No. 764,912. PATENTED JULY 12, 1904.

A. A. CARSON.

SANITARY APPLIANCE.

APPLICATION FILED DEC. 10, 1900.

NO MODEL.

Fig. 1.

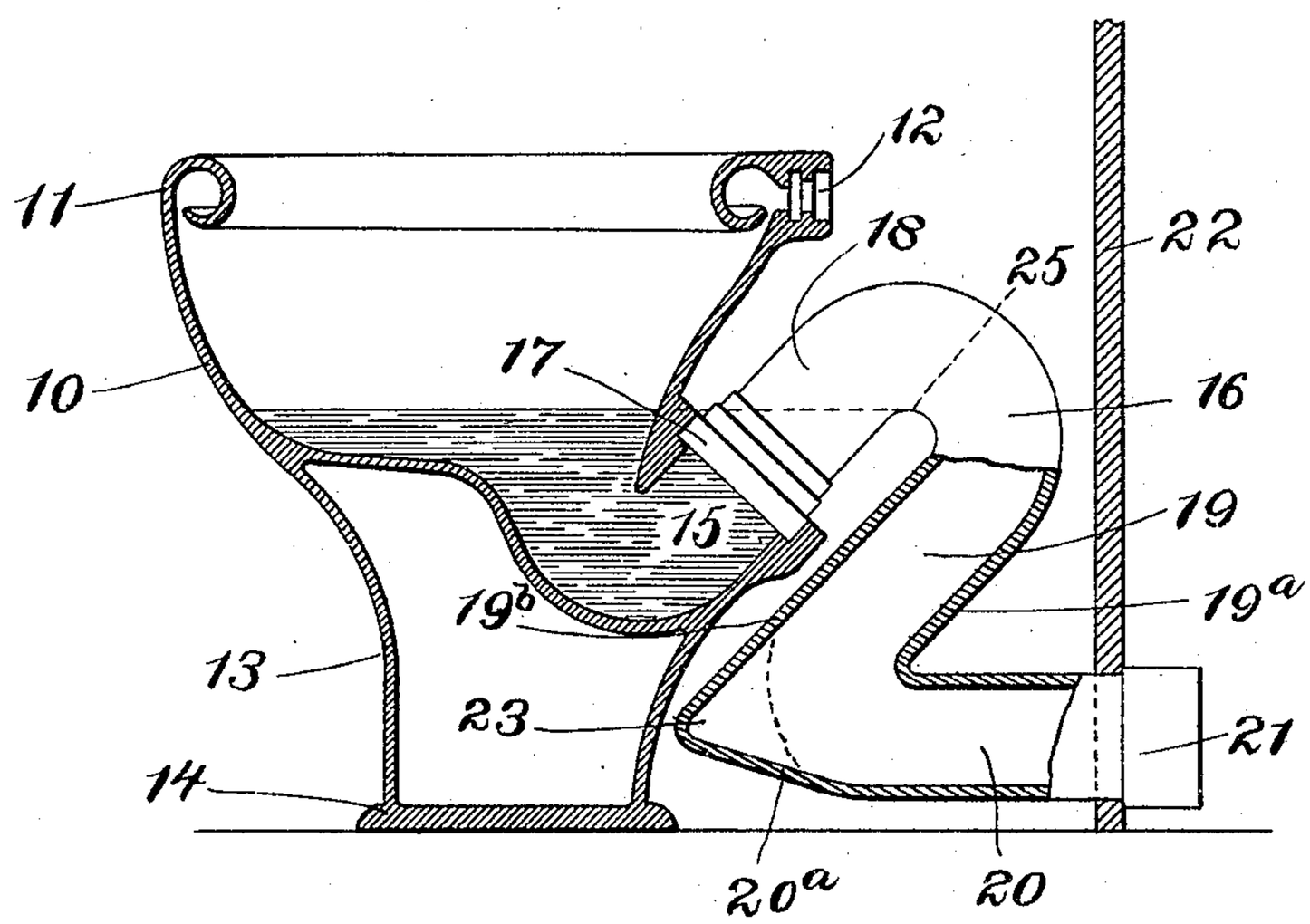
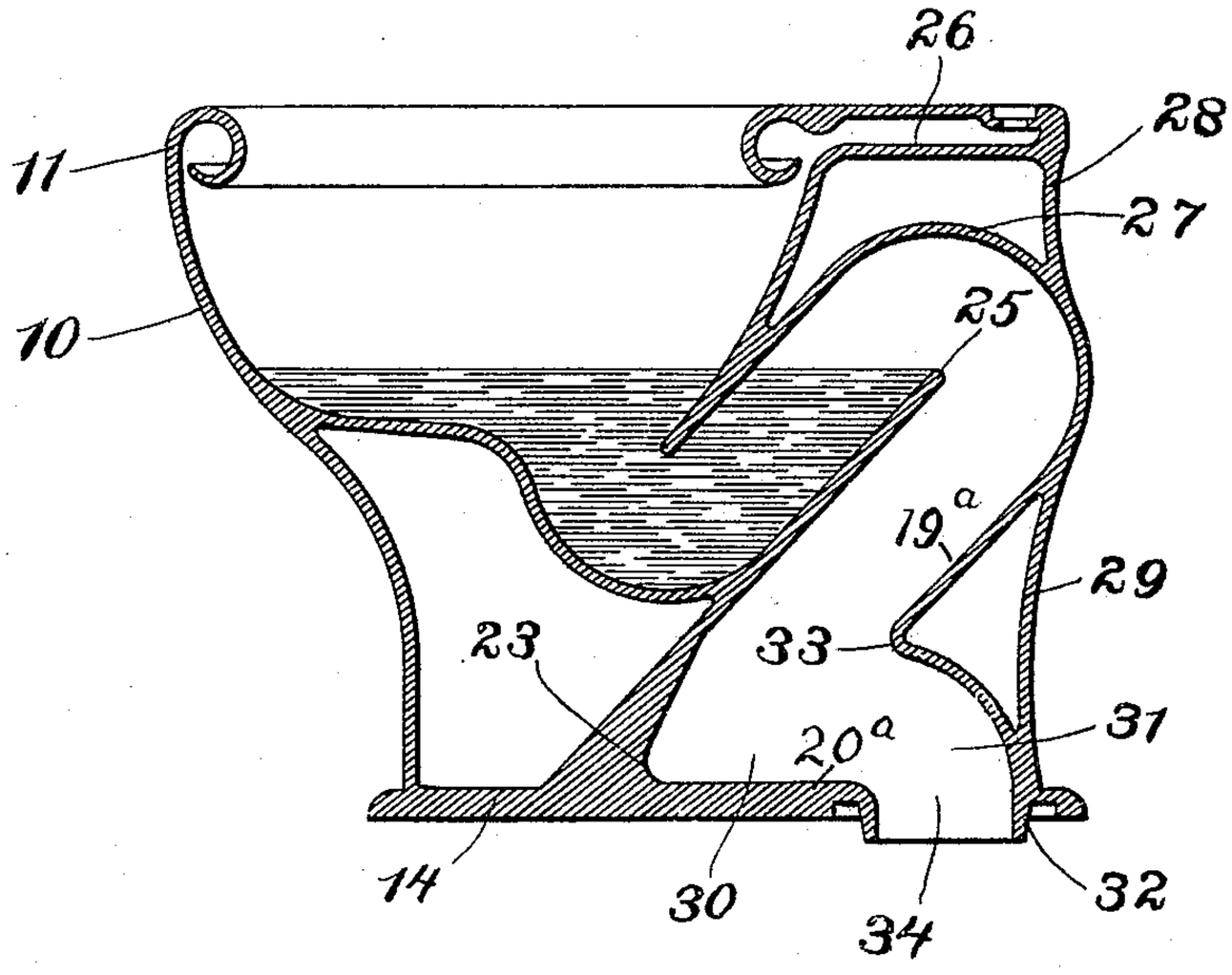


