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Patented May 8, 1900.

H. H. FOWLER & W. F. PACK.

ELECTRIC CIRCUIT CLOSER.

(Application filed Dec. 29, 1899.)

(No Model.)

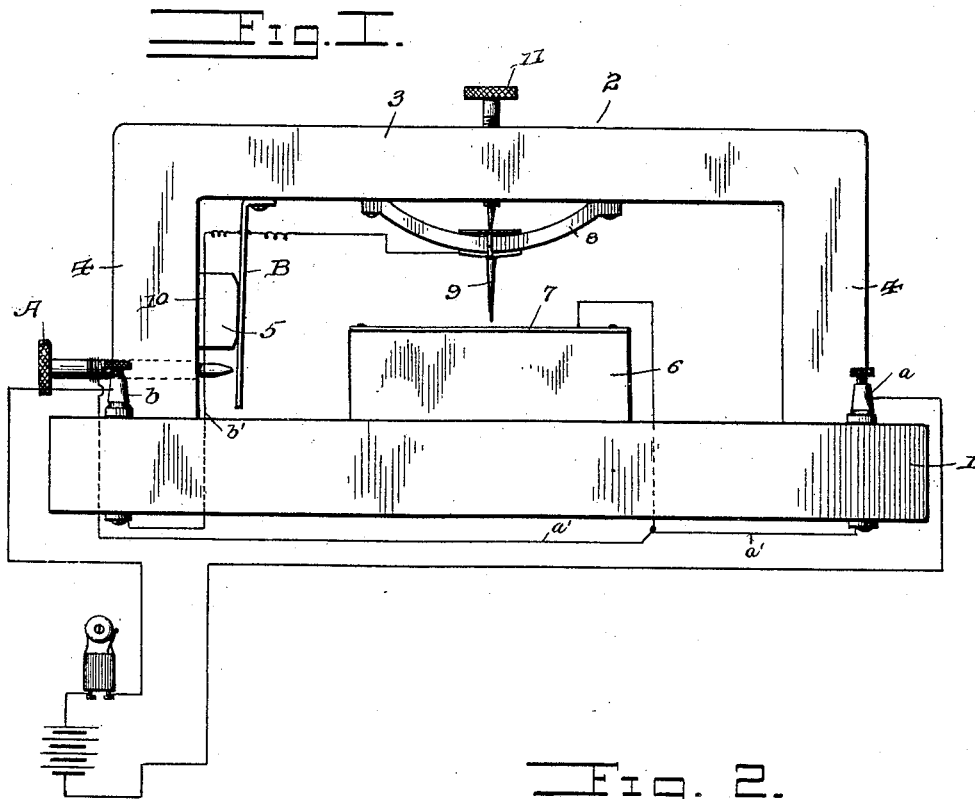
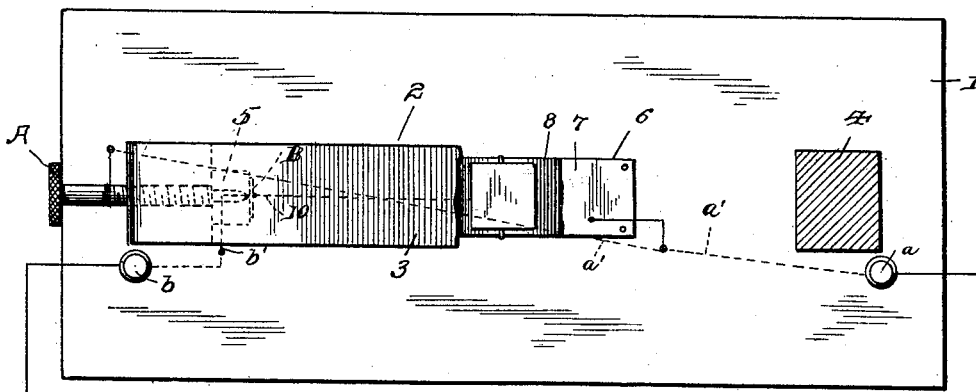


Fig. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

HARRISON H. FOWLER AND WILLIAM F. PACK, OF WAVERLY, TENNESSEE.

ELECTRIC-CIRCUIT CLOSER.

SPECIFICATION forming part of Letters Patent No. 648,939, dated May 8, 1900.

Application filed December 29, 1899. Serial No. 741,963. (No model.)

To all whom it may concern:

Be it known that we, HARRISON H. FOWLER and WILLIAM F. PACK, citizens of the United States, residing at Waverly, in the county of Humphreys and State of Tennessee, have invented a new and useful Electric - Circuit Closer, of which the following is a specification.

Our invention is an improved thermostatic or temperature-operated electric-circuit closer to be used in open circuit with an electric-bell annunciator or signaling system and which is adapted to be operated by changes of temperature and capable of adjustment, whereby it may be caused to close the circuit when the temperature lowers or rises to any predetermined degree, and thereby cause the electric bell or other annunciator to give an alarm.

Our invention is designed for use in hotels, factories, barns, and elsewhere to close an electric circuit or circuits in the event of a fire or dangerous rise of temperature threatening a fire and also to be used in greenhouses, warehouses, and elsewhere to close an electric circuit or circuits and announce a dangerous rise or fall of temperature.

A further object of our invention is to provide a temperature-operated electric-circuit closer which is extremely cheap, of simple construction, and thoroughly reliable and efficient, that requires little or no attention when in use, is not liable to injury by rust or dampness, which is extremely sensitive to changes of temperature, and is capable of fine adjustment, and hence rendered operative to close an electric circuit or circuits at predetermined degrees of heat and cold.

