

J. J. MEYER.
SIPHON FLUSHING APPARATUS.
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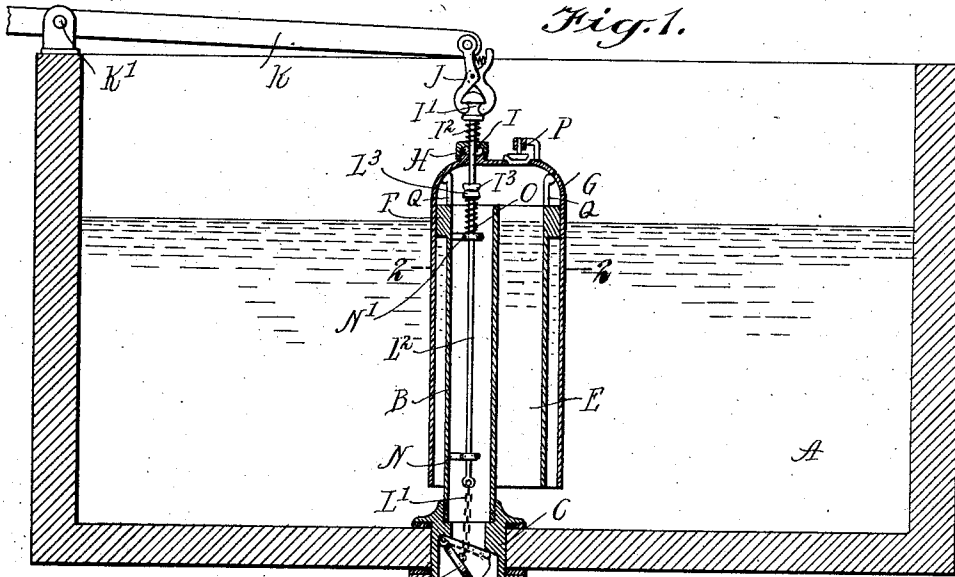
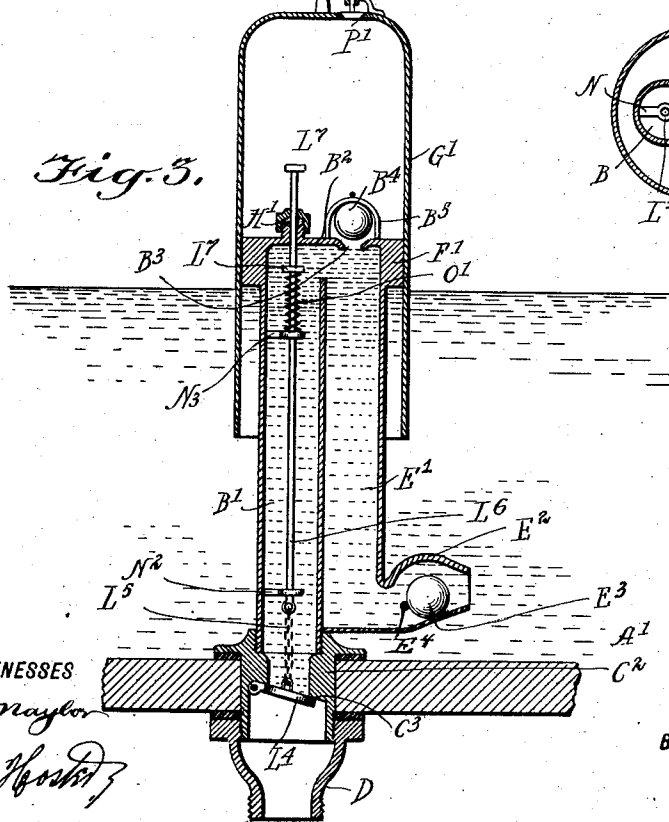


Fig. 2.



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SIPHON-FLUSHING APPARATUS.

1,009,544.

Specification of Letters Patent. Patented Nov. 21, 1911.

Application filed January 3, 1911. Serial No. 600,372.

To all whom it may concern:

Be it known that I, JOHN J. MEYER, a citizen of the United States, and a resident of Yonkers, in the county of Westchester and State of New York, have invented a new and Improved Siphon-Flushing Apparatus, of which the following is a full, clear, and exact description.

The invention relates to siphon flushing apparatus, such as shown and described in the application for Letters Patent of the United States, Serial No. 600,371, filed under even date herewith.

The object of the invention is to provide a new and improved siphon flushing apparatus for flushing tanks, arranged to insure the emptying of the water of the tank from above the level of the water in the tank, and dispensing with submerged valves, thus completely avoiding all leakage and waste of water.

