

J. A. STEVENSON & L. O. PHILLIPS.
WATER CLOSET.

APPLICATION FILED MAY 10, 1910.

1,025,655.

Patented May 7, 1912.

2 SHEETS—SHEET 1.

FIG. 1

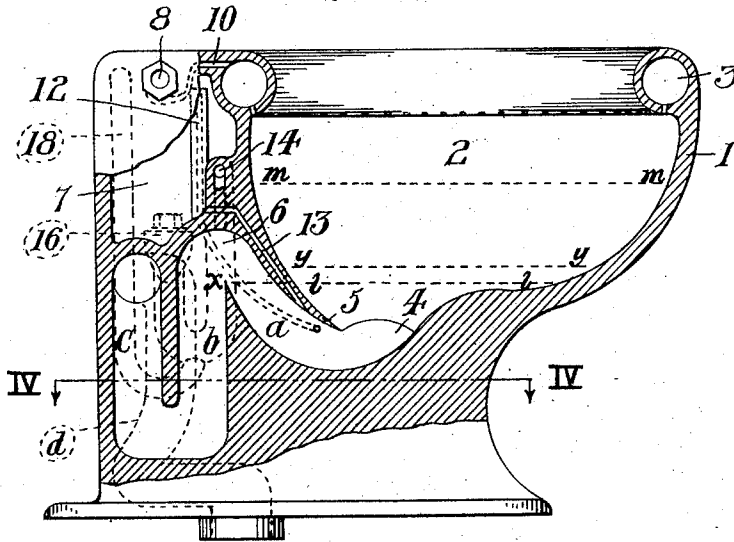
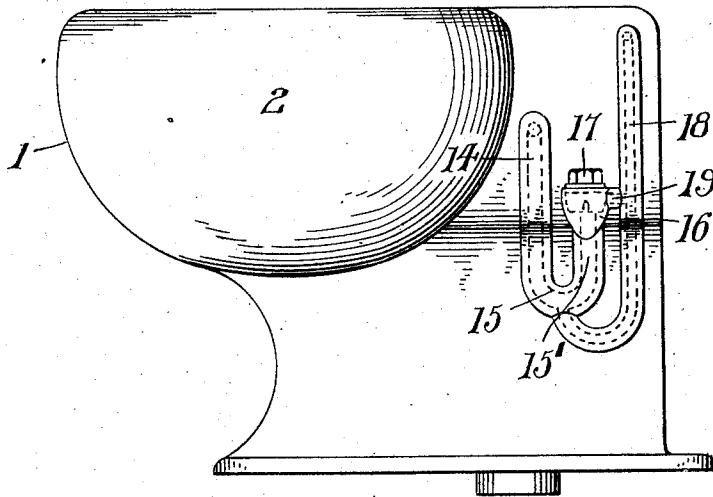


FIG. 2



WITNESSES

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2 SHEETS—SHEET 2.

