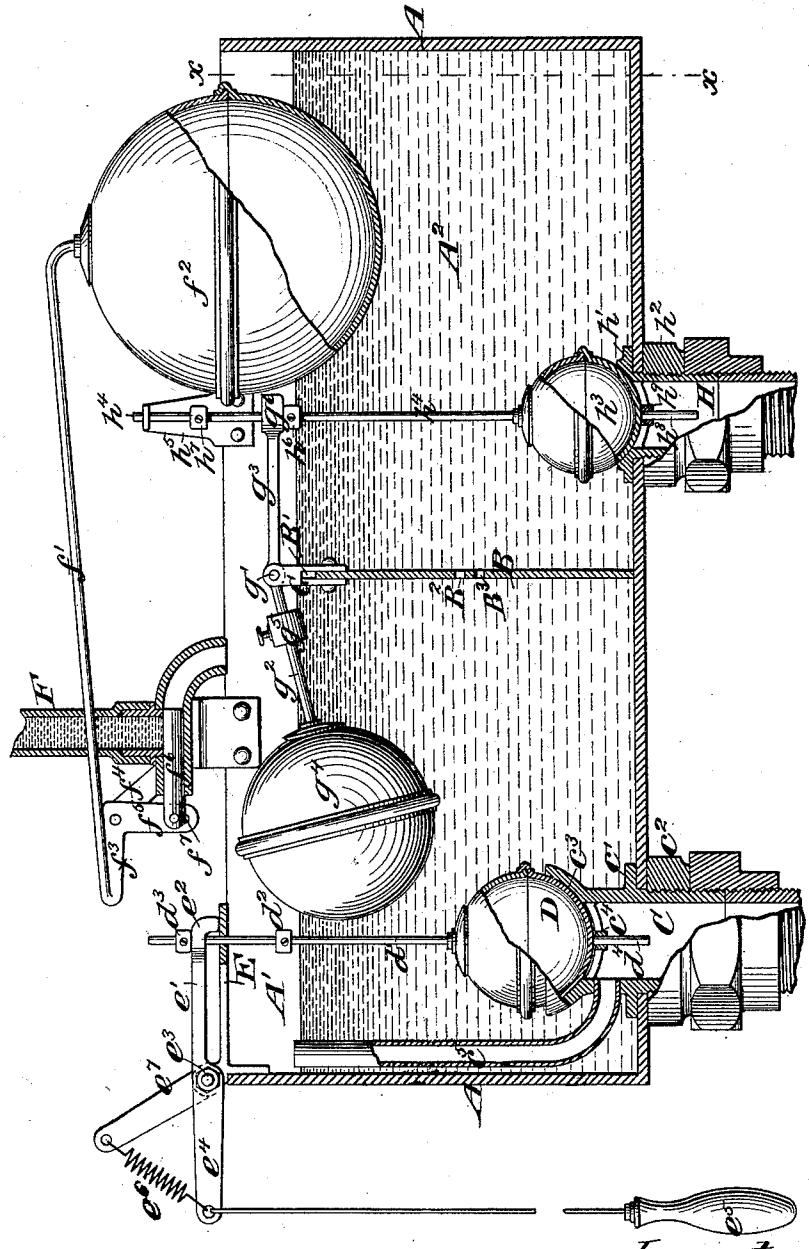
(No Model.) 3 Sheets—Sheet 1.

J. C. BEEKMAN.

DOUBLE FLUSH TANK FOR WATER CLOSETS.

No. 452,962. Patented May 26, 1891.

Fig. 1.



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(No Model.) 3 Sheets—Sheet 2.

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DOUBLE FLUSH TANK FOR WATER CLOSETS.

No. 452,962. Patented May 26, 1891.

Fig. 2.

