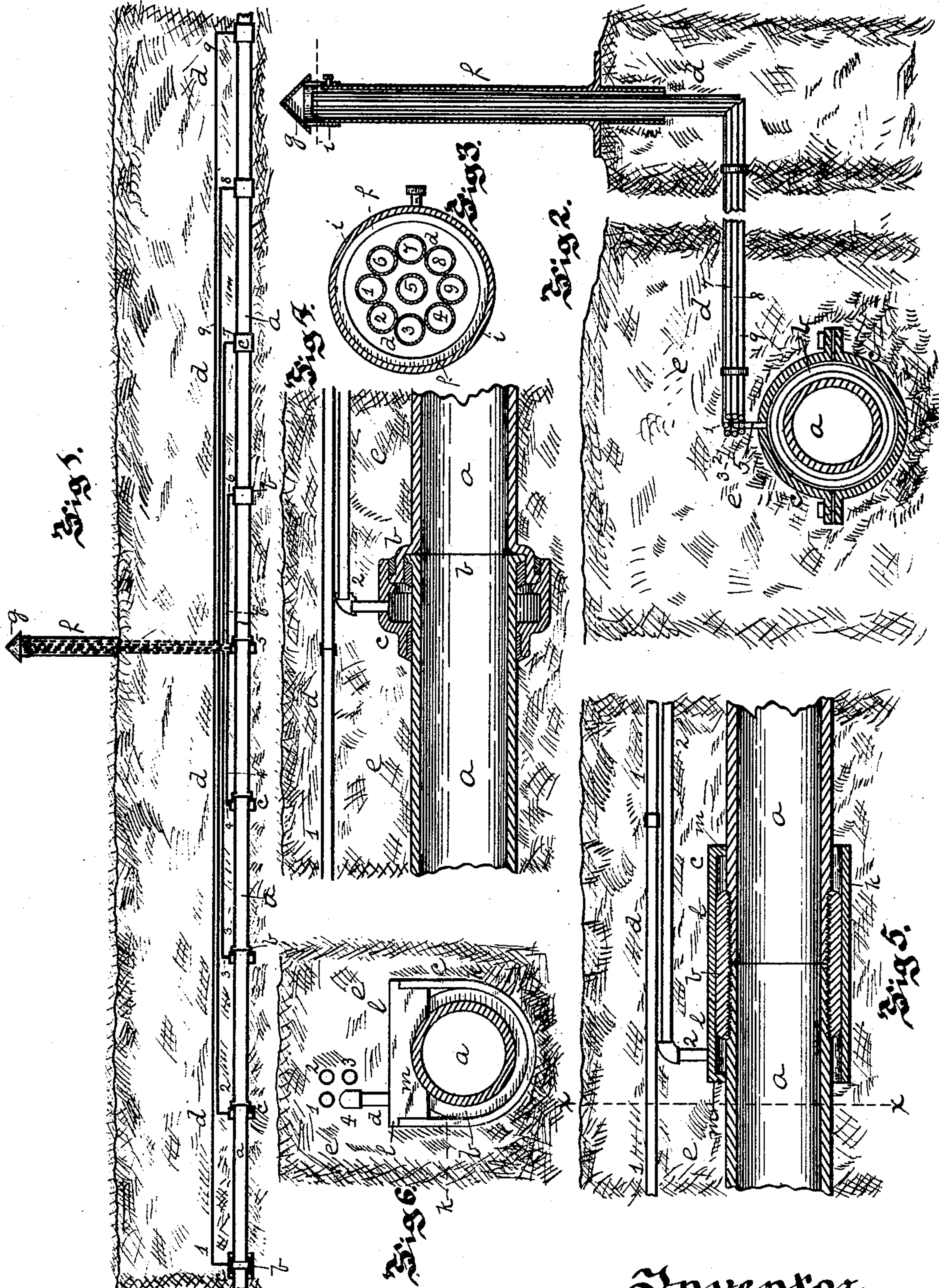


(No Model.)

J. I. KAY.  
GAS CONDUIT.

No. 329,568.

Patented Nov. 3, 1885.



Witnesses:  
J. E. Barnes.

Inventor.  
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# UNITED STATES PATENT OFFICE.

JAMES I. KAY, OF ALLEGHENY, PENNSYLVANIA.

## GAS-CONDUIT.

SPECIFICATION forming part of Letters Patent No. 329,568, dated November 3, 1885.

