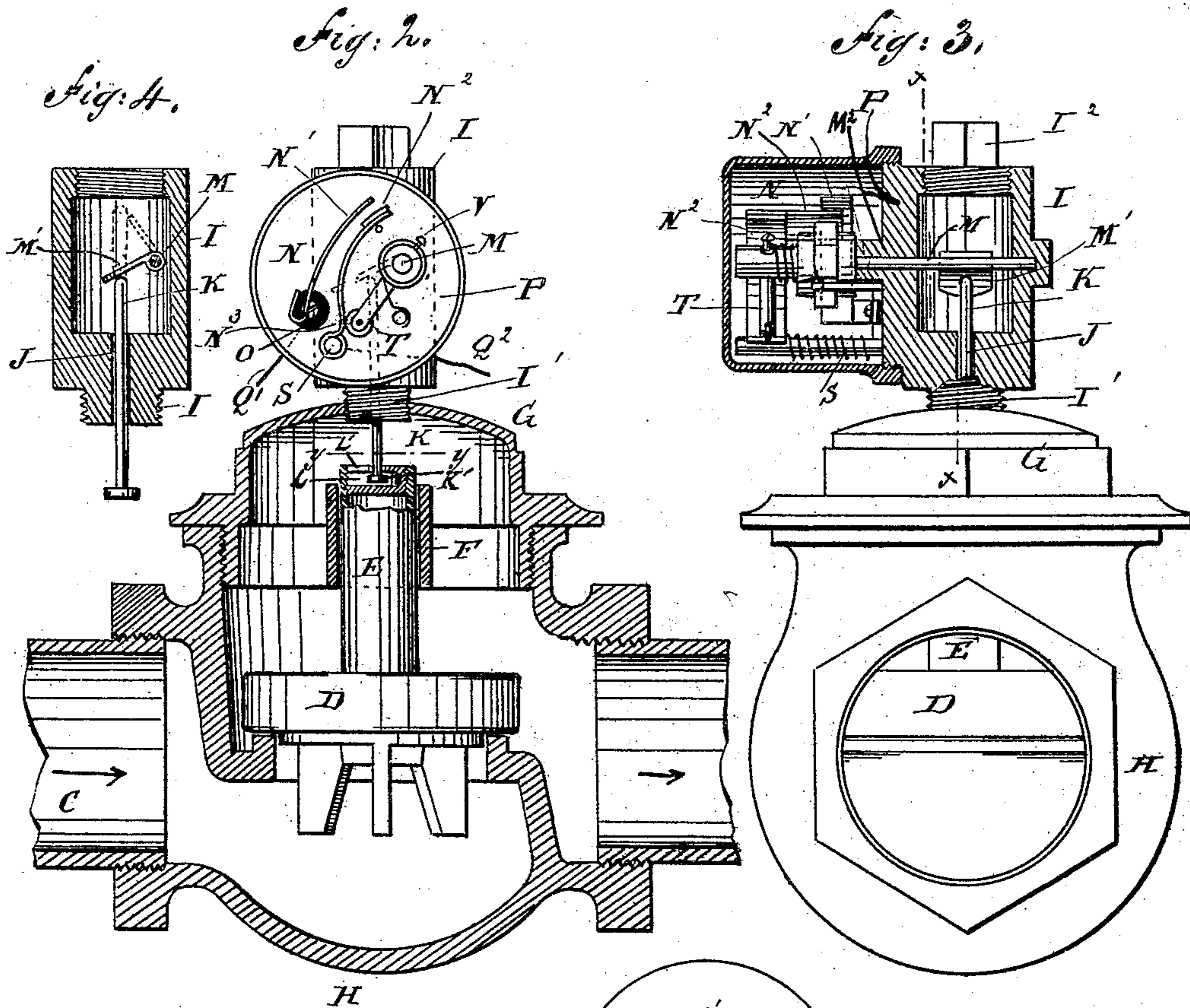
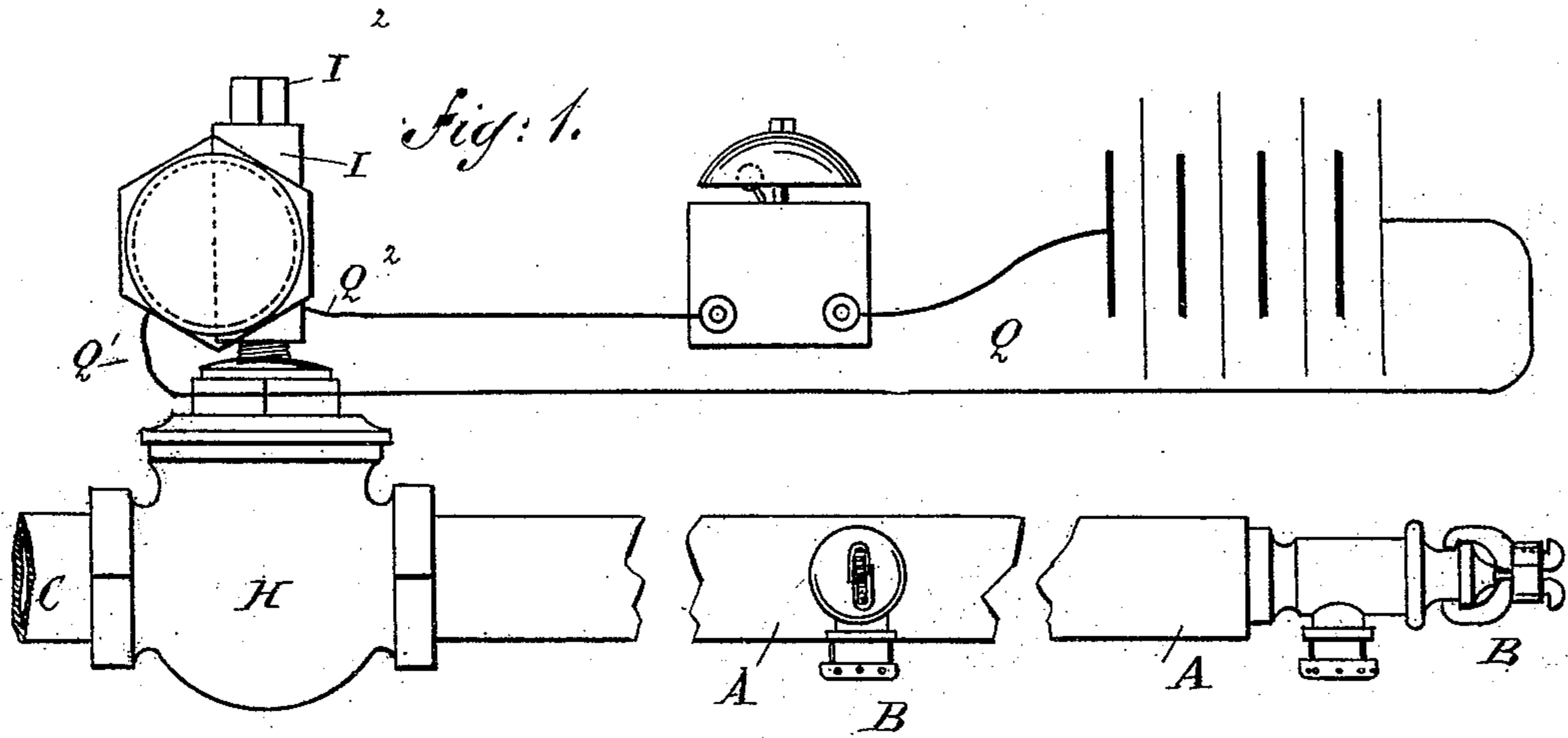


