

Sept. 21, 1937.

L. A. POPP

2,093,618

AIR PRESSURE GUN

Filed April 27, 1936

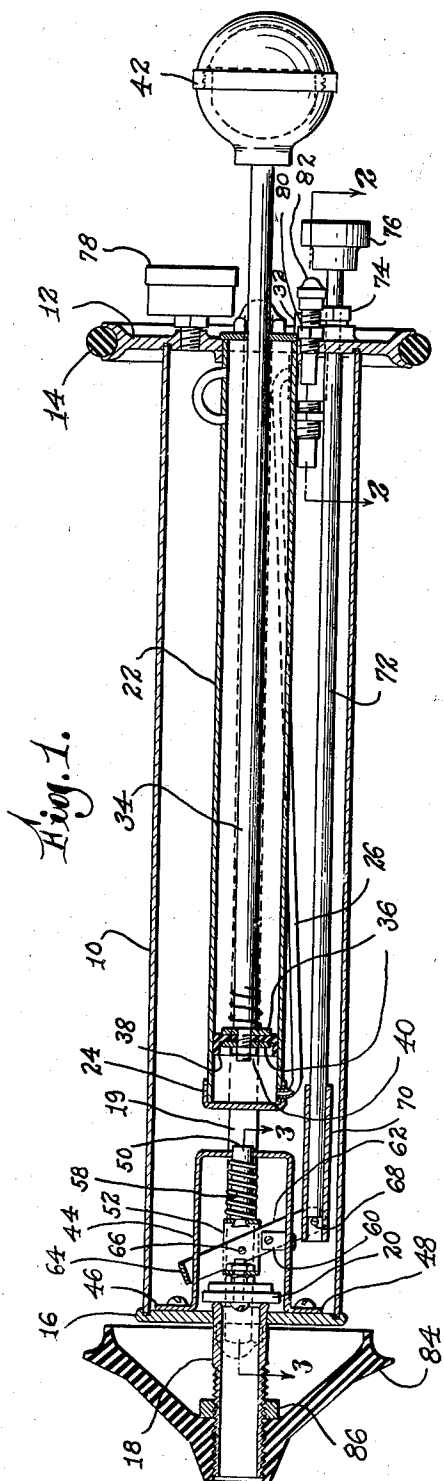


Fig. 1.

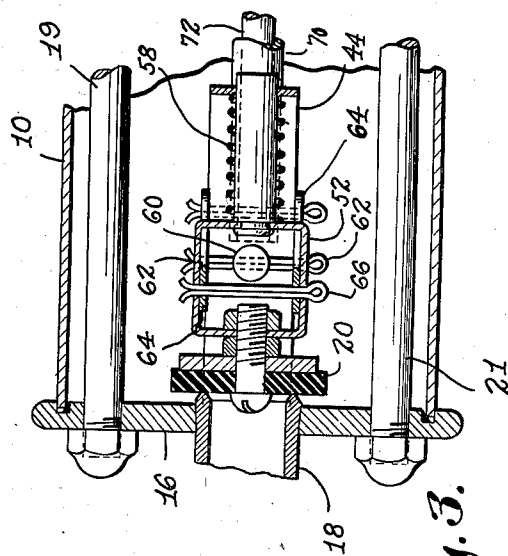


Fig. 3.

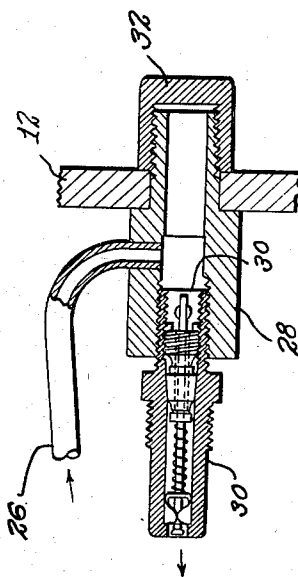


Fig. 2.

Inventor
Leonard A. Popp
by Carl A. Christofferson
Attorney

UNITED STATES PATENT OFFICE

2,093,618

AIR PRESSURE GUN

Leonard Alfred Popp, Saugus, Mass., assignor to
Master Products Co., Lynn, Mass., a corpora-
tion of Massachusetts

Application April 27, 1936, Serial No. 76,532

6 Claims. (Cl. 221-73.5)

This invention relates to improvements in air pressure guns, and, more particularly, to air pressure guns of the type constructed and arranged to force an obstruction from waste and other pipes.

Pressure guns for removing obstructions in waste pipes by releasing a blast of air are in common use and are effected for the purpose for which they are designed. In most guns of this type, the working parts are enclosed within the compression chamber, and since breakage of parts is likely to occur, the gun must be dismantled when worn or broken parts are to be replaced. In such guns, the mechanism which is most likely to break or become worn, is the valve mechanism between the end of the pump and the compression chamber. Ordinarily, this valve is mounted on the lower end of the air pump and any damage to this valve can be remedied only by dismantling the gun. In most instances, the pressure releasing mechanism is of necessity mounted within the gun in such a manner that it is difficult for a repair man to replace a broken or worn release valve mechanism. It is apparent, therefore, that, although the pressure guns now in common use are effective to remove obstructions, their effectiveness is vitiated by the fact that considerable mechanical skill is required in replacing worn or broken parts, with the result that the pressure guns are ordinarily returned to the manufacturer for repairs. This, of course, causes delay and deprives the owner of the use of the gun for a relatively great length of time.

