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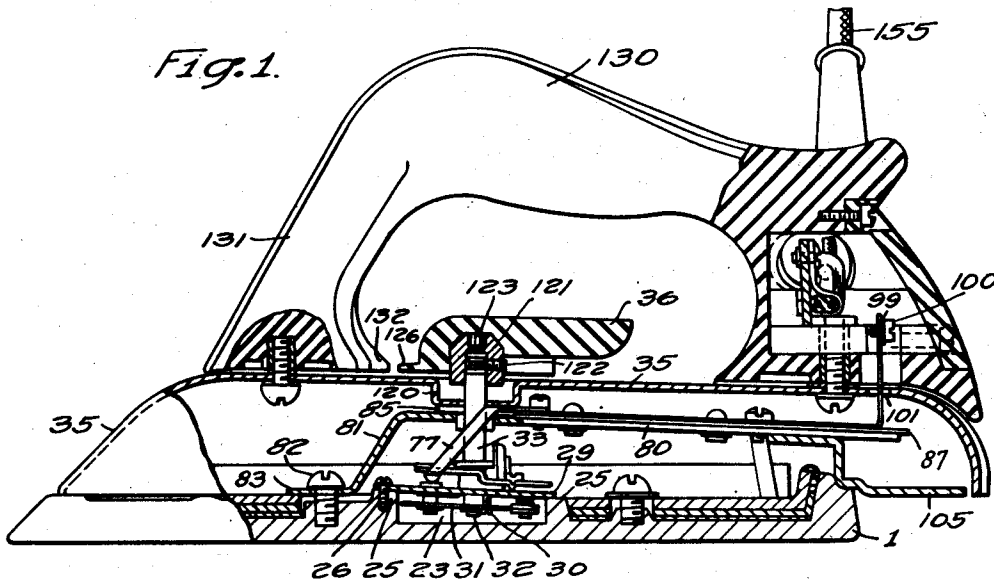
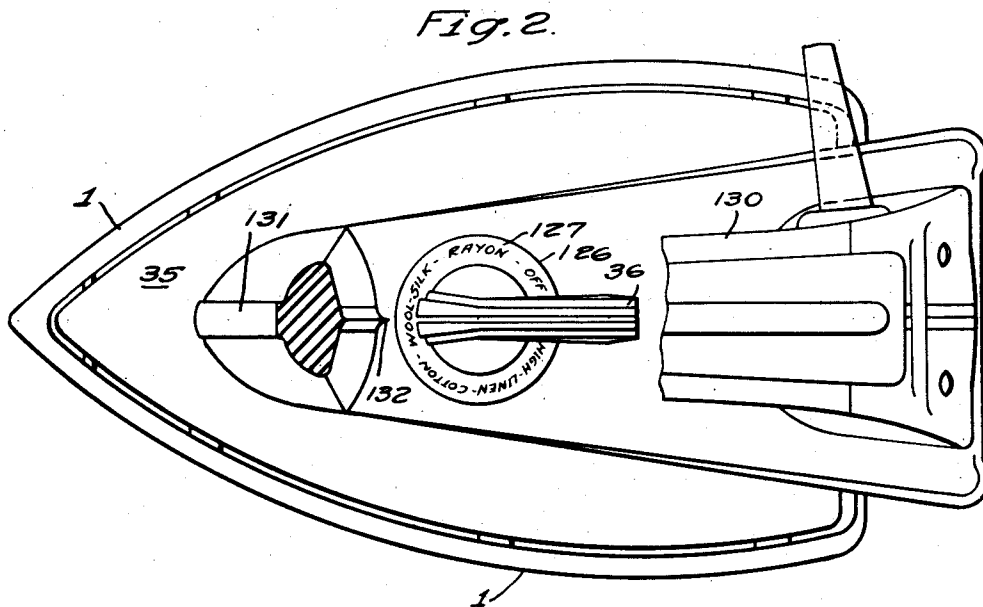
E. K. CLARK

2,195,002

SADIRON

Original Filed May 21, 1936

3 Sheets-Sheet 1



March 26, 1940.

