

Dec. 18, 1945.

E. O. WHITE

2,391,211

AIR OPERATED PUMP FOR FILLING STATIONS AND THE LIKE

Filed Feb. 23, 1945

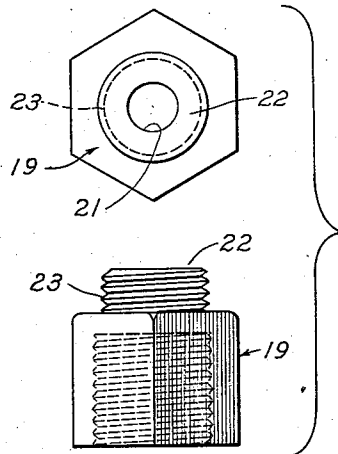
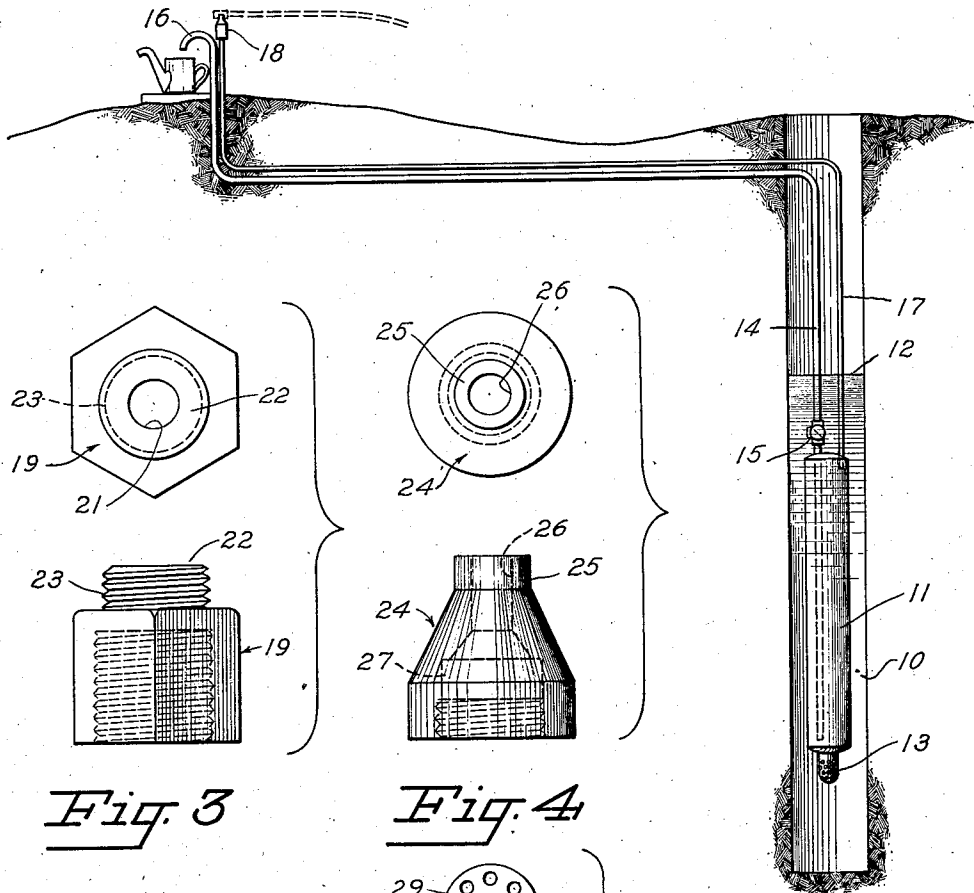


Fig. 3

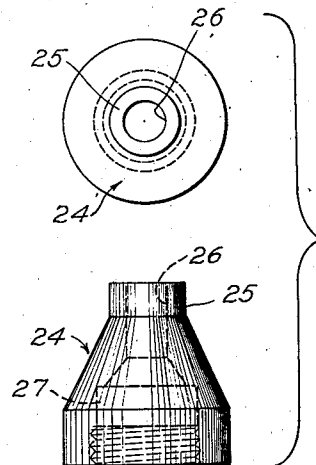


Fig. 4

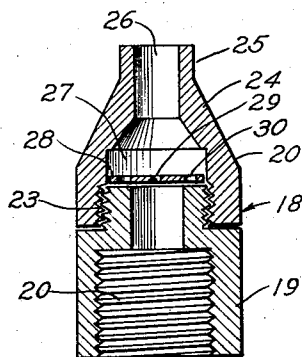


Fig. 2

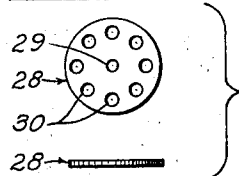


Fig. 5

Fig. 1

Inventor

Emory O. White

By *Christian R. Nielsen*
Attorney

UNITED STATES PATENT OFFICE

2,391,211

AIR OPERATED PUMP FOR FILLING
STATIONS AND THE LIKE

Emory O. White, Albertville, Ala.

Application February 23, 1945, Serial No. 579,406

2 Claims. (Cl. 103-234)

This invention relates to an air operated well pump, and it consists in the constructions, arrangements and combinations herein described and claimed.

