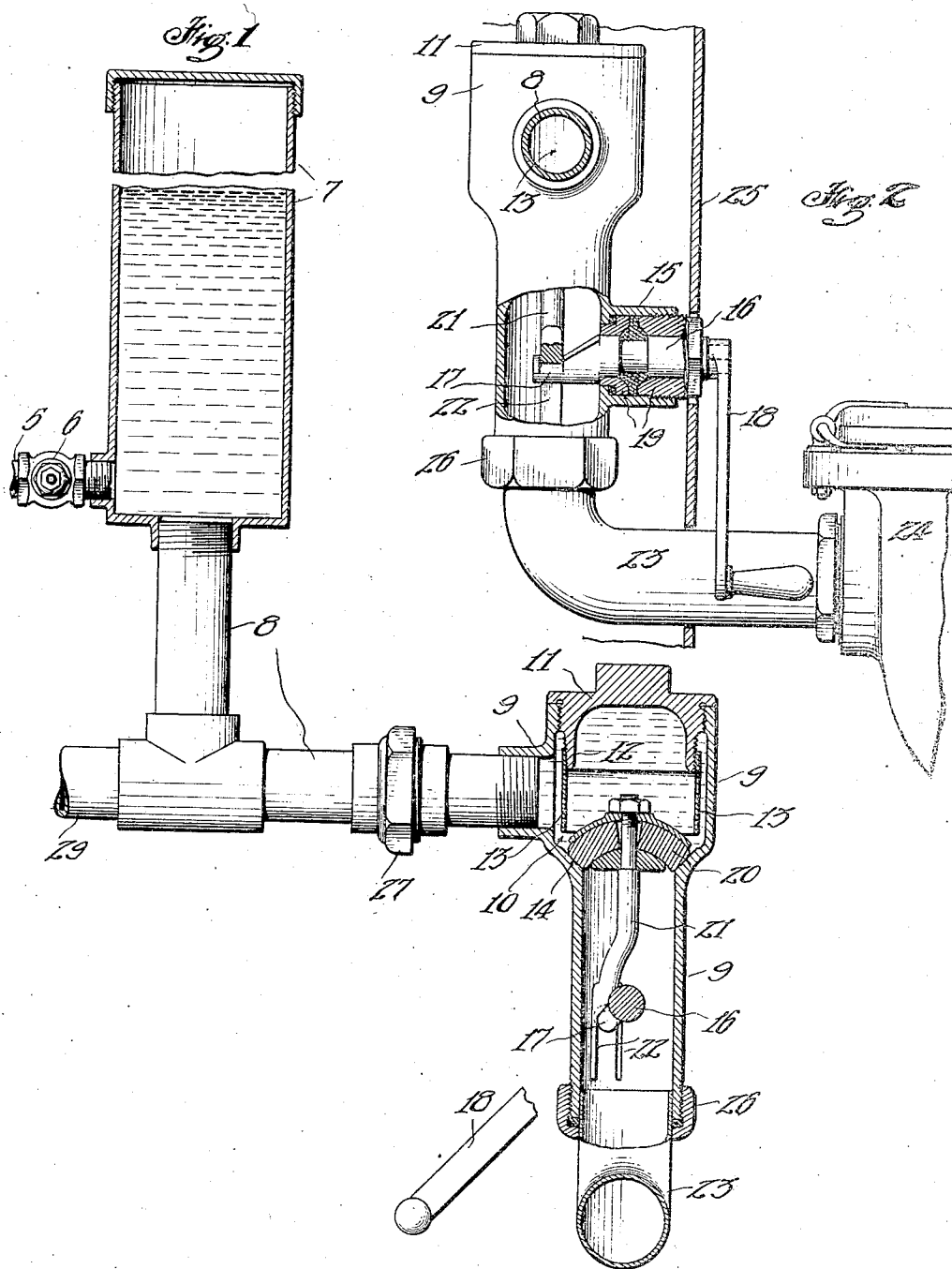


H. MORRIS.
FLUSHING APPARATUS.
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Patented Aug. 24, 1909.



Witnesses
William Field
S. B. Austin.

Inventor
Homer Morris
by G. E. Thompson
Attorney

UNITED STATES PATENT OFFICE.

HOMER MORRIS, OF HERMOSA BEACH, CALIFORNIA, ASSIGNOR OF ONE-HALF TO H. R. GAGE,
OF OCEANPAKE, CALIFORNIA.

FLUSHING APPARATUS.

931,948.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HOMER MORRIS, a citizen of the United States, residing at Hermosa Beach, in the county of Los Angeles, State of California, have invented new and useful Improvements in Flushing Apparatus, of which the following is a specification.

My invention relates primarily to apparatus for flushing water closets and is illustrated and described herein as applied to that purpose, although the apparatus may be used for other purposes, and the object thereof is to provide a device of simple construction and compact form in which the controlling valve is manually started to commence the operation and is held open automatically until the flushing is completed when the controlling valve will return to its seat automatically. I accomplish this object by the apparatus described herein and illustrated in the accompanying drawings in which:—

Figure 1 is a sectional front elevation of the flushing apparatus. Fig. 2 is a side elevation of the controlling valve partly in section and showing it connected to the closet bowl.

