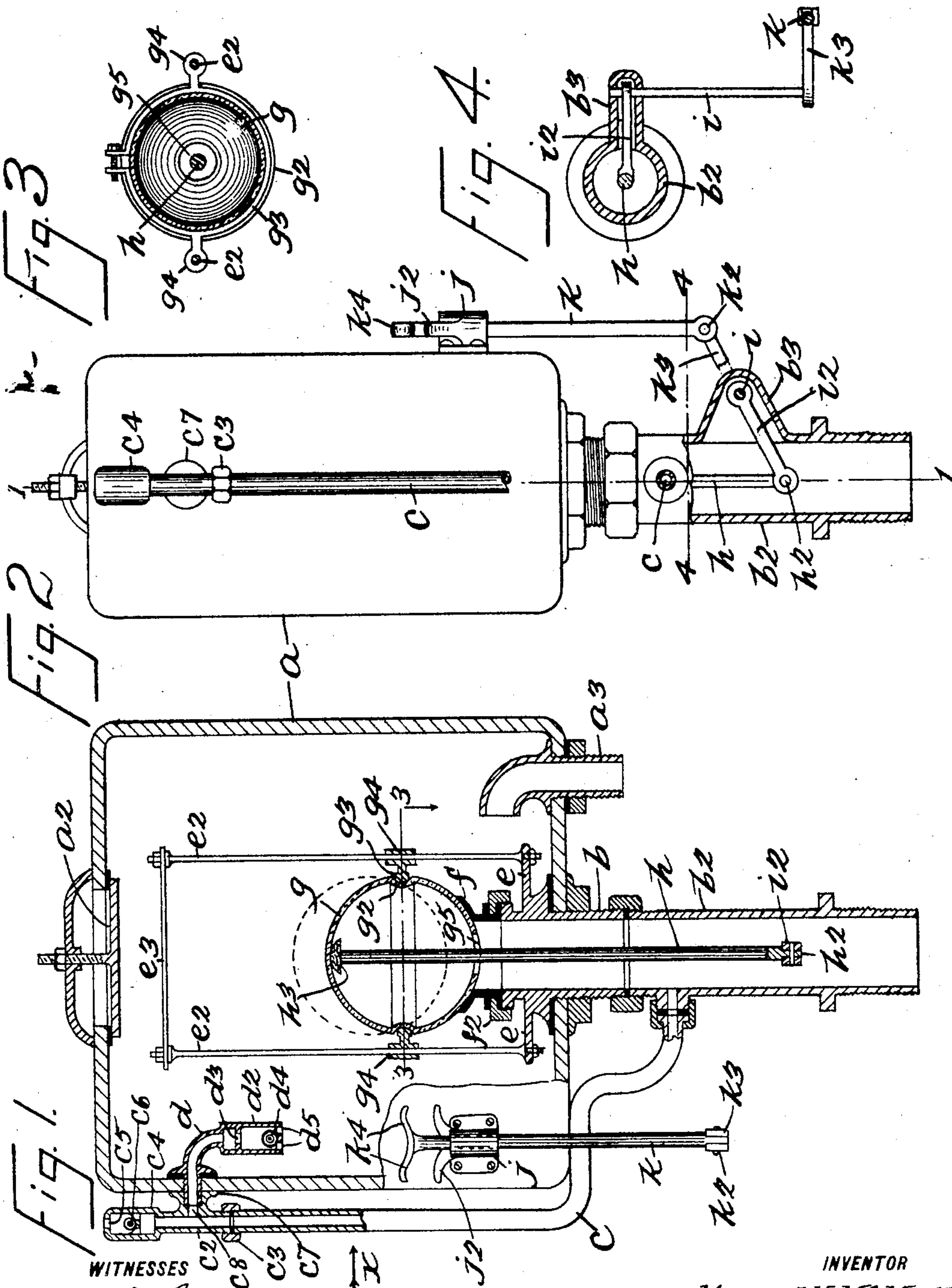


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PATENTED OCT. 31, 1905.

