June 17, 1930. G. S. BROWN 1,764,545

CISTERN AGITATOR AND PURIFIER

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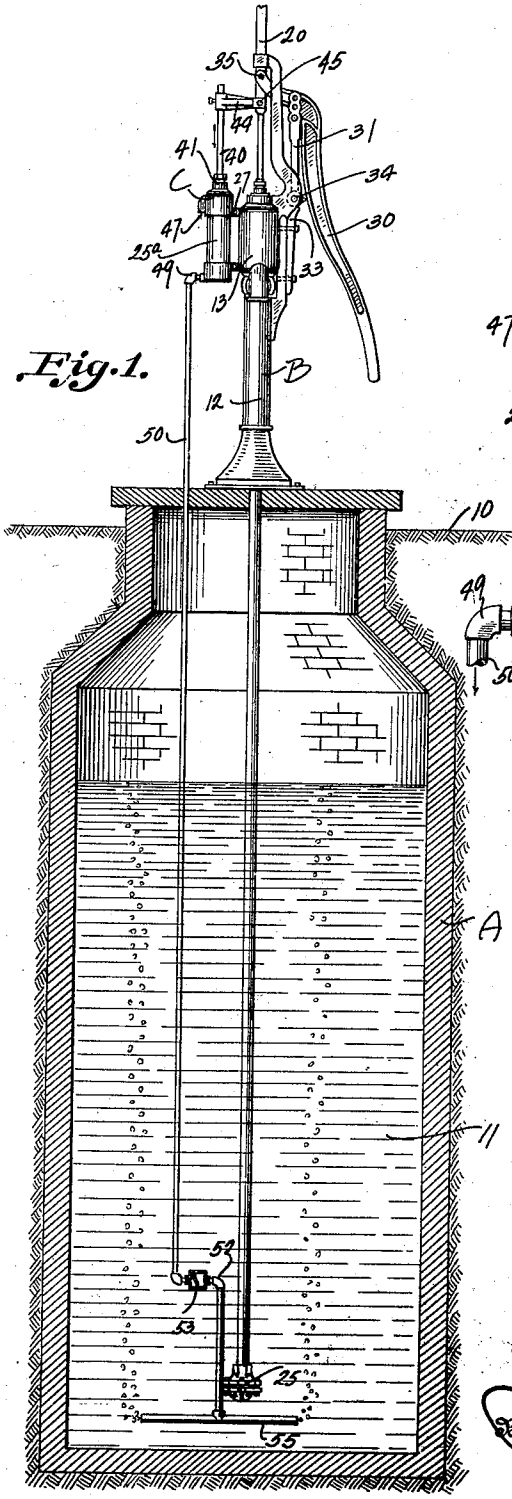


Fig. 1.

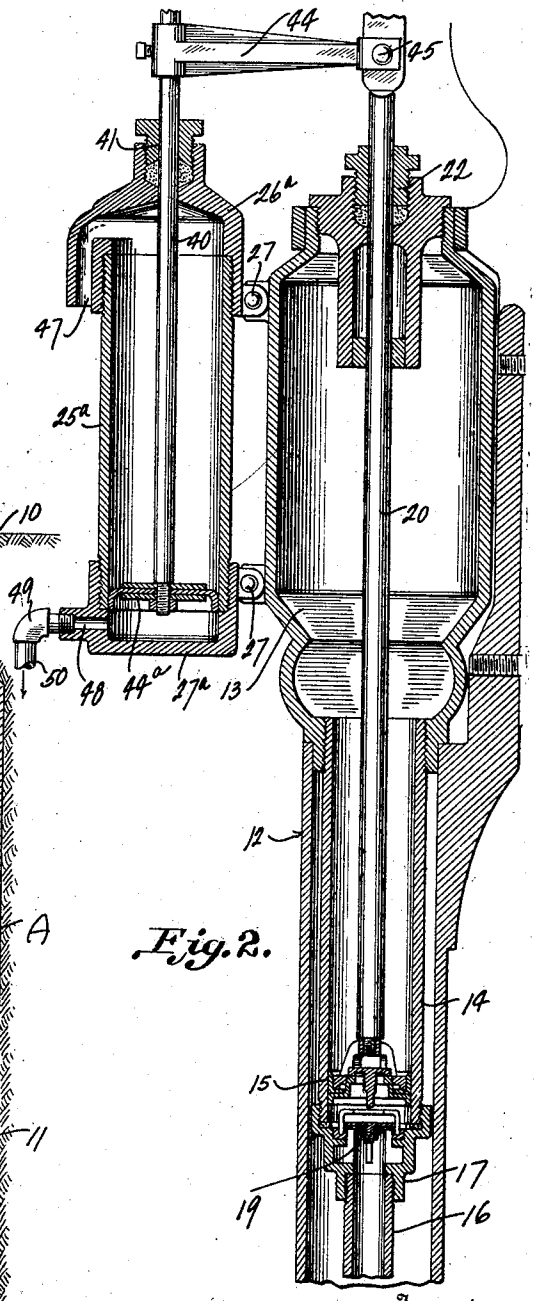


Fig. 2.

