

(No Model.)

2 Sheets—Sheet 1.

S. G. McFARLAND.
URINAL OR WATER CLOSET.

No. 460,485.

Patented Sept. 29, 1891.

Fig. I.

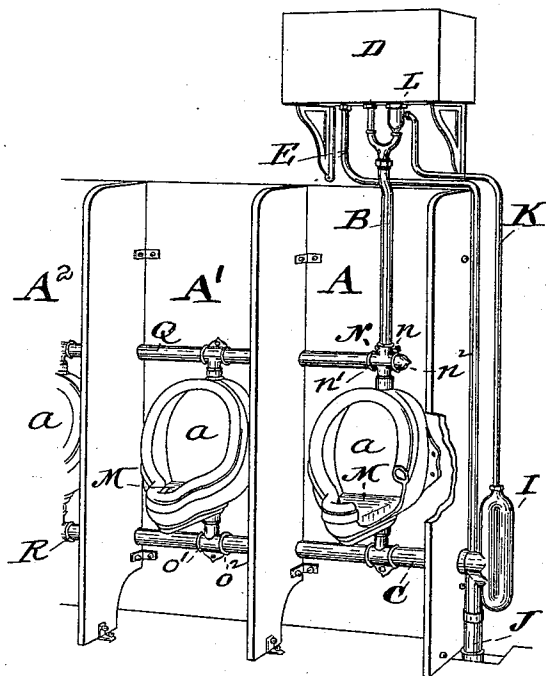


Fig. V.

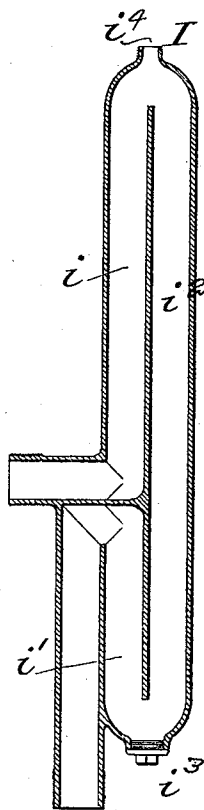


Fig. III.

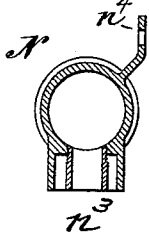
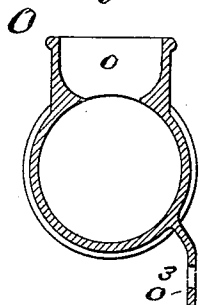
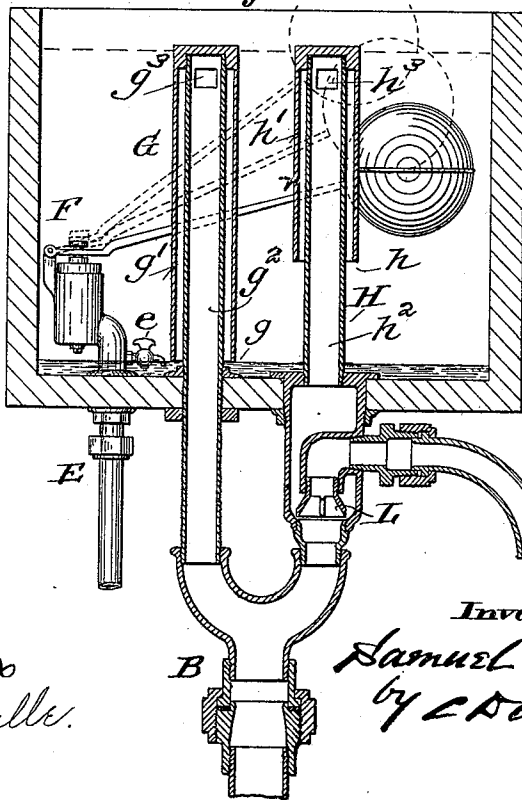


Fig. IV.



D *Fig. II.*



Attest:
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A. Bonville.

Inventor:
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by C. D. Moody
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(No Model.)

