

(No Model.)

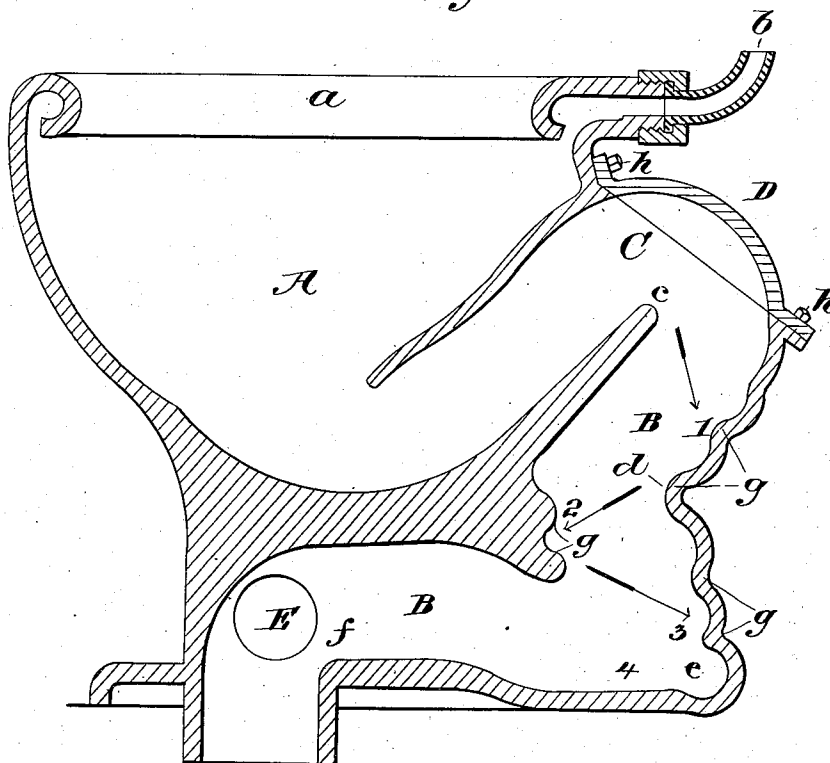
2 Sheets—Sheet 1.

J. G. MORRISON.
WATER CLOSET.

No. 563,397.

Patented July 7, 1896.

Fig. 1.



WITNESSES:

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Geo. J. Brennan

INVENTOR

John A. Morrison.

BY

Wm. H. Abbe

ATTORNEY

(No Model.)

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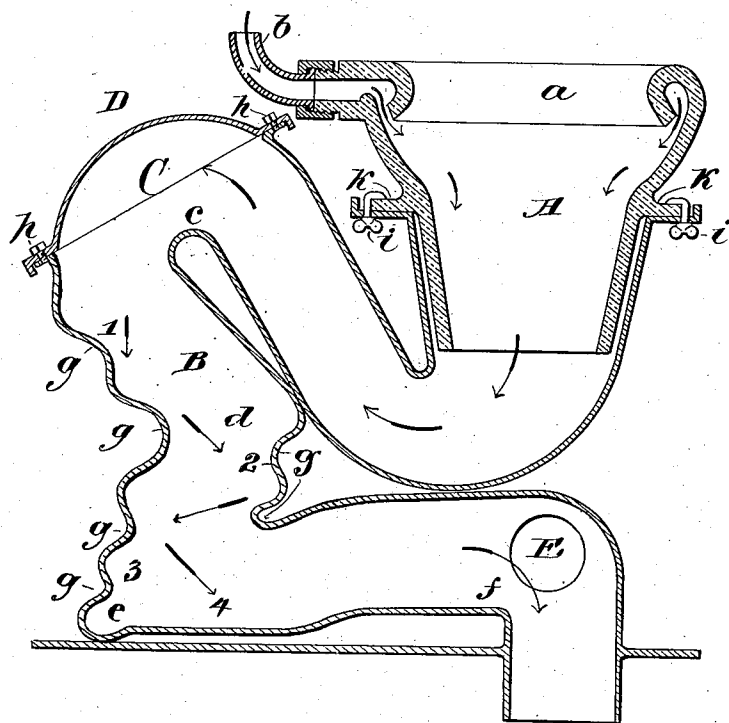


Fig. 2.

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UNITED STATES PATENT OFFICE.

JOHN G. MORRISON, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO
WILHELMINE M. MORRISON, OF BROOKLYN, NEW YORK.

WATER-CLOSET.

SPECIFICATION forming part of Letters Patent No. 563,397, dated July 7, 1896.

Application filed April 5, 1894. Renewed March 21, 1896. Serial No. 584,351. (No model.)