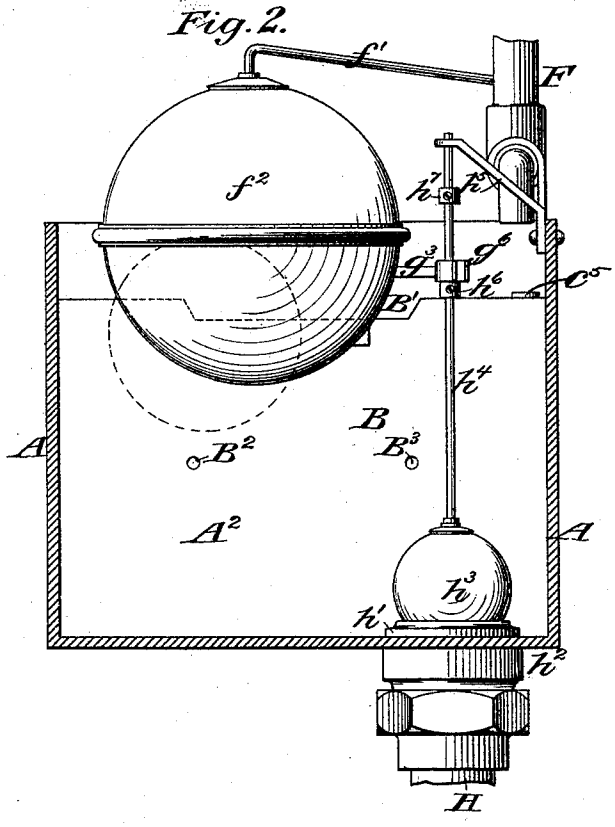
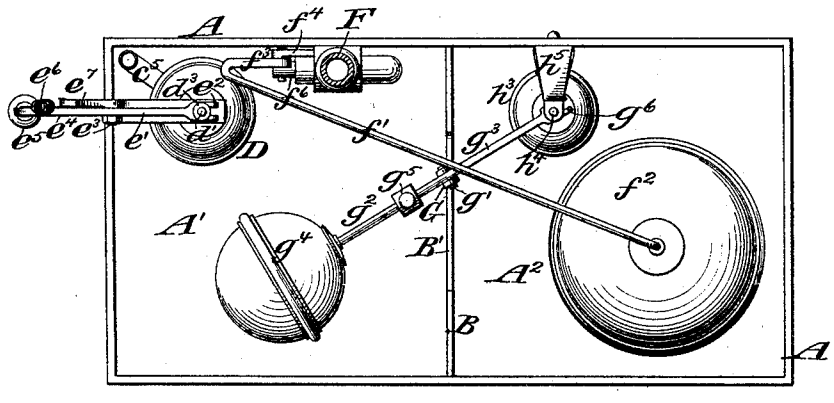


Fig. 3.



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(No Model.) 3 Sheets—Sheet 3.

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DOUBLE FLUSH TANK FOR WATER CLOSETS.

No. 452,962. Patented May 26, 1891.

Fig. 5.

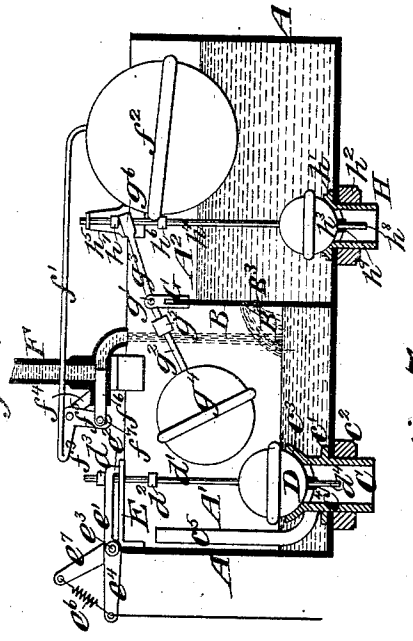


Fig. 7.

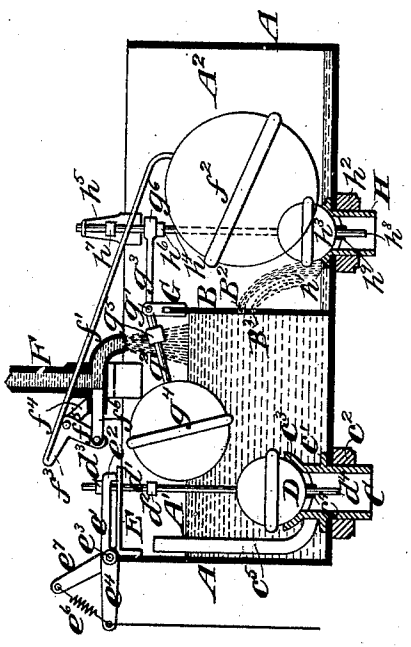


Fig. 4.

