

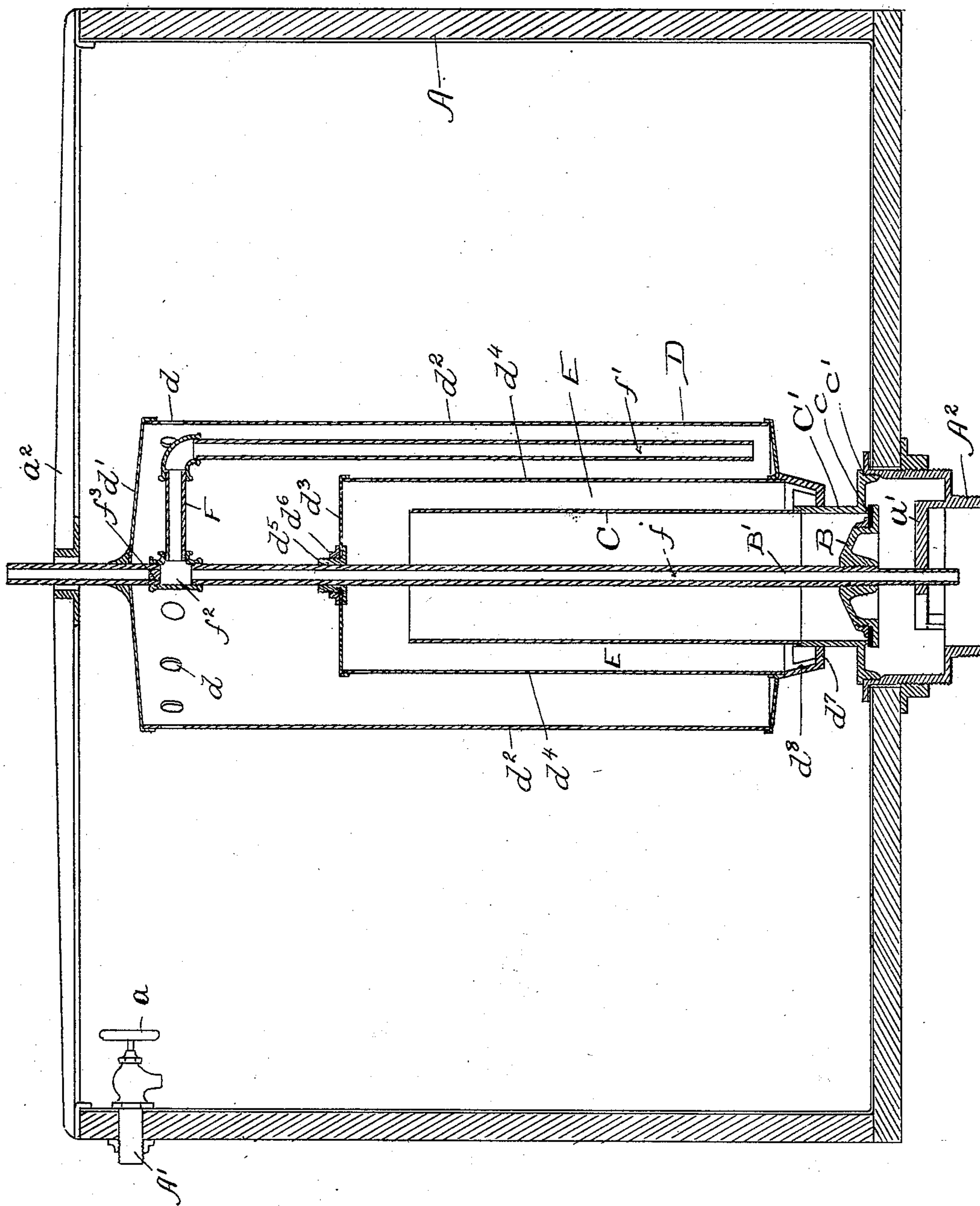
(No Model.)

A. HAGEN.

AUTOMATIC FLUSHING TANK FOR WATER CLOSETS, &c.

No. 543,013.

Patented July 23, 1895.



WITNESSES:

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AUTOMATIC FLUSHING-TANK FOR WATER-CLOSETS, &c.

SPECIFICATION forming part of Letters Patent No. 543,013, dated July 23, 1895.

