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2,125,600

AIR GUN

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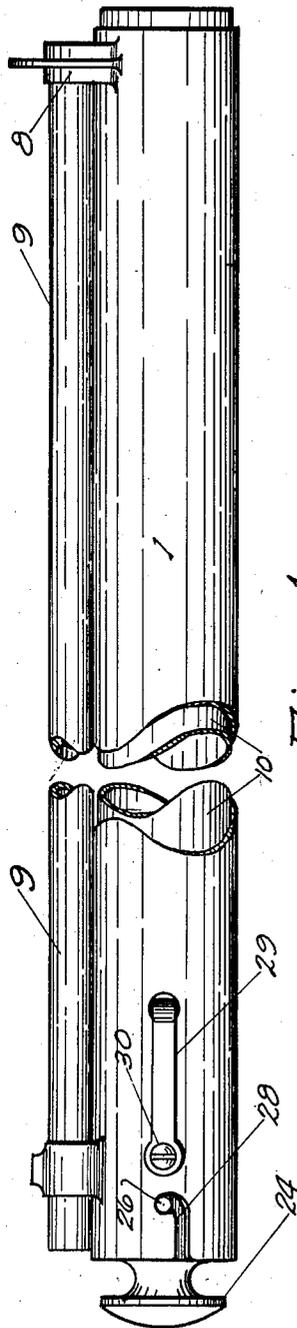


Fig. 1



Fig. 2

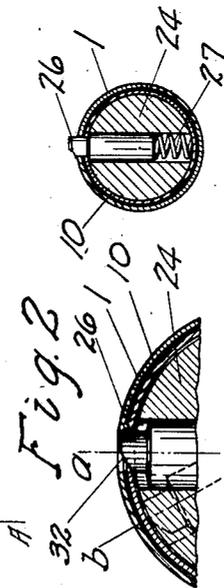


Fig. 3

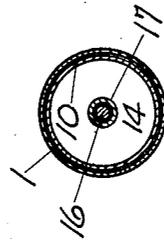


Fig. 4



Fig. 5

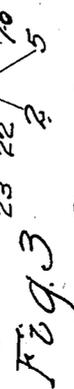


Fig. 6



Fig. 7

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AIR GUN

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3 Claims. (Cl. 124-13)

The objects of my invention are—first, to provide a storage chamber in a compressed air gun for the storing of compressed air and to provide a single supply sufficient for several successive discharges of a gun; second, to provide a discharge chamber directly connected to the storage chamber with a very small passage to permit automatic refills of the discharge chamber from the supply in the storage chamber, after the contents of the discharge chamber has been discharged; third, to provide such a storage chamber without increasing the bulkiness of the gun assembly. I attain these objects as are set forth in the following specification and as is shown in the accompanying drawing, in which:

Fig. 1 shows a side view of a typical air gun with the gun barrel super-imposed on the pumping chamber but without the usual gun stock. Fig. 2 shows a longitudinal section on a line transversely thru the muzzle end of the gun showing means for bolting the pump plunger within the pump cylinder. Fig. 3 is a longitudinal section thru the breech portion of the gun with the gun barrel removed. Fig. 4 shows a cross section on line A—A of Fig. 2; Fig. 5 shows a cross section on line B—B of Fig. 3; Fig. 6 shows the pressure spring on line C—C of Fig. 3; Fig. 7 shows an enlarged partial section of the bolt on line A—A, showing the bolt in dotted lines at position (b) in a disengaged position.

Referring to Fig. 1, 1 represents the pump cylinder connected to the breech block 2, (see Fig. 3) by the tubular nipple 3, and is soldered to the tube 1 in the solder groove 4. In the breech block 2 is located a check valve 5 connected to a valve stem 6, held in operative position by the pyramid compression spring 7. The tubular duct 3 extends up thru the rear sight support 8 and connects with the gun barrel 9 as shown in Fig. 1.

The pump plunger 10 shown in Fig. 1 and Fig. 3 is slidably operative within the pump cylinder 1, the pump plunger 10 is divided into a storage chamber 11 and a discharge chamber 14, said chambers are separated by a diaphragm wall 13, connected by a duct 17 thru said wall 13, the muzzle end of the chamber 11 has an end wall 12, the breech end of the discharge chamber 14 is provided with a check valve 15 mounted on the valve stem 16, said valve stem 16 operative within the tubular duct 17 and held in an operative position on its valve seat by the compression spring 18. The pump seal 19 is held in place by the housing nut 21 attached to piston head 20, said pump plunger 10 is connected and sealed to piston head 20 by the solder filled groove 23; pump

seal 19 is pressed to the pump cylinder wall by the spring 22 shown in Fig. 6 assuring a seal.

