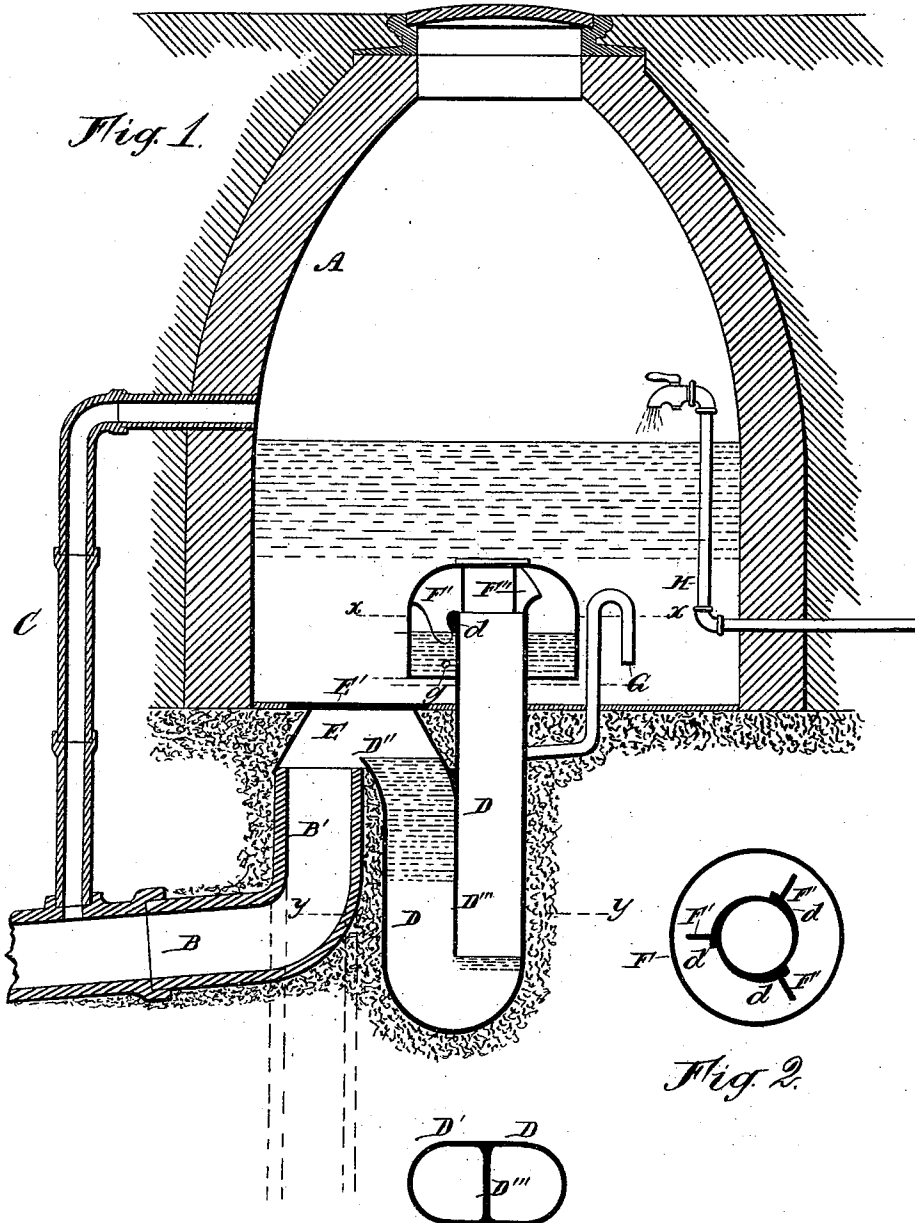


(No Model.)

R. C. DE LA HUNT.
FLUSH TANK.

No. 557,560.

Patented Apr. 7, 1896.



Attest.
J. F. Guat
W. J. Greene

Fig. 3.

Inventor
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UNITED STATES PATENT OFFICE.

