(No Model.)

T. H. RHODES.

ELECTRICAL CIRCUIT BREAKER FOR ANNUNCIATORS AND GAS LIGHTING APPARATUS.

No. 292,586. Patented Jan. 29, 1884.

Fig. 1.

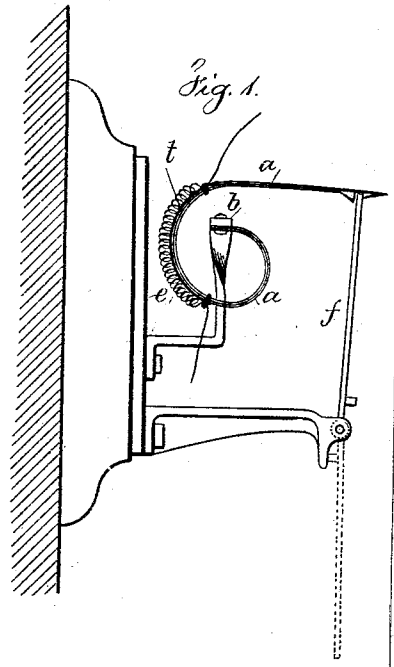


Fig. 2.

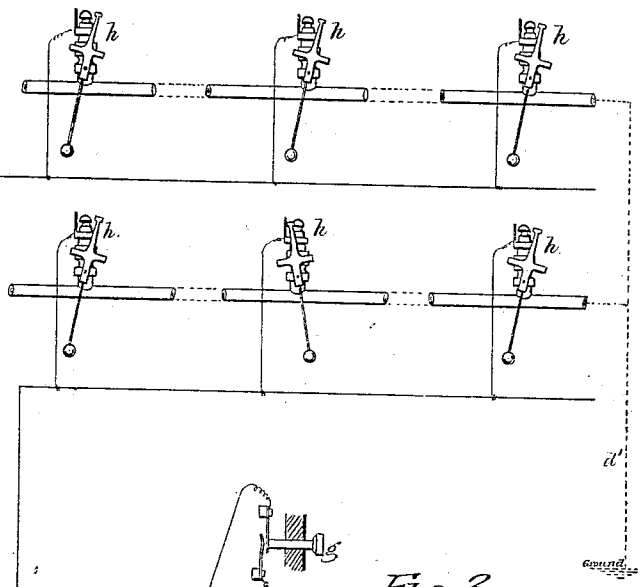
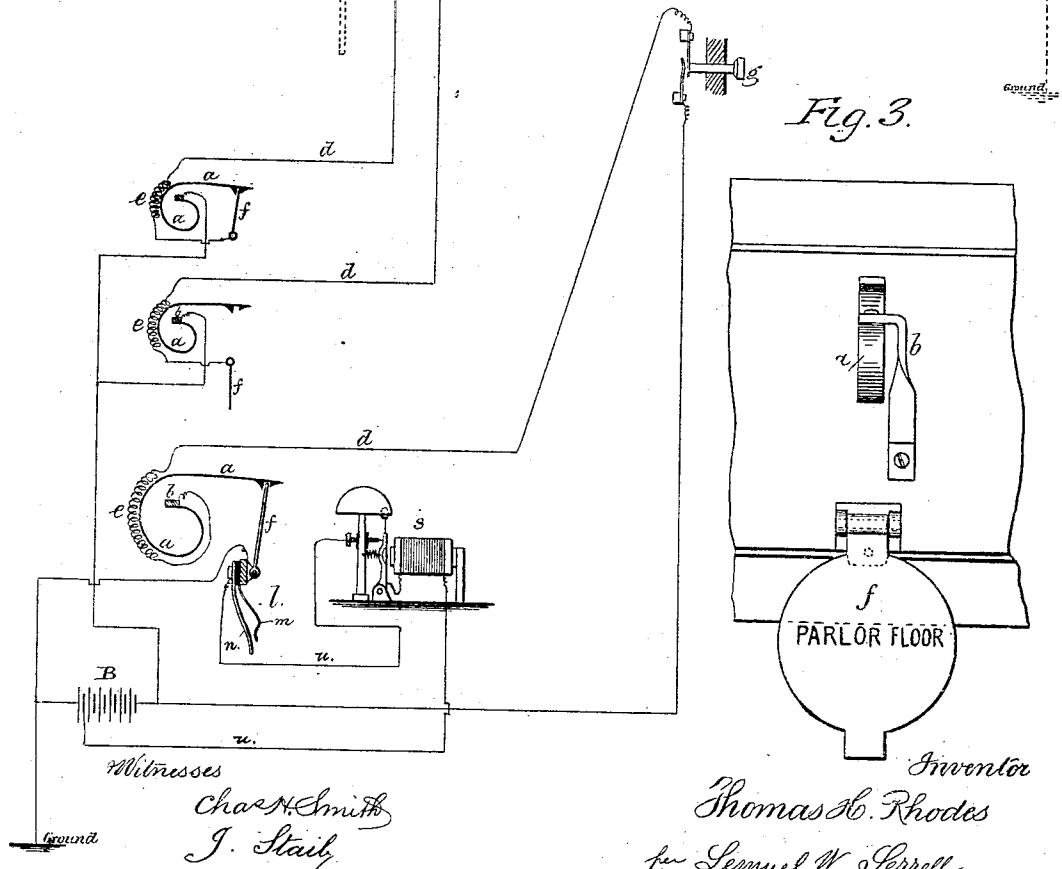


Fig. 3.



