

W. U. GRIFFITHS.

PUMP.

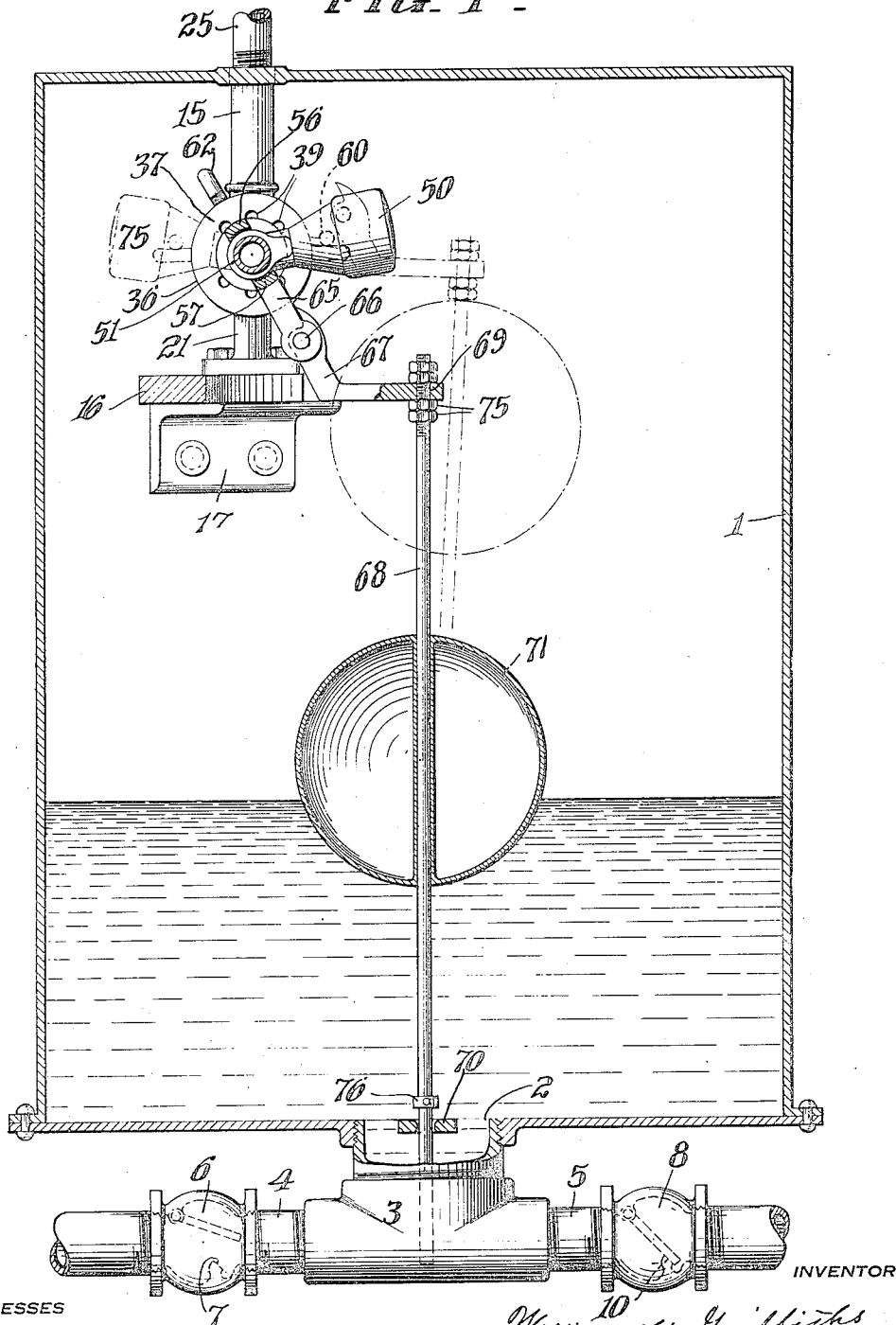
APPLICATION FILED AUG. 12, 1911.

1,060,594.

Patented May 6, 1913.

2 SHEETS—SHEET 1.

FIG. 1 -



WITNESSES

Gertrude E. Evans
Daniel Webster, Jr.

