2 Sheets—Sheet 1.

J. SARGENT.

Traps for Water-Closets, &c.

No. 199,582. Patented Jan. 22, 1878.

Fig. 1.

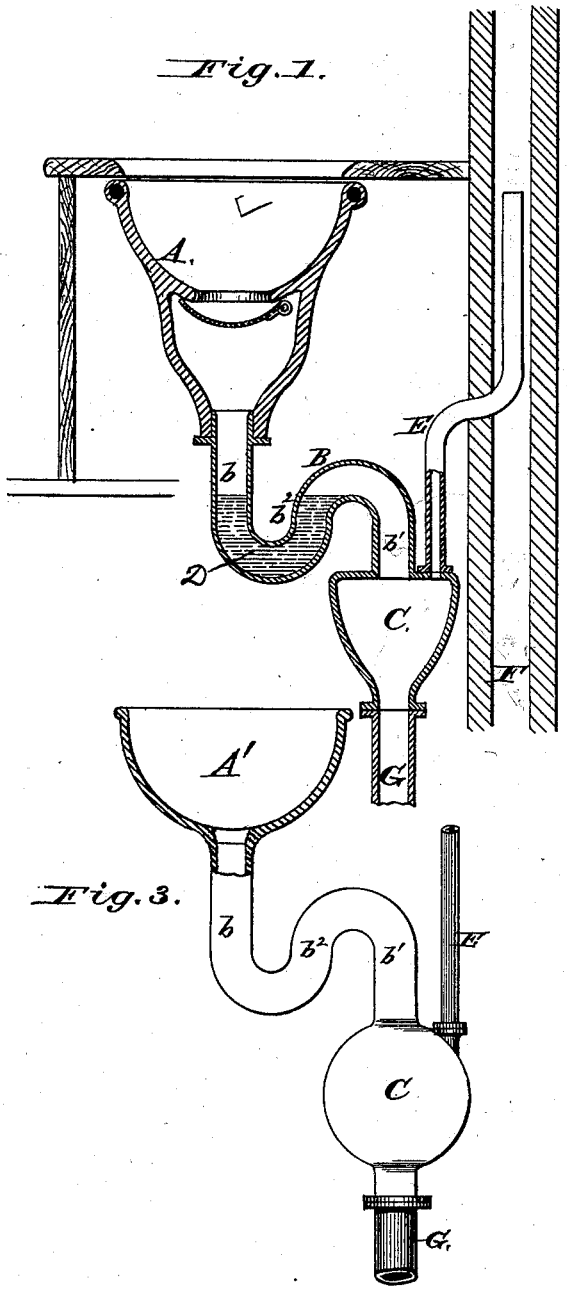


Fig. 2.

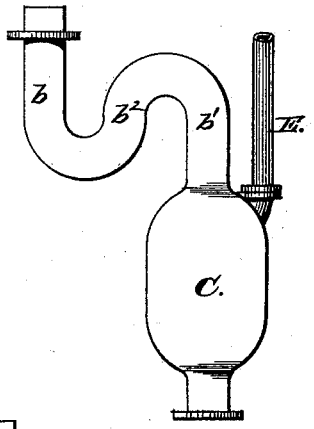
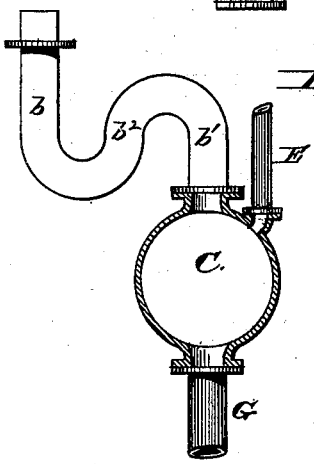


Fig. 3.

Fig. 4.



Attest:
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James Sargent.
Inventor.
By. James L. Norris.
Atty.

2 Sheets—Sheet 2.

J. SARGENT.

Traps for Water-Closets, &c.

