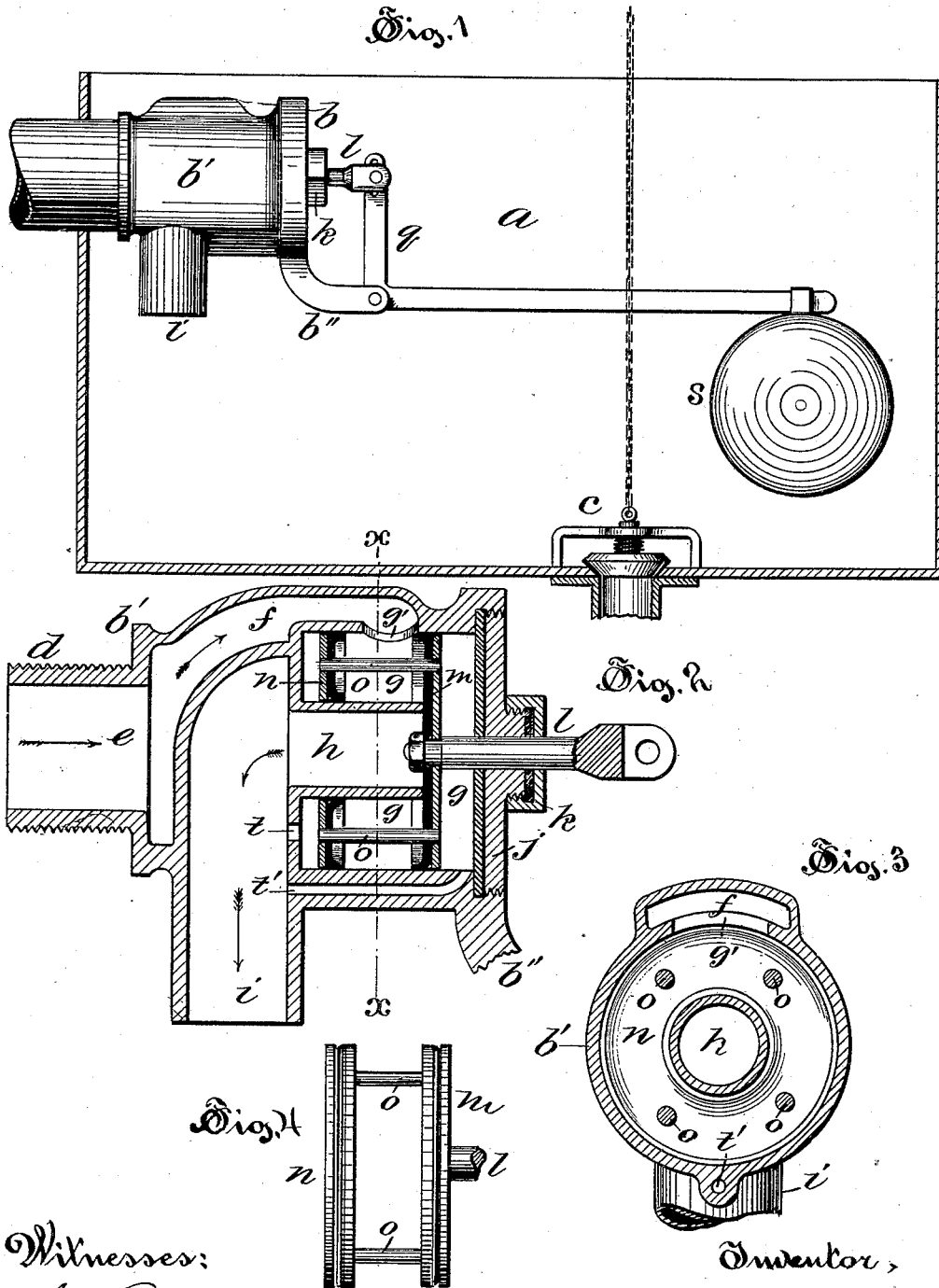


(No Model.)

C. BIRKERY.
VALVE.

No. 423,118.

Patented Mar. 11, 1890.



Witnesses:
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UNITED STATES PATENT OFFICE.

CORNELIUS BIRKERY, OF HARTFORD, CONNECTICUT.

VALVE.

SPECIFICATION forming part of Letters Patent No. 423,118, dated March 11, 1890.

Application filed April 8, 1889. Serial No. 306,323. (No model.)

To all whom it may concern:

Be it known that I, CORNELIUS BIRKERY, of Hartford, Connecticut, have invented certain new and useful Improvements in Valves, of which the following is a specification.