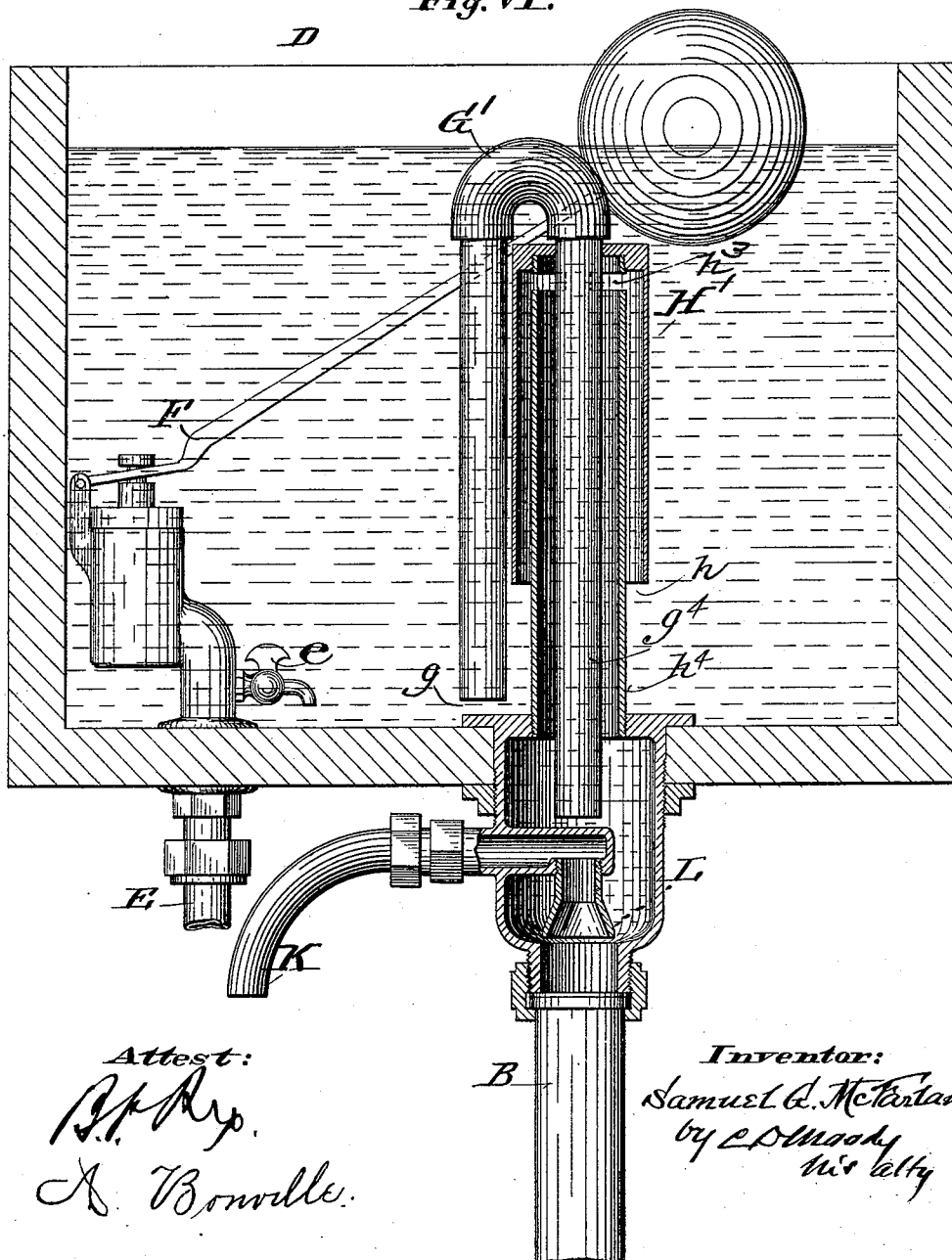
2 Sheets—Sheet 2.

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Fig. VI.



UNITED STATES PATENT OFFICE.

SAMUEL G. MCFARLAND, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE N. O. NELSON MANUFACTURING COMPANY, OF SAME PLACE.

URINAL OR WATER-CLOSET.

SPECIFICATION forming part of Letters Patent No. 460,485, dated September 29, 1891.

