No. 847,361. PATENTED MAR. 19, 1907.

S. A. & W. H. PALMER.

AUTOMATIC FLUSH TANK.

APPLICATION FILED JUNE 12, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

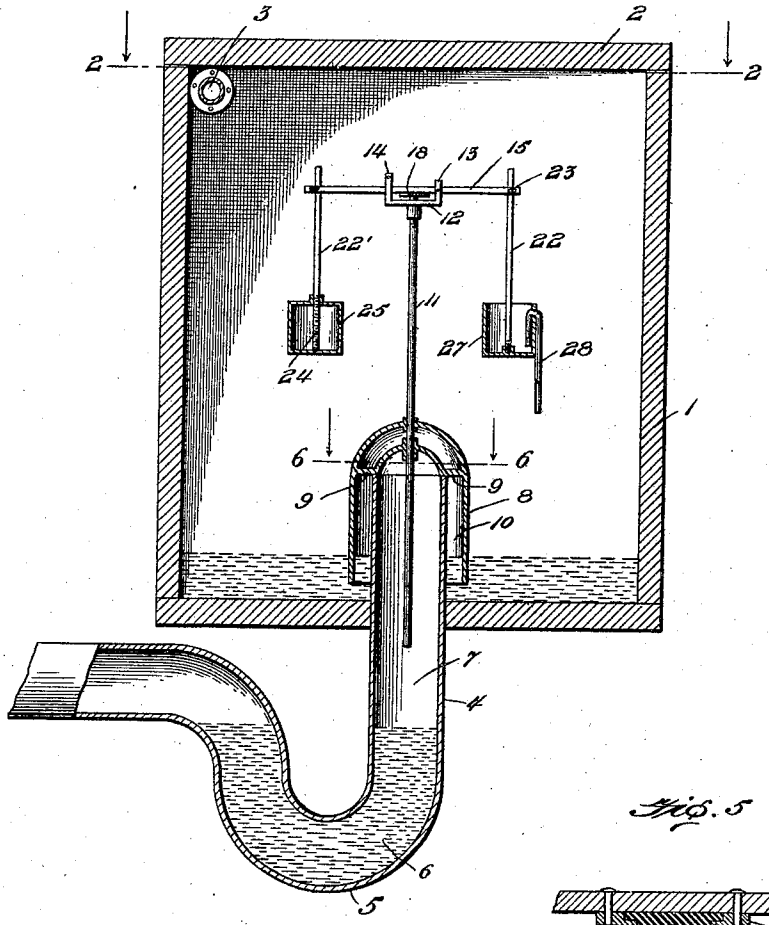


Fig. 5.

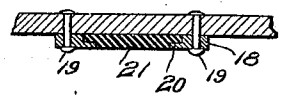
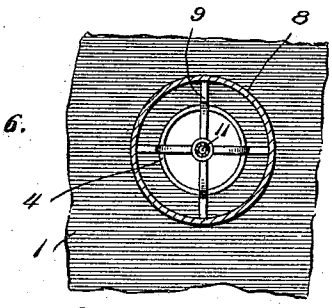


Fig. 6.



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their Attorney

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2 SHEETS—SHEET 2.

Fig. 2.