An object of the present invention, accordingly, is to provide a pressure gun wherein the above mentioned difficulties will be overcome. To this end, one feature of the invention resides in a pressure gun having an air compression chamber, an air pump mounted on one end of the chamber and constructed and arranged for access to permit removal of the valve without dismantling gun, the lower end of the pump being connected to the valve by any suitable conduit. Mounted on the lower end of the chamber is a discharge valve provided with means for maintaining the valve in closed position, and means for opening the valve to discharge air from the chamber.

With the above and other objects and features in view, the invention will now be described in connection with the accompanying drawing and pointed out in the appended claims.

In the drawing,

Fig. 1 is a vertical sectional view of an air

pressure gun illustrating a preferred embodiment of the present invention,

Fig. 2 is a view in cross-section of the pump valve mechanism taken along the line 2-2 of Fig. 1, and

Fig. 3 is a sectional view on an enlarged scale illustrating a preferred embodiment of the release mechanism.

The illustrated embodiment of the invention is provided with a chamber 10 formed of brass or other suitable rigid material. The chamber 10 is provided at its upper end with an end cap 12 which is provided with a plurality of holes for positioning the control mechanism of the gun. It will be noted that the top cap 12 is considerably larger than the diameter of the compression chamber 10. The periphery of the top cap 12 is concave as shown in Fig. 1 and is arranged to receive a soft rubber tire 14 which is arranged as a cushion member to prevent injury when the gun strikes against porcelain or enamel surfaces. The lower end of the chamber 10 is closed by a cap 16 to which the pressure release mechanism is mounted. The bottom cap 16 is chamfered adjacent to its periphery to form a seat for the lower end of the chamber 10. The central portion of the bottom cap 16 is provided with a throat 18 which extends through the bottom cap or plate and is provided with slightly bevelled walls upon which rests a valve 20 formed of rubber or other suitable soft and resilient material. The end plates and the chamber are held together by bolts 19, 21.

An air pump 22 is secured to the top cap or plate 12 by sweating or brazing. The lower end of the pump is closed by a cap member 24 through which a hole is formed to receive a tube 26 which is secured in place by soldering, brazing or sweating. The tube 26 leads to a check valve body 28 which is screwed through a hole formed in the top cap 12. The valve contained within the body 28 may be a check valve of the well-known Schrader type. It is to be noted that the tube 26 is located above the end of the check valve 30 and that the upper end of the valve body extends through the top cap 12 and is provided with a cap nut 32 which prevents escape of the air through the open end of the valve body 28. It is to be noted that the hole in the upper end of the valve body 28 is large enough to permit removal of the check valve 30 after the cap nut 32 has been removed. By this construction, the check valve 30 is accessible at all times without dismantling the gun and the check valve 30 can be replaced quickly by the average operator.

The pump 10 is provided with a plunger 34 to the lower end of which is secured a pair of metal washers 36, between which is interposed a piston member formed of leather or other suitable material. The piston 33 is clamped between the washers by a nut 40 screwed to the lower end of the plunger 34. The upper end of the plunger 34 is provided with a hollow handle 42 which may be formed of molded bakelite or other suitable material. It is preferred to have the plunger handle 42 made in two parts and hollow, to receive a slip of paper containing directions as to the operation of the pressure gun.

The end cap 16 is provided with a valve support 44 formed of a strip of brass or other suitable material. The support 44 is bent into a U-shape and is provided with a pair of outwardly extending flanges 46, 48 having holes through which rivets are passed to secure the support 44 to the end cap 16. The upper end of the support 44 is provided with a hole through which passes a guide rod 50, to the lower end of which is secured a square frame 52 formed of a strip of brass. Rigidly secured to the lower end of the guide end 52 is the valve 20. The lower face of the valve 20 is formed of rubber or other suitable material, which bears against the top of the throat 18. The valve 20 and the guide member 52 are normally held against the throat 18 by a spring 58 interposed between the top of the guide member 52 and the top of the support 44.

