G. E. LOEBLE.

FLOAT VALVE.

APPLICATION FILED JUNE 7, 1907.

916,735. Patented Mar. 30, 1909.

Fig. 1.

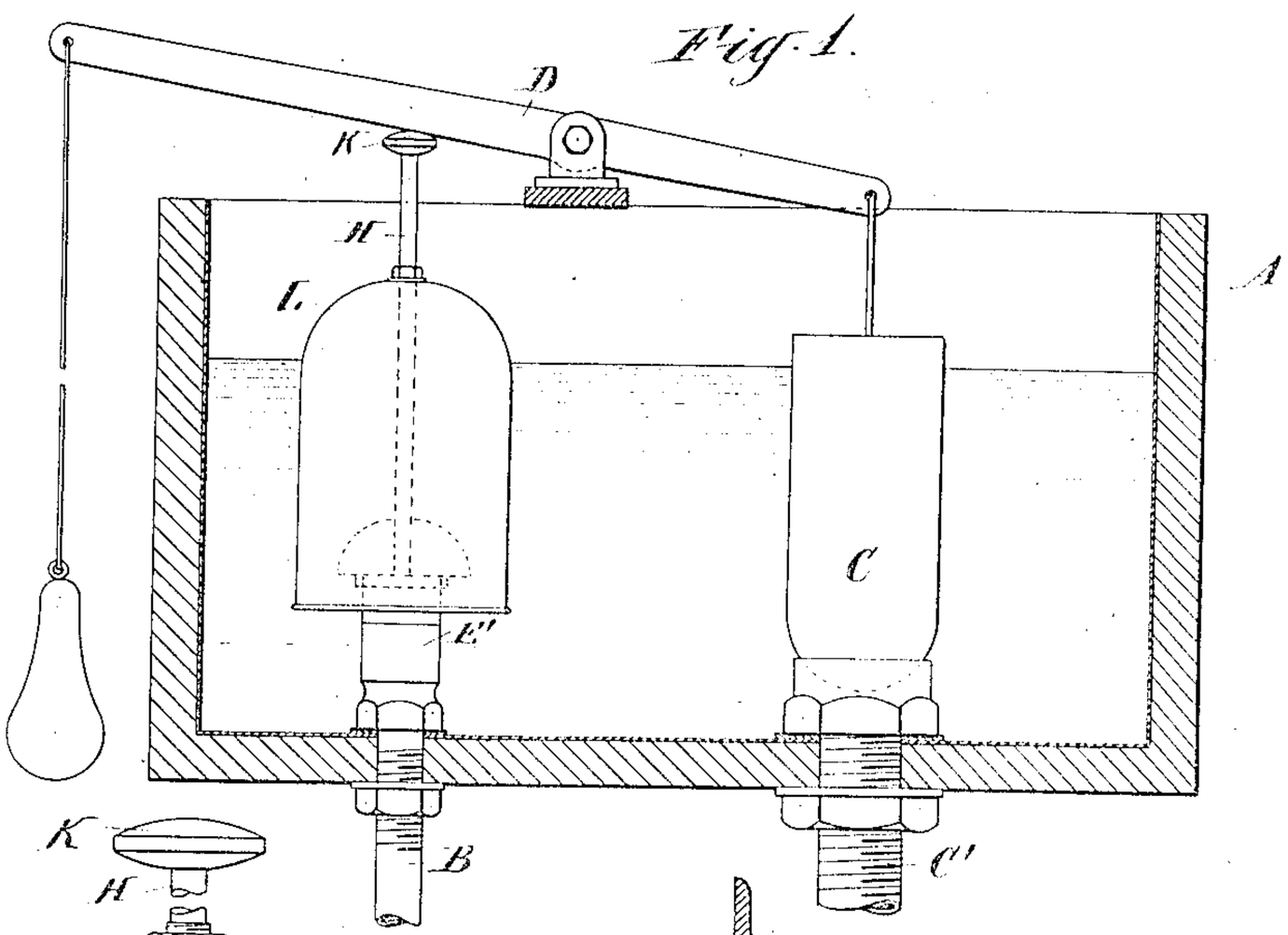


Fig. 2.

