(No Model.)

2 Sheets—Sheet 1.

P. FYFÉ & J. DOBSON.

DRAIN TESTING MACHINE.

No. 421,922. Patented Feb. 25, 1890.

FIG. 5.

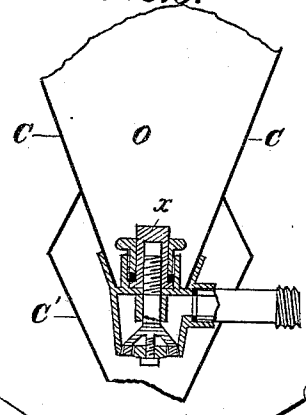


FIG. 1.

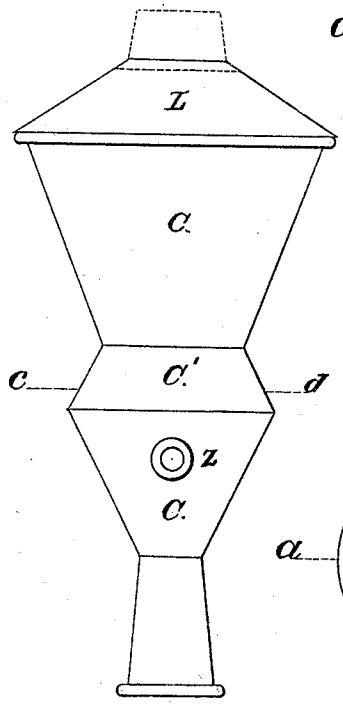


FIG. 2.

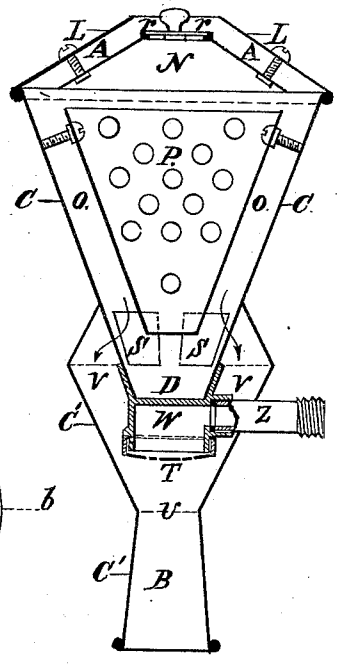


FIG. 4.

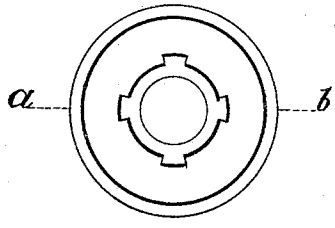
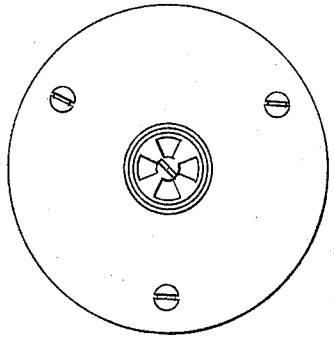


FIG. 3.



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(No Model.) 2 Sheets—Sheet 2.

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DRAIN TESTING MACHINE.

No. 421,922. Patented Feb. 25, 1890.

FIG. 6.