To all whom it may concern:

Be it known that I, JOHN G. MORRISON, a citizen of the United States, and a resident of Jersey City, county of Hudson, and State of New Jersey, have invented certain new and useful Improvements in Water-Closets, of which the following is a specification.

My invention relates to what are known in the art as "siphon-closets," or those in which the contents of the bowl are carried away and discharged by siphonic action set up in the discharge-pipe. In closets of this class as ordinarily constructed the discharge-pipe leading from the bowl usually extends upward therefrom in an inclined direction, then, bending back upon itself, descends to a point below the bottom of the bowl, and then communicates with the stand or other pipe that connects with the sewer. The upward-inclined portion of this discharge-pipe constitutes the short arm of the siphon, and the downward extending portion the long arm thereof, so that, in order to remove the contents of the bowl, all that is required is to supply water to the latter, exhaust or partially exhaust the air from the longer arm of the siphon, and allow the atmospheric pressure upon the water and other material in the bowl to force them upward in the shorter arm of the siphon and discharge them through the longer arm thereof. To effect the necessary exhaustion of the air from the longer arm of the siphon to set up this siphonic action, the water usually contained in the bowl and that supplied at the time the flushing and cleaning of the closet occurs is employed. In applying this water for the purposes of effecting the exhaustion, it is obvious, that, in order to remove the air from the longer arm of the siphon, the water descending therein must completely fill it, so that, in its descending movement, it will carry all the air before it and not allow of any returning past the same. The most usual mode of operation to effect this exhaustion of the air from the longer arm of the siphon is to supply to the bowl of the closet, when the required siphonic action is to be set up therein, a volume of water sufficiently great to cause it to flow down the longer arm

of the siphon in a solid stream or mass of the proper cross-section to completely fill the pipe.

To discharge the fecal and other matter deposited in the bowl, the discharge-pipe constituting the siphon must necessarily be of some considerable size, and when a solid stream or mass of water is thus employed to initiate and carry on the required siphonic action to effect the discharge of the closet a large volume of water is demanded. In some locations where the supply of water is limited the consumption thereof required to thus supply the closet with a sufficient volume to completely fill the longer arm of the siphon with a solid stream or mass is impracticable. To remedy this and provide for accomplishing the same result with a much less consumption of water, it has been essayed to so construct the portion of the discharge-pipe constituting the longer arm of the siphon as to cause the water flowing therethrough to be broken up into spray and thus pass through it in that form instead of in a solid mass. The water flowing through the longer arm of the siphon in this form has been found sufficient to effect the necessary siphonic action to discharge the contents of the closet when the division of the stream has been carried to the proper extent to thoroughly fill the interior of the pipe with the spray. The forms of construction heretofore employed for effecting this conversion of the stream of water into spray, consisting in most part of a screw-thread formed in the interior of the pipe, or of a number of abrupt angular bends therein, have not in all instances been found reliable in practice, and, as a result thereof, the proper flushing and cleansing of a closet when required have not at all times been attained. To obviate this and provide a closet which shall insure at all times the requisite conversion of the water descending in the longer arm of the siphon into spray, to effect the efficient discharge of the contents of the closet when desired, is the object of my invention.

To the ends thus specified the invention consists in providing the discharge-pipe of the water-closet at the points where the water impacts against its interior, as it passes through

the same, with a number of corrugations whereby to not only retard its velocity, but at the same time more effectively convert it into spray, all as will hereinafter more fully appear.

Referring to the accompanying drawings, which form a part of this specification, Figure 1 is a vertical central section of a water-closet constructed in accordance with my invention, the bowl and discharge-pipe being made integral of earthenware; and Fig. 2, a similar central section of a water-closet of the same class with the bowl made of earthenware and the discharge-pipe of metal.

In both figures like letters and numerals of reference are employed to designate corresponding parts.

a indicates a water-closet bowl which is or may be constructed of earthenware, and is provided around its upper edge with a flange *a*, through which the water for flushing and cleaning the closet may be admitted from a pipe *b*.

B indicates the discharge-pipe, by means of which the contents of the bowl *A* are carried away and delivered to the stand or other pipe communicating with the sewer. In the preferred form of construction this pipe leads from the bottom of the bowl *A* upward in an inclined direction to the point *c*, thence bends back upon itself and descends in a downward and inward direction to the point *d*, thence in a downward and outward direction to the point *e* below the bottom of the bowl, and thence in a slightly-upward direction to the point *f*, where it connects with the pipe that leads to the sewer. As thus constructed, the upward-inclined portion of the pipe, from the bottom of the bowl to the point *c*, constitutes the short arm of the siphon, and the downward and inwardly and downward and outwardly inclined portions, from the point *c* to the point *e*, the long arm thereof, while the upward inclination of the portion of the pipe extending from the point *e* to the point of connection with the stand-pipe allows of a sufficient depth of water normally accumulating at the point *e* to require but a small accession through the siphon to completely seal the lower end of the longer arm thereof.

