

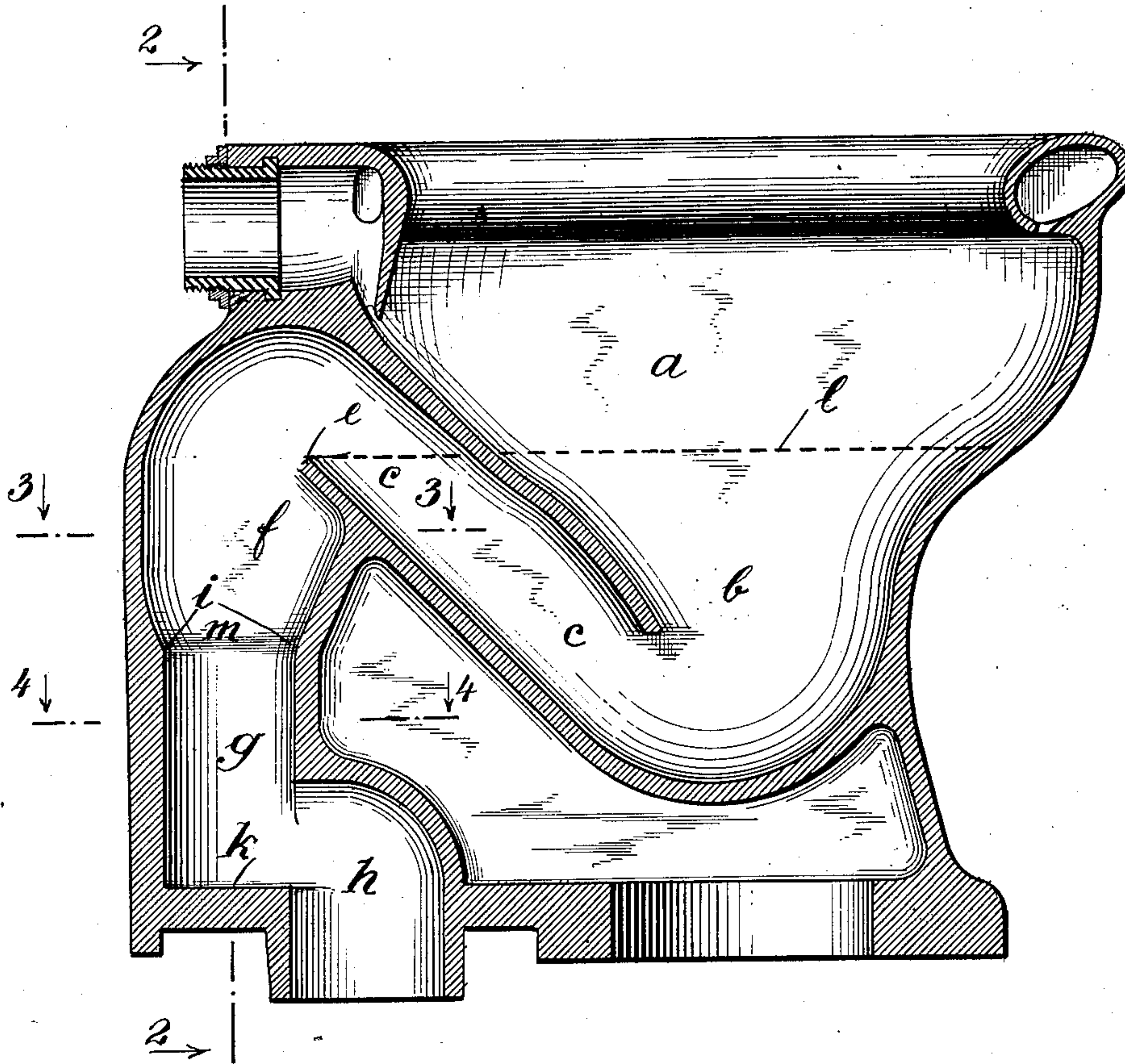
No. 897,118.

PATENTED AUG. 25, 1908.