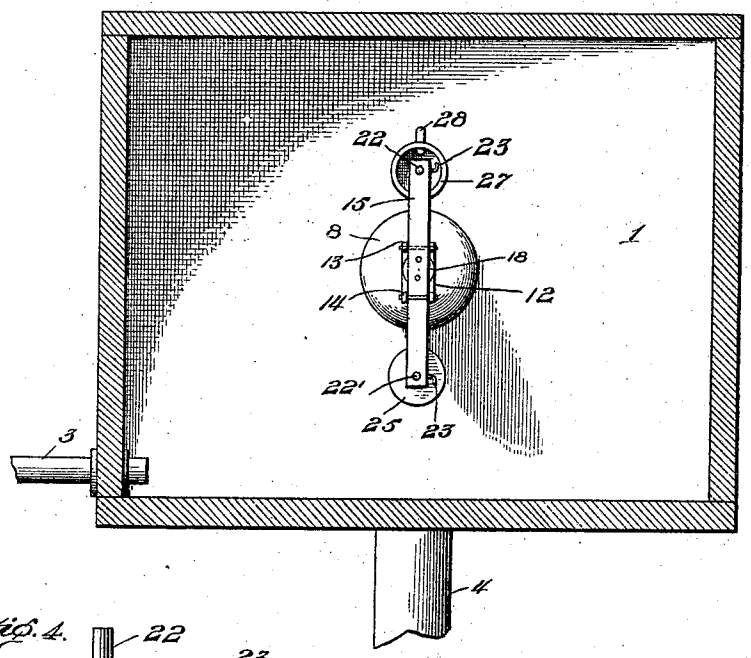


Fig. 4.

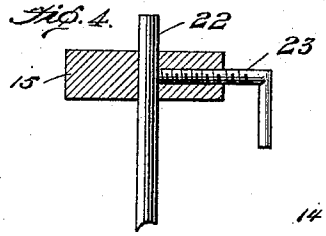
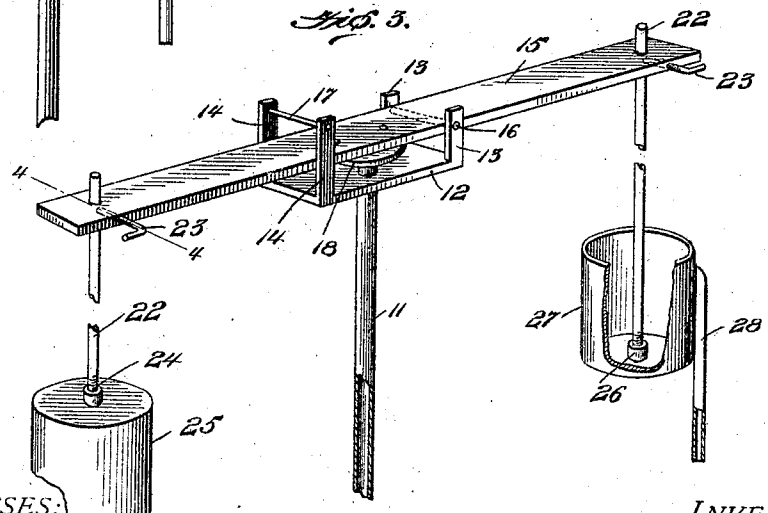


Fig. 3.



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UNITED STATES PATENT OFFICE.

SCOTT A. PALMER AND WILLIAM H. PALMER, OF SAN DIEGO, CALIFORNIA.

AUTOMATIC FLUSH-TANK.

No. 847,361. Specification of Letters Patent. Patented March 19, 1907.

Application filed June 12, 1906. Serial No. 321,373.

To all whom it may concern:

Be it known that we, SCOTT A. PALMER and WILLIAM H. PALMER, citizens of the United States, residing at San Diego, in the county of San Diego and State of California, have invented certain new and useful Improvements in Automatic Flush-Tanks, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in automatic flush-tanks, and has for its object the provision of means for facilitating the flushing of sewers, toilets, and other similar waste-conduits.

Another object of the invention is the improvement of the construction of the valve mechanism of an automatic flush-tank.

With these and other objects in view the invention consists of certain novel constructions, combinations, and arrangements of parts, as will be hereinafter fully described and claimed.

In the drawings, Figure 1 is a vertical central sectional view of an apparatus constructed in accordance with the present invention. Fig. 2 is a top plan view of the apparatus, taken on line 2 2, Fig. 1, and looking in the direction of the arrow. Fig. 3 is a perspective view of the valve device employed in the construction of our invention. Fig. 4 is a transverse sectional view taken on line 4 4, Fig. 3. Fig. 5 is a fragmentary longitudinal sectional view of the central portion of the pivoted bar or member. Fig. 6 is a horizontal sectional view taken on line 6 6, Fig. 1, and looking in the direction of the arrow.

Referring to the drawings by numerals, 1 designates the reservoir or tank, formed by employing a suitable receptacle. The tank 1 is provided with a cover 2. An inlet-pipe 3 is preferably secured to the tank 1 near its upper edge by any suitable means. The outlet-pipe 4 is bent or curved, as at 5, to form an ordinary water-trap 6. An air-chamber 7 is formed in the pipe 4, as will be hereinafter described.

