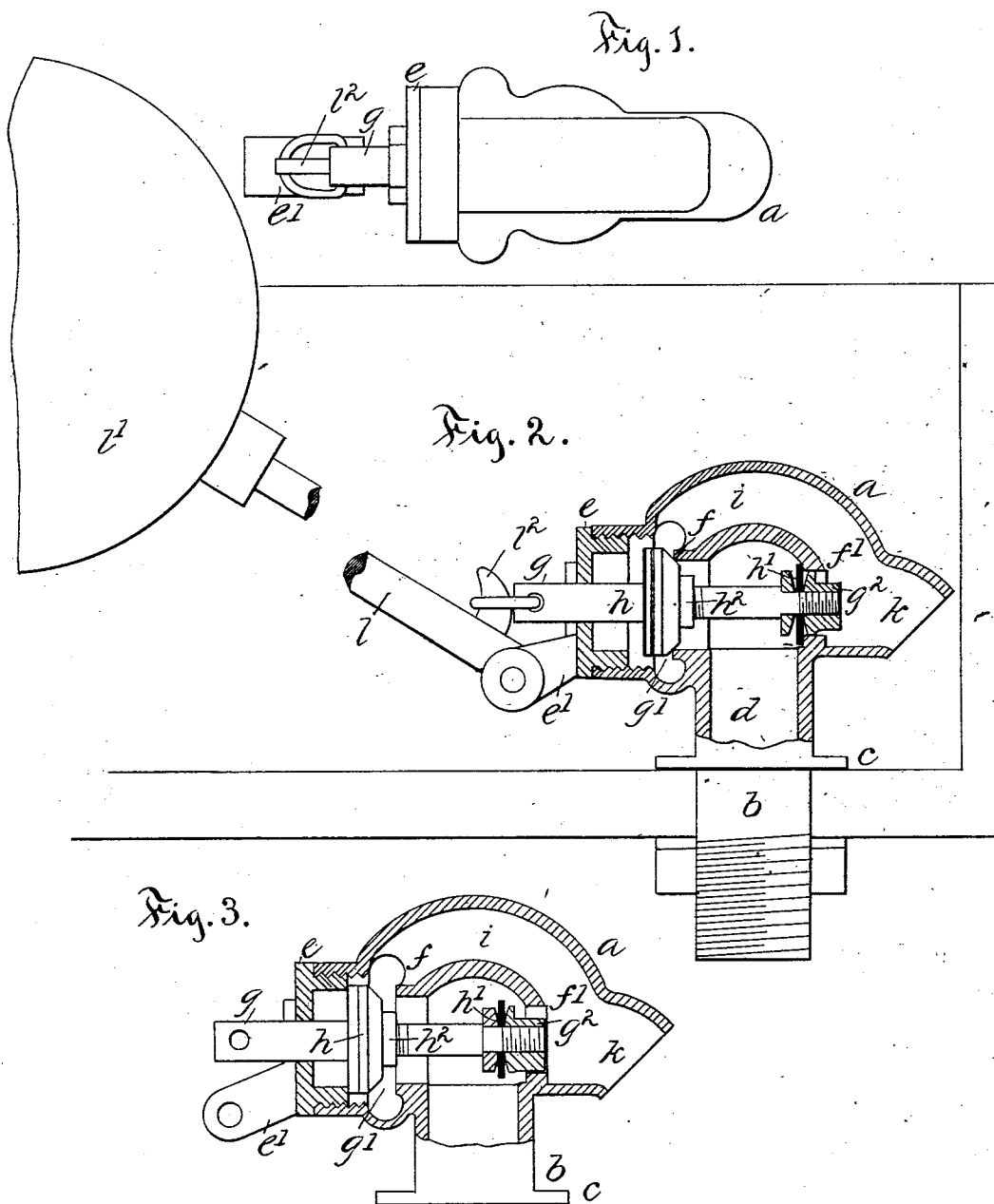


(No Model.)

C. F. SCHUMACHER.
FLUSH TANK VALVE.

No. 573,540.

Patented Dec. 22, 1896.



Witnesses:

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Inventor

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UNITED STATES PATENT OFFICE.

CHARLES F. SCHUMACHER, OF HARTFORD, CONNECTICUT.

FLUSH-TANK VALVE.

SPECIFICATION forming part of Letters Patent No. 573,540, dated December 22, 1896.

Application filed March 15, 1895. Serial No. 541,932. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. SCHUMACHER, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Flush-Tank Valves, of which the following is a full, clear, and exact description, whereby any one skilled in the art can make and use the same.

The object of my invention is to provide a valve which shall be particularly adapted for use in a flush-tank and is easily operated, as by means of a ball and lever, the valve being comparatively simple and cheap in construction and efficient in operation as compared with valves of the prior art.

To this end my invention consists in the details of the several parts making up the valve as a whole, and in the combination of such parts, as hereinafter described, and pointed out in the claims.

Referring to the drawings, Figure 1 is a detail plan view of the valve with the lever omitted. Fig. 2 is a detail view in vertical central section through the valve shown in place in a flush-tank, the valve being closed. Fig. 3 is a detail view, in vertical central section, of the valve opened.

In the accompanying drawings the letter *a* denotes the valve shell or body, which is preferably made of metal cast to shape, and has the tubular part *b* below the shoulder *c* threaded for the reception of a nut or union and serving as a means of securing the valve in position in a tank or other structure.

