Oct. 25, 1927. 1,646,882

F. W. SCHWINN

THERMOSTATIC SWITCH

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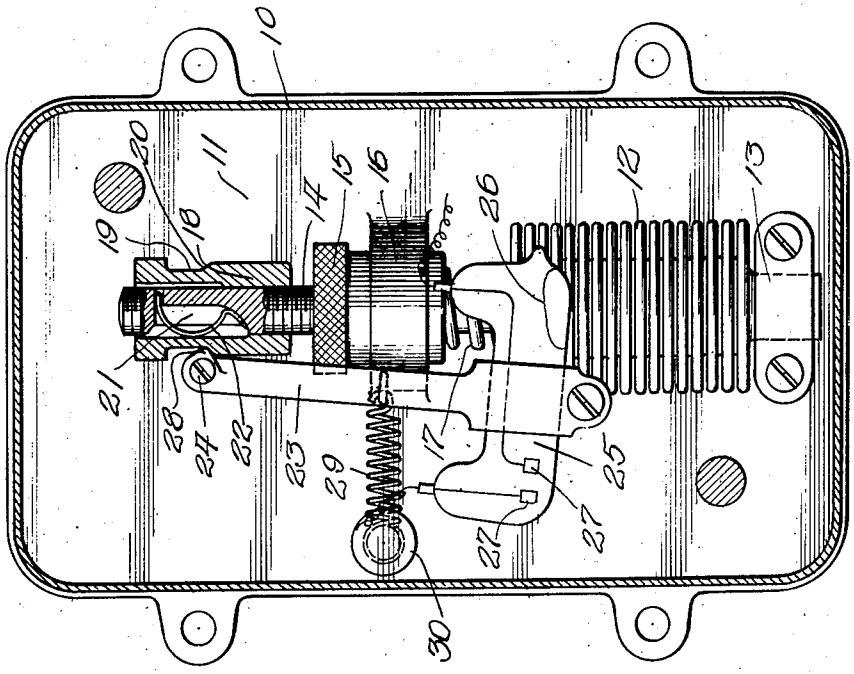


Fig. 2.

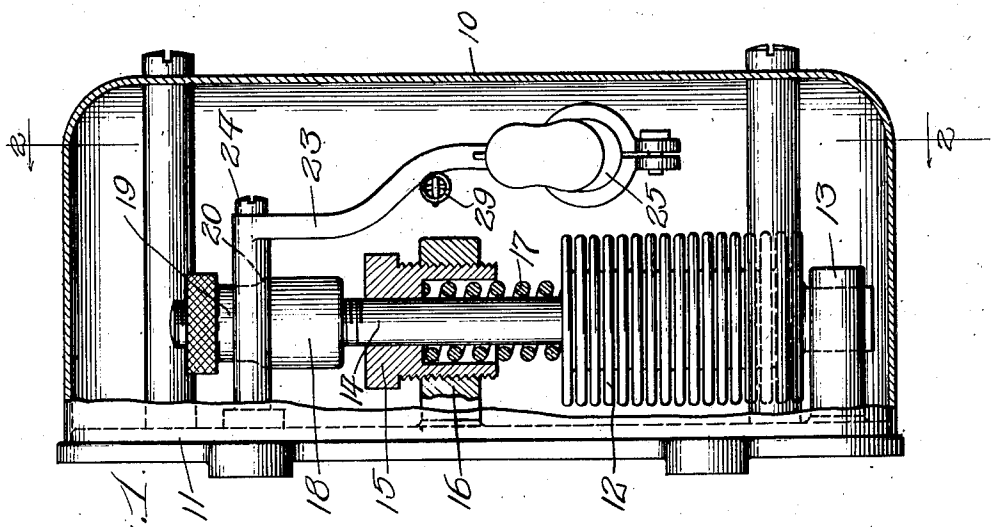


Fig. 1.

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FRANK W. SCHWINN, OF CHICAGO, ILLINOIS.

THERMOSTATIC SWITCH.

Application filed October 5, 1925. Serial No. 60,516.

This invention relates to improvements in thermostatic switches and for the purpose of illustration, is here shown as embodied in such a switch especially adapted for use in connection with refrigerating apparatus.

For example, in such apparatus it is frequently desirable to provide an electric switch adapted to be operated by changes in temperature. Such switches may be used for stopping and starting the compressor, or for other purposes.

