

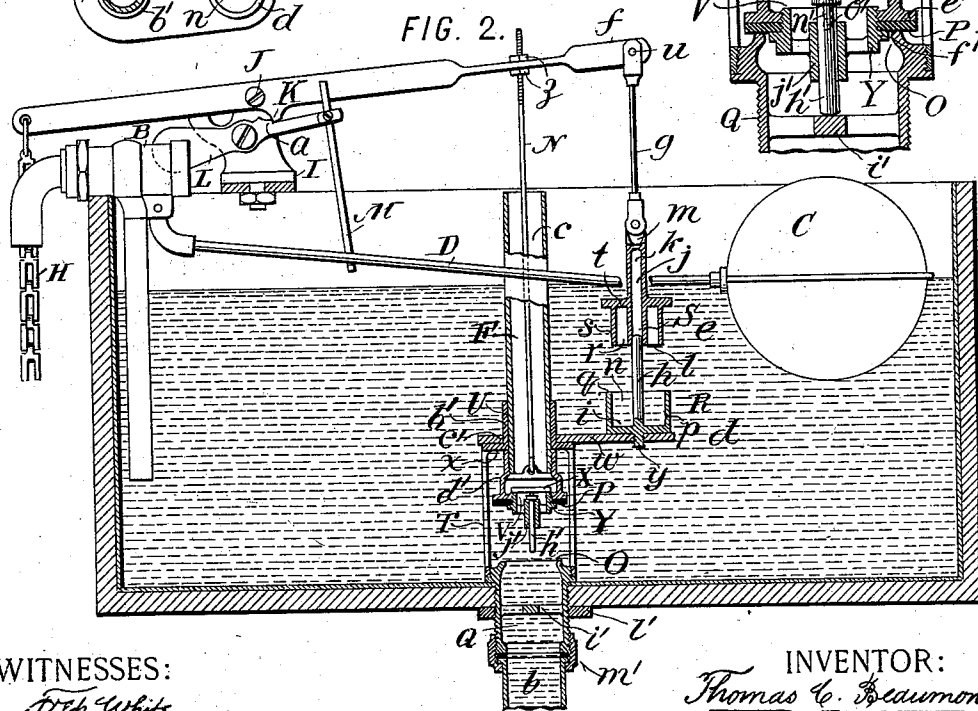
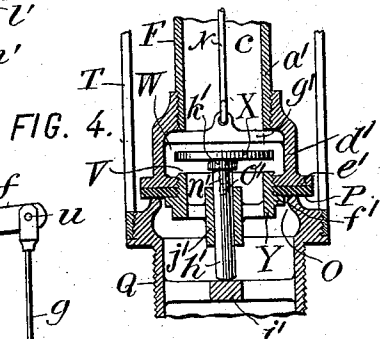
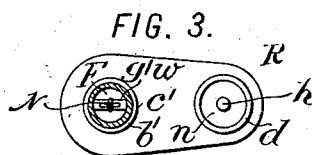
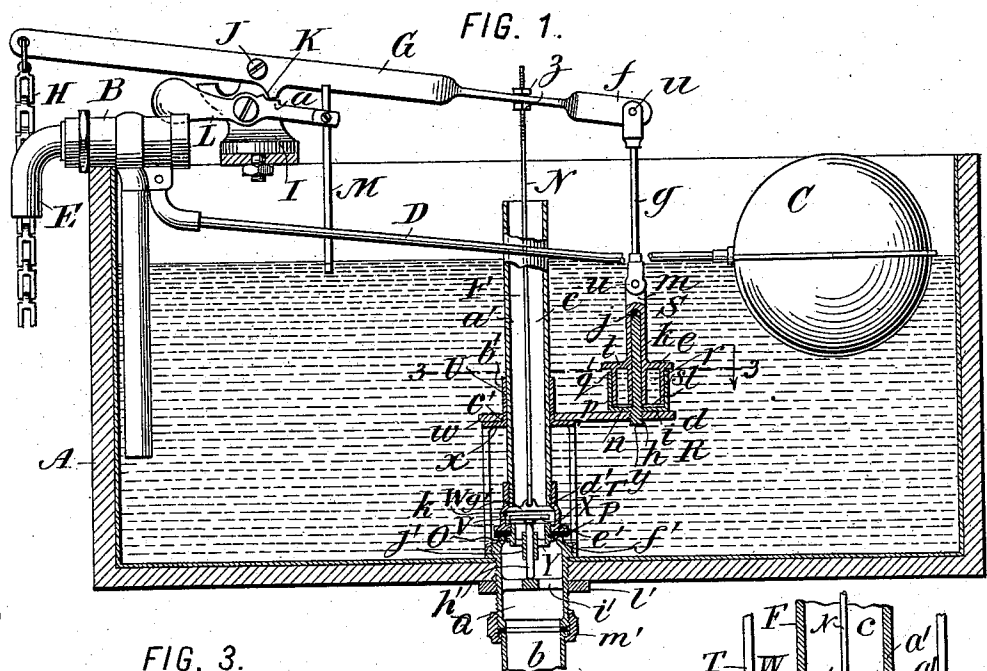
(No Model.)