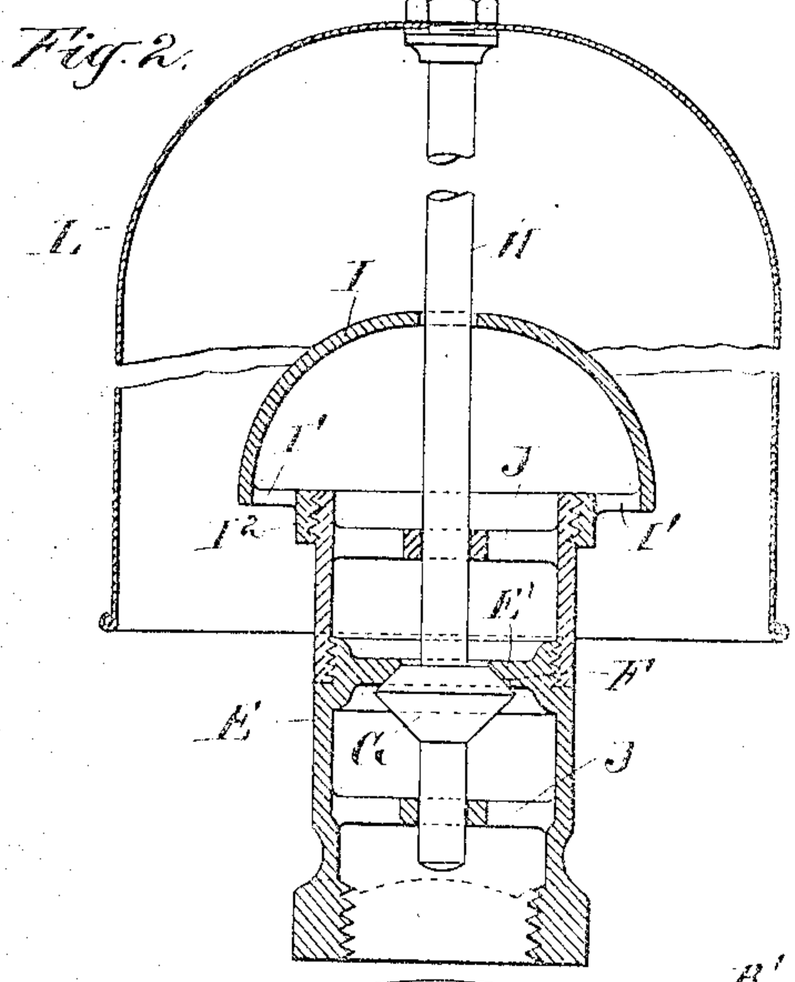


Fig. 3.

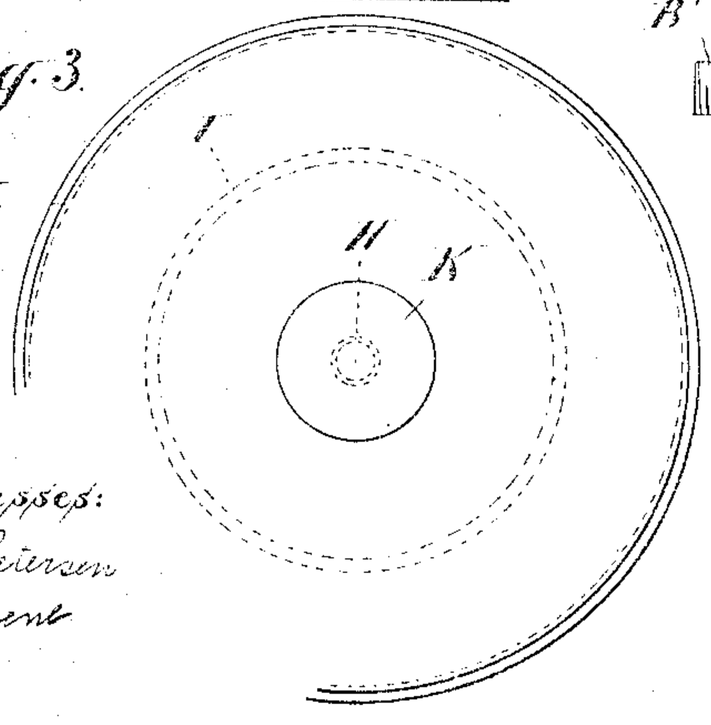


Fig. 5.