My improved switch is fine and accurate in operation and may be easily and cheaply made. One of the features of my invention, also, is the provision of means permitting variable adjustment of the switch so that operation will be effected by any desired change in temperature.

In that form of device embodying the features of my invention shown in the accompanying drawing, Figure 1 is a vertical sectional view of a switch and Fig. 2 is a view in side elevation, and partly in section.

As shown in the drawings, 10 indicates any suitable shell or housing containing the operative parts of the switch. The shell or housing 10 is suitably attached to a base-plate 11 on which the switch itself is mounted.

The switch itself comprises a temperature responsive element 12 which may be of any suitable form. I have here shown this member as consisting of a corrugated cylindrical tube of well known construction filled with a suitable fluid and adapted to increase in length with a rise in temperature. The lower end of the temperature responsive element 12 is firmly attached to the support 13 which is fastened to the plate 11. The upper end of this element carries a bar 14, the upper end of which is threaded.

The bar 14 is adapted to slide through the adjusting nut 15 which in turn is threaded in the support 16 attached to the plate 11. Surrounding the bar 14 and lying between the adjusting nut 15 and the upper end of the element 12 is a spiral spring 17 adapted to exert a yielding downward pressure against the upper end of the temperature responsive element 12.

Threaded on the upper end of the rod 14 is a cam-nut 18 provided with an annular recess 19 terminating at its lower end in a slanting shoulder 20. The rod 14 is also provided with a slot 21 in which is mounted a spring 22 adapted to frictionally engage the cam-nut 18 to prevent undesired rotation thereof.

23 indicates a swinging arm pivotally mounted on the shaft 24 and carrying at its lower end a glass vessel 25 containing therein a drop of mercury 26. Mounted within this vessel is also a pair of electrical terminals 27, 27 which in turn are connected to any electrical circuit desired to be controlled by the switch. The upper end of the arm 23 is also provided with a short projection or nose 28 lying against the shoulder 20 on the cam-nut 18.

29 indicates a spiral spring attached to the post 30 at one end and to the arm 23 at the other. This spring operates to urge the lower end of the lever 23 to the left (as viewed in Fig. 2) and holds the nose 28 in contact with the shoulder 20.

In the operation of the device, the element 12 upon becoming heated presses the bar 14 upwardly against the tension of the spring 17 and thus raises the nut 18. The shoulder 20 on this nut operates against the nose 28 on the arm 23 which causes the lower end of this arm to swing to the right (as viewed in Fig. 2) against the tension of the spring 29. After this arm swings to the right a sufficient distance to tilt the glass tube 25, the mercury 26 runs to the lower end thereof to make contact between the terminals 27, 27 and thus close the electrical circuit. Upon the temperature responsive element 12 becoming cooled, the rod 14 and nut 18 are lowered, thus swinging the arm 23 to the left until the mercury runs back into the position shown in Fig. 2, thus breaking the contact.

It is to be noted that the height of the shoulder 20 with respect to the nose 28 can be varied as desired by simply securing the nut 18 on the threaded end of the rod 14. By this means, adjustment may be made so that the switch will operate at any desired temperature change.

While I have shown and described certain embodiments of my invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as disclosed in the appended claims, in which it is my intention to

claim all novelty inherent in my invention as broadly as possible in view of the prior art.

What I claim as new, and desire to secure by Letters Patent, is:

1. A device of the character described including; a temperature responsive element; spring means urging said element in one direction; means for adjusting the tension of said spring means; a cam threaded on a shaft carried by the temperature responsive element; an electric switch; a member on the switch adapted to be engaged by said cam upon movement of the temperature responsive element; said cam adapted to be adjusted relative to said switch member by screwing the same inwardly or outwardly on said threaded shaft; and means for retaining said cam in its adjusted position, said means comprising a spring member interposed between said shaft and said cam.

2. A device of the character described including; a temperature responsive element; spring means urging said element in one direction; means for adjusting the tension of said spring means; a cam threaded on a shaft carried by the temperature responsive element; an electric switch; a member on the switch adapted to be engaged by said cam upon movement of the temperature responsive element; said cam adapted to be adjusted relative to said switch member by screwing the same inwardly or outwardly on said threaded shaft; and means for retaining said cam in its adjusted position, said means comprising a spring member interposed between said shaft and said cam, and housed in a recess in said shaft.

In testimony whereof, I have hereunto set my hand this 30th day of September, A. D. 1925.

FRANK W. SCHWINN.