Nov. 3, 1931. G. HERBSTER 1,830,657

THERMOSTATIC SWITCH

Filed Aug. 22, 1929

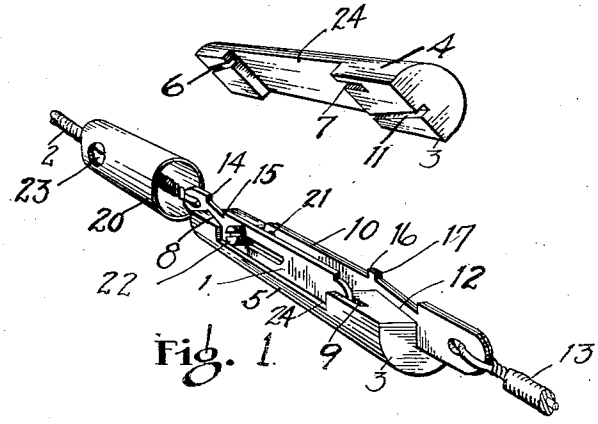


Fig. 1.

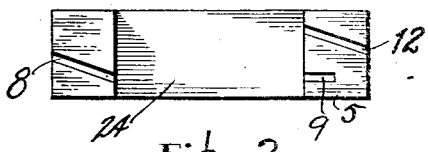


Fig. 2.

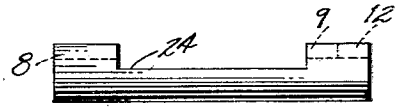


Fig. 3.

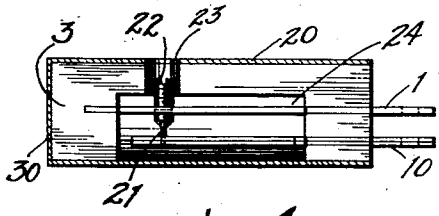


Fig. 4.

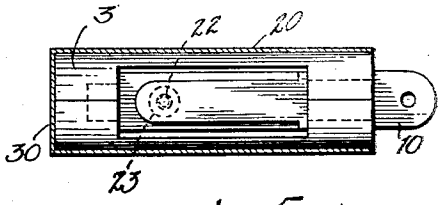


Fig. 5.

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UNITED STATES PATENT OFFICE

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THERMOSTATIC SWITCH

Application filed August 22, 1929. Serial No. 387,629.

My invention relates to thermostatic electrical switches and more particularly to such devices designed for use in connection with household electrical appliances.

It is well known that many pieces of household electrical equipment are ruined by overheating, short circuits and such, and quite often fires result from misuse of such equipment by non-technical operators.

Furthermore, most of such equipment is now provided at such low cost that no great expenditure is warranted in providing it with safety controls, especially as such must be not only small and neat in appearance but also inexpensive, simple in construction and adjustment, yet capable of functioning properly under very adverse conditions of care and use.

It is an object of my invention to eliminate the dangers mentioned by providing a thermostatic electric switch which will meet all requirements demanded in operation, yet which is so constructed that it may be manufactured at a very small cost.

Another object of my invention is to insure quick operation of a thermostatic switch by providing a switch which may be used at any place in the electric circuit and near to the source of the heat.

Further objects of my invention will become apparent from the following specification, in which reference is made to the accompanying drawings, the same reference numerals being used to designate the same parts in the various views.

In the drawings—

Fig. 1 is a perspective view of my invention with the outer shell and part of the core slightly removed for clearness of illustration.

Fig. 2 is a plan view of a part of the central insulating core.

Fig. 3 is a side elevation of the element shown in Fig. 2.

Fig. 4 is a vertical longitudinal section showing a modified form of my invention.

Fig. 5 is a horizontal longitudinal section of the form shown in Fig. 4.

Referring to the drawings, I provide a conductor 1 in the form of a metallic strip, preferably of brass, to which is connected a conductor 2 of an electrical circuit. This strip is mounted in an insulating core 3, a convenient form of which is illustrated and comprises two or more complementary sections, such as 4 and 5. The sections 4 and 5 are preferably formed of a substance capable of resisting high temperatures, such as for instance, a composition including lava as its principal ingredient. The thermostatic switch may thus be positioned close to a source of high temperature such as a flame, or an electrical resistance without danger of injuring the material or causing it to become softened or deformed. A suitable means of securing this strip in the core is by complementary grooves 6 and 7 and 8 and 9 of the core sections 4 and 5, respectively, into which the contact strip is seated. This is clearly shown in Fig. 1.

