

No. 759,449.

PATENTED MAY 10, 1904.

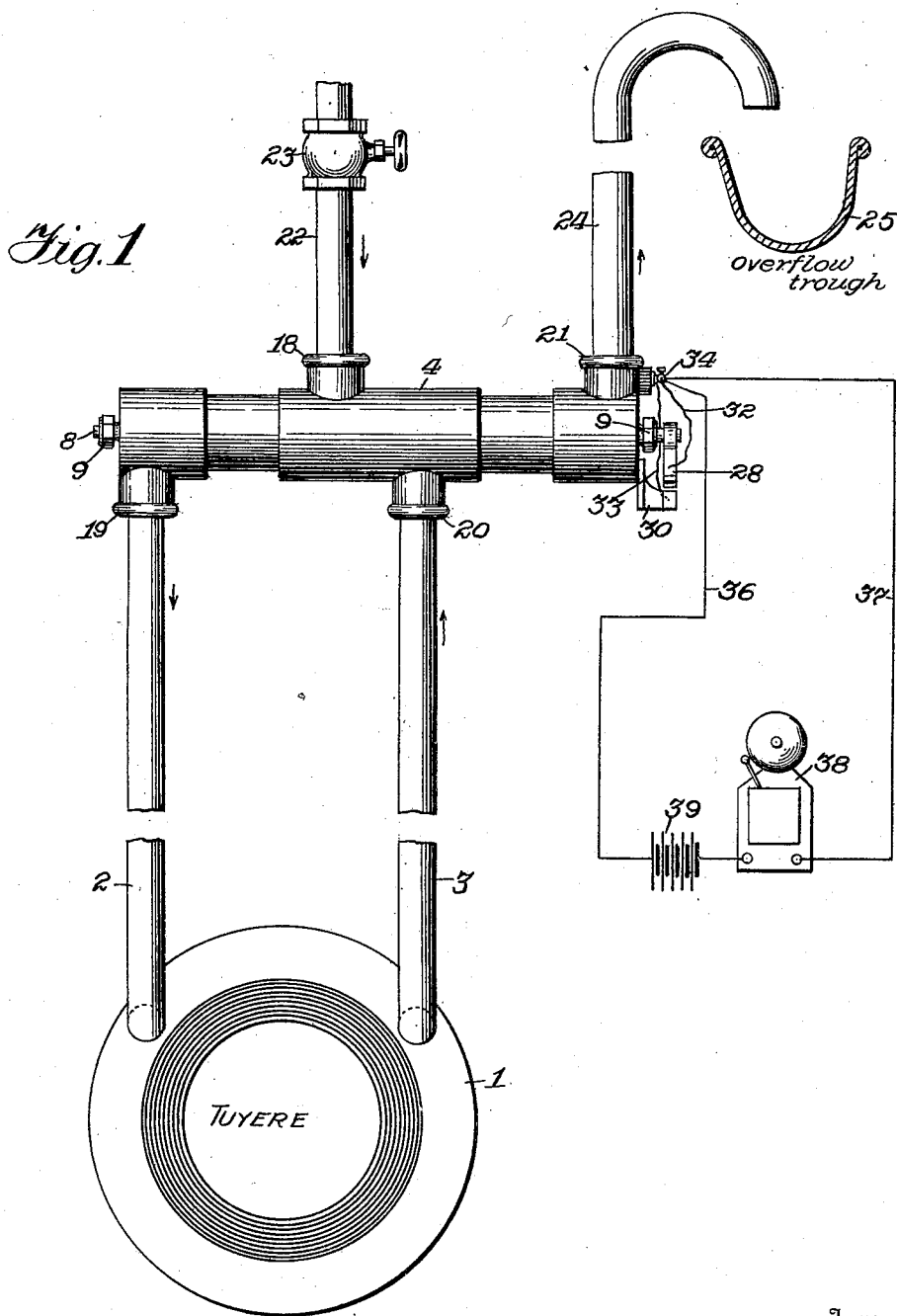
A. C. KLOMAN.

LEAK DETECTOR FOR TWYERS, COOLING BOXES, &c.

