J. W. BERRY.

FLUSH TANK SIPHON.

APPLICATION FILED JAN. 4, 1916.

1,235,641. Patented Aug. 7, 1917.

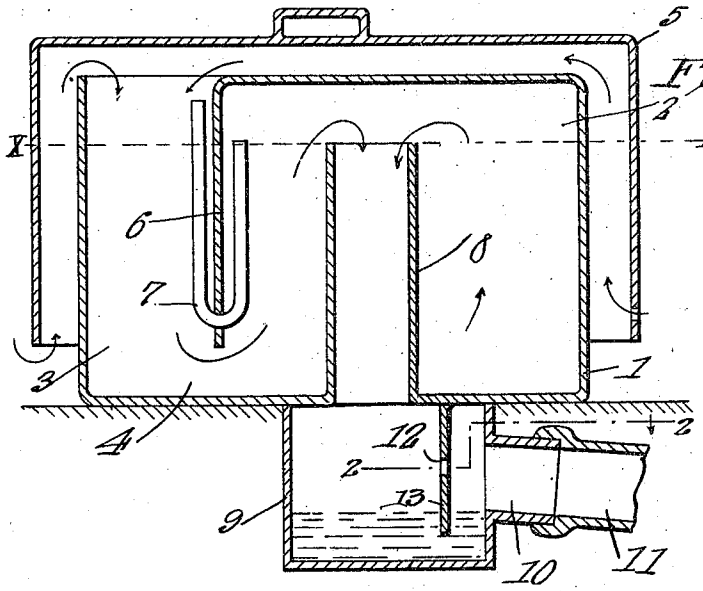


Fig. 1.

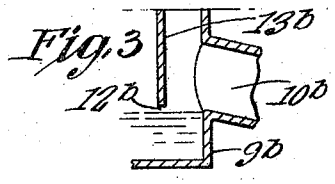


Fig. 3

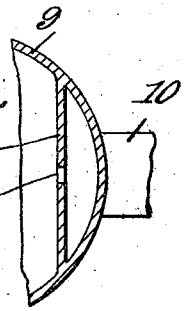


Fig. 2.

Witnesses

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UNITED STATES PATENT OFFICE.

JAMES W. BERRY, OF IOWA CITY, IOWA.

FLUSH-TANK SIPHON.

1,235,641. Specification of Letters Patent. Patented Aug. 7, 1917.

Application filed January 4, 1916. Serial No. 70,240.

To all whom it may concern:

Be it known that I, JAMES W. BERRY, a citizen of the United States, residing at Iowa City, in the county of Johnson and State of Iowa, have invented a new and useful Flush-Tank Siphon, of which the following is a specification.

The present invention appertains to flush tank siphons, such as are used in sewage systems, and the like.

The present invention is an improvement or addition for flush tank siphons which are disposed above the floors of the tanks, such as the siphons displosed in my Patent No. 1,128,575 granted February 16, 1915 and in my co-pending application Serial No. 22,168 filed April 17, 1915. With the floor siphons as disclosed in said patent and application, and others of the same general construction, it has been found in practice that when the water level within the tank lowers to such an amount that the siphonic action must be depended upon for the discharge of the remaining water within the tank, the siphon is not infrequently broken by air rushing into the siphon from the sewer, thus leaving the remaining water within the tank. When the water level within the tank is above the siphon, it is the pressure of the head or column of water within the tank that delivers the water through the siphon to the sewer, and when the water level lowers below the upper portion of the siphon, the siphonic action must be depended upon to carry out the remaining water so that if the siphon is broken or destroyed, the remaining water will not be discharged, and this will prove detrimental. This difficulty has been experienced with various types of floor siphons, and some are even found to be a failure on account of the air flowing back from the sewer into the pipe and destroying the siphonic action.

It is the object of the present invention, to provide simple yet effective means for arresting or preventing the flow of air from the sewer into the siphon during the siphonic action of the water, thereby maintaining said siphonic action, and the construction being such that after the water has been discharged, air is admitted into the siphon to restore normal conditions therein so that the water cannot be discharged from the tank until the water level again rises to the discharge line.

The present improvements can be used with the siphons disclosed in said patent and application, and with kindred other siphons, the novelty residing in the provision of a trap or sump for the discharge pipe of the siphon.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

The invention is illustrated in different forms in the accompanying drawing, wherein:—

Figure 1 is a vertical section of a flush tank siphon somewhat the same as disclosed in application Serial No. 22,168, illustrating the improvements assembled therewith.

Fig. 2 is a horizontal section taken on the line 2—2 of Fig. 1.

Fig. 3 is a vertical section illustrating a modification

The siphon illustrated in Fig. 1 is the same as that disclosed in the aforesaid application Serial No. 22,168 and since this siphon is to be taken as typical only, the same need not be considered in detail, reference being had to said application if necessary, and it being understood that the present improvements can be used on various types of floor siphons with equal propriety, for example, the siphon disclosed in the above mentioned Patent, No. 1,128,575 and other kindred siphons. Generally considering, the siphon disclosed in Fig. 1 embodies a casting 1 seated on the floor of the tank, and having a chamber 2 closed at the top, and a vertical passage 3, there being a communicating opening 4 between the lower end of the passage 3 and the lower portion of the chamber 2. A bell 5 is disposed over the casting 1, and the partition 6 between the chamber 2 and passage 3 carries a U-shaped relief trap 7 communicating with the upper portion of the chamber 2 and the upper end of the passage 3 and upper portion of the chamber within the bell 5. The bottom plate of the casting 1 has an upstanding discharge pipe 8 within the chamber 2.

