

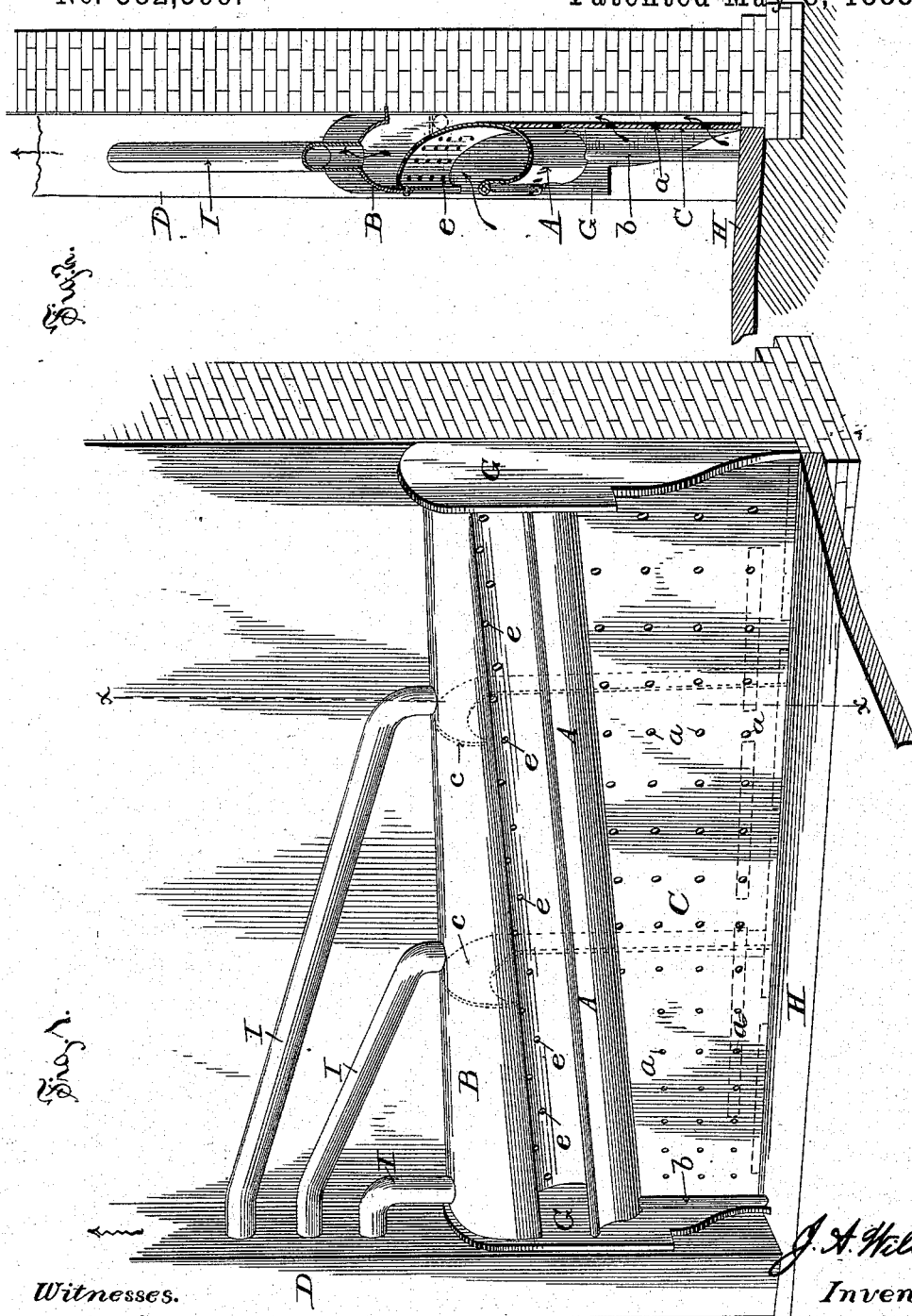
(No Model.)

J. A. WILLS.

URINAL.

No. 382,399.

Patented May 8, 1888.



Witnesses.