(No Model.)

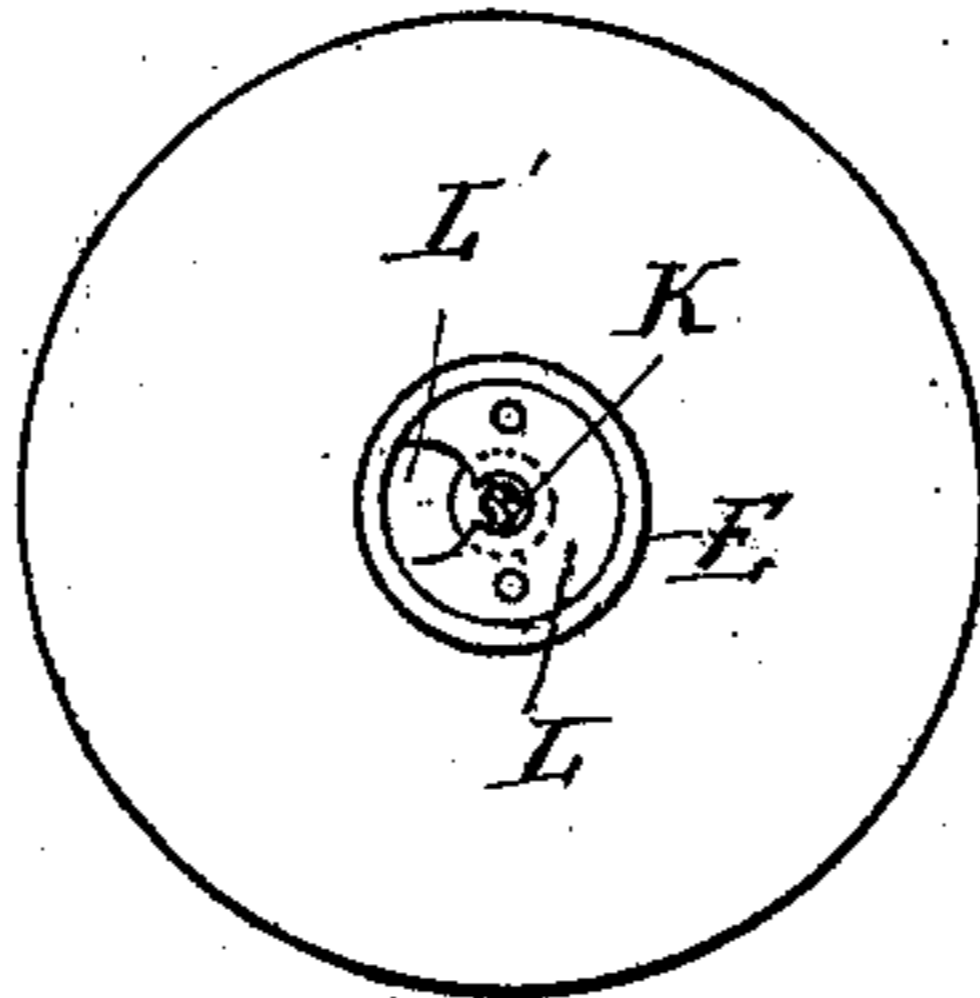
G. S. NEU.  
ELECTRIC LEAK OR FLOW DETECTOR.

