Dec. 19, 1922. 1,439,591.

A. J. WELDEN,

PUMP.

FILED FEB. 5, 1921. 2 SHEETS—SHEET 1.

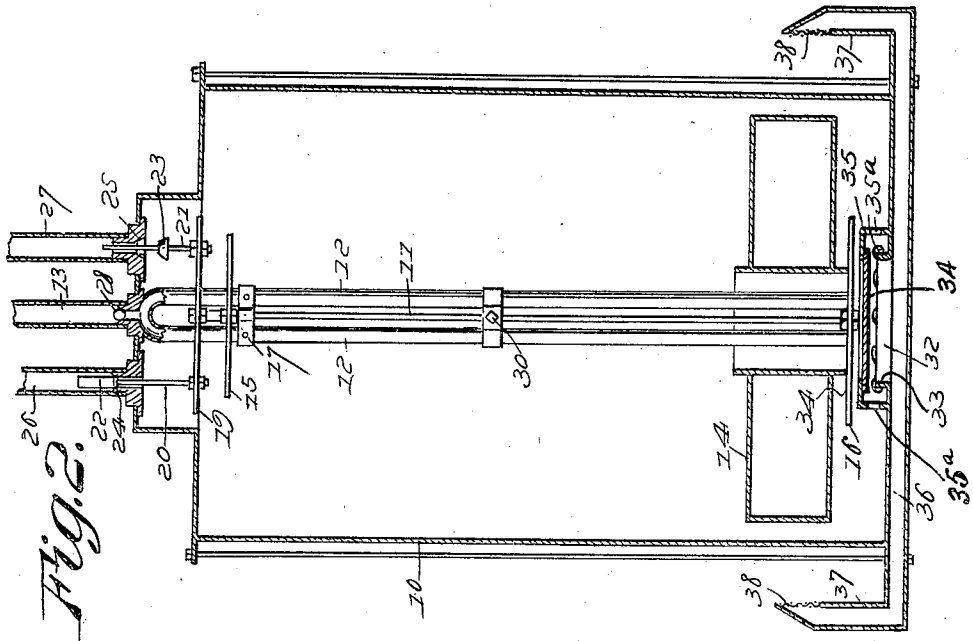


Fig. 2.

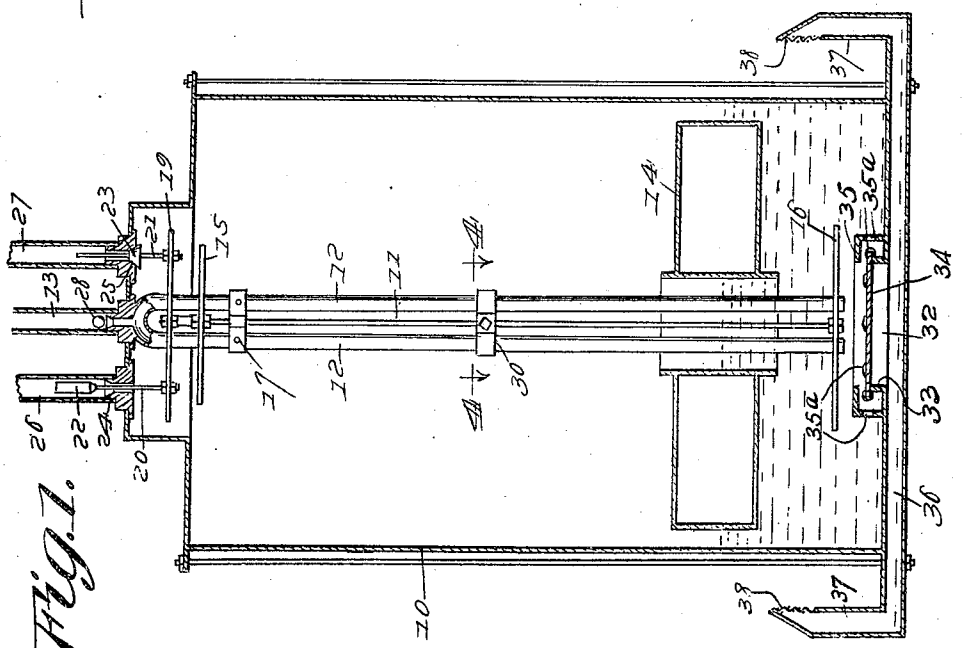


Fig. 1.

Inventor

A. J. Welden,

By F. Bennett Talbert

Attorney

Dec. 19, 1922.

1,439,591.

A. J. WELDEN,

PUMP.

FILED FEB. 5, 1921.