2 Sheets—Sheet 1.

T. C. BEAUMONT.
FLUSHING TANK, &c.

No. 568,729.

Patented Oct. 6, 1896.



WITNESSES:

Frederick White
Thomas J. Wallace,

INVENTOR:

Thomas C. Beaumont,

By his Attorneys,

Arthur O. Draper & Co.

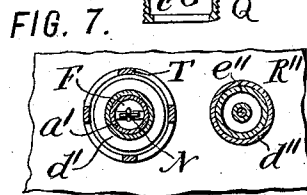
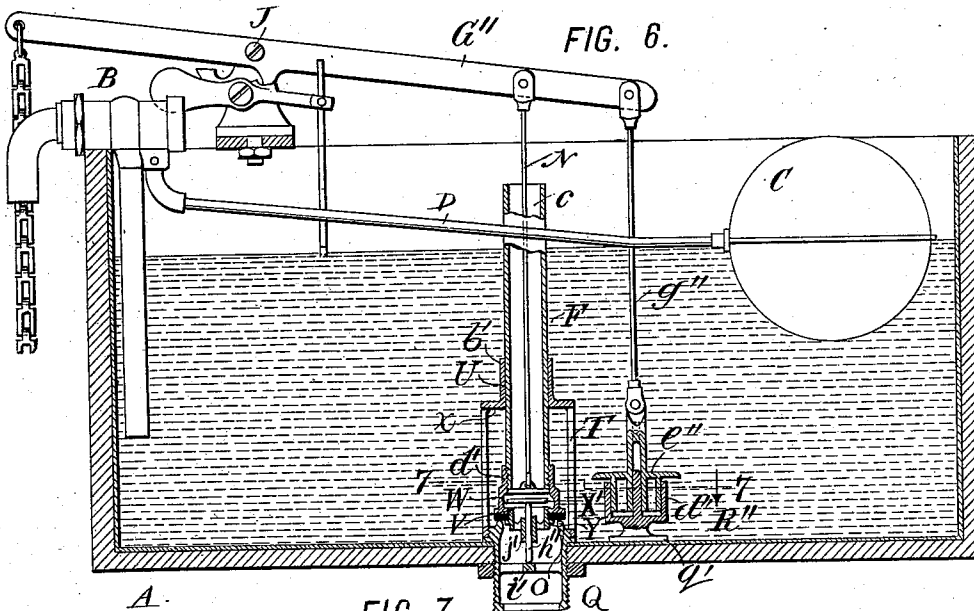
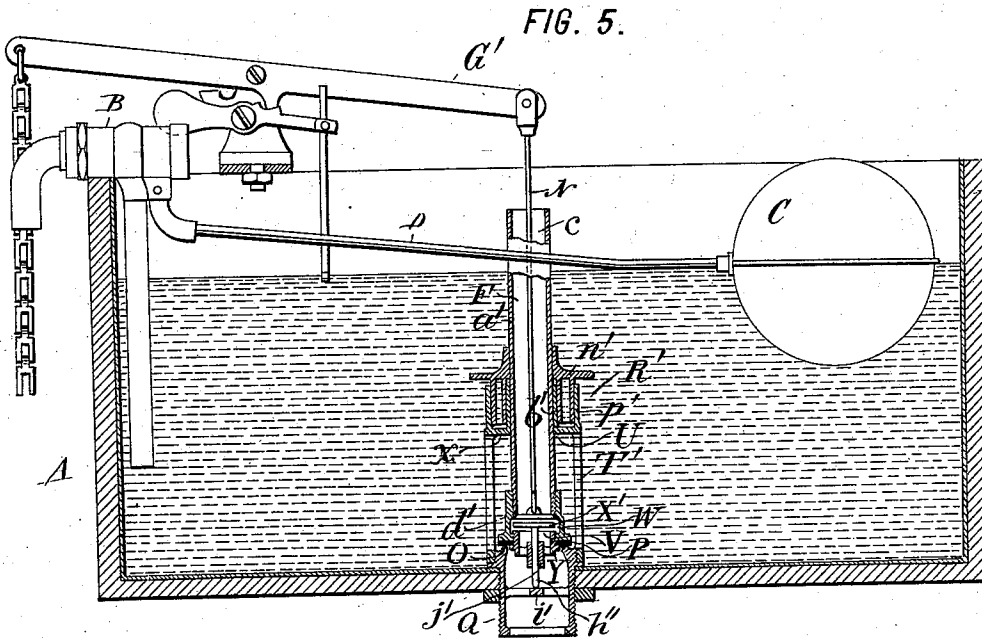
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2 Sheets—Sheet 2.