Application filed January 21, 1895. Serial No. 535,608. (No model.)

To all whom it may concern:

Be it known that I, AUGUST HAGEN, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Automatic Flushing-Tanks for Washout Closets, Ranges, Urinals, &c., of which the following is a specification.

My invention relates to automatic flushing-tanks for water-closets, urinals, &c.

The object of my invention is to produce an automatic flushing-tank of a simple, durable, and efficient construction, which will operate with certainty at suitable intervals and discharge suddenly and quickly a large amount of water and which will not be liable to get out of order or repair.

To this end, and herein my invention consists, I combine with the tank a movable valve, by the opening of which the contents of the tank may be quickly and suddenly discharged; a stationary tube or cylinder, open at the top, surrounding the valve and against the lower end of which the valve closes, and over the upper end of which the contents of the tank may be siphoned out; a movable annular cup or float, open at the top, surrounding the stationary cylinder and having an annular siphon-passage between its inner wall and the stationary cylinder, by the buoyancy of which annular cup or float the valve is held closed, and by the filling of water into which float or cup the valve is automatically opened to permit the siphon discharge of the water over the upper end of the stationary cylinder, and a supplementary siphon for emptying the water out of the annular cup or float. This latter siphon is of small capacity, so that the cup or float is not emptied and the valve again closed until after the main or large siphon-passage has emptied the tank.

My invention also consists in the novel devices and novel combinations of parts and devices herein shown and described, and particularly specified in the claims.

In the accompanying drawing, which forms a part of this specification, I have illustrated in central vertical section a device embodying my invention.

In the drawing, A represents a flushing-

tank for a water-closet range, urinal, or other device where a flush of water is required.

A' is a water-supply pipe furnished with the usual valve or cock *a* for supplying the water to the tank.

A² is the coupling by which connection is made with the discharge-pipe leading to the water-closet or urinal.

B is the discharge-valve secured to a hollow valve-stem B'.

The coupling A² is provided with a projecting arm or bridge *a'* to form a bearing or guide for the lower end of the valve-stem B', and the tank A is provided at its top with an arm or bridge *a''* to serve as a bearing or guide for the upper end of the valve-stem.

C is the stationary cylinder open at its top and surrounding the discharge-opening of the valve B, and against the lower end of which the valve B closes. The lower portion C' of this cylinder C is preferably made of brass in order to properly form a valve-seat *c* thereon and to properly connect it to the coupling A² by a screw-threaded flange or shoulder *c'*.

Secured to the hollow valve-stem B' is an annular cup or float D open at its upper end so that it may fill with water when the water in the tank A reaches the level of the openings *d* at the upper end of this annular cup. The annular cup D is preferably secured to the valve-stem B' through the medium of the head *d'* of the outer wall *d''* of the annular cup and also through the head *d'''* of the inner wall *d''''* of the cup. A tight joint between the valve-stem B' and the head *d''''* of the cup is formed by the screw-threaded couplings *d''''''* *d''''''''*.

Between the inner wall of the movable annular cup or float D and the stationary cylinder C is an open space E, constituting an annular siphon water-passage for the discharge of the water in the tank A over the upper end of the stationary cylinder C. To guide or steady the lower end of the annular float D it is provided with a guide or collar *d''''''* surrounding the stationary cylinder C, this guide or collar being connected with the annular float D by spider-arms *d''''''''*, so as not to obstruct the flow of the water into the annular passage E. The valve-stem B' is made hollow, so that the passage *f* through the same may

serve as the long leg of the small siphon F, the short leg f' of which extends to near the bottom of the annular cup D. This small siphon f serves to empty the water from the annular cup or float. The siphon-tube F is connected to the valve-stem B' by a T-coupling f^2 , the valve-stem B' at the upper end of this coupling being closed by a plug f^3 .

