No. 618,913. Patented Feb. 7, 1899.

G. F. SMITH.

AUTOMATIC AIR VENT.

(Application filed Jan. 20, 1898.)

(No Model.)

Fig. 1.

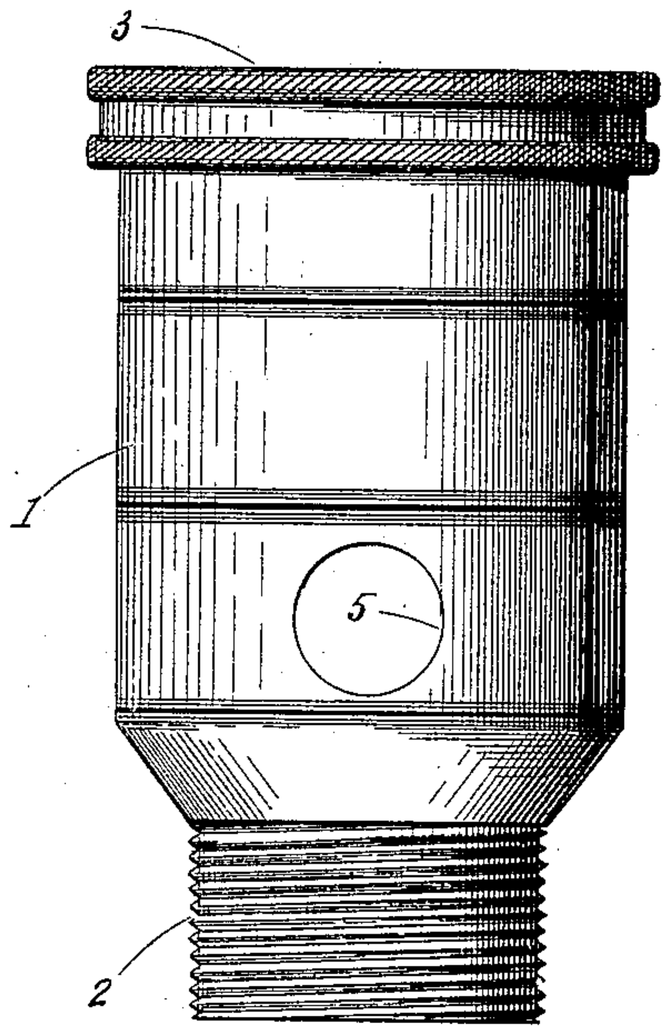


Fig. 2.

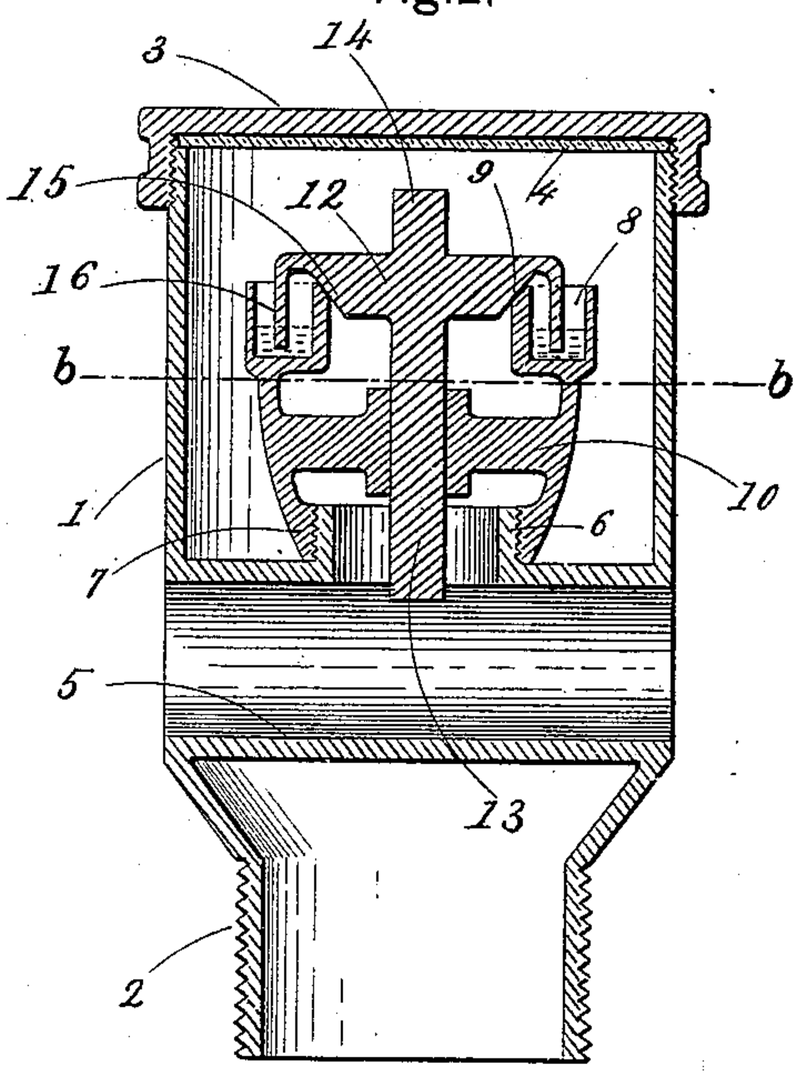


Fig. 3.

