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ELECTRICAL SIGNALING AND ALARM APPARATUS.

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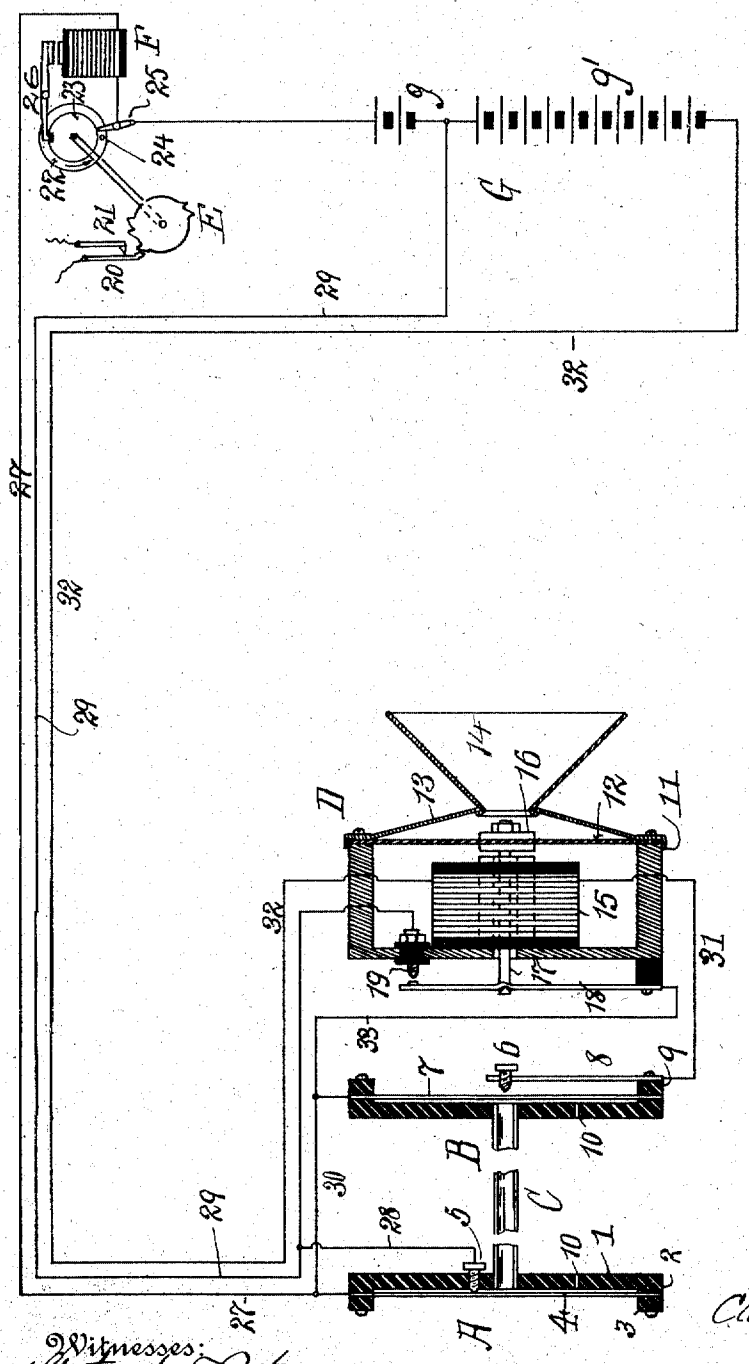
984,154. Patented Feb. 14, 1911.



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UNITED STATES PATENT OFFICE.

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ELECTRICAL SIGNALING AND ALARM APPARATUS.

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To all whom it may concern:

Be it known that I, CLARK H. POOL, 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 Electrical Signaling and Alarm Apparatus, of which the following is a specification.

The invention relates to an apparatus for sending signals to a distant station, from a place to be protected, and also giving an alarm.

The principle of the invention is as follows: An electrically controlled signaling device is normally in automatic test circuit, upon which the strength of current is not sufficient to operate said device, and an additional source of current, together with an alarm, are provided also in a circuit with said signaling device, but which last-named circuit, however, is normally kept open. When the alarm is to be sent, means, preferably automatic, (such as thermostats affected by a rise in temperature of the surrounding atmosphere) operate to cut in the additional source of current and the alarm—in consequence of which both the signaling device and the alarm are set in operation; the one to send signals, the other (if, as here shown, of the sound producing type) to produce a loud noise.

The accompanying drawing exhibits my invention in electrical diagram.

A and B are thermostatic circuit controllers, called hereafter for brevity "thermostats." The thermostat A comprises a case 1, preferably of insulating material, between the flange 2 of which and a ring 3, is clamped a metallic diaphragm 4. In the bottom of the case is an adjustable contact-screw 5 which passes through the air chamber formed between the diaphragm and bottom, and is normally in contact with said diaphragm. The thermostat B is similarly constructed except that the adjustable contact-screw 6 is disposed on the outer side of the diaphragm 7 and is carried by a spring 8, secured to the clamping ring 9. The screw 6 is adjusted normally out of contact with diaphragm 7. The air chambers formed between case and diaphragm in both thermostats are connected by an air pipe C, which may be of small diameter and indefinite length, and led around the place to be protected, so as to be exposed to rise of atmospheric temperature. In the bottoms of the cases are provided the usual air vents 10.

