J. NADER.

Drain for Gas-Mains.

No. 167,854. Patented Sept. 21, 1875.

FIG I

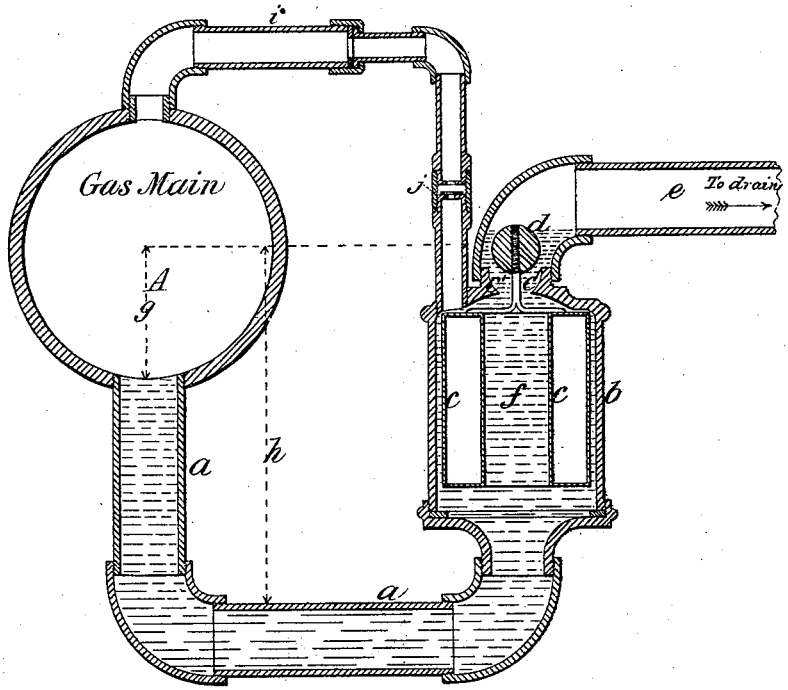
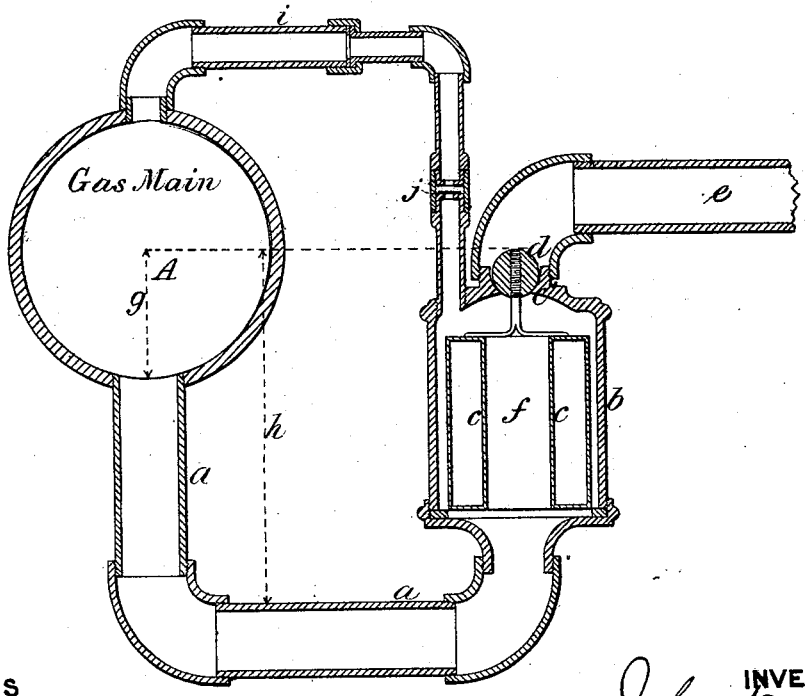


FIG II



WITNESSES

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JOHN NADER, OF MADISON, WISCONSIN.

IMPROVEMENT IN DRAINS FOR GAS-MAINS.

Specification forming part of Letters Patent No. **167,854**, dated September 21, 1875; application filed February 26, 1875.

To all whom it may concern:

Be it known that I, JOHN NADER, of Madison, in the county of Dane and State of Wisconsin, have invented certain new and useful Improvements in Automatic Gas-Drain; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon, which form a part of this specification.

