

(No Model.)

G. T. VOORHEES. FLUID TANK.

No. 512,416.

Patented Jan. 9, 1894.

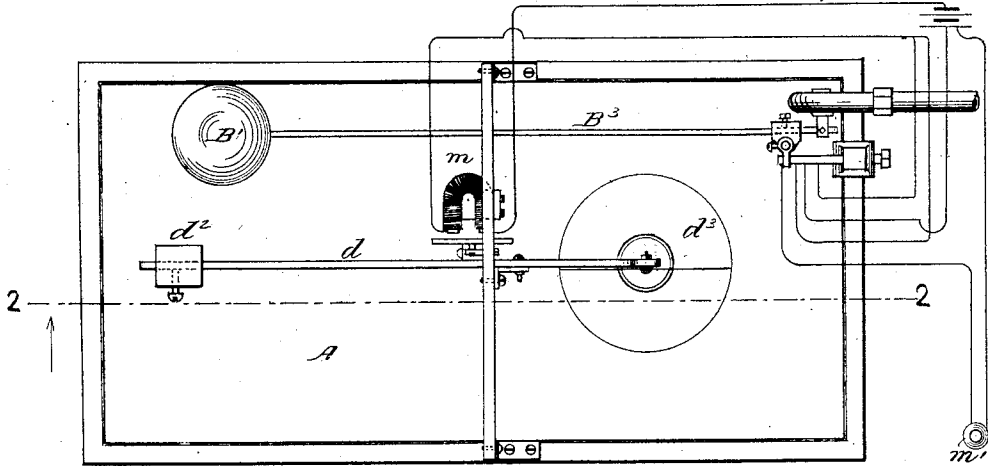


Fig. 1.

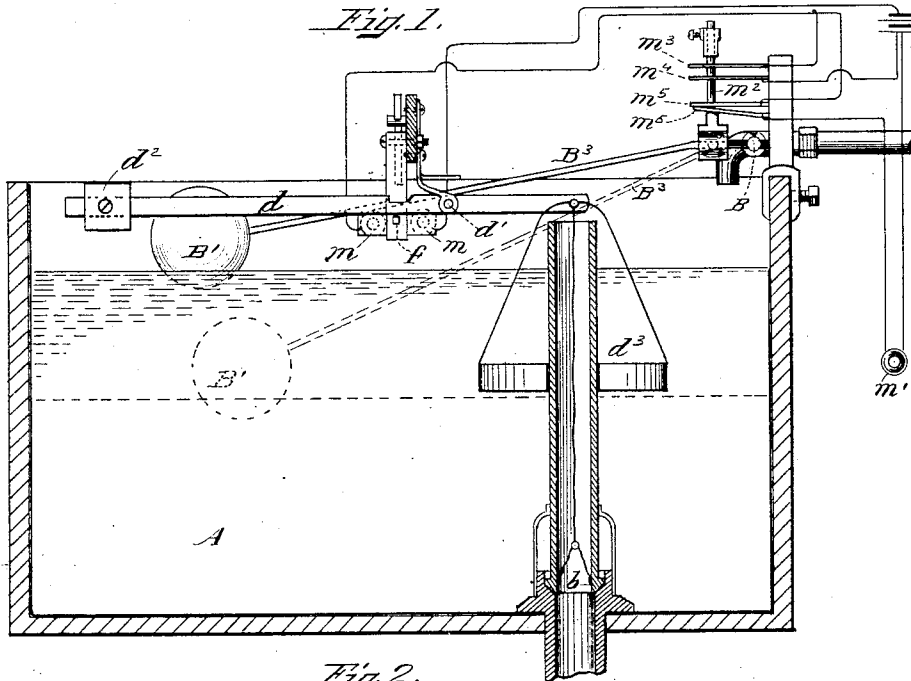


Fig. 2.

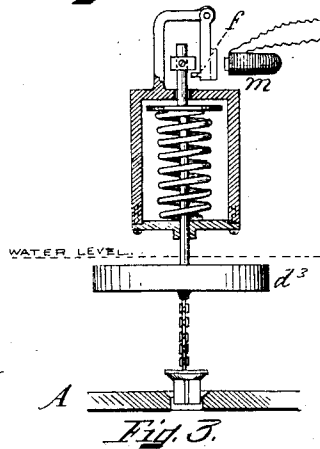


Fig. 3.

Witnesses:
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UNITED STATES PATENT OFFICE.

GARDNER TUFFTS VOORHEES, OF BOSTON, MASSACHUSETTS, ASSIGNOR, BY
MESNE ASSIGNMENTS, TO THE VOORHEES ELECTRIC COMPANY, OF SAME
PLACE.

FLUID-TANK.

SPECIFICATION forming part of Letters Patent No. 512,416, dated January 9, 1894.

Application filed July 18, 1892. Serial No. 440,317. (No model.)

To all whom it may concern:

Be it known that I, GARDNER TUFFTS VOORHEES, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Fluid-Tanks, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to the control of the outlet-valve and consists in a valve held by a catch in one position but when released moved into the other position, and again held by the catch.

