(No Model.) 2 Sheets—Sheet 1.

T. GRACE.

DRAIN TESTING APPARATUS.

No. 524,588. Patented Aug. 14, 1894.

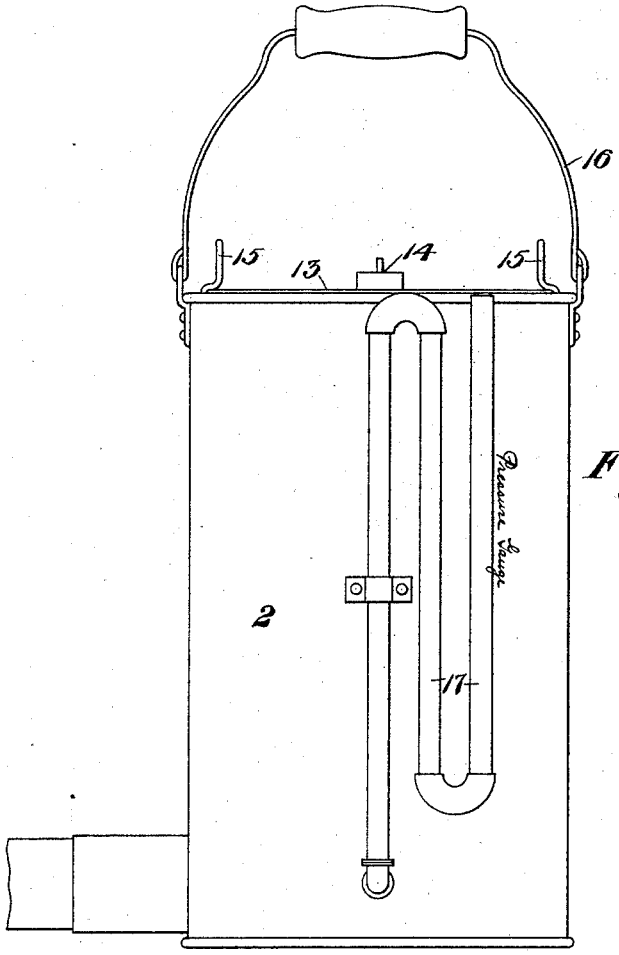

Fig. 1.

WITNESSES

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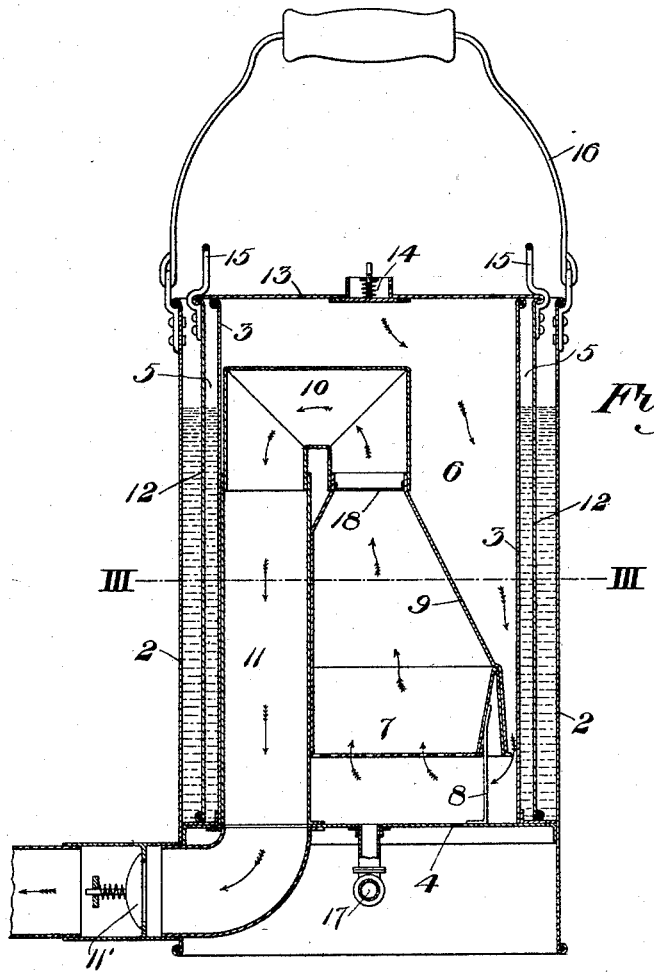

Fig. 2.

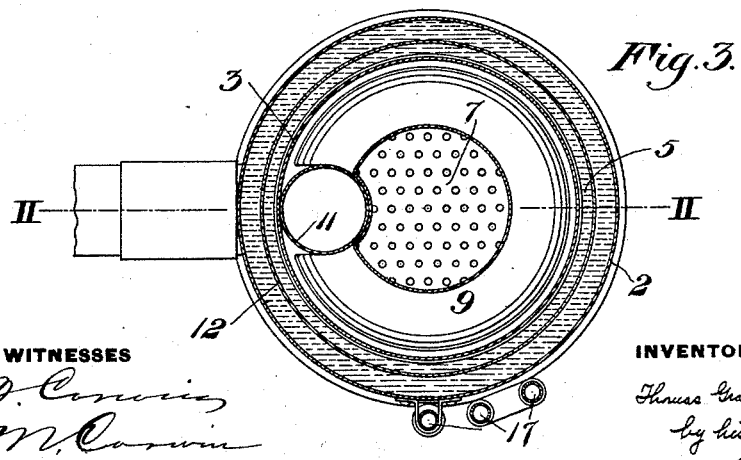

Fig. 3.

WITNESSES

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UNITED STATES PATENT OFFICE.

THOMAS GRACE, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO THE BAILEY FARRELL MANUFACTURING COMPANY, OF SAME PLACE.

