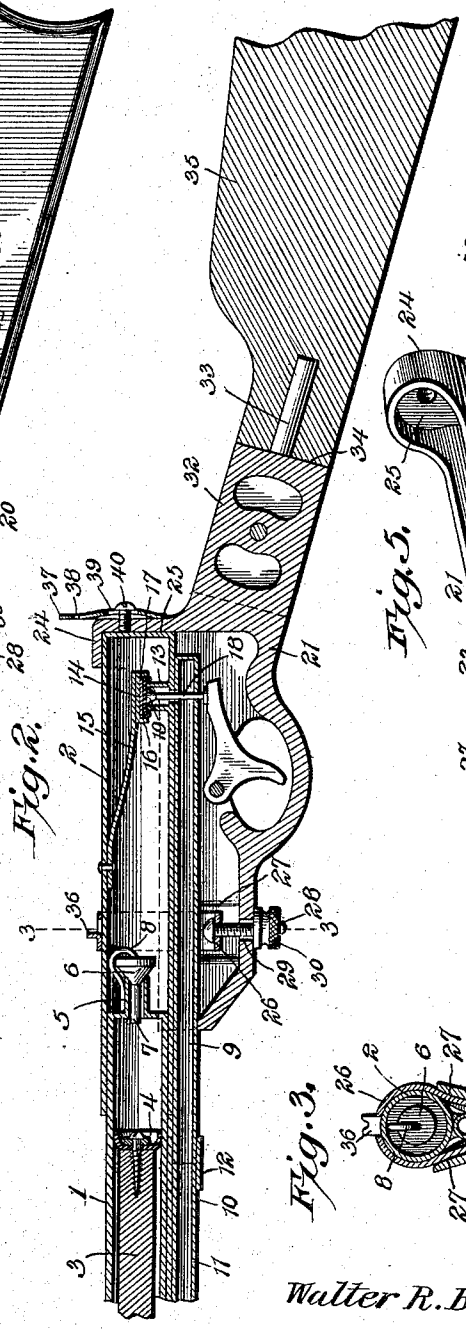


Fig. 2.

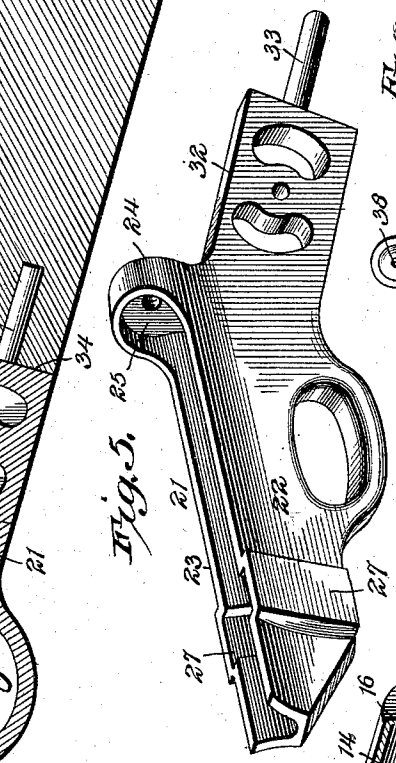


Fig. 5.

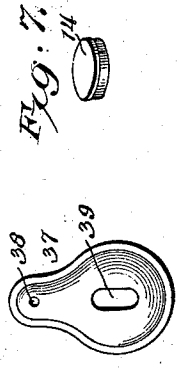


Fig. 6.

Fig. 7.

Fig. 3.

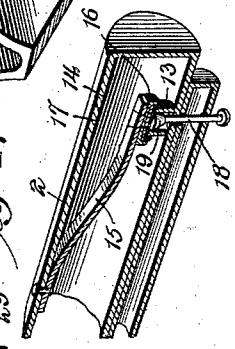


Fig. 4.

Witnesses
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No. 749,519. Patented January 12, 1904.

UNITED STATES PATENT OFFICE.

WALTER ROGERS BENJAMIN, OF ST. LOUIS, MISSOURI.

AIR-GUN.

