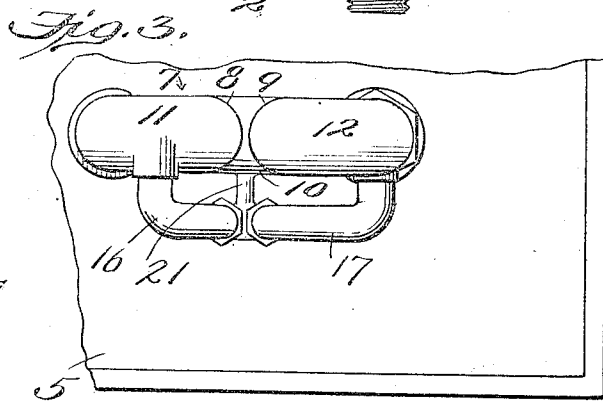
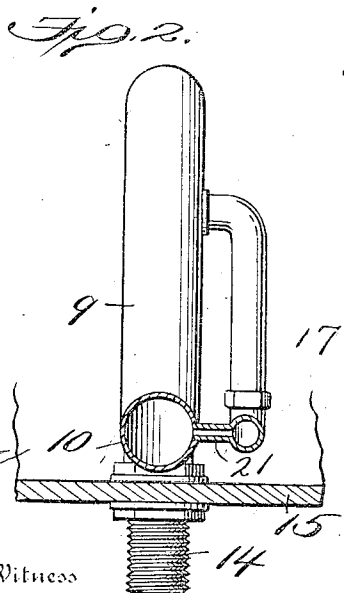
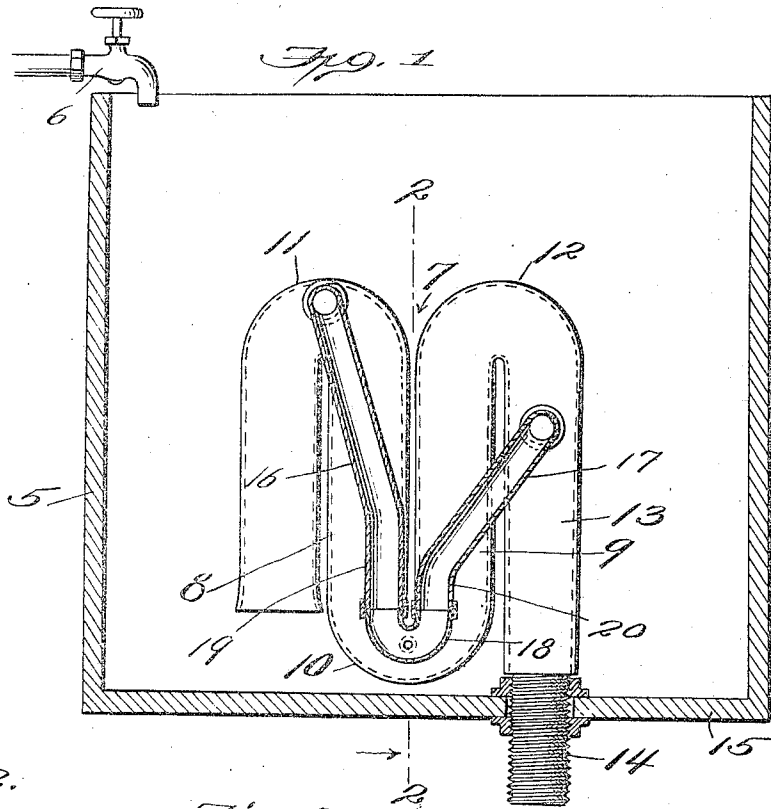


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 AUTOMATIC FLUSHING APPARATUS FOR WATER CLOSETS AND URINALS.
 APPLICATION FILED AUG. 9, 1917.

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Patented Dec. 31, 1918.



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AUTOMATIC FLUSHING APPARATUS FOR WATER-CLOSETS AND URINALS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JACOB F. LEANHART, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented new and useful Improvements in Automatic Flushing Apparatus for Water-Closets and Urinals, of which the following is a specification.

10 This invention relates to automatic flushing means adapted for general use but particularly intended for application to and operative in conjunction with a flushing tank of a water closet or urinal, and the primary object of the invention is to provide simple and reliable automatically operating siphon means for installation in a tank to replace the usual form of float ball, lever and cock, and capable of being readily mounted in active position with reliability, durability and certainty as to practical service.

25 The invention consists essentially of a double S-trap siphon mounted in a water tank and having an auxiliary siphon and trap tube to establish a more positive water seal and produce an apparatus of this class having greater hygienic value, the water supply prolongation of the flushing operation being regulable by adjustment of a tank supply faucet or valve.