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Thomas F. Wallace

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UNITED STATES PATENT OFFICE.

THOMAS C. BEAUMONT, OF NEW YORK, N. Y., ASSIGNOR TO THE HENRY HUBER COMPANY, OF SAME PLACE.

FLUSHING-TANK, &c.

SPECIFICATION forming part of Letters Patent No. 568,729, dated October 6, 1896.

Application filed August 28, 1895. Serial No. 560,760. (No model.)

To all whom it may concern:

Be it known that I, THOMAS C. BEAUMONT, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Flushing Tanks, Cisterns, and the Like, of which the following is a specification.

This invention relates to flushing tanks, cisterns, and the like, such, for example, as water-closet cisterns, which are filled with water by a feed usually controlled by a ball-valve and which are emptied to flush the closet by an outlet or flushing valve controlling the discharge through the flushing-pipe, and operated by a lever which is tilted by a pull-chain, or in other suitable manner, when a flush is desired. In such tanks it is usual to lock the valve open until the water-level has fallen to a predetermined extent, and then to release the lock, so that the valve may return to its seat, the release being effected by the falling of the ball as the water-level descends. A weighted dog engaging a stationary projection on the valve-lever is usually employed to lock the valve in the open position, and an arm in the path of the rod of the float and struck by the latter in its descent and connected to the dog to operate it, suffices to move the dog so that the lever can fall. The outlet-valve, in falling under its own weight, and the consequent outflowing water, causes a noticeable thud or jar when allowed to drop suddenly to its seat. The outlet-valve is usually made tubular to serve as an overflow-pipe and to facilitate the outflow from the tank, and it is usual to provide a hush-plate substantially closing the tubular passage through the valve at certain of its positions, so that while the valve is in the maximum open position the drawing of air in through it will be prevented or so retarded that no noise will result from this cause.

My invention provides certain features of improvement in devices of this general character, and aims to provide improved means for insuring the quiet and gradual closing of the flushing-valve and improved means for preventing a disagreeable sucking noise when the valve is open.

To this end, in carrying out my present im-

provements in their preferred form and combination, I provide an improved dash-pot, preferably submerged in the water of the tank, connected to the valve or lever and controlling or cushioning the closing movement, an improved casing for the valve fixedly connected to the valve-seat, guiding the valve and fixedly carrying the dash-pot, and an improved construction of hush-plate disposed within and at the lower part of the valve and operated through the valve-seat or casing; and I provide certain other features of improvement which will be hereinafter fully set forth.

In the accompanying drawings, which illustrate certain adaptations of my invention, Figure 1 is a vertical longitudinal section of a water-closet flushing-tank provided with the preferred form and combination of my improvements, the parts being shown in the closed position, that is, the outlet-valve being closed and the tank in the act of filling. Fig. 2 is a similar view, the parts being shown in the open position, that is, the valve being raised and locked in the open position. Fig. 3 is a fragmentary cross-section cut on the line 3 3 in Fig. 1. Fig. 4 is an axial section, on a larger scale, of the valve and outlet. Fig. 5 is a view corresponding to Fig. 1, but showing a modification. Fig. 6 is a similar view showing another modification; and Fig. 7 is a fragmentary horizontal section of the valve, cut on the line 7 7 in Fig. 6.

Referring to Figs. 1, 2, and 3 of the drawings, let A represent a tank or cistern; B, the feed-valve thereof; C, a float controlling this valve; D, the float-rod; E, the feed-pipe; F, the outlet-valve; G, the lever therefor; H, the pull-chain; I, the lever-stand; J, the fulcrumed lever thereon; K, an arm or projection on the lever; L, a weighted dog fulcrumed on the stand I and having a nose *a*, moving into and out of the path of the arm K; M, a link or arm extending from the dog L into the path of the rod D, engaged by this rod and thereby moving the dog; N, the valve-rod or projection between the valve and lever; O, the valve-seat; P, the face of the valve; Q, the casing in which the seat is formed, and *b* the flushing-pipe leading from the seat.