It is the cardinal object of the invention to provide a simple and cheap pump for elevating water from either a shallow or deep well by means of air under pressure, particularly adapted to use in connection with automobile service stations in outlying districts, where the installation of the usual automatic pumping unit would not be justified.

It is also an important object of the invention to provide a novel construction of air valve for use with the pump, the latter including a valve for ready release of air from the system, thus permitting quick refilling of a submerged water cylinder of the apparatus, for the next pumping operation.

It is a still further object of the invention to provide a pump which is of extremely simple construction, of few parts, liable in a minimum degree to derangement, and in which the manual effort to effect starting and stopping of the pump is greatly reduced.

Additional objects, advantages and features of invention will be apparent from the following description considered in conjunction with the accompanying drawing, wherein

Figure 1 is a vertical section through a well having my pump installed therein.

Figure 2 is a vertical section through the air valve of the device.

Figure 3 is an elevation and top plan view of the lower housing of the valve.

Figure 4 is an elevation and top plan view of the upper housing of the valve.

Figure 5 is an elevation and top plan view of the air regulating valve.

Attention is first invited to Figure 1 of the drawing, wherein there is shown a well 10 in which there is disposed a cylinder 11 submerged below the water line indicated at 12. The lower end of the cylinder includes a foot valve 13 of conventional form, admitting water into the cylinder as is well understood, in the art.

A water discharge pipe 14 enters the cylinder at its upper end and extends inwardly thereof, stopping short of the lower end of the cylinder. The discharge pipe 14 has a check valve 15 permitting passage of water through a water discharge end 16 and operative to maintain a head of water above the check valve 15.

An air line 17 is also connected with the upper end of the cylinder and includes an air inlet

valve 18, as will now be described, attention being invited particularly to Figure 2. The valve includes a lower hexagon-shaped housing 19, interiorly threaded as at 20, concentric with a bore 21 formed in a reduced nipple 22. The nipple 22 is exteriorly threaded as at 23 and receives thereon an upper housing 24, the upper end 25 being of reduced diameter so as to accommodate a chuck of an air hose, as will be described. The bore 26 of the housing is concentric with the bore 21 when the housings are in assembled relation.

The housing 24 is also formed with a cylindrical portion 27 inwardly of the threads of the housing so that when the housings are connected, a valve chamber is provided loosely housing a disk valve 28. The valve 28 is formed with a central opening 29 and a plurality of openings 30 arranged concentric of the disk. It will be noted that during admission of air, the disk will lie immediately above and upon the nipple 22 so that the openings 30 are closed to passage of air, the air required for elevating water passing through the central opening 29. The central opening 29 is of a diameter less than the openings 30 so as to restrict the ingoing air the proper amount during the pumping operation to insure a steady and not too violent flow of water from the discharge 16. The larger openings 30 permit discharge of air after pumping operation, as will be explained.

As has been stated, the present pump is particularly useful in service stations located in outlying districts where the water required is obtained from a well by means of a hand pump or windlass and bucket, which may be eliminated and in their stead, the cylinder 11 and connected water and air lines 16 and 17 are installed in the well, substantially as shown in Figure 1. The air and water lines are preferably entrenched beneath the surface of the ground, for protective reasons, but are directed upwardly above the surface, the water pipe terminating in the discharge 16 and the air line 17 having the valve 18 secured thereto.

To operate the pump, the air line of a conventional compressor is employed, the chuck of the line being manually applied to the reduced end 25 of the valve. Air will pass into the valve 18 and through the central opening 29 and into the air line 17, thus building up a pressure in the cylinder 11. Water will have previously entered the cylinder by way of the foot valve 13. As the pressure builds up in the cylinder, water will be forced upwardly through the check valve 15 and outwardly through the discharge 16 where it may be

received in a suitable receptacle. To stop the pumping operation, the air line chuck is simply removed from the valve 18, permitting outward flow of air from the cylinder 11. The pressure of outgoing air will elevate the disk valve 28, the openings 29 and 30 of the disk valve permitting ready escape of air to the atmosphere and insuring a quick refilling of the cylinder with water. It will be seen that the check valve 15 will maintain a head of water thereabove so that the next pumping operation can be started without undue delay.

While I have shown and described a preferred form of the device, this is by way of illustration only, and I consider as my own all such modifications in construction as fairly fall within the scope of the appended claims.

I claim:

1. Means for elevating a liquid from a well comprising a cylinder within the well submerged beneath the water level, said cylinder including a foot valve, a water discharge line connected to said cylinder and having a check valve, an air

line connected to said cylinder including a combined automatic air inlet and exhaust valve, and an air chuck and line detachably connected thereto.

5 2. Means for elevating water from a well comprising a cylinder within the well submerged beneath the water level, said cylinder including a foot valve, a water line connected to said cylinder and extended thereinto, said line including a discharge outlet, a check valve in said water line positioned between said cylinder and said outlet, constructed to maintain a head of water above said check valve, an air line connected to said cylinder at an upper part thereof, said air line having a fitting at the terminal end thereof, said fitting having an axial port, a disk valve loosely disposed within the chamber, said disk valve having an axial opening and a plurality of openings concentric with said disk normally closed by the base of said chamber, and an air chuck and line detachably connected to said fitting.

EMORY O. WHITE.