APPLICATION FILED AUG. 21, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses

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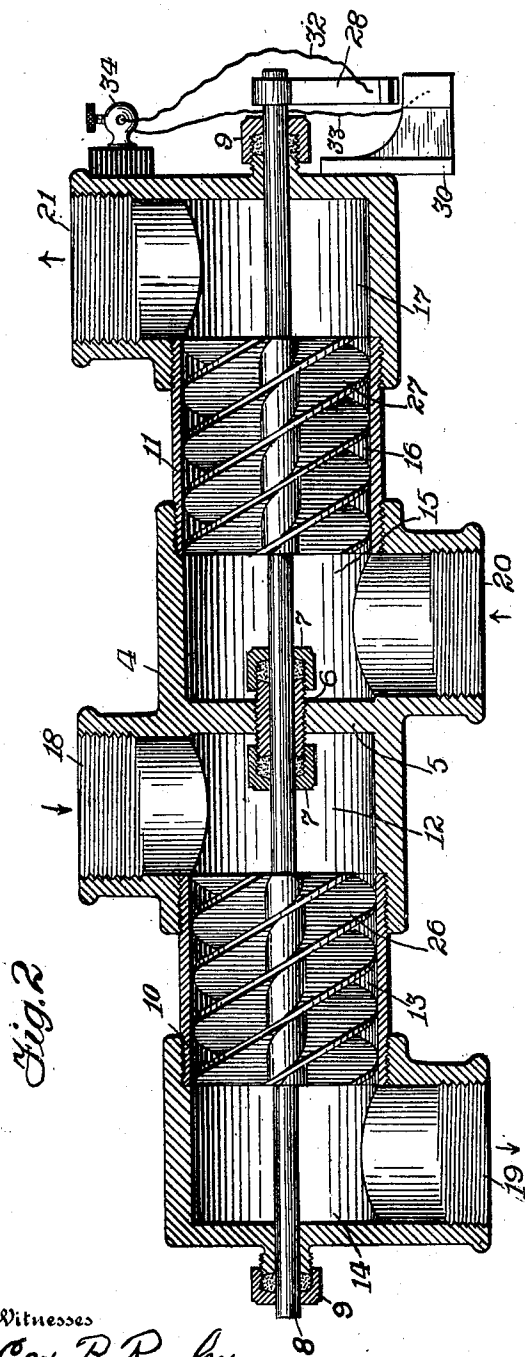


Fig. 2

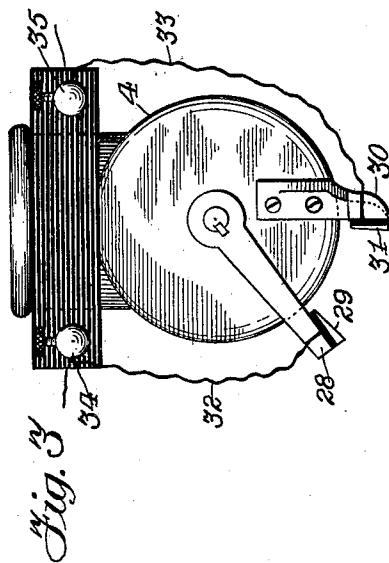


Fig. 3

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UNITED STATES PATENT OFFICE.

ANDREW C. KLOMAN, OF PITTSBURG, PENNSYLVANIA.

LEAK-DETECTOR FOR TWYERS, COOLING-BOXES, &c.

SPECIFICATION forming part of Letters Patent No. 759,449, dated May 10, 1904.

Application filed August 21, 1903. Serial No. 170,244. (No model.)

To all whom it may concern:

Be it known that I, ANDREW C. KLOMAN, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented or discovered new and useful Improvements in Leak-Detectors for Twyers, Cooling-Boxes, and the Like, of which the following is a specification.

My invention relates to devices for detecting leaks in twyers, bosh-plates, and cooling-boxes. As is well known, twyers, furnace-boshes, and other structures subjected to high heat have means for cooling them. These cooling means usually consist, in the case of twyers, of a water-circulation passage around the axis thereof, and, in the case of boshes, of iron, steel, or bronze boxes therein, through which water is caused to circulate. Frequently the twyers and cooling-boxes become burned through or cracked, so as to allow more or less of the water therein to escape into the furnace. It is frequently very difficult and sometimes impossible to determine which of the numerous cooling devices is the defective one. In many instances a large number of the devices must be removed, requiring in some instances the removal of portions of the wall of the furnace or other structure.

My invention has for its object to provide a means for detecting which one of the cooling devices is leaking as soon as the leak occurs.

Referring to the drawings, Figure 1 is an elevation of the general arrangement of my leak-detector. Fig. 2 is a longitudinal section through the motor-actuating part of my detector. Fig. 3 is an end elevation of the electric switch and its connections.

1 represents a twyer simply as a representation of a cooling device of any kind having a fluid circulation therethrough. 2 is the inlet thereto, and 3 the outlet therefrom.