As thus far described the parts may be of

any suitable construction, those shown being in their general features of well-known construction and operation.

The tank A may be any suitable cistern; the feed-valve B any ordinary valve-controlled ball-cock or other automatically-operated valve which is opened by the falling of the float C with the water-level as the tank is being emptied when the outlet-valve F is opened and is closed by the rising of the float as the tank falls when the outlet-valve is closed. The valve F is tubular and moves vertically toward and from the seat O, which latter is an upper lip on the casing Q, the latter being a tubular casing fastened in any manner to the bottom of the tank and suitably connected to the flushing-pipe. When the lever G is tilted to open the valve, the finger K moves from the dog L, and the weight of the latter tilts it until its nose *a* passes into the path of the arm K. On releasing the lever the tendency of the valve to fall moves the lever until its arm strikes the nose *a*, whereupon it is arrested and the parts are held in the open position until the float C falls with the descending water-level sufficiently to bring its rod D against the link M, and depressing the latter and the dog until the nose of the dog is below the arm K. Then the lever and outlet-valve are free to fall toward the closed position. As soon as the outlet-valve closes the feed-valve refills the tank, the outlet-valve remaining closed until opened by a pull on the chain H. When closed, the tubular passage *c* through the outlet-valve should be open to permit overflow from the tank, and when the valve is lifted this passage should be closed to prevent an inrush of air and the consequent sucking noise.

According to one feature of my present invention, I provide a dash-pot located within the tank and below the water-level therein for cushioning the fall or closing movement of the outlet-valve. This dash-pot is lettered R in Figs. 1, 2, and 3, and consists of two members, the one a pot or female member *d*, and the other a plunger or male member *e*, the one fixed relatively to the valve-seat and the other connected to and moving with the valve. The plunger is preferably the movable part and the pot the fixed part, and the plunger is preferably connected to the valve through the medium of the valve-lever, the end of which is extended and formed with an eye at *f*, to which is connected a link *g*, from the lower end of which the plunger is carried. The link *g* is flexibly connected to the lever and to the plunger, and the movement of the latter is made parallel with the movement of the outlet-valve, a guide S being provided for this purpose, which is preferably formed by constructing the pot with a long straight cylindrical guiding-stud *h*, rising from the center of its flat bottom *i*, and constructing the plunger with a long straight cylindrical hole *j*, receiving and making a guiding fit with the stud *h*, and extending vertically centrally of

the plunger through the stem *k* thereof, from the lower face *l* of the plunger almost to the link-eye *m* at top thereof.

The pot *d* has an annular chamber *n* between its stud *h* and its vertical circular side walls *p*, which walls terminate at its top edge at *q* below the water-level, so that there is certainty that the pot shall be filled with water when the plunger is lifted from it. The plunger has, surrounding the lower end of its tubular stem, an annular chamber *r* between the wall of its stem and its annular side wall *s*, which chamber is open at bottom and closed at top by the flat top wall *t* of the plunger. In the closed position the plunger lies within the pot with its bottom edge *l* almost to the bottom *i* of the pot. In moving to the open position it rises high above the pot, passing to such point that its lower edge will, during the emptying of the tank, come above the water-level, so that its chamber *r* will fill with air, which will be confined in this chamber upon the entrance of the lower end of the plunger into the open top of the pot during the closing movement, and thus make an air-cushion in addition to the water-check, so that no noticeable jar will be caused as the plunger enters the pot, and the consequent closing of the valve will be controlled by the outflow of water between the side walls of the pot and plunger, which walls are made to fit according to the speed of the closure desired for the valve.

By removing either of the pins *u* the plunger can be separated from the pot for the purpose of cleaning or repairing either.

The dash-pot may be disposed as convenience dictates, but according to one feature of my invention I prefer to fixedly connect together the valve-seat and dash-pot, so that their relations shall be preserved, and the application of these parts can be accomplished at one operation. To this end I mount the dash-pot fixedly, but preferably removably, on the valve-seat casing. This is best accomplished as shown in Figs. 1, 2, and 3. In this construction the casing Q has an open or apertured upward extension in the nature of a hood or cage T, on which is fixed a lateral bracket *w*, which rests on the flat angular top *x* of the cage and projects laterally to or beneath the pot *d*, being connected to the latter by the screwing of a screw-threaded projection *y* on the pot through a corresponding hole in the bracket. Any equivalent means of connecting the casing and pot together may be substituted for the particular arrangement here shown.