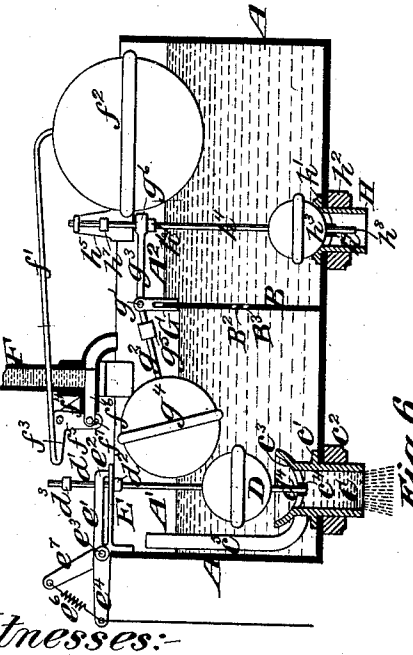
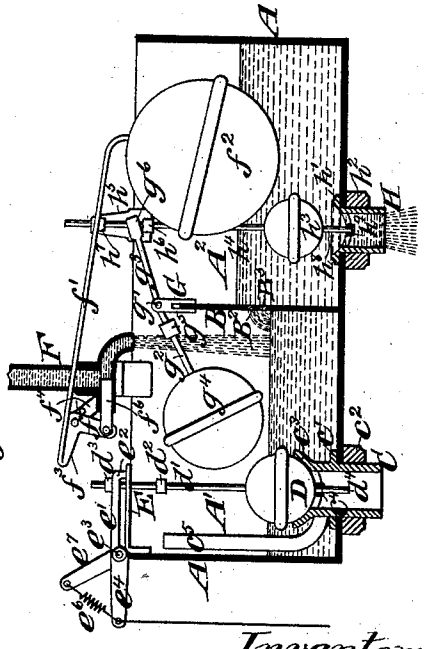


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOHN C. BEEKMAN, OF NEW YORK, N. Y.

DOUBLE FLUSH-TANK FOR WATER-CLOSETS.

SPECIFICATION forming part of Letters Patent No. 452,962, dated May 26, 1891.

Application filed June 11, 1890. Serial No. 355,112. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. BEEKMAN, of the city of New York, in the county and State of New York, have invented a certain new and useful Improvement in Double Flush-Tanks for Water-Closets, of which the following is a specification.

My invention relates to an improvement in double flush-tanks for water-closets, the object being to provide a float-valve and mechanism subject to the action of the valve by which a double flush may be obtained by a single impulse of the operating device.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 is a view of the tank in longitudinal vertical section, showing the valve and other operative parts partly in section. Fig. 2 is a transverse vertical section through line $x\ x$ of Fig. 1, with certain of the parts partially broken away to more clearly illustrate other parts. Fig. 3 is a top plan view on a reduced scale, and Figs. 4, 5, 6, and 7 represent the operative parts in side elevation and illustrate the positions which they assume at different stages of operation.

