

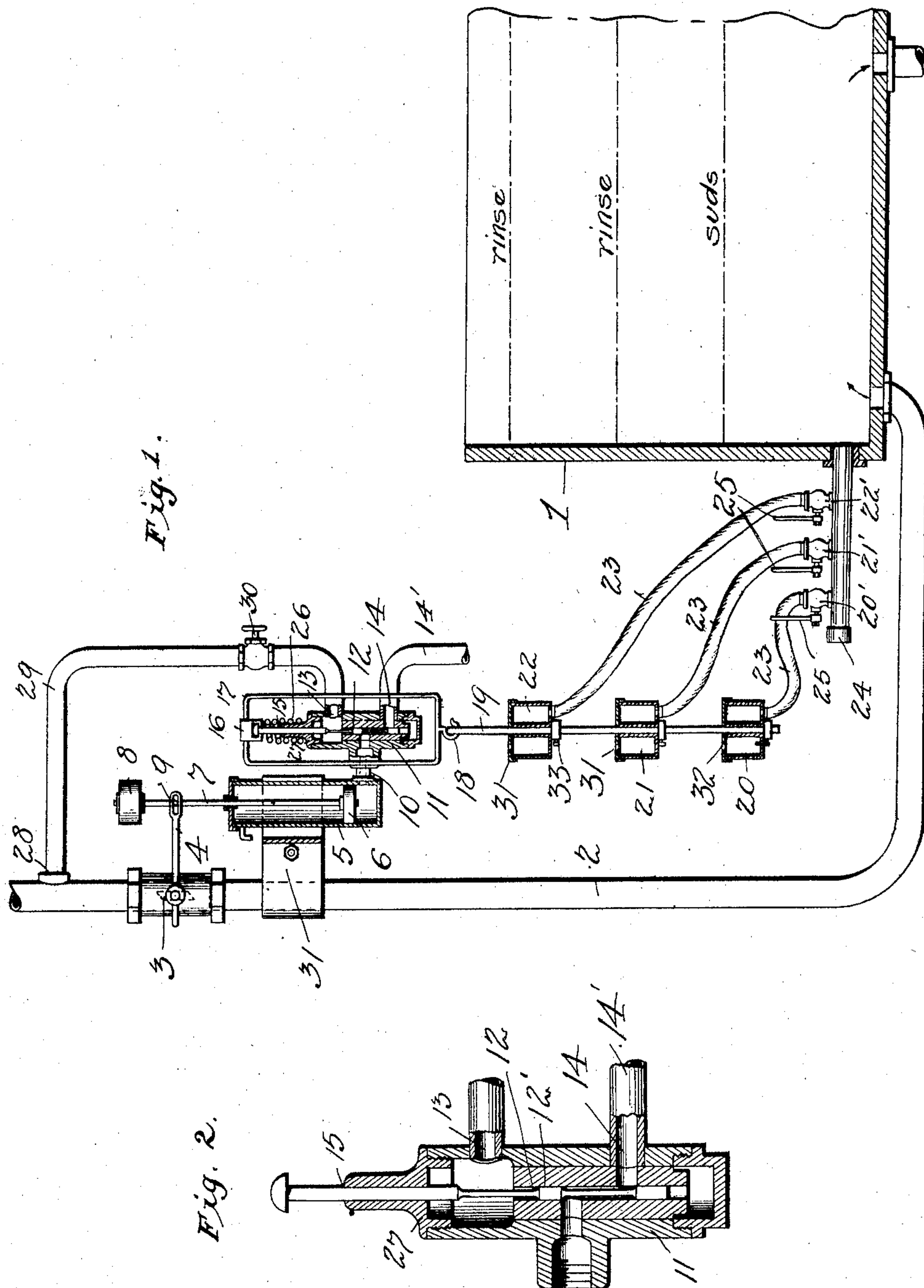
No. 865,229.

PATENTED SEPT. 3, 1907.

G. M. BOONE.

APPARATUS FOR DETERMINING HEIGHTS OF LIQUIDS IN RECEPTACLES.

APPLICATION FILED DEC. 13, 1906.



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APPARATUS FOR DETERMINING HEIGHTS OF LIQUIDS IN RECEPTACLES.

No. 865,229.

Specification of Letters Patent.

Patented Sept. 3, 1907.

Application filed December 13, 1906. Serial No. 347,645.

To all whom it may concern:

Be it known that I, GEORGE M. BOONE, a citizen of the United States, residing at Baltimore, Maryland, have invented certain new and useful Improvements in
5 Apparatus for Determining Heights of Liquids in Receptacles, of which the following is a specification.