*J. Coleman.*  
*James F. Duhamel.*

*J. A. Wills.*  
Inventor.

*by Dodge & Sons,*

*Attys*

# UNITED STATES PATENT OFFICE.

JAMES A. WILLS, OF PHILADELPHIA, PENNSYLVANIA.

## URINAL.

SPECIFICATION forming part of Letters Patent No. 382,399, dated May 8, 1888.

Application filed September 14, 1887. Serial No. 249,671. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES A. WILLS, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Urinals, of which the following is a specification.

This invention relates to that class of urinals which are designed more especially for use in connection with what is known as the "Smead Dry Closet," and in which no water is to be used, though it may be used independently of any style of closet; and the invention consists, first, in a trough covered by a hood, which is connected by one or more pipes to a draft-flue, and providing said trough with a series of vent-holes, which collectively shall be about equal in area to the area of the pipe or pipes leading to the draft-flue, for the purpose of producing an equal current of air throughout the entire length of the trough for the purpose of conveying away all the odors from all parts of the trough or urinal; and, second, in providing means for a current of air along or across the floor underneath the urinal and behind the same, all as hereinafter more fully set forth.

Figure 1 is a perspective view of my improved device, and Fig. 2 is a vertical section of the same on the line *xx* of Fig. 1.

Since the introduction of the Smead dry closet, the construction of which is shown in Patent No. 352,157, and to which reference is made as showing the means of producing a forced draft through the ventilating-flue, various forms of urinals have been devised to be used in connection therewith, the object being to so construct these urinals as to dispense entirely with the use of water and secure the removal of all odors by currents of air drawn from or through them into a vent-shaft extending out above the roof of the building in which they are located. The plan which I have devised for this purpose is as follows: I provide a metallic trough, A, of the requisite length to accommodate a large number of persons, it of course being proportioned to the number of scholars or other occupants of the building. This trough A, as shown in Fig. 1, is set inclined, and at its lowest point is provided with a pipe, *b*, which will convey the liquid contents to any point desired, either to the vault of the dry closet, preferably at the end where said vault unites with the vent-shaft, or, if

there be a sewer near by, then into it, that depending on circumstances. This trough A is conveniently made of sheet metal, though it may be of cast-iron, if desired. It is curved, as shown in section in Fig. 2, so that its back wall will be extended up over the trough proper and out even with the front edge of the lower part, or nearly so; or it may project a little beyond the lower edge, a little variation in that respect being immaterial. Its ends will be closed by end pieces, G, which, as shown in Fig. 1, may be extended to the floor, and thus serve as supports for the trough, though, if preferred, it may be supported by hooks or brackets secured to the wall in its rear or in any suitable manner. Over this trough, throughout its entire length, or nearly so, I place a hood, B, the rear edge of which is built into or otherwise secured to the wall in rear of the trough A in such a manner as to be air-tight, its front edge being secured to the upper front edge of the trough in such a manner as to be air-tight also, thus forming an air-chamber over the trough A throughout its entire length, or practically so. From this air-chamber I then extend one or more pipes, I, to the vent-flue D, there being three such shown in Fig. 1, located at different points.

As shown in Figs. 1 and 2, the upper wall or portion of trough A is provided with a series of perforations, *e*, care being taken to so apportion the number and area of these perforations that the sum of their areas shall be equal to the area of the pipe or pipes I, according as one or more may be used. When thus constructed, it will be seen that when a draft is created through the pipe or pipes I the air to supply it will be drawn uniformly through the perforations *e* at all points throughout the entire length of the trough, or practically so, because it will require all the air that can pass through all the perforations to fill the vent-pipe or pipes I, and as the suction will be equal at all the perforations *e*, the air will be drawn through them all with equal force and velocity. By this means I am enabled to create a uniform current of air along the whole length of the trough, it passing in at the front opening, thence through the perforations *e* into the air-chamber or duct over the trough, and from thence through the pipe or pipes I into the draft or vent shaft D,

and so out into the open air above the roof of the building, where it is dissipated.

