

(No Model.)

2 Sheets—Sheet 1.

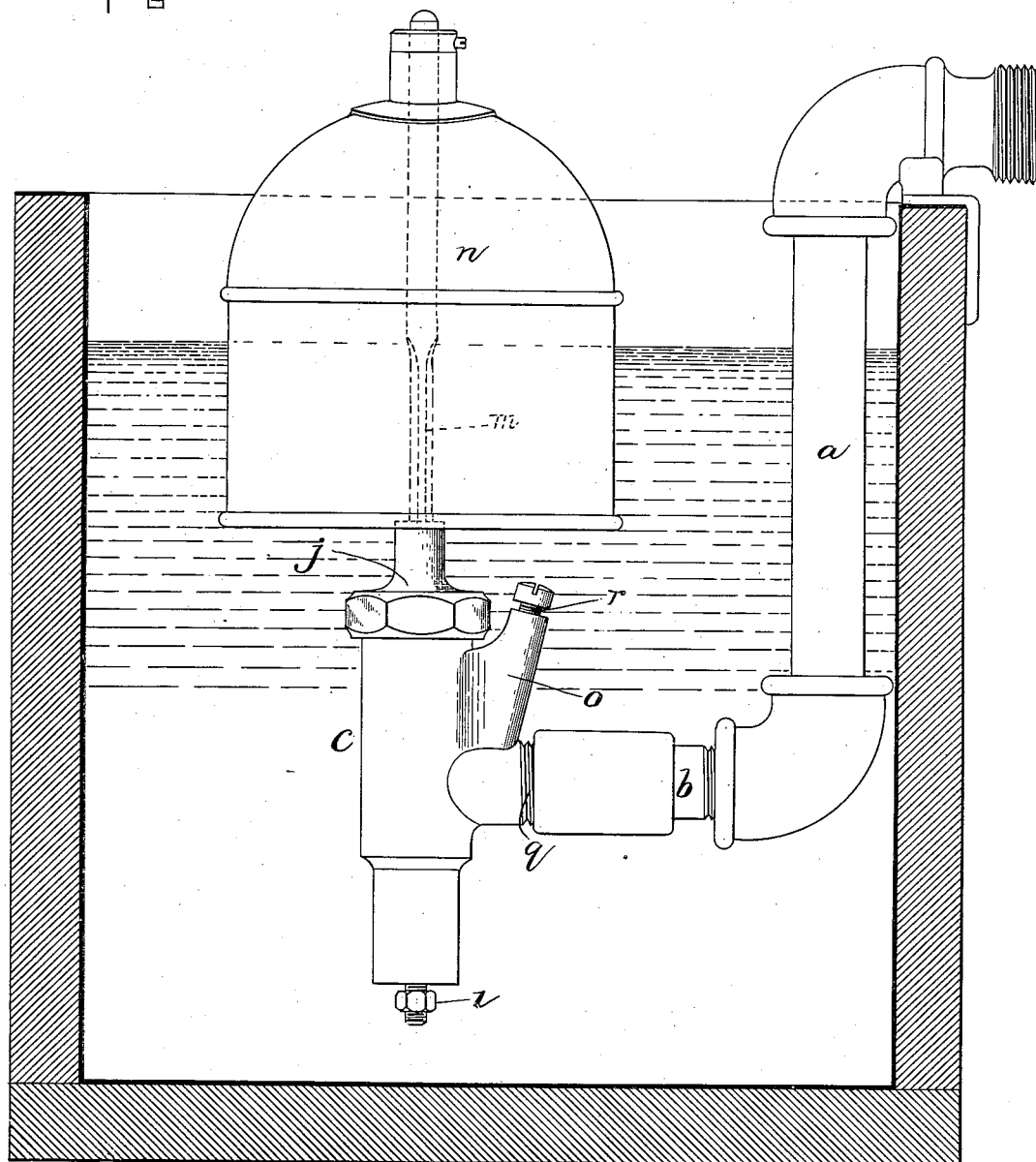
H. C. FOLGER & G. K. DEARBORN.

VALVE CONTROLLING MECHANISM FOR WATER CLOSET TANKS.