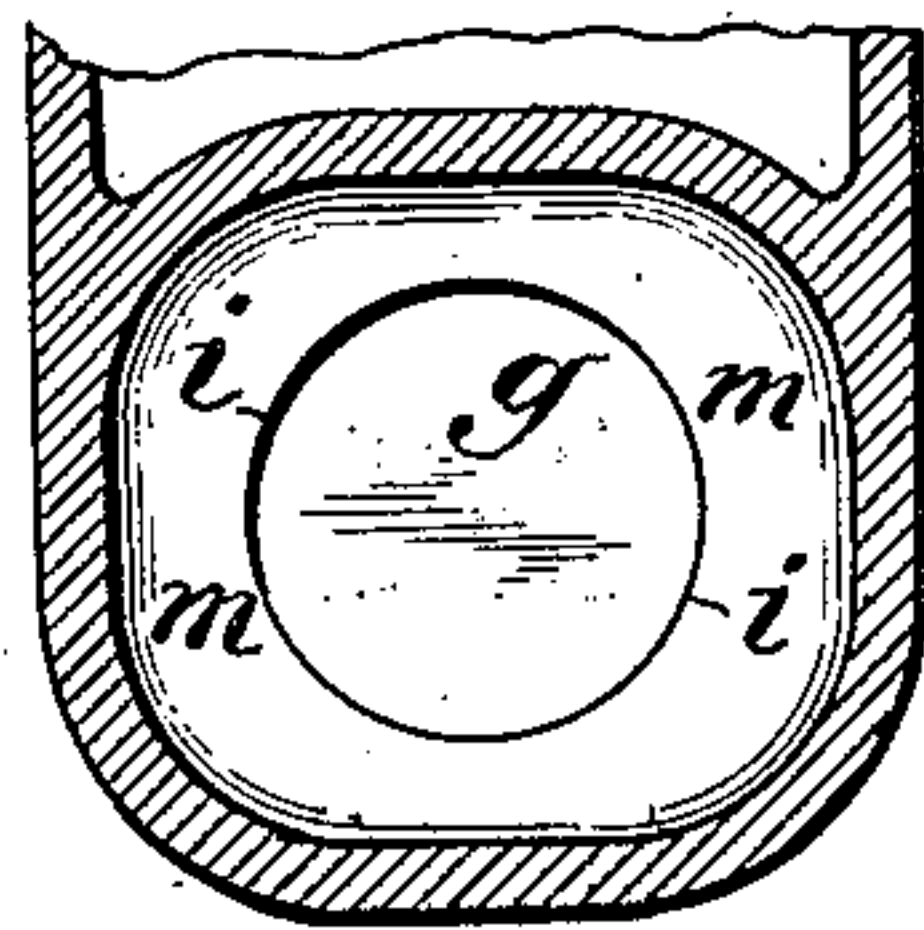
J. MADDOCK.  
SIPHON STRUCTURE.  
APPLICATION FILED DEC. 3, 1907.