BY

William U. Griffiths
Cyrus V. Anderson

ATTORNEY

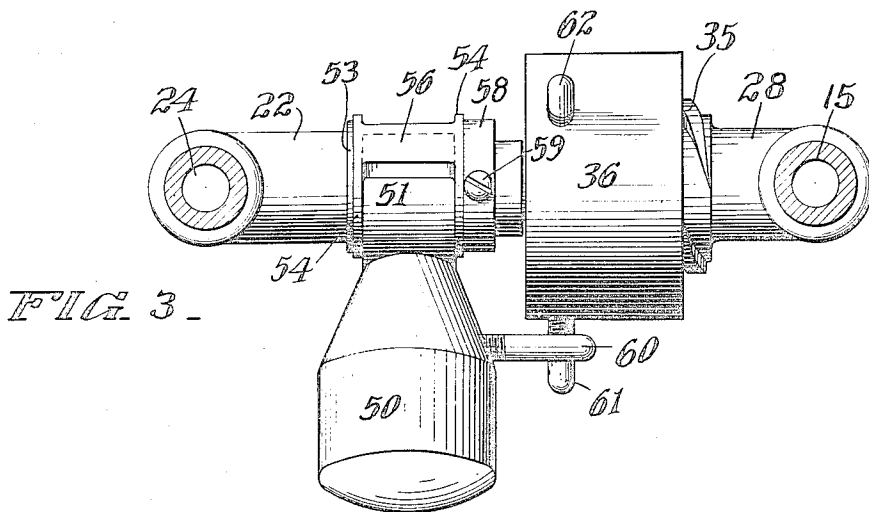
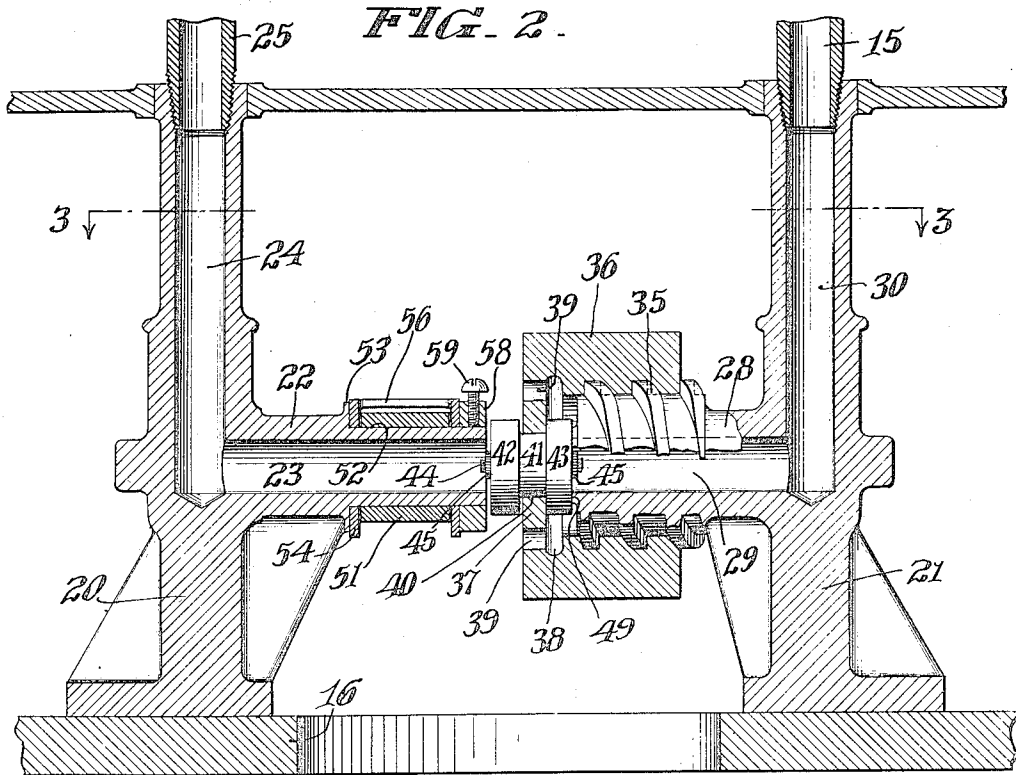
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WITNESSES

Gertrude E. Evans
Daniel Webster, Jr.

INVENTOR

William U. Griffiths
BY
Cyrus N. Anderson
ATTORNEY

UNITED STATES PATENT OFFICE.

WILLIAM U. GRIFFITHS, OF PHILADELPHIA, PENNSYLVANIA.

PUMP.

1,060,594.

Specification of Letters Patent.

Patented May 6, 1913.

