

No. 613,516.

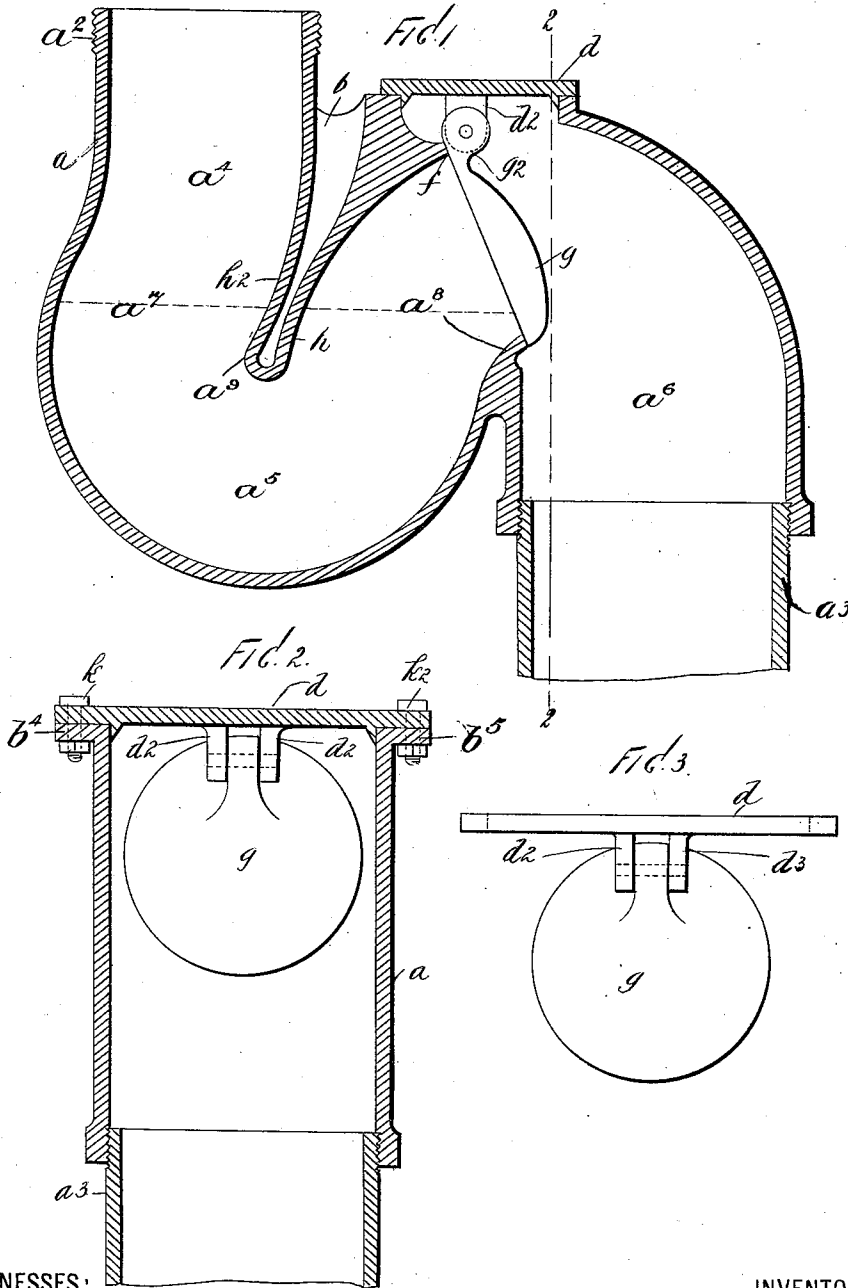
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J. D. JAMES.

TRAP.

(Application filed Sept. 9, 1897.)

(Model.)



WITNESSES:

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TRAP.

SPECIFICATION forming part of Letters Patent No. 613,516, dated November 1, 1898.

Application filed September 9, 1897. Serial No. 651,135. (Model.)

To all whom it may concern:

Be it known that I, JOSEPH D. JAMES, a citizen of the United States, residing at New York, (Brooklyn,) in the county of Kings and State of New York, have invented certain new and useful Improvements in Traps, of which the following is a full and complete specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to a trap, and has for its object the production of a device of this class which will automatically exclude obnoxious gases and the influx of backwater due to a back-up of the sewer, while admitting of the ready escape of waste water from the plumbing system in the house.

A further object of the invention is to provide a trap which is so constructed as to render a vent-pipe unnecessary and which will be simple in construction, efficient in operation, and which will be so arranged as to be susceptible of a thorough cleansing or flushing without the breaking of joints in the pipes or the necessity for removing a quantity of stationary or stagnant water.

The invention consists in the novel features of construction hereinafter set forth and described, and more particularly pointed out in the claims hereto appended.

Referring to the accompanying drawings, which form a part of this specification, Figure 1 is a sectional elevation of my improved trap; Fig. 2, a section on the line 2 2 of Fig. 1, and Fig. 3 shows a detachable cap with the gravity-valve attached thereto out of the proper relation to the trap.