In the normal condition of the closet the water usually stands in the bowl to the height of the first bend in the pipe, or of the point *c*. A slight accession of water to the bowl, either through the pipe *b* or otherwise, will cause such water to flow over the point *c* and impinge against the opposite side of the pipe, at about the point 1. From this point of impact it will be deflected across the pipe and strike the opposite side thereof at about the point 2. From this point it will be deflected back again across the pipe and contact with the same at about the point 3, and from this point it will be deflected downward to about the point 4 at the lower end of the longer arm of the siphon, the general course of the water in passing from the point *c* to the point *e* being

back and forth across the pipe, as indicated by the arrows in the drawings. The result of these back-and-forth deflections of the water and of its several impacts with the walls of the pipe, as it passes along the same, is to break up such water into spray and thereby cause its volume to very much increase. In some cases, where the accessions of water to the bowl *A* are considerable, the amount of spray formed by these several deflections and impacts will be sufficient to fill the long arm of the siphon and cause the carrying away and discharge of the contents of the closet, even when the interior of the pipe is left smooth and the same unprovided with obstructing surfaces. To insure the more perfect conversion of the water into spray, however, and thereby effect the efficient flushing and cleaning of the closet with the minimum amount of water, I provide the interior of the discharge-pipe *B*, at the several points 1, 2, and 3 of impact of the water therewith, with corrugations *g*, whereby to present surfaces over which the flow of water will be retarded and the volume of spray produced by its impact therewith very greatly increased. These corrugations extend around the interior of the discharge-pipe at the points where the impact of the water takes place for about one-half of its circumference, and may be made continuous throughout their length or broken up into a number of short sections, as preferred, it only being essential that, whatever their forms, they be so disposed in the discharge-pipe as to retard the flow of water over them and present abrupt surfaces, against which such water strikes in its descent to thereby convert it more completely into foam or spray.

Formed through the discharge-pipe *B*, at the junction of its upward inclined and descending portions, is a hand-hole *C*, by means of which access to its interior may be gained for purposes of repair or otherwise, and this hole may be closed by a removable cover *D*, secured in place by screws *h*, or other convenient means, as shown. This discharge-pipe may likewise be provided with an air-aperture *E*, with which a pipe leading to a hot-air flue or other suitable passage may be connected, whereby to carry away any gases that may come from the sewer or otherwise accumulate in the pipe, as is usual with closets as at present in use.

In the construction of my closet the bowl and discharge-pipe may be made of earthenware, or the bowl be made of earthenware and the discharge-pipe of metal. When made of earthenware, the bowl and discharge-pipe will be integral, as shown in Fig. 1. When, on the other hand, the bowl is made of earthenware and the discharge-pipe of metal, the two will be separate and joined together, as shown in Fig. 2. With this latter form of construction the bowl *A* is made with an open bottom, which is received within the open flaring end of the discharge-pipe *B*, and

is secured therein by suitable clamp-bolts *i*, passing through orifices formed in the flange on the upper end of the pipe and engaging with their hooked ends with the flange *k*, formed on the exterior of the bowl A. The bowl and pipe being thus secured together, the joint between them may be packed with any appropriate material suitably interposed, and the same is also true with respect to the joint between the hole C and cover D.

By the construction of parts above described a water-closet is produced in which the most efficient flushing and cleaning are attained with the minimum consumption of water.

Having now described my invention and specified the best ways contemplated by me for carrying it into effect, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A water-closet constructed with a discharge-pipe of siphon form, the descending portion of which is provided with a bend and with corrugations at the points of impact of the water therewith as it passes through the same, substantially as described.

2. The combination, with a water-closet bowl, of a discharge-pipe of siphon form having a bend in the descending portion thereof,

and provided with corrugations extending partially around its interior at the points of impact of the water therewith, as it passes through said pipes, substantially as described.

3. The combination, with a bowl, A, having a flange, *a*, around its upper edge through which water is discharged to its interior, and a water-supply pipe, *b*, of a discharge-pipe, B, made in siphon form with a bend in its descending portion at *d*, and with corrugations, *g*, at the points of impact, 1, 2 and 3, substantially as described.

4. The combination, with a bowl provided with an open bottom, and with a flange around its upper edge through which water is conveyed to its interior, and a water-supply pipe *b*, of a discharge-pipe, B, made in siphon form with a flaring upper end for reception of the lower end of the bowl and provided with a bend in its descending portion, and with corrugations at the point of impact of the water therewith as it flows through said pipe, as and for the purposes described.

In testimony whereof I have hereunto set my hand this 30th day of March, 1894.

JOHN G. MORRISON.

Witnesses:

S. L. TRIPPE,

GEORGE J. BRENNAN.