2 SHEETS—SHEET 2.

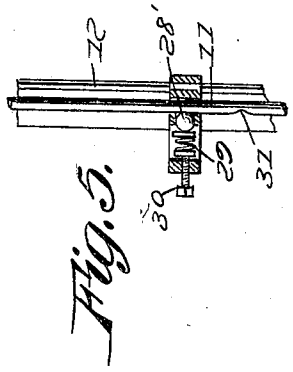


Fig. 5.

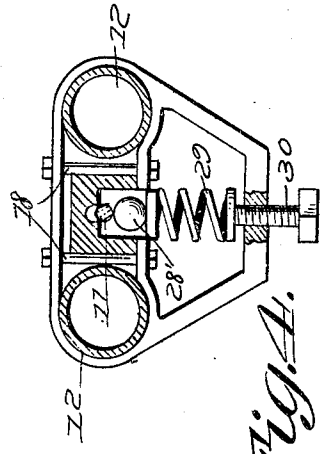


Fig. 4.

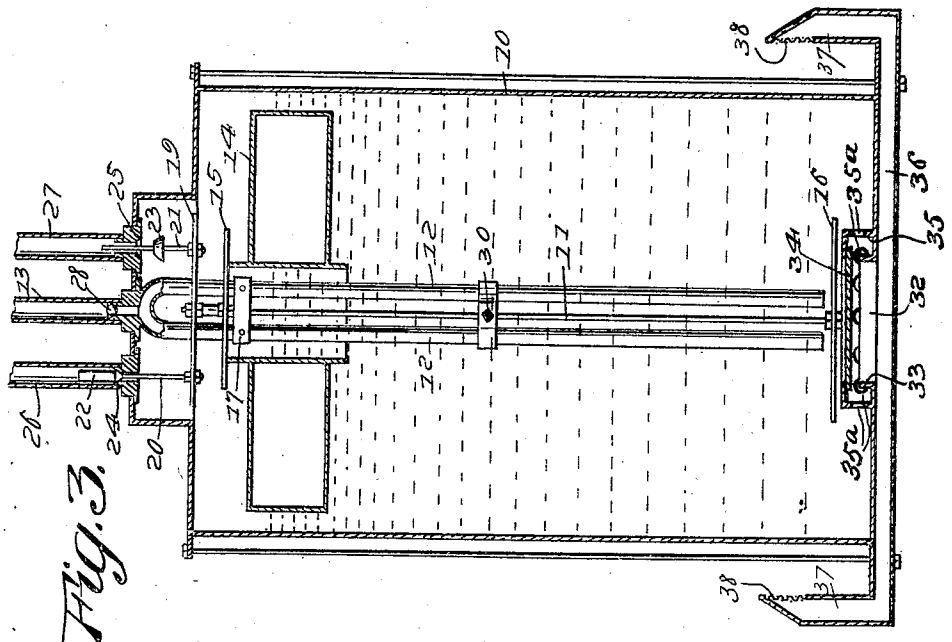


Fig. 3.

Inventor

A. J. Welden,

By G. Hume Talbert

Attorney

Patented Dec. 19, 1922. 1,439,591

UNITED STATES PATENT OFFICE.

ANDREW J. WELDEN, OF GRIFFIN, GEORGIA.

PUMP.

Application filed February 5, 1921. Serial No. 442,812.

To all whom it may concern:

Be it known that I, ANDREW JACKSON WELDEN, a citizen of the United States of America, residing at Griffin, in the county of Spalding and State of Georgia, have invented new and useful Improvements in Pumps, of which the following is a specification.

The object of the invention is to provide a simple and efficient pressure pump designed for automatic action under the impulse of a supply of air under pressure as from a suitable condenser or compresser controlled by a float which is actuable by the liquid contents of the pump cylinder, and the particular object in view is to provide a pump mechanism of the general type indicated wherein the parts are so related as to insure reliability in action to the end that dependent upon a continuous supply of pressure the water service pipe may be connected directly with the pump cylinder so as to be supplied therefrom as required without the intervention or interposition of a reservoir or elevated tank or the equivalent thereof; and with this object in view the invention consists in a construction and combination of parts of which a preferred embodiment is shown in the drawing, wherein:—

Figure 1 is a sectional view of the pump mechanism showing the parts in the positions which they occupy when the tank is supplying water under air pressure, the level of the water being low in the tank.

Figure 2 is a similar view showing the relation of the parts when, the level of the water in the tank having been lowered sufficiently to bring the float into contact with the lower tappet plate has reversed the positions of the parts to cut off the supply of air pressure and open the air vent preparatory to the refilling of the tank.

Figure 3 is a similar view showing the parts in the positions which they occupy when, the tank having been refilled, the float is brought into actuating contact with the upper tappet plate to again reverse the positions of the parts by closing the vent and opening the air pressure valve.

Figure 4 is a transverse section on the plane indicated by the line 4—4 of Figure 1.

Figure 5 is a vertical section on the plane indicated by the line 5—5 of Figure 1.

