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TEMPERATURE ALARM DEVICE.  
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966,904.

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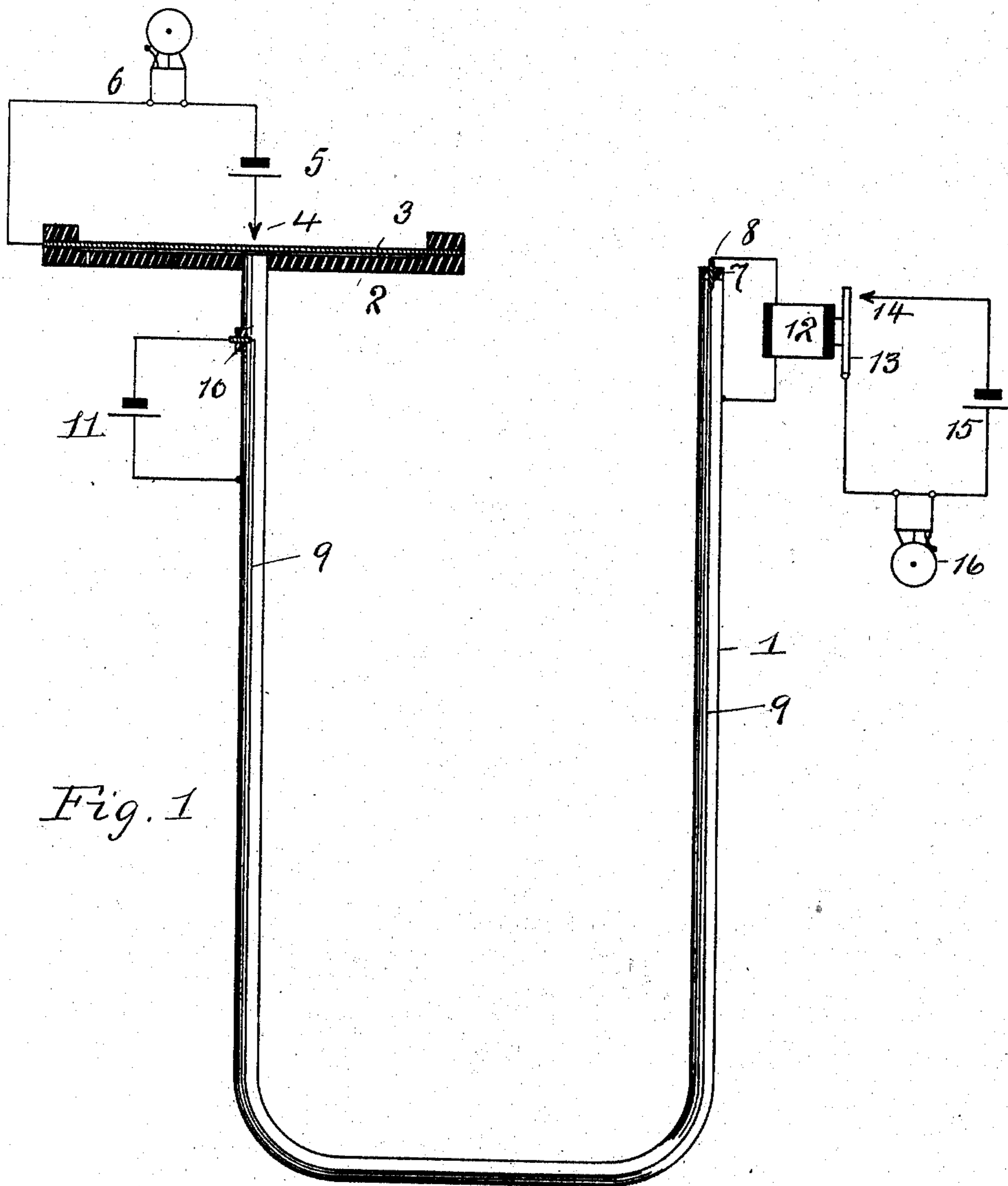