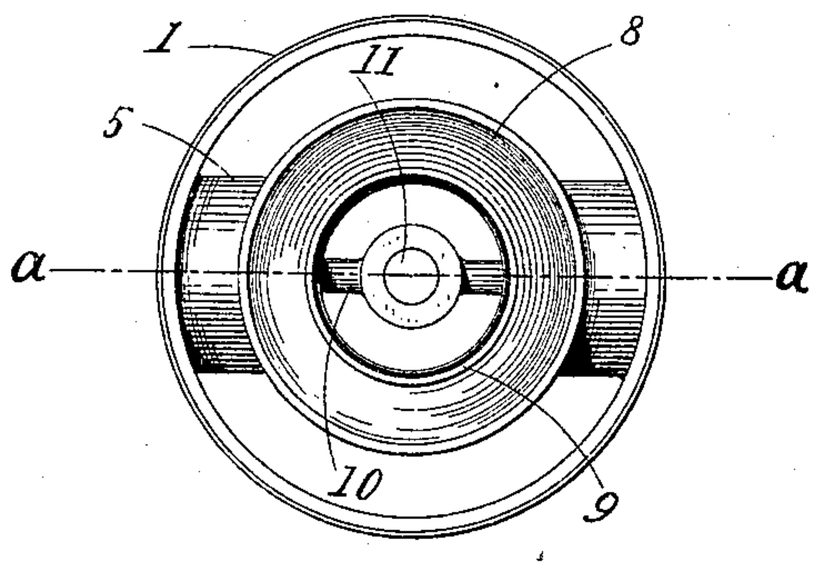
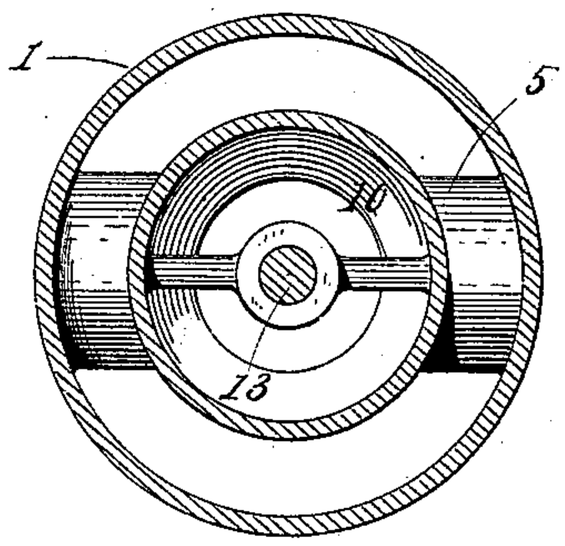


Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE F. SMITH, OF BUFFALO, NEW YORK.

AUTOMATIC AIR-VENT.

SPECIFICATION forming part of Letters Patent No. 618,913, dated February 7, 1899.

Application filed January 20, 1898. Serial No. 667,291. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. SMITH, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Automatic Air-Vents, of which the following is a specification.

My invention relates to an automatic double-seal air-vent for sewers, sinks, &c.; and the object thereof is the production of a simple, neat, and cheaply-constructed air-vent having both a liquid seal and a ground-joint seal and adapted to be operated automatically to simultaneously open both seals, the double seals providing means for sealing the vent even though one or the other of said seals should become inoperative.

It also relates to various details of construction, all of which will be fully and clearly hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 represents a side elevation of the device complete. Fig. 2 represents a vertical central section through the complete device on or about line *a a*, Fig. 3. Fig. 3 represents a top view, the cover and inverted valve-cup being omitted. Fig. 4 represents a horizontal section on or about line *b b*, Fig. 2.

Referring to the drawings in detail, in which like numerals designate like or duplicate parts, 1 represents the hollow case or shell of the air-vent, which is preferably constructed of iron or brass. It is provided at its lower end with a screw-threaded tubular reduced portion 2, adapted to engage with the end of a pipe connecting with the sewer or pipe requiring venting and at its upper end or top with a detachable cap or cover 3. This cap or cover 3 is preferably provided with an exterior milled edge and an interior screw-thread, and the exterior of the top portion of the shell is likewise screw-threaded to receive the cap. It is obvious, however, that any other well-known means may be used to secure the cap or cover upon the top of the shell. To provide a tight joint, a gasket 4, of leather or similar material, is interposed between the cap or cover and the shell, substantially as shown in Fig. 2. A pipe 5, forming an air-inlet, passes substantially transversely through the shell, (see Fig. 2,) and a short peripherally-screw-threaded tube or pipe 6 extends upward from at or near the middle of the pipe 5.

