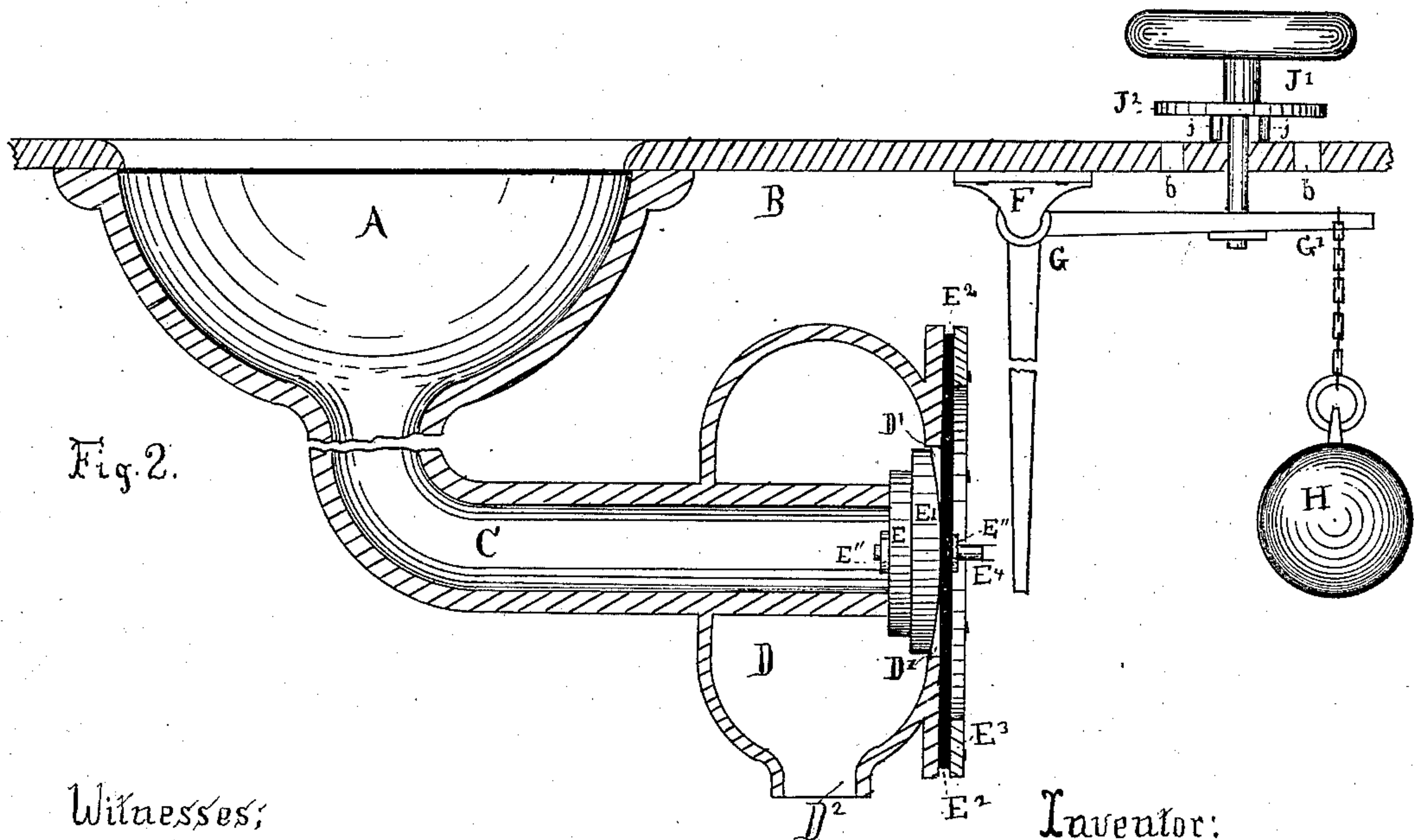