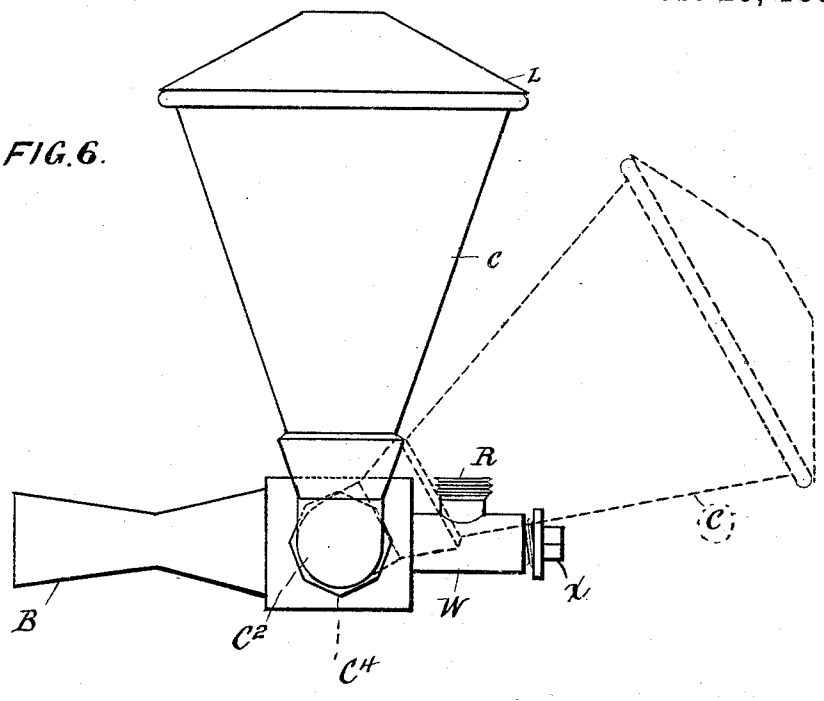
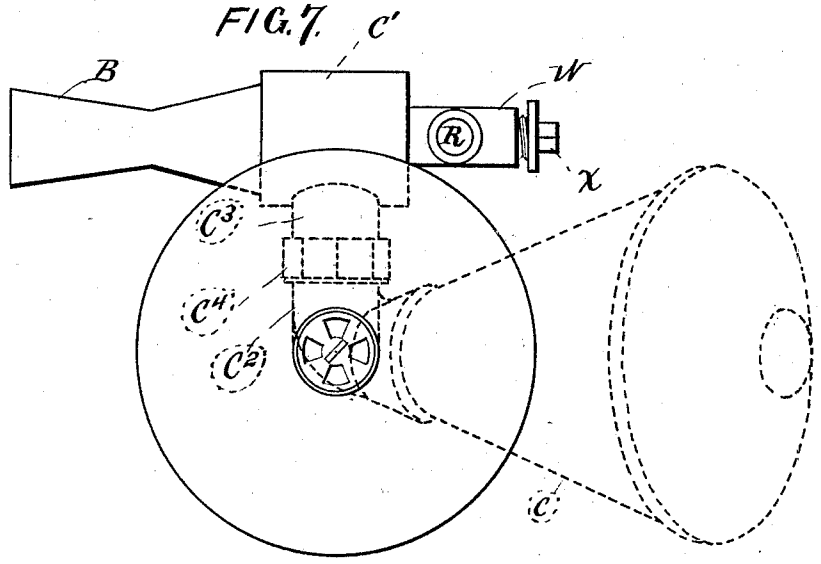


FIG. 7.



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UNITED STATES PATENT OFFICE.

PETER FYFÉ AND JAMES DOBSON, OF GLASGOW, COUNTY OF LANARK, SCOTLAND.

DRAIN-TESTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 421,922, dated February 25, 1890.

Application filed March 2, 1889. Serial No. 306,271. (No model.) Patented in England November 1, 1888, No. 15,748.

To all whom it may concern:

Be it known that we, PETER FYFÉ and JAMES DOBSON, citizens of the United Kingdom of Great Britain and Ireland, residing at Glasgow, in the county of Lanark, Scotland, have invented a new and useful Drain-Testing Machine, (for which we have obtained a patent in Great Britain, No. 15,748, bearing date November 1, 1888,) of which the following is a specification.

Our invention relates to improvements in drain testing and fumigating apparatus for drainage systems, sewers, conservatories, hothouses, &c., whereby such apparatus is rendered independent of an attendant, it being automatic in its action and having no working parts.

Our invention will first be described with reference to the accompanying drawings, and then more particularly pointed out in the claims.

In the said drawings, Figure 1 is a side elevation of the apparatus. Fig. 2 is a vertical section. Fig. 3 is a plan view. Fig. 4 is a sectional plan on the line *c d*, Fig. 1. Fig. 5 is a vertical section of a modification hereinafter described; and Figs. 6 and 7 are respectively a plan and a side elevation of a further modification.

The improved apparatus consists of an outside casing C C C′ C′, which is divided by a diaphragm D and water-chamber W into two compartments O O and V V.

In the upper compartment O O a perforated pan P, in the shape of a truncated cone, is fitted, into which the burning waste or other fumigant is placed.

The lid L L of the casing has a deflector N attached to it, in order to deflect the current of incoming air from the mouth of the pan P and guide it down the annular spaee A A, just sufficient air being allowed to pass through the regulator *r r*, fixed to the crown of the deflector N to insure combustion and give a plentiful smoke-supply.

At the bottom of the compartment O O there are four openings S S S S, through which the air and smoke are admitted into the compartment V V.

At the bottom of the upper casing a jet-nozzle W is formed, having a small pipe Z fitted to it, coming through the upper part of the lower casing C′ C′.

At the bottom of the nozzle W a rose-piece T is fixed, which admits water or other fluid or gas into V V in the form of a fine spray. This rose-piece T may also be made with minute annular milled spaces near its periphery, as shown in Fig. 5, and made adjustable or with a clear minute annular space at the outside of the disk, so that the fluid might, if preferred, be admitted in a thin sheet.