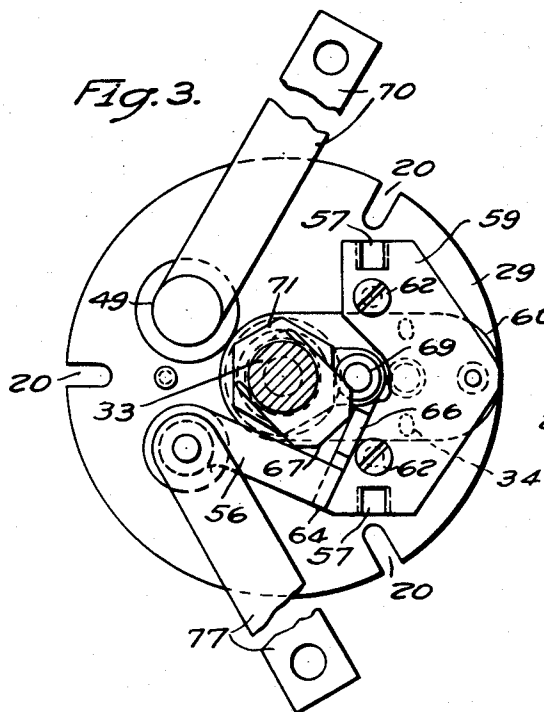
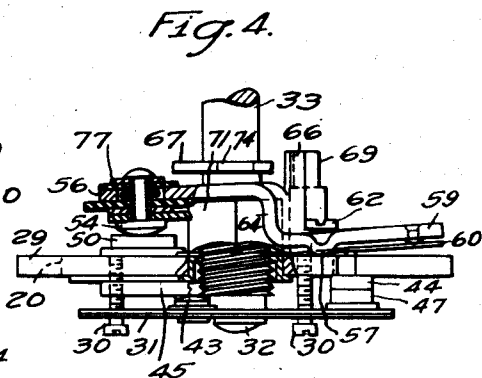
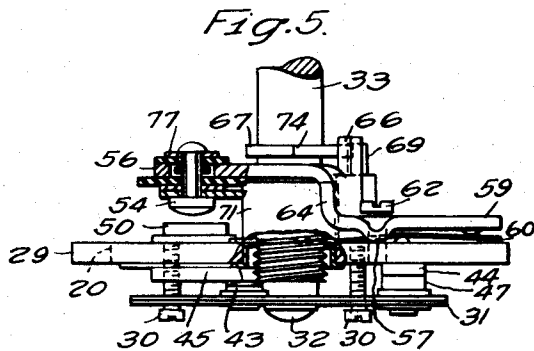
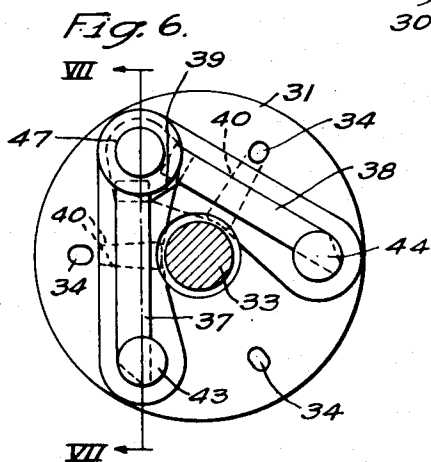
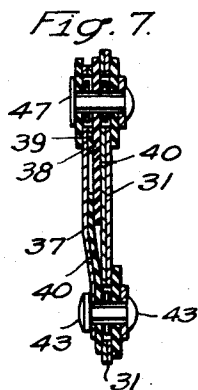
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SADIRON

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3 Sheets-Sheet 2



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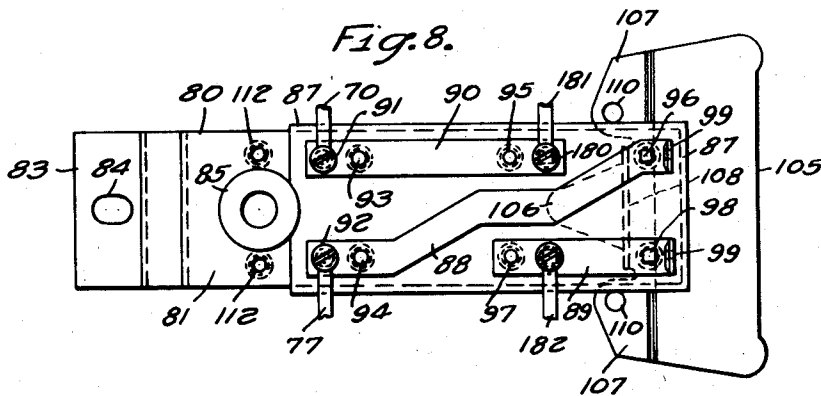
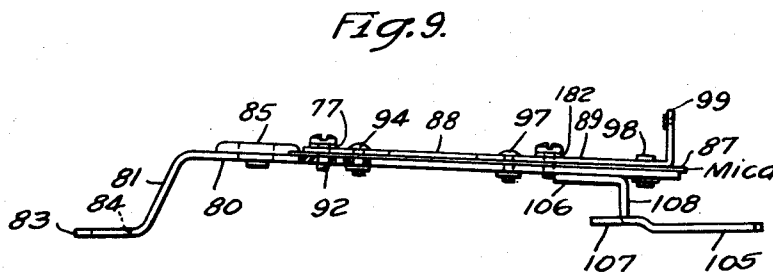
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SADIRON

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3 Sheets-Sheet 3



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2,195,002

SADIRON

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Original application May 21, 1936, Serial No. 81,052. Divided and this application November 22, 1938, Serial No. 241,767

6 Claims. (Cl. 200—138)

My invention relates to electrically heated sadirons, and particularly to such irons for domestic use, this application being a division of application Serial No. 81,052, filed on May 21, 1936.