No. 199,582. **Patented Jan. 22, 1878.**

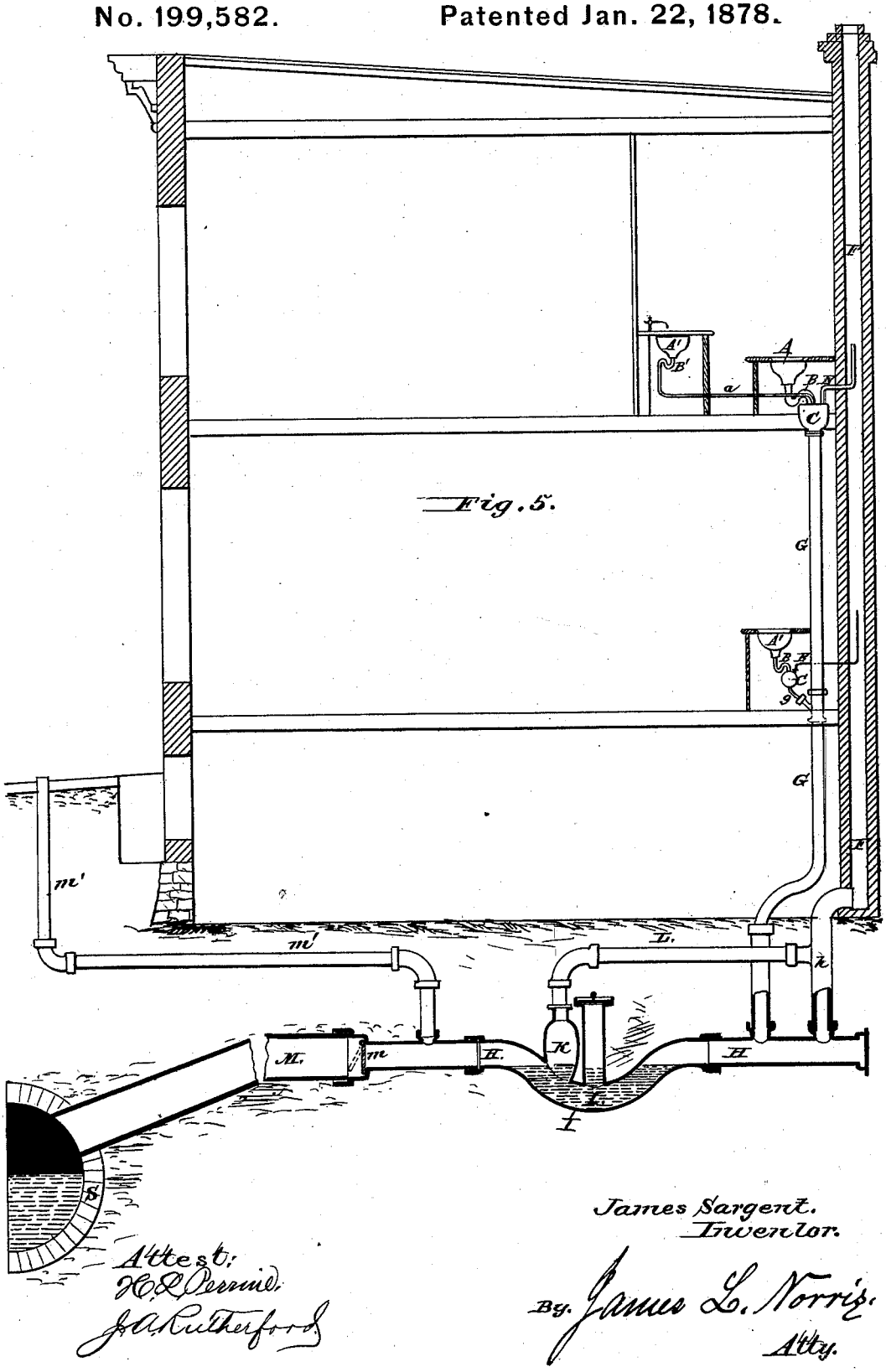

Fig. 5.

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UNITED STATES PATENT OFFICE.

JAMES SARGENT, OF ROCHESTER, NEW YORK.

IMPROVEMENT IN TRAPS FOR WATER-CLOSETS, &c.

Specification forming part of Letters Patent No. **199,582**, dated January 22, 1878; application filed December 31, 1877.

To all whom it may concern:

Be it known that I, JAMES SARGENT, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Traps for Water-Closets, Urinals, Sinks, &c., and mode of ventilating the same, of which the following is a specification:

My invention relates to that class of drain-traps known as the "siphon-trap or water-seal;" and its object is to prevent the water from being drawn from the seal by siphonic action, as is now frequently the case when the pipe is flushed and the seal becomes overbalanced by water closely filling the trap and drain-pipe below or beyond it for a distance greater than the length of the intermediate limb or the seal of said trap. When this occurs the water of the seal is so reduced below its effective level as to allow a free passage of air through the trap, and poisonous gases and foul air rising from the sewers are permitted to escape into the house through the traps and basins, and the atmosphere within the house becomes contaminated thereby, and engenders disease among the occupants.

