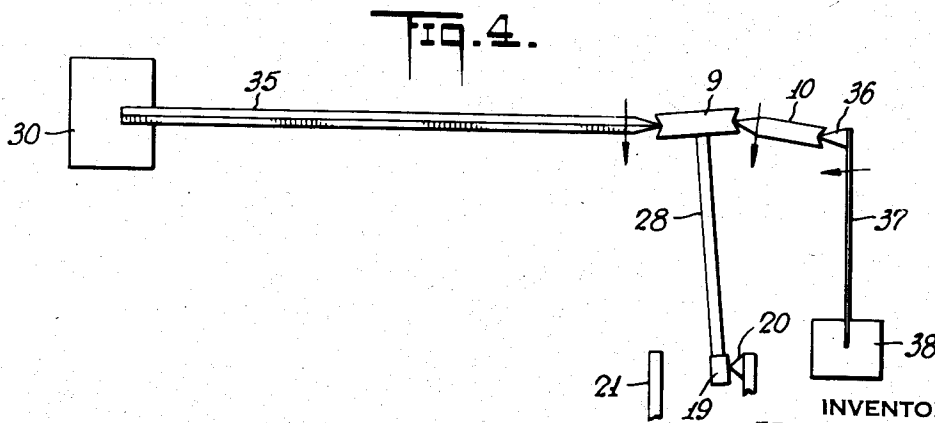
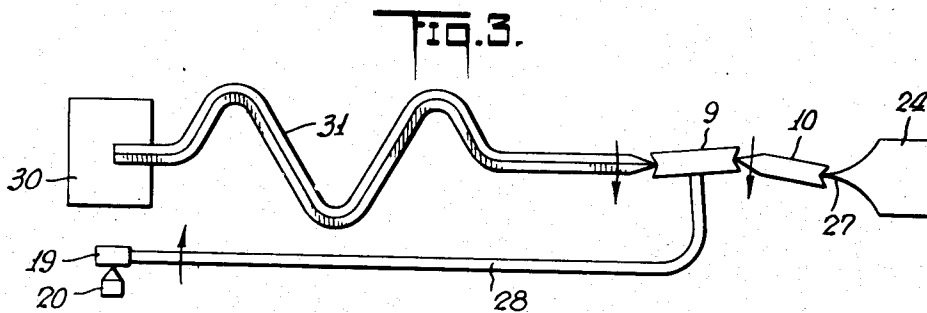
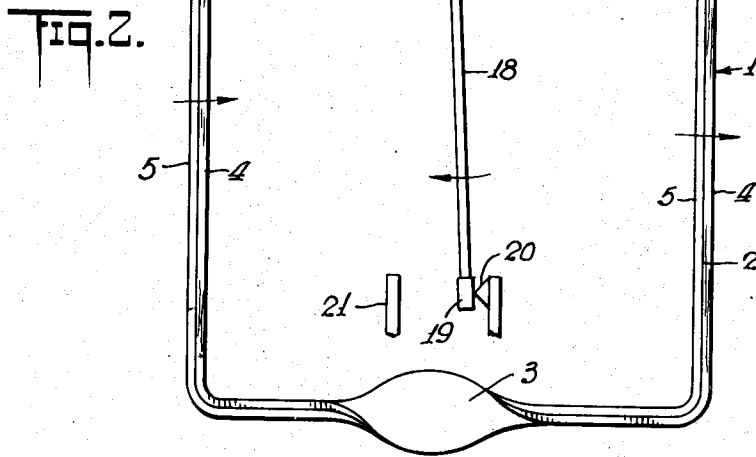
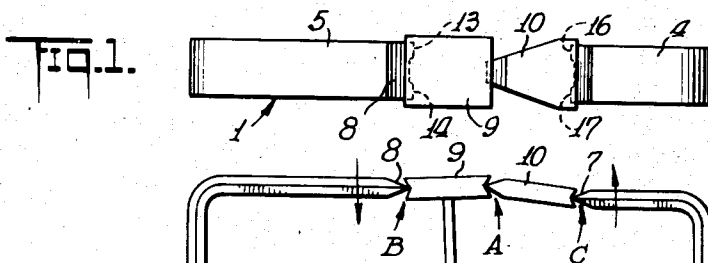


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THERMOSTATIC SWITCH

2,279,060

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THERMOSTATIC SWITCH

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1 Claim. (Cl. 200—138)

This invention pertains to that class of electrical switch which opens and closes in response to temperature changes, and which is commonly known as a thermostatic switch.

It is an object of this invention to produce a device which is simple and compact in construction, cheap to manufacture and substantially foolproof in operation.

It is another object to produce a switch which opens and closes quickly so as to reduce arcing, which results in burning of contact points.

A still further object of the invention is to produce a switch which can be readily adjusted for various temperature ranges and limits.

The drawing illustrates and the specification describes only one embodiment of my invention, but others will be apparent to those skilled in the art as will other advantages not herein recited.

Looking at the drawing:

Fig. 1 is a plan view of one form of the device;

Fig. 2 is a side elevation of the same form;

Fig. 3 is a side elevation of another embodiment of the invention; and

Fig. 4 is a side elevation of still a third embodiment.

Looking at Figs. 1 and 2, we find a square or rectangular framework 1, made up of a bimetallic strip 2, twisted at 3 so that the metal on the outside of the frame on the right side, is on the inside of the frame on the left side. One of the metals of the bimetallic strip is shown at 4 and the other at 5.