D is an alarm device and comprises a cup-shaped case 11, which may be of magnetic material, having its open end closed by a metal diaphragm 12, secured in place by the frusto-conical ring 13, in which is mounted a sound magnifying cone or trumpet 14. Within case 11 is secured an electro-magnet 15, to the armature 16 of which is attached a diaphragm 12. Said diaphragm carries a brass rod 17 which moves freely in an opening in the case bottom. A lug on said rod enters a notch in a contact spring 18, secured to the case, but insulated therefrom. The end of spring 18 comes opposite to an adjustable contact-screw 19 which passes through an insulating bushing in the case bottom. Magnet 15 is normally deënergized, and the contacts 18 and 19 are separated.

E is a code wheel controlling the spring contacts 20, 21 to transmit make and break signals to any suitable indicating device—not shown—located at a distant station. On the shaft of said wheel are two disks 22, 23. The disk 22 has a pin 24 on its face, which pin at each rotation of the disk operates the pivoted circuit breaking switch 25. The disk 23 has a notch in its rim to receive the bent over end of the pivoted detent 26 which is operated by electro-magnet E.

At G is a split battery, one section g of which is preferably weaker than the remaining section g'. An automatic test—and hence normally closed—circuit proceeds from one pole of the section g of split battery G, to switch 25, magnet F, wire 27, to diaphragm 4 of thermostat A, to contact-screw 5, wire 28, wire 29, to the other pole of battery section g. The strength of the current from section g is to be sufficient to keep this circuit, as stated, under automatic test, but not sufficient to energize magnet F to cause said magnet to raise the detent 26, and so free the signaling device. An additional source of current is provided, namely, section g' of battery B. In order to cut in this additional source, which is preferably stronger than the source supplying the automatic test circuit, and also the audible alarm device D, a lead proceeds from one pole of section g, to switch 25, magnet F, wire 27, wire 30, diaphragm 7 of thermostat B, contact-screw 6 (normally

out of contact with said diaphragm) spring 8, wire 13, magnet 15 in alarm device D, and by wire 32 to opposite pole of section g'; or, in other words, the entire battery G is connected. A lead is also established by way of wire 33, to spring 18, contact 19 and wire 29, to a point between the two connected battery sections g, g'.

The operation is as follows: When the atmospheric temperature in the neighborhood of thermostats A, B increases at a predetermined fixed rate, the air in the chambers closed by the diaphragms of said thermostats, moves diaphragm 4 of thermostat A out of contact with screw 5 and diaphragm 7 of thermostat B into contact with screw 6. Magnet F now receives the full battery current and moves the detent 26 out of the notch in disk 23. The code wheel E is now free to be rotated by the usual clockwork mechanism to make and break circuit at contacts 20, 21, and so transmit a signal. The pin 24 on disk 22 meets switch 25 and holds it open. Hence when the notch in disk 23 comes under the bent over end of detent 26, said end engages again in the notch in disk 23, and the rotation of the signal apparatus is stopped. By reason of the passage of the whole battery current through magnet 15, said magnet attracts its armature 16 against the resiliency of diaphragm 12, and, at the same time, moves the lug at the end of rod 17 away from the notch in spring 18. When the switch 25 is opened by the pin 24 to interrupt the circuit, as above described, the diaphragm 12 is released and swings back beyond its neutral position, thus carrying spring 18 into contact with screw 19: thus again completing circuit through magnet 15, by way of battery section g', wire 29, contact-screw 19, spring 18, wire 33, diaphragm 7, screw 6, spring 8, wire 31, magnet 15, wire 32, to other side of battery section g'. The diaphragm is thus set into rapid vibration, and produces a loud sound which is amplified by the trumpet 14: until conditions are restored, which permit the diaphragm 7 once more to break circuit at screw 6.

I claim:

1. In combination with an electrically controlled signaling device disposed in an automatic test circuit whereon the current strength is not sufficient to operate said device, of an additional source of current and an alarm, and thermostatic means operated by a rise in surrounding temperature for cutting said additional source and said alarm into said circuit and thereby actuating both said signaling device and said alarm.

2. The combination of a signaling mechanism, an electro-magnet controlling said mechanism, two sources of current of different strengths, an electrically operated alarm, and a thermostat normally closing circuit from said weaker source only to said electro-magnet, and a second thermostat normally opening circuit from said stronger source to the same and to said alarm: the said thermostats operating under a rise in atmospheric temperature to connect both of said current sources with said magnet and the stronger source to said alarm.

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

CLARK H. POOL.

Witnesses:

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