May 10, 1932. E. WALDER 1,857,899

THERMOSTATIC SWITCH PLUG

Filed March 3. 1927

Fig. 1.

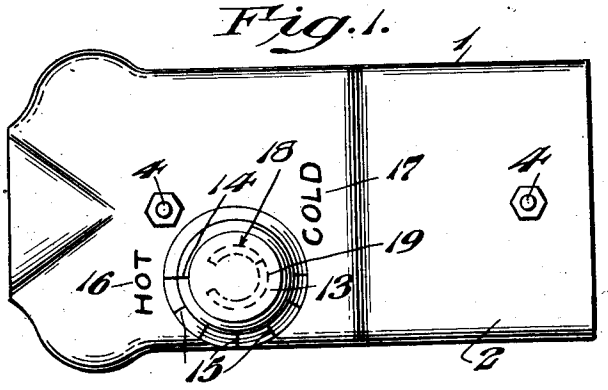


Fig. 6.

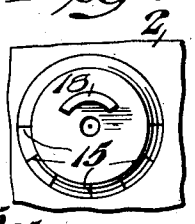


Fig. 2.

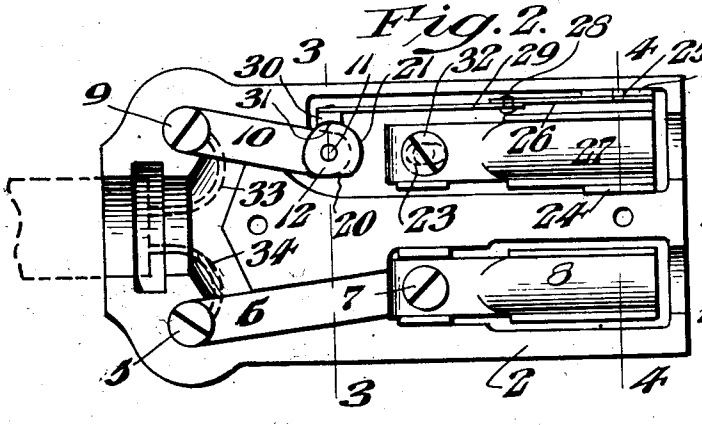


Fig. 7.

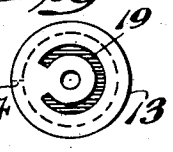


Fig. 3.

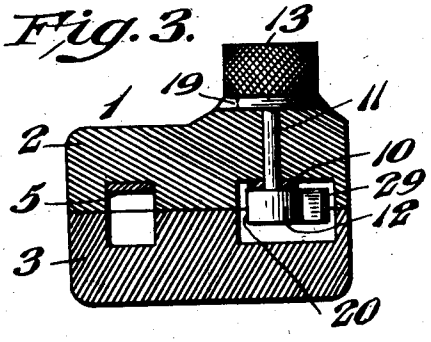


Fig. 4.

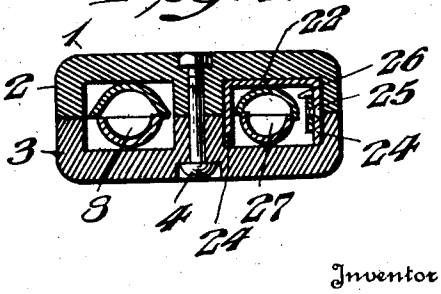
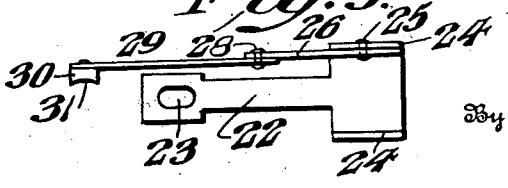


Fig. 5.



Inventor

Emil Walder

By Herbert S. Fairbanks

Attorney

Patented May 10, 1932 1,857,899

UNITED STATES PATENT OFFICE

EMIL WALDER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE BEARDSLEY & WOLCOTT MANUFACTURING COMPANY, A CORPORATION OF CONNECTICUT

THERMOSTATIC SWITCH PLUG

Application filed March 3, 1927. Serial No. 172,284.