30 The invention further consists in the construction and arrangement of the several parts which will be more fully hereinafter described and claimed.

In the drawing:

Figure 1 is a section of a tank showing the improved double S-trap and auxiliary siphon attachment therefor.

40 Fig. 2 is a transverse section taken in the plane of the line 2—2, Fig. 1.

Fig. 3 is a top plan view of a portion of the tank and the improved trap and siphon attachment.

45 The numeral 5 designates a tank provided with a faucet or valve 6 to control the supply of water to the tank from any suitable source. The exact location of the faucet or valve is not essential as the supply of water to the tank may be effected in many ways and supply connection to various parts of the tank may be made for this purpose. The tank may be modified in dimensions so as to increase or decrease the holding capacity thereof and correspondingly vary the

volume of liberated water and prolongation of the flushing service at timed intervals.

The improvement comprises a double S-trap siphon 7 having inner and outer members 8 and 9 connected by a lower elbow 10 60 and each member provided with two components having upper elbows 11 and 12. The outer component 13 of the outer member 9 has a discharge connection or threaded terminal 14 extending through the tank 65 bottom 15 for attachment of a suitable length of pipe for conveying the water to a water closet or urinal. The double S-trap siphon 7 is provided with an auxiliary siphon attachment forming the essential feature of the present invention and located 70 wholly exterior of the said trap. This auxiliary siphon attachment embodies legs 16 and 17 connected by a lower elbow 18, each leg extending vertically straight from the said elbow 18 for a portion of its length 75 as at 19 and 20 respectively, the leg 16 being longer than the leg 17. The elbow 18 has a communicable connection to the elbow 10 of the double S-trap siphon 7 by a horizontally disposed afterfill tube or pipe 21. 80 The legs 16 and 17 diverge above the vertically straight portions 19 and 20 thereof, and the upper end of the leg 19 is connected to and communicates with the elbow 11 of the inner member of the double S-trap siphon. 85 The upper end of the leg 17 is connected to and communicates with the outer component of the outer member 9 below the elbow 12 and at or slightly below the normal water 90 seal level. It will be seen that the entire auxiliary siphon attachment is exteriorly located relatively to the double S-trap siphon 7 along one side of the latter, the purpose of this particular application being 95 to avoid diminishing in the least the interior area and providing for an increased efficiency of operation of the said double S-trap siphon. The trap 7 and auxiliary siphon attachment may be placed in any position 100 within the tank, either parallel or at right angles to the front of the tank as may be most convenient.

Water is permitted to enter the tank 5 by opening the water inlet faucet or valve 6 105 until it fills the tank to a level of about two inches over the top of the double S-trap siphon 7, a small water seal forming in the auxiliary siphon attachment during this filling operation. When the water reaches 110

the level in the tank just specified, it forces the small water seal out of the auxiliary siphon attachment and the water subsequently flows into the double S-trap siphon 7, forcing what air remains therein through the auxiliary siphon attachment and causing the trap to be formed into a complete siphon which effectively empties the tank 5. The water in the double S-trap and the elbow 10 of the latter having found its level then passes through the afterfill tube or pipe 21 into the said elbow 18, thereby forming in the elbow 18 a water seal which remains until the water again rises in the tank 5 to the predetermined level hereinbefore explained. As the water rises in the tank 5, it compresses the air between the elbows 10 and 11, causing the water seal in the elbow 10 to rise in the member 9 and pass the afterfill tube or pipe 21, allowing the air to pass into the elbow 18 through the tube or pipe 21 and forcing the water seal out of the elbow 18 through the tube or pipe or auxiliary siphon member 17 which has its upper end connected to the outlet member 13 of the main or double S-trap siphon slightly below the water level of the member 9 next adjacent to the member 13. In consequence of this action, the water level in the auxiliary siphon is rendered slightly lower than the water level in the member 9 and causes the water seal in the elbow 18 to be broken and allows the air to freely pass from elbow 11 to the member 13, thereby permitting the water to fill the entire double S-trap siphon and producing a complete siphon which effectively empties the tank 5. The afterfill tube 21 connecting the elbow 10 and the elbow 18 respectively of the main siphon and the siphon attachment has a function which is essential to the regularity of operation of the main or double S-trap siphon. Without this afterfill tube or pipe the water seal in the elbow 18 at the close of the operation of the main siphon will be broken and allow the air from the elbow 11 to pass through the auxiliary siphon directly to the outer leg 13 of the main siphon, and should this happen the entire siphon would be out of commission. Therefore, the afterfill tube or pipe 21 allows a part of the water, at the close of the operation of the siphon, to pass from the elbow 10 into the elbow 18 and forms a water seal which prevents the air from passing into the leg 13 and thereby prepares the main siphon to operate perfectly and regularly at whatever interval may be desired. In addition, the tube or pipe 17 after carrying off the air carries off a part of the water into the outer member 9 of the double S-trap through the leg 17, thereby insuring a larger water volume in said member than in the intermediate portion of the trap with consequent efficiency in the flushing operation, as loss in