The mechanism consists essentially of a tank 10 which obviously may be of any desired shape, although preferably cylindrical, and dimensions or capacity, in which is arranged the tappet rod 11 preferably located between water outlet pipes 12 which are open at their lower ends and are united at their upper ends to communicate with a service pipe 13, said tappet rod being located between the outlet pipes which jointly form a guide for a float 14 disposed for movement in a path approximating the vertical dimensions of the tank between upper and lower tappet plates or disks 15 and 16. The tappet rod is guided in its reciprocatory movements, when actuated by the contact of the float respectively with the said tappet plates, by guides 17 consisting of complemental plates terminally engaged with the outlet pipes 12 and mutually forming a central bearing for the rod, said plates being held in place by means of transverse bolts 18 as shown clearly in Figure 4.

Carried by the tappet rod preferably through the intervention of a cross head 19 are the stems 20 and 21 of pressure and vent valves 22 and 23 disposed respectively for outwardly and inwardly opening movements with reference to valve seats 24 and 25 arranged in the pressure and vent pipes 26 and 27, the former leading from any suitable source of supply such as a condenser or compresser (not shown) while the latter may lead to the atmosphere to permit of the exhaust of air from the interior of the tank as the latter is filled with water by the action of gravity. The service pipe 13 is provided with an outwardly opening valve 28 preferably of the ball type arranged and adapted to retain in the service pipe any water which may have entered the same from the tank to prevent return of the same when the pressure upon the service pipe in the tank is relieved by the closing of the pressure valve 22. Said pressure and vent valves are suitably guided to insure their proper seating and may be connected with the cross head 19, as shown in the drawing, by suitable nuts whereby an effective relative adjustment thereof may be attained.

During the operation of the apparatus to supply water to the service pipe subject to the opening of faucets or outlets therein as in the use of the water for domestic and like

purposes, the pressure valve should be held in its open or unseated position while the vent valve should be held seated to prevent the exhaust of pressure applied to the surface of the water to cause its discharge through the pipes 12 to the service pipe, and in order to retain said valves in their indicated positions there is employed a locking means consisting of a ball 28′ actuated by a spring 29 of which the pressure may be regulated by an adjusting screw 30, said ball being yieldingly held in position for engagement with a seat 31 in the tappet rod and positioned upon the tappet rod for such engagement when the latter is in its elevated position and hence with said pressure and vent valves respectively in their unseated and seated positions.

When the operation of supplying water has proceeded to an extent sufficient to permit of the contact of the float with the lower tappet plate 16, as shown in Figure 2, the weight of the float will cause the depression of the plate and hence of the tappet rod, disengaging the seat 31 thereof from the locking means and simultaneously seating the pressure valve and unseating the vent valve. The surface of the liquid contents of the tank thereby being relieved of superatmospheric pressure the water in the well in which the tank is located, under the influence of gravity will enter the tank through the inlet 32 in the bottom of the tank, said inlet being surrounded by a seat 33 provided for the reception of the inlet valve 34 which is arranged in a suitable protecting cage 35, the wall of which is perforated as indicated at 35′ to provide ports through which water may enter the tank after having passed over the valve seat 33. Said valve is unseated by the pressure of the water from without, and which is conveyed to the inlet 32 by means of conductors 36 having upwardly directed terminal arms 37 provided at their upper ends with suitable screened orifices 38.

Inasmuch as the positioning of the pressure controlling and vent valves is dependent upon the movement of the float which in turn is actuated by the liquid contents of the tank, it will be obvious that as long as pressure is supplied to the pressure pipe 26 the operation of the mechanism will be automatic, the refilling thereof being effected from time to time as the supply therein is exhausted through the service pipe, and the premature movement or reversal in the positions of the pressure and vent valves after the refilling of the tank being prevented by the locking means which retains the tappet rod in its elevated position until positively released by the impulse of the descending float when the latter comes in contact with the lower tappet plate.

Moreover inasmuch as the construction of the locking means will offer an appreciable resistance to the movement of the tappet rod, which resistance may be varied by the adjustment of the tension of the spring which actuates the ball latch, there will be an appreciable reduction in the level of the water in the tank after the float comes in contact with the lower tappet plate, to impose a gradually increasing proportion of the weight of the float upon the tappet plate, and therefore when the latch finally yields to the impulse of the weight the tappet rod will be moved positively and promptly to such a position as to insure an effective readjustment or reversal in the positions of the pressure and vent valves to respectively seat and unseat the same, so that there may be no waste of the pressure incident to an ineffective seating of said valves and no obstacle to the prompt inflow of the water through the inlet port to refill the tank.