The principle of my invention is that if the outlet-valve be closed by a float or a weight counterbalanced to act as a float which is held in the closed position by a catch, and if fluid be then admitted to the tank until the weight or float is immersed wholly or partially, and the catch be then released the valve will be opened, and the float will be again caught by the catch and held in its new position until the fluid level falls to the desired amount, when the catch will be again released and the float being no longer immersed will fall and the valve will close and the float will be again caught by the catch, and held in its first position until the catch is again released.

Of the many forms in which my invention may be embodied those shown in the drawings are on the whole preferable to any other; but as my invention is the combination of a tank and its outlet valve with a catch, on the principle above described, it will be obvious that it may be embodied in a great variety of forms either of which may be preferable according to circumstances. The term "float" is usually applied to a body lighter than its bulk of a liquid; but a body heavier than its bulk of liquid will also be a float if counterbalanced sufficiently, both forms being shown in the drawings.

In the drawings: Figure 1 is a top plan of a tank provided with one form of my invention in which the float is counterbalanced by a weight; Fig. 2 a sectional view of the same on line 2—2 of Fig. 1; Fig. 3 a detail showing the substitution of a spring for the weight.

In Figs. 1, 2 and 3 illustrating one form of my invention, the tank A is of any suitable

construction with a suitable outlet valve, *b*. The lever *d*, fulcrumed at *d'*, opens valve *b* when weight *d²* overbalances weight *d³*; but closes valve *b* when weight *d³* overbalances weight *d²*; and when weight *d³* is immersed, the water tends to float it and weight *d²* is therefore sufficient to overbalance it; but when weight *d³* is not immersed it is sufficient to overbalance weight *d²*; for it is no longer supported in part by the water.

When in position shown in the drawings the parts are held by catch *f*; but when catch *f* is moved, (by magnet *m* or otherwise) the weight *d³* moves downward, its gravity and the floating effect of the liquid raising weight *d³* and lifting valve *b* from its seat; and fluid flows from the tank. But the motion of lever *d* causes catch *f* to again engage it and hold it in its new position, so that fluid continues to flow from the tank until catch *f* is again released; and if catch *f* be released after the fluid level has fallen low enough, weight *d³*, no longer immersed, will overbalance weight *d²* and move the parts back to their first position, when they will be again caught and held by catch *f*; and valve *b* will be closed. The tank then fills through ball cock B as usual until the fluid level is again restored, when the apparatus is again ready for operation. A spring may be used in lieu of weight *d²* as indicated in Fig. 3, where the spring *d²* is strong enough to cause weight *d³* to act as a float when immersed; but as soon as the level of liquid in the tank falls, weight *d³* will, when catch *f* is released, overcome spring *d²* (just as it overcomes weight *d²* in Figs. 1 and 2,) and close valve *b*. But when the fluid level rises and weight *d³* is immersed, the force of spring *d²* is sufficient, when catch *f* is released, to cause weight *d³* to act as a float and open valve *b*.

In many cases it is desirable that an electric contact should operate the apparatus; and for this reason I have shown catch *f* as controlled by magnet *m*, so that when contact is made as by push button *m'*, the magnet *m* is energized and releases catch *f* when float *d³* opens valve *b*, and catch *f* engages and holds the parts in position with valve *b* open. As the fluid level falls in the tank the ball of

ball-cock B falls with it; and—in the form shown in Figs. 1 and 2,—at the proper time the arm m^2 on the rod of ball-cock B makes the circuit through electrodes $m^3 m^4$, which again releases catch f ; and weight d^3 then moves to close valve b , and catch f engages and holds the parts in position with valve b closed.

As a matter of precaution I use electrodes $m^5 m^6$ which are in contact only when the ball of ball-cock B is in position to close the ball-cock, that is when the tank is as full as it is desired; for it is impossible to close the circuit by push button m' except when the circuit is also closed through electrodes $m^5 m^6$; and it is not desirable that catch f should be operated by push-button m' except when the tank is full.

For the weight d^3 , (Figs. 1 and 2) I prefer to use a vessel of sheet metal filled with water, as this gives the maximum difference between the effect of the weight when immersed, and when not immersed.

What I claim as my invention is—

1. In combination, a tank; its outlet valve; a float controlling the valve; a double catch

adapted to hold the float in its lower position with the valve closed and also to hold the float in its upper position with the valve open; and means for moving the catch to open the valve and moving it to close the valve, substantially as described.

2. In combination, a tank; its outlet valve; a float actuating the valve; a double catch adapted to hold the float in its upper and lower positions; a magnet and an electric circuit for operating the catch as and for the purposes set forth.

3. In combination, a tank; its outlet valve; a float controlling the valve; a double catch adapted to hold the float down to close the valve and to hold it up to keep the valve open; a magnet; an electric circuit to release the catch and open the valve another circuit a ball cock and a movable electrode operated by the ball cock to release the catch and close the valve, substantially as described.

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Witnesses:

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