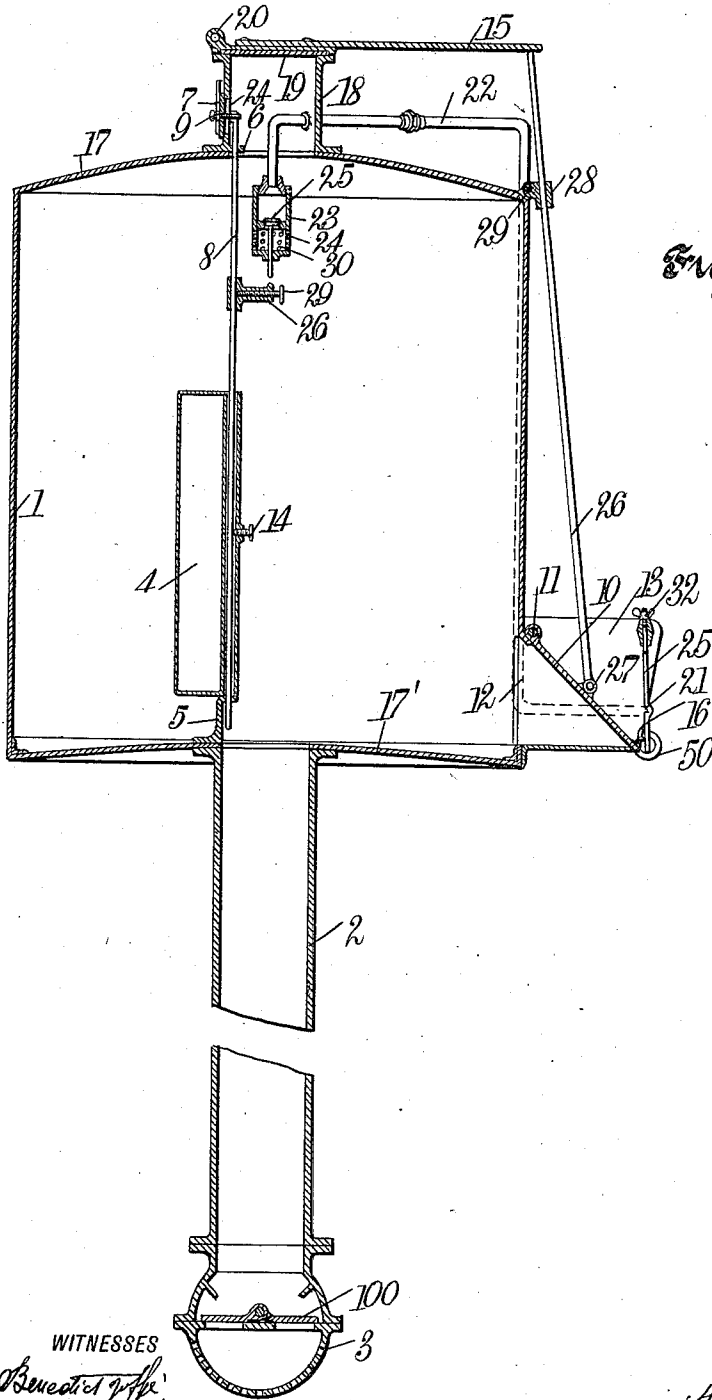


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 AUTOMATIC WATER LIFT.
 APPLICATION FILED AUG. 1, 1911.

1,041,452.

Patented Oct. 15, 1912.

2 SHEETS—SHEET 1.



WITNESSES
Benedict J. J. J.
L. J. Gallagher.