The object of this invention is to devise a novel construction and arrangement of an automatic switch plug wherein the electric current supply passing to an electrical appliance can be automatically controlled so that the electrical appliance can be maintained at substantially a constant temperature.

A further object of my invention is to devise a novel thermostatically controlled switch in which a bi-metallic thermostatic element is associated with the pilot terminal of a plug in a novel manner so as to derive its heat directly therefrom. This bi-metallic thermostatic element cooperates in a novel manner with a fixed contact, the position of which can be manually adjusted in order to fix the standard of temperature at which the electrical circuit will be opened and closed.

It further comprehends a novel construction and arrangement of an adjustable contact which can be manually adjusted for a desired temperature, this contact being preferably in the form of a cam or eccentric which is rotatably carried by the shell of the plug. The parts forming the electrical circuit are insulated from each other, and this can be accomplished by insulating them from the casing or by making the casing of insulating material.

With the above and other objects in view as will more clearly hereinafter appear, my invention comprehends a novel automatic switch plug wherein when the heating appliance reaches a predetermined temperature, the electrical circuit is opened, and wherein when the temperature of the heating appliance falls below the predetermined temperature, the electrical circuit is automatically closed.

It further comprehends a novel construction and arrangement of a bi-metallic thermostatic element which is secured in close proximity to a terminal of the plug and which carries in a novel manner the movable contact which is provided with a curved or rounded contacting face in order that the proper contact will be made with the periphery of the eccentric.

It further comprehends a novel construction and arrangement of a conducting member against which the terminal socket of the plug is secured and which can extend, if desired, on both sides of the terminal socket, said conducting member having fixed to it, preferably near the forward end of the socket, a bi-metallic strip and also a contact carrying element, so that the bi-metallic will extend along the terminal socket and will have its free end adapted to control the opening and closing of the circuit between the eccentric and the contact carried by the element.

Other novel features of construction and advantage will hereinafter more clearly appear in the detailed description and appended claims.

For the purpose of illustrating the invention, I have shown in the accompanying drawings a typical embodiment of it, which in practice, will give satisfactory and reliable results. It is however, to be understood that the various instrumentalities of which my invention consist can be variously arranged and organized and my invention is not limited to the exact arrangement and organization of these instrumentalities, as herein set forth.

Figure 1 is a plan view of an automatic thermostatic switch plug embodying my invention.

Figure 2 is a top plan view of the mechanism contributing with the electrical appliance to which it is attached to form the electrical circuit, one section of the plug casing or shell being removed for the sake of clearness of illustration.

Figure 3 is a section on line 3—3 of Figure 2.

Figure 4 is a section on line 4—4 of Figure 2.

Figure 5 is a top plan view of a conducting member, the thermostatic element and its contact, which are connected together as a unit of structure.

Figure 6 is a top plan view of a casing section with the handle removed.

Figure 7 is a bottom plan view of the handle.

Similar numerals of reference indicate corresponding parts.

Referring to the drawings:—

1 designates a thermostatic plug embodying my invention. The body of the plug is formed of casing sections 2 and 3 of insulating material which are secured together by means of fastening devices 4 of any desired character. The casing sections 2 and 3 are suitably recessed to receive the parts forming the electrical connections. The parts of the plug which contribute to form the electrical circuit are preferably all carried by one section of the casing.

5 designates a binding post which is connected by means of a metallic strip 6 and a fastening device 7, with a socket 8 adapted to receive a prong of any conventional heating appliance.

