

C. E. SHADALL.
 VENTILATING APPARATUS FOR CLOSET FIXTURES.
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1,004,917.

Patented Oct. 3, 1911.

Fig. 2.

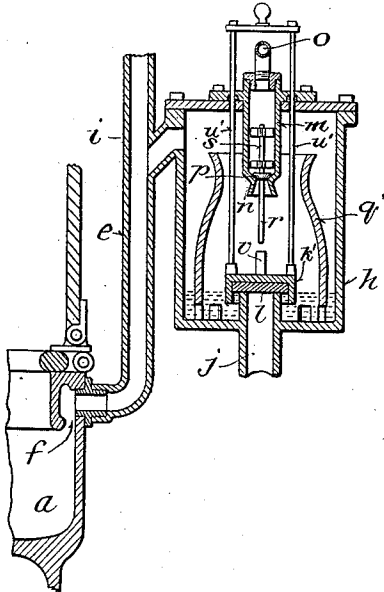
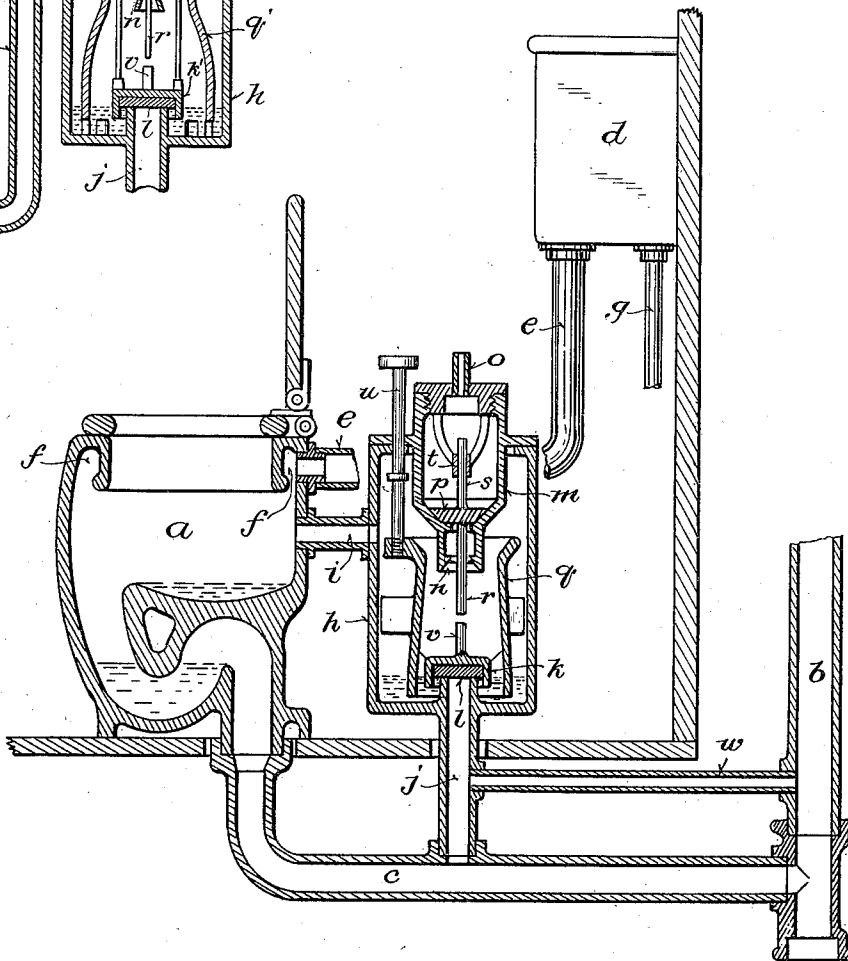


Fig. 1.



Witnesses:

Tred Palm

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UNITED STATES PATENT OFFICE.

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VENTILATING APPARATUS FOR CLOSET-FIXTURES.

1,004,917.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES E. SHADALL, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Ventilating Apparatus for Closet-Fixtures, of which the following is a specification, reference being had to the accompanying drawing, forming a part thereof.