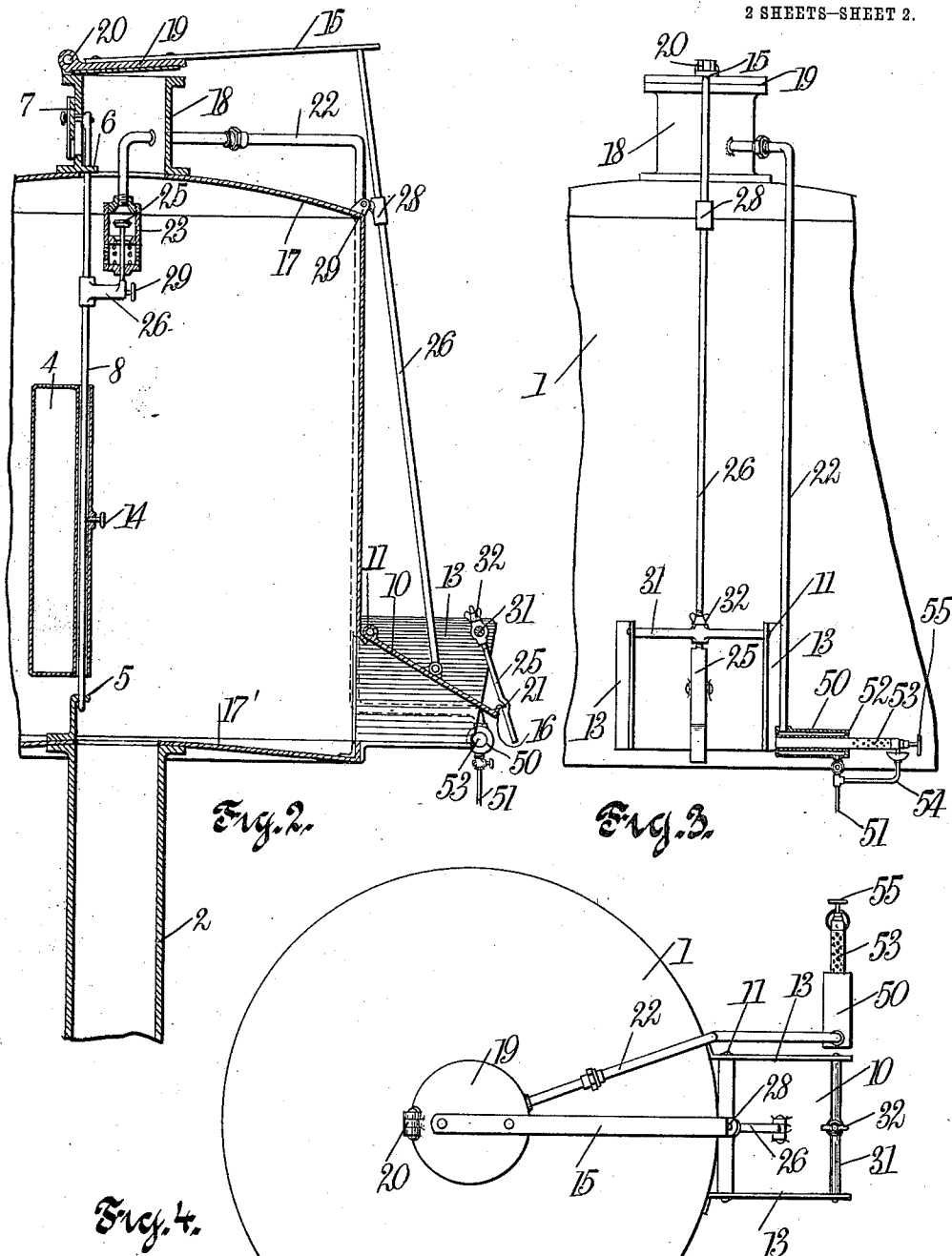
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UNITED STATES PATENT OFFICE.

GEORGE A. FERGUSON AND ALEXANDER MARSHALL, OF CONDON, OREGON.

AUTOMATIC WATER-LIFT.

1,041,452.

Specification of Letters Patent.

Patented Oct. 15, 1912.

Application filed August 1, 1911. Serial No. 641,711.

To all whom it may concern:

Be it known that we, GEORGE A. FERGUSON and ALEXANDER MARSHALL, citizens of the United States, and residents of Condon, in the county of Gilliam and State of Oregon, have invented a new and Improved Automatic Water-Lift, of which the following is a full, clear, and exact description.

Our invention relates generally to devices for lifting water and more particularly it involves means whereby a vacuum may be obtained in any suitable vessel communicating with a well or cistern whereby atmospheric pressure may force water from the well or cistern into the vessel.