FIG. 3

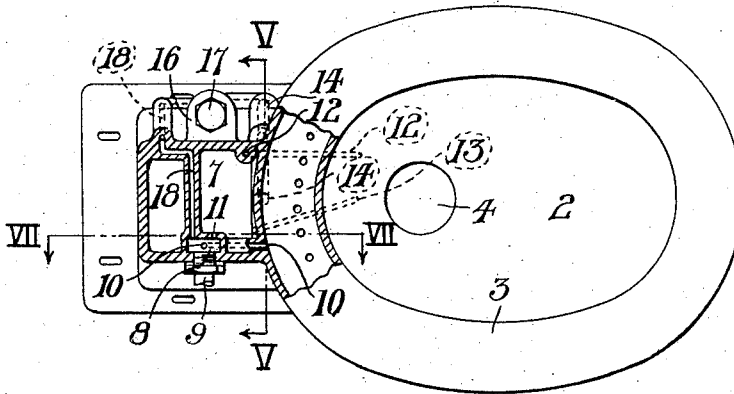


FIG. 4

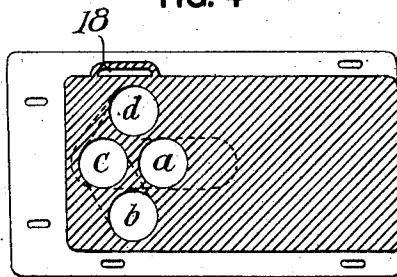


FIG. 5

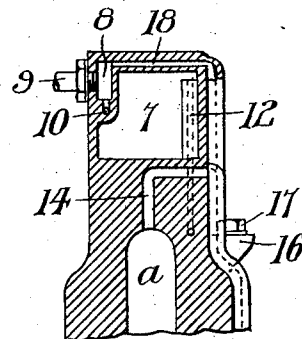


FIG. 6

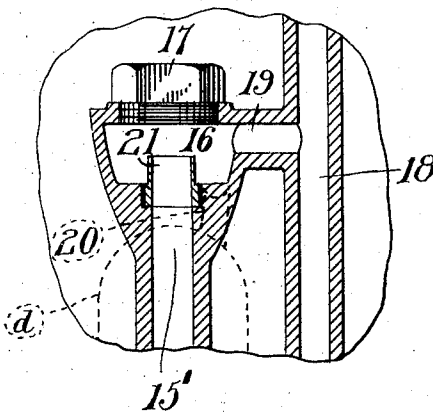
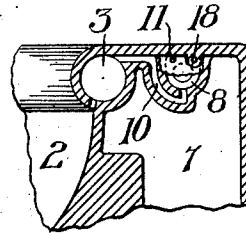


FIG. 7



WITNESSES

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UNITED STATES PATENT OFFICE.

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WATER-CLOSET.

1,025,655.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, JAMES A. STEVENSON and LEWIS O. PHILLIPS, citizens of the United States, residing at New Castle, in the county of Lawrence and State of Pennsylvania, have invented certain new and useful Improvements in Water-Closets, of which the following is a specification.

Our invention relates to certain new and advantageous improvements in water closets, urinals, sloop-hoppers, and other sanitary devices of a similar nature, which depend more or less upon siphonic action to carry away the contents of the bowl.

The invention hereinafter described, and shown in the accompanying drawings, is intended as an improvement over our former Patent #879,421, dated February 18, 1908, both inventions involving the same and essential features, and differing only so far as relates to the detail form of construction and arrangement of parts.

In this invention, as in the former mentioned one, we dispense entirely with the necessity for storage tanks, and present a device that can be successfully operated with only a normal supply pipe, and under any ordinary pressure. These advantages will readily be apparent to those skilled in the art to which this invention pertains, and will materially reduce the maintenance cost of sanitary appliances of this nature.

In this improved device we aim at simplicity of construction, together with a more reliable working efficiency, also the securing of a deeper after-fill in the bowl, and the provision of an auxiliary blow-pipe, or escapement means, for the air from the trap.

In the accompanying drawings in two sheets, Figure 1 is a sectional elevation of our improved closet, showing the different ducts and passage-ways; Fig. 2 is a reversed side elevation of the closet; Fig. 3 is a plan view, partly in section, taken near the top of the closet; Fig. 4 is a cross section on line IV—IV of Fig. 1; Fig. 5 is a fragmental vertical section taken on line V—V of Fig. 3, and looking toward the rear of the closet; Fig. 6 is an enlarged fragmental and ver-

tical section of the auxiliary air trap, and Fig. 7 is a sectional view taken on the line VII—VII of Fig. 3.

Throughout the drawings the numeral 1 indicates the body portion of the closet, which is constructed in the usual well known manner, and may be of any suitable material such as clay or metal, and involves the bowl portion 2, flushing rim 3, and outlet opening 4. Communicating with the said opening 4 is the first leg *a* of the discharge system, separated from the bowl by the bridge wall 5. This discharge, or outlet system, is the same as that shown and described in our former mentioned patent, and involves the two communicating and inverted U-shaped passages, having the legs *a—b—c* and *d*, for the purpose of providing two water seals with an intermediate air space or trap; here designated by the numeral 6.

The over-flow point in the secondary passage, between the legs *c—d*, is preferably made somewhat lower than the over-flow point X in the primary passage between the legs *a—b*, so as to create a natural fall or pull to the column of water passing through said legs during the siphonic action of the closet.

Positioned above the outlet system, and built into the closet, is an air reservoir or chamber 7 of any desired capacity. Interiorly of this said reservoir, in its upper section, is a spud opening or pocket 8, and connected in any suitable manner therewith is the water supply pipe 9. Leading from this said pocket, preferably from the bottom thereof, as shown in Fig. 7, is a duct 10, which enters and supplies the flushing rim 3 with water. A reduced opening 11 through the wall of this pocket, preferably in its upper section, serves to supply the air reservoir with water.