For the purpose mentioned use is made of a siphon arranged in the flushing tank and having its short leg opening into the tank while the long leg is connected with the flushing pipe, and means for producing a decrease of pressure in the siphon to start its siphoning action with a view to emptying the tank of water by way of the siphon.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a sectional side elevation of the vacuum flushing valve in normal position in the tank. Fig. 2 is a sectional plan view of the same, on the line 2-2 of Fig. 1, and Fig. 3 is a sectional side elevation of a modified form of the vacuum flushing valve.

In the flushing tank A shown in Fig. 1 is arranged a siphon having a long leg. A stand pipe B is secured at its lower end to a thimble C extending through the bottom of the flushing tank A and fastened thereto by a nipple D, screwing on the lower end of the thimble C and against a washer D' on the under side of the bottom of the tank A the long leg of the siphon consisting of the stand pipe B and a portion of the thimble C. The short leg of the siphon is in the form of a pipe E, opening at its lower end into the tank A a distance above the bottom thereof, as plainly shown in Fig. 1, the upper end of the suction pipe E being flush with the upper end of the stand pipe

B, so that water can flow from the upper end of the suction pipe E into the upper end of the stand pipe B.

The upper ends of the pipes B and E are provided exteriorly with a fixed piston head F, on which is mounted to slide a bell or a cylinder G, closed at its upper end and opening at its lower end into a tank A. The upper closed end of the bell G forms the top of the siphon. On the top of the bell G is arranged a stuffing box H, in which is slidably mounted a rod I, terminating at its upper end in a head I' engaged by a clutch, link or like connection J, connecting with the operating lever K fulcrumed at K' on the top of the tank A and connected with the usual operating mechanism, under the control of the user, for imparting a swinging motion to the lever K, with a view to raising or lowering the bell G. When the clutch connection J shown in Fig. 1 is used, the clutch connection disengages the head I' whenever the lever K reaches a predetermined height so that the bell G drops. It will be observed that the edges of the clutch J are rounded at their ends, and when the lever K passes above its pivotal point the clutch, which is being moved on the arc of a circle, is pulled far enough out of alignment so as to cause its rounded ends to disengage the head I', thereby permitting the bell G to drop. A spring I² presses against the under side of the head I' and rests on top of the stuffing box H, so as to hold the rod I normally in an uppermost position.

In the thimble C is arranged a valve seat C', adapted to be engaged by a flap or a wing valve L, fulcrumed in the thimble C and connected by a short chain with a stem L², mounted to slide vertically in bearings N, N' arranged in the stand pipe B. The upper end of the stem L² terminates in a head L³, adapted to be engaged by a head I³ on the lower end of the rod I previously mentioned. A spring O is coiled on the upper end of the stem L² and presses against the under side of the head L³, the lower end of the spring O resting on the bearing N'. The spring O serves to hold the valve L in a closed position when the bell G is raised, it being understood that when the bell is in a lowermost position, as shown in Fig. 1, then the rod I holds the stem L² in a depressed position, so that the valve L is open. The top of the bell G is provided with an outwardly opening relief valve or air vent

P, to allow the escape of air from the inside of the bell G when the latter drops or descends.

The operation is as follows: When the tank A is filled with water to the usual normal level, then the upper ends of the pipes B and E of the siphon are above the level of the water, and the bell G is in a lowermost position, so that the valve L is open. When it is desired to flush the bowl or other fixture, then the user on imparting an upward swinging motion to the lever K lifts the pin I, so that the stem L² is released and the spring O now forces the stem L² upward, to close the valve L. Further upward swinging movement of the lever K causes the head I³ to engage the inside of the bell G, to lift the same, and in doing so a decrease of pressure is produced in the pipes B and E, so that the atmospheric pressure on the water in the tank A forces the water up the pipe E, to overflow into the stand pipe B and to fill the same. The bell G, when reaching a desired height, is released by the clutch J disengaging the head I' so that the bell drops, and in doing so the air in the bell escapes by way of the vent P. When the lever K is released the clutch J re-engages the head I³ and pushes the rod I downward so that the head I³ of the rod I strikes the head L³ of the stem L² and pushes the same downward to allow the valve L to open, whereby the water is caused to flow down the pipe B and the siphon is started. The siphoning action of the siphon empties the tank A of the water, the latter being drawn out of the tank by the action of the siphon and discharged by way of the long leg into the flushing pipe, to flush the bowl, urinal or other fixture. The water is drawn out of the tank A until the level of the water reaches the lower end of the bell G, at which time air can pass into the lower end of the bell to break the siphon action. The downward movement of the bell G is limited by studs Q, held on the upper ends of the pipes B and E and adapted to be engaged by the bell top on the descent of the bell.

