

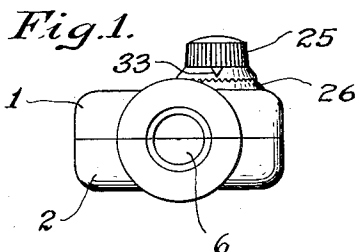
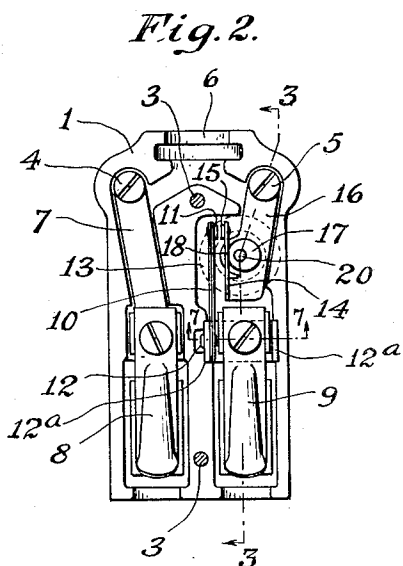
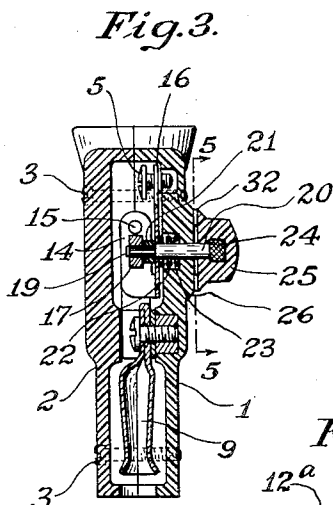
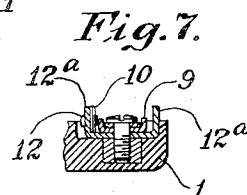
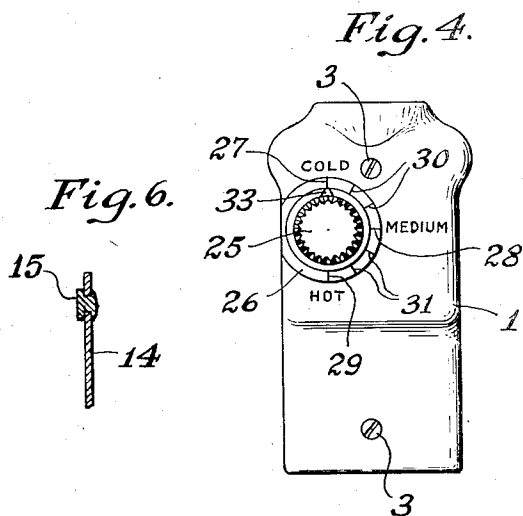
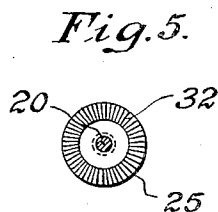
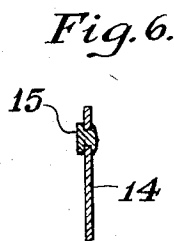
May 10, 1932.

F. E. WOLCOTT ET AL

1,857,906

THERMOSTATIC SWITCH

Filed March 28, 1928



Inventor
FRANK E. WOLCOTT
BY LOUIS V. LUCIA
by *[Signature]*
Attorney.

UNITED STATES PATENT OFFICE

FRANK E. WOLCOTT, OF WEST HARTFORD, AND LOUIS V. LUCIA, OF HARTFORD, CONNECTICUT, ASSIGNORS, BY MESNE ASSIGNMENTS, TO THE BEARDSLEY & WOLCOTT MFG. CO., A CORPORATION OF CONNECTICUT

THERMOSTATIC SWITCH

Application filed March 28, 1928. Serial No. 265,389.

This invention relates to thermostatic switches.