Another feature of improvement resides in the guiding provision for the valve F. This valve has a tubular cylindrical body throughout its upper part and a seat at its lower end, and the valve-rod N for lifting the valve is connected centrally of the valve to the lower part thereof near the seat and extends upwardly through the hollow interior of the valve to the lever G, to which it is adjustably

coupled by nuts *z*. My invention provides an improved guide U, surrounding the cylindrical tube *a'* of the valve intermediate of its ends, and thus guiding the latter. This guide preferably consists of a long slender sleeve *b'*, formed on the upper part of the casing Q, passing through a hole *c'* in the bracket *w* and disposed in substantially the same horizontal plane as the dash-pot *d*. The guide and dash-pot are parallel and mutually serve to preserve parallel motion of the valve and plunger. The valve is supported below its guide and its portion of greater weight is below the latter, the guide U preferably serving as the only guide for the valve.

My invention comprises an improved construction for the lower end of the valve and an improved hush-plate, the latter located below the water-level of the tank and within and preferably at the lower end of the valve. According to this feature the valve is constructed with an internal valve-seat V within and slightly above its seating-face P and an enlarged chamber W above this seat, and within this chamber is provided a valve or hush-plate X, seating on the seat V when the outlet-valve is lifted, and then closing the passage *c* through the outlet-valve and lifting off this seat when the outlet-valve is closed and then opening such passage. The hush-plate is inclosed within the outlet-valve, and the lower end of the latter is preferably constructed of a tubular shell *d'*, internally screw-threaded at its upper end and there screwing over the lower end of the tube *a'*, enlarged below this screw-threaded part and there serving as the wall for the chamber W, having a flat annular bottom wall *e'*, traversed by a screw-threaded aperture and carrying on its bottom face a ring of packing material constituting the seating-face P of the valve, and into the lower end of the shell *d'* is screwed a thimble Y, having an annular upper edge constituting the seat V for the hush-plate and an annular flange *f'* engaging the packing material of the seat P and clamping it against the face *e'* of the shell. The thimble Y is tubular and its hollow interior constitutes part of the passage *c* through the valve F, while it serves as the seat for the hush-plate and as the clamp for the packing material of the seating-face P. The shell *d'* above the hush-plate X has a projection or cross-bar *g'*, which limits the upward movement of the plate and to which the lower end of the rod N is hooked.

To manipulate the hush-plate, I prefer to employ gravity for closing it, using its own weight for this purpose, and for opening it I prefer to employ a lifter *h'*, arrested during the closing movement of the valve F and then opening the hush-plate and holding it open until the valve F is again lifted. The lifter *h'* is preferably a simple post or pin beneath the hush-plate, movable therewith or independently thereof, as desired, suitably retained in position beneath the plate and engaging some fixed point during the movement of the valve.

I prefer to put a lug or part *i'* on the casing Q and provide a guide *j'* on the thimble Y and mount the post *h'* loosely in this guide, proportioning the parts in such manner that as the valve seats the end of the post will strike the piece *i'* and be arrested thereby, so that the upper end of the post where it preferably has an enlarged head *k'* will, upon the further descent of the valve, contact with and lift the hush-plate X from its seat and hold it sustained thereover while the valve F is seated. Any other mechanical equivalent for accomplishing this may, however, be substituted for that shown. A pin *n'*, working in a hole *o'*, guides the plate X from the post *h'*.

In operation the outlet-valve will close silently and slowly. As it opens, the hush-plate will almost immediately check inflowing air, so that no noticeable sucking-noise will be heard, and this plate will remain tight on its seat until the valve is again almost closed. The dash-pot of the valve and valve-casing are all exposed and within the tank, so that access can be had to any part should occasion require. The hush-plate is protected against accident or injury and is disposed where no noise incident to its operation will be noticeable. It is entirely removed from the valve-lifting rod and does not in any manner interfere with the operation of the valve or the swinging of the valve-lever. The lower side wall *x* of the cage T and the upper edge of the shell *d'* are preferably disposed to abut and serve as stops against so great an upward movement of the valve as would disconnect the plunger of the dash-pot or guiding-stud *h* thereof. To remove all the parts relating to the valve and pot from the tank, it is only necessary to unfasten the casing Q, which can be done in the construction shown by unscrewing the nut *l'* and freeing the union *m'*.