DRAIN-TESTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 524,588, dated August 14, 1894.

Application filed February 3, 1894. Serial No. 498,979. (No model.)

To all whom it may concern:

Be it known that I, THOMAS GRACE, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Drain-Testing Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of my apparatus. Fig. 2 is a vertical section thereof, the section being taken on the line II—II of Fig. 3; and Fig. 3 is a horizontal section on the line III—III of Fig. 2.

My invention relates to improvements in apparatus for applying smoke tests to drains, water pipes, &c., by discharging into said pipes smoke which, if the pipes leak or if the traps be defective, will escape, and will thus give warning of the defect.

In the drawings, 2 represents the outer case of my improved apparatus, made preferably in the form of an open metal bucket containing on the interior a concentric cylindrical shell 3, the intervening space 5 being closed at the bottom by a base-plate 4, which extends entirely across the case or bucket 2. Near the bottom of the chamber 6, within the shell 3, is a pan 7, having a perforated bottom and upheld by suitable supports 8; but the pan fits sufficiently loosely within the chamber 6 to permit air to pass from above the pan down to the portion of the chamber 6 below the same. The pan is covered by a removable metal hood 9, constituting with the pan a smoke-box, and having at the top an outlet tube 10, the end of which is adapted to fit in a vertical outlet pipe 11, which is fixed to the bottom plate 4 and extends through the bottom plate to the exterior of the case or bucket 2. This pipe may be provided with a suitable valve 11′, adapted to permit the outgoing of the smoke and to prevent it from being sucked back.

12 is a hollow cylindrical shell of metal closed at the top by a plate 13, but open at the bottom; it fits within the annular space 5, and has in the plate 13 an air-inlet valve 14, so constructed that it will open inwardly to permit the entrance of air into the shell 12, and will close outwardly to prevent the exit of air therefrom.

15, 15, are suitable handles permitting the shell 12 to be moved up and down within the space 5; and 16 is a bail connected with the case 2 and permitting the same to be carried about easily.

18 is a wire screen in the hood to prevent passage of sparks or dirt through the outlet pipe.

The operation is as follows:—Water is put in the space 5 so as to act as a seal for the operation of the shell 12, and the hood 9 having been removed, waste, saturated with oil or any other suitable combustible material which will produce smoke freely, is put in the pan 7, and the outlet pipe 11 is connected with the drain to be tested by inserting it into the drain and packing the surrounding space. The operator then ignites the waste, puts on the hood of the smoke-box, and moves the shell 12 up and down within the space 5, and in such motion it acts as an air-pump, drawing air in through the valve 14 on its upstroke, and forcing the air on its down stroke through the chamber 6 and up through the perforated bottom of the pan 7, causing evolution of smoke from the waste and blowing the smoke through the outlets 10, 11, into the drain-pipe.

The device shown in the drawings is very convenient because it does not require the use of a separate blower, but is all contained in one portable apparatus. It also has other advantages which may be obtained even when the apparatus is modified so that all the parts are not combined in a single concentric structure. For example, the use of the blowing apparatus, consisting of a vessel having an opening at the bottom and adapted to be moved up and down in a body of water to draw in and discharge the air, results in simplicity of mechanism. The use of a smoke-box having an opening at the bottom and contained within an air-chamber from which it derives its air, and having a hood and outlet pipe leading therefrom, is desirable for many reasons. These constructions are new and are claimed by me herein.

Within the scope of my claims, unless otherwise expressed, the hood may be fixed in position and the bottom of the smoke-box made movable to admit of introduction of the combustible material.

An additional improvement which I show in the drawings, consists in the application to the outlet pipe of a pressure gage 17. This gage enables the operator to note when the pressure of air forced into the pipe by use of the apparatus equals or exceeds the degree at which there is danger of displacement of water from the traps of the waste-pipes. The operator can therefore tell whether the escape of smoke from the pipes in any case is due to the presence of a defective pipe, or is caused by the undue forcible pressure of the smoke through the water seal of the trap.

Modifications in the form, construction and relative arrangement of the parts may be made by the skilled mechanic without departure from my invention, since

What I claim is—

1. The combination of a case containing an annular water-sealing space, an inner chamber containing a smoke-box or case having a smoke outlet and air inlet, and an air-blowing shell movable in said space to supply air for combustion; substantially as described.

2. A drain-testing apparatus comprising a case containing an annular water-sealing space, a chamber within the space containing a smoke box, an air inlet in the lower portion of the smoke box, an outlet pipe leading from its upper portion, an air-blowing shell movable in the annular space, and an air inlet in said shell above the smoke box; substantially as described.

3. A smoke-testing apparatus having a chamber containing a box for smoke-producing material, said box comprising a pan with a removable hood and outlet pipe, and an inlet for air from said chamber to the smoke-box; substantially as described.

4. In smoke-testing apparatus, the combination of a case containing a central chamber 6 and an outer water space 5, a smoke-box in the chamber 6 comprising a removable hood and a pan, said pan having openings at the bottom for admission of air from the chamber 6, and the hood having an outlet opening adapted to fit an outlet-pipe leading through the case, and a blowing shell movable within the water-space; substantially as described.

5. A smoke-testing apparatus having a chamber containing a box for smoke-producing material, said box comprising a pan with a hood and outlet pipe, and an inlet for air from said chamber to the smoke-box; substantially as described.

6. A drain-testing apparatus comprising a portable case containing an annular water-sealing space, a chamber within the space and containing a smoke box having a smoke outlet and air inlet, an air-blowing shell movable in said space to supply air for combustion, and a pressure gage connected to the case; substantially as described.

In testimony whereof I have hereunto set my hand.

THOMAS GRACE.

Witnesses:
W. B. CORWIN,
H. M. CORWIN.