5 An object of this invention is to provide means located on top of an iron casing or housing for adjusting a thermostat within the iron, indicia on the adjusting means serving to indicate the goods for which the temperature of the iron at the particular setting of the thermostat indicated is appropriate for ironing purposes.

10 It is a further object of this invention to provide a point on the handle of the iron to cooperate as a reference point with the indicia on the adjusting means.

15 It is a further object of this invention to provide a switch so cooperating with the adjusting means for the thermostat that when the adjustment is moved to its extreme low-temperature position, current is completely shut off from the heater.

20 It is a further object of this invention to provide a switch which shall remain closed through all of the adjusting movement, except the very last portion of the movement to an extreme position and shall be opened an ample amount by the last portion of the adjusting movement.

25 Other objects of the invention and details of the construction will be apparent from the following description and the accompanying drawings, in which:

30 Figure 1 is a longitudinal elevational view of the iron, partly in section;

Fig. 2 is a top plan view of the iron with certain parts being broken away;

35 Fig. 3 is a top plan view of the thermostat;

Fig. 4 is a view partly in section and partly in side elevation of the thermostats showing the associated switch in closed position;

40 Fig. 5 is a similar view showing the switch in open position;

Fig. 6 is a top plan view of the thermostat disk and associated parts;

45 Fig. 7 is a sectional view taken on the line VII—VII of Fig. 6,

Fig. 8 is a top plan view of the conductor supporting shelf; and

Fig. 9 is a side elevational view of the shelf.

50 The illustrated sadiron comprises a base 1, preferably of forged steel of the usual general shape for the bottom of a sadiron and the weight of which constitutes most of the weight of the iron. If preferred the base may be of cast iron. The heater may be of the usual form comprising a sheet of mica with resistance wire wound there-

on plus top and bottom mica plates used for insulation. Since the construction of the heater in itself forms no part of this invention, it is unnecessary to describe or illustrate it in further detail.

5 A well 23 in about the middle of the base 1 extends so near to the bottom of the base that the portion of the base under the well is thinner than any other part of the base.

10 This well is provided with an upwardly extending parapet 25 on the rear side and a projection on the front side to accommodate holes for screws by which parts are secured to the side walls of the well. The thermostat is supported in the well 23 by a foundation plate 29, best shown in Figs. 3 to 5 and in section in Fig. 1. Notches 20 in the plate 29 cooperate with screws 26, one of which is seen in Fig. 1, to secure plate 29 over the well.

20 Screws 30, Figs. 4 and 5, mounted in the foundation plate 29 and extending through holes 34 (Fig. 6) in disk 31 afford bearings for the disk 31. The disk 31 is of bimetal and is carried at the lower end of a shaft 33 which extends to the top of the housing 35 where it is manipulated by means of an adjustment lever 36. The disk 31 is secured to the shaft 33 by heading the shaft over a washer, as shown at 32.

30 Conductor strips 37 and 38 mounted upon the upper side of the disk 31, which is the left-hand side in Fig. 7, are separated from the disk by pieces of mica 40 which overlap, as is indicated in dotted lines in Fig. 6.

40 Contact terminals 43 are on the upper ends of rivets which extend through the disk 31, mica 40 and the conductors 37 and 38 and cooperate with contacts carried on plate 29 but insulated therefrom. At the junction of conductors 37 and 38 there is a rivet extending through both and also the disk 31 and ending in a flat head 47. This head has no electrical function but serves to cooperate with a head 44 on disk 29 to present a symmetrical stop for the disk 31. Because the stop is symmetrical about the shaft 33, tendency for the disk to work loose is minimized. The conductors 37 and 38 form an uninterrupted connection from one contact rivet 43 through an irregular shaped washer 39 to which they are welded to the other contact rivet 43. Rivets 49 and 50, extending through plate 29, have at their lower ends contacts 45 cooperating with the contacts 43. At the upper end of rivet 49 it is connected to a ribbon 70.