No. 453,997.

Patented June 9, 1891.

Fig. 1.



WITNESSES:

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A. D. Hanson

INVENTORS:

H. C. Folger,  
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By Wright, Brown & Crossley  
ATTYS.

(No Model.)

2 Sheets—Sheet 2.

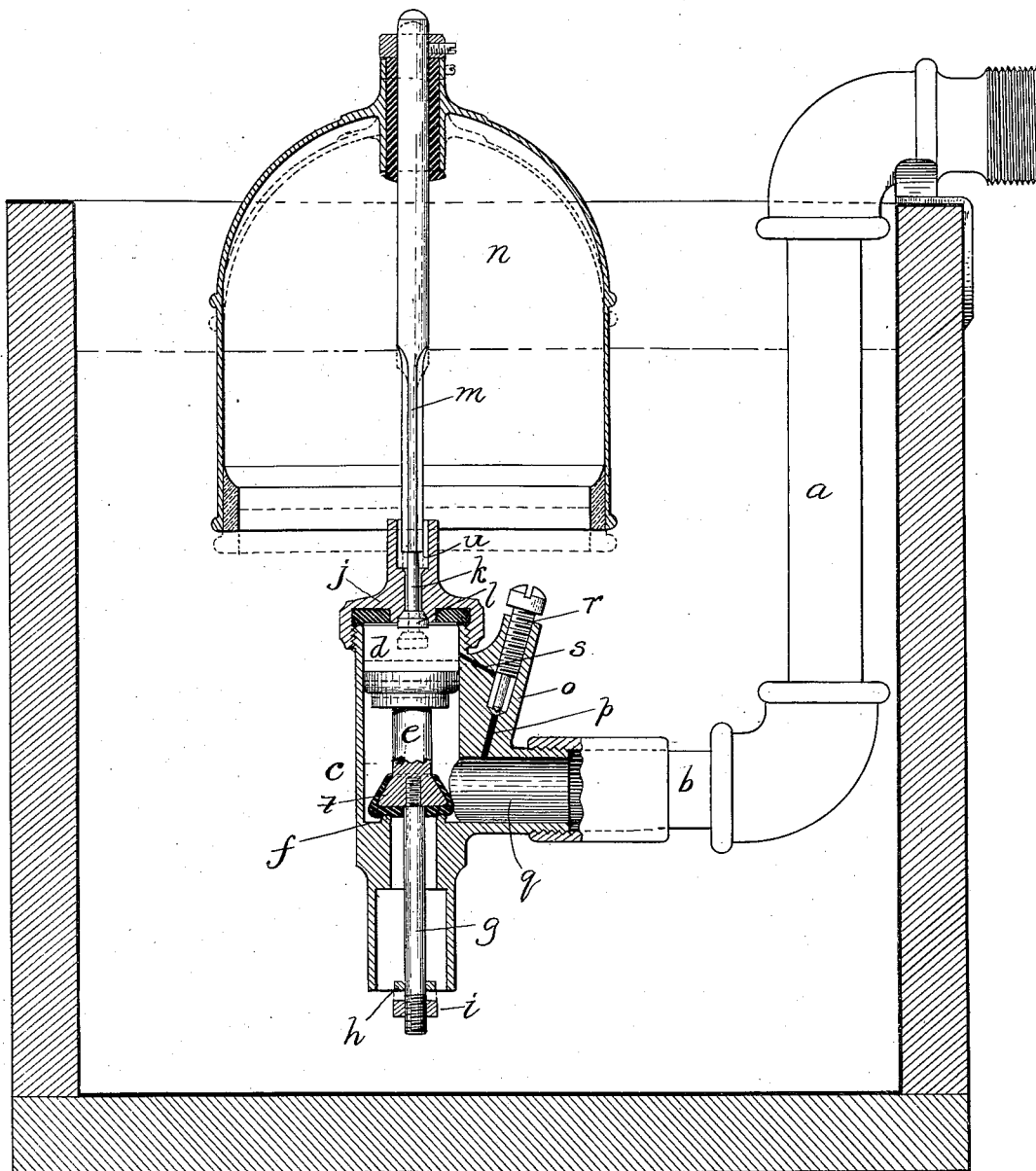
H. C. FOLGER & G. K. DEARBORN.