SPECIFICATION forming part of Letters Patent No. 749,519, dated January 12, 1904.

Application filed June 10, 1902. Serial No. 111,048. (No model.)

To all whom it may concern:

Be it known that I, WALTER ROGERS BENJAMIN, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented a new and useful Air-Gun, of which the following is a specification.

This invention relates to a novel air-gun of the type shown in my former patents, Nos. 627,320 and 693,823, the objects being to greatly simplify the construction of the gun, to make the working parts more durable, and to facilitate disorganization of the gun in order that repairs may be effected by the operator instead of necessitating skilled assistance.

To the accomplishment of these objects and others which will hereinafter more fully appear, the invention in its preferred embodiment comprehends the construction and arrangement of parts to be hereinafter described, illustrated in the accompanying drawings, and succinctly defined in the appended claims.

In said drawings, Figure 1 is a side elevation of the gun complete. Fig. 2 is a sectional view, on a somewhat enlarged scale, with certain of the parts broken away. Fig. 3 is a transverse section on the line 3 3 of Fig. 2. Fig. 4 is a sectional perspective view, showing more clearly the construction and mounting of the trigger-valve and its associated parts. Fig. 5 is a detail perspective view of the breech frame or casting. Fig. 6 is a detail view of the adjustable breech-sight, and Fig. 7 is a detail view of the trigger-valve.

Like numerals of reference are employed to designate corresponding parts throughout the several views.

1 indicates a pump-cylinder, and 2 is a cylindrical air chamber or reservoir into the open front end of which the rear end of the cylinder is fitted and secured by any suitable means—as, for instance, solder or the like—if the connection between the parts is not sufficiently close to prevent the escape of air from the chamber. Within the cylinder 1 is mounted for reciprocation a piston or plunger 3, provided at its inner end with a cup-valve 4 and designed to force air from the cylinder 1 to the interior of the air-chamber 2 in rear thereof. It should be understood that the pump, comprising the cylinder 1 and the plunger 2, is designed merely for the purpose of compressing a sufficient quantity of air within the chamber 2 to effect the storage of sufficient pneumatic energy to discharge a projectile. It will therefore appear that provision must be made for preventing the escape of air from the reservoir to the cylinder when the plunger is retracted. For this reason the inner end of the cylinder 1 is formed with a valve-nipple 5, at the end of which is seated a rubber or other suitable check-valve 6, having a stem 7, projecting into the nipple 5, but of somewhat smaller diameter to permit the escape of air around the stem and past the valve when the latter is unseated by the pressure of air within the pump-cylinder. The check-valve 6 may be supported in a variety of ways; but by preference said valve is secured to one end of a substantially U-shaped spring 8, the opposite end of which is secured to the nipple 5.

Inasmuch as one of the objects of the present invention is to make the valves readily accessible for purposes of adjustment and repair, attention may be called to the fact that the separable connection of the pump and air cylinders 1 and 2 and the disposal of the check-valve 6 beyond the rear end of the pump-cylinder enables the operator to quickly withdraw the pump-cylinder and repair or readjust the check-valve if for any reason the latter should fail to act properly.

Below the air-chamber 2 and preferably rigidly secured thereto is the rear or breech-section 9 of a projectile-barrel 10, the front section 11 of which is secured to and extends along the under side of the pump-cylinder 1. Inasmuch as these sections of the projectile-barrel are permanently attached to the separable sections of the main barrel, comprising the pump-cylinder 1 and the air-cylinder 2, it is evident that provision must be made for their connection. This may be accomplished in a number of ways; but by preference the rear end of the barrel-section 11 is provided with a joint-sleeve 12, designed to receive the front end of the rear section 9 of said barrel, as clearly shown in Fig. 2. Communication between the rear end of the projectile-barrel

10 and the air-reservoir 2 is effected through a valve-nipple 13 within the latter, and such communication is controlled by a trigger-valve 14, seated upon the upper end of the nipple and yieldingly sustained at one end of a flat spring 15, the opposite end of which is secured to the wall of the cylinder 2 at a point in advance of the valve.

