

C. M. MOORE.
 AUTOMATIC VALVE OPERATING DEVICE FOR TANKS.
 APPLICATION FILED MAY 13, 1910.

997,844.

Patented July 11, 1911.

Fig. 1.

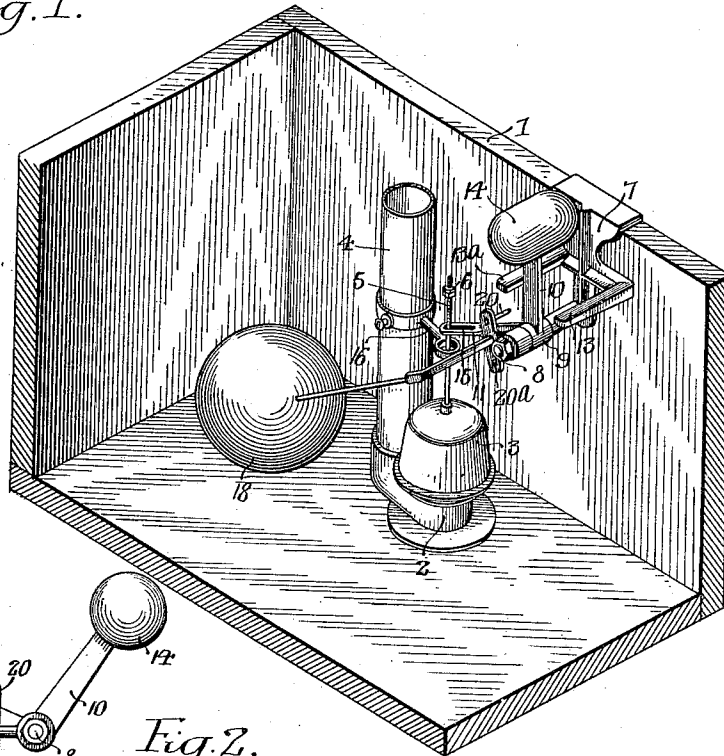


Fig. 3.

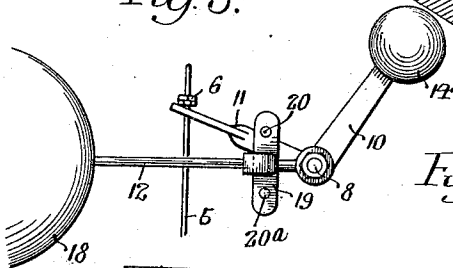
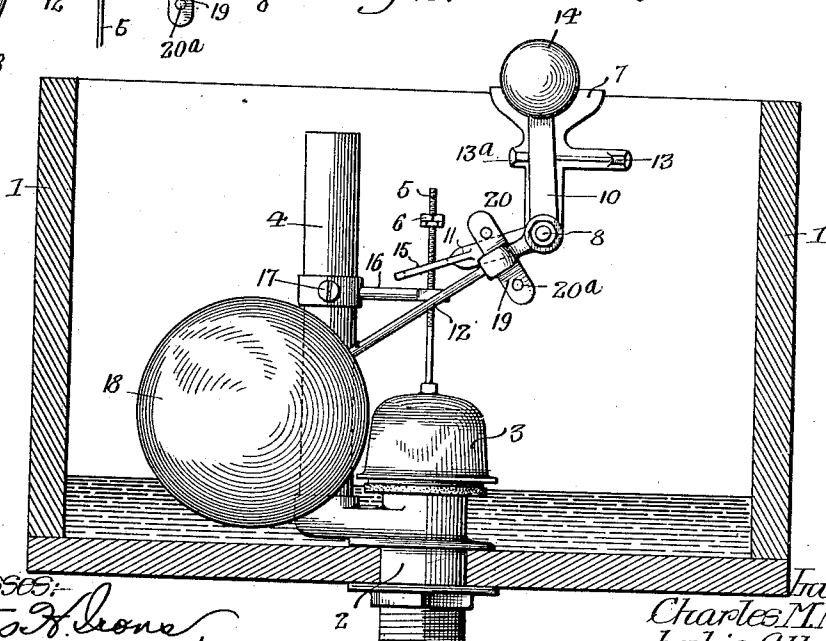


Fig. 2.



Witnesses:
 Titus H. Stone,
 Will A. Burrows.

Inventor:
 Charles M. Moore.
 by his Attorneys,
 Howson & Howson

UNITED STATES PATENT OFFICE.

CHARLES M. MOORE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO WALLS, OWEN & STAMBACH COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

AUTOMATIC VALVE-OPERATING DEVICE FOR TANKS.

997,844.

Specification of Letters Patent.

Patented July 11, 1911.

Application filed May 13, 1910. Serial No. 561,143.

To all whom it may concern:

Be it known that I, CHARLES M. MOORE, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Automatic Valve-Operating Devices for Tanks, of which the following is a specification.

One object of my invention is to provide an automatically acting device for opening the outlet valve of a flushing or similar tank after the liquid therein has risen to a predetermined height; it being especially desired that the construction and arrangement of the parts of the device shall be substantial, simple and inexpensive.