REVERDY C. DE LA HUNT, OF CEDAR RAPIDS, IOWA, ASSIGNOR TO ROBERT I. SAFELY AND WILLIAM K. WISNER, OF SAME PLACE.

FLUSH-TANK.

SPECIFICATION forming part of Letters Patent No. 557,560, dated April 7, 1896.

Application filed January 29, 1895. Serial No. 536,614. (No model.)

To all whom it may concern:

Be it known that I, REVERDY C. DE LA HUNT, a citizen of the United States, residing at Cedar Rapids, in the county of Linn and State of Iowa, have invented certain new and useful Improvements in Flush-Tanks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to that class of intermittent siphons operated without moving parts and used for the purpose of cleansing sewers and water-closets or like purposes.

The object of my invention is to so improve the construction and operation of intermittent siphons as to greatly reduce the cost of manufacture and at the same time produce a sensitive siphon that will operate under all conditions in a positive and reliable manner.

The construction of my improved siphon and the manner of its operation are fully described as follows, reference being had to the accompanying drawings, which form a part of this description.

Figure 1 represents the device as applied to a sewer flush-tank and is a vertical mid-section of my improved flushing apparatus. Fig. 2 is a plan view and horizontal cross-section of the intake and discharge limbs on the dotted line X X. Fig. 3 is a similar section of the trap on the line Y Y.

Similar letters of reference indicate corresponding parts.

This invention embodies some of the general features of a former invention of my own, as illustrated and described in certain Letters Patent of the United States issued December 25, 1894, No. 531,516, to which reference may be had.

The improvement consists of certain modifications of construction by which I dispense with all subsidiary means for bringing the siphon into action and use instead the vertical section of the sewer-pipe as a potent factor to induce siphonic action—that is, in the initial action of flushing a portion of the air confined in the siphon escapes through the seal of the trap, forcing a comparatively large

volume of water from the outlet of the trap into the vertical sewer-pipe. This premature flush or discharge of water descending in the sewer-pipe carries down with it a portion of the air, thus creating a partial vacuum between the descending water in the sewer-pipe and the siphon-outlet. The suction of this vacuum acting contemporaneously with the confined air-pressure in the siphon discharges the liquid contents of the trap and brings the siphon into action.

Referring to Fig. 1, A is the tank or reservoir, which communicates at the bottom with the sewer by the trapped discharge-pipe D. A pipe C gives air communication between the reservoir and sewer-pipe B. The inlet end of the vertical section of the sewer-pipe B communicates with the outlet of the siphon-trap D by means of an oblong dome E. This dome is composed of the shell or oblong ring E, flared at the bottom, and a flat cover E', which, when in position, is flush with and forms a part of the tank-floor. The bottom of the ring E fits neatly over the top of the sewer-inlet and the upper end of the outlet D' where the same branches off from the discharge-pipe D. By this improved construction the outlet and sewer-pipe are brought close together, the lip of one projecting over the edge of the other, and the water discharged from the outlet drops straight down the sewer-pipe, the better to produce the partial vacuum above referred to. A further advantage from this construction is that the cover E' may be removed with little or no injury to the floor of the tank when necessary to inspect or clean the sewer at this point.

The inlet end of the discharge-pipe D is made cylindrical, as shown in Fig. 2; but the trap D is of the elliptical form shown in Fig. 3, the two limbs being separated and formed by a single straight diaphragm D''.

The diaphragm D''' being made straight across the lower end a larger volume of the confined air may pass under it in the initial action of flushing. The effect of this is to cause a strong premature flush or discharge of water from the outlet of the siphon.

In order that the water ejected from the outlet of the siphon may be thrown forward as

well as up and out, the outlet is curved toward the sewer-pipe inlet, as shown. The ejected water is thus carried over the sewer-pipe inlet and descends into it. Little, if any, of such ejected water can therefore fall back into the trap on cessation of pressure behind it, and the difficulty of retrapping before the siphon comes into full action is avoided.

