Jan. 19, 1937. J. E. CARLSON 2,068,374

THERMOSTATIC SWITCH

Filed May 26, 1934

Fig. 1.

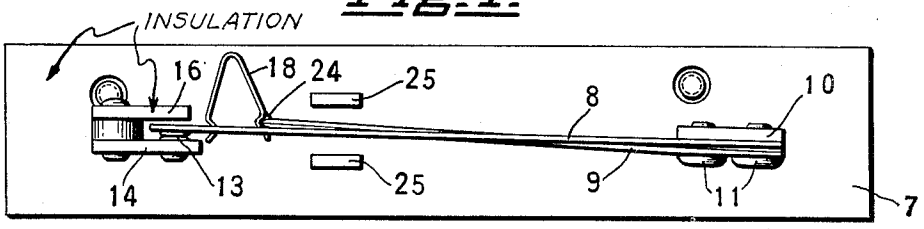


Fig. 2.

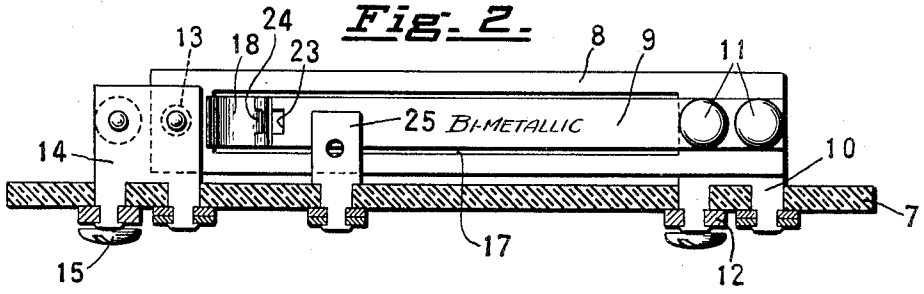


Fig. 3.

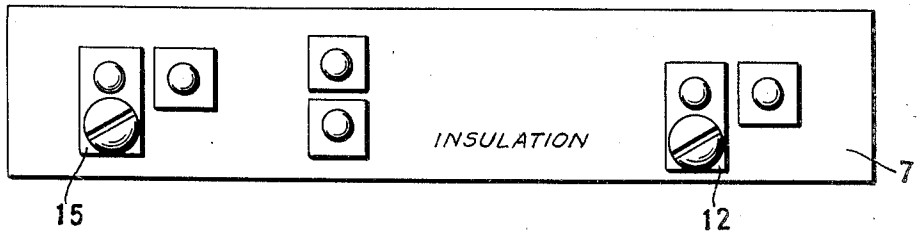
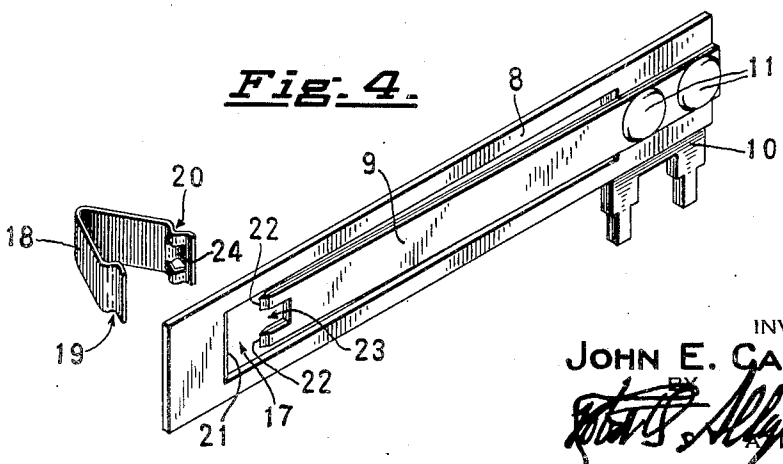


Fig. 4.



INVENTOR
JOHN E. CARLSON,
BY
ATTORNEY

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THERMOSTATIC SWITCH

John E. Carlson, Forestville, Conn., assignor to The Trumbull Electric Manufacturing Company, Plainville, Conn., a corporation of Connecticut

Application May 26, 1934, Serial No. 727,655

2 Claims. (Cl. 200—138)

My invention relates to improvements in thermostatic switches and has for its main object to simplify the construction.

One object is to provide a switch, the thermostatic parts of which are adapted to be made out of plain flat stampings.