Fig. 2.



WITNESSES:

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No. 764,912. Patented July 12, 1904.

UNITED STATES PATENT OFFICE.

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SANITARY APPLIANCE.

SPECIFICATION forming part of Letters Patent No. 764,912, dated July 12, 1904.

Application filed December 10, 1900. Serial No. 39,337. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER A. CARSON, of Braintree, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Sanitary Appliances, of which the following is a specification.

This invention has relation to water-closets, urinals, and other sanitary appliances wherein it is necessary or desirable to secure a discharge of the contents by siphonic action.

The object of the invention is to provide certain improvements in sanitary appliances of the character referred to for effecting a more rapid siphonic discharge of the contents of the bowl than has hitherto been possible without the aid of a jet or other auxiliary means.

In carrying out the present invention it is my purpose to effect the siphonic discharge of the contents of the bowl by retarding in the discharge-limb a quantity of water sufficient to practically close said limb, and thus form a water seal in said limb below the level of the intake, whereby the continued outflow over the dam effects the rarefaction of the air confined above the seal, with a consequent siphonic action. To cause an accumulation of water in the descending limb, I construct said limb with an angular pocket, into which the water is backed up as it flows outward over the dam, said pocket being provided by changing the course of the limb abruptly, laterally, and substantially horizontally, so that the angle formed by the abrupt bend is essentially acute. The chamber or recess thus formed with a straight substantially horizontal base and the upper side at an acute angle thereto constitutes a pocket in which the water accumulates and from which it is prevented from flowing out by the constant overflow of fresh water from over the dam.

I have found that by constructing a closet in accordance with my invention the outflow of water from the outlet portion of the discharging-limb is prevented so effectually during the initial discharge of the water over the dam that the accumulation of water in the said limb is effected quickly and the rarefaction of the confined air takes place rapidly, whereby a siphonic discharge of the contents of the bowl follows with promptness and before the water in the bowl, which is increased by accessions from the flushing-rim, rises to any marked extent.

Referring to the accompanying drawings, which illustrate two different embodiments of the invention, Figure 1 represents a closet which is best adapted for fireproof or slow-burning buildings, in which it is desired to obviate the passage of soil-pipes through the floor. Fig. 2 represents another form of the invention, in which the limbs of the siphon form an integral portion of the bowl structure.

So far as the bowl itself is concerned, it may be constructed after any suitable pattern. It is indicated in the drawings at 10 and is provided with a flushing-rim 11, to which water is supplied from a duct 12. The bowl is supported by the pedestal 13, having the base 14. The outlet for the bowl is indicated at 15, and according to the construction shown in Fig. 1 there is connected to said outlet a metallic or other pipe 16, the coupling being located below the level of water in the bowl, as shown at 17. The pipe is formed with the inlet-limb 18, having the usual intake, and the discharge-limb 19, said limbs being inclined from both the vertical and horizontal and, in point of fact, substantially at an angle of forty-five degrees to the horizontal. The limb 18, together with the outlet 15 of the bowl, forms a bowl-trap. The inlet-limb extends rearward and upward, and the discharging-limb extends downward substantially parallel thereto and toward the front portion of the bowl. It is then bent abruptly rearward to provide an outlet portion, as at 20, the end 21 extending far enough from the rear to project through a wall or partition 22. The angle of the descending limb is such that water falling upon the lower side thereof is not deflected across the limb in a film or spray, but, on the contrary, is allowed to flow down the said wall and be discharged across the mouth of the

laterally-extending outlet portion 20 of the pipe. The course of the water as it leaves the wall 19ª of the descending portion of the limb is such that when it strikes the lower wall 20ª of the outlet it flows forward into the pocket 23 instead of flowing in the opposite direction. It will be observed that the wall 20ª may be slightly inclined underneath the outlet of the descending portion 19 of the limb, but that in any event the angle formed by the wall 20ª and the wall 19ª is obtuse. This is an important feature of the invention, for if the portion 20 of the limb were formed by bending the pipe as indicated in dotted lines in Fig. 1 the water would not be backed up and caused to flow in an opposite direction to the outlet, and consequently siphonic action would seldom, if ever, occur without raising the water in the level of the bowl practically as high as the flushing-rim. The wall 20ª forms, as it were, a water directing or guiding surface which extends entirely across the mouth of the descending portion of the discharging-limb, and it forms, with the inner wall 19ᵇ of the said descending portion of the limb, the pocket 23. Consequently water flowing down through the descending limb is changed in its course and caused to flow in a direction opposite to the course of the outlet portion of the siphon.