Application filed September 24, 1885. Serial No. 178,028. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES I. KAY, of Allegheny city, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Gas-Conduits; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to gas-conduits for conducting natural and other gases through the streets of cities and in other locations where there is liability of the gas leaking from the joints of the conduit and passing through the ground into adjacent buildings or sewers and becoming ignited and exploding, serious accidents having occurred from this cause in the gas-mains heretofore carried through the streets of cities and towns. Prior to my invention these gas-conduits have been formed of gas-mains consisting of lengths or sections of cast or wrought metal tubing connected by the ordinary socket-and-spigot joints, or by the ordinary threaded sockets, and having around these joints castings or like devices forming chambers to hold the gas escaping from the joints, and an ordinary leak-conduit formed of tubing running parallel with the main conduit and having communication with these chambers around the joint, any gas leaking through the joints passing first into these surrounding chambers, and thence through the leak-conduit either above the surface of the ground, where it is permitted to escape, or to a suitable holder, in which the gas is retained at low pressure, the escaping gas in the latter case being utilized. In these conduits as so formed objections have been found, first, because of the expense of the auxiliary or leak conduit, as it was necessarily made large to carry away the gas leaking from all joints in the line and communicating with it, and the cost of making connections between this same line and the several casings or chambers at the joints was large; and, second, for the reason that, though this auxiliary line acted to carry off the gas leaking from the main conduit, yet in case of serious leak in the main conduit there was no means of testing each particular joint to discover the location of the leak, and it was necessary to open the entire line in order to locate the joint which required repair.

The object of my invention is to overcome

these difficulties in gas-lines by providing a less expensive gas-conduit, and at the same time providing means for testing each particular joint without the necessity of opening any portion of the line.

In my improved conduit I employ a suitable casing or other means of forming a chamber or space around each particular joint, and from each particular joint I arrange a separate and distinct line of tubing forming a leak-pipe, which extends through the same trench as the main line, these separate leak-pipes running parallel with each other, and being carried off together at suitable intervals to the surface of the ground within a suitable hollow post or standard, from which any leaking gas is permitted to escape, and in case of leakage at any one of the joints the leak-pipe leading from that particular joint will provide means for the escape of the gas, and will also enable the inspector to at once locate the joint which is leaking, so that he can repair that joint without opening any other part of the trench within which the main conduit lies.

To enable others skilled in the art to employ my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a vertical section of the trench within which the gas-line is laid. Fig. 2 is a cross-section, partly in full lines, of the same. Fig. 3 is a cross-section of the ventilating-post. Fig. 4 is an enlarged longitudinal section of an ordinary joint and chamber. Fig. 5 is a like view of a chamber of improved form; and Fig. 6 is a cross-section on the line *xx*, Fig. 5.

Like letters of reference indicate like parts in each.

The gas-main or main conduit *a* is formed of wrought or cast metal pipe, as desired, the several lengths of pipe being connected either by the ordinary screw-socket, by the ordinary bowl-and-spigot joint, or by any other suitable joint, as at *b*. At each joint *b* is formed a chamber adapted to collect any gas leaking from said joint, this chamber being in the form of a sleeve or casing, as at *c*, the sleeve or casing fitting either entirely or partially around the joint, and being properly calked in such manner as to form a tight joint with the tubing of the gas-main, or a chamber of other suitable form being constructed in any



desirable manner—such, for instance, as a covered trough fitting around the gas-main at the joint, as shown in Figs. 5 and 6. Leading from this chamber or space *c* is a line of tubing forming a leak-pipe, *d*, this leak-pipe extending along within the same trench, *e*, as the gas-main *a* to a suitable point from which it is desired to conduct it to the surface of the ground to permit the escape of the gas. A separate leak-pipe, *d*, leads from the chamber at each joint of the gas-main, these several leak-pipes running parallel with each other within the trench, until a suitable number for inclosing within a hollow post or standard is obtained, when the several separate leak-pipes are conducted together to the surface of the ground and inclosed within a suitable hollow post, from which the gas which leaks from any of the joints may escape. Where, as shown in the drawings, the underground gas-main extends along in the trench *e*, and it is desired to ventilate from five to ten of the several joints through the same ventilating-post, *f*, the leak-pipe leading from the joint at or near the center of the portion of the gas-conduit ventilated by said post (marked, for example, 5) leads directly to the post *f*, and the separate leak-pipes communicating with the chambers around the joints on one side of said central joint (marked 1, 2, 3, and 4) extend along the trench above the main conduit to said central joint, the lines running parallel with each other, and the separate leak-pipes on the other side of the central joint (marked 6, 7, 8, and 9) running along the gas-main until they reach the central joint, these several leak-pipes being carried along in the same trench with the gas-main, and where there are two or more of these separate leak-pipes running parallel with each other the several pipes being held together by suitable bands or wires, if desired. The nine leak-pipes then extend together out to the ventilating-post *f*, and up through said post to the surface of the ground, or to whatever height above it is desired. Where the gas-main is in the center of the street, or at any distance from the point at which the ventilating-post *f* is placed, the several separate leak-pipes are carried together through a trench to the sidewalk, at which the ventilating-post is placed, and rise up through the post, as above described. Each leak-pipe is kept entirely separate, so that each pipe can be tested separately, and each pipe is identified by numbers or other suitable marks, so that it can be identified within the ventilating-post. The ventilating-post *f* is covered by a suitable cowl, *g*, to prevent the entrance of water, and may be opened at the point where the several lines of tubing terminate to obtain access thereto.