Application filed August 9, 1890. Serial No. 361,561. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL G. MCFARLAND, of St. Louis, Missouri, have made a new and useful Improvement in Urinals and Water-Closets, of which the following is a full, clear, and exact description.

The invention is principally an improved means for flushing urinals, water-closets, and other constructions, and maintaining a water-supply therein; and it relates partly to the provision for delivering the water to the bowl of the construction, partly to the provision for exhausting it therefrom, partly to the means for maintaining the water in the bowl, and partly to other features of the construction, all substantially as is hereinafter set forth and claimed, aided by the annexed drawings, making part of this specification, and showing its application to a urinal and exhibiting a desirable mode of carrying out the improvement, and of which—

Figure I is a view in perspective showing a construction, such as a series of urinal-stalls, and having the improvement embodied therein. Portions of the construction are broken away. Fig. II is a vertical section of the tank and parts more immediately therewith connected; Fig. III, a detail, being a vertical section of the pipe fitting at the top of a urinal-bowl; Fig. V, a detail, being a vertical section of the pipe fitting at the bottom of the urinal-bowl; Fig. IV, a vertical section of the trap; and Fig. VI, a vertical section of the tank analogous to that of Fig. II, but showing a modification of the siphon construction.

The views are not all upon the same scale.

The same letters of reference denote the same parts.

The urinal or urinals A A', saving as they are modified or supplemented by the improvement under consideration, are of the usual form, and, in fact, owing to a feature (the improved trap) of the invention, the ordinary urinal-bowl now upon the market can be and preferably is employed in carrying out the improvement. The water is supplied to the bowl through the pipe B, and the contents of the bowl are discharged through the pipe C. The water is delivered to the pipe B from a tank D above the bowl, substantially as shown.

The water is fed into the tank through the pipe E, the inflow being regulated by the small cock *e* and the ball-valve F. The outflow from the tank is through the siphons G and H, Fig. II, and into the pipe B. The bowl-discharge pipe C leads to a trap I, and after passing through the trap the bowl contents are discharged into any suitable escape-pipe J. The trap is a double one, having an upper trap *i*, a lower trap *i'*, and an intervening air-chamber *i''*. An air-pipe K leads from the chamber *i''* to an ejector L, which is arranged between the siphon H and the pipe B substantially as shown. The upper end of the trap *i* is at the level at which it is desired to have the water M stand in the bowl or bowls *a*.

The operation is as follows: The water flows constantly into the tank through the cock *e*. This cock can be opened more or less to enable the water to flow faster or slower, according to the length of the intervals it is desired should occur between the flushings of the urinal-bowl. The water continues to flow until it has risen in the tank sufficiently to lift the ball-valve F. The water now enters the tank at a more rapid rate as it enters past the valve F, as well as through the cock *e*. The rise continues until the water reaches the level of the tops of the siphons G and H, whereupon the water is siphoned out of the tank and delivered ultimately into the bowl *a*—that is, the water discharged through the siphon H flows past the ejector L and thence into the pipe B. The water discharged through the siphon G flows into the pipe B at a point therein below the ejector, and the two currents then flow together into the bowl. The current flowing past the ejector causes that part to exhaust the air from the chamber *i''*, whereupon the contents of the bowl are withdrawn therefrom and discharged *via* the pipe C, trap I, and pipe J. The ejector continues to thus act and the bowl contents to be discharged until the water falls in the tank to the level of the inlet *h* to the ascending leg *h'* of the siphon H, whereupon that siphon is "broken" and the ejector ceases to act. The inlet *g* to the ascending leg *g'* of the siphon G is at a lower level than is the inlet *h*. The siphon G there-