H. H. McMULLEN.  
FLUSH TANK APPARATUS.  
APPLICATION FILED JAN. 5, 1905.



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# UNITED STATES PATENT OFFICE.

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## FLUSH-TANK APPARATUS.

No. 803,355.

Specification of Letters Patent.

Patented Oct. 31, 1905.

Application filed January 5, 1905. Serial No. 239,694.

*To all whom it may concern:*

Be it known that I, HOWARD H. McMULLEN, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Flush-Tank Apparatus, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to flush-tank apparatus for use in water-closets and similar places; and the object thereof is to provide an improved apparatus of this class which is simple in construction and operation and which will not get out of order and frequently need repairs, a further object being to provide an apparatus of this class in which the flow of the water from the tank is controlled by a vertically-movable air-valve which is normally in position to cut off the flow of the water through the discharge-pipe in the operation of flushing and the movement of which in order to open said pipe is effected by hand, a further object being to provide an apparatus of the class specified which is automatically sealed against the inflow of air in the operation of filling the tank, which operation is effected in the usual manner by water which is at liberty to flow into the tank from the usual water-supply pipes of the building in which the apparatus is placed and whereby an air-cushion is formed into the top of the tank which places the water therein under pressure; and with these and other objects in view the invention consists in an apparatus of the class specified constructed as hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which—

Figure 1 is a sectional side elevation of my improved flush-tank apparatus, the sectional parts being shown on the line 1 1 of Fig. 2; Fig. 2, a similar view looking in the direction of the arrow  $x$  of Fig. 1; Fig. 3, a partial section on the line 3 3 of Fig. 1, and Fig. 4 a section on the line 4 4 of Fig. 2.

In the practice of my invention I provide a tank  $a$ , which is provided in the top thereof with an ordinary hand-hole  $a^2$ , which is closed in the usual or any preferred manner, so that said hole when the apparatus is in op-

eration is hermetically sealed. The tank  $a$  is also provided, preferably at or in the bottom thereof and near one side thereof, with a water-supply pipe or coupling  $a^3$ , which in practice is connected with the ordinary water-supply pipe or pipes in the usual manner.

In the central portion of the bottom of the tank  $a$  is secured a tubular coupling  $b$ , with the lower end of which is connected a pipe-section  $b^2$ , which in practice is connected at its lower end with the water-basin to be flushed, and at one side of the tank  $a$  is a vertically-arranged overflow-pipe  $c$ , which extends below and communicates with the pipe-section  $b^2$ , but which may be connected with and communicate with the tubular pipe-coupling  $b$ , secured in the bottom of the tank. The upper end of the overflow-pipe  $c$  is provided with an upwardly-directed extension  $c^2$ , which in the form of construction shown is formed separately from the pipe  $c$  and connected therewith, as shown at  $c^3$ , and the upper end of the extension  $c^2$  of the pipe  $c$  is provided with an enlarged oblong head or member  $c^4$ , in the top of which is a port or passage  $c^5$ , and in the enlarged head or member  $c^4$ , and centrally thereof in the form of construction shown, is supported a vertically-movable ball-valve  $c^6$ , which is adapted to close the port or passage  $c^5$  and is provided with an open-work support, so that the air may be free to flow around said valve.

The extension  $c^2$  of the pipe  $c$  is provided at the side thereof with a laterally-directed member  $c^7$ , which bears on the tank  $a$  and which is provided with a port or passage  $c^8$ , which communicates with the extension  $c^2$  of the pipe, and in the tank  $a$  is placed an elbow-pipe  $d$ , one end of which is passed through the slide and through the tank and communicates with the port or passage  $c^8$  and with the extension  $c^2$  of the pipe  $c$ , and the other end of the elbow-pipe  $d$  within the tank  $a$  is provided with a depending tubular member  $d^2$ , in the top portion of which is a port or passage  $d^3$ , adapted to be closed by a ball-valve  $d^4$  and normally supported in the bottom of the bottom member  $d^2$ , and said bottom of the member  $d^2$  is provided with ports or passages  $d^5$ , through which air and water are free to pass, as hereinafter described.