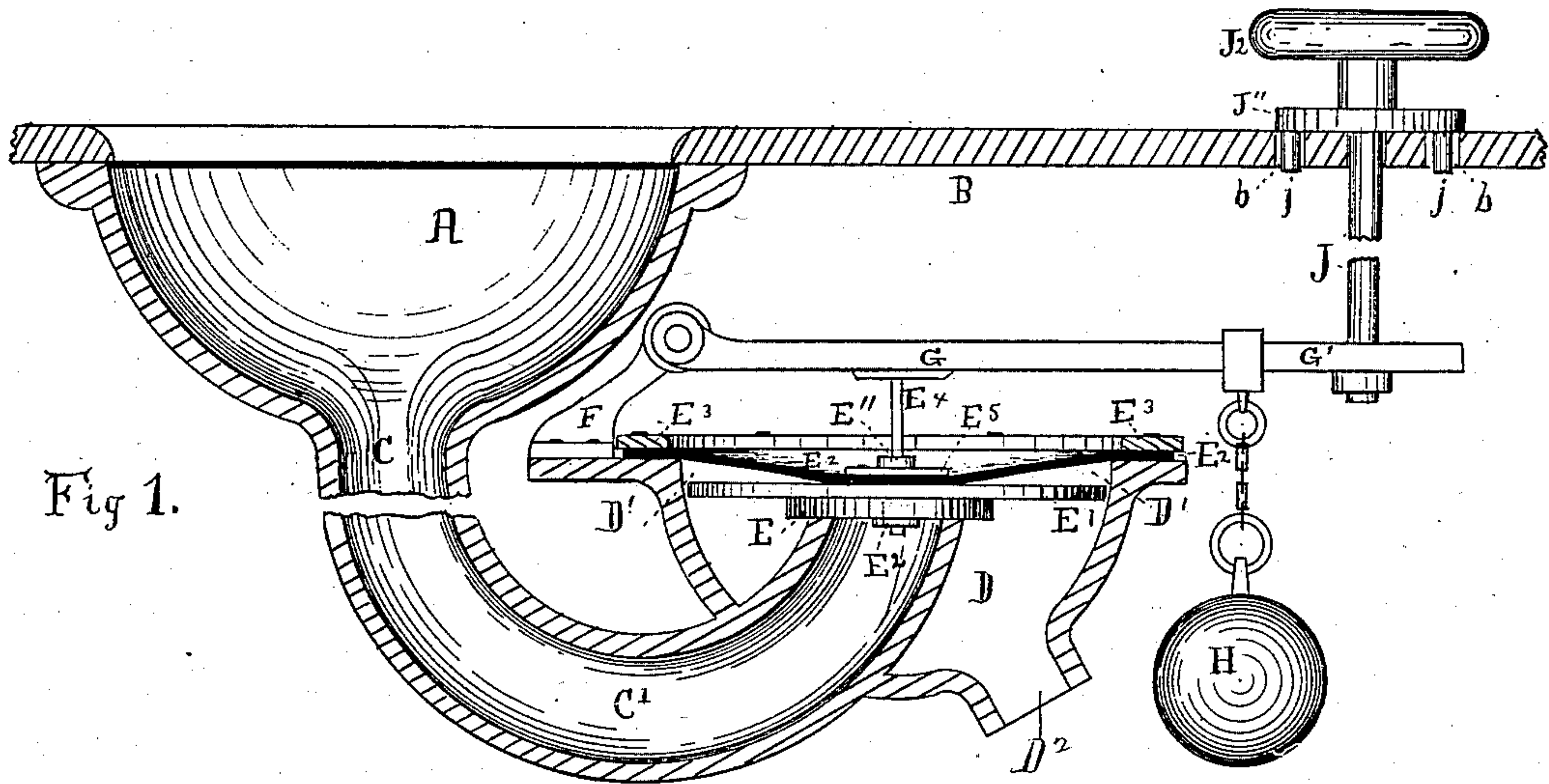