The operation of effecting the discharge of the contents of the bowl is substantially as follows: When the water from the flushing-tank is admitted to the flushing-rim, it raises the level of water in the bowl, so that it immediately begins to flow out over the dam 25. The outflowing water falls upon the wall 19ª of the descending limb of the siphon and flows down upon said wall and is discharged in a body upon the wall 20ª of the horizontal outlet 20. It strikes the said wall at such an angle and its momentum is such that it is directed forward underneath the bowl, striking against the wall 19ᵇ and piling up in the pocket and in the descending limb 19. Said water rises up above the entrance to the outlet and forms a seal across the same, being prevented from flowing out therethrough by the continued flow of water over the dam. The sealing of the lower end of the descending limb at a point below the intake or inlet to the ascending limb excludes air from passing from the outlet 20 into the limb 19, and the rarefaction of the air in the limb 19 above the seal by the flow of water from the dam takes place so quickly that siphonic action immediately occurs. As a matter of fact the siphonic discharge of the contents of the bowl is effected in a short time and before the level of the water in the bowl is raised by the accession of the flushing-water to any considerable height.

The most essential feature of the invention may be stated to be the formation of the discharging-limb of the siphon with a pocket in line with the descending portion of the limb, whereby water is caused to accumulate therein in sufficient quantities as to prevent backflow of air below the pocket and permit the rarefaction of air confined above it. The pocket is not to be confounded with the common weir in which water is retained at all times, for it will be observed that after the contents of the bowl of my closet have been withdrawn the pocket retains no water.

In Fig. 2 I have illustrated an embodiment of the invention in which the siphon-pipe is integral with the bowl structure and is adapted for connection with a soil-pipe extending up through the floor. The bowl, the inlet-limb, and the discharging-limb are formed of a number of sections of porcelain secured together and baked in the ordinary way to form a single integral structure. The water-inlet chamber 26 is extended rearwardly and is supported above the crown 27 of the trap by a brace or strut 28, while to render the closet symmetrical and also strong there is a strut 29, which supports the upper end of the descending limb of the siphon. The siphon does not differ from that already described, except that the horizontal outlet 30 of the discharging-limb does not project rearwardly beyond the bowl structure, but, on the contrary, bends downward at 31 and discharges at 34 through the base 14. Surrounding the outlet is an annulus 32 for connection with the soil-pipe. It will be noted in this connection that the wall 19ª of the ascending limb projects across the outlet 34, so that water flowing down it will be caused to strike against the wall 20ª of the horizontal portion at an obtuse angle and accumulate in the pocket 23. In operation the siphon in the closet last described differs in no wise from the one shown in Fig. 1, and as a description of its operation would be simply a repetition of what has already been given I shall not describe it.

The invention as thus described possesses numerous advantages, the foremost of which is the rapidity with which the siphonic action occurs upon the admission of flushing-water to the bowl, and in this connection will be observed the shallowness of the water in the bowl, for thereby we avoid the delay in siphoning that is unavoidable when the seal is deep by reason of the inertia of the water. The other advantages are comparatively minor and are easily perceptible to individuals skilled in the art to which this invention relates.

Of course my invention is not limited to closets having no jet, for in many cases I find it desirable to locate a jet-aperture in such relation to the ascending limb that the initial outflow over the dam is increased to secure a quicker discharge; but as the jet is a well-known expedient I have not illustrated or described it.

Having thus explained the nature of the in-

vention and described a way of constructing and using the same, although without having attempted to set forth all of the forms in which it may be made or all of the modes of its use, I declare that what I claim is—

1. A sanitary appliance comprising a bowl adapted to contain a body of water, a siphon, the ascending limb of which constitutes in conjunction with the bowl a trap, and the discharging-limb of which is formed with an acute angle to provide a descending limb extending toward the bowl, and a substantially horizontal outlet extending away from the bowl, with a non-retaining pocket at the junction of said limb and outlet formed by the walls thereof, whereby water flowing through said descending limb strikes on the lower surface of said outlet and is caused to flow in a direction toward the bowl and opposite the course of said outlet, and thereby in accumulating to prime the siphon.