The accomplishment of the immediate object of my invention has for its effect the entire abatement of this evil attending the use of the old forms of trap in connection with the drain or waste pipe leading from dwelling-houses to sewers.

To this end my improvement consists, first, in the combination, with a siphon-trap or water-seal of a drain or waste pipe, of an enlarged chamber or swell formed in said pipe downward, beyond the seal thereof, and an air-ventilating pipe or passage leading from said chamber or swell; second, in the combination, with the said trap and enlarged chamber or swell, of a ventilating-pipe and a flue or wall ventilating-passage, with which said air-pipe is connected, whereby the sewer-gases are carried off from the drain or waste pipe, and a constant supply of air furnished thereto; third, in a new article of manufacture consisting of a siphon-trap or water-seal combined with an enlarged chamber or swell, arranged at or near the eduction-terminal thereof, and adapted for connection to a ventilating-pipe, whereby said chamber or swell may be constantly supplied with air.

In the accompanying drawings, Figure 1, Sheet 1, represents a vertical section of a water-closet provided with my improved trap. Figs. 2 and 3 show modifications of the enlarged portion or swell of the drain or waste pipe; and Fig. 4 is a view, partially in elevation and partially in section, of Fig. 3. Fig. 5, Sheet 2, represents a vertical section of a dwelling-house, on the upper floor of which is shown a water-closet, and on the second floor a wash-basin; or they may be both on the same floor, and empty into the same trap or swell, as shown on the second floor in Fig. 5, A′ designating the wash-basin, connected above the swell C by pipe *a*, and A indicating the water-closet basin, connected as before explained.

On the first floor is a wash-basin only, the trap and swell of which are connected to the pipe G by a short connection, *g*, provided with my improved trap, and showing the chamber-drain or waste-pipe connected to a main house-pipe leading from the cellar to a sewer.

The letter A designates the basin or pan of a water-closet, which opens directly downward into the upright limb *b* of a siphon-trap, B, the downward opening, limb b^1 of which is enlarged into a chamber or swell, C, the top of which is near the level of the bottom of the seal D, which is formed by the water which stands in the lower parts and junction of the upright limb *b* and the intermediate limb b^2 of the trap. From the top or upper portion of the chamber or swell C a ventilating-pipe, E, leads into a flue, F, a wall ventilating-passage, or to the outer air, and allows the escape of foul air and sewer emanations from the drain or waste pipe G below the seal and trap, through which, consequently, they will not be forced by an accumulated sewer-pressure; and, furthermore, said ventilating-pipe E keeps the drain or waste pipe and chamber or swell C constantly supplied with air below the trap, so that light gases and foul air will not escape through the seal and create a vacuum or partial vacuum in the drain or waste pipe, into which the water of the seal would be forced by

the excess of pressure of the atmosphere upon the surface of the water in the upright limb *b* of the trap.

In the construction of these traps heretofore the downward-opening limb thereof has been of equal diameter and capacity, or nearly so, with the drain or waste pipe with which connected, and when the basin has been well flushed the overflow of the seal has accumulated in the downward-extending arm of the trap, and the connected drain or waste-pipe, to such an extent as to create a siphonic action of the water-passages, which drew the water from the seal, according to the well-known law of siphons, and permitted the escape through the traps of noxious sewer-gases and infected air, which, entering the house through the said traps and basins, spread disease among the inmates. Particularly has this been the case with those traps containing a considerable quantity of water, which is replaced by an equal quantity each time the basin is used in a water-closet, or a wash-basin full of water is discharged.

By enlarging the drain or waste pipe, or the terminal of the trap, so as to form the chamber or swell C, I provide a discharge for the downward-opening or eduction limb b^1 of the trap at or nearly on a level with the bottom of said trap and its seal, so that a column of water of sufficient length to overbalance the seal cannot accumulate in the said downward-opening limb of the trap, and consequently no siphonic action will occur to impair the efficiency of the seal, as will be readily understood from a knowledge of siphonic action.

My improvement is equally adapted to all kinds of sewer-connections or waste-pipes ordinarily leading from a dwelling-house or other buildings, such as the waste-pipes of a water-closet, wash-basin, sink, hydrant, &c.