(No Model.)

P. HARVEY.
WASTE PIPE TRAP AND VALVE.

No. 316,962.

Patented May 5, 1885.



Witnesses;
J. W. Parker
L. B. Riggs

Inventor:
Patrick Harvey
by Chas S. Burton
his atty.

UNITED STATES PATENT OFFICE.

PATRICK HARVEY, OF CHICAGO, ILLINOIS.

WASTE-PIPE TRAP AND VALVE.

SPECIFICATION forming part of Letters Patent No. 316,962, dated May 5, 1885.

Application filed September 22, 1884. (No model.)

To all whom it may concern:

Be it known that I, PATRICK HARVEY, a citizen of the United States, and residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Waste-Pipe Traps and Valves, which are fully set forth in the annexed and following specification.

The purposes of this invention are to provide a waste-pipe with a valve therein which shall obviate the necessity of the use of a plug in the sink or basin to which it is attached; to prevent the return of sewer-gas through the waste-pipe by preventing the emptying of the trap, as often happens by siphoning or suction arising by partial vacuum produced by any means beyond the trap; to remove the necessity of an overflow-pipe from the bowl, and to accomplish all these purposes without producing a standing column of water which may become dead and offensive or leave filth from the waste-water in the pipe or its connection out of the course of the waste-current which might carry it off.

Figure 1 is a vertical section of a bowl with my invention connected, the waste-pipe including an ordinary form of water-trap. Fig. 2 is a vertical section of a bowl with my invention attached, there being no water-trap in the waste-pipe except that afforded by the valve, which is the main feature of my invention.

A is the bowl. B is the slab or table in which it is sustained.

C is the waste-pipe leading to the valve-chamber D.

E is the valve, preferably of rubber, adapted to seat over the open end of the waste-pipe C, and either by its weight, when playing vertically, or by the shaping of the diaphragm hereinafter named, when playing horizontally, adapted to be normally on its seat without exterior pressure.

E' is a metal disk fitting, but not too closely, the opening D' in the wall of the valve-chamber D. It serves to limit the straining and stretching of the diaphragm E², which is preferably of rubber or similar water-proof and flexible material, and is of such size as to completely cover the opening D' and form

the wall of the chamber at that part. It is secured to the remainder of the wall by the metal ring E³, which is placed outside of the diaphragm and bolted to the wall of the chamber.

E⁴ is the valve-stem, which passes through the diaphragm E², the metal disk E', and the valve E, and has the clamp-nuts E'' E'' screwed onto it, one inside the valve and one outside the diaphragm. A further binding-disk, as E⁵, (shown in Fig. 1,) may be employed outside the diaphragm between it and the nut E''; but the use of such binding-disk is a matter of mechanical preference. D² is the waste or discharge pipe from the valve-chamber D.

To the valve-chamber, as in Fig. 1, or to any other convenient point—as the slab, as in Fig. 2—is secured the bracket, hanger, or standard F, and to this part F is pivoted the lever G, which has a horizontal arm, G', upon which is hung and adapted to slide the weight H. This lever is arranged to bear against the end of the valve-stem E⁴, and by the action of the weight H, hung upon its horizontal arm, to press the valve inward upon its seat over the mouth of the waste-pipe C, the amount of pressure in that direction being regulated, as required to accomplish the purpose hereinafter described, by sliding the weight H on the said arm of the lever.

To the extreme end of said arm is attached the rod J, which passes up through the slab, and is provided at its upper end with a suitable handle, J', and means in connection therewith, whereby said rod, being pulled up and lifting the outer end of the lever G, may be fixed temporarily in such upper position and let down at will to such position as will permit the valve E to rest upon its seat. The particular means shown, to which, however, I do not intend to confine myself, are that the rod J passes through the lever G and turns freely in it, and is provided above the slab B with a disk, J'', which has one or more, as illustrated two, studs, j, protruded from its lower surface. The slab B has the holes b b, adapted to receive the studs j j when the disk J'' is turned, so as to bring the studs over them. To sustain the valve off its seat, the

rod J is pulled upward until the studs *j* are clear of the slab B, and then turned in either direction, so that the studs *j* may rest upon the slab aside from the holes *b*. To seat the valve, the rod J is turned until the holes *b* are under the studs *j* and then allowed to fall.

As first stated, the difference between the forms of my invention illustrated in Figs. 1 and 2 is that in the former the waste-pipe is formed with a U-trap, C', while in the latter it is without such trap. The form of the lever G is adapted to the different position of the valve E and of the diaphragm which closes the valve-chamber opposite the valve, which results from making the waste-pipe without trap, being a straight lever of the second class in the form shown in Fig. 1, and a bell-crank lever of the first class in Fig. 2; but I do not confine myself to any particular form or arrangement of the lever, which may be varied according to the situation in which the device is located, and a spring may be substituted for the weight and its pressure regulated in any of the familiar methods.