It will be understood that my invention provides an improved flushing-tank, and that my improvements can be readily and advantageously availed of, and it will be understood that the invention is not limited to the particular details of construction, combination, or arrangement of the several parts hereinbefore set forth as constituting the preferred form of my invention, but that the invention can be availed of according to such modifications of structural details and arrangement or of combination as circumstances or the judgment of those skilled in the art may dictate without departing from the spirit of the invention.

In Fig. 5 I have shown a modification in which the parts are identical with those before described and bear the same letters, except as to the valve-lever, which is lettered G', the dash-pot, lettered R', and the cage, lettered T'. In this construction the dash-pot is concentric with the valve F, the plunger (lettered *n'*) being fixed to the tube *a'*, and the pot (lettered *p'*) being formed integrally with and as an upward extension of the cage T'.

In Figs. 6 and 7 the construction of the

parts is identical with that described with reference to Figs. 1 to 4, except that the lever (lettered G'') is extended and carries a long link g'' , and the dash-pot R'' is not carried by the cage T , but the pot d'' is constructed with a standard q' , which is fixed to the bottom of the tank, and the plunger (lettered e'') is connected to the end of the link g'' .

In Figs. 5 and 6 the hush-plate X' is fixed to as well as guided and operated by the post h'' .

What I claim is, in flushing tanks, cisterns, and the like, the following-defined novel features, substantially as hereinbefore set forth, namely:

1. In flushing tanks, cisterns and the like, a tank adapted to hold water, an outlet-valve for said tank and a lever operating said valve, in combination with a casing carried by said tank and having a valve-seat opposite said valve, a valve-guide carried by said casing above said seat and engaging said valve intermediate of its ends, and a dash-pot controlling the closing of said valve and consisting of two cup-shaped members, having their open ends opposed each to the other, the one connected to the valve and movable and the other connected to said casing and stationary.

2. In flushing tanks, cisterns and the like, a tank holding water, an outlet-valve therefor, and means for operating it, in combination with a dash-pot controlling said valve consisting of two members, a pot and a plunger the one movable into and entirely out of the other, the one fixed within said tank and the other connected to and movable with the valve, one of said members having an elongated guiding-stud h parallel with the movement of the valve, and the other an inverted-cup-shaped member, above and moving down upon the fixed member, having its open lower side opposed thereto, and having an elongated tubular stem k having an internal socket j fitting and sliding on said stud and thereby guiding said members in their relative movements.

3. In flushing tanks, cisterns and the like, a tank, a vertically-movable outlet-valve therefor and means for moving it, in combination with a dash-pot controlling closing of said valve, consisting of a fixed pot, and a movable plunger e , the plunger connected to and moving with the valve and having an annular chamber r open at bottom passing above the pot, when the valve is lifted, and

the pot disposed below the point of normal water-level of the tank, cup-shaped and receiving the end of the plunger when the latter falls, whereby the plunger in falling confines air within its chamber r , and during the closing of the dash-pot this air cushions its fall.

4. In flushing tanks, cisterns and the like, a tank having an outlet-valve having a communicating passage through it, and an upwardly-extending end rising above the water-line, in combination with a hush-plate within the lower end of said valve near its seat controlling communication through the valve, and automatically closing such communication when the valve is lifted and opening it when the valve is closed, said valve having an internal guide near its lower end, and a post movably carried in said guide, projecting below the valve, striking a fixed part of the tank when the valve seats, and then operating said plate.

5. For flushing tanks, cisterns and the like, a tubular valve having an outer and an inner seating-face, the outer face adapted for engagement with a valve-seat and the inner face adapted for engagement with an inner valve, in combination with a hush-plate valve within said tubular valve and engaging the inner seat thereof, and means for operating said hush-plate valve projecting exteriorly of said tubular valve, said valve having a guide below said plate guiding said means substantially as and for the purpose set forth.

6. For flushing tanks, cisterns and the like, an outlet-valve comprising a casing Q having seat O , tubular passage therebelow, lug i' below said seat, of a valve proper F having a face P engaging said seat, traversed by a tubular passage and having a movable internal seat V , a hush-plate X within said valve proper F opposite said seat, a guide j' in said valve proper below said seat V , and a post h' carried movably by said guide j' between said hush-plate and said lug, and engaging the latter when the valve proper is closed, and thereby moved upward and lifting said hush-plate.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

THOMAS C. BEAUMONT.

Witnesses:

GEORGE H. FRASER,
CHARLES K. FRASER.