The object of our invention is to provide a simple and effective device which shall be automatic and continuous in its operation, suitable means being provided whereby a vessel may be filled with gas, this gas being later exploded in the vessel whereby a reduction of pressure takes place therein, the vessel receiving a quantity of water from a well or cistern to which it is connected in consequence of such reduction in pressure; means are provided whereby the water within the vessel may be discharged and the device brought into operation to again receive a further quantity.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference denote corresponding parts in all the views, and in which—

Figure 1 is a vertical sectional view showing the parts of the device in inoperative position; Fig. 2 is a vertical sectional view showing the valves of the device open; Fig. 3 is a side view of the device; Fig. 4 is a top plan view.

The device is made up of a suitable tank 1 having a pipe 2 leading therefrom to a well or cistern, there being a strainer 3 at the bottom of the pipe and a suitable foot valve 100 within the pipe and adjacent the strainer; it is to be noted from the drawings that the top 17 of the tank is curved upwardly and the bottom 17' is likewise curved slightly upward whereby a domed construction results.

A vertically movable float 4 is suitably supported within the tank on a rod 8, the rod engaging in suitable brackets 5, 6, whereby it is guided in its movement, the float being secured to the rod by any suitable means such as an adjustable thumb screw

14; the float is operated by the water within the tank rising and falling therewith.

In the top member 17 of the tank a suitable opening is provided which communicates with the interior of the dome 18 carried by the tank, the dome being adapted to be closed by means of the hinged release valve 19 which is pivotally supported on the dome at 20. An opening 24 is provided in the side wall of the dome which forms an air inlet valve, this opening being adapted to be varied by means of the block 7 which is suitably guided adjacent the opening and is secured to the upper end of the rod 8, the block being positioned on the rod by means of the thumb screw 9.

A gas supply pipe 22 communicates with the interior of the tank 1 passing through a suitable opening in the dome 18, the pipe terminating in an outlet valve 23. This outlet valve may be of any preferred form of construction but is preferably as shown in Fig. 1, the valve being provided with an intermediate seat 24 against which the valve proper 25 is adapted to be seated, this valve being actuated by the adjustable arm 26 secured on the rod 8 by means of a thumb nut 29. The stem and the valve are movable up and down through engagement with the arm 26, the lower end of the valve being in the nature of a screen 30 whereby foreign material is prevented from entering the gas pipe or leaving it.

Adjacent the bottom of the tank 1 is a suitable opening 12 which is adapted to be closed by a discharge valve 10 pivotally secured at 11 to the outside of the tank, the valve operating between the side boards 13 carried by the tank; a link 26 is pivotally secured at 27 to the discharge valve 10, the upper end portion of this link passing through a collar 28 movably secured at 29 to the tank, the upper end of the link engaging the end of the outwardly extending portion 15 secured to the valve 19 whereby movement of the link will move the valve. The outer end of the valve 10 is provided with a projection 16 which is adapted to be engaged in a notch 21 in the side of the lever 25 which is secured to a shaft 31 positioned between the side boards 13, the lever 25 being secured on the shaft 31 by any suitable means such as a thumb nut 32.

Our device is especially adapted for use with gases and also with gasoline and when used with those liquids which require va-

porization we provide a suitable generator 50 closely adjacent the opening in the tank 12 of the tank 1, the gas supply pipe 22 into the interior of the tank leading from this generator; the generator is also in communication with a suitable supply of gasolene through a pipe 51. The generator consists essentially of a cylindrical hood 52, the interior of which communicates with the interior of the supply pipe 22, there being a concentric cylindrical member or burner 53 positioned within the hood which is supplied with gasolene from the pipe 51 through the auxiliary pipe 54 and a suitable valve 55; combustion of the gasolene within the burner heats the hood 52 and thereby vaporizes the gasolene supply before it enters the pipe 22 through which it is conducted to the interior of the tank 1.