4 is the detector-casing, having closed ends and a central transverse partition 5, in which is screwed a bearing 6, having a stuffing-box 7 at each end, one on each side of the partition. Extending axially through the casing is the shaft 8, having bearings in the bearing 6 and in the ends of the casings, which have stuffing-boxes 9 external thereto. The casing

is divided by said partition into two chambers 10 and 11, the former having the sections 12, 13, and 14 and the latter the sections 15, 16, and 17. The section 12 is provided with a lateral inlet 18 and the section 14 with a lateral outlet 19. The section 15 is provided with the lateral inlet 20 and the section 17 with the lateral outlet 21. The inlets 19 and 20 are connected, respectively, with the inlet 2 and the outlet 3 of the twyer or cooler. The inlet 18 is fed by the pipe 22, having the valve 23, and the outlet 21 is connected to the outlet or waste pipe 24, which discharges into the overflow-trough 25 or other suitable conduit.

The sections 13 and 16 are each provided with screws 26 and 27, secured rigidly to the shaft 8, both screws having their spirals in the same direction around the shaft. Each screw is located between the inlet and the outlet of the chamber in which it lies.

One end of the shaft 8 has secured thereto outside the casing 4 an arm 28, carrying at its free end the insulated contact 29. Secured to the casing 4 is a bracket 30, carrying an insulated stationary contact 31. Joined to the contacts 29 and 31 are the wires 32 and 33, which are secured to the binding-posts 34 and 35, the binding-posts being connected by wires 36 and 37 to the electric bell or alarm 38. 39 represents the battery for actuating the alarm. The alarm shown is illustrative merely of an alarm which may be of any type, whether audible or visual. The alarm may be other than electric, since the shaft 8 may cause the operation of any equivalent of the same.

The operation is as follows: The pipe 22 being connected to a source of water-supply, the valve 23 is opened. The water then flows from the pipe 22 through the inlet 18, the sections 12, 13, and 14 of the chamber 10 of the casing 4, the outlet 19, the twyer-inlet 2, the twyer or cooler 1, the twyer-outlet 3, the inlet 20 of the casing 4, the sections 15, 16, and 17 of the chamber 11 of the casing 4, the outlet 21, the waste-pipe 24, and the overflow-trough 25. It will be seen that the water will flow through the spirals of the screws 26 and 27, and as the spirals extend in the same di-

rection and the water flows through them in opposite directions the tendency of the water to turn the screw 26 will be counterbalanced by the tendency of the water in the screw 27, and as long as the flow through both screws does not cause a rotation of the shaft 8 the flow through the inlet 18 and outlet, and consequently through the screws, is the same, indicating that there is no leak in the cooler. 10 If, however, the cooler leaks, the flow through the inlet-screw 26 will be greater than through the outlet-screw 27, and the screw 26 will turn the shaft 8 and bring the two contacts 29 and 31 together, causing the actuation of the signal 38, which indicates what cooler is 15 leaking.

I have shown a screw-propeller as illustrative of one manner in which my invention may be constructed; but I may employ any 20 other form of rotary propeller.

I believe I am the first to accomplish the result sought by the above-described invention, and therefore, though I have described with considerable particularity a device for such a 25 result, I do not intend to be limited to the precise details thereof, but shall claim the same broadly.

My invention is capable to be used in any situation where leaks are liable to occur, 30 whether of water, air, or other liquid or gas.

Having described my invention, I claim—
1. A cooling device having a passage therein for a cooling fluid, and an inlet and an outlet therefor, a rotary device in said passage 35 constructed to rotate when the inflow is greater

than the outflow, and means whereby the rotation of the rotary device may be indicated.

2. A fluid-circulating device, means through which the fluid passes both before and after circulation through said device, and an indicator, said means having in the path of the fluid mechanism operable when the normal outflow from said device becomes relatively less than the normal inflow thereto to actuate the indicator. 40 45

3. A fluid-circulating device, two chambers in said device and in the path of fluid circulation, a rotary device in each chamber connected together and so constructed and arranged that when the inflow to said fluid-circulating 50 device exceeds the outflow, the said rotary device will rotate, and means whereby the rotation of the rotary device may be indicated.

4. A fluid-circulating device, a chamber on each side of said device and in the path of 55 fluid circulation, a screw in each chamber through whose spirals the fluid passes, the spirals being so arranged and constructed that when the outflow and inflow of fluid are the same the screws are stationary, and when 60 inflow exceeds the outflow they rotate, and an indicator actuated by the rotation of the screws.

Signed at Pittsburg, Pennsylvania, this 18th day of August, 1903.

ANDREW C. KLOMAN.

Witnesses:

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