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To all whom it may concern:

Be it known that I, WILLIAM U. GRIFFITHS, a citizen of the United States, and a resident of Philadelphia, county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

My invention relates to improvements in pumps which are adapted to operate automatically and which are designed primarily for the purpose of pumping or causing the transfer of a liquid, such as water, from a lower to a higher level. It may be used, for instance, for the purpose of pumping water from the cellar of a house or similar structure to some point at a higher level.

One of the objects of my invention is to simplify the construction of the valve mechanism and the means for operating the same and at the same time increase or enhance the efficiency of the same.

Other objects and advantages of my invention will be set forth in the detailed description of my invention which follows or will be apparent therefrom.

A convenient form of embodiment of my invention is illustrated in the accompanying drawing to which reference should be had in order that my said invention may be more readily understood and comprehended but it should be understood that changes in the details of construction within the scope of the claims may be made without departing therefrom.

In the drawings,—Figure 1 is a longitudinal sectional view of a device or apparatus embodying my invention, certain parts thereof being shown in elevation: Fig. 2 is a longitudinal sectional view of the valve mechanism by which the operation of the pump is controlled; and Fig. 3 is a top plan view of the said valve mechanism, being taken on the line 3—3 of Fig. 2.

Referring to the drawings,—1 designates a tank of any suitable construction having a port or opening 2 therein through which the water enters and leaves the tank. The port 2 has connection with a T-coupling 3 to which the pipes 4 and 5 are connected. The water entering the tank 1 flows through the pipe 4,—the pivoted plate valve 6 turning about its pivot as indicated in Fig. 1 of the drawings to permit the passage of water through the said pipe. When, however, pressure is exerted upon the top of the water

in the tank to force it therefrom the valve 6 is closed against its seat 7 and prevents back flow of the water through the pipe 4 and causes it to flow outwardly through the pipe 5,—the pivoted plate valve 8 opening outwardly to open the said pipe and permit such outward flow. The pipe 5 leads to any point to which it is desired to conduct the water which is forced out of the tank 1. When the valve 8 is in position against its seat 10, as shown in Fig. 1, the water is prevented from returning through the pipe 5 into the tank 1. The water or other similar liquid is forced from the tank 1 by means of vapor or air under pressure which enters the tank through a pipe 15. The entry of said air or vapor into the tank is controlled by valve mechanism, the construction and operation of which will now be described.

The valve mechanism is supported upon a bar or other suitable member 16 which in turn is supported upon brackets 17 (only one of which is shown) secured to the sides of the tank.

20 and 21 designate posts which are secured to and rise from the supporting member 16. The said posts extend upwardly through the top of the tank 1 as clearly shown in Fig. 2 of the drawings. The post 20 is provided with a projecting arm 22 having a hole 23 extending longitudinally thereof which opens into a hole 24 extending longitudinally of the upper portion of the said post 20. The hole 24 in the post 20 communicates with a pipe 25 secured in the upper end of the said hole 24 which pipe opens into the air outside of the tank 1. The post 21 is provided with a projecting arm 28, provided with a hole 29, extending longitudinally thereof, which hole communicates with a hole 30 extending longitudinally of the upper part of the post 21. The hole 30 communicates with the pipe 15, which, as already stated, extends from a source of air or vapor under pressure.

The projecting arm 28 is provided with external screw threads 35 which engage the internal screw threads of a relatively large nut 36. The hole or opening in the nut 36 does not extend entirely therethrough but the inner end thereof is closed or interrupted by means of a relatively thick plate 37 which is illustrated as being integral with the said nut but which may be made separately and secured thereto if desired. Inside of and adjacent to the part 37 I have

provided an annular groove 38 and in the said plate 37 I have provided a plurality of openings 39 which communicate with the said annular groove 38.