The operation of our device is as follows. The tank is set up in any suitable position with the pipe 2 leading into a well or cistern, the burner and the pipes leading therefrom being placed as previously described; the burner is lighted and the flame therefrom shoots across the outside of the opening 12 in the tank and between the side boards 13. The rod 26 is lifted until the projections 16 at the outer end of the discharge valve 10 come into engagement with the notch 21 in the lever 25 when the parts will be held as shown in Fig. 2; the float rod 8 is then moved upwardly in order to operate the gas supply valve 23 and open the air inlet valve 7 in the dome 18. The gas will enter the tank 1 through the pipe 22 and, being heavier than the air, will sink to the bottom of the tank gradually, this gas being exploded by the flame from the burner 50 when it begins to issue from the opening 12 in the tank, the shock of the explosion throwing the discharge valve 10 up, moving the pivoted lever 25 outwardly from the valve 10, which closes before the lever 25 moves back into the position shown in Fig. 1 so that the projections 16 will not be engaged by the notch 21 in this lever. The result of the ignition of the gas is to create a vacuum within the tank 1 and water will enter the tank through the foot valve 100 and pipe 2 and will rise to a certain height therein due to the fact that the discharge valve 10 is closed as is the valve 19. The water will rise until the pressure thereof is sufficient to lift or open the discharge valve 10 and bring it into the position shown in Fig. 2 when the water will begin to issue through the opening 12; as the water issues the air will enter the tank through the open valve 19 and the air inlet valve 7, the float being in elevated position because of the water, the gas then entering the tank through the gas supply valve 23. The air entering the tank through the valves will mix with the gas therein until the tank has

been substantially emptied of water when the gas will again be shut off by means of the float-actuated valve and the flame from the burner 50 will again explode the gas when it begins to issue from the opening 12 when the same series of steps is again gone through.

From a consideration of the drawings, together with the description herein-before set forth, it will be seen that the construction of our device is exceedingly simple. The valves, through operation of which the supply of water is obtained, are few in number; due to the automatic operation of the valves through the ignition or explosion of the gas within the tank and the co-acting influences due to the level of the water therein, the device when set in operation will operate continuously and with a minimum amount of expense. The shape and size of the tank and the particular conformation of the various parts may, of course, be changed in order to adapt the device to different liquids without departing from the spirit and scope of our invention.

Having thus described our invention, we claim as new, and desire to secure by Letters Patent:—

1. An automatic water lift comprising a tank adapted to receive an amount of water from a well or cistern, an opening adjacent the bottom of the tank, a movable member carried by the tank adapted to close the said opening, a release valve adjacent the top of the tank, means engaging the movable member and the said valve whereby they may be opened and closed simultaneously, together with an ignition device adjacent the opening in the bottom of the tank and exterior thereof, the said ignition device providing means for supplying gas to the tank, the issuing gas from the said opening being fired by the said ignition device, the shock of the explosion bringing the said movable member into position to close the opening in the tank and also closing the said release valve.

2. An automatic water lift comprising a tank adapted to receive an amount of water from a well or cistern, an opening adjacent the bottom of the tank, side boards on the outside of the tank and on each side of the opening, a movable member mounted between the said boards and adapted to close the opening, a release valve carried on the tank, movable means between the said movable member and release valve whereby they may be operated together, means for holding the said movable member in open position and with it the release valve, an ignition device adjacent the opening in the tank and exterior thereof, the said device affording means for providing gas into the tank whereby when the said movable member is in open position and gas issues through the

opening in the tank the gas within the tank will be exploded by the said ignition device, the shock of the explosion releasing the said movable member and permitting it to close the said opening, the release valve also coming to closed position.

3. An automatic water lift comprising a tank adapted to receive an amount of water from a well or cistern, an opening adjacent the bottom of the tank, boards on the outside of the tank at opposite sides of the opening, a member pivotally mounted between the boards and adapted to close the opening, a release valve adjacent the top of the tank, an arm pivotally secured to the said movable member, one end of the arm engaging the said release valve whereby the valve and the said member may be operated simultaneously, a lever having a notch therein mounted between the said boards, the

said notch being engaged by the outer end of the said movable member whereby it may be held in open position, an ignition device adjacent the said opening and exterior of the tank, the said device affording means for providing gas to the interior of the tank, the issuing gas from the tank through the opening being exploded by the said device, the shock of the explosion bringing the said movable member into closed position, the said release valve also closing.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

GEORGE A. FERGUSON.
ALEXANDER MARSHALL.

Witnesses:

T. A. WEINKE,
GEORGE JAMIESON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