fore continues to act, and the water of the tank is thereby delivered into the pipe B and bowl *a*, and the bowl is thereby refilled again with water. This refilling continues until the water in the tank has fallen to the level of the inlet *g*, whereupon the siphon G is also broken and the flow of water into the bowl is arrested. The tank, by means of the water flowing past the cock *e*, now begins to be refilled again, and the operation is repeated, and it continues to be repeated, as stated, at intervals, whose length is determined by the rate of the inflow through the cock *e*. The devices for admitting the water into the tank—namely, the valve F and the cock *e*—are in themselves of ordinary construction. Either siphon G or H also of itself is of a familiar form; but the two siphons in combination for the purpose of emptying the urinal-bowl and then refilling it substantially as described is considered novel, and especially so in connection with the tank-inlet valves. The preferable form and relative arrangement of the siphons are shown in Fig. II. The ascending leg *g'* of the siphon G surrounds the descending leg *g''* thereof, and the two legs are connected by means of the opening *g''*. The ascending leg *h'* of the siphon H similarly surrounds the descending leg *h''* thereof, and the water flows from the leg *h'* to the leg *h''* through the opening *h''*. The openings *g''h''* are at the upper ends, respectively, of the siphons. The siphons are arranged side by side, and they are preferably of the same height. A different relative arrangement, however, can be employed, and in height it is possible for the siphons to vary somewhat. In all cases the water should be supplied to the tank in sufficient quantity and sufficiently fast to enable both siphons to act in the manner described—that is, the water-supply should suffice to fill the siphons to cause them to act, and then the siphons in turn, when started, should suffice to discharge the water from the tank, so as to effect the seating of the ball-valve.

The trap is another feature of the construction. Unlike many water-closet traps, and also unlike some urinal-traps, it is not embodied in the bowl *a*, but is distinct therefrom. This not only enables the ordinary urinal-bowl of commerce to be used, but it also enables one trap to suffice for a series of urinals, such as shown at A A' A², &c., Fig. I. The particular form of trap here shown and preferably used is a minor feature—single casting extending directly upward and downward and so as to be quite narrow in proportion to its height, thereby providing a trap which occupies but little room comparatively alongside the urinal. It has an opening *v''* at its lower end for cleaning purposes, and at its upper end an opening *v'* to connect the trap with the air-pipe.

Another minor feature is the fittings N O used at the top and bottom, respectively, of each bowl *a*, and thereby making it practica-

ble to dispense with more expensive constructions—such as lead pipe-joints—and to use straight pipes—such as the pipes Q R, &c.—in connecting the various parts of the construction. The fitting N is a cross having an upper branch *n*, two side branches *n'* *n''*, and also a lower branch *n'''*, whose shell is annular, as shown, to connect with the customary neck at the top of the bowl *a*. The fitting is also provided with an ear *n⁴* to enable the fitting to be attached to the wall of the urinal-stall, as shown, and thus uphold or assist in upholding the parts connected with the fitting. The fitting O has three branches: the branch *o*, to connect the fitting with the outlet from the bowl *a*, and the side branches *o'* *o''*, to connect with the pipes, as shown. It also has an ear *o'''* to enable the fitting to be secured to the wall, as shown.

The modification of the siphon construction shown in Fig. VI is as follows: In the place of having the siphons detached from each other the descending leg *g⁴* of the siphon G' is arranged within the descending leg *h⁴* of the siphon H'. The inlets to said siphons are respectively at different levels, as before described; but the outlets from the siphons may be in common substantially as shown—that is, the outlet from the leg *g⁴* need not connect with the pipe B below the ejector, but may be arranged as shown.

The present improvement can be applied to water-closets and other constructions. A feature of the construction is the co-operation of the two siphons. Either siphon acts upon the other. A working of the one induces action in the other. This is notably the fact in the arrangement shown in Fig. VI, in which the top of the siphon G chances to be above the level of the siphon H.

I claim—

1. A tank having two siphons for discharging the water therefrom, the inlets to said siphons being, respectively, at different levels, the outlets, respectively, of said siphons being separate from each other, one of said outlets leading to an ejector and thence to a discharge-pipe and the other of said outlets leading to said discharge-pipe at a point therein below said ejector, substantially as described.

2. A tank having means, substantially as described, for supplying a smaller amount of water constantly thereto and a larger amount of water at intervals thereto and also having two siphons for discharging the water from said tank, the inlets to said siphons being, respectively, at different levels, the outlets, respectively, of said siphons being separate from each other, one of said outlets leading to an ejector and thence to a discharge-pipe and the other of said outlets leading to said discharge-pipe at a point therein below said ejector, substantially as described.

SAMUEL G. MCFARLAND.

Witnesses:

C. D. MOODY,
J. VOSBURGH.