2 SHEETS—SHEET 1.

*Fig. 1,*



*Fig. 3,*



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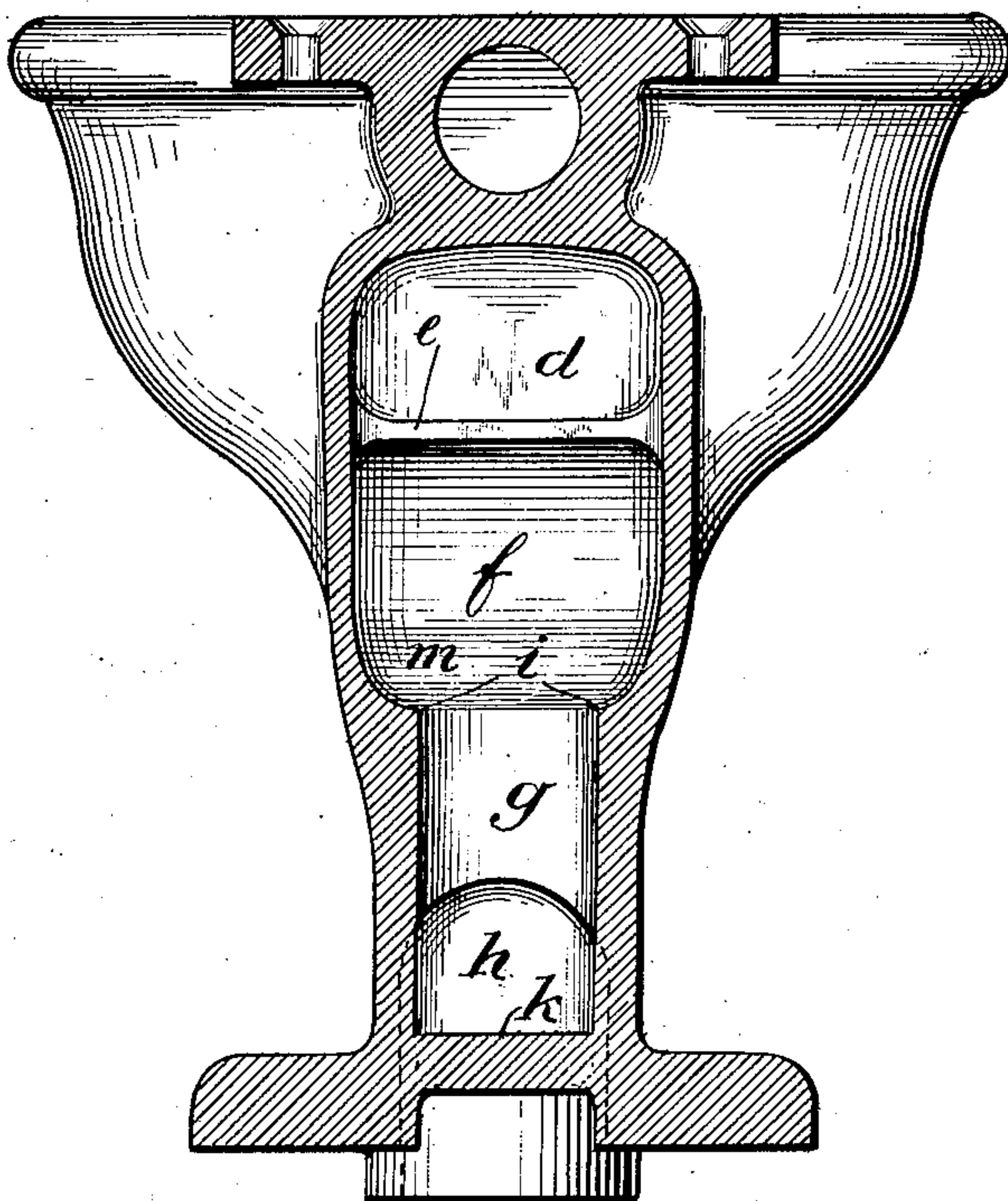