No. 442,385.

Patented Dec. 9, 1890.



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

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## ELECTRIC LEAK OR FLOW DETECTOR.

SPECIFICATION forming part of Letters Patent No. 442,385, dated December 9, 1890.

Application filed March 20, 1890. Serial No. 344,644. (No model.)

*To all whom it may concern:*

Be it known that I, GUSTAVE S. NEU, a citizen of the United States, residing in the city, county, and State of New York, have invented  
5 a new and useful Improvement in Electric Leak or Flow Detectors, of which the following is a specification.

This invention relates to apparatus for automatically detecting the escape of fluids from  
10 conduits, particularly of water, from the closed supply-pipes of the automatic fire-extinguishing or "sprinkler" systems in common use in buildings, by causing the movement of the water in the pipe, due either to leakage or opening of the system accidentally or by  
15 fire, to operate a valve, which in turn closes an electric signaling-circuit and sounds an alarm or works an annunciator.

The object of my improvement is to provide an apparatus for this purpose which can be easily adjusted to pipes of different dimensions, and to secure greater sensibility and certainty of action than have heretofore been obtained.

25 In order that my invention may be clearly understood, I shall first describe in detail the mode in which the same may be carried into effect, and then point out its novel features in the claims.

30 Reference is to be had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a diagrammatic side elevation of a detector of the character described embodying my invention. Fig. 2 is an enlarged side view of the valve-operated circuit-closer of the same, the valve being in section and the circuit-closer-operating device in elevation, but its cover removed. Fig. 3 is an end  
40 view of the same, illustrating the circuit-closer-operating device in section and the valve in end elevation. Fig. 4 is a detail vertical section of a part of the same on the line X X, Fig. 3. Fig. 5 is a detail sectional plan  
45 view on the line Y Y, Fig. 2.

Like letters of reference designate corresponding parts in the several figures.

A designates part of what is known as a "wet-pipe" sprinkler system, in which the  
50 pipe normally contains the water under pressure,

which is automatically ejected when any of the sprinklers B are opened. Any leakage from the pipe system A or any escape of water therefrom due to fire or accident produces a movement of the water in  
55 the main water-supply pipe C, to detect which I introduce a vertically-working valve D, preferably of the well-known "check" pattern here shown, in which the stem E is guided in its vertical movement by an internal sleeve  
60 F, carried by a cap G, which is screwed into the top of the valve-casing H, so as to make the valve-chamber water-tight. This valve will normally remain tightly closed by gravity, owing to the sprinkler-pipes behind it being  
65 closed, but will rise immediately on a lessening of the pressure behind it by leakage or escape of water from the sprinkler-pipes. The top of the valve-cap G is here shown tapped and the downwardly-projecting neck I' of a  
70 hollow upright box I screwed thereto, which box is closed at the top by a screw-plug I<sup>2</sup>, and is formed with a vertical bore J, extending downward from its interior through its neck I', so as to make a water-tight communication between the said box and valve-  
75 chamber.