Inventor
George S. Brown
By Lancaster and Allwine
Attorneys

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Fig. 3.

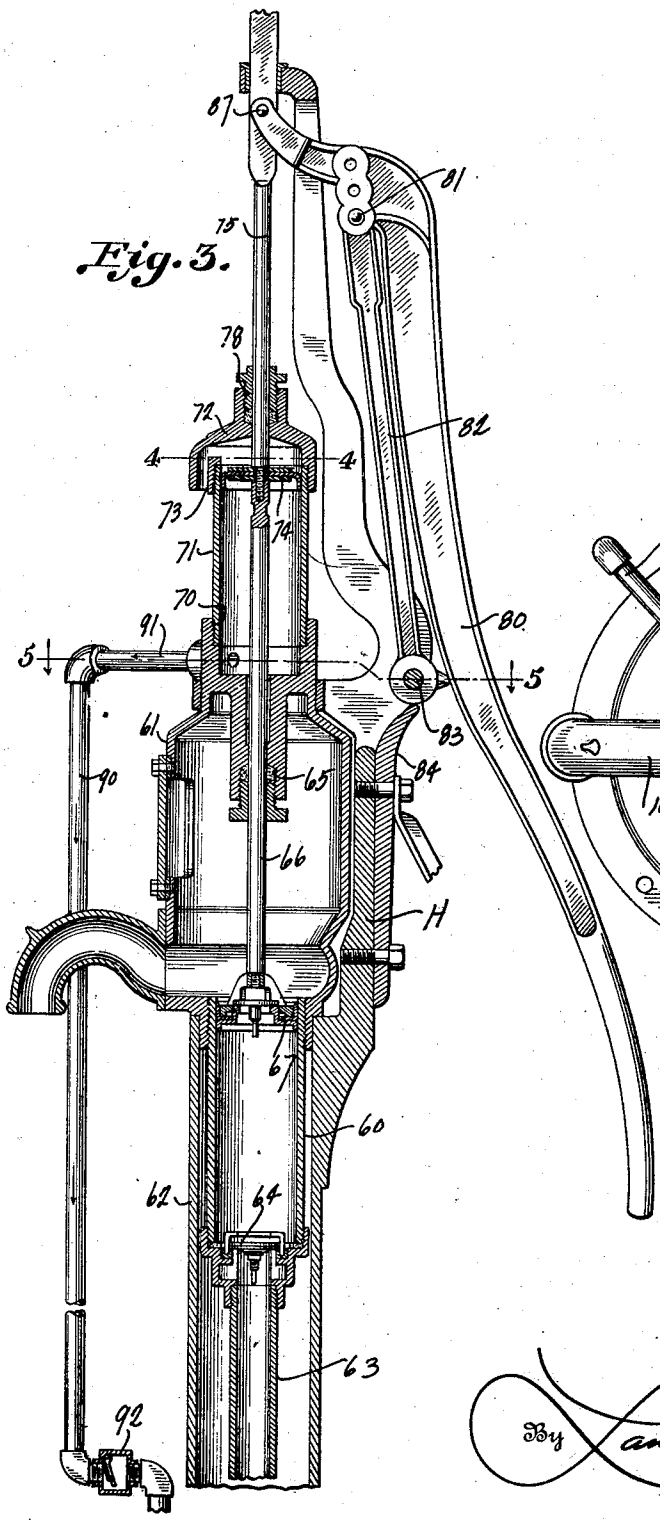
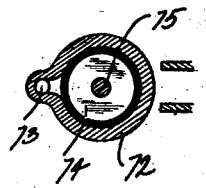


Fig. 4.



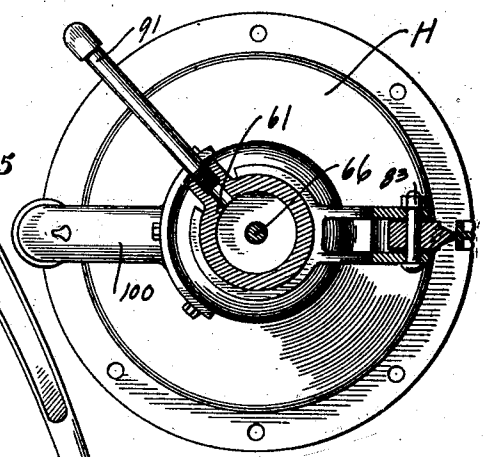


Fig. 5.