It has for its object to provide an improved thermostatic switch having improved manually adjustable means for varying the point at which the thermostat breaks the circuit. A further object of this invention is to produce an improved switch of this character which is capable of being manufactured cheaply and is further capable of a wide variation of adjustment. A still further object of the invention is to provide an improved thermostatic switch having improved adjustable contact means adapted to cooperate with the thermostatic contact, improved means for adjusting this adjustable contact, and improved means for holding the adjusting means in different positions of adjustment. These and other objects and advantages will hereinafter more fully appear.

In the accompanying drawings is shown for purposes of illustration one embodiment which the invention may assume in practice.

In these drawings,—

Figure 1 is an end elevation of a switch embodying the improvement, showing the two sections thereof in assembled relation;

Fig. 2 is a plan view of the inside of the upper section shown in Fig. 1;

Fig. 3 is a sectional view taken on line 3—3 of Fig. 2;

Fig. 4 is a plan view of the assembled switch shown in end view in Fig. 1; and

Fig. 5 is a sectional view on line 5—5 of Fig. 3;

Fig. 6 is a sectional detail showing how the contact buttons are attached to the contact members, and

Fig. 7 is a sectional detail on line 7—7 of Fig. 2.

In this illustrative construction is shown a switch comprising cooperating enclosing casing members 1 and 2 adapted to house the switch mechanism therein and be connected by suitable connecting means, as by screws

3; one of the sections herein the section 1, carrying suitable binding posts 4 and 5 adapted to be connected to the ends of line conductors entering through an end aperture 6 and one of the binding posts 4 being connected in a usual manner by a through connection 7 to a plug socket 8, while the other is connected to a similar plug socket 9 through improved thermostatically controlled switch mechanism hereinafter described.

In this construction an elongated thermostatic member 10, having a contact button 11 attached to its free end, is suitably attached at its opposite end, as by a rivet or other suitable means 12, to one side of a cradle 12^a in turn connected to the inner end of the plug socket 9. Herein, the member 10 extends from its point of connection 12 longitudinally of one side of the section 1 toward the opening 6, as shown, and is disposed edgewise in a chamber 13 formed by cooperating apertures in the sections 1 and 2. Cooperating with this thermostatic contact is a parallel spring contact member 14, herein shorter than the member 10, and likewise disposed edgewise in the chamber 13 but nearer the side of the member 1 than the member 10. A contact button 15, adapted to engage the button 11, is attached to the free end of this member 14 while the latter is connected at its opposite end, nearer the contact 9, with an underlying conducting strip 16 carried by the section 1 and carrying the binding post 5. Herein, the contact 14 is formed integral with this strip 16 and bent up therefrom at right angles so that it may be disposed in the desired parallel relation to the member 10 when the member 16 is seated on the section 1 in the bottom of the chamber 13.

It will also be noted that manually adjustable means are provided acting upon the contact 14 at a point between its ends and operating to adjust the button 15 on this contact relative to the button 11 on the thermostatic contact member 10. Herein these means

are in the form of an eccentric 17 having at one side thereof a flat surface 18 adapted when the contact 14 engages therewith to permit that contact to occupy the circuit breaking position illustrated in Fig. 2. Further, it will be noted that this eccentric 17 is carried on the fluted inner end 19 of a shaft 20 journaled in the section 1 at right angles to the member 16, and that a suitable spacing sleeve 21, preferably of fiber, is also carried on this end of the shaft between the eccentric and the conducting strip 16. Moreover, the shaft is encircled at a point intermediate its ends and on the opposite side of the strip 16 from the sleeve 21, by a coiled spring 22 seated in a suitable aperture 23 formed in the section 1. Herein, the shaft extends through a suitable opening to the exterior of the section 1 and is there provided with an enlarged outer end 24 so seated in a larger knob 25 that the shaft and eccentric may be turned when the knob 25 is turned.