Witnesses

Chas. H. Smith

J. Stail

Inventor

Thomas H. Rhodes

per Lemuel W. Serrell

atty

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

THOMAS H. RHODES, OF BROOKLYN, NEW YORK.

ELECTRICAL CIRCUIT-BREAKER FOR ANNUNCIATORS AND GAS-LIGHTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 292,586, dated January 29, 1884.

Application filed August 15, 1883. (No model.)

To all whom it may concern:

Be it known that I, THOMAS H. RHODES, of Brooklyn, in the county of Kings and State of New York, have invented an Improvement in Electric Circuit-Breakers for Annunciators and Gas-Lighting Apparatus, of which the following is a specification.

Thermic circuit-closers have heretofore been employed in which the local circuit acts on a magnet, as may be seen in Letters Patent No. 276,286, granted to me.

The present invention relates, primarily, to a device in which heat developed by a resistance in an electric circuit acts to break the circuit, so that the injury sometimes resulting to the battery in gas-lighting and annunciator devices from the circuit remaining closed an undue length of time is prevented. I combine with this a drop that answers as an indicator, and also a device for closing a local circuit to a bell or alarm that is used to call attention to the action of the thermic circuit-breaker.

In the drawings, Figure 1 is a side elevation of the thermic circuit-breaker. Fig. 2 is a diagram representing some of the electric connections in which it may be employed. Fig. 3 is a face view of one of the thermic circuit-breakers with the drop down.

The thermic circuit-breaker is composed of a spring, *a*, one end of which is attached to a fixed stud or support, *b*, and the other end is free. This spring is preferably of two different metals—such as brass and steel—in order that the free end may be moved when the spring becomes unduly heated. The thermic circuit-breaker, however, may be composed of any suitable materials that will expand differentially and produce a motion at the circuit-breaker, and this thermic circuit-breaker may be straight or curved, or U-shaped, or in the volute form represented. The electric circuit, consisting of the wires *d d* and a return wire or ground, *d'*, passes through a resistance—such as the helix *e*—of fine platina wire in intimate contact with or proximity to the spring *a*, so that when said helix becomes heated by the resistance as the electric current passes through the same the free end of the spring *a* is moved to break the electric circuit between such free end of the spring and drop *f*. There should be a strip of silk or other insulating material between the helix *e* and the spring *a*, as at *t*, Fig. 1, to prevent the electric current passing directly from the helix to the spring. The battery B is in the circuit *d*, and in the same circuit there is to be a push-button, *g*, or a gas-lighting device, *h*, or any electric appliance or appliances. If now the push-button *g* is depressed too long, or the spark-points of the gas-lighter *h* remain in contact, or the wires become accidentally crossed, or the electric current continues to flow an undue length of time, so that the power of the battery is weakened or the elements consumed unnecessarily, the heat developed by the current passing through the resistance *e* is communicated to the thermic circuit-breaker *a*, and the circuit is broken between the free end of *a* and the drop *f*. This drop *f* may also become an indicator or annunciator. For instance, in a building fitted with gas-lighting devices there may be a thermic circuit-breaker to each floor or section, as indicated in Fig. 2, and if the current remains on through any burner or other connection on one of the sections the dropping of the tag *f* will indicate the section where the difficulty has arisen. These indicators may be placed side by side and each drop properly marked. By arranging the wires as illustrated in the diagram the circuit will remain in working condition, except upon the floor or branch circuit where the trouble has arisen. In this case it is understood that the return-circuit is through the burner and gas-pipe or ground connection; but a return-wire may be provided. This improvement may be used as an annunciator in cases where the thermic device is properly adjusted to insure the liberation of the drop by the heat developed during the time that the push-button *g* is pressed upon. This allows an annunciator to be made without the use of an electro-magnet. When used as an annunciator, the drop *f* should have numbers or other indicating-marks on the back, or be used as a cover for marks placed on a dial or face. In some instances the fall of the drop *f* is employed to close a circuit to an automatic circuit-breaking alarm-bell. A device for doing this is shown at *l*, where there is a circuit-closing spring, *m*, against

which the drop falls and presses it into contact with an insulated stop, *n*, so as to close a circuit through the wires *u* from one or more cells of battery through the alarm or bell S, which, hence, is rung to call attention to the drop *f*, and to circuit-connection which has caused the thermic circuit-breaker to operate the drop.

This improvement is available wherever it is desired to break the electric circuit after a short lapse of time. Under ordinary circumstances of use in electric gas-lighting apparatus the circuit is made and broken so instantaneously that there is not time for the thermal circuit-breaker to operate, and the period of time consumed in heating the thermic circuit-breaker will depend on the delicacy or the peculiar construction of the same and the strength of the current.

I claim as my invention—

1. The combination, with a thermic-circuit-breaker, of an electric circuit, and a heating resistance in such circuit, adjacent and parallel to the thermic circuit-breaker and intervening layer of insulating material, whereby the heat developed by the resistance when the circuit is closed acts upon the thermic device to break the electric circuit, substantially as set forth.

2. The combination, with a thermic circuit-breaker, of an electric circuit, a resistance in such circuit to develop heat and operate the thermic circuit-breaker, and a drop that is disengaged and forms an annunciator, substantially as set forth.

3. The combination, with a thermic circuit-breaker, of an electric circuit, a resistance in such circuit to develop heat and operate the thermic circuit-breaker, a drop disengaged by the circuit-breaker, a local circuit and alarm, and a spring circuit-closer operated upon by the drop, substantially as set forth.

Signed by me this 13th day of August, A. D. 1883.

THOS. H. RHODES.

Witnesses:
GEO. T. PINCKNEY,
WILLIAM G. MOTT.