

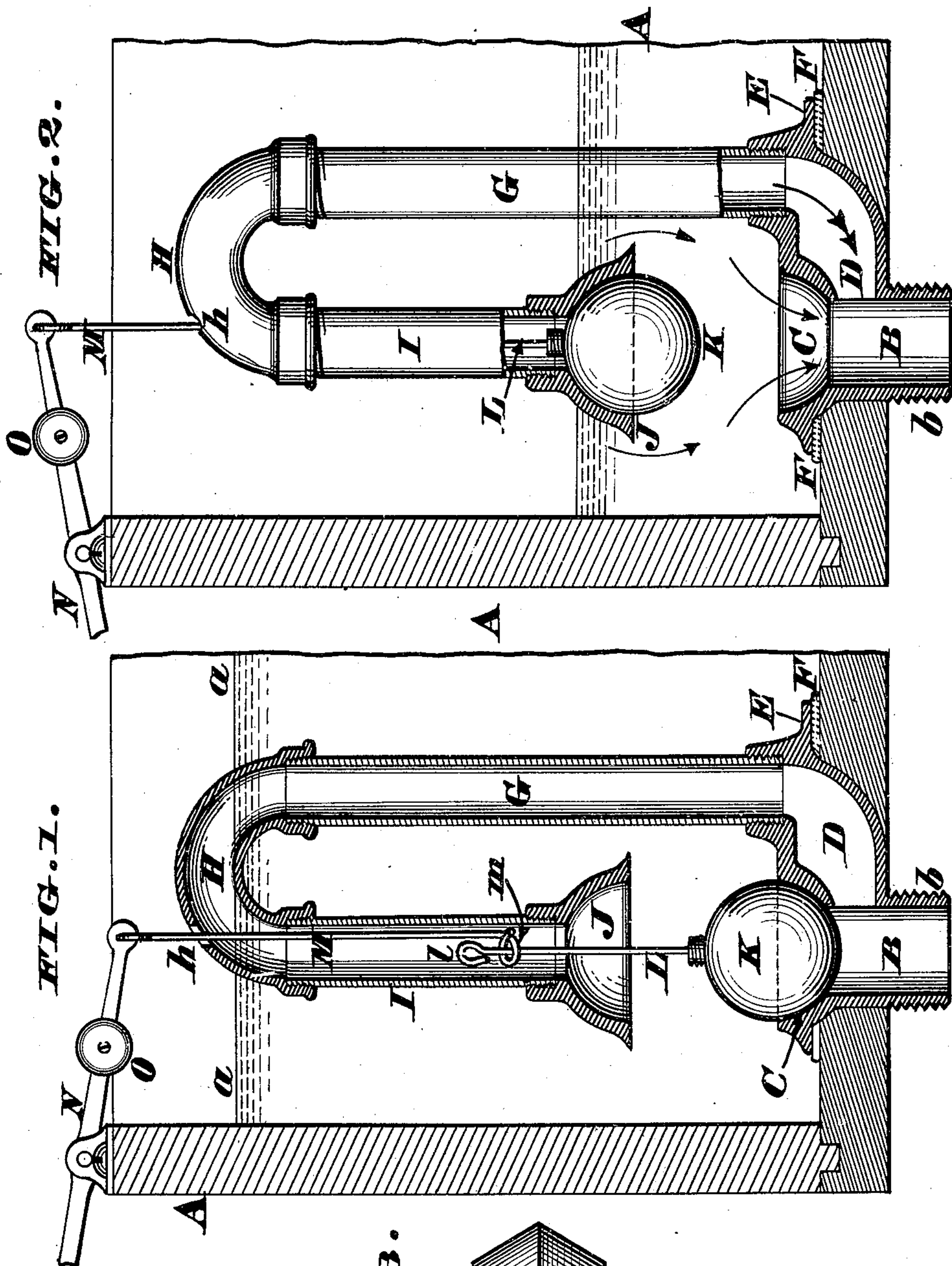
No. 629,464.

