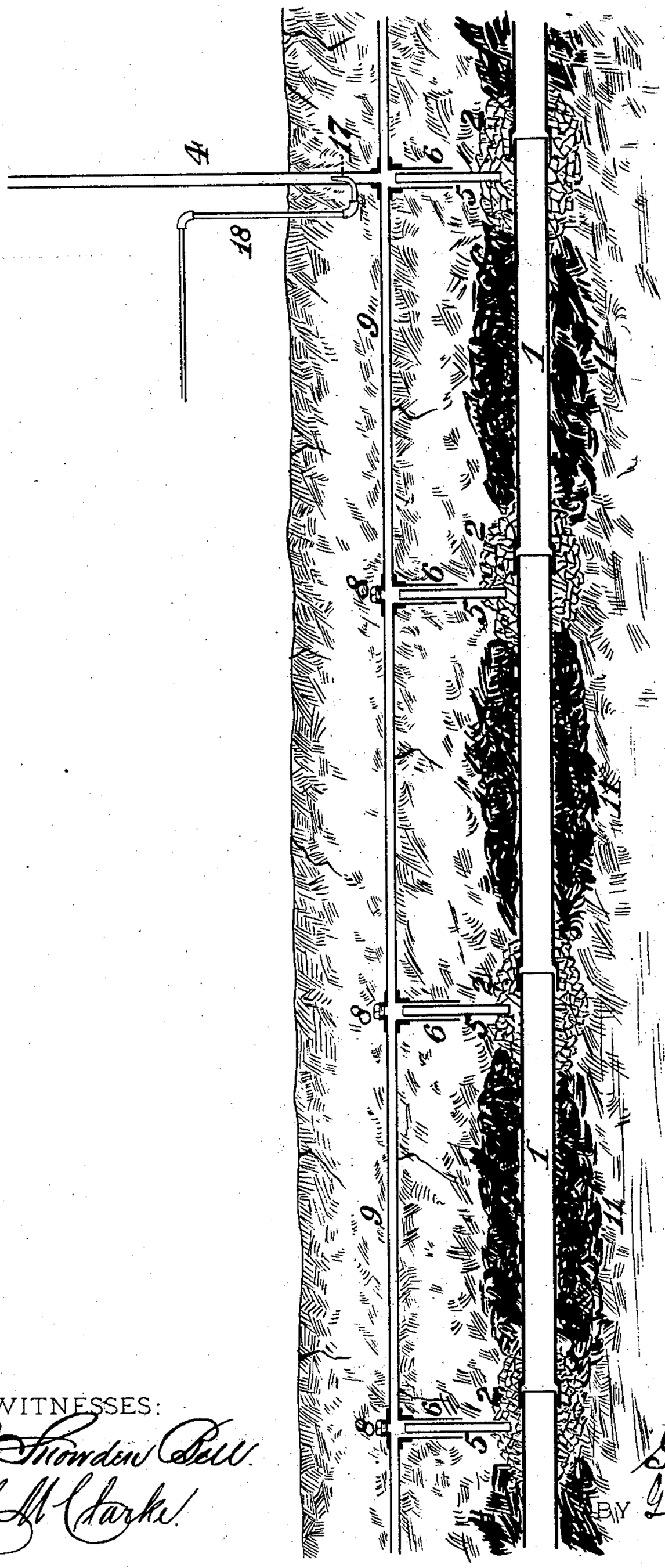
(No Model.)

G. WESTINGHOUSE, Jr.

MEANS FOR CARRYING OFF LEAKAGE FROM GAS MAINS.

No. 312,777. Patented Feb. 24, 1885.



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MEANS FOR CARRYING OFF LEAKAGE FROM GAS-MAINS.

SPECIFICATION forming part of Letters Patent No. 312,777, dated February 24, 1885.

Application filed January 26, 1885. (No model.)

To all whom it may concern:

Be it known that I, GEORGE WESTINGHOUSE, Jr., a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Means for Carrying Off Leakage from Gas-Mains, of which improvements the following is a specification.

In the accompanying drawing, which makes part of this specification, the figure is a longitudinal central section through an underground gas-main with my improvement applied.

My present invention is of the class exemplified in Letters Patent of the United States, No. 306,556, granted and issued to me under date of October 14, 1884, and in my application, Serial No. 153,481, filed January 22, 1885; and its object is to insure the conveyance of all leakage of gas within determined lengths of a line of underground gas-main to suitably-located escape-pipes, and to thereby guard against the passage of such leakage through the ground to adjacent structures or excavations.

To this end my invention, generally stated, consists in the combination, with an underground gas-main, of a leakage-pipe leading from a point adjacent to the main to an escape-pipe discharging at a point above the surface of the ground, and an exhauster connected with the escape-pipe and adapted to induce an upward current therein.

The improvements claimed are hereinafter fully set forth.