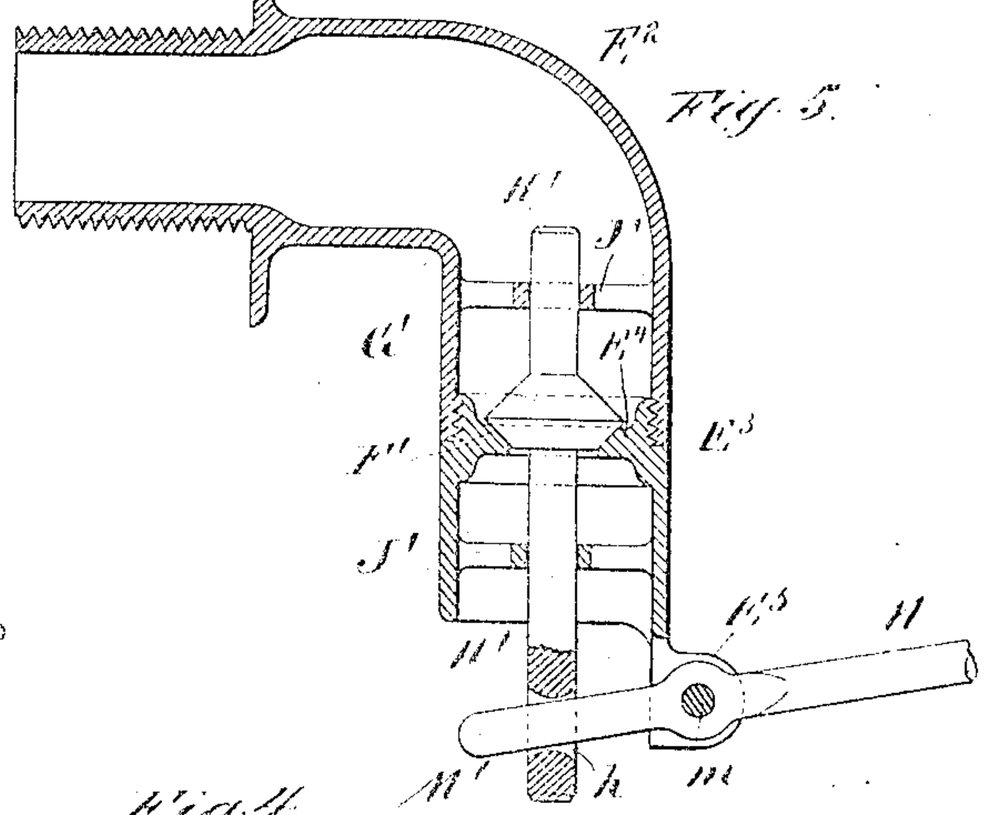
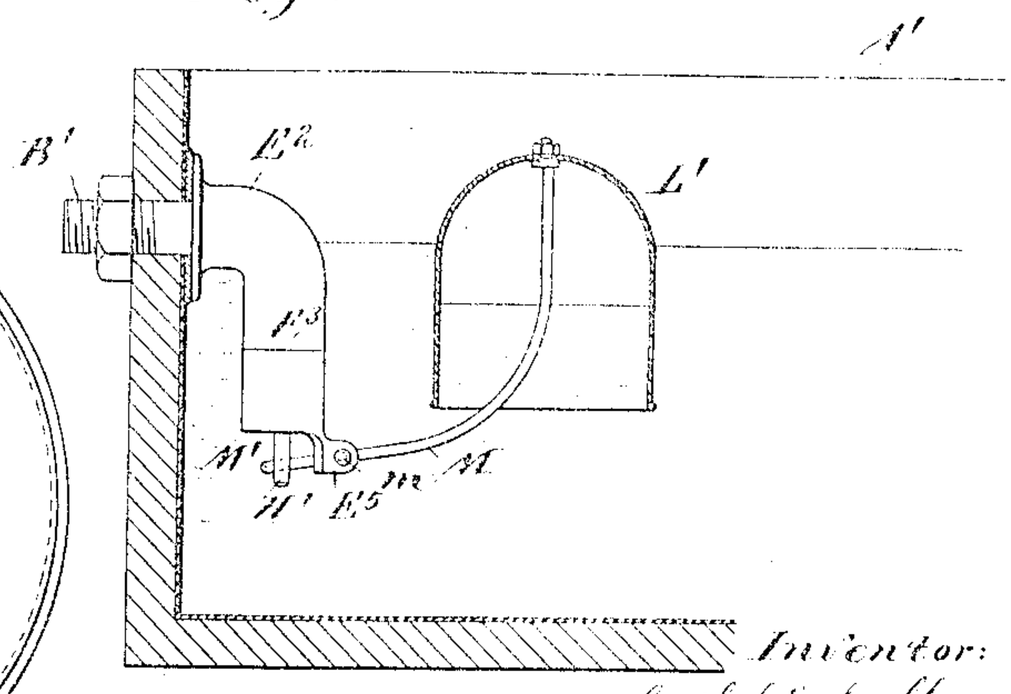