My invention relates to the class of valves used for water-closets and cisterns, which are automatically opened and closed by the varying levels of water in a tank or float-chamber.

The object of the invention is to construct a valve of this class which is so balanced that under widely-differing pressures it will operate easier, surer, and with less hammering than prior valves of this class.

Referring to the accompanying drawings, Figure 1 is a sectional view of a tank, showing the valve in side elevation. Fig. 2 is a view in central longitudinal section of the valve on enlarged scale. Fig. 3 is a cross-section of the valve on plane denoted by the broken line $x x$ of Fig. 2. Fig. 4 is a detail side view of the valve-disks.

In the drawings, a indicates a tank; b , an automatic valve adapted to keep the water in the tank at the desired level, and c an ordinary outlet for emptying the tank of water. The casing b' of the valve is cast to shape with a cylindrical body having a threaded hub d at one end, whereby the valve may be attached to a water-pipe. A channel f is formed from the inlet e through the hub d to the opening g' into the chamber g in the opposite end of the casing. The front end of the cylindrical hub h , which projects into the chamber g , forms the disk-seat, and the opening through this hub leads from the chamber g into the outlet-spout i . The valve-disks m and n are connected together and held with a space between them by rods o , the outside diameter of these disks being equal to the diameter of the chamber g . The disk m extends entirely across the chamber. Its packing makes a water-tight joint with the walls of the chamber, and when it moves up and seats itself against the front end of the hub h the passage of water through the valve is stopped, while the disk n has a central opening which fits the hub h , the packing of this disk making a water-tight joint with the walls of the chamber g , also with the hub h . A spindle l is secured to the disk m , and after extending through the cap j and stuffing-box

k terminates in a fork, between which the end of a bent lever q is held by a pin that passes through the arms of the fork and a slot in the end of the lever.

The lever q is preferably pivoted at its bend to an arm b'' , projecting from the casing, and bears on its outer end a float s , which has a movement along the lever to determine its rise and fall, and consequently adjust the opening and closing of the valve as the level of the water in the tank changes. t is an escape for any water that leaks back of the packing of the disk n , and t' is an escape for water which leaks past the packing of the disk m . These small openings t and t' also permit air to slowly enter into or escape out of the chambers back of the disks, so that air-cushions are formed which retard the movement of the disks and prevent them from any quick and jerky movement in opening or closing, thus preventing water-hammer.

Water entering the passage e traverses the channel f through the opening g' into the chamber g , between the disks m and n . When water is drawn from the tank and the float drops, the disk m is pulled away from its seat against the end of the hub h , and water passes through the hub h and spout i into the tank until the float is raised sufficiently to force the disk m against its seat. It will be noticed that the water-pressure upon the disks m and n is in opposite directions, which so balances the pressure that the disks are easily moved, but a few ounces of weight are required to open the valve, and but a small float is necessary to close it, which operations, also on account of this balancing, are free from the usual hammering. Another advantage resides in the fact that the disks move in closing in the direction of the departing water, and dirt and grit will not become caught between the disk m and its seat, the balancing of the disks and the air-cushions back of them making the disks move slowly in closing and allow the escaping water to draw away any sediment liable to be caught between the face of the disk and the end of the hub. This is not so where a valve closes suddenly or is pulled up against the force of the current.

The invention is illustrated and described in connection with a tank, but obviously it can be used in connection with cisterns and

water-closets without departing from the invention.

I claim as my invention—

1. In a valve, a casing having an inlet, a disk-chamber, a hub projecting into the disk-chamber, and an outlet, in combination with a disk-packing and a ring-packing located in the disk-chamber upon opposite sides of the inlet-opening, with an air-chamber back of them, the disk being adapted to close the outlet and the ring to retard the movement of the disk, and means for automatically opening and closing the valve, substantially as specified.

2. In a valve, a casing having an inlet, a channel from the inlet to an opening into the disk-chamber, a hub projecting into the disk-chamber, and an outlet-spout, in combination with a disk adapted to seat itself against the

end of the hub and a ring connected to the disk adapted to slide upon the hub, and a spindle, lever, and float for automatically opening and closing the valve, substantially as specified.

3. A valve-packing consisting of a disk and a ring-piston rigidly connected with a space between them, said disk reciprocating in the disk-chamber of a valve on one side of the inlet and adapted to open and close the outlet, said piston being mounted on the outlet-hub and reciprocating in the disk-chamber on the opposite side of the inlet to regulate the motion of the disk, substantially as specified.

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Witnesses:

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