The combined valve supporting and sealing device comprises a hollow portion which at or near its lower end contracts into an interiorly-screw-threaded portion 7, which is adapted to engage with and screw upon the screw-threaded pipe 6 and which at its upper end is provided with an annular cup or receptacle 8 for the mercury or other liquid or semiliquid sealing medium. The inner rim of the cup 8 is beveled at its upper edge 9, the purpose of which will appear clearly farther on. A transverse brace 10 extends across the interior of the valve supporting and sealing device and is provided with a central vertical opening 11. The inverted valve-cup 12 is provided with a lower stem 13, which is adapted to be inserted in the opening 11 to aline and support the said cup properly in its position. It is also provided with a short upward-extending stem 14, the office of which is to limit the upward movement of the inverted cup. The inverted cup is also provided with a circular beveled portion 15, which is adapted to seat upon and form a ground-joint seal with the beveled edge 9 of the inner rim of the cup 8.

It will be observed by referring to Fig. 2 that while the rim 16 of the inverted cup is immersed sufficiently deep in the mercury to form a seal it does not extend entirely to the bottom, thus allowing for a close connection between the bevel edge 9 and the bevel portion 15 to insure a perfect ground-joint seal. The valve supporting and sealing device is preferably formed of malleable iron, which is not affected by mercury, and the inverted valve-cup is preferably formed of aluminium, as that metal combines the most desirable qualities of lightness and non-corrosiveness.

My improved air-vent can be easily dismounted by removing the cap 3 and then the inverted cup, pouring out the sealing medium.

The combined valve supporting and sealing device can be removed, if desired, by unscrewing it from the pipe 6.

To assemble, proceed in the reverse order.

The action of the device is substantially as follows: The flowing of the sewage through

the pipe or pipes with which the pipe sustaining the air-vent is in connection causes a partial vacuum within the shell 1 and lifts the inverted cup sufficient to open the seals and allow the air to flow in through the inlet-pipe 5 and its short vertical extension 6.

It is obvious that if from any cause the liquid seal should be destroyed or become defective the ground-joint seal would still operate, thus affording double protection.

Other forms of ground-joint seals may be employed or the general form, arrangement, or construction of the features herein described may be varied or changed within the scope of my invention.

I claim as my invention—

1. An automatic air-vent comprising a shell provided with means of attachment to a pipe, an inlet-pipe having a connection projecting into the interior of the shell, and supporting an annular cup holding a liquid sealing medium and an inverted valve-cup adapted to seat upon the rim of the annular cup and thereby form both a liquid and a ground-joint seal, as set forth.

2. An automatic air-vent comprising a shell provided with means of attachment to a pipe, an inlet-pipe having a connection projecting into the interior of the shell, and supporting an annular cup holding a liquid sealing medium and an inverted valve-cup having a circular beveled portion adapted to seat upon the inner rim of the annular cup and thereby form both a liquid and a ground-joint seal, as set forth.

3. An automatic air-vent comprising a shell provided at its lower end with a screw-threaded portion adapted to be screwed upon a pipe, a removable cap at its upper end, an air-inlet tube passing transversely through the shell, a short peripherally-screw-threaded tube extending upward from at or near the middle of the air-inlet tube, a valve supporting and sealing device provided with a screw-threaded portion at its lower end adapted to screw upon the upward-extending screw-threaded tube and at its top with an annular mercury-cup, the inner rim of which is beveled to form the lower portion of a ground-joint seal, a supporting-brace extending transversely within the air-valve supporting and sealing device and provided with a central substantially vertical opening and an inverted valve-cup having a downwardly-projecting stem adapted to be inserted in the vertical opening in the supporting-brace, an upward-extending stem adapted to limit the upward movement of the cup, a circular downward-extending rim adapted to be immersed in the mercury sufficiently to form a seal and an inner circular beveled portion adapted to seat against the beveled edge of the inner rim of the annular cup to form a ground-joint seal, as set forth.

4. An automatic air-vent comprising a shell provided at its lower end with a screw-threaded portion adapted to be screwed upon a pipe, a valve supporting and sealing device provided at its top with an annular mercury-cup, the inner rim of which is beveled to form the lower portion of a ground-joint seal and an inverted valve-cup having a circular downward-extending rim adapted to be immersed in the mercury sufficiently to form a seal and an inner circular beveled portion adapted to seat against the beveled edge of the inner rim of the annular cup to form a ground-joint seal, as set forth.

5. An automatic air-vent comprising a shell provided with an inlet-pipe having a connection projecting into the interior of the shell, and supporting a receptacle holding a liquid sealing medium and a valve device adapted to seat upon the rim of the receptacle and having a portion immersed in the sealing medium, thereby forming both a liquid and a ground-joint seal, as set forth.

GEORGE F. SMITH.

Witnesses:
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