When water is admitted to the reservoir 7 the air confined therein is forced through the only outlet it has, which is a duct 12, extending from a point near the top of said reservoir, as shown in Fig. 5, to the bridge wall 5, and terminates in the leg *a* below.

the normal water level, so that its lower opening is submerged, and the air that is being forced from the reservoir 7 is compelled to pass through a body of water and escape from the point of least resistance; which will be into the trap 6.

Opening out of the bottom of the reservoir 7 is a duct 13, which enters the leg *a* parallel with the bridge wall 5, its lower opening also being below the normal water level, and on an approximate plane with the duct 12, its function being to drain said reservoir after each action of the closet, and assist in furnishing the after-fill in the bowl.

Communicating with the crown of the air trap 6 is a passageway 14, which first preferably extends upward a predetermined distance, as shown in Fig. 1, then outward through and down the side of the closet, terminating in a curved or U-shaped seal portion 15, involving the upwardly extending short leg 15', which is crowned with a cup-shaped portion 16, having the removable cap 17. This foregoing described passage 14 and leg 15' serves the purpose of an auxiliary air seal or escapement, and is kept supplied with water by means of a duct 18 which enters the lowest point of the trap, and extends upwardly through and into the air reservoir, entering the pocket 8 on a level with the opening 11.

A duct 19 connects the pocket or cup 16 with the said passageway 18; another duct 20 serves to drain said pocket into the sewer leg *d*; and a removable nipple 21 seated over the mouth of the leg 15', permits an adjustment feature to regulate the maximum height of the water to be stored up in the bowl; which will be further described hereinafter.

It will readily be seen and understood from the foregoing description, and by reference to the drawings, that the reservoir which supplies air to the trap is entirely separate and independent from the escapement means, and that the operation of our improved closet will be as follows: Attached to the supply pipe 9, and conveniently located so as to be within easy reach of the operator, will be a water regulating valve, not shown, which may be either automatic or under control of the operator, and when this valve is opened, for the purpose of flushing the closet bowl, water will flow simultaneously in three directions, viz: a greater portion will go direct through the duct 10 to the flushing rim, and incidentally will enter the bowl; a second supply will pass direct through the opening 11 into the air reservoir 7; and a third stream will pass through the duct 18 to supply the auxiliary air trap 15, the surplus water escaping through the duct 20 into the sewer leg *d*.

As water enters the reservoir 7 it drives

the air therefrom, through the duct 12 into the trap 6, and the filling up process continuing, a considerable compression is set up in the said trap which acts as a dam to hold back the water entering and accumulating in the bowl. This compressed air also is free to enter the duct 14 out of the crown of said trap, and as the filling up process continues the water standing in the longer leg of the auxiliary trap 15 is gradually forced downward and up through the shorter leg 15', overflowing the nipple 21 into the pocket 16, and out through the duct 20 into the sewer leg *d*. The filling process continuing the compressed air pushes the water down and out of said trap 15, and at the instant the maximum height of water is reached in the bowl, indicated by dotted line *m-m*, that instant the water in the leg 14 reaches the curved turn at the lower end, and the result is that the confined air held in the trap 6 and leg 14 escapes rapidly through the vent 20, and into the sewer leg *d*, carrying with it practically all the water that remains in the leg 15' and cup 16. At the same instant this escapement action takes place, and the air impediment being thus quickly removed, the head of water that has accumulated in the bowl will pass with siphonic action through the outlet system, carrying with it the entire contents of said bowl. The normal level of the water, which drops back after the discharge action for the after-fill, is reinforced by water draining out of the air reservoir 7 through the duct 13, will be on a line with the over-flow point X; as shown by the lower dotted line *l-l*.

In order to provide an additional after fill, above the normal water level, the air that is drawn into the trap 6 by natural suction when the siphonic action takes place, is prevented from escaping by reason of the supply duct 12 leading from the air reservoir being submerged and covered by the after fill, and also from the fact that the auxiliary trap 15 has again been supplied with water from the duct 18; part of said water having been blown through the duct 19 during the escapement of air from the trap 6. The fact also that the drain duct 13, leading from the air reservoir, terminates below the normal water level, will prevent any of the air drawn into the said trap 6 from escapement in that direction. Thus, in this manner, sufficient air is trapped in the seal 6 to insure an additional after-fill in the bowl above the normal water level, approximately an inch or so above said line; as indicated by dotted line *y-y*.