The inner end of the inlet *d* within the valve-body is closed, except on opposite sides, where ports *f* and *f'* are formed through the walls of the chamber in a line preferably at right angles to the axis of the inlet. On one side of the valve-shell and in line with the ports described there is an opening into which a cap *e* is fitted and secured by interengaging threads on the respective parts. This cap supports a valve-stem *g*, which extends into the shell across the head of the inlet and through the port *f'*, in which opening it is operatively supported. On the valve-stem are secured the valves *h* and *h'*. The valve *h* is the larger and is secured to the stem near the cap and in a valve-chamber *g'* between the inner surface of the cap and the wall of the

inlet. This valve is preferably secured in place by screwing it onto a threaded portion of the stem and following it up with a lock-nut *h²*. The valve *h* is preferably provided with a packing of softer material than metal and is preferably beveled to fit the tapered surface of the valve-seat. From the port *f* a communication is established with a fluid-way *i*, which surrounds the inner end of the inlet on one side, and the end communicates with the opposite outlet *k* on the opposite side of the valve-body from the cap, as the parts are arranged in the sample valves herein described.

Near the inner end of the valve-stem and in position to register with the port *f'* is secured a valve between a shoulder on the stem and a nut, the valve being located within the inlet, while the other valve *h* is arranged outside of the inlet. This valve *h'* is of flexible material, as leather or india-rubber or composition, the edge of the valve extending beyond the periphery of the clamping-nuts and lying flat upon the valve-seat. The nut *g²* on the inner end of the valve-stem *g* fits quite closely in the port *f'*, and the edge of the flexible valve *h'* overhangs the nut and lies on the valve-seat, the back of this annular valve being exposed to the pressure of the water and by its flexibility being forced into contact with the seat in such manner as to compensate for any slight irregularity of construction and secure a tight joint.

The valve as constructed is so nearly balanced as to operate under great degrees of pressure with the exertion of a comparatively small force, a small-sized ball on the end of the lever *l* being sufficient to operate the valve.

To the arm *e'* on the cap *e* is pivotally attached the ball-lever *l*, on the outer end of which the ball *l'* is secured, and the valve-stem *g* is connected to the lever *l* by means of a link attached to the stem and to a hook-shaped arm *l²* on the lever. The valve is operated in the usual manner by the rising-and-falling motion of the water in the tank, which moves the lever and through it the connected valve-stem to open or close the valve, as the case may be.

An important feature of my improvement resides in the peculiar form of flexible annular valve which, used in connection with the

larger valve on the valve-stem, enables both ports through the walls of the inlet to be tightly closed without requiring extreme care in workmanship or exact fitting of parts. The outer end of the nut g^2 , which extends through the port f' , is cut away, so as to provide space for the free flow of water and yet leave enough surface for bearings to enable the nut to fulfil its function as a guide.

The clamping parts, which support the flexible valve h , are preferably beveled or rounded on their clamping-faces, so as to provide a greater freedom of movement of that portion of the valve which extends beyond the clamp and overlies the valve-seat. It is to be noted that the outlets from this valve are of different sizes, which would under ordinary circumstances preclude the idea of a balanced valve; but by constructing a tortuous passage around the head of the chamber from the larger outlet the force of the current is so reduced as to make a balanced valve while the parts are in operation. As before stated, it is so nearly balanced when the valve is closed that but little power is required to open it.

I claim as my invention—

1. In a valve in combination with a shell having an inlet terminating in a chamber arranged within the body of the valve, an outlet arranged transversely of the inlet and at one side thereof, ports opening in opposite directions through walls of the chamber, transversely of the inlet and in line with the outlet, a fluid-way communicating between the outlet and the port located farthest from it and extending around the head of the inlet-chamber to the opposite side thereof, a reciprocating valve-stem bearing valves appurtenant to the respective valve-seats at the opening at the head of the inlet one valve having its under face presented to the inlet and the other valve having its back toward the inlet, the latter valve being annular and flexible and with its upper surface presented to the pressure of the surface of the water within

the inlet and whereby it is forced to its seat, and means for reciprocating the valve-stem, all substantially as described.

2. In combination in a balanced valve, a shell or body part having an inlet terminating in a chamber arranged within the shell, an outlet arranged transversely of the inlet, ports formed transversely of the inlet through opposite walls of the chamber and in line with the outlet and at one side thereof, a communicating passage extending between the outlet and the port farthest away from it and around the head of the inlet-chamber to the opposite side thereof, a reciprocating valve-stem located within the shell and having two valves facing in the same direction one valve lying outside the inlet and the other within it, the latter of flexible material and extending beyond the edges of the clamping parts and adapted to be forced to its seat by pressure of water within the inlet, and means for reciprocating the valve-stem, all substantially as described.

3. In a balanced valve in combination with a shell having an inlet terminating in a chamber arranged within the shell, an outlet from the shell arranged transversely of the inlet, ports oppositely arranged through the walls of the chamber transversely of the inlet and in line with the outlet, a communicating passage between the outlet and the port farthest away from it, a reciprocating valve-stem bearing valves appurtenant to the respective valve-seats at the opening to the head of the inlet, both valves facing in the same direction, the valve within the inlet having flexible edges and held between clamps with beveled clamping-faces, and means for reciprocating the valve-stem, all substantially as described.

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Witnesses:

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