5 In an opening 40 centrally of the plate 37 I have provided a valve supporting member 41, to the opposite ends of which, upon opposite sides of the plate 37, valves 42 and 43 are secured. The parts 41, 42 and 43 may be
10 made separately and secured together in the position illustrated in Fig. 2 of the drawings by means of a bolt 44, which extends through the parts 41, 42 and 43, and nuts 45; or if
15 desired one of the valves 42 or 43 and the part 41 may be integrally constructed, one only of the valves being made separately and the parts secured together by the bolt 44 and nuts 45 as indicated. Preferably the
20 part 41 is slightly longer than the thickness of the plate 37 so as to provide for a certain amount of play of the valves 42 and 43 toward and away from the said plate 37. The valve 43 is adapted to cooperate with the
25 seat 49 formed upon the inner end of the projecting arm 28 for the purpose of opening and closing the inner end of the hole or opening 29 in the said arm. The valve 42 is adapted to be moved into and out of engagement
30 with the inner end of the projecting arm 22 to open and close the hole or opening 23 in said arm. Movement of the said valves to open and close the holes or openings 29 and 23 is caused by turning the nut
35 36 upon the arm 28 first in one direction and then in the other. When the said nut is turned to the right it causes the said valves to move to the right so as to move the valve
40 43 into engagement with its seat 49 and thereby close the inner end of the hole or opening 29 and at the same time the valve 42 is moved to the right out of engagement with the inner end of the projecting arm 22, with the result that the inner end of the hole or opening 23 is simultaneously opened.
45 For the purpose of automatically turning the nut 36 in directions to open and close the valves 42 and 43, I have provided a weight 50 which is connected to a sleeve 51 which fits over the inner end of the projecting
50 arm 22, the said inner end being reduced in size as indicated at 52, whereby a shoulder 53 is formed thereon. The said sleeve 51 is located between washer-like members 54 which are connected by cross members 56
55 and 57. The said weight and the washer-like members 54 are secured and held in position upon the inner end of the projecting arm 22 by means of a collar 58 held by a set screw 59. The weight 50 is provided with a
60 projecting finger 60 which is adapted to engage fingers 61 and 62 which project from the peripheral surface of the nut 36. The fingers 61 and 62 are spaced from each other in the manner indicated in Figs. 1 and 3 of
65 the drawings. The purpose of the fingers

60, 61 and 62 will be hereinafter explained. It should be noted that the weight 50 and the washer-like members 54 are adapted to be oscillated automatically upon their supporting arm 22.

65 65 designates an arm which projects radially from the cross member 57 extending between the washer-like member 54. The said arm 65 is pivotally connected at 66 to an angular extension 67 to which the upper end
70 of a rod 68 is connected, as indicated at 69. The lower end of the rod 68 is guided in a hole or opening through a guide bar 70 extending across the port 2 and secured to opposite edges thereof.

71 designates a float which is adapted to move up and down upon the rod 68.

The operation of the apparatus is as follows: Water entering the tank from the pipe 4 fills the said tank and causes the float
75 71 to move upwardly upon the rod 68 until it comes into contact with the outer end of the arm formed by the parts 65 and 67 or into contact with parts such as the nuts 75 which are fixed relatively to the part 67.
80 After the float comes into contact with the outer end of the said arm, or with a part having a fixed position with respect thereto, the continued filling of the said tank with water causes the said float to lift the said
85 arm with the result that the members 54 are turned upon their bearings bringing the cross-piece 57 into contact with one side of the inner end of the weight 50 and causing said weight to also turn upon its bearings.
90 After the said weight has been turned until a line which passes through its center of gravity passes to the left of the axis of its pivotal movement (having reference to Fig. 1 of the drawing) it then falls or moves
95 rapidly to the left into the position indicated by the dotted lines at 75, Fig. 1. In moving to said position the finger 60 thereon contacts with the projecting finger 62 upon the nut 36 causing rotative movement thereof to the left to thereby move the valves 42 and 43 toward the left in Fig. 2, whereby the valve 43 is moved out of engagement with the valve seat 49 and opens the inner
100 end of the hole or opening 29. Simultaneously the valve 42 moves into engagement with the inner end of the projecting arm 22 and closes the hole or opening 23 therein. The vapor or air under compression immediately enters the tank through the pipe 15 and
105 through the holes 30 and 29 and the pressure thereof upon the top of the water forces the same downwardly in the tank and out through the pipe 5, the valve 8 opening to permit such out-flow of the water and the
110 valve 6 simultaneously closing to prevent a back flow of the water through the pipe 4. As the water is lowered in the tank the float moves downwardly upon the rod 68 until it comes into contact with the sleeve 76 thereon
115 120 125 130