It is expressly understood that when the bell G is caused to slide upward on the fixed ring F, a decrease of air pressure is produced in the upper portion of the bell G, and consequently the atmospheric pressure on the surface of the water in the tank A causes the water to flow up the suction pipe E and overflow into the stand pipe B, as previously explained.

In the modified form shown in Fig. 3, the bottom of the tank A' is provided with a thimble C², to the lower end of which is secured the nipple D connected with the flushing pipe, and the upper end of the thimble C² carries the standpipe B', alongside of which is arranged the suction pipe E' of the siphon. The upper ends of the pipes B' and

E' are connected with each other below an integral top B², provided with a valve seat B³ controlled by a valve B⁴, preferably in the form of a ball valve arranged in a cage B⁵. The head F' surrounds the upper ends of the pipes B' and E', and on the said head is mounted to slide the bell G', connected at its top with a raising and lowering device G², of any approved construction and under the control of the operator, as previously explained. The lower end of the suction pipe E' is provided with an inlet E², adapted to be closed by a check valve or ball E³. The bottom of the inlet E² is inclined, for the ball valve E³ to roll down into an open position and against a stop piece E³ held on the inlet E².

The thimble C² is provided with a valve seat C³, adapted to be closed by a valve L⁴ connected by a chain L⁵ with the stem L⁶ mounted to slide in bearings N², N³ arranged in the standpipe B'. A spring O' is coiled around the stem L⁶ and rests with its lower end on the bearing N³, while the upper end of the spring O' presses against the collar L' attached to the stem L⁶ within the stand pipe B'. The upper portion of the stem L⁶ extends through a stuffing box H' held on the top B², and the upper terminal of the stem L⁶ is provided with a head L⁸ adapted to be engaged by the top of the bell G' when the latter descends, so as to open the valve L⁴ for the discharge of the water contained in the stand pipe B'. The top of the bell G' is provided with a relief valve or vent P'.

When the bell G' is drawn upward, the valve L⁴ is released and the spring O' closes the valve and a decrease of air pressure is produced in the upper portion of the bell, so that the valve B⁴ opens and a suction action is produced in the pipes B' and E', to cause the water to flow up the pipe E' and overflow into the stand pipe B' and be temporarily retained therein by the closed valve L⁴. When the bell G' is released and descends the valve B⁴ closes, the valve P' opens, to allow escape of the air from the bell G', and the top of the bell finally strikes the head L⁸, to push the stem L⁶ downward, to allow the valve L⁴ to open and discharge the contents of the stand pipe B' and to start the siphoning action, as before explained, to empty the tank of the water by way of the siphon.

When the tank A is emptied of its contents down to the inlet E², then further siphoning action ceases and the water flows out of the pipe B', to empty the same.

It is understood that during the time the bell G' is dropping the valves B⁴ and E³ simultaneously move into closed positions so that the air can escape by way of the valve P', and the water in the top portion of the siphon is retained, as the water cannot flow

out of the leg E', and hence the valve L⁴ can be located high up in the long leg of the siphon, the said valve L⁴ being only opened at the time the bell G' reaches a lowermost position, and when the valve L⁴ opens the siphoning action begins and opens the valve E³, which latter now remains open until the next following operation.

By having the bell G' fitting tightly on the head F', leakage of air between the said parts is prevented, to insure a proper siphoning action.

It is understood that the tank is filled with water in the usual manner.

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

1. In a siphon flushing apparatus, a tank, a long siphon leg passing through the bottom of the tank, a short siphon leg disposed adjacent said long siphon leg and opening into the tank, a stationary piston head, the upper ends of both of said siphon legs being open and being secured in said piston head, a movable bell disposed over the piston head and in sliding engagement therewith, and means for raising and lowering said bell.

2. In a siphon flushing apparatus, a tank, a long siphon leg passing through the bottom of the tank, a short siphon leg disposed adjacent said long siphon leg and opening into the tank, a stationary piston

head, the upper ends of both of said siphon legs being open and being secured in said piston head, a movable bell disposed over the piston head and in sliding engagement therewith, a valve disposed in the long leg, a valve stem for operating said valve, and means for raising and lowering said cylinder, the raising and lowering of the cylinder serving to close and open said valve.

3. In a siphon flushing apparatus, a tank, a long siphon leg passing through the bottom of the tank, a short siphon leg disposed adjacent said long siphon leg and opening into the tank, a stationary piston head, the upper ends of both of said siphon legs being open and being secured in said piston head, a movable bell disposed over the piston head and in sliding engagement therewith, a valve disposed in the long leg, a valve stem for operating said valve, and means for raising and lowering said cylinder, a portion of said means being adapted to engage said valve stem for operating said valve.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN J. MEYER.

Witnesses:

THEO. G. HOSTER,
PHILIP D. ROLLHAUS.