Cooperating with the shaft and knob is also improved graduating and indicating means. Attention is here directed to the fact that upon one half of the inclined face 26 of the casing 1 which surrounds the protruding end of the shaft 20, a series of graduations 27, 28 and 29 is provided, these being marked respectively "Cold", "Medium", and "Hot" and having two or more graduations 30 between "Cold" and "Medium", and two or more graduations 31 between "Medium" and "Hot". Moreover, inside these graduations the surface of the member 1 is raised and serrated in a circle, as indicated at 32, while the knob 25 is provided on its adjacent surface with a similarly raised and serrated surface adapted to interfit therewith, each surface having its projections seated in the corresponding depressions in the other by the action of the spring 22. Attention is also directed to the fact that the knob 25 is provided with a pointer 33 adapted to rotate therewith and come opposite the marks 27, 28 and 29 or the intermediate marks 30 and 31 as the eccentric is rotated; and to the further fact that herein the serrations 32 are finer than the outer graduations so that the adjustment of the knob 25 may be even more finely regulated if desired.

In considering the operation of this improved construction, it will be understood that the thermostat member 10 tends to bend backward to the left in Fig. 2 when heated, and that the contact 14 is adapted to be moved in the same direction as the eccentric 17 is rotated by the knob 25 from the open circuit position illustrated in Fig. 2, corresponding to the indication "Cold", in such manner as to enable the operator to vary the temperature at which the thermostat acts. Thus, for example, when it is desired to connect the contacts, the eccentric is so turned that the pointer 33 is brought opposite the first mark

30. At this point, the contact buttons 15 and 11 are in contact and current flows through the conducting strip 16, the contact 14, the buttons 15, 11, the thermostatic contact 10, and the contact socket 9. Thereafter, by further turning the knob 25 in the same direction, the eccentric 17 is rotated in such manner as to press the contact 14 further toward the contact 10 so that for each graduation on the dial 26 it takes a greater amount of heat to make the button 11 on the thermostat separate from the button 15. In other words, the temperature at which the thermostat can act to open the circuit is increased as the eccentric 17 is rotated by the rotation of the indicator 33 from the "Cold" position toward the "Hot" position, illustrated in Fig. 4. For example, the temperature limit of the first mark 30 may be 100° and the second 200°, while that of the mark 28, indicated "Medium", may be 300°, that of the first mark 31, 400°, that of the second mark 31, 500°, and that of the mark 29, 600°; it thus being made possible for the operator to vary the point of thermostatic release by moving the contact button 15 farther and farther along the path of the contact button 11 so that the separation of this contact button 11 is deferred. When, however, the desired maximum for safe operation is reached, it will be understood that the member 10 will act alone, the eccentric being so proportioned that it cannot move the contact 14 too far. In fact, further rotation of the knob will permit the member 14 to snap back to the circuit-breaking position shown in Fig. 2. It will further be evident that in any predetermined setting of the knob, whenever the thermostat is sufficiently heated it will act automatically to separate its button 11 from the button 15, the thermostat thereby always being enabled to continue to function as an automatic means preventing over heating.

As a result of this improved construction it is made possible to utilize a manually movable contact member of strip form. It is also made possible to utilize contact surfaces in the form of two small and relatively cheap contact buttons, thereby substantially reducing the cost of manufacture as compared with previous devices of this character wherein the eccentric formed the manually adjustable contact and consequently the whole eccentric surface engaging the button 11 had to be formed of expensive contact material, such as sterling silver or the like. Moreover, it will be noted that the contact member 14 is made capable of formation, as by stamping, with the conducting strip 16 in such manner that it may be very cheaply made, while the contact button 15 may be later attached thereto in a usual manner. As the eccentric 17 acts on the contact 14 and does not form a contact surface, the finishing of this eccentric surface is also not such a delicate matter as is

the case where it is a contact. Attention is also directed to the fact that arcing between the thermostat button and the eccentric and the objectionable results thereof on the eccentric surface are overcome, the construction in general being not only more economical to manufacture, but more simple and also better adapted to stand up in service. Through the provision of the coiled spring it will also be noted that the knob is normally pulled in so that after it has been turned into any position manually it is automatically seated by the spring and held in the selected position with the serrations interengaging. Moreover, the spring functions to hold the contact 14 and eccentric in the desired relation. Attention is also directed to the fact that in addition to the fine adjustments made possible by the knob and the cooperating serrated surfaces and graduations, as above described, a very convenient visual indication of the position of the switch is provided by these elements. These and other advantages of this improved construction will, however, be clearly apparent to those skilled in the art.