The lower casing C′ C′ is attached to the upper casing, so as to allow a convenient passage for air and smoke. It has a throat U and a mouth-piece or nozzle B, so placed in conjunction with the rose-piece at the bottom of W that the spray fills the orifice and forms with such rose-piece an injector. The pipe Z is screwed into the nozzle W, so that a connection may be made by small hose-pipe or otherwise between the sink-tap and the machine.

The dotted lines at the top of Fig. 1 show how the machine may, if desired, be attached by a hose-piece to a hand fan or bellows and utilized simply as a generating-pan.

The following is the manner in which the apparatus operates in testing a drainage system: When the grating has been removed from the ventilating-trap or other opening into the drains found or made, the apparatus is set into the opening with the nose-piece or nozzle B opening downward. Clay or other soft material is then packed around the apparatus between it and the sides of the opening, in order to make it tight and impervious to air. The lid L is then lifted, and preferably oily waste mingled with ground sulphur is laid loosely into the pan P. A suitable hose is now attached by a tap-union, or by other simple means, to the nearest hydrant or other water-tap in the dwelling-house or premises, and the other end is secured to the tube Z of the apparatus. The water then being turned on enters the nozzle W and rushes in a spray from it. The oily waste or other material in the pan P is set on fire and the lid L put on again. In a very short time the strong downdraft, which the fine spray of water from the nozzle W induces, kindles the oily waste or other material in pan P into a red burning

mass. When this is observed, the operator regulates the combustion by turning the small air-regulator *r*, situated on the top of the deflector N, so that the oily waste or other material is caused to smoulder away in smoke, just sufficient air being admitted to the pan P to keep up combustion and prevent the undue and useless burning of the fumigating material. The air, which is drawn down the annular spaces A A and O O, exhausts the smoke from the pan P through the numerous perforations in the pan. The mingled smoke and air now rush through the ports S S into V, and thence under the immediate influence of the fine spray from the nozzle W, by which they are propelled under pressure down into the drain, and along thence in two or three minutes through all the pipes and connections of the drainage system, the water meantime escaping through the trap or cesspool into the common sewer. The apparatus would also work in precisely the same manner if the hose-connection were made to any other source of pressure—such as a steam-boiler, compressed-air reservoir, compressed-gas chamber, or any material gas or vapor under even slight pressure.

In applying the apparatus to hot-houses, conservatories, disinfecting-chambers, and the like it is simply set in any suitable position in the hot-house, conservatory, disinfecting-chamber, or other place requiring fumigation or disinfection in such a way as that the waste water which runs from the machine will be caught in a suitable receptacle or allowed to run off in a suitable way to the nearest outlet.

A combination of this apparatus may be made by separating the upper and lower casing and connecting them by a swivel-coupling, so that the nozzle B in testing may be laid at any angle while the pan is kept vertical. Such a device as this is represented at Figs. 6 and 7. In this instance the upper casing C is provided at its lower end with a neck C^2, branching at right angles thereto, which is joined to a pipe C^3 by means of an ordinary swivel-coupling C^4. This pipe C^3, of course, extends into the lower casing C′ and conveys the fumes from the casing C thereinto in the manner hereinbefore described with reference to the other forms. The nozzle W—such as shown in Fig. 5 in this modification—projects axially into the lower casing C′, and its rear end protrudes therefrom and is provided in its side with a threaded neck R, to which a hose-pipe may be secured, as before described, and from its extremity projects the end of the regulating-screw X, for regulating the opening of the nozzle in the manner indicated in Fig. 5.

Having now particularly ascertained and described our said invention in its nature and in what manner the same is to be performed, we declare that what we claim is—

1. In a drain testing or fumigating apparatus, the combination of the casing having two communicating chambers, a perforated pan for containing fumigant arranged in one of said chambers, and a jet-nozzle arranged in the other of said chambers and turned away from said pan, whereby the fumes from the latter will be exhausted, substantially as set forth.

2. In a drain testing or fumigating apparatus, the combination of the casing having upper and lower communicating chambers, said upper chamber having an air-port and a pan arranged in said upper chamber, a deflector extending from said air-port toward said pan, and a jet-nozzle arranged in the lower chamber, substantially as set forth.

3. In a drain testing or fumigating apparatus, the combination of the casing having the upper and lower communicating chambers, said upper chamber having an air-port in its top and the lower chambers having the nozzle B, a pan arranged in the upper chamber, and a jet-nozzle arranged to discharge into the nozzle B, substantially as and for the purposes set forth.

4. In a drain testing or fumigating apparatus, the combination of the upper and lower casings having the communicating chambers O V, a pan arranged in chamber O, and a jet-nozzle having a rose arranged in the chamber V, substantially as and for the purposes set forth.

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JAMES DOBSON.

Witnesses:
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O. B. MACKINTOSH.