In operation, the weight H is set at such point on the lever-arm G as to retain the valve E on its seat against the pressure of such column of water as it is desired to admit to the bowl. When that height is reached, any increase of water will lift the valve and permit the water to waste, but will not permit it to waste below the determined level. When it is desired to empty the bowl, the lever may be lifted by means of the rod, whereupon the water will evacuate the bowl, and the lever being then allowed to fall, the valve being re-seated, will close the mouth of the waste-pipe and prevent the passage of sewer-gas.

When the form shown in Fig. 1 is employed, it is not necessary to drop the lever after having raised for the purpose of emptying the bowl, but it may be left sustained in the position to retain the valve open. The trap C', being now full will while it so remains prevent the return of sewer-gas through the bowl, and should any suction originate beyond the trap, which would tend to empty it of its water, such suction first acting to rarefy the air in the valve-chamber will by that means cause the diaphragm E² to yield and allow the valve, if not already on its seat, to descend onto its seat, thereby preventing the emptying of the trap by such means. Should the valve-chamber D become filled with water, so that the water might be withdrawn from the trap C' by siphoning, the effect will be the same as when a direct suction is exerted upon the water—viz., that the diaphragm will yield and cause the valve to be firmly seated and retain the water in the trap. A similar result may be secured in the form shown in Fig. 2, or in any form wherein there is no U-trap. By so shaping the diaphragm or so weighting the valve that the valve shall be normally on

its seat without the application of any exterior pressure, then any suction or tendency to siphoning will seat it firmly as in the case of the form, Fig. 1.

It will be seen that the weighted lever and means for operating it may be omitted and the remainder of the device applied to any bowl having the customary plug, and that in that form it will be effective as a preventive of siphoning and return of sewer-gas; also, that a check-valve may be placed in the waste-pipe or the valve E detached from the diaphragm and provided with suitable guides, and thereby made to serve as a check-valve, and thereby, in addition to all the purposes above enumerated, made to prevent back-water passing into the bowl.

I claim—

1. In combination with the bowl, the waste-pipe leading therefrom and having a U-trap and opening within the valve-chamber, the valve-chamber having an eduction-port, the flexible diaphragm forming part of the wall of the valve-chamber, the valve secured on the inner surface of the diaphragm and adapted to seat over the open end of the waste-pipe, and an arm exterior to said chamber under adjustable pressure acting against said diaphragm and removable therefrom at will, substantially as set forth.

2. In combination with the bowl, the waste-pipe opening within the valve-chamber and having between the bowl and the valve a water-trap, a valve-chamber having an eduction-port, the flexible diaphragm forming part of the wall of the chamber, the valve secured on the inner surface of the diaphragm and thereby retained seated over the open end of the waste-pipe, substantially as set forth.

3. In combination with the bowl, the waste-pipe opening within the valve-chamber and having between the bowl and the valve a water-trap, the valve-chamber having an eduction-port, the flexible diaphragm forming part of the wall of the valve-chamber, the valve secured on the inner surface of the diaphragm, and thereby seated over the mouth of the waste-pipe, an arm exterior to said chamber bearing against said diaphragm and removable at will, substantially as set forth.

4. In combination with the bowl, the waste-pipe opening within the valve-chamber and having between the bowl and the valve a water-trap, the valve-chamber having an eduction-port, the flexible diaphragm forming part of the wall of the valve-chamber, the valve secured on the inner surface of the diaphragm, and thereby seated over the mouth of the waste-pipe, and an arm exterior to said chamber under adjustable pressure bearing against said diaphragm and removable and detachable therefrom at will, substantially as set forth.

5. In combination, substantially as hereinbefore set forth, the bowl, the valve-chamber,

the waste-pipe connecting them, and having
between them the water-trap, the valve within
the valve-chamber and adapted to close the
waste-pipe, the diaphragm forming part of the
5 wall of the valve-chamber and exteriorly ex-
posed to atmospheric pressure and acting in-
wardly to seat the valve, substantially as set
forth.

In testimony whereof I have hereunto set my
hand, in the presence of two witnesses, at Chi- 10
cago, this 3d day of September, A. D. 1884.

PATRICK HARVEY.

Attest:

CHAS. S. BURTON,
FRANCIS W. PARKER.