9 designates a binding post which has extending from it a metallic strip 10 which is apertured to receive a rod 11, which, at its inner end, has fixed to it an eccentric or cam 12. The outer end of the rod extends through the casing section in which it is mounted and has secured to it a grasping handle 13 which is provided with a graduation 14 which, on the rotation of the handle, can be brought into registration with the graduations 15 on the casing section 2. The casing or shell section 2 also preferably has indicated on it in proximity to the graduations 15, the word "Hot", as indicated at 16, and the word "Cold", as indicated at 17. The extent of rotation of the handle 13 is limited by means of a lug 18 which extends into a curved recess 19, the extent of which limits the relative rotation of the grasping handle with respect to the casing section 2. The casing section 2 is faced off in proximity to the graduations 15, in order to form a flat seat on which the grasping handle is rotatable.

The eccentric 12 is provided with a flat face 20 which merges into an eccentric face 21. 22 designates a conducting member which consists of a flat strip of conducting material extending substantially throughout the length of the terminal beneath the latter and which at its rear end herein, is provided with an elongated slot 23, and, at its forward end, is provided with one or more upwardly projecting sides or flanges 24, herein forming a cradle. One of these flanges, herein the outer flange, has fixed to it, by means of a suitable fastening device 25, one end of a bimetallic thermostatic element 26, which extends rearwardly along side of and in proximity to a pilot terminal 27 in the form of a socket adapted to receive the prong of an electrical appliance and adapted to seat in the cradle. The free end of the bimetallic thermostatic element 26 has secured to it by a fastening device 28, a metal strip 29 which carries a contact 30 having a curved contact face 31 which cooperates with the eccentric to effect the opening and closing of the electric circuit in accordance with the variations in temperature of the electric appliances to which the thermostatic plug is attached.

The pilot terminal 27 is seated against the conducting member 22 and is fixed in position with respect to the shell by means of a fastening device 32, such as for example, a screw which passes through the slot 21 and engages a nut, not shown, set into the material of which the shell is made. The casing sections which form the shell are recessed in the usual manner to receive the electrical conductors 33 and 34 which are connected to the binding posts 5 and 9, and the shell is recessed to receive the customary wire protector for the conductors, (not shown).

Special attention is directed to the fact that in accordance with my present invention, the pilot socket 27 is in contact with the conducting member 22, substantially throughout its length, and the bi-metallic thermostatic strip 26 is connected to one of these flanges and extends along the side of the terminal socket so that the heat derived from the prong of the heating appliance and radiating through the socket, will be quickly communicated to such bi-metallic thermostatic strip.

In the operation of my novel thermostatic plug, the eccentric is adjusted by means of the grasping handle 13 so that the eccentric will be positioned for the desired degree of temperature which it is desired to maintain.

When the flat face 20 on the eccentric is parallel with the contact 30, the electrical circuit will be opened. On turning the grasping handle in a clockwise direction, the eccentric will be brought into such position that it will engage with the contact.

When the temperature of the heating appliance rises above the degree of temperature for which the eccentric is adjusted, the thermostatic strip 26 will, due to the difference in coefficients of expansion of the metallic strips of which it is made, have its free end deflected outwardly, thereby moving the movable contact 30 away from the fixed contact formed by the eccentric 12, so that on an increase in temperature, above the standard of temperature for which the eccentric has been adjusted, the circuit will be opened. As soon as the heating appliance has cooled off to the degree of temperature for which the eccentric has been adjusted, the bi-metallic element will have its temperature correspondingly lowered, so that the movable contact 30 will be returned into electrical engagement or contact with the eccentric, and the electrical circuit will be closed.

I have found that it is of special advantake in some types of heating appliances, such as for example, electrically heated irons, to have the bi-metallic thermostatic element closely associated with the pilot terminal in-

stead of being located at a distance therefrom. If an electrically heated iron is being employed on damp clothes, it cools to such an extent, in case the bi-metallic element is not closely associated with the pilot terminal, that a considerable amount of time is lost during the time interval necessary for the iron to heat up to its set or adjusted standard of temperature.

In the present case I have preferred to illustrate the grasping handle by means of which the position of the fixed contact is adjusted, as being located on the side of a casing section, but it will be apparent that this may be so arranged that it will have any desired location on the casing or shell.