VALVE CONTROLLING MECHANISM FOR WATER CLOSET TANKS.

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Fig. 2.



WITNESSES:

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A. D. Hanson.

INVENTORS:

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# UNITED STATES PATENT OFFICE.

HENRY C. FOLGER AND GILBERT K. DEARBORN, OF SOMERVILLE, MASSACHUSETTS, ASSIGNORS, BY MESNE ASSIGNMENTS, TO THE BOSTON SANITARY SPECIALTY COMPANY, OF SAME PLACE.

## VALVE-CONTROLLING MECHANISM FOR WATER-CLOSET TANKS.

SPECIFICATION forming part of Letters Patent No. 453,997, dated June 9, 1891.

Application filed June 18, 1890. Serial No. 355,822. (No model.)

*To all whom it may concern:*

Be it known that we, HENRY C. FOLGER and GILBERT K. DEARBORN, both of Somerville, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Valve-Controlling Mechanism for Water-Closet Tanks, of which the following is a specification.

Our invention relates to supply apparatus for cisterns generally, and particularly to supply-cocks for water-closet tanks, it being the object of the invention to provide such improvement in the devices of the kind mentioned as will secure both the opening and closing of the valve by water-pressure.

It is also the object of the invention to provide such improvements in valves for water-closet tanks as will insure the opening of the valve to its fullest extent when opened at all and retaining the same in full open position until the operation of closing the valve is performed, when such operation will be accomplished momentarily.

It is also the object of our invention to provide such improvements in supply apparatus for water-closet cisterns as will obviate the necessity of employing a long arm and float connected with the ball-cock to open and close the same.

Our invention will first be described in connection with the accompanying drawings and letters of reference marked thereon, forming a part of this specification, and then be pointed out in the claims appended.

Of the said drawings, Figure 1 is a cross-sectional view of a water-closet tank equipped with our improved supplying apparatus, the latter being shown in side elevation. Fig. 2 is a view similar to Fig. 1, but showing the major portion of the supply apparatus in vertical central section.

The same letters of reference indicate the same parts and features, as the case may be, wherever they occur.

In the drawings, *a* designates the supply-pipe, which may enter the tank over the upper edge thereof and extend down therein toward the bottom, the lower end being provided with an angular portion *b*, to which the "ball-cock" *c*, so called, is attached. The

said ball-cock is provided in its upper end with a valve-chamber *d*, in which there is arranged a balance-valve *e*, adapted to be seated on a valve-seat *f*. The valve *e* is provided with a stem *g*, which extends through the exit-port of the cock and through a hole in a bridge *h* on the lower end thereof. The lower end of the stem *g* is screw-threaded and provided with a nut *i*, so as to regulate the extent to which the valve may move vertically in the chamber *d*, the extent of the upward movement of the valve being limited by the nut *i* coming in contact with the bridge *h*.

The upper end of the chamber *d* is closed by means of a cap *j*, screwed upon the cock *c*, as shown in Fig. 2. A hole *k* is formed in the cap *j*, and the lower portion of said hole is formed as a ground valve-seat for the reception of a valve *l*, formed on the lower end of a rod *m*, which extends through the hole *k* and is provided on its upper end with an air-dome *n*, which is vertically adjustable upon the rod *m*. The hole or aperture *k* is enlarged at its upper end, as shown, and the portion of the rod *m* extending into such enlarged portion is grooved or chamfered in its sides, for a purpose presently to be explained. The air-dome is packed about the rod *m* substantially air-tight.