Like letters refer to like parts throughout the several views.

In the accompanying drawings, *a* denotes an S-shaped pipe or seal, which is designed to be attached to a waste-pipe by means of a screw-thread *a*² and to a sewer-pipe *a*³. This S-shaped pipe or seal is preferably made of one integral casting and is composed of a vertical or upwardly-directed inlet portion *a*⁴, a downwardly-directed loop-shaped portion *a*⁵, which forms the seal proper, and a downwardly-directed or vertically-arranged portion *a*⁶, which constitutes the outlet of the seal and with which the pipe *a*³ is connected.

Theseal portion *a*⁵ comprises a downwardly

and outwardly curved leg *a*⁷, which is a continuation of the inlet *a*⁴, and an upwardly and outwardly directed leg *a*⁸, between which and the outlet *a*⁶ is an annular valve-seat *f*, said valve-seat being arranged at the point where the outlet-leg *a*⁸ of the trap proper communicates with the outlet *a*⁶, and said valve-seat being also set at a slight inclination to a vertical line, the inclination being in the direction of the inlet-pipe *a*⁴.

The trap is provided directly over the valve-seat *f* with an opening, which is provided with a detachable cover *d*, said cover being provided on its lower side with lugs *d*² and *d*³, and hinged to said lugs is a weighted gravity-valve *g*, provided with a lug *g*², and the said gravity-valve is normally seated on the valve-seat *f*, and in the operation of the device the water is held by said valve within the trap *a*⁵ and in the legs *a*⁷ and *a*⁸ thereof, above the lower portion of the circular valve-seat *f*, which constitutes the outlet of the trap proper. It will also be seen that the central downwardly-directed loop-shaped walls *a*⁹ of the trap proper extend below the lower portion of the valve-seat and valve, and in practice said downwardly-directed parts or walls are constantly immersed in the water which forms the seal.

That portion of the trap with which the cover *d* is connected is provided at its opposite sides with flanges *b*⁴ and *b*⁵, and the said cover *d* is connected therewith by bolts *k* and *k*², and said cover and the valve *g*, connected therewith or hinged thereto, may be removed or detached from the trap whenever desired. That portion of the trap *a*⁵ which forms the outlet and with which the pipe *a*³ is connected is larger than the outlet-leg *a*⁸ of the trap and also larger in cross-section than the valve seat or opening *f*, the object of this construction being to provide means whereby the trap may be flushed with a full head of water, after the cover *d* is removed, without producing an overflow through the opening, which is normally closed by said cover.

In the operation of the trap or in the operation of flushing the same under ordinary conditions when the trap is in use the water flows into the trap through the inlet part *a*⁴ and rises in the trap or in both legs thereof until the pressure in the trap is sufficient to

raise the valve *g*, when the water immediately drops or falls vertically through the outlet portion *a*⁶ of the trap into and through the pipe *a*³.

5 It will be seen that by reason of the location of the valve *g* and valve-seat the flow of the water after it passes the valve-opening of the outlet-leg of the trap is vertical, and by means of this construction the valve-seat and
10 valve are kept clean at all times, the force of the water being sufficient to accomplish this result.

In the normal position of the trap or the parts thereof, or when the trap is not being
15 flushed, the water rises in the seal and in both legs thereof to a level considerably above the lower side of the valve-opening, and the water is held in the seal by the valve, which is weighted for this purpose, and the
20 valve at all times serves to prevent any back-flow into the seal from the sewer-pipe either of sewer waters or gases. It is also evident that if at any time the trap should need cleaning the cover *d* and valve may be easily re-
25 moved for this purpose, and, as hereinbefore stated, by reason of the peculiar form of the trap and the fact that the outlet part *a*⁶ is larger than the valve-opening the trap may, after the cover *d* has been removed, be flushed
30 with a full head of water, and said water will not overflow through the opening, which is normally closed by the cover *d*.

It is a well-known fact that in traps of this class as heretofore constructed the water is
35 sometimes siphoned out of the trap after the flow through the supply-pipe has been cut off, and this renders the trap absolutely useless, the gases from the sewer being free to pass therethrough. In my improved construction, however, the depth of the trap portion *a*⁵ is such that after the flow of water
40 through the inlet-pipe is cut off there is always enough water left in the outlet-leg *a*⁸ to complete the seal after the valve *g* falls to its seat, and the danger of siphoning out the water of the seal is thus completely obviated, and as another result of this construction I avoid the use of a vent-pipe for the trap, which has heretofore been an expensive and cum-
45 bersome connection of traps of this class. It will also be seen that in my improved trap the inlet-leg of the seal, with which the inlet-pipe is adapted to be connected, is curved inwardly toward the vertical center of the seal,
50 and both the inlet and outlet openings being arranged substantially in vertical and parallel lines the trap may thus be connected with inlet and outlet pipes which are very close together, and my improved trap is thus particularly adapted for use in narrow or con-
55 tracted spaces, which feature renders it particularly applicable to the basins of water-closets, for which it is primarily designed.

