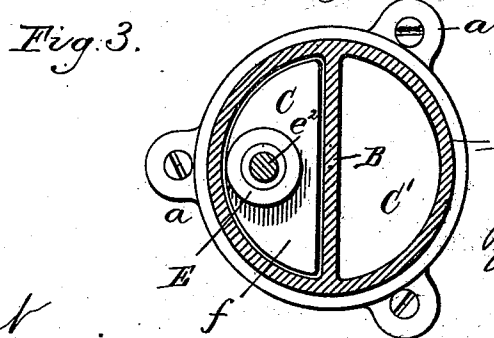
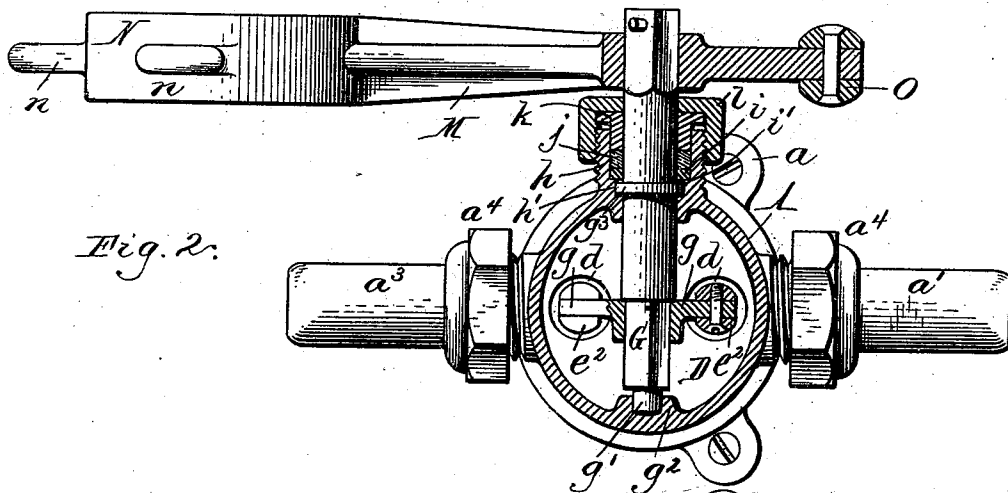
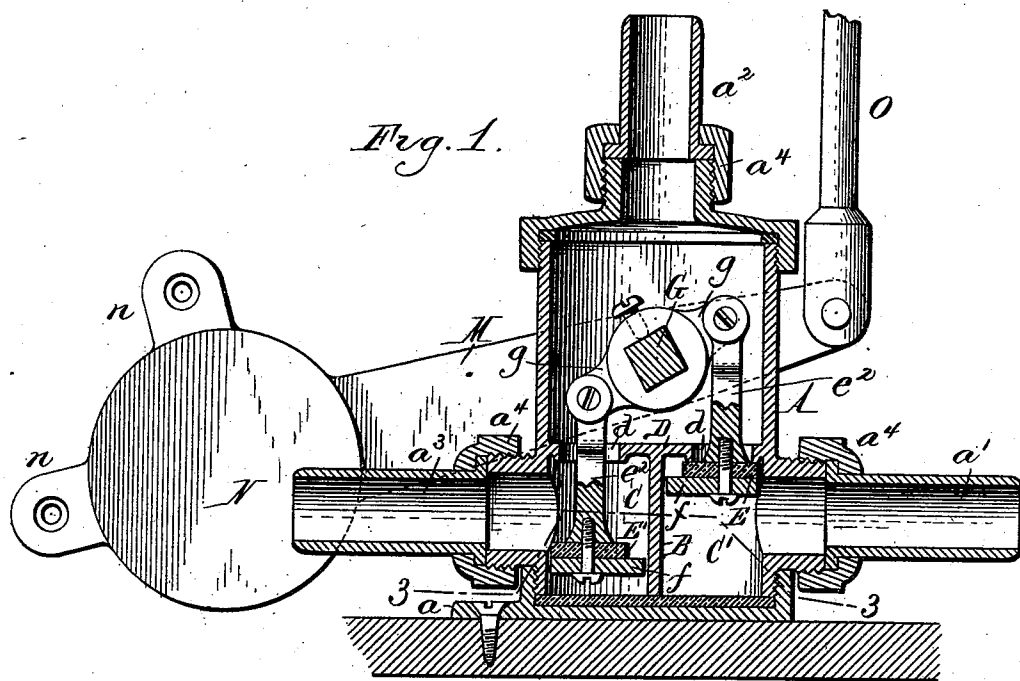


(No Model.)