The muzzle end of the pump plunger 10 is provided with a knob 24, said knob is rotatively held in place within the end of the plunger cylinder 10, between the storage chamber and wall 12 and the stop ring 25 secured to the tube 10; within the said knob 24 is a small compression spring bolt 26 held in transverse operative position by a compression spring 27. The said springbolt is limited in its outward movement by the upset shown, the spring bolt 26 is shown in its anchored position. In Fig. 1, the slotted groove 28 at the end of the pump cylinder leads from the end of the pump cylinder 1 to the position of anchorage for the spring bolt. Fig. 7 shows the beveled face 32 of the spring bolt 26, said face facilitates placing the bolt in an inoperative position. The spring stop catch 29 is secured to pump cylinder 1 by a screw 30 as shown in Fig. 1 and Fig. 2. The catch extends thru an opening in the pump cylinder 1, operatively it connects with the annular stop recess 31 on the piston head 20, Fig. 3. In operation, my device functions as follows: to fill the storage chamber 11 with compressed air the knob 24 of the pump plunger is turned sufficiently in the slot 28 to release the said plunger 10, then the knob 24 is turned anti-clockwise as shown in Fig. 7 to a position (b) thus preventing the spring bolt to project from the tube 10; this done, the operator may proceed with the pumping of air into the chamber 11, until the desired pressure is obtained. The spring bolt 26 will pass freely into the pump cylinder and permit the piston head to be forced in tight against the breech block and force practically all compressed air thru the valve 15 into the discharge chamber 14. From this chamber the air passes slowly on along the valve stem thru the tube 17 into the chamber 11. It will be noted that the air pressure in chambers 11 and 14 will equalize; when the air is being pumped into the chamber 14, the pressure will be greater in the discharge chamber immediately after being pumped than after equalization with the pressure in the chamber 11. However, when the gun is discharged, the discharge chamber is quickly emptied and the reverse action takes place. The compressed air pressure in the discharge chamber is quickly discharged by opening the check valve 15 with a suitable trigger action applied to the end of the valve stem 6 of valve 5 thus opening the valve 5 first to provide a free passage for the air to be discharged from the discharge chamber 14, in the trigger operation the trigger forces the valve 5 against valve

15 and thereby opens the said valve 15. When the compressed air has been discharged from chamber 14, the trigger valve is released, the check valve 15 closes and the chamber 14 slowly
 5 refills with air pressure released from the storage chamber 11 thru duct 17. The filling speed will of course depend on the area of free air passage provided around the valve stem 16. Before the
 10 gun can be fired, however, it will be observed that the spring bolt 26 must be placed in position shown in Fig. 1 for the purpose of keeping the plunger from being expelled and also to provide the proper relationship between the valves 5 and
 15 operative. The chief function of valve 5 is to close the opening while the air supply is being compressed.

The spring stop 29 limits the movement of the pump plunger as it engages the piston head at
 20 the annular recess 31, when the screw 33 is removed the spring stop 29 is also removed and the plunger may be withdrawn from the cylinder for examination or repair. It will be observed that the storage chamber may be about 12 times
 25 the size of the discharge chamber, thus making it possible to discharge the gun a number of times from the one air supply in the storage chamber without losing too much pressure, thus making repeat action available in a compressed
 30 air gun.

I am aware that compressed air guns are on the market, but not to my knowledge has my device been incorporated and therefore I claim broadly as follows:

35 1. In an air pumping mechanism for com-

pressed air guns, a pump cylinder, a tubular plunger operative within the said pump cylinder, means for dividing said tubular plunger into a storage chamber and a discharge chamber, said
 5 dividing means having an equalizing duct therein, means for regulating the speed of equalization of the air pressure in the aforesaid chambers and means for releasing the compressed air from the said discharge chamber to fire a suitably connected compressed air gun. 10

2. In an air pumping mechanism for compressed air guns, a pump cylinder, a tubular plunger operative within the said pump cylinder, a storage chamber within the said plunger, means admitting compressed air into the said storage
 15 chamber, means for anchoring the said plunger in a fixed inserted position, means for releasing portions of the stored compressed air from the aforesaid tubular storage chamber, and means for controlling the volume of air discharged in
 20 each consecutive discharge.

3. In an air pumping mechanism for compressed air guns having a pump cylinder, a tubular plunger operative within the said pump cylinder, said tubular plunger having a storage
 25 chamber therein, means for sealing said plunger to the inner walls of the aforesaid pump cylinder, means within the plunger for admitting and retaining air in the storage chamber, means for anchoring the said plunger securely within the
 30 pump cylinder, means for releasing the compressed air from the said storage chamber to fire a suitably connected air gun.

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