The operation of the siphon is well known in the art, and is described in detail in said application No. 22,168, but briefly considered

is as follows: After the water is discharged from the tank, water remains in the relief trap 7, and in the chamber 2 and passage 3 below the upper end of the discharge pipe 8. As the water level rises within the tank, the pressure of the column or head of water will force the water up into the bell 5, thus displacing the air and forcing the air from the bell into the passage 3 and relief trap 7, and before the water level in the passage 3 reaches the lower end of the partition 6, the water is forced entirely from the relief trap 7, thus allowing the air to escape from the passage 3 and bell 5, and starting the flow of water through the siphon quickly, the water flowing out through the discharge pipe 8 to the sewer by a gushing action. When the water level in the tank reaches the line *x*—*x* in Fig. 1, the siphonic action of the water must be depended upon to carry off the remaining water in the tank, and if the siphon is broken or destroyed, the water will remain in the tank, which is objectionable since it destroys the utility of the siphon, it being found that with ordinary floor siphons, air will rush into the discharge pipe 8 from the sewer to destroy the siphonic action.

Coming to the improvements, they reside in means for preventing the flow of air from the sewer into the discharge pipe 8 during the discharge of the water, thereby avoiding the disruption of the siphonic action, but allowing air to flow into the discharge pipe 8 after the water has been discharged, in order that normal conditions will be resumed in the siphon for the proper subsequent operation, the operation being intermittent.

In carrying out the invention, there is provided a basin 9 having its rim or edge abutting against or secured to the bottom or base of the siphon around the lower portion of the discharge pipe 8, and one side of the bowl or basin 9 is provided with a lateral outlet 10 for the connection of the sewer or pipe 11 into which the water rushes from the siphon for flushing out the sewer pipe. The outlet 10 is spaced above the bottom of the bowl or basin, and said basin is provided with a chordal partition 13 adjacent to and extending across said outlet, the lower edge of the partition being spaced from the bottom of the basin and the upper edge of the partition being flush with the upper edge of the basin. Said partition prevents the unrestricted flow of air past it, and the lower edge portion of the partition depends within the trap or sump provided by the lower portion of the basin in which water collects, thereby providing a water seal normally closing the opening underneath the partition. The discharge pipe 8 is located between the partition 13 and that side of the basin opposite the outlet. The bottom plate of the siphon seats upon the upper edge of the basin and partition to close the openings between the partition and opposite sides of the basin. The partition 13 is provided with a vent or aperture 12 above the lower portion of the outlet 10, whereby a restricted flow of air from the sewer 11 into the pipe 8 is provided after the water has been discharged, to allow the air to flow into the siphon to fill the pipe 8 and upper portion of the chamber 2 for the proper subsequent operation of the siphon. During the discharge of the water, however, the water flowing through the aperture or vent 12 will effectively close the same to prevent air flowing from the sewer into the pipe 8, and the water seal provided by the trap or sump will naturally prevent air flowing from the sewer into the lower end of the discharge pipe 8. Consequently, after the water level within the tank reaches the line *x*—*x*, so that the siphonic action is started, there is no possibility of sufficient air entering the pipe 8 from the sewer 11, to destroy the siphonic action, and said action will therefore continue until all of the water is discharged from the tank, with the exception of a small amount below the lower edge of the bell 5. By the provision of the trap or sump and air vent, the floor siphon is rendered thoroughly effective for its intended purpose, and the present improvements can be employed in connection with various floor siphons.

Fig. 3 illustrates a modification generally resembling that shown in Fig. 1, there being a basin 9^b having the outlet 10^b at one side, and a chordal vertical partition 13^b, which is not provided with the aperture or vent, but which has its lower edge terminating just slightly above the horizontal plane of the lowermost portion of the outlet 10^b, to provide an air vent 12^b of relatively small proportions above said horizontal plane, or the level of the water within the lower portion of the basin 9^b, as indicated in dotted lines in Fig. 3. During the discharge of the water, the water in flowing under the partition 13^b will prevent the flow of air from the outlet 10^b past the partition 13^b, but when the water is discharged, the water level within the trap or sump will be slightly below the lower edge of the partition 13^b thereby permitting air to flow from the outlet 10^b past the partition 13^b into the siphon.

In each form of the invention, there is provided a basin having a water trap or sump between the outlet and lower end of the discharge pipe, and acting as a water seal for the lower end of said pipe, there being a restricted air vent above the water trap or seal establishing communication between the outlet and discharge pipe.

Having thus described the invention, what is claimed as new is:

A device of the character described embodying a basin having an outlet at one side

spaced above the bottom thereof, and a chordal partition adjacent to and extending across said outlet, the lower edge of the partition being spaced from the bottom of the basin and the upper edge of the partition being flush with the upper edge of the basin, said partition preventing the unrestricted flow of air and having an air vent providing a restricted flow of air from the outlet past said partition, and a siphon having a bottom plate seated upon the upper edges of the basin and its partition to close the openings between the partition and opposite sides of the basin, said bottom plate having a vertical discharge pipe located between said partition and that side of the basin opposite the outlet.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JAMES W. BERRY.

Witnesses:

FRANC MOON,

HENRY G. WALKER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."