J. J. BOYNE & W. CALDWELL.
VALVE.

No. 510,883.

Patented Dec. 19, 1893.



Witnesses:

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UNITED STATES PATENT OFFICE.

JOHN J. BOYNE AND WILLIAM CALDWELL, OF BUFFALO, NEW YORK.

VALVE.

SPECIFICATION forming part of Letters Patent No. 510,883, dated December 19, 1893.

Application filed September 11, 1893. Serial No. 485,246. (No model.)

To all whom it may concern:

Be it known that we, JOHN J. BOYNE and WILLIAM CALDWELL, citizens of the United States, residing at the city of Buffalo, in the

5 county of Erie and State of New York, have invented a new and useful Improvement in Valves, of which the following is a specification.

This invention relates to that class of valves
10 which are employed more especially in connection with flushing closets for preventing freezing of the water in the pipes connected with the bowl of the closet or the elevated supply reservoir.

15 One of the objects of our invention is to render the valve reversible, so that the water supply can be connected with either branch thereof and the waste or discharge pipe with the other branch, as may be most convenient.

20 Another object of the invention is to accurately guide the valves to their seats.

In the accompanying drawings:—Figure 1 is a sectional elevation of our improved valve. Fig. 2 is a horizontal section thereof, the
25 plane of section being through the rock shaft. Fig. 3 is a similar section on line 3—3, Fig. 1.

Like letters of reference refer to like parts in the several figures.

30 A represents the cylindrical casing of the valve which is preferably provided at its lower end with ears a for securing it to the floor or other support.

a' is the inlet branch of the valve which is arranged on one side thereof, near its lower
35 end, and to which the water supply pipe is connected. a^2 is its outlet branch which is arranged at the upper end of the casing and to which is connected the pipe which leads to the bowl of the closet or the usual elevated
40 supply reservoir; and a^3 is the branch thereof with which the usual drain or waste pipe is connected and which is located opposite the inlet branch a' . The water supply pipe, the
45 waste pipe are connected with the corresponding branches of the valve by the usual unions or couplings a^4 . The inlet and waste pipe branches or connections of the valve are constructed of uniform size or diameter as shown, so that, if desired, the position of the valve
50 may be reversed and the inlet branch be used

as the waste branch and the latter as the inlet branch.

B is an upright or longitudinal diaphragm arranged centrally in the lower portion of the
55 valve casing and dividing the latter into two independent valve chambers C' of substantially semi-circular cross section, as shown in Fig. 3. The inlet branch a' communicates with one of these valve chambers, while the
60 waste branch a^3 connects with the other chamber.

D is a horizontal diaphragm which forms the top of the valve chamber and separates
65 the same from the upper portion or chamber of the valve casing. This diaphragm is formed with openings or passages d , whereby the valve chambers communicate with the upper chamber of the valve casing.

E is a cut off valve arranged in the inlet
70 chamber C' and controlling the passage of the water from the supply branch into the upper chamber of the valve casing, and E' is a similar valve arranged in the waste chamber C and controlling the flow of the water
75 from the upper chamber of the valve casing to the waste branch. Each of these valves consists of a disk of leather or similar material which is attached to the lower end of a valve stem e^2 passing through the passage d
80 in the top of the valve chamber. These valves are adapted to close against seats arranged at the lower ends of the passages d . To the under side of each valve is attached a
85 guide f consisting of a semi-circular plate which is fitted closely in the correspondingly shaped valve chamber. This plate accurately guides the valve in its movements and causes the same to bear squarely against its seat. The upper ends of the valve stems e^2 are
90 attached to rock arms g secured to diametrically opposite sides of a rock shaft G arranged transversely in the upper portion of the valve casing, so that upon rocking said shaft one of the valves is closed and the other opened.
95 The inner end of this rock shaft is formed with a journal g' which turns in a bearing g^2 formed in the adjacent inner wall of the valve casing, while the outer portion of the shaft extends through a cylindrical stuffing
100 box h arranged in the opposite wall of the casing. This stuffing box is formed in its in-

ner end with a contracted seat h' , which receives a collar or flange g^3 formed on the adjacent portion of the rock shaft.