Inventor
George S. Brown
By Lancaster and Allwine
Attorneys

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UNITED STATES PATENT OFFICE

GEORGE S. BROWN, OF HARRIMAN, TENNESSEE

CISTERN AGITATOR AND PURIFIER

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This invention relates to improvements in lift pumps.

The primary object of this invention is the provision of improvements in lift pumps by means of which a suction type of pump may be used for pumping water from cisterns, in such manner as to agitate the water in the cistern and supply air thereto, positively, during a pumping operation, thus purifying the water and keeping the same from getting stagnant, such as would ordinarily occur with a lift or force pump.

Other objects and advantages of this invention will be apparent during the course of the following detailed description.

In the accompanying drawings, forming a part of this specification, and wherein similar reference characters designate corresponding parts throughout the several views,

Figure 1 is a vertical sectional view taken through a cistern, showing a conventional type of lift pump associated therewith, with the improved purifier attachment thereon.

Figure 2 is an enlarged sectional view taken through the reservoir head of a lift pump of conventional types, showing the association therewith of a pump for positively forcing air into the well during the pumping operation.

Figure 3 is a vertical sectional view showing a special type of lift pump with a built-in air pump for forcing air into the well or cistern.

Figures 4 and 5 are sectional views taken substantially on their respective lines in Figure 3 of the drawings.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of this invention, as an attachment, and a further embodiment of the invention in connection with a special pump having the built-in purifier, the letter A may generally designate a cistern or well of any approved construction, upon which a conventional type of pump B is associated, with which the purifying attachment C may be connected in a novel relation.

The well A as is well understood is located beneath the ground surface 10, and receives a body of water 11 therein which is ordinarily quiescent.

The pump B is of the conventional type, including the supporting casing or stock 12, upon which the reservoir head 13 is detachably or otherwise disposed. Attachable within the lower part of the reservoir head 13 is a cylinder 14 within which a plunger 15 is reciprocably disposed. A pump barrel 16 is detachably connected at 17 to the lower end of the cylinder 14, and at the juncture of the cylinder with the pump barrel a check valve 19 is ordinarily situated, which permits water to be lifted into the cylinder 14 and prevent its return into the barrel 16, in accordance with conventional construction. A pump rod 20 detachably receives the plunger 15 at the lower end thereof; the pump rod 20 extending axially through the cylinder 14 and upwardly through the reservoir head 13, and extends upwardly through a stuffing box connection 22, shown in Figure 2 of the drawings.

The working barrel 16 extends downwardly into the water to adjacent the bottom of the cistern, where the same is provided with a suitable inlet coupling 25 of approved formation.

In connection with ordinary lift or suction pump construction a handle 30 is pivotally connected by a connecting rod or link 31 to the stock or a suitable bracket 33 of the pump, at a location 34, and the end of the handle opposite the pivot connection from the hand grasping portion is pivotally connected, at 35, to the pump rod 20, as shown in Figure 1 of the drawings. It is of course quite apparent that upon oscillation of the handle 30 the pump rod 20 wil be reciprocated, for likewise reciprocating the piston 15 and drawing water upwardly into the cylinder 14, from whence it is discharged past the check valve of the plunger 15 into the compartment of the reservoir head 13, from whence it flows through an ordinary spout.

The purifier attachment C is adapted to be attached to existing types of pumps, such as that shown in Figures 1 and 2 of the drawings, and above described. It consists of an air pumping cylinder 25[a], having upper and

lower detachable caps 26ª and 27ª, connected by means 27 to the reservoir head 13, or to other parts of the pump stock or casing, so as not to interfere with the withdrawal of water. This air cylinder 25ª may be attached by bands by lugs as shown, or in any other approved vertical and stable relation upon the pump casing. A short piston rod 40 is reciprocably disposed in a leak-proof connection thru a stuffing box 41 in the cylinder head 26 of the air cylinder, and supports an ordinary plunger 44ª of the flexible gasket type at the lower end thereof within the compartment of the cylinder 25ª. At its upper end the piston rod 40 extends exteriorly of the air cylinder and is suitably connected by an adjustable and detachable bracket arm 44 with the upper end of the main pump rod 20, by means of a suitable connection 45. The air cylinder 25ª, and preferably the cap 26ª, is provided with an air inlet opening 47, through which air enters the cylinder during the upstroke of the piston 44ª, and the latter flexes to permit the air to pass the same to the lower portion of the cylinder below the piston or plunger 44ª. In the bottom cap 27ª is an outlet and exit 48, to which a fitting 49 connects the purifier pipe 50, which extends vertically downward into the well or cistern A. Intermediate its ends the purifier pipe 50 is provided with an offset 52 having a check valve 53 therein which permits air to be forced downwardly through the pipe 50 and prevents the passage of water upwardly into the purifier pipe incident to suction. At its lower end, preferably below the pump inlet 25, the purifier pipe 50 is provided with a T-shaped distributing head 55, of a tubular nature, thru which air is forced from the purifier pipe 50, and exits at the ends of said pipe 55 in streams of air which bubble upwardly through the cistern at opposite sides of the pump barrel or casing which depends into the well, as shown in Figure 1 of the drawings.