A represents the tank divided by a cross-partition B into two compartments A' A². The partition B terminates at a point below the sides and ends of the tank A, and is provided centrally along its upper edge with a depression B' for the overflow of water from one of the compartments into the other. Through the bottom of the compartment A' extends a discharge-pipe C, the same being secured water-tight to the bottom, as herein shown, by an annular flange c', which is intended to rest upon the bottom of the tank around the margin of the opening through which the pipe extends, and the lower portion of the pipe is screw-threaded and adapted to receive a nut c^2, which, when forced home into contact with the bottom of the tank A, serves to tightly seal the joint between the flange c' and the upper face of the nut c^2, and at the same time hold the pipe securely in position. The upper portion of the pipe C is provided with a flaring valve-seat c^3, the face of which is preferably circular in order to fit the curved surface of a spherical valve D. Across the upper end of the discharge-pipe C is a bar or other suitable support c^4, centrally through which there is a perforation to receive the depending stem d^4, which serves to center the valve within its seat. An overflow-pipe c^5 leads from a point above the water-line down to and opens into the discharge-pipe C. The spherical valve D, here shown as formed of two hemispherical shells united at their edges, is provided with an upwardly-extending operating-rod d', which extends upwardly through a suitable guide E at the top of the tank and between the forked ends e^2 on the arm e' of the operating-lever. Stops to limit the rise and fall of the operating-rod d', and hence of the valve, are located in the desired adjustment upon the operating-rod d', and are here shown as collars d^2 and d^3, provided with set-screws, as is common, to secure them in the desired positions on the rod. The operating-lever is fulcrumed upon a suitable support e^3, and to the end of its arm e^4 the operating-cord provided with an operating-handle e^5 is secured. A stationary arm e^7 projects upwardly in a slanting direction from the tank, in the present instance from the line of the pivotal connection e^3, and to its end and to the end of the arm e^4 of the operating-lever the ends of a spiral spring e^6 are secured. The tension of the spring e^6 is exerted in a direction to return the operating-lever to its horizontal adjustment after it has been operated by pulling down on the handle e^5.

The valve D, I am pleased to term a "float-valve," as it is intended that it shall be of such specific gravity as that when it is wholly immersed in water it will have a tendency to float therein; but its weight, as compared with the weight of the water which it displaces, is such that when the water-pressure shall have been removed from a portion of its surface—as, for example, that portion below the upper margin of the valve-seat—the pressure of the water on the other portion, together with the weight of the valve, will be sufficient to hold the valve seated. It is evident, of course, that the valve itself need not be of less specific gravity than water, as the same function could be secured by counterbalancing a valve, which was of greater specific gravity than water in such a manner as to cause it to float when wholly immersed and remain permanently seated when the wa-

ter-pressure was taken off from a portion of its surface. The stop d^2 is so located upon the rod d' that the upward travel of the valve will be terminated before the stem d^4 shall have escaped from the guide-bar c^4, and hence the valve will always be in position to return centrally to its seat. The operation of this valve D is as follows: When a pull is exerted upon the handle e^5, the valve D will be lifted from its seat through the forked arm e' of the operating-lever d^3 and the rod d'. The operating-lever, through the tension of the spring e^6, will be immediately returned to its normal position; but the valve D being now wholly immersed will remain lifted from its seat and floating. The water will rush from the discharge-pipe C until the compartment A′ has been emptied to a point so low as to no longer float the valve D, when the latter will fall again to its seat and the discharge-pipe will be closed. As the compartment A′ again fills with water, the valve D, being now in a position to prevent the water from gaining access to its lower portion, will remain seated.

The second flush is under the automatic control of the valve hereinabove described, and the mechanism by which it is accomplished is constructed and arranged as follows: A discharge-pipe H is secured to the bottom of the compartment A^2, preferably by means of an annular flange h' and nut h^2, engaged upon the threaded portion of the pipe below the bottom in a manner quite similar to that described with respect to the discharge-pipe C. The upper portion of the discharge-pipe H is provided with a concave seat adapted to receive the lower portion of a spherical valve h^3, and a bar h^9, extending across the upper portion of the discharge-pipe, is provided with an opening to receive the depending valve-stem h^8, which serves to guide and center the valve in its seat. The valve h^3 is also what I term a "float-valve," in that when wholly immersed in water it will tend to float, but when the water-pressure is removed from the lower portion of its surface the pressure on the remaining part of it will be sufficient to hold it seated. As herein shown, the valve h^3 is seated nearer the bottom of the compartment A^2 than the valve D is to the bottom of its compartment. An operating-rod h^4 extends upwardly from the top of the valve h^3 and through a suitable opening in a bracket h^5, secured to the side of the tank.