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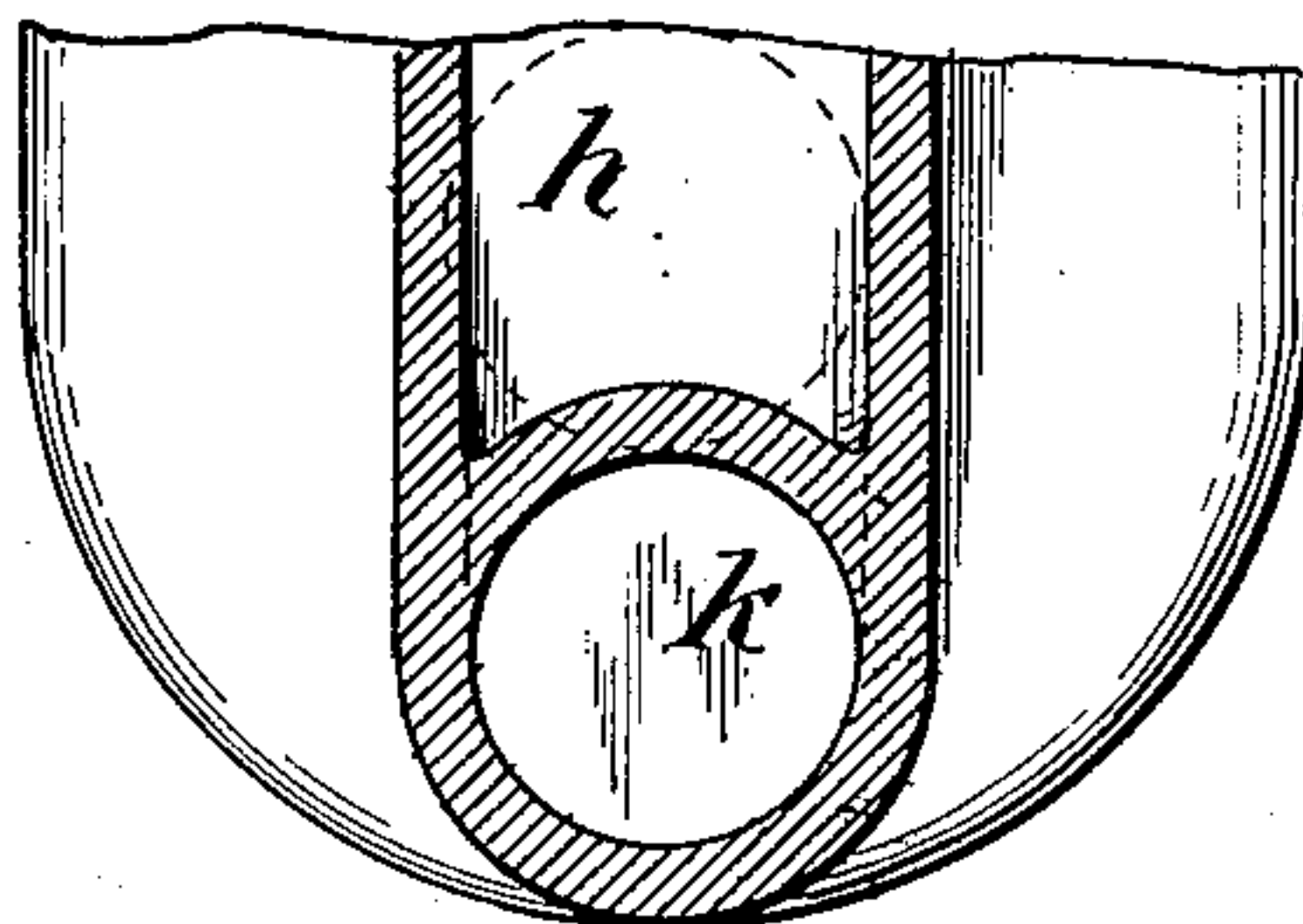
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2 SHEETS—SHEET 2.