The pipe 4 extends through an aperture formed in the bottom of the tank 1 and projects into said tank a suitable distance for permitting the inverted-bell-shaped or cup-shaped hood 8 to be supported upon the inner end of said pipe 4. The hood 8 entirely surrounds the inner end of pipe 4. A plurality of arms 9 9 are employed for supporting or suspending the hood 8 upon the inner end of pipe 4. Each set of the arms 9 is preferably formed by a single bar, which is upwardly bowed, Fig. 1, and is provided with horizontally-extending portions at the ends. The inner ends of the horizontal portions, Fig. 1, are secured in any suitable manner, preferably to the inner end of pipe 4, and the outer ends of said portions are fixedly secured in any suitable manner to the interior of the hood 8. By reason of thus supporting the hood upon the inner end of pipe 4 the liquid, preferably water, can pass through the compartment 10, formed between the pipe 4 and the hood 8, and flow through the water-trap 6 when the air in air-chamber 7 is exhausted.

In the air-chamber 7 there is normally formed an air bond. When the air is exhausted from said chamber, the liquid may flow freely from the tank 1 through the water-trap and into any suitable outlet. The valve means for controlling the exhaust of air from the air-chamber 7 comprises a tube or pipe 11, constituting a hollow member, the lower end of which pipe extends into the air-chamber 7, and the upper end of the pipe 11 is normally closed by a valve device, hereinafter described. The pipe 11 extends through the top of the hood 8 and through the crossed portions of the bars forming the arms 9. Therefore the hoods 8 and the arms 9 produce an upper and a lower fastening means for securing the pipe 11 in a fixed position within the pipe 4. The plurality of fastening means for suspending the pipe 11 in the position specified prevents any independent movement of said pipe within the tank 1, as it is rigidly secured therein. It is to be noted that the lower end of the pipe 11 preferably extends below the horizontal plane in which the floor of the tank is positioned.

The upper end of the vertical pipe 11 is preferably threaded, and positioned upon this threaded end of said pipe is a bracket 12, which is preferably rectangular shaped. At one end of the horizontal bracket 12 is preferably a pair of vertical supporting-posts 13 13 and at its opposite end preferably a pair of vertical guiding-posts 14 14. A pivoted bar or member 15 is supported, preferably, upon posts 13 by passing a bolt 16 or any suitable transverse member through said

posts 13 and the bar 15. A bolt or transverse member 17 extends through the guiding-posts 14 14 near their upper end and is provided for the purpose of limiting pivotal movement of bar 15. The bar 15 extends across the upper end of pipe 11. A washer 18 is secured against the bottom or under face of the bar by any suitable means—as, for instance, rivets 19 19. The washer 18 is preferably provided with a flanged portion 20, Fig. 5, which flanged portion is formed for securing a yielding disk 21, preferably formed of rubber, against the bar 15. It will be noted that this rubber disk constitutes filling means. The washer 20 is positioned upon the bottom of the bar 15, so as to place the rubber disk 21 over the upper end of pipe 11, and thereby when the bar 15 is in its normal position forming an air-tight seal for the upper end of the pipe 11.

Rods 22 and 22′ extend through the ends of bar 15 and are adjustably secured in a fixed position by suitable locking members 23, constituted by threaded thumb-screws. Each rod 22 and 22′ is vertically adjusted in the same manner. Referring particularly to Fig. 4, it will be seen that rod 22 extends through an apertured portion in the bar 15, and the locking member 23, constituted by a thumb-screw, is threaded into the bar 15, and the inner end of said locking member 23 clamps against the rod 22 and securely retains it in an adjusted position.

The lower end of rod 22′ is preferably threaded, as at 24, and said rod 22′ supports a removable hollow air-tight float 25. The extreme lower end of the rod 22 is also threaded, and this threaded end is screwed, preferably, into a stud 26, formed integral with the bottom of a bracket 27. A siphon 28 extends through the side of the bucket near its upper edge. Of course it will be obvious that the specific means of fastening the rods 22 and 22′ to the bucket 27 and the float 25, respectively, may be varied at our option; but the drawings illustrate a practical application of the invention.

