A. GOLDSTEIN.

TEMPERATURE ALARM.

APPLICATION FILED MAR. 28, 1910.

981,996. Patented Jan. 17, 1911

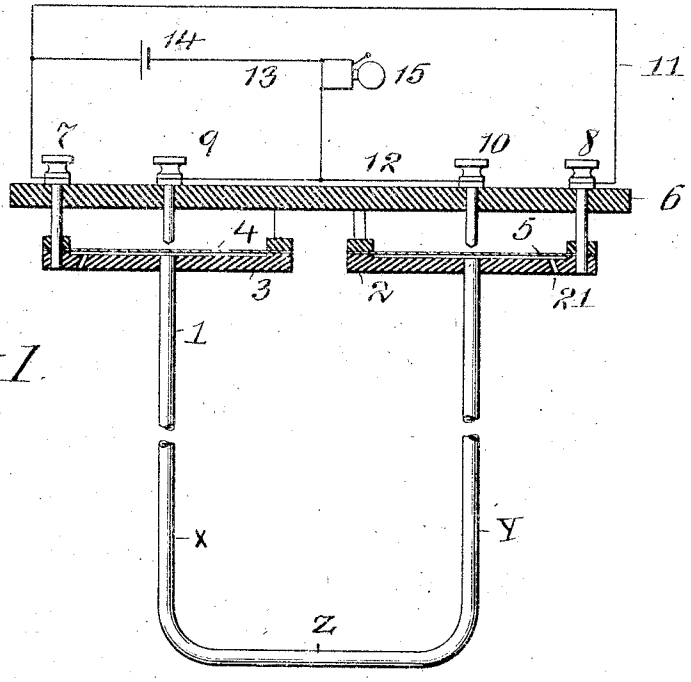

Fig. 1.

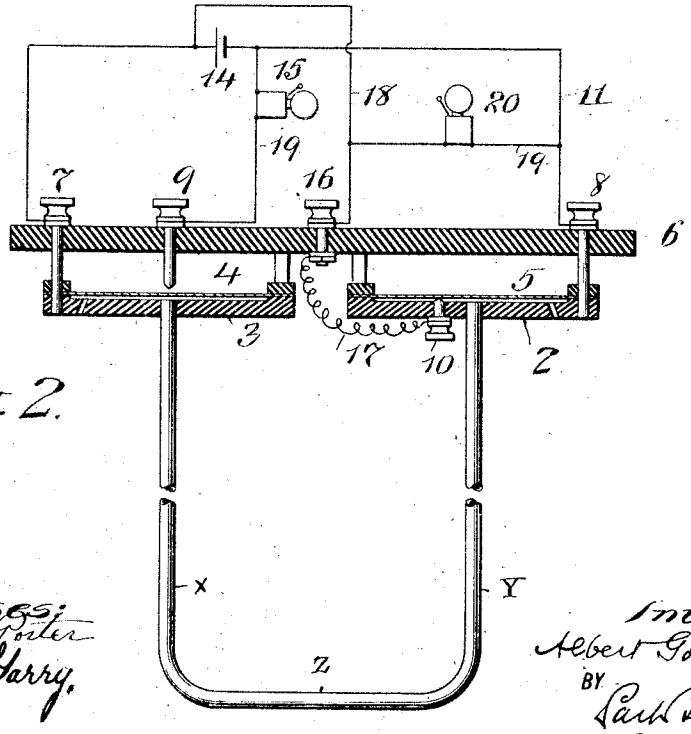

Fig. 2.

Witnesses:
Gertrude T. Porter
May T. McGarry.

Inventor
Albert Goldstein
BY
Paul Bryan
His ATTORNEY

UNITED STATES PATENT OFFICE.

ALBERT GOLDSTEIN, OF NEW YORK, N. Y., ASSIGNOR TO INTERNATIONAL ELECTRIC PROTECTION COMPANY, A CORPORATION OF NEW YORK.

TEMPERATURE-ALARM.

981,996. Specification of Letters Patent. Patented Jan. 17, 1911.

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To all whom it may concern:

Be it known that I, ALBERT GOLDSTEIN, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a certain new and useful Improvement in Temperature-Alarms, of which the following is a specification.

The invention relates to that type of alarms in which an increase of temperature in the room or other locality to be protected acts upon a body of air confined in a pipe of small diameter disposed along the wall or ceiling of said room, to cause said air to act upon a diaphragm, and so to control an electrical circuit including an alarm device.

The invention consists in the construction whereby the device will operate despite a break in said pipe or a choking thereof at any point along its length.

In the accompanying drawing—Figure 1 is a sectional view, showing the pipe in combination with two diaphragms, the construction being such as that upon the closing of a local circuit by either one or both of said diaphragms, the alarm is caused to sound. Fig. 2 is a similar view, showing a modified form of the device in which each diaphragm operates a separate alarm device.

Similar numbers of reference indicate like parts.