Fig. 4.



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UNITED STATES PATENT OFFICE.

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FLOAT-VALVE.

No. 916,735. Specification of Letters Patent. Patented March 30, 1909.

Application filed June 7, 1907. Serial No. 377,682.

To all whom it may concern:

Be it known that I, GOTTLOB E. LOEBLE, a citizen of the United States, residing in the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Float-Valves, of which the following is a specification.

The invention relates to self-closing valves of the ball-cock class, and its object is to provide a simple, inexpensive valve with a closing-float, which shall be positive in operation and not liable to derangement.

The invention consists in certain novel features and details of construction by which the above objects are attained, to be hereinafter described.

The accompanying drawings form a part of this specification and show the invention as applied to flushing-tanks.

Figure 1 is a vertical section through a tank, showing the valve-casing and its connected parts in elevation. In this form the water supply enters through the bottom of the tank. Fig. 2 is a corresponding section through the valve-casing and float, on a larger scale. Fig. 3 is a plan view of the float. Fig. 4 is a section through a portion of a flushing-tank, on the same scale as Fig. 1, showing the invention adapted for service with a supply-pipe entering the side of the tank. The float is shown in section, with the valve-casing in elevation. Fig. 5 is a vertical section, partly in elevation, showing on a larger scale the valve in the preceding figure.

Similar letters of reference indicate like parts in all the figures.

Referring to Figs. 1, 2 and 3, A is the tank adapted to receive water through a supply-pipe B at the bottom and deliver it through a flushing-valve C and flushing-pipe C^1, operated by a lever D fulcrumed on a bar extending across the tank, all of which may be of any ordinary or approved construction. The valve controlling the inlet comprises a casing E within the tank, screwed upon the end of the pipe B and having a horizontal diaphragm E^1 on the lower face of which is a valve-seat F receiving a conical valve G on a vertically movable valve-stem H guided in spiders J above and below the diaphragm E^1. The upper or delivery end of the casing E is open to allow water to flow freely therethrough when the valve is depressed, and is covered by a dome-shaped hood or deflector I attached by arms I^1 to a screw-threaded ring I^2 screwed on the upper end of the casing, serving to intercept the vertical jet therefrom and deflect the water downward toward the bottom of the tank. The valve-stem H extends loosely through the deflector I and is continued vertically upward, terminating in a head or disk K immediately below the long arm of the lever D and arranged to be struck and forced downward thereby to open the valve by the act of raising the flushing-valve C. On the valve-stem, above the deflector, inclosing the latter and a portion of the casing E, is secured the float L which is in the form of an inverted cup closed at the top, through which the valve-stem extends axially, and open at the bottom. It is so located relatively to the valve and tank as to rise and lift the valve, and shut off the supply when the water level has risen to the height in the tank to which the float has been set.