The framework 1 possesses sufficient springiness and is so constructed that the open ends thereof shown at 7 and 8, tend to move toward each other when spread sufficiently to accommodate links 9 and 10 therebetween. Opposite edges of link 9 are shaped in the form of a V groove as shown in Fig. 2. The left hand edge of link 10 is shaped to a sharp edge and the right hand side to a V groove (Fig. 2).

The end 8 of the frame 1 may be equipped with two bearing points or surfaces 13 and 14 designed to rest in the left V-shaped groove of the link 9. The pointed and sharpened edge of link 10 is designed to rest in the other V-shaped groove of link 9. The end 7 of the frame 1 is formed into two bearing points or surfaces 16 and 17, which are designed to rest in the right hand V groove of link 10.

To the underside of link 9 is attached an arm 18 on the lower end of which is a contact point 19 adapted to cooperate with stationary contact point 20 to make and break an electrical circuit.

A stop 21 serves to arrest the arm 18 in its clockwise movement as viewed in Fig. 2.

Fig. 3 discloses a somewhat different form of the invention and includes a stationary frame or foundation 30 to which is firmly secured a bimetallic strip 31 made into a more or less serpentine form as illustrated in the figure. The link 9 carries a bent arm 28 and on the end of arm 28 is a contact point 19 adapted to cooperate with stationary contact point 20 to make and break a circuit. The member 30 acts as a stop for the arm 28 when it moves in a clockwise direction as indicated by the arrow, and thus serves the same purpose as the stop 21 of Fig. 2.

Link 10 is disposed between link 9 and a stationary V-shaped frame member 24 equipped with suitable bearings points, one of which is shown at 27. Links 9 and 10 and the bearing end of member 31 are the same as the links and bearing points heretofore described in relation to Fig. 2. The member 31 is so proportioned that it is slightly compressed when links 9 and 10 are inserted between its free end and member 24, and thus normally exerts a pressure on the links 9 and 10 in the direction of the member 24.

In Fig. 4, is another embodiment of the invention including a stationary frame member 30, a straight bimetallic member 35 cantilever mounted thereon, links 9 and 10 and a bearing member 36 attached to an adjustable spring arm 37 which is supported in the frame member 30. The length of the members 35 and 36, and the links 9 and 10 are such that when in position a slight strain is imposed on the spring member 37 which normally urges the member 36 toward the bimetallic member 35. Link 9 is equipped with an arm 28 carrying a contact point 19 adapted to cooperate with contact point 20. The movement of arm 28 is limited by point 20 and stop 21.

Fig. 2 illustrates the position of the various elements of the device after it has been subjected to a relatively low temperature so that the contacts closed. As the temperature rises the ends 7 and 8 of the bimetal move in the directions indicated by the vertical arrows, and the following changes take place in the linkage and the forces acting upon it:

Points A and B move downward and to the right. Point C moves upward to the right. Thus point A moves from a position above an imaginary line connecting points B and C until it lies on the same line. Up to this time the force exerted on link 9 by link 10 at point A tends to keep contacts 19 and 20 together; that is, the vertical component of this force is upward. When point

A comes into line with points B and C, the vertical component of the activating force at A becomes zero. The instant the point A moves below this neutral line, the vertical component of the force exerted on link 9 by link 10 at point A, becomes downward. This causes the contact arm to snap over to stop 21.

When the temperature falls, the reverse of this action takes place and the contact 19 snaps over to contact 20. It is evident that the switch is operated by a change in direction of the force exerted by the bimetal acting on link 9.

In the device herein disclosed there is no tendency for the contacts to open before the instant of "snapping." On the contrary, as the device moves from "cold" to neutral, not only do the forces tend to keep the contacts closed, but the whole linkage moves in such a direction as to tend to press the contacts together.

The device is very flexible, and it can be made to respond to a wide variety of temperature ranges and limits. If the links 9 and 10 are made short, it will operate within a narrow temperature range, and, of course, if they are lengthened, operation will be through a wider range. If the device is constructed so that point A is a relatively great distance above the imaginary line connecting points B and C when the bimetal is cool and the contacts together, then a higher temperature will be required to cause the contacts to open than if the point A is more nearly on line BC. If the distance (Fig. 2) between stop 21 and contact 20

is decreased, the device will operate within a smaller temperature range and vice versa. In Fig. 2 if contact 20 and stop 21 are moved to the left (without changing the distance between them), the temperature range remains substantially the same (i. e. the number of degrees between "on" and "off"), but the operating temperatures are lowered. Of course, if these are moved to the right the temperatures are raised.

It is thus obvious that applicant's switch is capable of many adjustments to make it suitable for nearly any kind of service within its capacity.

If it is desired to control low temperatures with this device, as would be desirable in the refrigeration industry, the stop 21 and contact 20 (Fig. 2) are interchanged.

I wish it to be understood that I do not limit myself to the exact details of construction shown and described, as my invention is obviously capable of various modifications.

I claim:

In a thermostatic switch, a substantially straight bimetallic member formed with a pivot point at one end thereof, a spring actuated movable pivot point, a pair of links supported between said pivot points of such size and proportions as to normally cause said movable pivot point to be urged in the direction of the bimetallic pivot point, and a switch arm on one of said links and means for limiting its movement in both directions.

HENRY W. RIMBACH.