Jan. 5, 1932. F. J. MURPHY 1,839,329

CIRCUIT BREAKER

Filed April 30, 1931

Fig. 1,

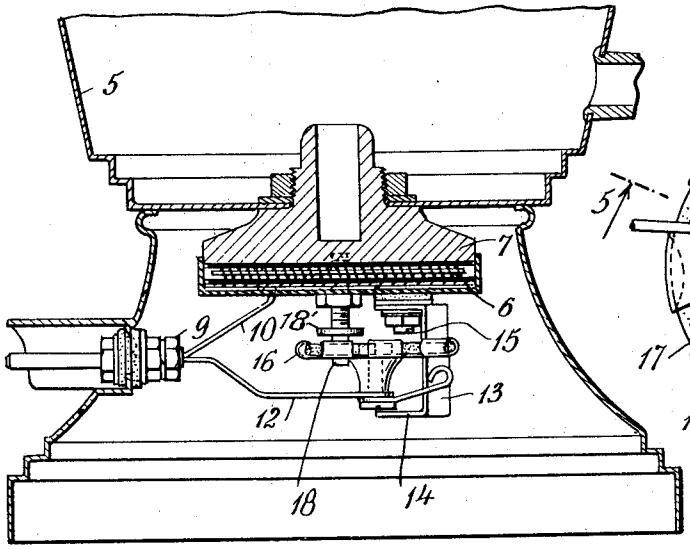


Fig. 4,

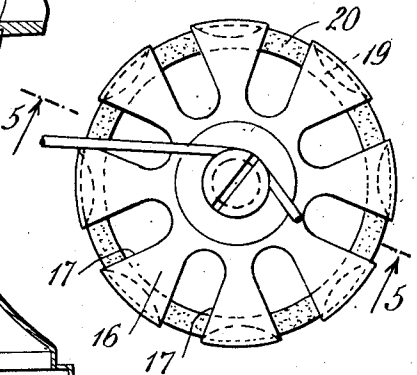


Fig. 5,

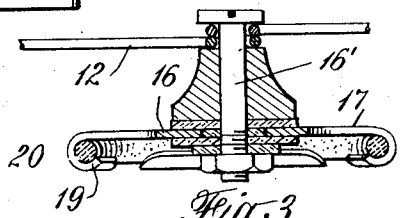


Fig. 2,

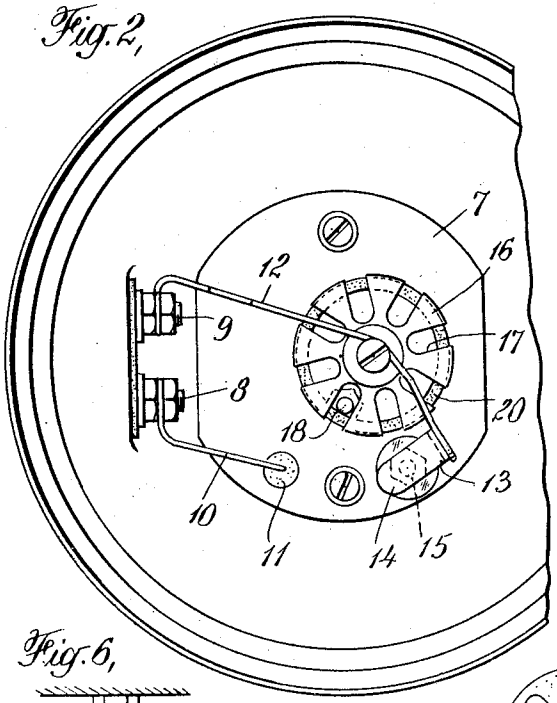


Fig. 3,

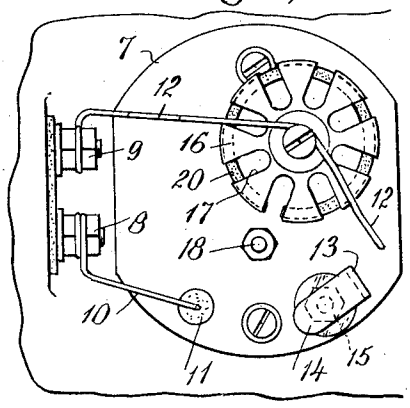


Fig. 6,

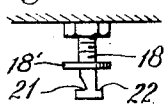
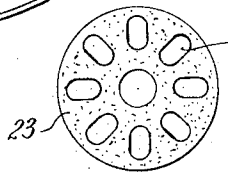


Fig. 7



INVENTOR
Frank J. Murphy
BY
Pennie Davis Marvin & Edmonds
ATTORNEYS

Patented Jan. 5, 1932 1,839,329

UNITED STATES PATENT OFFICE

FRANK J. MURPHY, OF FLORAL PARK, NEW YORK, ASSIGNOR TO S. W. FARBER, INC., OF BROOKLYN, NEW YORK, A CORPORATION OF NEW YORK

CIRCUIT BREAKER

Application filed April 30, 1931. Serial No. 533,897.