The manner of attaching the valve 14 to the spring may be varied within wide limits; but since one of the primary objects of the invention is to facilitate the repair of the valves, as heretofore stated, I prefer to permanently attach a valve-cup 16 to the rear end of the spring 15 for the reception of the valve proper, which is a leather, rubber, or other compressible disk provided with a stiff backing-disk 17, cemented in the valve-cup to prevent air from escaping behind the valve and forcing the latter into the valve-nipple. In the event of the derangement of this valve it is simply necessary to uncouple the pump-cylinder, remove the trigger-valve from its cup, and replace it by another. In my former construction the stem of the trigger-valve was passed through the rubber disk constituting said valve; but it has been found in practice that this arrangment is objectionable for the reason that the wearing of the rubber will permit the escape of air around the stem.

One of the features of the present construction therefore resides in the employment of a valve-stem or operating-pin 18 entirely separate from the valve and extended through and below the projectile-barrel. The upper end of the stem 18 is provided with an enlarged head 19, designed to contact with the under side of the trigger-valve, and its lower end is disposed in operative relation with a trigger 20, pivotally mounted in the breech-frame or casting 21 and designed to raise the valve-stem for the purpose of opening the trigger-valve against the resistance of the spring 15 to permit the escape of air to the projectile-barrel behind a small shot or other projectile therein. The entire breech-frame 21 is constructed in a single casting, comprising upwardly-diverging side portions or walls 22 and 23, connected at their rear ends by a semicircular breech-collar 24, fitting around the breech of the air-cylinder 2 and disposed in advance of a vertical wall 25, which constitutes an abutment for the air-cylinder. The side walls 22 and 23 of the breech-frame afford a seat for the cylinder 2, and the latter is drawn down upon its seat and rigidly held in place by means of a breech-band 26, passed around the air-cylinder 2 and the rear breech-section of the projectile-barrel and received within offset band-seats 27, formed in the walls 22 and 23.

Below the projectile-barrel the band 26 is apertured for the reception of a draw-bolt 28, passed through an opening 29 in the bottom wall of the frame 21 and having its head located within the band. Below the breech-frame the bolt is provided with a thumb-nut 30, by the adjustment of which the barrels may be drawn firmly to place in the breech-frame or may be released when it is necessary to take down the gun for the purpose of repairing or adjusting any of its parts. At the rear end of the frame 21 are formed an integral stock-plate 32 and a rearwardly-extending pin 33, the plate 32 being bolted within a bifurcated portion 34 of the stock 35 and the pin being extended into the body of the stock, as shown in Fig. 2.

A rear sight 36 may be formed by bending up a lip cut from the band 26, as shown in Figs. 2 and 3; but it is also desirable to provide an adjustable breech-sight 37 in the form of a dished or spring plate having a sight-opening 38 and an elongated slot 39, through the latter of which is passed a screw 40, designed to secure the plate to the vertical wall 25 of the breech-frame.

It is thought that from the foregoing the construction and operation of my novel air-gun will be clearly apparent; but while the illustrated embodiment is believed at this time to be preferable I wish to be distinctly understood as reserving to myself the right to effect such changes, modifications, and variations of the illustrated structure as may be fairly embraced within the scope of the protection prayed.

What I claim is—

1. In an air-gun, the combination with a breech-frame, of an air-cylinder and a projectile-barrel section connected together for detachment in unison from the frame, a pump-cylinder separably connected to the air-cylinder, and a second projectile-barrel section permanently attached to the pump-cylinder.

2. In an air-gun, the combination with a breech-frame, of an air-cylinder and a projectile-barrel section connected together, means common to the said cylinder and barrel-section for attaching them to the frame, a pump-barrel having interfitting relation with the air-cylinder, and a second projectile-barrel section attached to the pump-cylinder for removal therewith when the pump-cylinder is separated from the air-cylinder.