It will now be apparent that I have devised a new and useful thermostatic switch plug which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description, and while I have, in the present instance, shown and described preferred embodiments thereof which will give in practice satisfactory and reliable results, it is to be understood that these embodiments are susceptible of modification in various particulars without departing from the spirit or scope of the invention or sacrificing any of its advantages.

Having thus described my invention what I claim as new and desire to secure by Letters Patent, is:—

1. In a thermostatic switch for an electrical plug, a transversely split pilot terminal, a conducting member extending substantially throughout the length of said terminal and having a portion disposed beneath the bottom portion of said terminal and an upstanding portion on its front end, holding means holding the rear end of said terminal in contact with the rear end of said conducting member, a thermostatic connection connected to said upstanding portion on said conducting member and carrying a contact on its rear end, and a manually adjustable rotatable contact disc co-operating with said last mentioned contact.

2. In a thermostatic connection for electrical plugs, a conducting member having a rearward portion adapted to be disposed beneath the rear end of a pilot terminal and a forwardly extending portion adapted to be disposed beneath said pilot terminal substantially throughout its length and having on opposite sides of its forward end upward extensions adapted to receive the forward end of said terminal between them, and a thermostatic connection carried by one of said extensions and extending rearwardly along said conducting member and carrying a contact on its rear end.

3. In a thermostatic switch, a thermostatic connection, a contact thereon movable thereby, and a manually adjustable rotatable contact having an eccentric surface progressively engaged by said contact as said second mentioned contact is adjusted and a flat surface at one end of said eccentric surface and so disposed as to make and break the circuit along a peak forming the junction between said eccentric surface and said flat surface.

4. In a thermostatic switch, a thermostatic connection, a contact thereon movable thereby, a manually adjustable rotatable contact having an eccentric surface progressively engaged by said contact as said second mentioned contact is adjusted and a flat surface at one end of said eccentric surface and so disposed as to make and break the circuit along a peak forming the junction between said eccentric surface and said flat surface, and means for interrupting rotating of said adjustable contact in one direction when said first mentioned contact is in open circuit position spaced from said flat surface and in the opposite direction when it is at the opposite end of said eccentric surface.

5. A thermostatic plug comprising a casing and having pilot terminals therein, a thermostatic connection responsive to temperature changes of one of the latter and carrying a contact, a cooperating adjustable contact journaled in said casing and having an eccentric surface engageable with said contact and a non-engaging surface at one end of said eccentric surface, a grasping handle on the exterior of said casing for adjusting said adjustable contact, and means including a slot and cooperating projection one on the grasping member and the other on the casing for controlling the adjustable contact and operative to stop rotation thereof in one direction when said first mentioned contact is opposite said non-engaging surface and in the other direction when it is at the opposite end of said eccentric surface.

6. A thermostatic plug comprising a casing and pilot terminals therein, a conducting member extending beneath one of said terminals substantially throughout the length thereof and having an upward extension at the forward end thereof, holding means for said terminal holding said terminal and conducting member in contact, a thermostatic connection connected to said upward extension and extending rearwardly therefrom and carrying a contact on its rear end, a manually adjustable contact having an eccentric surface engageable with said first mentioned contact and a flat non-engaging surface at one end of said eccentric surface, a grasping member rotatable from the exterior of said casing to adjust said adjustable contact, and means for stopping rotation thereof in one direction when said first mentioned contact is opposite said non-engaging surface and in the other direction when said contact is in engagement with the opposite end of said eccentric surface.

7. A thermostatic switch for an electrical plug, comprising a terminal, a conducting member extending beneath said terminal substantially throughout the length of the latter and having upwardly extending spaced means on its forward end forming a cradle to receive said terminal, a thermostatic connection having one end fixed to one of said upwardly extending means on said member, a movable contact electrically connected with said connection and adapted to be moved thereby, and a manually adjustable eccentric contact disc forming a contact to cooperate with said movable contact.

EMIL WALDER.