I preferably form the siphon-trap and enlarged chamber or swell and the basin or pan in one piece, either of cast-iron, lead, or other metal, or of porcelain or other earthenware, and said trap and enlarged chamber or swell may be attached to and formed in one piece with the water-closet, pan, or wash-basin, if found desirable, or made in separate pieces; but in applying my improvement to traps and drains or waste-pipes already in use, I cut away a sufficient length of the drain or waste pipe at the end of the eduction-limb of the trap, and at or near the level of the bottom of said trap, and connect therewith an enlarged chamber or swell for the drain or waste pipe, which has been separately formed, as shown in Fig. 4, the lower part of which chamber or swell is connected to the drain or waste pipe G.

In Fig. 5, Sheet 2, the vertical drain or waste pipe G is shown extending downward below the floor of the cellar, and connected with a main, house-drain, or waste-pipe, H, from which a ventilating-pipe, *h*, leads to the flue F. The drain or waste-pipe H, beyond the point of connection of the vertical waste-pipe G, is provided with a trap, I, near the outer terminal of which an enlarged chamber, K, is formed, from the top or side of which a ventilating-pipe, L, leads to the pipe *h*, or may lead direct to the flue F or other ventilator, or to the open air. Beyond the trap I the pipe H is provided with a valve or gate, *m*, pivoted or hinged to the top of said pipe, and opening outwardly into a larger pipe, M, which leads to the sewer S. Drainage flowing from the house through the pipe H forces open and flows by or through the valve or gate *m;* but backwater from the sewer will force inward and shut said valve or gate against the end edge of the pipe H, where it is pivoted or hinged, effectually closing said pipe, and thereby preventing the influx of backwater into the cellar of the house. Moreover, when this gate is hanging in its natural position, and not forced outward by drainage, it will close the pipe H so as to prevent the escape of sewer-gases into the cellar through any pipes which may lead thereto. Between the gate *m* and chamber or bulb K a ventilating-pipe, *m'*, is connected to pipe H, and leads outward and upward, terminating a short distance above the surface of the ground, the purpose of said pipe being to supply fresh air to the pipe H and its connecting waste or drain pipes leading from the water-closets, wash-basins, &c., of the house.

It is not material what shape is given to the chamber or swell C, either when formed separately or in one piece with the trap, but it must have a diameter greater than that of the trap, and I prefer to have it about two or three times the diameter of the trap and drain or waste pipe, respectively, and of an inner capacity greater than that of the seal.

I have shown in Fig. 1 the siphon-trap and chamber or swell C made together and in one piece, but the action of my improvement is quite as efficient when the chamber or swell C is separately formed and attached with perfect joints intermediately of the ordinary siphon-trap and drain or waste pipe.

Fig. 3 shows the basin, trap, and swell C, formed in one piece, the material being either metal or earthenware.

What I claim is—

1. The combination, with a drain or waste pipe and siphon-trap, of an enlarged chamber or swell, connected to or formed in one piece with the eduction end of said trap, and an air-supply pipe or passage leading from said chamber or swell, substantially as described, whereby siphoning of the trap of a water-closet, urinal, wash-basin, or sink is prevented, and sewer-gases and foul air are excluded from passing through said traps.

2. The combination, with a water-trap or seal, of an enlarged chamber or swell connected to the eduction end of said trap, a

ventilating-pipe leading from the said chamber or swell to the open air, and a flue or wall ventilating-passage, substantially as set forth.

3. The improved water-trap or seal herein described, consisting of the tubular limbs b b^1 b^2 of the reversely-bent pipe B, and the enlarged chamber or swell C, formed in one piece therewith, and adapted for connection to a ventilating-pipe, substantially as described and for the purpose set forth.

4. As a new article of manufacture, a combined wash or water-closet basin, trap, and ventilating swell, formed near the lower terminal of said trap, and adapted for connection with a ventilating-pipe, the whole formed in one piece of metal, earthenware, or other suitable material, substantially as set forth.

5. The combination of the trap I, swell K, gate m, and the intermediate ventilating-pipe m', substantially as described, whereby sewer emanations are excluded from and pure air admitted to the house-pipe H and connecting waste-pipes.

6. The combination of the water-closet basin A and wash-basin A′, each provided with a top, B, and connecting with a common waste-pipe, G, above the swell C, whereby one ventilated swell, as hereinbefore described, may serve for two basins.

In testimony that I claim the foregoing I have hereunto set my hand.

JAMES SARGENT.

Witnesses:
R. F. OSGOOD,
JACOB SPAHN.