The main object of this invention is to remove from water closet fixtures such as bowls and urinals, foul air and odors, and to prevent the same from escaping into the rooms in which such fixtures are located.

It consists in the peculiar construction, arrangement and combination of parts as hereinafter particularly described and pointed out in the claims.

In the accompanying drawing like characters designate the same or similar parts in both figures.

Figure 1 is a vertical central section and partial side elevation of one form of apparatus embodying the invention as applied to a water closet, and Fig. 2 is a similar sectional view showing a modification of the apparatus.

Referring to Fig. 1, *a* designates a water closet bowl, which may be of the well-known or any suitable form, *b* a soil or waste pipe with which the lower part of the bowl is connected in the usual manner by a discharge pipe *c*, and *d* an elevated flushing tank connected in the usual manner by a pipe *e* with an annular channel *f* surrounding the upper part of the bowl and opening on the under side into the same.

g is a water supply pipe leading into the tank *d*.

h is an aspirator or ejector casing which may be made of any suitable material. It is connected on one side by a pipe *i* with the upper part of the bowl *a* and at the bottom by a pipe *j* with the discharge pipe *c* which leads into the waste pipe *b*. The pipe *i* forms an air exhaust connection which is adapted to draw foul air and odors from the bowl *a* and even from the room in which the bowl is located. The pipe *j* extends at its upper end above the bottom of the casing *h* and is normally closed by a vertically movable cap *k* which has a depending rim

forming a water seal around the opening into said pipe when the cap is in its lower or normal position, as shown. The cap is provided inside with a gasket *l* of rubber or other suitable material, which serves as a valve to close the opening into the discharge pipe *j* in case the water seal should fail.

m is a valve case terminating at its lower end in a pressure nozzle *n* and connected by a pipe *o* with a water or other fluid pressure supply.

p is a valve seated in the case *m* and controlling the admission of the fluid pressure medium to the nozzle *n*.

q is a mixing nozzle or tube surrounding the pressure nozzle *n* and communicating at its upper end with the interior of the casing *h* so as to exhaust air therefrom and through the pipe connection *i* from the bowl *a* when a jet of water or other pressure medium issues from the nozzle *n*. In the present case the mixing nozzle or tube is formed with or attached to the cap *k* and movable vertically therewith in the inclosing casing *h*. A deflector or spreader *r* is arranged axially in the pressure nozzle *n* to deflect outwardly or spread the water or other pressure medium as it issues from said nozzle into the mixing nozzle or tube *q*, thus rendering the jet more effective in action and enabling it to entrain or draw a larger volume of air for a given volume of water. In the present case the deflector or spreader *r* is attached to the valve *p* and serves as a means for opening the same. The movement of the deflector or spreader relative to the nozzle *n* every time the valve *p* is opened, prevents dirt or sediment from collecting or lodging in the throat of the nozzle and interfering with its operation. The valve is however, guided independently of the deflector or spreader by means of an upwardly projecting stem *s*, working in a guide *t* in the valve case.

For operating the pressure valve *p* and the cap *k* with the discharge valve associated therewith, a rod *u* is shown as passing through the top of the casing *h* and attached to the mixing nozzle or tube *q*, and the cap *k* is provided with an upwardly extending stem or projection *v*, which by engagement with the deflector or spreader *r* lifts the valve *p* from its seat when the cap *k* and discharge valve are lifted to break the water

seal and open the discharge pipe. The rod *u* may be provided with a handle, as shown, or other suitable means for operating it by hand, or may be provided with any suitable connection for operating it by hand or foot or automatically from the seat of the closet.

The discharge pipe *j* of the aspirator may be connected above the discharge pipe *c* from the bowl by a vent pipe *w* with the soil or waste pipe *b*, to prevent the discharge of liquid from the bowl through the pipe *c* from affecting the liquid seal in the lower part of the aspirator casing.

The construction and arrangement of the parts of the apparatus may be varied widely to adapt it to fixtures of different kinds under varying conditions without materially affecting its principle and mode of operation.