In the practice of my invention a line of waste-gas-conducting pipe, 9, of small diameter relatively to the main 1, through which gas is conveyed, but sufficiently large to carry away any ordinary leakage without substantial increase of pressure, is laid at such level below the ground as to be conveniently accessible. The line 9 is, as in my application Serial No. 153,481, above referred to, divided into sections of any desired length—as, for instance, one or more blocks in cities, or the width of fields or inclosures in country districts—and a series of leakage-pipes, 5, leads from the conducting-pipe 9 to points adjacent to joints or branch connections of the main 1, so as to be adapted to carry gas leaking therefrom into the conducting-pipe. A removable screw cap or plug, 8, is secured on the conducting-pipe 9, adjacent to the upper end of each leakage-pipe, or the same may be fixed in small pipes connected to the line 9 and extending to or near the surface of the ground, and the leakage-pipes may, if desired, be fitted loosely within open-ended socket-pipes 6, projecting downwardly from the conducting-line. The lower ends of the leakage-pipes are preferably inserted in bodies of loose packing 2, formed of fragments of stone or metal, coarse gravel, or any other material which will provide an open space or a series of intercommunicating recesses, so as to form an avenue or avenues for directing the escaping gas into the leakage-pipes, and the sections of the main 1 may be surrounded by tight packing 11, of clay, cement, or other material which will resist the passage of gas along the outside of the main, and direct the same into the loose packing 2 and leakage-pipes 5. A detector and escape pipe, 4, is connected to each section of the line of conducting-pipe 9 at any convenient point in its length, and extends therefrom to a point above the level of the ground, located conveniently for testing, and in such position relatively to adjacent buildings, railways, &c., that escape of gas may be permitted without liability to accident from its ignition. The pipes 4 may be passed up through lamp-posts, when the same are sufficiently near to the line of the main, or be placed in any other suitable position where they will be exempt from being tampered with by unauthorized persons, and may in some instances be provided with small jets, which can be kept constantly lighted and serve as street-lamps, any excess in their flame indicating a corresponding increase of leakage. By the application of a light to the delivery ends of the pipes 4 the existence and approximate extent of leaks throughout the section of the main corresponding with a particular section of the conducting-pipe will be indicated, and the same may be located and stopped by removing a plug or plugs, testing the conducting-pipe, and excavating at the point where a defective joint or connection is found.

For the purpose of promoting the flow of gas which may leak from the main to and through the escape-pipe 4, and opposing any tendency of the same to gain access to buildings, cellars,

or subways adjacent to the main by permeating the surrounding earth, an exhauster of any suitable construction may be connected with the escape-pipe, so as to induce an upward draft or suction therein and in the leakage-pipes, which communicate therewith through the conducting-line 9. In this instance the exhauster illustrated is a contracted nozzle or jet, 17, which is directed upwardly within the escape-pipe 4, and connected to a pipe, 18, supplying steam or compressed air to the nozzle.

An exhaust fan or pump of any suitable construction, or a heated flue or chimney, may be substituted for the contracted nozzle, if deemed preferable, and gas from the main may be employed for heating the chimney. A lighted jet in the escape-pipe 4 may also serve for inducing upward draft therein.

It will be seen that the action of the upward draft produced by the exhauster tends to create a partial vacuum in the spaces within the loose packing-bodies 2, adjacent to the ends of the leakage-pipes, and thereby induces currents drawing the leakage of gas toward and into said pipes, in lieu of permitting the same, as otherwise might be the case, to work outwardly through the earth and gain access to adjacent structures or excavations. Stop-cocks may be located in the several escape-pipes 4 and in the conducting-line 9, which may be made continuous and connected with an exhauster at any point convenient for the application of steam. An upward current may thus be maintained throughout the length of the conducting-line by opening its stop-cocks, so as to place it continuously in communication with the exhauster, and closing those of the escape-pipes, except that with which the operated exhauster is connected, and when it is desired to investigate the location of possible leaks, the same may be detected by closing the stop-cocks of the conducting-line, so as to divide it into separate sections, and opening the cocks of the escape-pipes, which may then be severally tested, as before specified.

I claim herein as my invention—

1. The combination, with an underground gas-main, of a leakage-pipe leading from a point adjacent to the main to an escape-pipe having its discharge-opening at a point above the surface of the ground, and an exhauster connected with the escape-pipe and adapted to induce an upward current therein, substantially as set forth.

2. The combination, with an underground gas-main, of a line of conducting-pipes, a series of leakage-pipes, each leading from said conducting-pipe to a body of loose packing surrounding the main, an escape-pipe leading from the conducting-pipe to a point of discharge above the surface of the ground, and an exhauster connected with the escape-pipe and adapted to induce an upward current therein, substantially as set forth.

In testimony whereof I have hereunto set my hand.

GEO. WESTINGHOUSE, JR.

Witnesses:

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