My invention relates to means for determining the heights of water level in vessels, said means enabling the attendant who is in charge of a plurality of machines
10 such as washing machines to set the said machines so that they will receive water only to the height predetermined upon by the attendant and for which he correspondingly sets the controlling apparatus.

The invention is particularly adapted for use in laundries, where, in the operation of washing it is necessary to have the washing fluid reach at different times to different heights in the machines. For instance, the attendant will first prepare a solution of suds to reach to a certain height and after the clothes have been treated
20 for the required time to these suds the fluid or suds is run off and rinsing water is introduced into the machine or tank and allowed to rise to a higher level and after the clothes have been treated with this rinsing water it in turn is run off and fresh rinsing water is introduced
25 and allowed to rise to a greater height than the first rinsing water.

With my invention it is possible for the attendant by manipulating a valve, to set the apparatus so that when the water level predetermined upon, has been reached
30 the supply will be cut off automatically and when this height of washing fluid has been run off the supply will be turned on automatically to run to the same height as before or to a different height as may be predetermined upon by the attendant who will set the controlling apparatus accordingly.

While I have stated that the invention is particularly useful in connection with laundries I wish it understood that I do not limit myself in this respect as the principle of the invention may be embodied in apparatus designed for other uses.
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The invention consists in the features, combination and arrangement of parts hereinafter described and particularly pointed out in the claims.

I have shown one embodiment of my invention in the accompanying drawing which represents in
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Figure 1 a portion of a washing machine or tank in section with a supply pipe leading thereto and controlling apparatus connected with the supply valve whereby the supply is turned on or off when the predetermined conditions have been fulfilled. Fig. 2 is a detailed view of the controlling valve.
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In these drawings 1 indicates the tank or tub of a washing machine or similar apparatus to which water is led from the main by a pipe 2, the passage through which is controlled by a valve 3. This valve is provided with a lever 4 with which the automatic control-
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ling mechanism is connected. This automatic controlling mechanism comprises a cylinder and piston 5, 6, the piston rod 7 of which is weighted at 8 and is connected through the pin and slot 9 with the lever 4 of the supply valve. The cylinder is connected with a pipe 10 leading from a valve casing 11 in which a slide valve 12 is located, said slide valve controlling also a port 13 for the inlet of the pressure fluid for operating the piston 6, and controlling also a port 14 leading from the valve casing through which the pressure fluid after having acted on the power piston is discharged. This valve will be described more in detail hereinafter. Its stem 15 is provided with a head at its upper end engaging a block 16 on a loop or yoke 17 which loop at its lower end is connected loosely as by the hook 18 with a rod 19 carrying a series of vessels or buckets 20, 21, 22, which buckets or vessels are arranged at different heights corresponding to the different heights at which it is desired to allow the water to run into the tank or tub at different times. These buckets or vessels are supplied with water through the flexible pipes 23 extending from the valves 20', 21' and 22' to the buckets 20, 21, 22 respectively.
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Each of the valves is connected with the pipe 24 extending from the tank or tub and each is provided with a handle as at 25 by which the valve is operated.
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The controlling valve 12 is pressed normally upwardly by the spring 26 which bears at its upper end against the block 16 and at its lower end against the cap piece 27 of the valve casing and the force of this spring is sufficient not only to hold the valve up but also to sustain the rod 19, and the several buckets or vessels thereon so long as these are empty. When, however, the water enters one of these buckets its weight will overcome the force of the spring 26, draw the rod 19 downwardly, and this, through the loop will force downwardly the controlling valve, thus opening the port leading to the pipe 10 and allowing the water to flow from the main 2 at a point 28, above the main cut-off valve 3 through the pipe 29; the port 13; the valve and the pipe 10 into the cylinder, where, acting upon the piston 6 will cause the same to rise and thus through the lever 4 turn the valve 3 so as to cut off the flow of water through the main 2 into the tank or tub, it being understood that this action takes place when the predetermined water level has been reached in the said tank or tub. For instance, if it is desired to have the water rise to the level marked "suds" in the drawing the valve 20' will be open while the valve 21', 22' will be closed by the operator and the tub will continue to fill until the level marked "suds" is reached when the weight of the water in the lowermost bucket 20 will cause the operation of the controlling valve as above described. It will be observed that it is only necessary for the operator to open the proper valve and then he can proceed with his work at other machines
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or at other portions of the plant without giving further thought to the filling of the tub or machine which he has just set. Similar setting operations of the apparatus are performed by the attendant when it is desired to have the height of water at the line marked "rinse" in the drawing, or at the level above this point, the attendant in the one case opening the valve 21' to bring the bucket 21 into operation and in the other case opening 22' to bring the bucket 22 into operation. After the clothes have been treated for the required time with the water at the height determined upon, the attendant, by turning a suitable outlet valve draws off the water to empty the tank. This action will also drain the particular bucket which had been filled and as this removes the weight from the rod 19, the spring 26 will again exert its force, raising the valve so that communication between the port 13 and the pipe 10 will be cut off and communication will be made between the said pipe 10 and the port 14 so that the water which has acted in the cylinder on the piston will then escape through the pipe 14' with the result that the piston under the action of its weight 8 will drop and thus turn the valve 3 by means of the lever 4, so as to turn on again the water supply from the main to the tank and the operator, then by setting the proper valve, will cause the water to be cut off when the proper height is reached within the tank.