Assuming the tank to contain a supply of water, a downward pull on the long arm of the lever D lifts the flushing-valve C and permits the water to escape through the flushing-pipe C^1 until the lever is released and the flushing-valve reseated by gravity; the same downward movement of the lever-arm depresses the valve G in opposition to the pressure in the pipe B and permits water therefrom to flow past the valve into the now empty tank. The valve is held in the open condition by its gravity and that of the float and valve-stem, and the flow continues until the water level rises sufficiently to imprison a volume of air in the open-mouthed float and the displacement thus produced raises the float and lifts the valve to its seat, the closing movement being aided by the current of water flowing past the valve in the direction to close it. When the valve is thus closed it is held to its seat by the water pressure until the valve-stem is again forced downward.

The action is similar in the arrangement shown in Figs. 4 and 5. In these figures the supply-pipe B^1 is at the side of the tank A^1 and joins a valve-casing E^2 having a downwardly projecting portion E^3 having a diaphragm E^4. The valve-seat F^1 is on the upper face of the diaphragm. In this form the pressure side, and the valve G^1 opens upwardly. Guides J^1 receive the valve-stem

H^1 and the lower end of the latter is slotted as at *h* to receive the end M^1 of a lever M fulcrumed at *m* to a downwardly extending lug E^5 on the valve-casing E^3. On the lever M is a float L^1 similar to the float above described. The action is the same as in the first form excepting the valve is lifted from its seat by the gravity of the float L^1 acting through the lever M instead of being acted upon by the flushing lever. Water flowing past the valve G^1 gradually fills the tank until the float L^1 rises and draws the valve downward, in the direction of the flow, to its seat on which it is held as before by the service pressure until overcome by the gravity of the float L^1 as the latter descends.

In both forms the valve is seated in the direction of the current, and is held in the closed condition by the water pressure, thus avoiding danger of leak and obviating the use of stuffing-boxes or like devices, and the cup-shaped float reduces the expense and annoyance attending the employment of the usual water-tight ball.

Especial importance is attached to the form shown in Figs. 1, 2, and 3 on account of its simplicity. The direct attachment of the float concentrically to the valve-stem reduces the number of parts, and lessens the expense of manufacture; this construction also effects a considerable saving in space, thus permitting the valve to be installed and operated successfully in narrow quarters.

I claim:—

1. In a float valve device, a tank, a casing therein mounted upon the supply pipe and having therein a horizontal diaphragm with a valve seat on its under side, a vertically movable valve stem, guides therefor above and below the diaphragm, a conical valve on said stem, the upper end of said casing being open, a dome-shaped hood supported from the upper end of said casing and having a central opening through which the valve stem passes, and a float supported on said stem, concentric with said hood, with its lower end extended below the lower edge of the hood and forming an air chamber around the hood and between the same and the wall of the float both above and below said hood.

2. In a float valve device, a tank, a casing therein mounted upon the supply pipe and having therein a horizontal diaphragm with a valve seat on its under side, a vertically movable valve stem, guides therefor above and below the diaphragm, a conical valve on said stem, the upper end of said casing being open, a dome-shaped hood supported from the upper end of said casing and having a central opening through which the valve stem passes, and a float supported on said stem, concentric with said hood, with its lower end extended below the lower edge of the hood and forming an air chamber around the hood and between the same and the wall of the float both above and below said hood, said casing being formed of detachable parts and the hood being vertically adjustable on the uppermost of said parts.

3. In a float valve device, a tank, a casing therein mounted upon the supply pipe and having therein a horizontal diaphragm with a valve seat on its under side, a vertically movable valve stem, guides therefor above and below the diaphragm, a conical valve on said stem, the upper end of said casing being open, a dome-shaped hood supported from the upper end of said casing and having a central opening through which the valve stem passes, and a float supported on said stem, concentric with said hood, with its lower end extended below the lower edge of the hood and forming an air chamber around the hood and between the same and the wall of the float both above and below said hood, said hood being detachably secured upon the upper end of the casing and said float being directly attached to the valve stem and concentric therewith.

In testimony that I claim the invention above set forth I affix my signature, in presence of two witnesses.

GOTTLOB E. LOEBLE.

Witnesses:

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