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AIR PUMP FOR PRESSURE TANKS

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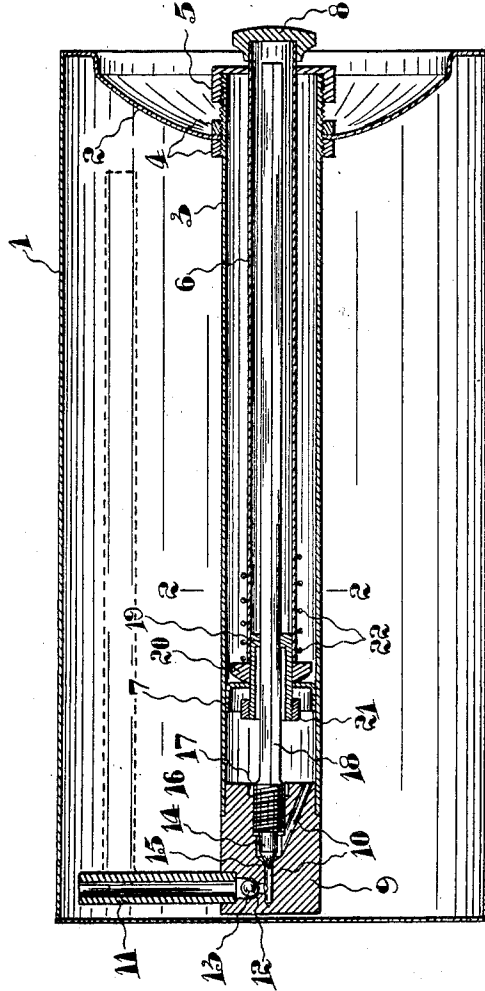


FIG. 1.

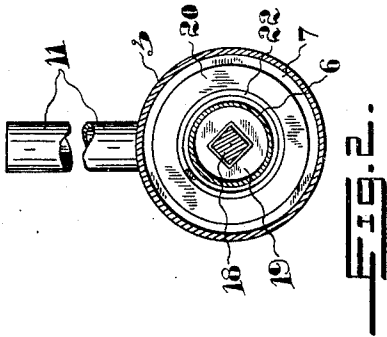


FIG. 2.

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# UNITED STATES PATENT OFFICE

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## AIR PUMP FOR PRESSURE TANKS.

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This invention relates to pumps as used for pumping air into the fuel tanks of camp stoves, lamps, blow torches and the like to provide the necessary pressure to supply the fuel to the burner for combustion, and the object of the present invention is to devise an arrangement whereby back flow of the fuel to the interior of the pump barrel is prevented, thus avoiding damage to the pump washer through contact of the fuel therewith, and in which the supply of air to the tank is controlled by means of a needle valve, which needle valve is operated by imparting a rotary movement to the normally longitudinally movable pump stem.

I attain my object by means of the constructions hereinafter described and illustrated in the accompanying drawings in which

Fig. 1 is a longitudinal section of a fuel tank showing my improved air pump mounted therein; and

Fig. 2 a section of the pump on the line 2-2 in Fig. 1.

In the drawings like numerals of reference indicate corresponding parts in the different figures.

1 is a fuel tank, which may be of any suitable shape and size. The end 2 of the tank is provided with a hole in which the pump cylinder 3 is supported. The cylinder 3, adjacent one end is threaded, and a pair of collars 4 are screwed thereon between which the end 2 is clamped as shown. A cap 5 is screwed on the outer end of the cylinder, through which cap is slidable the plunger rod 6, on the end of which is mounted the cup washer or plunger 7. For a purpose which will hereinafter appear, the rod 6 is formed of tubing. The end of the rod outside the cylinder is provided with a knob or handle 8 by means of which it may be operated.

The inner end of the cylinder is closed by means of a plug 9 through which is formed an outlet passage 10, one end of which passage communicates with the interior of the cylinder and the other end adapted to discharge into the tank. As the pump cylinder will often be below the level of the fuel in the tank, a tube 11 is connected with the discharge end of the passage 10, which tube extends up above the maximum level of fuel in the tank. In order to check back flow of air, a valve seat 12 is formed in the passage

10, on which is normally adapted to rest a ball valve 13.

To prevent back flow when the pump is not in use, the passage 10 is controlled by a needle valve 14, a suitable seat 15 being formed in the passage against which the valve 14 is adapted to seat. This needle valve is formed as part of a plug 16 threaded in a recess 17 in the plug 9. The needle valve is operated by means of a stem 18, preferably square in cross section, connected with the plug 16, which stem extends into the interior of the hollow rod 6. In the inner end of the rod 6 is secured a sleeve 19, provided with a square hole therein for the passage of the square stem 18. On the sleeve 19 is mounted a ring 20 forming a backing for the washer or plunger 7, while a nut 21 is threaded on the other end of the sleeve 19 to retain the washer 7 in position.

The device is operated as follows. The needle valve 14 is normally lying against the seat 15. By rotating the knob 8, the rod 6, sleeve 19, stem 18, and plug 16 are also rotated and the needle valve is thus retracted from its seat. By reciprocating the plunger rod with its washer or plunger longitudinally of the cylinder, the tank may be supplied with air until the desired pressure is reached, the ball valve 13 tending to prevent back flow of air. When sufficient air has been pumped into the tank, the stem 18 is rotated to seat the needle valve 14.

To prevent jarring of the ring 20 against the cap 5, I mount on the rod 6 a buffer spring 22 which takes the jar and prevents the ring 20 striking the cap.

The pump will usually occupy the horizontal position shown, but in some cases it may be necessary for the pump to occupy a vertical position, and in this case in order that the end of the tube 11 may be above the maximum fuel level, the tube may be longer and bent to the position shown in dotted lines in Fig. 1.

From the above description it will be seen that I have devised a construction which will satisfactorily attain the object of my invention as set out in the general statement of this specification.

What I claim is:

A pump comprising, in combination, a cylinder provided at one end with a passage extending from the interior to the exterior of the cylinder and a recess communicating

with the interior of the cylinder and the passage, a conical valve seat in alinement with the recess, the outer portion of said recess being threaded; a hollow plunger rod in the cylinder; a plunger on the rod; a valve stem being slidable longitudinally but non-rotatable relative to said rod; a threaded plug on the stem engageable with the threaded portion of the recess; and a needle valve on the plug receivable upon the seat, the cylindrical portion of said valve being spaced from the walls of the recess to allow the passage of fluid therebetween.

Signed at Toronto, Canada, this second day of May, 1925.

EDWARD DEVINE RANCK.