Ordinarily a single vent-pipe will be used; but any number may be used, opening out of the air-chamber at various points, as shown in Fig. 1. In such case partitions *c* may be inserted in the air-chamber, as indicated by dotted lines in Fig. 1, so that each pipe will draw from an air-chamber of its own, and in the case of very long troughs extending around two or three sides of a room such arrangement may be desirable.

In order to provide for carrying away, also, any odor that may arise from the stone or metal platform *H* or the floor under the urinal, I set the urinal out from the wall a short distance, so as to leave between it and the wall a narrow space through which a current of air can be drawn from the floor below, as shown in Fig. 2; and in order to secure a uniform current along the whole space, I extend from the trough downward a partition, *C*, preferably of sheet metal or slate, which is also set out from the wall a little distance, so as to leave an air-space between it and the wall, as shown in Fig. 2. This partition I provide with a series of perforations, *a*, as shown in Figs. 1 and 2, or it may have a series of narrow slits at or near its lower edge, as indicated by the dotted lines in Fig. 1, for the air to enter, either plan being adopted, as may be preferred.

In Fig. 2 I have shown the space in rear of the partition and trough as being connected direct with the air-chamber over the trough *A*, which is the simplest form of construction. It is obvious that when so arranged the area of the draft pipe or pipes *I* must be increased, so as to be equal to the area of all the perforations or air-inlets *e* and *a*, as otherwise the air will be drawn through a portion of them only, and hence would not operate to take up the odors at all points as perfectly.

It is obvious that by closing the space in rear of the trough at a point below the perforations therein, as indicated by the dotted line in Fig. 2, and which may be easily done by a strip of sheet metal, the air-space in rear of the partition may be separated from that above the trough, in which case a separate pipe or opening into the vent-shaft may be used to draw off the air and odors from the space below the trough, such pipe or opening being indicated by dotted line in Fig. 2. I prefer, however, to connect the two air-spaces—that in rear of the partition *C* and that over the trough *A*—and use a pipe or pipes of the proper area for both, as it is simpler and cheaper to construct and works equally well.

It is of course obvious that the trough with its air-chamber and vent-pipe may be used in-

dependently of the partition *C* and its air-space, and I so propose to use it in some cases; but I prefer to use both together, as it is a more perfect device and is more complete in its operation.

Practical use of this device has demonstrated that its operation is so perfect in conveying away all odors arising from the urinal that the presence of the latter in a room cannot be detected by any odor arising therefrom.

While this urinal is more especially designed for use in connection with the Smead dry closet in large school buildings and similar structures, it is obvious that it may be used independently of the dry closet, provided a proper draft be furnished, and that it is admirably adapted for use in depots, factories, hotels, and all places where a large number of persons congregate, it being understood that in all cases where this urinal is used a positive or forced draft is to be provided for the draft-flue.

I am aware that water-closets have been ventilated by a pipe leading from a hole in the hopper, and that a pipe has been connected direct to the top of a single urinal to ventilate the same; but such devices are not adapted to be used simultaneously by a large number of persons like this. I am also aware of the patent granted to E. C. Condit, No. 349,030, and I claim nothing shown therein; but,

Having thus fully described my invention, what I claim is—

1. A urinal consisting of a trough, *A*, having its rear upper wall perforated, in combination with an air chamber over the same, and one or more vent-pipes, *I*, connecting said air-chamber with a draft-flue, *D*, said parts being constructed and arranged to operate substantially as shown and described.

2. In combination with a trough or urinal, the perforated partition below the same, with one or more vent-pipes arranged to draw the air and odors from underneath the urinal into the air-space in rear of said partition, and from thence into a draft-flue, *D*, substantially as described.

3. The combination, in a urinal, of a trough, *A*, having its rear upwardly-extending wall perforated, an air-chamber arranged to receive the air and odors down through said perforations, and one or more pipes connecting said air-chamber to a draft-flue, the area or capacity of said pipe or pipes being equal to or greater than the combined area of said perforations for the purpose of securing a uniform current of air to intercept and convey away the odors through the entire extent of said trough.

JAS. A. WILLS.

Witnesses:

THOS. S. WILTBANK,  
FRANK N. LINEWEAVER.