While in this application is specifically described one embodiment which the invention may assume in practice, it will be understood that the invention is not limited thereto but may be modified and embodied in various other forms without departing from its spirit or the scope of the appended claims.

What we claim as new an desire to secure by Letters Patent is:—

1. In a switch, a thermostatically controlled contact carrying member, a movable contact carrying member, adjusting means for the latter movable relative thereto to adjust the contact carrying portion thereof, a casing enclosing said mechanism, cooperating means in part on the casing and in part movable with said adjusting means for holding said adjusting means in different positions including a plurality of interengaging surfaces, and a spring holding said surfaces in interengagement.

2. In a switch, a thermostatic contact carrying member, a cooperating contact carrying strip member, and a cylindrical cam having its periphery engageable with said strip member, and rotatable to move the same, the periphery of said cam having a flattened section adapted to be disposed parallel to said strip member in open circuit position.

3. In a switch, a casing, a thermostatically controlled contact carrying member therein, a cooperating contact carrying strip member therein, means engaging said strip member to adjust the latter, an operating member for said means outside the casing, cooperating serrations on the outside of said casing and on said operating member, and resilient means holding said last member in different adjusted positions, said serrations and resilient means being coaxial with said member.

4. In a switch, a casing, a thermostatically controlled contact carrying member therein, a cooperating contact carrying strip member therein, means engaging said strip member to adjust the latter, an operating member outside the casing, cooperating serrations on the outside of said casing and on said operating member, and resilient means holding said member in different adjusted positions, said serrations and resilient means being coaxial with said operating member and said resilient means being disposed between said adjusting means and said operating member.

5. In a switch, a thermostatically controlled contact carrying member, a cooperating contact carrying strip member, a conducting member carrying said strip member disposed substantially at right angles thereto and to said thermostatic member and also carrying a binding post, a socket connected to said thermostatic member, and means for manually adjusting said strip member relative to said thermostatic member including an eccentric on one side of said conducting strip and operating means for said eccentric operable from the other side of said conducting strip.

6. In a switch, a combined terminal and contact member comprising a body having a binding post at one end and a resilient contact carrying member attached to said member and disposed at right angles to said body and having its free end extending toward said binding post and movable transversely of said body.

7. In a switch, a combined terminal and contact member comprising a binding post carrying body having a resilient contact carrying member attached thereto and disposed at right angles thereto and having its free end movable transversely thereof, and an adjusting cam for said contact having a shaft extending through said binding post carrying body and a cam disposed in planes parallel to said body and engageable with the non-contact carrying side of said resilient member.

8. In a thermostatic plug, a casing having a pair of plug sockets, a pair of binding posts, one of said sockets being connected to one of said binding posts, a thermostatic contact-carrying member connected to the other socket, a resilient contact-carrying member connected to the other binding post, a cylindrical adjusting cam having its periphery engaging said resilient contact-carrying member to control the temperature at which the circuit will be opened, a shaft for said cam passing through said casing, and a manually operated knob outside of said casing mounted on said shaft.

9. In a thermostatic plug, a casing having a pair of plug sockets, a pair of binding posts, one of said sockets being connected to one of said binding posts, a thermostatic

contact-carrying member connected to the other socket, a resilient contact-carrying member connected to the other binding post, a cylindrical adjusting cam having its periphery engaging said resilient contact-carrying member to control the temperature at which the circuit will be opened, and a spring for holding said cam in adjusted position.

In testimony whereof we affix our signatures.

FRANK E. WOLCOTT.
LOUIS V. LUCIA.

15

20

25

30

35

40

45

50

55

60

65