The invention having been described, what is claimed as new and useful is:—

1. A pump having a tank provided with a bottom valved inlet, a centrally located water discharge pipe having a valved communication at its upper end with a service pipe, oppositely opening pressure and vent valves for respectively controlling the admission of pressure to and the exhaust of pressure from the interior of the tank, a tappet rod having connection with said valves and having spaced upper and lower tappet plates, and a float disposed between the planes of said tappet plates for actuation by the liquid contents of the tank.

2. A pump having a tank provided with a bottom valved inlet, a centrally located water discharge pipe having a valved communication at its upper end with a service pipe, oppositely opening pressure and vent valves for respectively controlling the admission of pressure to and the exhaust of pressure from the interior of the tank, a tappet rod having connection with said valves and having spaced upper and lower tappet plates, and a float disposed between the planes of said tappet plates for actuation by the liquid contents of the tank, the tank inlet being provided with an inwardly opening valve, and supply pipes having screened orifices being in communication with said inlet.

3. A pump having a tank provided with a bottom valved inlet, a centrally located water discharge pipe having a valved communication at its upper end with a service pipe, oppositely opening pressure and vent valves for respectively controlling the admission of pressure to and the exhaust of pressure from the interior of the tank, a tappet rod having connection with said valves and having spaced upper and lower tappet plates, and a float disposed between the planes of said tappet plates for actua-

tion by the liquid contents of the tank, means being provided for yieldingly securing said tappet rod in position to maintain said pressure and vent valves in their open and closed positions.

4. A pump having a tank provided with a bottom valved inlet, a centrally located water discharge pipe having a valved communication at its upper end with a service pipe, oppositely opening pressure and vent valves for respectively controlling the admission of pressure to and the exhaust of pressure from the interior of the tank, a tappet rod having connection with said valves and having spaced upper and lower tappet plates, and a float disposed between the planes of said tappet plates for actuation by the liquid contents of the tank, means being provided for yieldingly securing said tappet rod in position to maintain said pressure and vent valves in their open and closed positions and consisting of a spring actuated ball for engagement with a seat on the tappet rod.

5. A pump having a tank provided with a bottom valved inlet, a centrally located water discharge pipe having a valved communication at its upper end with a service pipe, oppositely opening pressure and vent valves for respectively controlling the admission of pressure to and the exhaust of pressure from the interior of the tank, a tappet rod having connection with said valves and having spaced upper and lower tappet plates, and a float disposed between the planes of said tappet plates for actuation by the liquid contents of the tank, means being provided for yieldingly securing said tappet rod in position to maintain said pressure and vent valves in their open and closed positions and consisting of a spring actuated ball for engagement with a seat on the tappet rod and having means for varying the tension of the actuating spring.

6. A pump having a tank provided with a bottom valved inlet, a centrally located water discharge pipe having a valved communication at its upper end with a service pipe, oppositely opening pressure and vent valves for respectively controlling the admission of pressure to and the exhaust of pressure from the interior of the tank, a tappet rod having connection with said valves and having spaced upper and lower tappet plates, and a float disposed between the planes of said tappet plates for actuation by the liquid contents of the tank, said discharge pipe consisting of parallel branches carrying guides, and a tappet rod being arranged in interposed relation with said branches and mounted in the guides.

7. A pump having a tank provided with a bottom valved inlet, a centrally located water discharge pipe having valved communication at its upper end with a service pipe, oppositely opening pressure and vent valves for respectively controlling the admission of pressure to and exhaust from the interior of the tank, upper and lower stops operatively connected with the pressure and vent valves, and a float in surrounding relation to the discharge pipe and movable between and engageable with said stops for the purpose specified.

8. A pump having a tank provided with a bottom valved inlet, a discharge pipe having valved communication with a service pipe, oppositely opening pressure and vent valves for respectively controlling the admission of pressure to and exhaust from the interior of the tank, a tappet rod having connection with said pressure and vent valves and provided with spaced upper and lower tappet plates, and a float in surrounding relation to the tappet rod for engagement with either tappet plate for the purpose specified.

9. A pump having a tank provided with a bottom valved inlet, a discharge pipe having valved communication with a service pipe, oppositely opening pressure and vent valves for respectively controlling the admission of pressure to and exhaust from the interior of the tank, a tappet rod having connection with said pressure and vent valves and provided with spaced upper and lower tappet plates, a float disposed between the planes of said tappet plates and in surrounding relation to the tappet rod for movement into engagement with either tappet plate to effect longitudinal movement of the rod, and means for locking the rod in one of the two positions to which it may be moved by the float.

10. A pump having a tank provided with a bottom valved inlet, a water discharge element having valved communication with a service pipe, oppositely opening pressure and vent valves for respectively controlling the admission of pressure to and the exhaust from the interior of the tank, upper and lower stops operatively connected with the pressure and vent valves, and a float movable between and engageable with either of said stops for the purpose specified.

In testimony whereof he affixes his signature.

ANDREW J. WELDEN.