As shown in Fig. 2, the mixing nozzle or tube *q'* which may be made of glass, porcelain or other suitable material different from that of the casing *h*, is stationary, resting at its lower end on the bottom of said casing, and the cap *k'* is made separate therefrom and connected by rods *u'* passing upwardly through the top of the casing with a handle or any suitable means for operating said cap and the pressure valve *p* either manually or automatically. When the mixing nozzle or tube is separate from the cap *k* and stationary, it may be made to serve as the casing for the aspirator, and the extra casing *h* thus dispensed with. The aspirator casing may also be made in one piece with the bowl or other fixture. The air exhaust connection, instead of being made directly with the bowl or other fixture by a pipe *i* which requires a special opening therefor, may be made as shown in Fig. 2, with the flushing pipe *e*.

In the operation of the apparatus, when the cap *k* is lifted, breaking the water seal and opening the discharge pipe *j* and the valve *p* is opened, water under pressure from the supply pipe *o*, or other pressure medium such as steam or air taken from any convenient source, is admitted to the nozzle *n*, and issuing therefrom in a jet which is spread or deflected outwardly in all directions by the deflector or spreader *r*, draws foul air and offensive odors from the bowl or other fixture and forces them with the water or other pressure medium through the mixing nozzle or tube *q* or *q'* into the discharge pipe *j*, from which they escape into the soil or waste pipe *b*, the water, when water or steam is employed to operate the aspirator, escaping through the soil or waste pipe below the discharge connection therewith, and the air escaping through said pipe or the vent pipe *w*, above said connection.

Closing communication between the soil or waste pipe *b* and the air exhaust connection with the bowl or other fixture by a water seal or valve, as shown, when the as-

pirator is not in operation, avoids the possibility of sewer gas escaping through said connection into the room, and at the same time avoids obstruction or resistance to the discharge of the aspirator when it is in operation, the water seal being broken or the discharge valve opened.

Various modifications in the details of construction and arrangement of parts of the apparatus other than those specifically shown and mentioned may be made without departing from the principle and scope of the invention.

I claim:

1. The combination of a casing having an air inlet and a discharge connection, a nozzle having a valve controlled fluid pressure supply connection, and a movable deflector adapted to spread the jet of fluid issuing therefrom.

2. The combination of a mixing tube having an air inlet at one end thereof and a discharge connection at the other end thereof, a nozzle directed axially through said tube and having a valve controlled fluid pressure supply connection, a movable deflector arranged to spread the jet of fluid issuing from said nozzle, and a valve for closing communication between said air inlet and said discharge connection.

3. The combination of a mixing tube having an air inlet and a discharge connection, a nozzle directed axially through said tube and having a fluid pressure supply connection, a valve controlling said supply connection, a liquid seal normally closing said discharge connection, and means for operating said valve and breaking and restoring said liquid seal.

4. In ventilating apparatus for closet fixtures, an aspirator casing having an air inlet and a discharge connection extending upwardly into the lower part of said casing, a nozzle having a valve controlled fluid pressure supply connection, a vertically movable cap having a depending rim adapted to form a liquid seal around the opening into said discharge connection, and means for moving said cap to break and restore the liquid seal.

5. In ventilating apparatus for closet fixtures, an aspirator having an air inlet and a discharge connection extending upwardly into the lower part thereof, a nozzle having a fluid pressure supply connection, a vertically movable cap having a depending rim adapted to form a liquid seal around the opening into said discharge connection, a valve controlling said fluid pressure supply connection and adapted to be opened by the lifting of said cap, and means for raising and lowering said cap to open and close said discharge connection.

6. In ventilating apparatus for closet fixtures, an aspirator having an air inlet and

a discharge connection extending upwardly into the lower part thereof, a nozzle having a fluid pressure supply connection, a vertically movable cap normally seated upon and closing said discharge connection and having a depending rim forming a liquid seal around the discharge opening, and means for raising and lowering said cap to open and close the discharge connection and to break and restore said liquid seal. 10

In witness whereof I hereto affix my signature in presence of two witnesses.

CHARLES E. SHADALL.

Witnesses:

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