The cock *c* is provided on the side adjacent to the supply-pipe *b* with an enlargement *o*, through which enlargement in a vertical direction is formed a hole *p*, intersecting the inlet-port *q* of the cock. The upper portion of said hole *p* is enlarged and provided with a screw-thread, so as to receive a screw *r*, tapped into said enlargement of said hole. A small hole *s* is also formed in the enlargement, connecting the chamber *d* above the valve *e* with the hole *p*. With this construction and arrangement of parts, when the tank is substantially filled with water, as represented in Fig. 1, the pressure of the water upon the air in the dome *n* will raise the latter, and with it the rod *m* and valve *l*, so as to close the chamber *d* against the escape of water through the hole *k*, the result of which will be to accumulate water in the said chamber *d* above the valve *e* through holes *p* *s* of the enlargement *o*, and by the pressure of water upon

the valve in the said chamber force the latter down upon its seat *f*, shutting off the flow of water into the tank. When, however, sufficient water is drawn out of the tank to allow the dome *n* and rod *m* to fall until the shoulder *t* of said rod is brought to rest upon the offset *u* of hole or aperture *k*, thus lowering the valve *l* from its seat, as shown by dotted lines in Fig. 2, the water in the chamber *d* will be allowed to escape freely through the hole *k* alongside the rod *m*, and so relieve the valve *e* from pressure upon its upper end, permitting the said valve to be raised by the pressure of water operating against its lower end, and thus opening the valve to its fullest extent.

By means of the screw *r* the extent of the opening of the holes *o* and *p*, through which the water flows into the chamber *d* above the valve *e*, may be varied in accordance with the "head" or pressure of the water or other circumstances.

It is to be noted that the valve *e* will remain fully open until the tank has been sufficiently filled to raise the dome *n* and rod *m* to the very limited extent indicated by the full and dotted lines in Fig. 2, and that immediately upon closing the valve *l* the pressure of the water in the chamber *d* upon the valve will close the latter completely and instantly, shutting off the flow of water into the tank, and that instantly upon opening the valve *l* the valve *e* will be released from pressure above and will be fully opened by the pressure of the water from below.

We prefer to construct the lower portion of the valve *e* in the form of a frustum of a cone, as represented at *t*, and to spring thereover a cup-shaped washer or cover of rubber and secure the rod *g* to the valve by screwing it into the lower end of the frusto-conical part *t*, as shown in Fig. 2. This form of valve is simple in and economical of construction and is efficient to the highest degree.

By adjusting the float or dome *n* vertically upon the valve-rod *m* we are enabled to regulate the amount of water that may be admitted to the tank.

It will be seen that by our improvements we dispense with the long cumbersome arm commonly employed in water-closet cisterns to connect the float with the valve-operating means in order to open and close the valve, and that a construction is provided by our im-

provements which by connecting the float directly with the vertical valve stem or rod *m* is not liable to get out of order, and which is absolutely certain in its operation.

It is obvious that changes may be made in the form and arrangement of parts comprising our invention without departing from the nature or spirit of the improvement. For example, a float of common or other suitable form may be connected with the valve-stem *m* for operating the valve *l*.

Having thus explained the nature of our invention and described a way of constructing and using the same, we declare that what we claim is—

1. A supply-cock for tanks, embracing in its construction the supply-pipe *b* and an exit-port provided with a valve-seat *f*, a valve *e*, to co-operate with the said valve-seat to open and close the said exit-port, a chamber *d* above the said valve, provided with an outlet-port, a valve *l* for opening and closing the said outlet-port, a valve-rod *k*, connected with the said valve *l* and extended vertically through the said outlet-port, a float connected with the said valve-rod, and a port *s*, communicating between the chamber *d* and the supply-pipe *b*, substantially as set forth.

2. A supply-cock for tanks, embracing in its construction a valve, a chamber above said valve provided with an outlet-port, a valve-rod connected with valve *k* and extending vertically through said port, a dome vertically adjustable on the said valve-rod, and a port communicating with the said chamber and supply-pipe, as set forth.

3. The combination, in a supply-cock provided with a valve *e*, a chamber *d* above said valve, and an outlet-port communicating with said chamber, of a valve *l* for controlling said outlet-port, a valve-rod *m*, connected with said valve, a float connected with said valve-rod, a port *p* *s*, communicating with the supply-pipe, and the regulating valve-screw *r*, as set forth.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 27th day of May, A. D. 1890.

HENRY C. FOLGER.

GILBERT K. DEARBORN.

Witnesses:

ARTHUR W. CROSSLEY,

A. D. HARRISON.