3. In an air-gun, the combination with a breech-frame, of an air-cylinder and a projectile-barrel section connected together for detachment in unison from the frame, a pump-cylinder separably connected to the air-cylinder, a second projectile-barrel section permanently attached to the pump-cylinder, an exteriorly-arranged valve at the inner end of the pump-cylinder, a valve controlling the escape of air to the barrel, and a trigger for operating said last-named valve.

4. In an air-gun, the combination with a breech-frame, and a barrel comprising a pump-

cylinder and an air-cylinder, of a projectile-barrel seated in the frame, a breech-band encircling the barrels, and an adjustable device for drawing the band into the frame to firmly seat the barrels.

5. In an air-gun, the combination with a breech-frame having a seat and a breech-collar at the end of said seat, of a main barrel comprising a pump-cylinder and an air-cylinder seated in the frame and having its end extended into the breech-collar, a projectile-barrel disposed below the main barrel, a breech-band encircling the barrels, and means for drawing the band into the frame.

6. In an air-gun, the combination with a breech-frame and a main barrel seated therein and comprising a pump-cylinder and an air-cylinder, of a projectile-barrel below the main barrel, a breech-band encircling the barrels, a draw-bolt connected to the band and passed through one wall of the frame, and a thumb-nut screwed upon the outer end of said bolt.

7. In an air-gun, the combination with a breech-frame comprising side walls constituting a seat, and a breech-collar at the end of said seat, of a barrel seated in the frame between the side walls and having its end extended into the breech-collar, and a breech-band connected to the breech-frame for holding the barrel in place.

8. In an air-gun, the combination with a breech-frame, of an air-cylinder and a projectile-barrel section connected together for detachment in unison from the frame, a pump-cylinder having its inner end telescoping within the air-cylinder, and a second projectile-barrel section having its inner end communicating with the outer end of the first-mentioned projectile-barrel section and connected to the pump-cylinder.

9. In an air-gun, the combination with a projectile-barrel, of an air-cylinder, a valve controlling the escape of air to the barrel, and a pump-cylinder having an exteriorly-arranged valve at one end, said end being removably fitted into the air-cylinder.

10. In an air-gun, the combination with a main barrel comprising an air-cylinder and an interfitting pump-cylinder, of a check-valve carried by the inner end of the pump-cylinder, a projectile-barrel comprising separate sections connected to the cylinders, means for closing the joint between the barrel-sections, and a valve controlling the passage of air to the projectile-barrel from the air-cylinder.

11. A breech-frame for air-guns, comprising side walls constituting a barrel-seat, a breech-collar at the rear end of the seat, and a vertical wall constituting an abutment for the barrel, in combination with the barrel fitted in the seat, and clamping means for holding the barrel in its seat.

12. In an air-gun, the combination with an air-reservoir and a projectile-barrel, of a valve-nipple and a spring, both located in the reservoir, a valve seated on the nipple by the spring and comprising a cup and a disk retained therein and directly opposed to the nipple, a valve-operating pin passed through the projectile-barrel and having one end disconnected from but disposed to operate the valve, and a trigger operatively related to the pin.

13. In an air-gun, the combination with an air-reservoir and a projectile-barrel; of a valve-nipple in the reservoir, a valve comprising a cup and an imperforate disk of yielding material seated therein and directly opposed to the nipple, a leaf-spring connected at one end to the wall of the reservoir and at its opposite end to the valve-cup to urge the same toward the nipple, a valve-operating pin extended into the nipple and opposed to the valve-disk, and means for moving the pin to open the valve.

14. In an air-gun, the combination with an air-reservoir and a projectile-barrel; of a valve-nipple extending into the reservoir, a valve comprising a cup and an imperforate disk of yielding material removably seated therein and directly opposed to the nipple, a leaf-spring connected at one end to the wall of the reservoir and at its opposite end to the valve-cup to urge the valve toward the nipple, a valve-operating pin passed through the projectile-barrel and into the nipple and having one end disconnected from but opposed to the disk of the valve, and a trigger operatively related to the pin.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WALTER ROGERS BENJAMIN.

Witnesses:
THOS. STALLINGS,
GEORGE E. WHITTER.