The invention herein consists of an automatic sealing device for drawing water from gas-mains, and to avoid the necessity of employing a pump for the purpose, and at the same time prevent the escape of gas. A drain-pipe is connected with the main and with an overflow-pipe by an intermediate chamber, within which an automatically-operating float-valve is arranged, the elevation of which by the accumulation of water within the chamber from the main will open a valve and the discharge will be through the overflow-pipe into an adjacent drain, sewer, or other arrangement. The drain is arranged to operate for any pressure from the minimum to the maximum—say from three to six inches. The water under a minimum gas-pressure will be even with the bottom of the main, while at the same time any further accumulation will be discharged automatically and maintain the sealed condition of the main. Should the pressure of the gas be increased in the main the water will be forced down the drain-pipe until the column from the surface to the overflow of the discharge-pipe shall be in equilibrium with the gas-pressure. Should the maximum pressure be increased, then the float and valve would drop to close the valve, and a spasmodic filling and discharging would take place, which would not be objectionable. Should at any time the supply be so great as to surcharge the discharge-pipe, the same would act as a siphon, and drain the chamber sufficiently to allow the float to drop. The valve would then close and prevent the escape of the gas. The same result would happen in case of evaporation, since the float, although constructed with sufficient displacement to rise with less than minimum pressure on the accumulation of water in the chamber, yet its weight is considerably in excess of the maximum pressure, thereby securing the escape of gas. I have also combined with the gas-main and the automatic drain an equilibrium-pipe and air-valve to allow the gas to escape from the float-chamber as the water rises therein, the action whereof will be that as soon as the float raises the main valve the back pressure from the gas-main will close the equilibrium-pipe valve.

In the accompanying drawings, Figure 1 represents a vertical section, showing the automatic drain applied to the gas-main, and with the overflow-pipe open for the discharge of the water; and Fig. 2, a similar section, showing the drain float-valve closed with the overflow-pipe.

The drain consists of a small pipe, *a*, connecting with the gas-main A, a water-tight chamber, *b*, and a metallic float, *c*, which carries at its upper end a valve, *d*, arranged to open and close by a valve-seat, *c'*, at the junction of the overflow-pipe with the float-chamber, the communication of the said chamber with the overflow-pipe *e* leading to the sewer or discharge place. The float is shown with a central opening, *f*, through which the water discharges when the valve is open. The minimum pressure of the gas is indicated by the dotted line *g*, and the maximum pressure by the dotted line *h*, so that it is obvious as the water accumulates in the float-chamber the float is raised thereby, and opening the valve the water is forced out into the discharge-pipe.

The construction of the device may be varied. The float-chamber may be square or cylindrical, and may be placed at the bottom of the main with the valve in the bottom or discharge from the side.

The automatic device will thoroughly and reliably drain the water from gas-mains, and effect a saving of the labor of pump-men, and be more reliable. It can be constructed at a mere nominal cost, of any suitable metal, so as to require few, if any, repairs for a number of years. It can be applied as easily as service-pipe. The valve, properly constructed, will always preserve its seat in perfect sealing condition, and the escape of gas in the

absence of water will be almost impossible, while with the water-seal it will be entirely gas-tight.

An equilibrium device is employed with the automatic drain. As shown, this device consists of a pipe, *i*, which unites the gas-main with the top of the float, and at a suitable point within this pipe a wafer or other suitable valves, *j*, is arranged to allow the gas to escape from the float-chamber as the water rises therein, when, as soon as the float raises the main valve, the back pressure will close the valve *j*, and thereby insure the perfect working of the drain.

The connecting and equilibrium pipes may be made of any desirable length, so as to place the whole device beyond the influence of frost in cold climates, and provided with suitable couplings for convenience of attachment and construction.

I claim—

1. The combination, with the gas-main A, of the automatic drain, consisting of the connecting-pipe *a*, float-chamber *b*, valved float *c d*, and overflow-pipe *e*, operating as herein set forth.

2. The combination, with the gas-main and the automatic drain, of an equilibrium-valved pipe uniting these parts for joint action, substantially as herein set forth.

In testimony that I claim the foregoing as my own I have affixed my signature in presence of two witnesses.

JOHN NADER.

Witnesses:
WM. J. KAYSER,
THEODOR KAYSER.