My improved trap is simple in construction
60 and operation and perfectly adapted to accomplish the result for which it is intended, and is also comparatively inexpensive.

Having fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The herein-described trap, comprising a jointless **S**-shaped pipe formed in a single piece and embodying an upwardly-directed inlet, a downwardly-curved water-seal portion and a downwardly-directed outlet, an interior integral circular valve-seat at the point where the water-seal portion communicates with the outlet, and forming a valve-opening, said valve-seat being slightly inclined upwardly and in the direction of the inlet portion, the direction of the water after it leaves the valve-opening being vertically downward, said trap being also provided directly over the valve-seat with an opening, and a plate by which said opening is closed, and a gravity-valve hinged to the under side of said plate and adapted to be seated on the valve-seat, whereby the communication between the water-seal portion and the outlet is closed, the bottom of the middle wall of the seal being extended downwardly below the bottom of said valve-opening and below the bottom of the lower side of said valve, and the weight of said valve being such that it will maintain the water seal at its normal level above the lower edge of the valve-opening and resist the pressure of the water which normally bears against the lower side of said valve, and said valve being removable with the plate to which it is hinged, substantially as shown and described.

2. The herein-described trap, comprising a jointless **S**-shaped pipe formed in a single piece and embodying an upwardly-directed inlet, a downwardly-curved water-seal portion and a downwardly-directed outlet, an interior integral circular valve-seat at the point where the water-seal portion communicates with the outlet, and forming a valve-opening, said valve-seat being slightly inclined upwardly and in the direction of the inlet portion, the direction of the water after it leaves the valve-opening being vertically downward, said trap being also provided directly over the valve-seat with an opening, and a plate by which said opening is closed, and a gravity-valve hinged to the under side of said plate and adapted to be seated on the valve-seat, whereby the communication between the water-seal portion and the outlet is closed, the bottom of the middle wall of the seal being extended downwardly below the bottom of said valve-opening and below the bottom of the lower side of said valve, and the weight of said valve being such that it will maintain the water seal at its normal level above the lower edge of the valve-opening and resist the pressure of the water which normally bears against the lower side of said valve, and said valve being removable with the plate to which it is hinged, and the downwardly-directed outlet portion of the trap which incloses the valve and valve-seat being larger in cross-section than the valve-opening, substantially as shown and described.

3. The herein-described trap, comprising a jointless **S**-shaped pipe formed in a single piece and embodying an upwardly-directed inlet portion, a downwardly-curved water-seal portion, and a vertically and downwardly directed outlet, the water-seal portion being between the inlet and outlet, and the upper end of the inlet portion being curved inwardly over the water-seal portion, said trap being provided with an interior integral circular valve-seat at the point where the water-seal portion communicates with the outlet, and forming a valve-opening, said valve-seat being slightly inclined upwardly and in the direction of the inlet portion, said trap being also provided directly over the valve-seat with an opening, and a plate by which said opening is closed, and a gravity-valve hinged to the under side of said plate and adapted to be seated on the valve-seat, whereby the communication between the water-seal portion and the outlet portion is closed, the water-seal portion of the trap being extended downwardly below said valve-opening, and the middle wall of the seal being also extended downwardly below the bottom of said valve-opening, and the weight of said valve being such that it will maintain the water seal at its normal level above the lower edge of the valve-opening, and resist the pressure of the water which normally bears against the lower side of said valve, and said valve being removable with the plate to which it is hinged, the form of the outlet and the relation thereof to the valve-opening being such that the water falls vertically through said outlet after passing through said valve-opening, substantially as shown and described.

4. An integral **S**-shaped trap comprising an upwardly-directed inlet portion, a vertical and downwardly-directed outlet portion and an intermediate downwardly-curved water-

seal portion, said trap being provided at the highest point of the communication between the seal and outlet portions with an annular or circular valve-seat arranged transversely of said communication, and the bottom of which is directly over the inner wall of the outlet portion, and an opening formed over said valve-seat, a detachable plate for closing said opening, and a valve hinged to the bottom of said plate so as to rest on said valve-seat and close the valve-opening formed thereby when the water rises in the seal above the bottom of said valve-opening substantially as shown and described.

5. An integral **S**-shaped trap comprising an upwardly-directed inlet portion, a vertical and downwardly-directed outlet portion and an intermediate downwardly-curved water-seal portion, said trap being provided at the highest point of communication between the seal and outlet portions with an annular or circular valve-seat arranged transversely of said communication, and the bottom of which is directly over the inner wall of the outlet portion, and an opening formed over said valve-seat, a detachable plate for closing said opening, and a valve hinged to the bottom of said plate so as to rest on said valve-seat and close the valve-opening formed thereby when the water rises in the seal above the bottom of said valve-opening and the outlet portion being larger in cross-section than the seal portion and valve-opening, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of the subscribing witnesses, this 1st day of September, 1897.

JOSEPH D. JAMES.

Witnesses:

C. GERST,

A. C. VAN BLARCOM.