The controlling valve consists simply of a rod having certain portions thereof reduced so as to form a water passage between itself and the adjacent parts of the valve casing, the said rod having an intact portion 12' between the reduced parts, which by being positioned either above or below the port leading to the pipe 10, will determine whether the water flows into the cylinder or out therefrom.

The supply of water through the pipe 29 to the controlling valve may be shut off by turning a valve 30.

The cylinder 5 is supported from the main pipe 2 by any suitable bracket, such as shown at 31.

The buckets or vessels are provided with removable covers 31 and vent openings 32 are formed therein. Each vessel has a central tube through which the carrying rod passes. The vessels rest on adjustable collars 33 on the rod whereby the vessels may be raised or lowered.

I claim as my invention:—

1. In combination with a receptacle, a supply valve therefor, means for operating the said valve, controlling means for said operating means comprising a plurality of buckets or vessels at different heights to severally operate when the water reaches certain heights each having a connection with the tank and means for controlling the passage through each of said connections, said buckets severally receiving the water from the tank and by the weight thereof, operating the said controlling means, substantially as described.

2. In combination with a receptacle, a plurality of vessels at different heights movably supported, valved connections between said vessels and the receptacle whereby the vessels receive the water severally and at different heights, and means controlled by the filling and movement of said vessels for controlling the supply of fluid to the receptacle, substantially as described.

3. In combination with a receptacle, a plurality of vessels at different heights, movably supported and independently having connection with the receptacle to receive water therefrom, a valve for controlling the supply of water to the receptacle, power operating means for said valve, a controlling valve for supplying pressure fluid to the said power operating means, said controlling valve having connection to and being operated by the filling of either vessel, substantially as described.

4. In combination with a receptacle, a plurality of buckets or vessels at different heights having each an independent connection with the receptacle whereby they may individually receive water from said receptacle when certain heights are reached, a movable rod carrying all of the said buckets, and means controlled by the movement of the said rod for shutting off the supply when the predetermined height is reached in the receptacle, substantially as described.

5. In combination with a tank or receptacle, means for supplying water, a plurality of buckets or vessels at different heights, independent valved connections between the buckets and the receptacle whereby the buckets individually receive water when different levels are reached in the tank, means whereby the movement of the vessel which has received water is transmitted to the supply means to control the same and means for moving the said vessel upwardly to operate the supply means in the reverse direction when the water is discharged from said vessel as a result of drawing the water off from said receptacle, substantially as described.

6. In combination with a receptacle, a supply valve, a cylinder and piston with connections to the valve for operating the same, a valve for controlling the pressure fluid to the cylinder and discharging it therefrom, and a plurality of buckets arranged at different heights and individually connected with the receptacle with a valve in each connection, and a connection between the buckets and the controlling valve to operate the same when either bucket lowers on receiving water, due to the water reaching the predetermined height in the receptacle, substantially as described.

7. In combination with a receptacle, a supply valve, a cylinder and piston with connections to the valve for operating the same, a valve for controlling the pressure fluid to the cylinder and discharging it therefrom, and a plurality of buckets arranged at different heights and individually connected with the receptacle with a valve in each connection, and a connection between the buckets and the controlling valve to operate the same when either bucket lowers on receiving water, due to the water reaching the predetermined height in the receptacle and the spring for lifting the valve and the buckets to allow the water to be discharged from the cylinder, thus shutting off the supply valve, substantially as described.

In testimony whereof, I affix my signature in presence of two witnesses.

GEORGE M. BOONE.

Witnesses:

ADRIAN J. GRAPE,
W. H. YEATMAN.