1 is the pipe which is usually of metal, having a bore of about 1/20 of an inch in diameter, and of any desired length. The ends of the pipe are received in plates 2, 3 of insulating material, on which are supported the metal diaphragms 4, 5—air chambers as thin as possible being formed between said diaphragms and said plates. The plates 2, 3 may be supported from a platform 6 of insulating material, through which extend two binding posts 7 and 8 which respectively are electrically connected to the diaphragms 4, 5. Also passing through the platform are binding posts 9, 10, the ends of which extend downward into proximity to the diaphragms 4, 5. In Fig. 1 the binding posts 7 and 8 are connected by the wire 11, and the binding posts 9, 10 are connected by the wire 12. Extending between wires 11 and 12 is a shunt 13 which includes a battery 14 and any suitable alarm mechanism, such as a bell 15.

In the modified form of my device shown in Fig. 2, the binding post 10 instead of passing through the platform 6 projects upwardly through the supporting plate 2 and is normally in contact with the diaphragm 5. Another binding post 16 passing through platform 6 is connected by wire 17 to binding post 10. The battery 14 is interposed in the wire 11 which connects binding posts 7 and 8. Binding post 16 connects by wire 18 to a point on wire 11 between battery 14 and binding post 7. Binding post 9 connects by wire 19 to a point on wire 11 on the opposite side of battery 14 and includes an alarm bell 15. A shunt 19 extends between wire 16 and wire 11 and includes another bell 20. In the supporting plates 2 and 3 are formed vent holes 21.

The operation of the device shown in Fig. 1 is as follows: Normally upon increase of surrounding temperature, the air in pipe 1 is quickly expanded, producing an impulse which acts upon diaphragms 4 and 5. In rising, said diaphragms complete circuit from battery 14 to binding post 7, diaphragm 4, binding post 9, to bell 15 and back to battery, and from battery 14, by wire 11, to binding post 8, diaphragm 5, post 10, wire 12, bell 15 and back to battery. If, however, a break should occur in the pipe at any point, or if the pipe in any way should become choked at such point, then on one or the other side of the break or choke there will always be a length of pipe sufficiently great to provide a body of air which will operate the diaphragm communicating therewith. In the case of a break, the frictional resistance to the escape of air from the ruptured end of the longer portion of the pipe will be sufficient to cause the impulse acting on the diaphragm to be strong enough to operate the same: while in the case of a choke, the air in the longer portion of the pipe still remains confined. Thus, to illustrate, if the brake occurs at the point X in Fig. 1, then the length of pipe between the point X and the diaphragm 5 will contain the body of air which acts on the diaphragm 5. Similarly, if the break should occur at the point Y, then the operating part of the pipe would extend from Y to the diaphragm 4, and hence diaphragm 4 would be acted upon. On the other hand, if the break should occur at the point Z exactly in the middle of the pipe, then the bodies of air in the two parts of the pipe on opposite sides of the break would actuate

both diaphragms 4 and 5. Hence no matter where the break or choke occurs, the alarm 15 is sounded by reason of the closing of its circuit by either one or both of the diaphragms, as the case may be.

In the modified form of the device shown in Fig. 2, the diaphragm 4 is raised by the air impulse in pipe 1 to close contact with the binding post 9, thus establishing circuit from battery 14, to binding post 7, diaphragm 4, post 9, and alarm bell 15. On the other hand, diaphragm 5 normally closes circuit to binding post 10, and this circuit proceeds from battery 14, by wire 18, to binding post 16, wire 17, binding post 10, diaphragm 5, post 8, wire 11, and so back to battery. This short-circuits the bell 20. When the diaphragm 5 is caused by the air impulse to move out of contact with post 10, the short-circuit is broken, and the bell circuit then proceeds from battery 14, by wire 18, wire 19, bell 20, and wire 11 back to battery, with the result that the bell is sounded.

It will be seen that diaphragm 4 sounds bell 15 and diaphragm 5 sounds bell 20. When the break or choke comes, for example, at Z in the pipe 1, for the reasons already explained in connection with Fig. 1, both diaphragms will be operated by the rise in surrounding temperature, and both bells will sound. But if the break takes place at X, then only the diaphragm 5 will be operated and in such case the bell 20 will sound, whereas if the break occurs at Y, only the diaphragm 4 will be operated, and hence only the bell 15 will sound. By this arrangement, therefore, the location of the break can be approximately determined.

I claim:

1. A temperature alarm apparatus comprising a pipe in loop form having open ends, diaphragms respectively disposed in front of said ends, terminals in proximity to said diaphragms, and means for electrically indicating a change in the contact relation between each of said diaphragms and its associated terminal.

2. A temperature alarm apparatus comprising a pipe in loop form having open ends, diaphragms respectively disposed in front of said ends, terminals in proximity to said diaphragms, and two electrical circuits each including a terminal, a diaphragm and an alarm device.

3. A temperature alarm apparatus comprising a pipe in loop form having open ends, diaphragms respectively disposed in front of said ends, terminals in proximity to said diaphragms, and two electrical circuits each including a terminal, a diaphragm and an alarm device, the said terminals being adjusted normally to open circuit at one diaphragm and close circuit at the other diaphragm.

In testimony whereof I have affixed my signature in presence of two witnesses.

ALBERT GOLDSTEIN.

Witnesses:

GERTRUDE T. PORTER,

MAY T. MCGARRY.