To these ends our invention consists in the combination, with a dilating member adapted to expand with heat and contract with cold, of a movable electrode carried or actuated by said dilating member and a relatively-fixed electrode adapted to contact with said movable electrode.

Our invention further consists in the combination, with a pair of heat-operated dilating members having electrodes on their opposing sides adapted to contact when said members dilate, of a cold-operated contracting member carrying an electrode adapted to contact with a relatively-fixed electrode.

Our invention further consists in a bowed

or curved dilating member carrying an electrode at its center and having its ends fixed, whereby the electrode will be moved as the dilating member varies its contour in contracting or expanding.

Our invention further consists in a curved or bowed dilating member carrying an electrode at its center, in combination with an adjusting device to vary the contour of said member.

Our invention further consists in a dilating member, as of rubber, carrying an electrode.

Our invention further consists in the peculiar construction and combination of devices hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a thermostatic or temperature-operated electric-circuit closer, and Fig. 2 is partly a top plan view and partly a horizontal sectional view of the same in which the circuits are indicated.

On the base-plate 1 is located a bridge-frame or spanner 2, comprising the horizontal intermediate portion 3 and the standards 4. In a threaded opening in one of said standards is an adjusting-screw A, which constitutes an electrode and is connected to the binding-post or terminal *a* by an electric conductor *a'*. On the inner side of the same standard 4 which supports the electrode A is a dilating member 5, which constitutes a block of india-rubber of suitable size and shape and against which presses a spring-electrode B, that is attached to the bridge-frame, as shown, and is movable by the dilating member 5 and is disposed in opposition to and is adapted to contact with the relatively-fixed adjustable electrode A. Said electrode B is connected with the binding-post or terminal *b* by a conducting-wire *b'*.

Secured on the base-plate 1 is a dilating member 6, which is a block of india-rubber of suitable size and shape and carries on its upper side a plate or disk 7, that constitutes an electrode and is connected to the binding-post or terminal *a* by the conducting-wire *a'*.

On the under side of the bridge-frame or spanner is secured a bowed or curved dilating member 8, the ends of which are securely fixed to said bridge-frame or spanner, so

that when the latter contracts and expands under varying temperatures its contour is varied and assumes differently-curved forms, and hence its central portion approaches and recedes from the oppositely-disposed dilating member 6. Said member 8 carries at its center a contact-point or electrode 9, which is adapted to contact with the electrode 7 when said members 6 and 8 dilate or expand under the influence of heat. Said electrode 9 is connected electrically with the binding-post or terminal *b* by a conducting-wire 10. An adjusting-screw 11, which operates in a threaded opening in the bridge-frame or spanner, bears upon the center of the bowed or curved member 8 and is adapted to adjust the latter, so as to move the electrode 9 toward and from the electrode 7 and to set the same at any required distance therefrom.

Our improved thermostatic electric-circuit closer is included when in use in open circuit with a source of electricity and an electric bell or other annunciator, as indicated diagrammatically in the drawings, and the operation thereof is as follows: Under the influence of heat at any abnormal predetermined degree, ascertained by the adjusting-screw 11 and the bowed or curved dilating member 8, which admit of great nicety of adjustment, the expansion or dilation of said members 6 8 causes their electrodes 7 9 to come in contact with each other, and thereby close the electric circuit, including the bell, annunciator, or other indicating device, and signal an alarm, as will be readily understood. Said circuit will remain closed and the indicating device will continue in operation until the temperature is lowered below the abnormal point, when the consequent contraction of the members 6 8 will separate the electrodes 7 9 and reopen the circuit. When the temperature is lowered to an abnormal or dangerous point, ascertained and predetermined by the adjustable electrode A, the contraction of the member 5, which carries or controls the electrode B, will cause the latter to contact with said electrode A, and hence close the circuit and give the alarm, as before.

The rubber temperature-operated dilating members employed in our improved thermostatic electric-circuit closer are exceedingly sensitive to variations of temperature and of maximum mobility under such conditions and are not subject to deterioration by rust and dampness and are, moreover, exceedingly cheap and simple.

Our improved thermostatic electric-circuit

closer, while being entirely efficient, extremely sensitive, and adapted to great nicety of adjustment, and thereby enabled to be used for indicating high and low temperature of any predetermined degree, is of exceedingly-simple construction and may be manufactured and sold at a low price.

Having thus described our invention, we claim—

1. In a thermostatic electric-circuit closer, the combination with a pair of heat-operated dilating members, having electrodes on their opposing sides, adapted to contact when said members dilate, and means to adjust one of said dilating members, of a cold-operative contracting member and an electrode movable by said contracting member, adapted to contact with a relatively-fixed electrode, the latter being adjustable, substantially as described.

2. The combination, in a thermostatic electric-circuit closer, of the pair of rubber dilating members, adapted to expand with heat and contract with cold, said members having electrodes adapted to contact on the expansion of the dilating members, and an adjusting device for one of said members, substantially as described.

3. In a thermostatic electric-circuit closer, the combination with the curved or bowed rubber dilating member, carrying an electrode, of an adjusting device to vary the contour of said curved or bowed dilating member, for the purpose set forth, substantially as described.

4. In a thermostatic electric-circuit closer, the combination, with a pair of heat-operated dilating members, having electrodes on their opposing sides, adapted to contact when said members dilate, of a cold-operative contracting member, an electrode movable by said contracting member, adapted to contact with a relatively-fixed electrode, substantially as described.

5. In a thermostatic electric-circuit closer, the curved or bowed dilating member, carrying the electrode at its center, in combination with an adjusting device to vary the contour of said member, substantially as described.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

HARRISON H. FOWLER.
WILLIAM F. PACK.

Witnesses:

MASON SANDERS,
A. P. McMURRY.