*Fig. 2,*



*Fig. 4,*



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# UNITED STATES PATENT OFFICE.

JOHN MADDOCK, OF TRENTON, NEW JERSEY.

## SIPHON STRUCTURE.

No. 897,118.

Specification of Letters Patent.

Patented Aug. 25, 1908.

Application filed December 3, 1907. Serial No. 404,920.

*To all whom it may concern:*

Be it known that I, JOHN MADDOCK, a citizen of the United States, residing at Trenton, in the county of Mercer and State of New Jersey, have invented certain new and useful Improvements in Siphon Structures, of which the following is a specification.

My invention relates to siphon structures, and has for its objects a construction which will, if desired, afford a deep and expansive water-seal, induce prompt, effective and comparatively noiseless action in clearing a receptacle of its contents, and possess other advantages of construction and operation.

My invention, although useful in other structures, is especially adapted to siphon water closets, and in this specification I shall illustrate and describe it as so applied, claiming it generally as well as more specifically in combination with water closets.

Speaking, then, generally, and especially concerning the state of the art as it has been applied in the construction of siphon water closets, I note that heretofore improvers in the art concerned appear to have confined their efforts to the introduction in the outlet-leg or passage of the siphon structure of various devices intended to deflect and impede the outflow of water from the receptacle or bowl of the closet in such manner as to induce the formation within the discharge-leg of a sufficiently dense body or "plug" of water to start siphonic action and clear the receptacle of its contents. While providing the discharge-leg of the siphon with what I believe to be novel means for promoting the prompt formation of such water "plug", I have gone further, and, by producing a new form of intake-leg, and a novel relative proportion between the calibers and capacities of the intake and discharge legs of the siphon, with means for affording a very prompt and copious initial flow of water from the intake-leg into the discharge-leg, I have produced desirable results hitherto unattained in the operation of such structures.

My improvement is illustrated in the accompanying drawings, forming a part of this specification, wherein

Figure 1 is a vertical sectional view of a water closet containing my invention; Fig. 2 is a sectional view thereof taken on the line 2—2 in Fig. 1; Fig. 3 is a sectional view of the discharge-leg taken on the line 3—3 in Fig. 1, looking down, and Fig. 4 is a sectional

view of another part of the discharge-leg taken on the line 4—4 in Fig. 1, looking down.

The bowl, *a*, of the closet is provided with the usual flushing-rim, spreader, &c. adapted to admit water to the bowl to flush and cleanse it. The outlet, *h*, of the bowl, opening into the intake-leg of the siphon, is of the usual form. The intake-leg, *c*, is of approximately oblong form in cross-section, as indicated at *d* in Fig. 2, its width being considerably greater than its depth. At the lower side of the discharge end of the intake-leg, *c*, is located the dam *e* which has a length substantially equal to the internal width of the intake-leg at that point. This dam, *e*, is made as straight and flat as may be at its edge, and extends well over the funnel-shaped part of the discharge-leg next hereinafter described. See Figs. 1 and 2. The upper portion, *f*, of the discharge-leg is of a funnel form, and has a considerably larger caliber than the lower part, *g*, of that leg; while said part *g* and its extension, *h*, are of substantially equal calibers and capacities. At *i* the wall of the portion *f* of the discharge-leg is contracted to the diameter or caliber of the part *g* of the discharge-leg, as shown in Figs. 1, 2 and 3. At *k* there is formed an abrupt deflecting-wall which lies in a plane substantially at a right angle with the axis of the part *g* (see Figs. 1 and 2), while the part *h* of the discharge-leg has its axis parallel to the axis of the part *g*, but is out of line therewith. See Figs. 1 and 4.

The foregoing description and the drawings make clear the details of my construction, and I shall now describe the operation thereof. When the closet is not operated the water in the bowl and intake-leg of the siphon stands at the level indicated by the dotted line *l* in Fig. 1. Upon admission of water to the bowl from the flushing-tank to flush the closet, there ensues a slight rise of the level of the water in the bowl and intake-leg, and the water immediately begins to flow over the dam *e*. The water passing over the dam follows the wall of the funnel portion *f* of the discharge-leg, and is projected off from such circular wall at the point of contraction, *i*, in the discharge-leg, and, meeting from all sides, begins to form a "water-plug", which plug is further and completely formed when the water strikes upon the deflecting-wall *k* at the bottom of the part *g*, and is upwardly deflected therefrom.



The air contained in the discharge-leg below the point of contraction  $i$  is thus quickly commingled with the water passing through the discharge-leg, and is drawn off with it through the lowermost section,  $h$ , of the discharge-leg and the soil-pipe below, causing a practically instantaneous rarefaction of the air remaining in the part of the discharge-leg above said point of contraction,  $i$ , to a sufficient extent to induce siphonic action, and exhaust the entire contents of the bowl through the siphon; the siphonic action continuing for an appreciable time after the level of the water in the bowl has been reduced to a point below the outlet of the bowl. The siphon then breaks almost noiselessly, and the bowl is quickly refilled to the normal water-level.