A further object of my invention is to provide an automatic valve operating device of the general character above indicated in which a float, under predetermined conditions, shall so actuate a weighted lever that this latter is caused to automatically act to open the outlet valve.

These objects and other advantageous ends I secure as hereinafter set forth, reference being had to the accompanying drawings, in which;—

Figure 1, is a fragmentary perspective view of a flushing tank showing my invention as applied thereto; Fig. 2, is a front elevation partly in section further illustrating the invention and showing the various parts in the positions occupied when the tank is practically empty, and Fig. 3, is a fragmentary elevation of the float and certain of its associated parts, showing these in the positions occupied just after the valve has been opened.

In the above drawings, 1 represents a tank or other container, extending through the bottom of which is an outlet pipe 2 whose upper end projects a short distance above the bottom of the tank and forms a seat for a float valve 3. The pipe 2 has connected with it an overflow pipe 4 of the well known form, and the float valve 3 has extending upwardly from it an operating rod 5. The upper end of this rod is preferably threaded and carries one or more nuts 6 forming an adjustable abutment for a purpose hereafter noted. Mounted on the side of the tank adjacent the upper end of the valve rod 5 is a bracket 7 having a forwardly extended spindle 8 which serves as a journal for a weighted lever 9. This latter has two

arms 10 and 11 and it is to be noted that the spindle also serves as the pivotal support for a float rod 12.

The bracket 7 has two forwardly projecting arms 13 and 13^a forming stops for the arm 10 of the lever 9 which carries at its upper end a relatively heavy weight 14; the arrangement of said stops relatively to this lever being such that the stop 13^a permits said lever arm 10 to move for a relatively short distance to the left hand side of a vertical line drawn through the spindle 8, while the stop 13 is a considerably greater distance away from said lever on the other side. The lever arm is thus capable of moving for a limited distance to either side of a position of unstable equilibrium and as a result, a very slight movement of the lever arm 10 from the position shown in Fig. 2 will suffice to cause the center of gravity of its weight 14 to pass beyond the vertical line through the supporting spindle, whereupon it is free to move through an arc of about 45° under the action of gravity until it engages the stop 13. The arm 11 of the lever is provided with an elongated slot through which passes the valve rod 5, and the abutment formed by the nuts 6 on this valve rod is so adjusted that the lever arm 11 will engage the same shortly after the weighted arm 10 has passed to the right of its "dead center line." Thereafter the float valve 3 is moved off its seat under the action of the weight 14.

A guide arm 16 is adjustably held to the overflow pipe 4 by means of a screw 17 and serves to prevent displacement of the valve 3 or its rod. The float rod 12 has a float 18 fixed to its outer end and is preferably offset as shown in Fig. 1 to prevent interference of the float with any of the other parts of the device. Immediately adjacent the lever arm 11 the float rod has oppositely projecting transverse arms 19 respectively provided with pins 20 and 20^a projecting on opposite sides of said lever arm.

As a result of this construction, when the tank is empty, the various parts are in the positions shown in Figs. 1 and 2, with the weighted arm 10 in engagement with the stop 13^a; the valve in engagement with and closing the upper end of the outlet pipe 2 and the float in its lowest position. As liquid is admitted to the tank from any de-

sired source of supply, the float 18 gradually rises, until slightly before the level of the liquid has reached a predetermined height in said tank, the pin 20^a of the float rod 12 engages the lever arm 11 so that the rise of the float turns the lever 9 upon the spindle 8. This turning has but to continue through a relatively small angle in order to cause the weighted arm 10 to pass beyond its dead center line, after which the action of gravity upon the weight 14 causes this latter to quickly and forcibly continue the movement of the lever independently of the float until it engages the stop 13, thereby bringing the arm 11 into engagement with the abutment on the valve rod 5 and forcibly lifting the valve 3 from its seat. As soon as this lifting occurs the valve with its rod floats upwardly independently of the lever arm. The liquid in the tank is thereafter rapidly discharged through the pipe 2 and the weight of the float and its attached parts is such that as the level of the liquid falls, it gradually turns the lever 9 on its spindle 8 through the medium of the pin 20 until the weight 14 finally passes to the left of its dead center line and falls into engagement with the stop 13^a. This movement lowers the end of the lever arm 11 to an extent sufficient to permit the valve 3 to again seat itself, after which the tank is again filled by the constantly admitted liquid and the above cycle of operations is repeated.

From the above it will be noted that although there are but few parts to the device, its operation is practically certain, the mass of the weight 14 being capable of raising the float valve off of the end of the discharge pipe 2 against the downward pressure of the liquid in the tank under all conditions found in operation.

I claim;—

The combination with a container having an outlet pipe and a float valve placed to control the flow of liquid thereto; an upwardly extending rod connected to said valve and provided with an abutment at its upper end; a bracket having a spindle and provided with two stops of which one is nearer a vertical line drawn through said spindle than the other; a lever having a slotted arm for the reception of the rod and also provided with a weighted arm extending upwardly between the two stops on the bracket; a float rod also mounted on the spindle of the bracket and provided with a transverse member having two pins each capable of engaging the slotted arm of the lever; and a float fixed to said rod.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

CHARLES M. MOORE.

Witnesses:

WILLIAM E. BRADLEY,
WM. A. BARR.

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