2. A sanitary appliance comprising a bowl adapted to contain a body of water, and a siphon, the discharging-limb of which is bent inward toward the bowl and then outward at an acute angle to form a pocket, with a substantially straight horizontal portion against which the water from the upper portion of the limb strikes at an obtuse angle.

3. A sanitary appliance comprising a bowl adapted to contain a body of water, a siphon, the ascending limb of which constitutes, in conjunction with the bowl, a trap, the discharge-limb of which consists of a descending limb joined to a horizontal outlet at an acute angle whose apex extends toward the bowl, forming a pocket in which water is accumulated and retarded by its own momentum, prior to passing through the horizontal outlet, said pocket holding water only while it is flowing through the discharge-limb.

4. A sanitary appliance comprising a bowl adapted to contain a body of water, and a siphon, the discharging-limb of which descends at an inclination under the bowl and then extends horizontally outward at an acute angle, said limb having a pocket located at the bend or angle which holds water only when it is flowing through said discharging-limb.

5. A siphon-closet, comprising a bowl adapted to contain a body of water and a siphon, the ascending limb of which constitutes in conjunction with the bowl a trap, and the discharge-limb of which is composed of two straight portions one opening directly from the ascending limb and leading downward at an inclination to both the vertical and the horizontal, and the other portion extending substantially horizontally at an acute angle thereto, there being a non-retaining pocket at the junction of the two said straight portions whereby water flowing through the inclined portion of the descending limb strikes on the lower surface of the substantially horizontal portion and is caused to accumulate in the said pocket for the purpose of priming the siphon.

6. A sanitary appliance comprising a bowl adapted to contain a body of water, and a siphon, having a downwardly and inwardly inclined descending limb and a horizontal outlet extending away from the bowl, the inner wall of said descending limb, in conjunction with the lower wall of the horizontal outlet, extending beyond a curve with a radius equal to the diameter of the descending limb struck from a point at the junction of the outer wall of the descending limb and the upper wall of the horizontal outlet, to form a pocket in which water accumulates and is retarded by its own momentum, prior to passing through the horizontal outlet, said pocket holding water only while it is flowing through the discharge-limb.

7. A sanitary appliance comprising a bowl adapted to contain a body of water, and a siphon the ascending limb of which constitutes in conjunction with the bowl a trap, and the discharging-limb of which is bent at an acute angle to provide a water-directing surface extending entirely across the limb at an angle obtuse thereto, said surface, with the upper wall of the said limb, forming an angular pocket.

8. A sanitary appliance comprising a bowl adapted to contain a body of water, a siphon, the ascending limb of which constitutes, in conjunction with the bowl, a trap, the discharge-limb of which descends at an inclination toward the bowl and then extends laterally at an acute angle thereto, the area of the limb in cross-section at the angle or bend being greater than the area of the descending limb in cross-section above said bend, thus forming a pocket in which water is accumulated and retarded in passing through the lateral extension, said pocket holding water only while water is passing through the discharge-limb.

9. A sanitary appliance comprising in one integral structure, a bowl, a flushing-rim, and a siphon, the discharging-limb of said siphon descending toward the bowl at an angle both to the vertical and the horizontal, then extending rearward, substantially horizontally, and having a downwardly-projecting outlet.

10. A sanitary appliance having a bowl adapted to contain a body of water and a siphon, the descending limb of which constitutes in conjunction with the bowl a trap, and the discharging-limb of which descends toward the bowl at an inclination and then extends laterally at an acute angle thereto, the area of the limb in cross-section at the angle or bend being greater than the area of the descending limb in cross-section above said bend.

11. A sanitary appliance comprising a bowl adapted to contain a body of water, and a siphon, the ascending limb of which constitutes in conjunction with the bowl a trap, and

the discharging-limb of which is inclined downwardly toward the bowl and then bent at an acute angle to provide an outlet leading away from the bowl and having a horizontal surface in the course of the descending water to guide the same in a direction opposite the course of the said outlet.

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

ALEXANDER A. CARSON.

Witnesses:
WILLIAM G. CUMMINGS,
JOSIAH H. QUINCY.