In order to open the valve 20 to discharge the air contained within the chamber 10, mechanism is provided for opening the valve 20. Secured at one side of the support 44 by any suitable fastening, is a member 60 which is provided with a hole to receive a pin 62 which acts as a fulcrum for a lever 64. The lever 64 is U-shaped and surrounds the support 44 and the guide member 52. The lever 64 is pivotally secured to the guide member 52 by a pin 66. It will be noted that downward pressure on the free end of the lever 64 causes the valve 20 and the guide member 52 to be moved upwardly against the tension of the spring 58. The free end of the lever 64 is provided with holes through which passes a pin 68 which forms a pivotal connection between the lever 64 and a hollow sleeve 70. The lower end of a rod 72 fits into the sleeve 70 and bears against the pin 68. The upper end of the rod 72 extends upwardly through the upper end cap 12 which is provided with a bushing 74 to prevent air from leaking out of the chamber 10. The upper end of the rod 72 is provided with a cap or button 76. The spring 58 is strong enough to close the valve 20 and move the sleeve 70 and the rod 72 associated therewith upwardly.

The end cap 12 is provided with a tapped hole to receive a threaded bushing attached to a pressure gage 78, which is calibrated to indicate the number of pounds contained within the chamber 10. The pressure gage may be of any suitable size. Under some conditions, particularly in those places where compressed air is available, it has been found to be more advantageous to utilize such compressed air for building up pressure in the chamber 10. To this end, the top cap 12 is provided with a bushing 80 in which is a valve 82, which is of the well-known Schrader type. The lower end of the throat 18 is provided with a flanged nozzle member 84 formed of rubber or other suitable material. The nozzle 84 is secured to the throat 18 and is prevented from being displaced upwardly by means of a knurled nut 86. The nozzle 84 may be reversed, depending upon

conditions surrounding the drainage opening which it is desired to free from obstruction.

Summarizing briefly, it will be noted that the parts of the pressure gun are so arranged that it is easy and convenient to make repairs and replace parts. The check valve 28 is mounted in the top end cap 12 and may be replaced without dismantling the gun. The release or discharge valve mechanism 20 is mounted on the bottom end cap 16 and is removed as a unit when the bottom end cap is removed. By removing two nuts from the tie rods, all of the parts of the gun are exposed for removal or replacement. By the use of such a construction, costly repairs and delays are avoided. Furthermore, the provision of the rubber bumper 14 in conjunction with the rubber nozzle 84 prevents the gun from injuring enamel or porcelain surfaces on which it may accidentally be dropped.

Having thus described my invention what I claim as new and desire to obtain by Letters Patent of the United States is:—

1. A pressure gun having in combination, an air compression chamber, an air pump mounted in said chamber, a valve mounted on one end of said chamber, said valve being accessible to permit removal of the valve without dismantling the gun, a pipe connecting the pump to the valve, a discharge valve mounted on the lower end of said chamber, means for maintaining the valve in closed position to prevent discharge of air from said chamber, and means for opening said valve to discharge air from the chamber.

2. A pressure gun having in combination, an air compression chamber, an air pump mounted on said chamber, a valve mounted on the upper end of said chamber, said valve being accessible to permit removal of the valve without dismantling the gun, a pipe connecting the pump to the valve, a discharge valve mounted on the end of the chamber, a frame in which said valve is mounted, a guide for said valve, a spring for maintaining the valve in closed position to prevent discharge of air from the chamber, a lever connected to said valve, and means connecting said lever with the top of the chamber to permit opening said valve to discharge air from the chamber.

3. A pressure gun having in combination, an air compression chamber, end caps at the ends of said chamber, means for supplying compressed air to said chamber, release mechanism mounted on one of said caps to permit removal of said release mechanism as a unit, said release valve mechanism including, a valve support, a valve guide mounted within the support, a valve rigidly secured to said guide, means for maintaining the valve in closed position, and means operable to open said valve to permit substantially instantaneous discharge of air from said chamber.

4. A pressure gun having in combination, an air compression chamber, end caps at the ends of said chamber, means for supplying compressed air to said chamber, and release valve mechanism mounted on one of said caps to permit removal of said valve mechanism as a unit, said release valve mechanism including, a valve support, a valve guide mounted within the support, a valve rigidly secured to said guide, means for maintaining the valve in closed position, a lever fulcrumed to said support and pivotally connected to said guide, and means connected to said lever for opening said valve to permit discharge of air from said chamber.

5. A pressure gun having in combination, an

air compression chamber, an air pump mounted in said chamber, a valve mounted on the upper end of said chamber, said valve being accessible to permit removal of the valve without dismantling the gun, a pipe connecting the pump to the valve, a valve support, a valve guide mounted within the support, a valve rigidly secured to said guide, means for maintaining the valve in closed position, and means operable to open said valve to permit instantaneous discharge of air from said chamber.

6. A pressure gun having in combination, an air compression chamber, an air pump mounted in said chamber, a valve mounted on the upper

end of said chamber, said valve being accessible to permit removal of the valve without dismantling the gun, a pipe connecting the pump to the valve, a valve support, a valve guide mounted in said support, a discharge valve mounted in said support, a valve rigidly secured to said guide, a spring interposed between said valve guide and said support for maintaining the relief valve in closed position, a lever fulcrumed to said support, and pivotally connected to said guide, and means connected to said lever, for opening said discharge valve to permit discharge of air from said chamber.

LEONARD ALFRED POPP.