i is a retaining ring or washer surrounding the rock shaft on the outer side of its collar and bearing against the annular shoulder or offset i' formed at the outer end of the seat h' .

j is a packing ring of rubber or other suitable material which surrounds the rock shaft between such retaining ring and a gland k fitted in the outer portion of the stuffing box. This gland is tightened, for compressing the packing ring, by means of a screw cap l which engages with an external screw thread formed on the stuffing box and which is formed with a central opening for the passage of a rock shaft. The latter is held against lengthwise movement by its collar which is confined between the bottom of the seat h' and the retaining ring, but as the latter bears against the shoulder i' , it relieves the collar from the pressure of the packing and avoids clamping of the same against the bottom of the seat h' . The shaft, while capable of being tightly packed, is thus free to operate with a minimum amount of friction. By supporting the inner end of the rock shaft in a bearing within the casing, cramping or binding of the shaft is effectually prevented.

M is the actuating arm or lever which is attached to the projecting outer end of the rock shaft for operating the same, and N is the weight arranged upon the long arm thereof, which tends to turn the shaft in the proper direction to close the supply valve and open the waste valve.

O is the rod which is connected to the short arm of said actuating lever and which may be attached to the vertically movable closet seat or terminate in proximity thereto, in a well known manner, so that when the seat is occupied, its depression causes the rod to swing the lever in the proper direction to open the supply valve and close the waste valve, so as to flush the closet. If desired, the actuating lever may be operated by hand by means of a chain attached to one of the perforated ears n of the weight N .

The actuating lever M is provided with a square or flat sided opening which receives the correspondingly-shaped outer end of the rock shaft, and the lever is removably attached to the latter by a pin or other suitable means, so that the same may be reversed on the shaft, when the position of the valve is reversed for bringing the weight N on the opposite side of the valve casing. By so constructing the two valves, their valve chambers and the inlet and waste branches of the valve casing, that one set of such parts is the duplicate of the other set and making the actuating lever reversible, either side of the valve can be used as the inlet side and the other as the waste side, thus enabling the pipe connections to the valve to be made in the most convenient manner and without the use of extra

pipes, which is necessary with a non-reversible valve, in case the arrangement of the pipes is such as to prevent a direct connection thereof to the supply and waste branches of the valve. The valve is placed below the frost line in a well known manner.

When the valve is used in connection with a water closet and the closet seat is unoccupied, the supply valve is closed and the waste pipe is open, as shown in Fig. 1, thus permitting the water in the water pipe connected with the upper branch of the valve casing to escape through the valve into the waste pipe, whence it may be discharged into the trap of the closet or into the sewer. When the seat is occupied, the waste valve is closed and the supply valve opened, allowing the water to pass through the valve to the bowl or to the supply reservoir, when such a reservoir is used.

Although our improved valve is especially desirable as a water closet valve, it is equally useful in connection with wash stands, bath tubs or other water fixtures, in which the pipes are liable to become frozen.

We claim as our invention—

1. In a reversible valve, the combination with the casing provided at its top with an outlet and on opposite sides of its lower portion with inlet and waste branches or connections, of a longitudinal diaphragm dividing the lower portion of the casing into two similar valve chambers which communicate respectively with the inlet and waste branches, a transverse diaphragm forming the top of said valve chambers and having passages, reciprocating valves arranged in said chambers and adapted to close said passages, a transverse rock shaft arranged in the casing above its transverse diaphragm and having rock arms on opposite sides, and stems connecting the valves with said rock arms and extending through the passages of the transverse diaphragm, substantially as set forth.

2. In a valve, the combination with the cylindrical casing provided on opposite sides with inlet and waste branches, of a longitudinal diaphragm arranged centrally in the lower portion of the casing and dividing the same into two valve chambers of semi-circular cross section, valves arranged in said chambers and having semi-circular guide plates fitted closely in said valve chambers, a transverse rock shaft arranged in the upper portion of the casing and having rock arms on opposite sides, and stems connecting said valves with said rock arms, substantially as set forth.

Witness our hands this 18th day of August, 1893.

JOHN J. BOYNE.
WILLIAM CALDWELL.

Witnesses:

CARL F. GEYER,
JNO. J. BONNER.