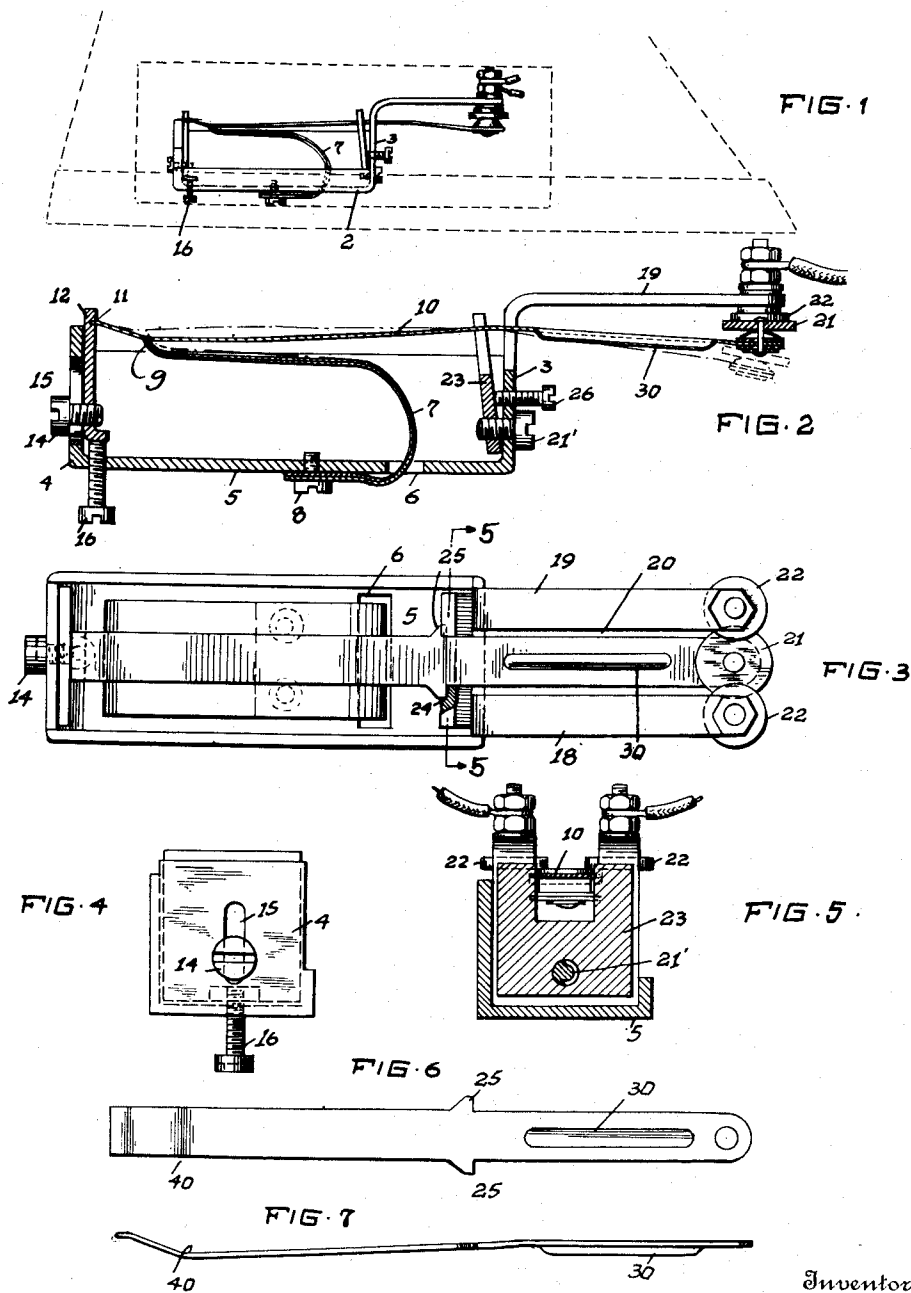


Dec. 11, 1928.

1,695,103

A. U. HOOK
THERMOELECTRIC SWITCH
Filed May 16, 1927



By

ARLEY U. HOOK

John A. Bomhardt
Attorney

UNITED STATES PATENT OFFICE.

ARLEY U. HOOK, OF NEW WASHINGTON, OHIO.

THERMOELECTRIC SWITCH.

Application filed May 16, 1927. Serial No. 191,854.

This invention relates to improvements in thermo switches for electric current and more particularly to devices for cutting off an electric current supply as soon as the desired heat or objectionable heat is created.