The tubular member  $b$  in the bottom portion of the tank  $a$  is provided at its upper end or within said tank with laterally-directed arms  $e$ , with which are connected vertically-arranged rods  $e^2$ , which are connected at their



upper ends by a transverse plate, rod, or bar  $e^3$  or in any desired manner and connected with the upper end of the tubular member or coupling  $b$ , and within the tank  $a$  is an  
 5 annular valve-seat  $f$ , preferably composed of rubber, rubber and canvas, or other material which will not be injuriously affected by water, and this connection being preferably made by means of a collar  $f^2$  in the manner  
 10 shown.

I also provide a hollow-ball valve  $g$ , which is preferably composed of glass, but which may be composed of any material which will not be injuriously affected by water—such as  
 15 copper, aluminium, hard rubber, or other material of this class—and said valve is provided around the central portion thereof with a groove  $g^2$ , in which is placed a clamp-band  $g^3$ , provided at its opposite sides with vertically-arranged tubular bearings  $g^4$ , through  
 20 which the rods  $e^2$  pass, and said rods form a cage and guides for the valve  $g$  and hold it in proper position at all times.

The valve  $g$  is provided in the bottom thereof with an opening  $g^5$ , through which passes a vertically-arranged rod  $h$ , which is arranged in the tube or tubular coupling  $b$  and passes downwardly into the tubular member or section  $b^2$ , and said tubular member or section  $b^2$   
 30 is provided at one side with a hollow boss  $b^3$ , through which is passed a shaft  $i$ , to which is secured within the boss  $b^3$  an arm  $i^2$ , which is pivotally connected with the lower end of the rod  $h$ , as shown at  $h^2$ .

Secured to the front side of the tank  $a$  is a bracket or keeper  $j$ , through which is passed a vertically-arranged rod  $k$ , the lower end of which is pivotally connected at  $k^2$  with a crank  $k^3$ , which is rigidly secured to the shaft  $i$ .  
 40 The rod  $k$  is provided at its upper end with a cross-head  $k^4$ , and the bracket or keeper  $j$  in the form of construction shown is provided with laterally-directed fingers  $j^2$ , and in the form of construction shown the rod  $k$  is provided at its upper end with a head  $k^3$ , preferably composed of rubber or similar material, and which is designed to prevent the said rod from breaking the valve  $g$  if said valve is made of glass.

The normal position of the parts of my improved flush-tank apparatus when the latter is not in operation is that shown in Fig. 1. If now water be permitted to flow into the tank through the pipe or pipe-coupling  $a$ , the water  
 55 will gradually rise in the tank, and the valve  $g$  will remain seated, as shown in Fig. 3, and as the water continues to rise in the tank the valve  $d^4$  will be raised and will close the port or passage  $d^3$ , and the further escape of air from the tank will be cut off, and an air-cushion will thus be formed in the top of the tank which will place the water therein under pressure, and only a small amount of water can enter the tank after the flow of air through  
 65 the pipe  $d$  is cut off. It will be understood

that the air which flows outwardly through the pipe  $d$  also escapes through the port or passage  $e^5$  in the upper end portion of the extension  $e^2$  of the pipe  $c$ , and whenever it is desired to operate the valve  $g$  and allow the  
 70 water to escape from the tank the rod  $k$  is depressed by pressing the hand on the cross-head  $k^4$  or by placing the hand on said cross-head and grasping the laterally-directed fingers  $j^2$  of the bracket or keeper  $j$  and drawing  
 75 down said rod. This operation turns the crank  $k^3$  and the shaft  $i$ , and the arm  $i^2$ , connected with the shaft  $i$ , raises the rod  $h$ , which operation raises the valve  $g$ , and the water is free to flow into the basin to be flushed through  
 80 the pipe members  $b$  and  $b^2$ . When the water in the tank has fallen below the valve-seat  $f$ , the valve  $g$  will descend and assume the position shown in Fig. 1, and this operation raises  
 85 the rod  $k$ . It will be understood that the valve  $g$  may be made of any desired weight, and when the valve has been raised, as hereinbefore described, a small amount of water will flow into said valve through the opening  $g^5$ ; but this water always flows out of said valve  
 90 in the operation of flushing or when the valve rests on its seat, as shown in Fig. 1. After the rod  $k$  has been depressed and the valve raised in the operation of flushing, as hereinbefore described, the rod  $k$  may be raised by  
 95 hand, and the valve  $g$  will return to its seat when the operation of flushing is completed, as hereinbefore described, and, if desired, a spring or similar device may be employed for raising the rod  $k$ .  
 100