Fig. 1

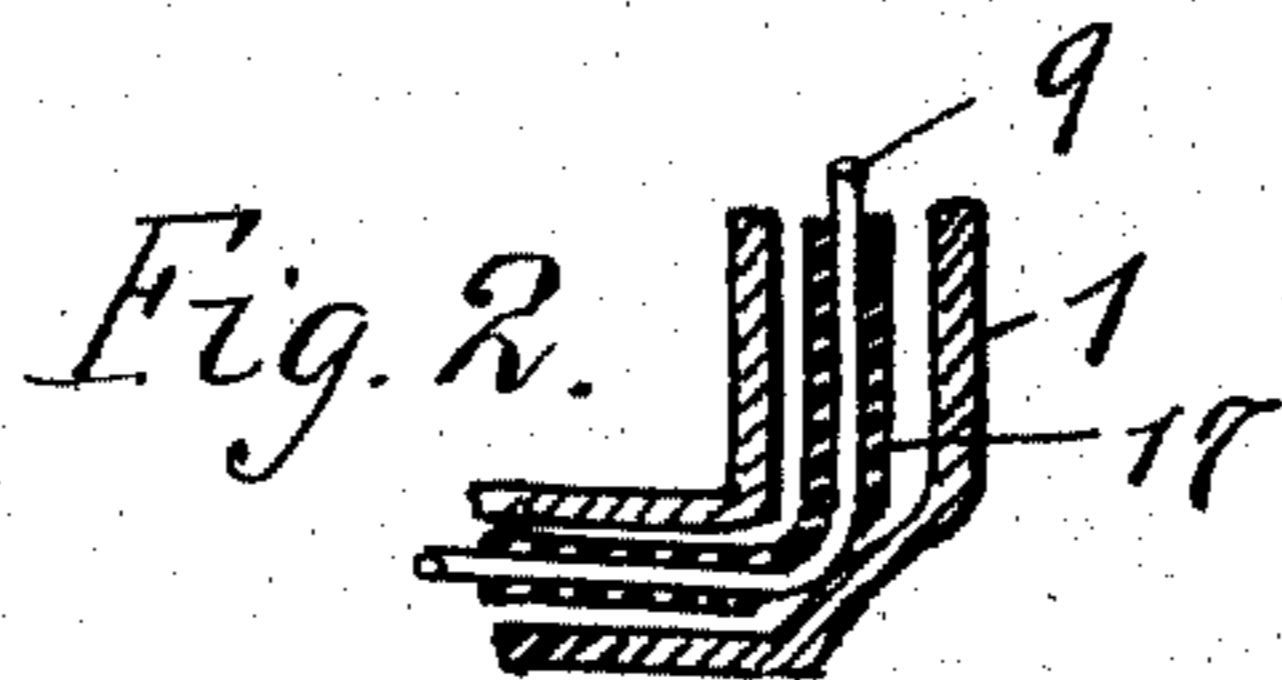


Fig. 2.

Witnesses:  
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By his Attorney  
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# UNITED STATES PATENT OFFICE.

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## TEMPERATURE ALARM DEVICE.

966,904.

Specification of Letters Patent.

Patented Aug. 9, 1910.

Application filed March 28, 1910. Serial No. 551,819.

*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 Alarm Devices, of which the following is a specification.

The invention relates to that type of temperature alarm devices in which is comprised a pipe and an alarm actuated by the impulse produced by a rise in external temperature, in the air confined in said pipe.

The object of the invention is to cause an alarm to be sounded in event of a break in said pipe.

The invention consists in a line conductor within said pipe, and an electrical alarm device so arranged as to be actuated upon the rupture of said conductor.

In the accompanying drawings—Figure 1 shows the mechanical parts of my temperature alarm in section, and the electrical parts diagrammatically. Fig. 2 is a sectional view of a part of the pipe and insulated wire, illustrating the short-circuiting of wire and pipe due to a bend and compression of said pipe.

Similar numbers of reference indicate like parts.

The pipe 1 is of metal and may have a bore about 1/20 of an inch in diameter. It may be of indefinite length to extend around or throughout the space to be protected against rise of temperature. One end of the pipe is open and is received and supported in a plate 2 of insulating material. Above the open end of the pipe and preferably as close thereto as possible is supported a metal diaphragm 3, between which and the plate 2 a thin air space intervenes. Above the diaphragm is a contact 4 which is in circuit with a local battery 5, an alarm device 6 (here an electric bell) and with the diaphragm itself. The other end of the pipe 1 is closed with a plug 7 of insulating material through which extends a metal terminal 8, to which is connected one end of the wire 9 which is covered with insulating material 17, and extends entirely through the pipe 1, to a point near the plate 2, and then is connected to a terminal 10 which extends through an insulating bushing and is

connected to one pole of a battery 11. The other pole of said battery is connected to the pipe 1. The metal terminal 8 is also connected to the pipe 1, through the coil of a magnet 12, which controls a switch 13. Said switch at contact 14 makes and breaks a local circuit including a battery 15 and alarm device 16.

The pipe 1 operates in the usual way; any predetermined rise in temperature producing an impulse or wave in the body of confined air, which acts upon the diaphragm 3, causing said diaphragm to meet contact 4 and so establish circuit to alarm 6. The object of the inclosed wire 9 and its electrical attachments is to give warning of a break in the pipe which would obviously prevent the above-described operation. Normally the circuit from battery 11 proceeds to wire 9, magnet 12, pipe 1, and so back to battery. As a consequence, magnet 12 is energized and actuates its lever 13 to open the local circuit at 14. Should, however, a break occur in the pipe and consequently in its contained wire 9, magnet 12 at once fails, its switch 13 closes circuit at 14 and the alarm 16 is continuously sounded so long as the break continues.

If abnormal contact should take place between wire 9 and pipe 1, as, for example, when the pipe is flattened at some point by external pressure, or by other deformation of the pipe, as illustrated, for example, in Fig. 2, or if it should occur through moisture entering the pipe and accumulating as liquid trapped at a bend, then in the first two cases, the insulation of the wire may become impaired, especially by the spreading of the threads if the covering be of silk. In such event, electrical contact is established between pipe 1 and wire 9, thus short-circuiting the magnet 12, and so allowing the circuit including alarm 16 to be closed. Similar short-circuiting is produced by trapped water if it can penetrate the insulation on wire 9. It is, therefore, preferable to make the insulating covering of wire 9 of silk or other material easily broken or penetrated, in order to insure the operation of the alarm under the conditions before stated. A choking of the pipe which, if taken place near the diaphragm, would, if sufficient to render the device inoperative as

a heat alarm, also cause the short-circuiting of pipe and wire, is thus indicated by the sounding of alarm 16.

I claim:

- 5 1. A temperature alarm device comprising a pipe, an alarm actuated by impulses produced in the air therein, a wire within said pipe, and an electrical alarm actuated upon the rupture of said wire.
- 10 2. A temperature alarm device comprising a pipe, a diaphragm supported in front of an open end of said pipe, an alarm circuit controlled by said diaphragm, a wire within said pipe, a source of current, a circuit closer

in circuit with said conductor, and an alarm 15 circuit controlled by said circuit closer.

3. A temperature alarm device comprising a pipe, an alarm actuated by impulses produced in the air therein, a wire covered with insulating material within said pipe, and an 20 electrical alarm operated by abnormal short-circuiting between said wire and said pipe.

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

ALBERT GOLDSTEIN.

Witnesses:

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