By means of the adjustability of the bucket 27 and the float 25 under normal conditions the pivotal bar will rest, preferably, in a horizontal plane, and thereby permit the rubber disk 21 to seal or close the upper end of the pipe 11, and consequently said disk performs the function of a valve. While the upper end of the pipe 11 is closed, the air bond in the air-chamber 7 will prevent liquid from passing from the tank through the outlet-pipe 4. If liquid is flowing into the tank 1 through the inner pipe 3, as soon as said liquid is of sufficient depth to reach the float 25, and if said liquid continues to flow, said float will be gradually lifted, and synchronously with the lifting of the float 25 the liquid will rise around the bucket 27, and as the float 25 is submerged in the liquid the bucket 27 will be filled, thereby adding considerable weight to assist the float in swinging bar 15 upon its pivot, constituted by bolt 16, and the valve, constituted by the washer and disks 18 and 21, respectively, will be removed from the end of pipe 11, permitting the air to exhaust from the air-chamber 7 and allowing the liquid to flow freely from the tank 1 through the compartment 10 and into the outlet-pipe 4. As soon as the liquid has fallen below the lower end of siphon 28 the liquid is siphoned from bucket 27, and as the bucket is emptied the bar 15 will gradually swing to its normal horizontal position, and when the liquid is entirely siphoned from the bucket the valve will be in engagement with the upper end of pipe 11, thereby closing said pipe and again forming the air bond in the air-chamber until the liquid again rises in the tank and the device is actuated. It will be noted that the lower end of the hood is of necessity at all times submerged in liquid, which is contained in tank 1.

What we claim is—

1. In an apparatus of the class described, the combination with a tank, of an outlet-pipe secured to said tank, of an exhaust-pipe extending into said outlet-pipe, a horizontal bracket provided with pairs of posts, supported upon said exhaust-pipe, a bar pivoted upon one of said pairs of posts, means carried by the other pair for limiting pivotal movement of said bar, a valve in engagement with said bar and normally closing one end of said exhaust-pipe, and means for controlling movement of said bar and said valve.

2. In an apparatus of the character described, the combination with a tank, an outlet-pipe extending into said tank, an exhaust-pipe extending into said outlet-pipe, of a horizontal bracket supported upon said exhaust-pipe, near its upper end, vertically-extending posts formed upon said bracket, a bar pivotally mounted between said posts, means for limiting pivotal movement of said bar, means for automatically controlling movement of said bar, and a valve in engagement with said bar and normally closing the upper end of said exhaust-pipe.

3. In an apparatus of the class described, the combination with a tank, of a valve device positioned within said tank, said device comprising a pivotally-mounted bar, a valve member fixedly secured to said bar near its central portion, a vertical rod slidably mounted in and extending through said bar near each end, means securing each rod in an adjusted position, a siphon-bucket secured to the lower end of one of said rods, and a float secured to the lower end of the other rod.

4. In an apparatus of the class described, the combination with a tank and an exhaust-pipe, of a valve device positioned contiguous to said exhaust-pipe, said device comprising

a horizontal bracket, a plurality of pairs of posts carried by said bracket, a bar pivotally mounted upon one pair of said posts, said bar extending between the other pair of said posts, means carried by the last-mentioned pair for limiting upward movement of said bar, a valve member secured to the bar between the pairs of posts and being capable of closing one end of said exhaust-pipe, and means for automatically actuating said bar for moving said valve member.

5. In an apparatus of the class described, the combination with a tank, of a valve device carried by said tank, said valve device comprising a support, a pivotally-mounted bar carried by said support, a valve member carried by said bar, a bucket, a rod adjustably secured to said bar and removably secured within and to the bottom of said bucket, a siphon extending through the side of said bucket, and a float secured to said bar.

In testimony whereof we hereunto affix our signatures in presence of two witnesses.

SCOTT A. PALMER.
WILLIAM H. PALMER.

Witnesses:
T. J. DALEY,
J. E. JOHNSON.