The lengthening or shortening of the nipple 21, seated over the upper end of the trap leg 15', determines and regulates the

relative maximum height of the water to be stored in the bowl; the longer the nipple, the higher the water will rise, owing to the additional weight of water supplied to the short leg 15', which must be lifted and overcome by the compressed air pressure exerted against the water in the longer leg 14. In other words, the added or lessened weight of the column of water in the two auxiliary trap legs 14 and 15' necessitates a corresponding increase or diminution of the air pressure from the trap 6, and hence a more or less height of water to store up in the bowl, before said air pressure forces the water out of said trap 15, and permits the contents of the bowl to escape through the outlet system.

The lower extremity of the siphon leg *d* is provided with a rearwardly sloping portion, and approximately reversed right angled turns, in order to provide a "chuck" at this point, and by breaking the column of water passing out through said leg materially aid in the siphonic action of the closet. No particular novelty or invention is claimed for this feature of our device, but is merely shown as an adjunct and advantage to the successful working of our invention.

The air chamber 7, after each action of the closet, obtains an air relief, in order to insure the emptying of said chamber of water, by the air from the siphon leg *d* passing through the duct 20, cup 16, ducts 19 and 18, then through the pocket 8 and duct 11.

We desire, however, to have it understood that the device here shown and described is merely illustrative, and that such changes as are necessary can be made in the detail form of construction without departing from the original spirit and intention, and that will be within the scope of the claims appended hereto.

What we claim as new is:

1. In a device of the character described, the combination with a suitable bowl and communicating outlet system, of an air seal in said outlet; an air reservoir; means for forcing air from the reservoir into the seal; an auxiliary air trap; and means for an escapement of air from the first mentioned seal through the auxiliary trap.

2. In a device of the character described, the combination with a suitable bowl and communicating outlet system, of an air seal in said outlet; an air reservoir; means for forcing air from the reservoir into the seal during the filling process; an auxiliary air trap; and means for an escapement of air from the first mentioned seal through the auxiliary trap during the emptying process.

3. In a device of the character described, the combination with a suitable bowl and

communicating outlet system, of an air seal in said outlet; an air reservoir; means for forcing air from the reservoir through a body of water into the said seal; an auxiliary air trap; means for supplying said trap with water; and means for forcing the water out of said trap to permit an escapement of air from the first mentioned seal.

4. In a device of the character described, the combination with a suitable bowl and communicating outlet system, of an air seal in said outlet; an air reservoir; means for forcing air out of said reservoir through a body of water into the said seal during the filling process; an auxiliary air trap; means for supplying said trap with water; means for removing the water out of said auxiliary trap to permit an escapement of air from the first mentioned seal; and means for draining the said reservoir of water to assist in furnishing the after-fill in the bowl.

5. In a device of the character described, the combination with a suitable bowl and communicating outlet system, involving two water seals and an intermediate air trap, of an air reservoir; a connection from the reservoir into one of the water seals; a drain duct opening out of the reservoir; and terminating in one of said water seals; an auxiliary air trap communicating with the first mentioned trap; means for supplying water to the bowl, air reservoir, and auxiliary air trap; and means for removing the water from said auxiliary trap to effect an escapement of air from the first mentioned trap.

6. In a device of the character described, a suitable bowl having a communicating outlet system involving two water seals and an intermediate air trap; an air reservoir; means for forcing air from said reservoir into the trap during the filling process; and means for trapping the air drawn by natural suction into said trap during the emptying process in order to provide an additional after-fill in the bowl above the normal overflow point.

7. In a device of the character described, a suitable bowl having a communicating outlet system involving two water seals and an intermediate air trap; means for supplying said trap with air to hold up a body of water in the bowl; an auxiliary air trap; means for an escapement of air from the first mentioned trap through the said auxiliary trap to permit the contents of the bowl passing through the outlet system; and means, forming a part of said auxiliary trap, for governing the height of water to be stored up in the bowl.

8. In a siphonic acting water closet, a suitable bowl provided with a communicating outlet system involving two water seals and an intermediate air trap; an air reser-

voir; an air duct leading from said reservoir to a point in one of said water seals; a drain duct extending from said reservoir to a point in one of said water seals; an
5 auxiliary blow trap; a duct leading from the crown of said first mentioned trap to the said auxiliary trap; means for supplying water to the bowl, reservoir, and auxiliary trap; and means, forming part of the aux-

iliary trap, for governing the height of water to be stored up in the bowl. 10

In testimony whereof we affix our signatures in presence of two witnesses.

JAMES ALBERT STEVENSON.

LEWIS OLIVER PHILLIPS.

Witnesses:

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H. M. HANNA.

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