This invention relates to circuit breakers for electrical appliances and particularly to devices in which the circuit is broken when the appliance is overheated.

It has been customary to provide a link or plug of fusible metal in the circuit of electrically heated appliances in such relation to the heating element that the link or plug is melted when the appliance is overheated. When the link or plug is melted, the circuit is broken and the supply of current is cut off. The appliance cannot be used thereafter until the link or plug is replaced, and since replacements are often not immediately available, considerable inconvenience to the user may result from overheating of the appliance.

It is the object of the present invention to provide a simple and convenient circuit breaking device for electrically heated appliances which will open the circuit and cut off the supply of current when the appliance is overheated and is readily adjustable to permit immediate closure of the circuit without the aid of tools or special skill.

Other objects of the invention are the provision of means which ensure the rapid breaking of the circuit when the device is released, prevent release thereof except under the conditions for which the device is designed, and avoid misadjustment and consequent inability of the device to function as intended.

Other objects and advantages of the invention will be apparent as it is better understood by reference to the following specification and accompanying drawings, in which

Fig. 1 is a vertical section through the device illustrating its application to a percolator;

Fig. 2 is a plan view illustrating the device in closed position;

Fig. 3 is a similar view showing the circuit broken;

Fig. 4 is a plan detail of one of the parts of the device;

Fig. 5 is a section on the line 5—5 of Fig. 4;

Fig. 6 is a detail in elevation of one of the elements of the device; and

Fig. 7 is a plan view of a modified form of another element.

The invention will be described in an embodiment adapted particularly for use in connection with electric percolators. It may be applied with equal advantage to other types of electrically heated appliances.

Refering to the drawings, 5 indicates the shell of a percolator having a heating element 6 enclosed in a housing 7 at the bottom thereof. Insulated posts 8 and 9 extend through the base of the percolator and are adapted to be supplied with current through the usual connector and conductors (not shown). One end of the heating element is connected to the post 8 through a wire 10 which extends through an insulating bushing 11.

The other post 9 supports a spring arm 12, one end of which is adapted to engage an abutment 13 with a foot 14 which is supported on an insulated post 15. The post 15 is connected to the other end of the heating element, thus completing the circuit when the spring arm 12 is engaged with the abutment 13.

The spring arm is held in the desired position by engagement of an adjustable member 16 having slots 17 with a pin 18 which acts as a heat conductor. In the preferred form of the invention, the member 16 is circular and is mounted on and insulated from a stud 16′ for rotation on the spring arm 12. It is provided with a depending flange 19 and the ends of the slots 17 are closed normally by an annulus 20 of fusible metal such as an alloy of lead and tin adapted to fuse at a predetermined temperature. Such alloys are well known in the art.

When the pin 18 is engaged in one of the slots, the spring arm 12 is held under tension. The arm 12 is so formed that it is flexed on both sides of the pivotal connection with the member 16 ensuring a firm contact with the abutment 13 and instantaneous breaking of the circuit when the arm is released. Thus, if the fusible metal bends slightly before it is melted, the contact between the arm 12 and abutment 13 remains until the instant when the fusible metal melts and releases the arm. The spring arm then swings away from the abutment. The circuit is thus broken.

To close the circuit again, it is necessary merely to turn the member 16 to engage the

pin 18 in another slot so that the spring arm is held in engagement with the abutment 13. The appliance should, of course, be permitted to cool sufficiently before the readjustment is made. When the fusible metal in all of the slots has been melted by repeated overheating, a new annulus can be inserted. However, in practical use the number of slots is sufficient to outlive the appliance unless it is greatly abused.

To avoid breaking the circuit by jarring, the pin 18 may have a notch 21 near its end or it may be provided with a shoulder 22 at the end. It may also have a flange 18′ to limit movement of the member 16 in the direction of the heating element.