volume, due to friction in the double S-trap is thus overcome. As soon as the flushing operation is complete and the main volume of water flows through the lower elbow 10 of the double S-trap, allowing the air to pass into the trap with the water, the air rises to the top of the elbow 11 and the water seeks its level in both members 8 and 9 and in the elbow 18 and so remains until a sufficient volume of water is again allowed to flow into the tank 5.

It will be understood that after the water inlet faucet or valve 6 is opened to admit water to the tank 5, the water is repeatedly discharged from the tank by the improved double S-trap siphon and its auxiliary attachment when and as often as the water reaches the predetermined level in the tank over the siphon, the intervals of flushing operation being regulable by the rapidity of inflow of the water into the tank or the frequency of predetermined level recurrence in the tank. If the tank is increased in size and capacity with the same dimensions of double S-trap siphon, the intervals of flushing discharge will be longer. In all applications of the improved trap and its auxiliary attachment, the flushing operation will be automatically effected so long as water is admitted to the tank in which the apparatus is disposed. Therefore, the apparatus needs no attention after it is started.

It will also be noted that the member 13 is tapered from the elbow 12 down to the threaded terminal or coupling end 14. The object of this taper is to choke the water in the outer or outlet leg of the double S-trap siphon 7 in order to prevent the water in the member 13 from flowing out too fast and also to fill said member solid with water. If this member 13 was not tapered the water passing through it without being retarded to overcome its gravity would cause a certain amount of air to pass into the said outlet and prevent the siphon from perfectly operating. This taper and the operation ensuing therefrom is especially advantageous when the pipe between the tank and bowl or urinal is very short.

What is claimed is:

1. A tank with water supply means, a main double S-trap siphon therein having an outlet through the tank, and an auxiliary siphon attachment applied along one side and wholly exterior of the said main double S-trap siphon and having divergent leg members of different lengths and an elbow respectively connected to the legs and lower elbow of the main double S-trap siphon, the connection between the elbow of the attachment and the lower elbow of the double S-trap siphon causing the formation of a water seal in the lower elbow of the attachment to prevent the passage of air from the inner to the outer leg of the double S-trap

siphon at the termination of the operation of the latter.

2. A tank with water supply means, a main double S-trap siphon in the tank and having inner and outer members with upper elbows and connected by a lower intermediate elbow, and an auxiliary siphon attachment wholly exterior of the said main siphon and having legs of different lengths connected to the said inner and outer members at different elevations and provided with an elbow having an afterfill pipe connected to the lower intermediate elbow of the main double S-trap siphon to cause a water seal to form in the elbow of the attachment at the conclusion of the operation of the siphon as a whole to prevent the escape of air from the inner to the outer legs of the main siphon.

3. A tank with a continual water supply means, a main double S-trap siphon in the tank having an outlet through a portion of the latter and provided with a lower intermediate elbow, and an auxiliary siphon attachment with a lower elbow and applied along one side and wholly exterior of the said main siphon and connected at three different points to the main siphon, one of the connections consisting of an afterfill pipe between the lower elbow of the auxiliary siphon attachment and the lower elbow of the

main siphon to cause the formation of a water seal in the elbow of the attachment subsequently to the operation of the siphon as a whole to prevent the passage of air from the inner to the outer legs of the main siphon.

4. A tank provided with a continuous flowing water supply, a double S-trap siphon mounted therein and having an outlet therethrough, said siphon having inner and outer members with upper elbows and connected by a lower elbow, an auxiliary siphon attachment applied at one side to the said trap siphon and wholly exterior of the latter, the attachment having upwardly extending divergent legs of different lengths respectively connected to the inner and outer members and a lower elbow, and an afterfill tube connection between the lower elbow of the double S-trap siphon and the lower elbow of said attachment, the said tube maintaining a water seal which is automatically overcome when sufficient head of water is admitted to the tank.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JACOB F. LEANHART.

Witnesses:

SADIE J. GRAUMAN,
LOUIS H. SAUER.

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