The port or passage  $e^5$  is intended to permit air to flow into the tank  $a$ , as hereinbefore described, and the valve  $e^6$  is intended under certain circumstances to prevent water from  
 105 being thrown out through said port or passage, which might occur in case that the valve  $d^4$  should fail to operate or in the case of a sudden inrush of water into the tank  $a$ , at which time the valve  $d^4$  might not operate.

It will be understood from the foregoing  
 110 description that the tank  $a$ , except as hereinbefore described, must be hermetically closed against the entrance therein of air and the discharge of air therefrom, and by placing the rod  $h$  in the discharge-pipe members  $b$  and  $b^2$   
 115 and operating the rod by devices located outside of the tank the desired result is accomplished much better and more conveniently than it could be done if the said operating devices were located in the tank or partially  
 120 therein.

My invention is not limited to the exact details of construction herein shown and described, and various changes therein and  
 125 modifications thereof may be made without departing from the spirit of my invention or sacrificing its advantages, and I reserve the right to make all such alterations therein as fairly come within the scope of the invention.

Having fully described my invention, what  
 130



I claim as new, and desire to secure by Letters Patent, is—

1. In a flush-tank apparatus, a tank, means  
5 for supplying water thereto, a discharge-pipe  
secured in the bottom of said tank and pro-  
vided at its upper end with a valve-seat, a  
vertically-movable hollow-ball valve normally  
10 seated on the valve-seat and provided with  
vertically-arranged side guides and an open-  
ing in the bottom thereof, a rod arranged  
vertically in the discharge-pipe and passing  
upwardly into said valve, devices for moving  
15 said rod vertically, an air-discharge tube in  
one side of said tank below the top thereof,  
and means whereby the flow of water into  
said tank will cut off the flow of air through  
said pipe, substantially as shown and de-  
scribed.

2. In a flush-tank apparatus, a tank pro-  
20 vided in one side and near the top thereof  
with an air-discharge pipe, means for supply-  
ing water to said tank, a water-discharge  
pipe secured in the bottom portion of the tank  
and passing therethrough and provided at its  
25 upper end with an annular valve-seat, a ver-  
tically-movable hollow-ball valve mounted on  
said valve-seat and provided with an opening  
in the bottom thereof, a rod mounted verti-  
cally in the water-discharge pipe and passing  
30 upwardly into said valve, devices located out-  
side of the tank for moving said rod verti-  
cally, and means whereby the flow of water

into the tank will cut off the flow of air  
through the air-discharge pipe, substantially  
as shown and described.

3. In a flush-tank apparatus, a tank pro-  
35 vided in one side and near the bottom thereof  
with an air-discharge pipe, means for supply-  
ing water to said tank, a water-discharge  
pipe secured in the bottom portion of the tank  
40 and passing therethrough and provided at its  
upper end with an annular valve-seat, a ver-  
tically-movable hollow-ball valve mounted on  
said valve-seat and provided with an opening  
in the bottom thereof, a rod mounted verti-  
45 cally in the water-discharge pipe and passing  
upwardly into said valve, devices located out-  
side of the tank for moving said rod verti-  
cally, and means whereby the flow of water  
into the tank will cut off the flow of air 50  
through the air-discharge pipe, said tank be-  
ing also provided with an overflow-pipe which  
is connected with the air-discharge pipe and  
with the water-discharge pipe in the bottom  
55 portion of the tank, substantially as shown  
and described.

In testimony that I claim the foregoing as  
my invention I have signed my name, in pres-  
ence of the subscribing witnesses, this 4th day  
of January, 1905.

HOWARD H. McMULLEN.

Witnesses:

F. A. STEWART,

C. E. MULREANY.