In the drawings 5 is the supply pipe which is connected to a source of water supply under pressure of a sufficient head for flushing purposes. Usually this will be the city water main. This pipe is provided with a regulating cock 6 and is connected to and opens into an air chamber 7. I have shown a supply pipe connected to the air chamber at the bottom, but the connection may be made at the top, or at any intermediate point between the top and bottom, providing the supply pipe passes a point on a level with or below the bottom of the air chamber. Leading from the bottom of the air chamber is a pipe 8 which is connected to the casing 9 of valve chamber 10. The top of valve chamber casing is preferably closed by a plug 11 which is provided with a downwardly projecting flange 12 which is exteriorly threaded. On this flange is screwed a tubular regulator 13 which can be screwed up or down upon the flange to regulate the distance between the regulator and valve seat 14 which is formed on the casing 9 at the bottom of the valve chamber, whereby the volume of water flowing through the valve chamber can be regulated. Below the valve seat, casing 9 is reduced in size and is pro-

vided with a boss 15 through which projects the valve operating shaft 16, the inner end of which forms a crank or eccentric 17. On the outer end of shaft 16 is the operating handle or lever 18. Within the boss and connected thereto and surrounding shaft 16 is a stuffing box 19 to make the joint around the shaft water-tight. On valve seat 14 is valve 20 which is secured upon the top of valve stem 21 in any suitable manner. This valve when raised off its seat passes up into regulator 13. This regulator forms a cup-shaped receptacle in which the valve, when raised, is held by the flow of the water until the pressure in the air chamber is relieved. The lower end of the valve stem is bifurcated and the furcations 22 thereof straddle crank 17. To the lower end of the casing 9 is secured flushing pipe 23 which leads to and is connected with the closet bowl 24. I prefer to place the air chamber and the valve casing within the partition wall and to cover the opening necessary for the insertion of these parts by a removable plate 25 which can be taken off when it is desired to remove the parts for repair. A slip coupling 26 permits of the disconnection of the valve casing from the flush pipe, and a union 27 on pipe 8 permits the removal of the valve casing without interfering with the air chamber. By unscrewing plug 11 the valve can be removed from the casing and replaced after being repaired. When installing this apparatus the air chamber would preferably be connected up when the plumbing of the building was roughed in, although it could be installed afterward.

Where there are closets on the same floor on the opposite sides of the partition the pipe 8 may be provided with a branch 29 which would lead to another valve casing containing a valve and other connections similar to those described herein. It will be understood that the air chamber is of sufficient capacity to hold the desired quantity of water for flushing purposes, but that it does not require a capacity sufficient to hold all of the water required for a single flushing of the closet, as a certain amount of supply will be furnished through pipe 5 during the flushing operation.

With my flushing apparatus in position and properly connected, when it is desired to flush the closet, the operating handle would be turned to throw the valve into the regulator, when the water would flow

downwardly around the bottom of the regulator passing on through the casing and flush pipe into the bowl in the usual manner. The flow of the water under the regulator will hold the valve up in the regulator until the air pressure in the air chamber is relieved, when the suction of the water passing through the lower part of the valve casing and the weight of the valve will cause the valve to automatically seat itself. The supply of water passing through cock 6 must be less than the amount of water which can be discharged through the valve chamber, and the time that it will take for the valve to reseal itself will be regulated, first by the quantity of water which accumulates in the air chamber, and secondly by the amount of water that is permitted to flow into the air chamber during the process of flushing. It will be observed that if the quantity of water entering the air chamber through pipe 5 was equal to the quantity of water discharged through the valve chamber when the valve was raised into the regulator it would remain in that position as long as the water flowed, and it is necessary therefore that the supply of water entering the air chamber shall be less than that discharged through the valve chamber. It will also be observed that the volume and velocity of flow of water passing through the valve chamber is controlled by the regulator, so that my apparatus can be used upon any water system whether the pressure be high or low. If the pressure is high, the distance between the bottom of the regulator and valve seat would be much less than if the pressure were low, the distance being regulated in accordance with the pressure. It will also be observed that after the valve is seated the water pressure of the main causes the water to accumulate in the air chamber until the air is compressed to a point equal to the water pressure, and that when the valve is unseated this air pressure is exerted on the whole body of the water in the air chamber and that during the flushing process a certain quantity of water flows through the supply pipe and aids in flushing until the valve is reseated. It will also be observed that as long as the air pressure in the air chamber aided by the inflow of water from the service pipe is sufficient to discharge the water through the valve chamber with a velocity sufficient to hold the valve up in the regulator the flushing proceeds,

but that as soon as the velocity of the water is not sufficient to hold the valve in the regulator it will automatically return to its seat. It will also be observed that in causing the valve to reseal itself there will be the weight of the valve and the stem and the suction of the water below. Without the use of the regulator the valve would remain unseated the same time whether the pressure was high or low and would therefore be an unsatisfactory apparatus as I have found from my practical experiments.

Having described my invention what I claim is:—

1. In a flushing apparatus an air chamber; a connection from the bottom of said air chamber to a valve chamber provided with a valve seat; a connection from said valve chamber to a place of use; a valve in said valve chamber; an adjustable cup-shaped regulator in said valve chamber above the valve seat into which the valve is received when unseated, said regulator and valve being so arranged that when the valve is unseated the water flows between the valve seat and the regulator below the valve and holds the valve up into the regulator until the air pressure is relieved in the air chamber; means to unseat said valve; and means to supply said air chamber with water under pressure, said supply means being of less capacity than the discharge means when the valve is unseated.

2. In a flushing apparatus a closet bowl; a connection from said bowl to a pressure water supply; a portion of said last connection consisting of a piece of vertical casing; a valve chamber and a valve seat in the upper portion of said vertical casing; a dependent cup shaped receptacle in said valve chamber over said valve seat; means to regulate the distance between said cup shaped receptacle and said valve seat; a valve on said seat adapted to be moved up into said cup shaped receptacle and to be held therein by the flow of water between the valve seat and the receptacle; and means to move said valve into said receptacle.

In witness that I claim the foregoing I have hereunto subscribed my name this 16th day of March, 1907.

HOMER MORRIS.

Witnesses

G. E. HARPAM.

S. B. AUSTIN.