A composite bimetallic bar suitably secured at one end as by fitting it into complementary grooves 11 and 12 of the core sections 4 and 5, respectively, provides the thermostatic element 10. The stationary end of the thermostatic element is connected to an electrical conductor 13 of a normally closed circuit. The other end is free to move toward and away from the contact strip 1. The thermostatic element is placed in the core with the more expansible of the two materials of which it is composed, toward the contact strip 1, so that, in response to a rise in temperature, it is deflected away from the contact strip 1, to break the circuit, and in response to a drop in temperature moves toward the closed circuit position.

A suitable contact point 21 may be provided near the end of the thermostatic element and an adjusting screw 22 on the conductor 1, so that the range of operation of the two may be varied or regulated. A suitable means for securing the sections of the core in their proper positions includes a shell 20 of any suitable heat conducting material which slides tightly over the assembled sections of the core.

Shoulders 14 and 15 and 17, may be provided on the conductor 1, and the thermostatic element 10 respectively, to secure them

against axial movement in the core. Likewise for neatness in appearance and additional locking of these members in place, a portion toward the ends may be offset and the corresponding grooves formed in the core set at an angle to the axis, so that the ends of the contact strip and the thermostatic element 10 project centrally from opposite ends respectively of the core.

It is desirable to provide an opening 23 in the shell 20 through which a screw driver or other implement may be inserted to turn the adjusting screw. The sections 4 and 5 are provided with a depression 24 forming an axial opening through the core when the sections are assembled, and preferably extending beyond the opening in the shell, thus forming an unobstructed passage for air to the thermostatic element, and permitting freedom of movement of the said element in response to a variation in temperature.

Figs. 4 and 5 illustrate a modified form of my invention, in which both connections with the external electric circuit are at one end of the thermostat. In such case the shell 20 may be closed at one end, as illustrated in Figs. 4 and 5 at 30. In this form of my invention the grooves for supporting one end of the contact and thermostatic elements are formed in one end of the core sections, the other end of the conductor being supported in a groove in the other end of one of the sections, as before described. In other respects this form of my invention is similar in form and function to the first described form.

The thermostatic switch is located in an electric circuit at any point where it is desired to control the range of temperature, as, for instance, when used with an electric iron or heater, it may be attached to the same where it will respond to the temperatures of such devices. When cold the thermostat element is bent toward and into contact with the conductor 1, closing the electric circuit. If, however, the temperature near the thermostat exceeds a predetermined degree, the thermostatic element responds by moving away from the conductor 1 to break the electric circuit, and thus deenergize the device connected in the circuit. By adjusting the screw, the thermostat can be made to operate over a wide or narrow range of temperature changes.

It will be apparent by my invention that a thermostatic electric switch of this type may be manufactured at a very small cost because of its extreme simplicity of construction which permits the parts to be formed from standard stock by simple stamping and molding operations. The conductor may be readily stamped from sheet material, while the thermostatic element may be likewise stamped from strips of composite thermostatic materials. The core sections 4 and 5 may readily be molded from a single mold and the slots 6, 8, 11 and 12 subsequently cut in, or these parts may be molded separately in simple molds and the slots formed in the molding thereof. The section shown in Figs. 4 and 5 may also be readily molded. The shell 20 is cut from standard tubing stock of suitable diameter.

While I have described my invention as desirable for use with household electric appliances, it is not my intention to so limit its use, but to include any and all uses to which it may be adapted. Various changes may be made in the details of construction and arrangement of parts without departing from the spirit of my invention or the scope of the appended claim.

I claim:

In a thermostatic electric switch, a heat conducting shell, a core in the shell having separable complementary portions and having an axial opening therein intermediate its ends, the complementary portions of said core having cooperating slots therein, a rigid conductor extending the full length of the opening in the core and having its ends seated in certain of said slots, means to prevent longitudinal movement of the conductor in the core and a thermally responsive conductor having a portion seated in the cooperating slots in one end of the core and having its other end extending into the opening in the core for movement therein in response to a variation in temperature, said thermally responsive conductor being movable toward and away from said rigid conductor to make and break an electric circuit through the conductors.

In testimony whereof, I hereunto affix my signature this 10th day of August, 1929.

GEORGE HERBSTER.