As will be understood from what has been said and shown, I procure the prompt formation of the essential "water-plug", and vigorous and effective siphonic action by giving the intake-leg of the siphon a materially greater capacity than the discharge-leg thereof; by making the discharge end of the intake-leg flat on its lower side, and of a greater horizontal caliber at that point than the smaller caliber or calibers of the discharge-leg, and providing a deflecting surface in the discharge-leg. I thus secure as prompt and copious a discharge of water from the intake-leg into what I may term the "choking-chamber" of the discharge-leg as the intake-leg receives from the bowl, and as the bowl receives from the flushing-tank, the stream passing out of the discharge end of the intake-leg compensating in its width for what it lacks in depth, and preventing the excessive rising of the water in the bowl when flushing begins, and the attendant delay in action (which must occur in all structures having a comparatively small horizontal caliber of discharge end of intake-leg) before a sufficient volume of water can pass from the intake-leg into the discharge-leg to form the "water-plug", and induce siphonic action.

It should be understood that the dam mentioned and referred to in the foregoing description may, in certain constructions, inhere entirely in the lower side of the discharge end of the intake-leg; in other words, as a structure distinguishable from the intake-leg, it may be entirely omitted in some forms of siphon structures, and it is my intention to cover such modified forms in my appended claims as well as the form shown and described herein.

Having thus described my invention, I claim:—

1. A siphon structure having an intake-leg of materially greater capacity than its discharge-leg, said intake-leg having its discharge end of materially greater horizontal than vertical caliber.

2. A siphon structure having an intake-

leg of greater capacity than the discharge-leg of said structure, and said intake-leg having a flat terminal at its discharge end, and having at said end a horizontal caliber greater than a caliber of the discharge-leg of said structure.

3. A siphon structure having an intake-leg of greater capacity than the discharge-leg of said structure, and said intake-leg having a flat terminal at its discharge end, and having at said end a horizontal caliber greater than a caliber of the discharge-leg of said structure; the discharge-leg of said structure having a deflecting surface located within the same below the outlet of the intake-leg.

4. A siphon structure having an intake-leg of greater capacity than the outlet-leg of such structure, said intake-leg having at its discharge end a horizontal caliber greater than a caliber of the said outlet-leg; a flat dam located at the discharge end of the intake-leg; and an outlet-leg having a contracted deflecting surface below said dam.

5. In a water closet, the combination of the bowl with a siphon structure the intake-leg whereof is of substantially greater capacity than the discharge-leg thereof, and has a horizontal caliber at its discharge end greater than its vertical caliber at said point, and than a caliber of its discharge-leg.

6. In a water closet, the combination of the bowl with a siphon structure having an intake-leg of greater capacity than the discharge-leg thereof, said intake-leg having a flat terminal at its discharge end, and having at its said end a greater horizontal caliber than a caliber of the discharge-leg.

7. In a water closet, the combination of the bowl with a siphon structure having an intake-leg of greater capacity than the discharge-leg thereof, and said intake-leg having a flat terminal at its discharge end, and having at its said end a horizontal caliber greater than a caliber of the discharge-leg of said structure; said discharge-leg having a deflecting surface located within the same below the outlet of the intake-leg.

8. In a water closet, the combination of the bowl with a siphon structure having an intake-leg of greater capacity than the discharge-leg of such structure; said intake-leg having at its discharge end a horizontal caliber greater than a caliber of said discharge-leg; a flat dam located at the discharge end of said intake-leg; and said discharge-leg having a contracted deflecting surface below said dam.

9. In a water closet, the combination of the bowl with a siphon structure having an intake-leg of substantially greater capacity than the discharge-leg of such structure, said intake-leg having at its discharge end a horizontal caliber materially greater than a caliber of said discharge-leg; a flat dam located at the discharge end of said intake-leg, and



said discharge-leg being funnel shaped at and just below its junction with the intake-leg, and having a channel of less caliber below said funnel portion, said last mentioned channel having a deflecting-surface formed therein below its upper end.

10. In a water closet, the combination of the bowl with a siphon structure having an intake-leg of substantially greater capacity than the discharge-leg of such structure, said intake-leg having at its discharge end a horizontal caliber materially greater than a caliber of said discharge-leg; a flat dam located

at the discharge end of said intake-leg and extending over a funnel shaped portion of the discharge-leg; said discharge-leg being funnel shaped in its upper portion at and below its junction with the intake-leg, and having a channel of smaller caliber below said funnel portion, said channel being tortuous and having a deflecting-wall formed in its course.

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Witnesses:

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