The operation of the attachment C in connection with the pump B will be apparent. On each stroke of the plunger rod 20, incident to an operation of the handle 30, the air cylinder piston 44ª will be reciprocated, and the pumping of air into the well proceeds positively as the water is pumped up into the reservoir head and discharged. Thus, means is provided for positively forcing air into the cistern in a novel relation to purify the water and prevent its getting stagnant.

In the special pump shown in Figures 3, 4, and 5, the details of the pump comprise a cylinder 60 detachably connected to the lower end of the reservoir head 61, which is mounted upon the pump casing or stock 62 in the usual relation. The working barrel 63 is connected to the lower end of the cylinder 60 in the usual relation, and at the juncture of these parts a check valve 64 is provided which permits water to be sucked upwardly into the cylinder 60 and prevent its return. An internal stuffing box 65 is provided in the top of the reservoir head 61, thru which the plunger rod 66 slidably reciprocates; the said rod 66 at the lower end thereof having the check valve plunger 67 thereon, of the ordinary suction pump construction, well known in this art.

As a novel feature of the special pump H, shown in Figure 3 of the drawings, the reservoir head 61 may be internally screw threaded at 70, for detachably receiving therein the lower end of an air cylinder body 71; the upper end of which body 71 detachably receives a cap 72 having an air inlet and outlet duct 73 therein, by means of which air may enter the cylinder 71. A gasket piston 74 slidably operates in the cylinder body 71, and it is clamped in place on the top of the pump rod section 66 by means of an upper pump rod section 75, thru a detachable connection at the plunger 74, as shown in Figure 3. The air cylinder cap 72 is provided with a stuffing box 78 at the top thereof, upwardly thru which the pump rod 75 slidably extends.

A handle 80 is pivotally connected at 81 with a connecting link 82, pivoted at 83 on the bracket 84 of the pump H, and at the opposite side of the pivot 81 from the hand engaging portion the handle 80 is pivotally connected at 87 with the upper end of the pump rod section 75. It is readily apparent that oscillation of the handle 80 will cause a reciprocation of the pump rod and a corresponding reciprocation of both the air plunger or piston 74 and the water drawing check valve piston 67.

A purifier pipe 90 has a connection 91 in an inlet opening in the lower end of the air cylinder 71, and the purifier pipe 90 extends downwardly into the well in the same relation as the purifier pipe 50 above described, and intermediate its ends it is provided with a check valve 92 in the cistern or well, to prevent up flow of water thru the line 90 upon the upstroke of the air plunger 74.

Reciprocation of the plunger rod sections 66 and 75 will cause a synchronous operation of the water and air pumping pistons 67 and 74; the former drawing the water upwardly into the water reservoir head 61 and the latter drawing air into the cylinder 71 and forcing it downwardly through the pipe 90 into the cistern, from whence it is distributed in a T-shaped head, the same as above described for the form of attachment C.

As shown at Figure 5 of the drawings, the connection of the air purifier line should be such as not to obstruct the nozzle 100, from which the water flows from the reservoir head 61.

Various changes in the shape, size, and arrangement of parts may be made to the forms

of invention herein shown and described, without departing from the spirit of the invention or the scope of the claims.

I claim:

1. A combined pump and purifier for cisterns, and the like, comprising a water lifting pump adapted to be mounted over a well and having a tube extending downwardly into the body of water and open at its lower end to provide a water intake for the pump, and an air compressing pump adapted to be mounted over the well and connected to the water lifting pump for operation therewith, said air compressing pump having an outlet pipe extending downwardly in the well to a point below the lower open end of the water pump tube and having an outlet opening at its lower end located below the open end of the tube, whereby upon operation of the water lifting pump fresh air from above the well is forced into the body of water below the point from which the water is raised to prevent lifting of obnoxious gases with the water.

2. A combined pump and purifier for cisterns, and the like, comprising a water lifting pump adapted to be mounted over a well and having a tube extending downwardly into the body of water and open at its lower end to provide a water intake for the pump, and an air compressing pump adapted to be mounted over the well and connected to the water lifting pump for operation therewith, said air compressing pump having an outlet pipe extending downwardly in the well to a point below the lower open end of the water pump tube and an outlet spreader comprising radiating arms connected to the lower end of the air outlet pipe and extending outwardly from the sides of and below the open end of the water intake pipe to inject fresh air from above the well into the body of water in the well and in the zone below the intake of the water lifting pump.

GEORGE S. BROWN.