causing downward movement of the rod 68 and the arm 65—67 to turn the washer-like members 54 about their bearing so as to bring the cross bar 56 into contact with the side of the said weight opposite that engaged by the opposing bar 57, the weight of the said float and parts associated therewith being sufficient to cause the weight 50 to move to the right upon its bearing. After the weight 50 has moved to such position that its line of gravity passes to the right of its axis of rotative movement, the said weight moves rapidly, by reason of gravity, to the right and the projecting finger 60 coming into contact with the projecting finger 61 causes rotative movement of the nut 36 to the right, thereby causing movement of the valves 42 and 43 to the right bringing the valve 43 into contact with its seat 49 and closing the inner end of the opening 29. The simultaneous movement of the valve 42 to the right opens the hole or opening 23 so that the interior of the tank is thus placed in communication with air at atmospheric pressure so that the water is permitted to enter the tank 1. If no means were provided for placing the interior of the tank in communication with air at atmospheric pressure during the time that it is being filled with water it is obvious that the flow of water into the tank would cause a compression of the air or other vapor in the tank and a point would be reached at which the pressure of said air or other vapor would be sufficient to prevent the further flow of water into the tank. The pitch of the screw threads 35 and the cooperating screw threads in the nut 36 is such that the pressure of the air or other vapor upon the valve 43 when it is closed does not cause rotation of said nut and consequent accidental opening of said valves to permit the air or vapor under pressure to flow into the tank when it is not desired.

45 Having thus described my invention, I claim:—

1. In a pump, the combination of a casing having a chamber which casing is provided with a port for permitting the entry of water into said chamber, a port for permitting the entry of air, steam or other gaseous fluid into the said chamber and a port for permitting communication of the said chamber with air at normal pressure, the said two last named ports being located in opposite and juxtaposition with respect to each other, a nut being supported in operative position with relation to one of the two last named ports, valves supported upon the said nut and means for turning the said nut alternately in opposite directions to cause bodily movement thereof transversely of the planes of the said ports to cause movement of the said valves alternately

toward and from the said ports to open and close the same.

2. In a pump, the combination of a casing having a chamber which casing is provided with a port for permitting the ingress and egress of water from the said chamber, a port for permitting the ingress of air, steam or other gaseous fluid into the said chamber and a port for providing communication between the said chamber and air at normal pressure, an internally screw threaded nut supported in operative relation to one of the two last named ports, one end of the said nut being closed, valves supported upon the closure of said nut and means for turning the said nut alternately in opposite directions, thereby causing bodily movement of the said nut transversely of the planes of the said two last named ports whereby the said valves are alternately moved in opposite directions toward and from the said ports to open and close the same.

3. In a pump, the combination of a casing having a chamber which casing is provided with a port, means for permitting and controlling the induction and eduction of water through the said port into and from the said chamber, means for permitting the induction of air, steam or other gaseous fluid into the said chamber and means for providing communication between the said chamber and air at normal pressure and means for controlling the entry of said air, steam or other gaseous fluid into the said chamber and also controlling communication of the said chamber with air at normal pressure, the said last mentioned means comprising a nut, valves carried thereby and means for causing rotative movement of the said nut alternately in opposite directions.

4. In a pump, the combination of a casing having a chamber, a member located in the said chamber and having an opening extending therethrough which opening communicates with a source of air, steam or other gaseous fluid under pressure, a member located in the said chamber which member has an opening therethrough which communicates with air at normal pressure, and one of the said members having a projecting portion provided with screw threads, a nut in engagement with the said screw threaded portion, valves carried by the said nut and means for causing rotative movement of the said nut alternately in opposite directions to thereby cause bodily movement of the said nut in opposite directions whereby the said valves are moved in opposite directions to open and close the openings through the said members.

5. In a pump, the combination of a casing having a chamber, which casing is provided with a port through which water enters and leaves the said chamber, members

supported in the said chamber and projecting through the said casing, the said members being provided with parts projecting laterally therefrom and toward each other
5 and the said members being provided with openings which extend through the said projecting parts and outwardly through the said members, the opening in one of the said members communicating with a source of
10 air, steam or other gaseous fluid under pressure and the opening of the other of said members communicating with air at normal pressure, a nut operatively connected to one
15 of the said projecting parts, said nut having a plate extending across one end there-

of, valves secured to the said plate and means for causing rotative movement of the said nut alternately in opposite directions, whereby movement of the said valves in opposite directions is caused to alternately
20 open and close the openings through the said members and the said projecting parts.

In testimony that I claim the foregoing as my invention, I have hereunto signed my
25 name this 11th day of August, A. D., 1911.

WILLIAM U. GRIFFITHS.

In the presence of—

GEO. H. WEIDNER,
CARRIE E. KLEINFELDER.