In the vertical bore J works and is guided a rod K, its lower end having a head K', which is held in a button-hole-slotted cavity  
80 L', formed in a nut L, which is screwed into the tubular upper end of the valve-stem E, as shown in Figs. 2 and 5, so that while the rod K is immovable vertically with respect to the valve-stem it can be readily coupled thereto  
85 or uncoupled therefrom, and will be allowed a sufficient lateral play to accommodate imperfections in fitting. The upper end of the rod K is adapted, when elevated by the valve, to press upward a certain distance and then  
90 pass, without further affecting, a cam-arm M' of a rock-shaft M, which is mounted transversely across the interior of the box I, and projects outward through a lateral stuffing-box M<sup>2</sup> on said box and operates a circuit-  
95 closer, as hereinafter described, the arrangement being such that whatever be the size and play of the valve to which the circuit-closer-operating rod K is applied by means of the adjustable nut-coupler L, the circuit-  
100

closer will be moved only enough to close the circuit, after which further play of the valve will have no effect upon, and hence not injure, the circuit-closer.

5 The circuit-closer N here shown is composed of a stationary spring-contact N', which is attached to an insulated post O on a covered base-plate P, by preference cast on the box I, and connected with one terminal Q' of  
10 the electric signaling-circuit Q, and a movable spring-actuated contact N<sup>2</sup>, which is pivoted to a post S upon said base-plate P, being either grounded therewith or connected with the other terminal Q<sup>2</sup>, and is arranged to be  
15 pressed against the other contact N' by an arm T of the projecting rock-shaft M, when the latter is turned by the rise of the valve D, as before described, so that the circuit will be closed and the annunciator dropped  
20 or the alarm sounded as long as the motion of the water in the pipe continues. The arm of the pivotal contact N<sup>2</sup> is made eccentric to the rock-shaft M for a short distance only from its pivoting-post S, as at N<sup>3</sup>, on which  
25 cam portion N<sup>3</sup> the friction-roller, mounted, by preference, on the rock-shaft arm T, acts, so that owing to the leverage of said arm T on the contact N<sup>2</sup>, and also that of the rod K on the interior cam-arm M', the slightest motion of water in the pipe, and hence of the  
30 valve, will throw the contact N<sup>2</sup> against the contact N' and close the circuit. The arm of the contact N<sup>2</sup> beyond the cam N<sup>3</sup> is shaped so as to be, when thus thrown, concentric  
35 with the rock-shaft M, whereby any excess of movement of the rock-shaft or valve will throw the contact N<sup>2</sup> no farther, and hence possible injury thereto will be avoided. The arm T of the rock-shaft M is secured thereto  
40 by a collar and set-screw V, so that it may be properly adjusted with respect to the other parts to throw the movable contact the required distance and no more.

I am aware that a swing-valve has heretofore  
45 been arranged to close an electric alarm-circuit by means of an operating rod or device; but such a valve will put a lateral strain on the operating device, so as to cause it to bind, and, further, from its swinging nature, will  
50 open and operate the circuit-closer when there is no movement of water in the pipe, unless held closed by a spring, which greatly impairs the sensitiveness of the apparatus.

I claim as new and desire to secure by Letters Patent—

1. The combination, with a fluid-conduit having a valve-port, of a flow-detecting valve working perpendicularly to said port and pro-

vided with a stem also guided perpendicularly to said port, a circuit-closer, and a circuit-closer-operating rod coupled to the valve-stem and working in alignment therewith, substantially as described.

2. The combination, with the flow-detecting valve having a threaded stem, of a nut screwing on said stem, an electric circuit-closer, and a circuit-closer-operating rod connected to said nut, substantially as set forth.

3. The combination, with the flow-detecting valve, of a nut moved thereby having a button-hole slot, a circuit-closer, and a circuit-closer-operating rod having a head held removably in said slot, substantially as set forth.

4. The combination, with the flow-detecting valve, of a nut moved thereby having a cavity and slot, a circuit-closer, and a circuit-closer-operating rod adapted to play laterally in said slot, but its head held against other movement in the cavity, substantially  
80 as set forth.

5. The combination, with the flow-detecting valve, of an electric circuit-closer, a circuit-closer-operating arm, and a device operated by the valve and arranged to throw said arm  
85 enough to close the circuit and then to pass said arm, substantially as set forth.

6. The combination, with the flow-detecting valve, of a fluid-tight box communicating with the valve-chamber, a valve-operated rod or device extending within said box, a rock-shaft mounted and projecting through said box and having an arm operated by said rod or device, an outside circuit-closer, and a circuit-closer-operating arm on the outer part of  
95 the rock-shaft, substantially as set forth.

7. The combination, with the flow-detecting valve, of a circuit-closer, a rock-shaft, and connections operated by the valve, a circuit-closer-operating arm on the rock-shaft, and  
100 means for adjusting said arm circumferentially on the rock-shaft, substantially as set forth.

8. The combination, with the flow-detecting valve, of a swinging arm T and connections operated by the valve, and a circuit-closer  
105 the movable contact of which is eccentric, as a cam, with respect to the pivot of the swinging arm T for a part of its length and concentric therewith for another part of its length,  
110 substantially as and for the purpose set forth.

GUSTAVE S. NEU. [L. S.]

Witnesses:

CLARENCE L. BURGER,  
EDWIN L. KALISH.