Another object is to provide a construction which can be made cheaply according to predetermined design and readily assembled with assurance of producing uniform results.

In carrying out the invention I provide a construction in which there is a main spring arm formed of a flat strip anchored at one end and actuating the contacts directly or indirectly at the other end.

A second spring arm or finger is anchored at the stationary end of the main arm and extends parallel with it.

A bowed spring is interposed between the movable ends of the two strips just mentioned and serves to produce the toggle effect of a snap action in conjunction with the two spring strips. This bowed spring itself is so designed that it can be readily assembled without the use of special tools.

Fig. 1 is a plan view of a thermostatic switch embodying one form of my invention.

Fig. 2 is a side view of the same showing the support in section.

Fig. 3 is a rear view.

Fig. 4 is an exploded perspective view of the movable parts of the device.

An insulating strip 7 serves as a base or support for the other parts of the mechanism. The main spring arm 8 and the supplemental spring arm or finger 9 are supported by a common post 10 by rivets 11 which perform the double function of supporting the two strips or arms and securing them rigidly together at their stationary ends.

A circuit terminal 12 is connected to the post 10 at the back of the base. The stationary contact 13 is carried by a post 14 which is suitably secured to the base and provided with a circuit terminal 15 at the back.

The movable end of the arm 8 which supports or constitutes the movable contact of the switch member is movable between the contact 13 and the abutment 16 which may be of insulating material or might under some conditions serve as an additional or supplemental contact.

The main arm has an opening 17 which extends longitudinally to permit movement of the movable end of the spring finger 9.

The bowed toggle spring 18 has grooves 19 and 20 in which the edge 21 of the arm 8 and the tip end 22 of the finger 9 interlock so as to hold the bowed spring member in position. The end of the spring finger 9 has a notch 23 and the bowed spring has an outwardly projecting lug 24 which extends into this notch to assist in positioning and preventing lateral displacement of the spring member 18. This spring member 18 is a V-shape so as to permit it to be readily inserted into the opening 17 between the edges 21 and 22 so that these parts can be assembled without the use of any special tools. Stops 25 may also be provided to limit the movement of the spring arms when desired.

The finger or strip 9 is preferably formed of bimetallic material adapted to bend or warp under changes in temperature.

As this member 9 extends longitudinally of the main arm 8 and in substantially the same plane with it, it will be seen that when the finger 9 is bent or warped from one side to the other of the centrifugal plane of the arm 8 it will change the direction of motion of the bowed spring member 18 so as to move the contact end of the arm 8 from one side to the other with a snap-like action.

It should be understood, however, that the arm 8 might also be made of thermostatic material, if desired, or that this arm 8 may be made of thermostatic metal and used in connection with an arm 9 made of ordinary spring metal.

The two members 8 and 9 being of flat or substantially flat stock can be readily stamped out of sheet metal or what is known as strip stock. These two members being anchored on the same support, it is impossible for them to shift or be shifted one with respect to the other. There is therefore no danger of the characteristics of the device being changed by mechanical displacement or loosening when in use.

The end of the longer spring cantilever beam 8 constitutes an abutment for the pressure spring 18 so that such abutment is slightly resilient normally of the short cantilever with the result that the amplitude of flexure for each of these cantilevers is reduced over what it would be if the abutment were either fixed or freely movable. The addition of stationary abutments 14 and 16 to limit movement of this resilient abutment is another feature contributing to small amplitude of flexure and in-

creased sensitiveness to the device of this invention.

I claim:

1. A switch including two cantilever spring arms having their supported ends clamped adjacent one another, one of said arms being longer than the other and slotted to permit movement of the short spring arm between the sides of the long spring arm, a bowed expansion spring between the end portions of said arms, a contact carried by the end portion of the long spring arm beyond said bowed spring, abutments for limiting flexural movement of said long arm, abutments spaced apart a greater distance than are the first abutments for limiting flexural movement of both of said spring arms, said second mentioned abutments being located between said bowed spring and the supported ends of said arms, and a base of insulating material to which all of said abutments are secured.

2. A switch including two cantilever spring arms having their supported ends clamped adjacent one another, one of said arms being longer than the other, an expansion spring between the outer end portions of said arms to constitute a toggle, a contact carried by one of said arms, abutments for limiting flexural movement of the long arm, at least one of said arms being bimetallic and an additional abutment for limiting flexural movement of the short arm in event it should become disengaged from said spring and flex substantially more than it does in normal actuation of said toggle.

JOHN E. CARLSON.