To obtain access to the separate ventilating-pipes within the post *f*, I prefer to carry the pipes to or nearly to the top thereof, and to make the cowl *g* removable, so that the inspector can more readily test them. For this

purpose I form at the base of the cowl a collar, *i*, which fits around the top of the post, and is secured thereto by a set-screw or locking device. These separate lines of tubing are carried in the manner above described from the separate chambers at several joints in the gas-main, the ventilating-posts being placed at intervals of from fifty to one hundred feet along the line, and the entire gas-conduit provided in this manner with means for carrying off any gas escaping from the joints.

In Figs. 5 and 6 are shown an improved form of leak-chamber, formed of a trough, *k*, within which the joints *b* rest, and over which is fitted the cover-plate *l*, this plate having the end pieces, *m*, the lower faces of which conform in shape to the outer face of the gas-main, the cover-plate and end pieces, in conjunction with the trough, forming a chamber above the joint, into which any gas leaking therefrom will rise, and from which it can escape through the leak-pipe. The ends of the trough may be closed by cement or clay, but this is not necessary. At suitable periods the leak-pipes opening into the several ventilating-posts are tested by a torch or other suitable means, the inspector testing each separate leak-pipe rising within the ventilating-post, and in case a serious leak is found the leak-pipe from which the gas is escaping is marked in such manner that he can at once locate the leaking joint, and by measuring the distance from the ventilating-pipe to that joint can open the gas-main at that joint and repair the leak without disturbing any other part of the gas-main. As the ventilating-pipes extend above the ground, no digging or opening of boxes or other work is necessary in order to test the several joints in the gas-line, and for this reason my improved conduit can be examined and kept in repair with much less labor than any other gas-conduit heretofore devised. As each separate leak-pipe leading from the joint is only required to carry off the gas leaking from that particular joint, it is evident that these lines of tubing can be formed of small pipe, a pipe from one-half to three-fourths inch inside diameter being large enough for the purpose; and as this tubing is much cheaper than the tubing necessarily employed where one auxiliary line communicates with several chambers around the joints of the main line, even though a greater length of tubing is required, the cost is less than the apparatus heretofore employed. As there is no connection between the several chambers around the joints, the expense of laying the line is much less than where the joints or connections have to be made between the auxiliary line and the several chambers surrounding the joints of the main line, as above described.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a gas-conduit, the combination, with an underground gas-main, of a leak-chamber at or around each joint, and a separate leak-



5 pipe extending from each chamber in the same trench with the gas-main, said several leak-pipes leading together above the surface of the ground, substantially as and for the purposes set forth.

10 2. In a gas-conduit, the combination, with an underground gas-main, of a leak-chamber at or around each joint, a separate leak-pipe extending from each chamber in the same trench with the gas-main, and a ventilating-post, said several leak-pipes leading together above the surface of the ground into said ventilating-post, substantially as and for the purposes set forth.

15 3. In a gas-conduit, the combination, with an

underground gas-main, of a ventilating-post having a removable cowl and a series of separate leak-pipes, each extending from a joint of the gas-main in the same trench with the main, the said pipes leading together above the surface of the ground and through said ventilating-post, substantially as and for the purposes set forth. 20

In testimony whereof I, the said JAMES I. KAY, have hereunto set my hand.

JAMES I. KAY.

Witnesses:

W. C. BARR,  
J. N. COOKE.