An object of the invention is to form a simplified device permitting adjustment for action at any desired degree of heat. Another object of the invention is the construction of a simple device for making and breaking the circuit by a spring snap action. Other objects of the invention will be more readily understood from the following description and the annexed drawings referred to therein in which:—

Fig. 1 shows the side view of the improved thermo-electric switch;

Fig. 2, a longitudinal section through the middle of the device;

Fig. 3, a top view of Fig. 2 showing the arrangement of the contact members and the shifting spring;

Fig. 4 is an end view of the device;

Fig. 5 is a section on line 5—5 of Fig. 3;

Fig. 6 is a plan view of the spring or shifting member for the contact members;

Fig. 7, a side view of the spring shown in Fig. 6.

As shown, the switch device comprises a hollow, boxlike frame member 2 open at the top and provided with upwardly extending end walls 3 and 4. The bottom or middle portion 5 connecting the end walls 3 and 4 is slotted at 6, and a composite metal thermal bar 7 of U-form, connected by screws 8 to the middle portion 5, extends through the slot to the inside of frame 2. The thermal bar is composed of two thin strips of different metals preferably copper and zinc welded together at both ends. The free end 9 of the thermal bar is upwardly bent to contact with a spring member 10 of special shape which will later be particularly described. As specifically shown in Figs. 2 and 3, the spring member 10 is rigidly held at 11 in an adjustable supporting member or plate 12 connected to end wall 4 of body 2 by a screw 14 slidably confined in a slot 15 of wall 4. The supporting member 12 may be vertically shifted to change the position of the end support of spring 10, and in order to facilitate such shifting the top portion of plate 12 is bent to form an abutment for an adjusting screw 16 screwed into the bottom 5 of body 2 so that slight loosening of screw

14 will permit a very accurate shifting of plate 12 by screw 16.

The end wall 3 of body 2 is bent rectangularly to form an offset extension parallel to the bottom 5, and is divided into two parts or prongs 18 and 19 by a slot 20 cut into this extension and extending into the end wall 3. Slot 20 permits the spring 10 to extend outside of the body 2 and said spring 10 bears at its free end a contact plate 21 adapted to engage contact plates 22 arranged on the prongs 18 and 19.

Spring member 10 is also supported by a second supporting member 23 of yoke shape having grooves 24 for the edges of the spring 10 engaged therein. These grooves are small saw cuts in the branches of the member 23 and are engaged by extensions 25 on the spring 10 and provide a rigid fulcrum support permitting slight pivotal movement of member 10 at the supporting points. Supporting member 23 is also adjustable horizontally or lengthwise of the spring by an adjusting screw 26 screwed into end wall 3 and cooperating with screw 21' to support the member 23 on wall 3. By adjustment of plate 12 and member 23 spring 10 may be put under preliminary or normal tension so that contact plate 21 is closed with contact plates 22, but under certain other circumstances a sudden shift of member 10 may occur, causing the end of spring member 10 bearing contact plate 21 to travel suddenly a relatively large distance to break the contact without great arcing, as may occur with direct current by a relatively slow break.

The shape of the spring 10 is such, and the place of contact of the thermal bar therewith is so chosen, that it will automatically spring back to its set position when the pressure of the thermal bar is released. To achieve this purpose spring 10 is sharply bent close to its rigid support 12 at one end as at 40, and the bearing end of the thermal bar on spring 10 is located quite close to said end of the spring. By this arrangement a relatively small movement of the end of thermo band will effect a quick shift of member 10 and snap action of the switch. The free or extended end of the spring 10 has a rib 30 pressed therein which increases the stiffness or rigidity of the free end of the spring.

In operation, the pressure of the thermo

band under the influence of excessive heat will bend the spring 10 until it passes center and it will then snap the contacts open. When the pressure is released the kink 40
5 in the spring will have the effect of restoring or snapping back the spring to original position thereby closing the contacts. If desired, the spring may be made without this kink, in which event the switch will remain
10 open after actuation, if desired; but by provision of the kink in the spring it will restore the circuit as before stated.

The adjustment of the plate 12 is important, as it permits a setting for operation according to the desired temperature.
15 That is, by adjusting the plate one way or another by means of the screw 16 the position of the spring 10 relative to the expansion member 9 may be varied so much the
20 temperature at which the spring will act to open the circuit. This permits the device to be used under various conditions or with different appliances.

I claim:

25 1. A thermal switch having a spring fixed

at one end and free at the other, the free end carrying a contact, and a support between the ends of the spring, the spring being bowed under tension between said support and the fixed end, and a thermal element 30 bearing against the bowed part of the spring, the fixed end of the spring being adjustable crosswise of the spring to vary the pressure of the spring against the thermal element. 35

2. A thermal switch as set forth in claim 1, the free end of the spring having a longitudinal rib to increase its stiffness.

3. A thermal switch comprising a frame having its end wall slotted and provided 40 with two prongs extending outwardly from said wall, a bowed spring in tension in the frame and projecting through the slot, and with its free end beside the prongs, contacts on the prongs and said end, and a thermal 45 element supported in the frame and bearing against the spring.

In testimony whereof, I do affix my signature.

ARLEY U. HOOK.