The operation is as follows: The tank A, for example, being empty, the valve B will be held open by its own weight and that of the annular cup or float D, secured to it, until the water in the tank A rises to such a height as to cause the buoyancy of the float D to lift the valve B against the valve-seat c , thus closing the discharge-valve, which will occur some considerable time before the water rises to the level of the upper end of the stationary cylinder C. As the water continues to rise in height in the tank A the buoyancy of the cup or float D continually increases and by the time the water reaches the level of the upper end of the stationary cylinder C and begins to flow into said cylinder and rest upon the valve B the buoyancy of the float is so increased that it will counterbalance the water in said cylinder and resting upon the valve and still hold the valve closed. After the water in the tank A rises to the level of the openings d in the annular cup or float D the water flows into the cup and by its weight, destroying the buoyancy of the float, causes the cup to sink or move downward and open the valve B, when the water is quickly and suddenly discharged from the tank A in an ample flush. The sinking or depression of the cup D carries the upper portion of the siphon F below the surface of the water and thus starts this small siphon into operation to empty the cup or float D. The float or cup emptying siphon F is, however, of so much smaller capacity than the main or tank-emptying siphon E C that the cup or float D is not emptied or its buoyancy restored until after the tank A has been emptied or discharged. The tank A then again fills with water through the supply-pipe and the operation is repeated over and over again automatically at intervals. By regulating the water-supply with the valve a the frequency of the discharge may be increased or diminished, as desired.

The stationary tube C and also the annular or surrounding cup or float D are preferably made circular in cross-section; but they obviously may be made in any other suitable form.

It is a matter of convenience in construction to make the valve-stem hollow and utilize it as the long leg of the supplemental siphon F, which extends through the valve B.

I claim—

1. The combination with a flushing tank provided with an upwardly projecting tube surrounding its discharge opening, of a movable valve at the lower discharge end of said tube for closing said tube, a cup or float surround-

ing said tube and forming therewith a siphon passage or discharge for the water, and a supplemental siphon tube having its short leg extending into said cup or float and its long leg extending through said valve for emptying the water from said cup or float, substantially as specified.

2. The combination with a flushing tank provided with an upwardly projecting tube surrounding its discharge opening, of a movable valve at the lower discharge end of said tube for closing said tube, a cup or float surrounding said tube and forming therewith a siphon passage or discharge for the water, a supplemental siphon for emptying the water from said cup or float having its short leg extending into said cup or float and its long leg extending through said valve, and means for connecting said valve with said cup, substantially as specified.

3. The combination with tank A of tube C surrounding the discharge opening of the tank, a movable valve B, hollow valve stem B', annular cup D secured to said valve stem and having an opening near its upper end, and a supplemental siphon having its short leg extending into said annular cup D and communicating with said hollow valve stem, substantially as specified.

4. The combination with tank A of tube C surrounding the discharge opening of the tank, of a movable valve B, hollow valve stem B', annular cup D secured to said valve stem and having an opening near its upper end, and a supplemental siphon having its short leg extending into said annular cup D and communicating with said hollow valve stem, said tube C having a valve-seat c near its lower end, substantially as specified.

5. The combination with tank A of tube C surrounding the discharge opening of the tank, of a movable valve B, hollow valve stem B', annular cup D secured to said valve stem and having an opening near its upper end, a supplemental siphon having its short leg extending into said annular cup D and communicating with said hollow valve stem, and coupling A^2 furnished with a guide arm or bridge a' for said valve stem, substantially as specified.

6. The combination with tank A of tube C surrounding the discharge opening of the tank, of a movable valve B, hollow valve stem B', annular cup D secured to said valve stem and having an opening near its upper end, a supplemental siphon having its short leg extending into said annular cup D and communicating with said hollow valve stem, coupling A^2 furnished with a guide arm or bridge a' for said valve stem, and said tank A having a guide arm or bridge a^2 for said valve stem, substantially as specified.

7. The combination with a flushing tank provided with an upwardly projecting tube surrounding its discharge opening, of a movable valve for closing said tube, a cup or float surrounding said tube and forming therewith

a siphon passage or discharge for the water, a supplemental siphon having its short leg extending into said float and its long leg extending through said valve for emptying the
5 water from said cup or float, means for connecting said valve with said cup or float, and said cup or float being furnished near its lower end with a guide or collar surrounding said tube, substantially as specified.

10 8. The combination with a tank provided with a siphon discharge, of a valve at the lower end of said siphon for closing said dis-

charge, and a cup or float adapted to be filled with water at intervals and connected with said valve for operating the same, and means 15 for discharging the water from said cup or float at intervals, consisting of a supplemental siphon having its short leg extending into said float and its long leg extending through said valve, substantially as specified.

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Witnesses:

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