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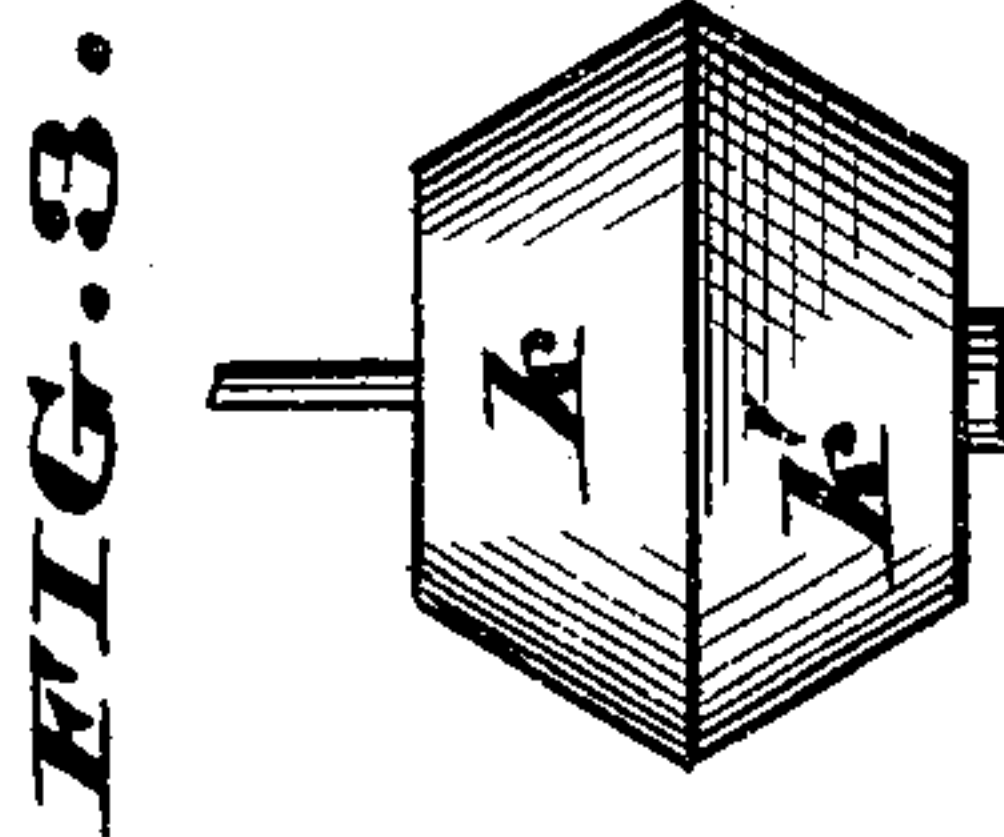
R. M. PAUL.
OUTLET VALVE FOR WATER TANKS.

(Application filed Feb. 18, 1899.)

(No Model.)



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UNITED STATES PATENT OFFICE.

ROBERT M. PAUL, OF NEWPORT, KENTUCKY.

OUTLET-VALVE FOR WATER-TANKS.

SPECIFICATION forming part of Letters Patent No. 629,464, dated July 25, 1899.

Application filed February 18, 1899. Serial No. 706,019. (No model.)

To all whom it may concern:

Be it known that I, ROBERT M. PAUL, a citizen of the United States, residing at Newport, in the county of Campbell and State of Kentucky, have invented certain new and useful Improvements in Outlet-Valves for Water-Tanks; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, which form a part of this specification.

My invention comprises a peculiar construction of outlet-valve for water-tanks generally, although the device has been designed more especially for application to those elevated cisterns used for flushing out water-closet basins. The object of said construction is to afford an unusually free and unobstructed passage for the escape of water the instant the valve proper is raised from off its seat and to utilize the "suction" produced by this discharging current to retain said valve in its open elevated position, as hereinafter more fully described.