The discharge-pipe D, extending above the floor of the reservoir, is provided with an intake F, forming the short leg of the siphon. An improvement in this part consists of a convenient device for fastening the intake securely to the pipe and prevents its being buoyed up off the same. To this end its supporting-ribs F' F' are provided with internal notches F'' and the upper end of the pipe D with external flanges adapted to engage therewith. These flanges are eccentric to the pipe, merging therewith at one extremity. This admits of the intake being slipped over the pipe and fastened securely in position by turning it until the flanges engage the notches in the supporting-ribs.

The siphonage-breaking device consists, preferably, in the vent-pipe G. This is in the form of a siphon with its longer leg extending down through the floor of the reservoir and turning inwardly to a connection with the discharge-pipe slightly above the normal level of the water in the trap. The downrush of water prevents the breaking of the siphonage until the water-level in the reservoir falls nearly to the bottom of the intake, when the flow is diminished and the siphonic action broken by air entering through the vent-pipe G; but the breaking device may consist of a small hole *g*, called a "sniff-hole," in the intake.

The operation is as follows: The siphon being first sealed by filling the trap, water or other liquid is allowed to flow into the reservoir through the supply-pipe H. The reservoir being filled to the mouth of the siphonage-breaking device, the air within the siphon is then confined in the intake and discharge limbs. As the water continues to rise in the reservoir the confined air is compressed and the liquid in the receiving-limb of the trap correspondingly depressed. This effect is increased until the liquid in the receiving-limb of the trap is depressed to a point at which the whole volume of the compressed air can no longer be retained within the siphon and a large elongated bubble of air breaks through the seal along the straight edge of the diaphragm. Simultaneously with the discharge of the bubble from the trap an inflow from the reservoir drives the air out of the siphon and a full siphonic action is attained. The liquid in the reservoir being discharged nearly to the bottom of the intake, the flow is diminished and air enters the siphon through the siphonage-breaking device, restoring the liq-

uid seal of the trap to its natural level, when the siphon is again ready for operation.

The drawings are made on a scale of one to sixteen and are designed to show an eight-inch discharge-limb with a seal of twenty-four inches. The intake is twenty inches in diameter.

It will be observed that the form and construction of the herein-described siphon is adapted to the manner of its operation. The intake F is made of such capacity and so adjusted that the water-level therein is brought up nearly to the mouth of the pipe D by the discharge of a portion of the confined air in D and F.

The vertical sewer-inlet B' may extend to any depth, as shown by dotted lines, thereby increasing the vacuity and its resultant effect upon the seal of the siphon.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a flush-tank, the combination of a reservoir, a discharge-pipe therefor having a trap formed in the lower, oblong portion by a single straight web, with a level, straight lower end, the outlet end of the trap being separated a short distance from the discharge-pipe to receive an overlapping dome, a sewer-pipe having a vertical portion close to the outlet portion of the trap, and a dome of practically the same capacity as the said pipes, consisting of an oblong ring, flared at the bottom and overlapping the upper end of the sewer-pipe and the outlet end of the trap, and a separable cover therefor flush with and forming a portion of the tank-floor, substantially as and for the purpose set forth.

2. In a flush-tank, the combination of the reservoir A, sewer-pipe B, having vertical portion B' practically conterminous with the outlet of the discharge-pipe trap, the discharge-pipe D having trap D' formed by the diaphragm D'', and having the outwardly-extending outlet portion D'', the dome E hermetically closed above composed of an oblong, flaring ring overlapping said outlet and the upper end of the sewer-pipe, with its cover E', the intake F, and the vent-pipe G, substantially as and for the purpose set forth.

3. In a flush-tank, the combination with the discharge-pipe D, having eccentric flanges *d, d, d*, of the intake F, having supporting-ribs F' F' provided with notches *f* to engage said flanges, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

REVERDY C. DE LA HUNT.

Witnesses:

ROBERT I. SAFELY,
J. M. INGOLD.