Stops, shown in the present instance as collars h^6 and h^7, embracing the rod h^4 and provided with set-screws to hold them in the desired adjustment, are located in such positions on the rod h^4 as to determine the upward movement of the valve and also the movement of a float g^4, located in the compartment A′, as follows: The float g^4 is connected to the arm g^2 of a lever fulcrumed, as shown at g', to a suitable support G, secured to the partition B. The other arm g^3 of the lever extends into a position to engage the rod h^4, and the forked end g^6 of the arm g^3 embraces the opposite sides of said rod h^4 between the stops h^6 and h^7. A counterbalance-weight g^5 is secured conveniently by means of a set-screw in the desired position upon the arm g^2 to give the requisite preponderance of weight to the arm g^2. A float f^2 is located within the compartment A^2 and connected with an arm f^3 of an angle-lever pivoted at its angle to a suitable support f^4 and having its other arm f^5 connected with a slide-valve f^6 for controlling the supply of water to the tank A through a suitable supply-pipe F. The rod f', which connects the float f^2 with the arm f^3 of the angle-lever, is fixed to the arm f^3, so as to cause the said arm to move with the rod f'. The sliding valve f^6 consists, in the example shown herein, of a cylindrical plug adapted to slide across the opening in the supply-pipe F, and the arm f', which is connected with the end of the valve, is provided with an elongated slot f^7 to allow for the play of the arm as the angle-lever is rocked upon its pivot. The supply-pipe F leads into the compartment A′.

The operation of the whole is as follows: When a pull is exerted upon the handle e^5, and the valve D thereby raised, as hereinbefore explained, the valve will remain suspended (see Fig. 4) and the water in the compartment A′ will rapidly lower. As the water in the compartment A′ gradually lowers, water from the compartment A^2 will flow over the partition B and through similar openings B^2 and B^3 (see Fig. 5) in the partition B into the compartment A′, but the escape of water through the partition B will be much more rapid than the increase of water from the compartment A^2 and from the now partially-opened supply-pipe. The lowering of the water in the compartment A′ will gradually lower the float g^4 until the forked end g^6 of the lever connected with the float engages the stop h^7 on the rod h^4 and produces a sufficient lift upon the valve h^3 to lift it from its seat. When lifted from its seat, the valve h^3, because of its tendency to float, will remain open and the water will gradually fill it, the valve h^3 having seated itself as soon as the water in the compartment A^2 became so low as not to float the valve, the rise of the float g^4 and the engagement of the forked end g^6 of the lever with the stop h^6 on the rod h^4 having assisted to seat said valve h^3 in case the water in the compartment a^2 had not sufficiently lowered to accomplish it. The refilling of the compartment A^2 will again lift the float f^2 and close the valve f^6 as the tank H becomes completely filled and the whole will be ready for a repetition of the double flush before described.

What I claim as my invention is—

1. The combination, with a flush-tank provided with suitable discharging-pipes, of a valve having a tendency to float when immersed for controlling the first discharge from the tank, and a second valve controlled by

the action of the first-named valve to effect a second discharge, the said valves having no connection with each other except through the liquid in the tank, substantially as specified.

2. The combination, with a tank provided with intercommunicating compartments and a discharge-pipe for each compartment, of a valve under hand control having a tendency to float when immersed for effecting a discharge from one of the compartments, and a valve in the other compartment having a tendency to float when immersed and under the immediate control of a float in the first-named compartment for effecting a second discharge, the connection between the valve for the second discharge and the float being such that the float is allowed to move through a predetermined distance before effecting an opening of the said valve, substantially as set forth.

3. The combination, with a tank provided with intercommunicating compartments, a supply-pipe for supplying water to one of the compartments, and a discharge-pipe for each compartment, of a valve under hand control having a tendency to float when immersed for effecting a discharge from the compartment to which the supply leads, a float in said compartment having an engagement with a valve for effecting a discharge from the other compartment, and a float in said last-named compartment for controlling the supply, the said floats for operating the second discharge and the supply being separate from each other, substantially as set forth.

4. The combination, with the tank provided with compartments for the first and second discharge, the partition between the compartments being provided with openings therethrough, of a first discharge-valve and means for operating it by hand, a second discharge-valve in the other compartment and having its operating-rod connected with a float in the first discharge-compartment by a lever, the said float being wholly separate from the valve and valve-operating mechanism of the first discharge and the said lever having a free play between stops located at a predetermined distance apart upon the second discharge operating-rod, and a supply-valve operated by a float in the compartment of the second discharge and wholly separate from the discharge-valve and their operating mechanism, substantially as set forth.

JOHN C. BEEKMAN.

Witnesses:
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