In the annexed drawings, Figure 1 is a vertical section showing my outlet-valve in its normal or closed position. Fig. 2 is a sectionized elevation showing said valve in its elevated or wide-open position. Fig. 3 is a modification of the valve proper.

A represents a water-tank or cistern, and B is an outlet-tube projecting through its bottom and screw-threaded at *b* to permit the ready coupling to said tube of a pipe leading down to a water-closet basin or other place of discharge. This tube is preferably integral with a concave or dished valve-seat C, and below this seat is a lateral branch D. Again, this casting B C D has a horizontal flange E, resting upon a gasket or packing F, to prevent leakage from the tank A.

Coupled to the upper end of the lateral branch D is a vertical pipe G, united by a return-bend H to another, but somewhat shorter, vertical pipe I, having at its lower end a downwardly-flaring hood or bell J, the axis of this pipe I being in line with the axis of the outlet B. This hood is also a casting and is larger in diameter than the buoyant valve K, the latter being preferably an india-rubber sphere or ball capable of fitting snugly in the seat C. Furthermore, this valve is car-

ried by a stem L, which stem after being passed through a loop *m* of rod M has a stop *l* on its upper end, by which arrangement said stem is loosely coupled to a lever N, carrying a counterbalance O. Rod M works freely through a perforation *h* in the upper side of the return-bend H, no packing nor stuffing-box being required at this opening, because the admission of air or water within said bend is so limited that it does not in the least interfere with the prompt and thorough operation of the valve.

When the tank A is filled about to the level indicated at *a* in Fig. 1, the water-pressure forces the valve K down snugly within the concave seat C, and thereby prevents any escape of the fluid contents of said tank at its outlet B. As soon, however, as the valve K is raised from off its seat by any means whatever a discharge takes place through the communicating passages C B, as indicated by the single-headed arrows in Fig. 2. It is necessary to raise the valve a limited distance only, and then its buoyancy causes it to ascend and fit snugly within the bell or hood J, where it is retained by the suction produced by the column of water descending the pipe G and branch D, which discharge is indicated by the double-headed arrow. When the valve is thus elevated, the overhanging hood J screens it from the vortex produced by the water rushing down to the outlet C B. Therefore there will be no danger of the valve K dropping until the tank is almost empty, and then it gradually and automatically seats itself within the bearing C and independently of any action of the lever N. Again, as said valve is free to rotate around the stem L, a fresh surface is brought to bear against the seat C every time said valve is operated, and therefore its wear and tear are reduced to a minimum. Furthermore, it will be noticed there are no bars projecting up from the seat C to guide the ball K in a vertical path, which form of inclosing cage is found in a number of water-closet tanks and is objectionable, because such cages wear the valves when they are deflected from side to side by lateral currents in the discharging water; but another and a greater objection is the impediment or resistance these bars offer to the free and direct escape of water when the valve

is raised from off its seat. Consequently by dispensing with such obstructing bars I secure an unusually free outlet, reduce the diameter of the discharge-tube, and thus effect
5 a corresponding decrease in the cost of manufacture. Finally, the valve may be operated by any of the automatic appliances well known to plumbers, and in some cases it may take the shape of a double cone $k\ k'$. (Shown
10 in Fig. 3.)

I claim as my invention—

The combination, in an outlet for water-tanks, of the discharge-tube B, having a concave seat C, at top; the lateral branch D, communicating with said tube below its seat; the
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vertical pipe G, attached to said branch D; a shorter vertical pipe I, axially in line with said tube B, and having a concave hood J at its lower end; a perforated connection H, h uniting the upper ends of said pipes G, I; and 20 a buoyant valve K, having a stem M, traversing said perforation h , pipe I and hood J, in the manner described, and for the purpose stated.

In testimony whereof I affix my signature 25 in presence of two witnesses.

ROBERT M. PAUL.

Witnesses:

JAMES H. LAYMAN,
JOHN C. ROGERS.