The foot 14 extends sufficiently to indicate to the user that the end of the arm 12 should not be placed in the wrong side of the abutment so that the arm cannot be released when the fusible metal is melted.

Instead of the member 16 with the annulus 20 of fusible metal, I may employ a member 23 of fusible metal having a plurality of openings 24 to receive the pin 18 as indicated in Fig. 7.

In the device as illustrated and described, if the appliance is heated without first introducing water, or if the water is boiled away, the pin 18 will become overheated and the spring arm will be released when the temperature reaches a predetermined point. As soon as the appliance has cooled slightly the circuit can be completed again and the appliance is again ready for use without the necessity for removing or replacing any parts.

Obviously various other details of the structure may be modified, including the form and arrangement of the various parts. The device may be modified, moreover, to adapt it to applications other than to percolators. All of these modifications within the scope of the accompanying claims are a part of my invention.

I claim:

1. A circuit breaking device comprising a resiliently biased arm, an abutment adapted to be engaged thereby to form an electrical connection, a pin adapted to transmit heat, and adjustable means on the arm having a plurality of openings each adapted to selectively embrace the pin, a wall of the selected opening engaging the pin and being of metal fusible at a predetermined temperature whereby the wall is melted and the arm is released when the pin is overheated.

2. A circuit breaking device comprising a resiliently biased arm, an abutment adapted to be engaged thereby to form an electrical connection, a pin adapted to transmit heat, and adjustable means on the arm having a plurality of openings each adapted to selectively embrace the pin, a wall of the selected opening engaging the pin and being of metal fusible at a predetermined temperature whereby the wall is melted and the arm is released when the pin is overheated, the pin being formed to prevent inadvertent separation of the adjustable means therefrom.

3. A circuit breaking device comprising a resiliently biased arm, an abutment adapted to be engaged thereby to form an electrical connection, a pin adapted to transmit heat, and adjustable means on the arm including a slotted member, fusible means supported therein and forming openings adapted selectively to embrace the pin, the fusible means engaging the pin and being adapted to be melted at a predetermined temperature whereby the arm is released when the pin is overheated.

4. A circuit breaking device comprising a resiliently biased arm, an abutment adapted to be engaged thereby to form an electrical connection, a pin adapted to transmit heat, and adjustable means pivotally mounted on the arm including a slotted member, fusible means supported therein and forming openings adapted selectively to embrace the pin, the fusible means engaging the pin and being adapted to be melted at a predetermined temperature whereby the arm is releasd when the pin is overheated.

5. A circuit breaking device comprising a resiliently biased arm, an abutment adapted to be engaged thereby to form an electrical connection and having a projecting foot, a pin adapted to transmit heat, and adjustable means on the arm including a slotted member, fusible means supported therein and forming openings adapted selectively to embrace the pin, the fusible means engaging the pin and being adapted to be melted at a predetermined temperature whereby the arm is released when the pin is overheated.

6. A circuit breaking device comprising a heat transmitting pin, a rotatable member having openings adapted selectively to embrace the pin, a wall of each opening being of fusible metal, resiliently biased means supporting the rotatable member, and an abutment adapted to be engaged by the supporting means to complete a circuit when the pin is engaged in one of the openings.

7. A circuit breaking device comprising cooperating means including a heat transmitting member, an adjustable member with openings for selective engagement therewith, a wall of each opening being of metal fusible at predetermined temperature, an abutment and means supporting the adjustable member adapted to close a circuit by engaging the abutment, the supporting means being resiliently biased away from the abutment whereby the circuit is broken when the fusible metal wall is melted.

8. A circuit breaking device comprising cooperating means including a heat transmitting member, an adjustable member with openings for selective engagement therewith,

a wall of each opening being of metal fusible at predetermined temperature, an abutment and means supporting the adjustable member adapted to close a circuit by engaging the abutment, the supporting means being resiliently biased away from the abutment whereby the circuit is broken when the fusible metal wall is melted, the heat transmitting member being formed to prevent inadvertent separation of the adjustable member therefrom.

9. A circuit breaking device comprising cooperating means including a heat transmitting member, an adjustable member with openings for selective engagement therewith, a wall of each opening being of metal fusible at predetermined temperature, an abutment having a projecting foot, and means supporting the adjustable member adapted to close a circuit by engaging the abutment, the supporting means being resiliently biased away from the abutment whereby the circuit is broken when the fusible metal wall is melted.

In testimony whereof I affix my signature.

FRANK J. MURPHY.