55 The upper end of rivet 50 is a contact to cooperate with contact 54 carried by the lever 56 but

insulated therefrom as shown most clearly in Figs. 4 and 5. The lever 56 is provided with two downwardly off-set portions 57 which bear against the plate 29. The portion 59 of the lever 56 between the portions 57 is a blunt pointed triangle. A spring 60 presses against the under side of the apex of the triangle 59 and tends to depress the contact 54. Upward movement of the lever as a whole is prevented by screws 62 which extend through the lever near the base of the triangle 59 and hold it, with a certain lost motion, against the support plate 29. The degree to which the portions 57 are struck downward serves to determine spacing of lever 56 and thus the normal position of contact 54.

The lever 56 has two right angle bends whereby an upwardly extending part 64 is formed therein which permits the end of the lever carrying the contact 54 to be at a higher level than the triangle 59. The vertically extending portion has a projection at one side thereof which forms an upstanding part 66, which extends into the pathway of a projection or lug 67 rigidly fastened to the shaft 33. A post 69 secured in the foundation plate 29 extends close to, and nearly parallel with, the extending arm 66 and forms a stop against which the projection 67 comes to rest. The upper part of post 69 is of smaller diameter to afford room for projection 67 to move further before reaching its stop but the lower part is made large enough to provide ample metal to secure the post to the plate 29.

Ribbons 70 and 77 extend from the thermostat and switch to conductors carried upon a shelf 80, shown in detail in Figs. 8 and 9. An upwardly extending leg 81 supports the body of the shelf from the base of the iron to which it is fastened by means of a screw 82, Fig. 1. The foot 83 at the bottom of the leg 81 contains a perforation 84 for cooperation with the screw 82. This perforation is not round but elongated to provide for variations in position of the shelf and the base when the iron is assembled.

A collar 85 secured to the shelf 80 where it is traversed by the shaft 33, affords a stop against which the shelf can be positioned.

A sheet of mica 87 extends lengthwise of the shelf and may, if desired, project slightly beyond the shelf at the side and rear. The mica separates the shelf from the conductors mounted thereon, which include a central conductor 88, a longitudinal conductor 89 which extends over only part of the shelf and a second longitudinal conductor 90 which extends over the other part.

The two ribbons 70 and 77 extend from their described connections in the thermostat and switch to the terminals 91 and 92 which are at the forward end of the conductors 88 and 90. Binding screws are provided at these points. The conductors are threaded where these binding screws traverse them, but the cooperating holes in the shelf are made larger than the screws and are unthreaded. The ends of the ribbons are perforated with holes that slip easily over the threads. A very convenient way of making connections is thus provided.

Rivets 93 and 94, adjacent the screws, are insulated from the shelf by appropriate washers and secure the conductors in place. Similar rivets 95 and 96, similarly insulated from the shelf, secure the other ends of the same conductors to the shelf. A similar pair of rivets 97 and 98 are installed near each end of the conductor 89. The rear ends of the conductors 88 and 89 have up-

wardly turned parts 99 which extend through the housing 35, as shown in Fig. 1. A slot 101, Fig. 1, is provided in the housing for their accommodation. At their upper ends they are provided with screw threaded orifices, and the screws cooperating therewith are shown at 100 in Fig. 1.

The rear end of the shelf 80 has secured thereto a support 105. A triangular tab 106 affords sufficient area for welding, brazing or other means by which the support is secured to the shelf. The under-surface of the rearmost part of the support 105 affords convenient location for a trade mark, size numbering or other desired legend, since it is outside of the iron, being beyond the rear edge of the base 1. It has two ears 107 which extend forward of the upright portion 108 and are provided with holes 110 through which assembly screws may be passed.

The shelf 80 is thus secured to the base and supported therefrom only by the leg 81 and the upright portion 108. These being of steel afford only small thermal conductive connection between the base 1 and the shelf 80. The shelf, therefore, is but slightly heated by conduction from the base. Two threaded holes 112 in the shelf 80 on each side of the collar 85 provide a grip for screws (not shown) by which the housing 35 is secured in place. When the screws are driven home they draw the depressed part 120 of the housing against the collar 85 on the shelf 80, thus positioning both parts.

Depression 120 is provided in the iron housing where the shaft 33 extends through it. Holes for the screws cooperating with the shelf 80 at 112 are provided in this depressed portion as well as a hole for the shaft 33.

Where the end of the shaft extends above the bottom of the housing, the metal hub 121 is secured to it by means of a set screw 122, Fig. 1. The hub constitutes an insert in the molded material of adjustment lever 36 which gives the lever the advantages of molded material and also the secure position of a metal portion. A groove in the upper part of the shaft cooperates with the set screw 122 and a knurled head 123 at the top of the shaft provides good connection to the handle 36. The interior of the top of the hub is broached to cooperate with the knurled head. Provision for securing the adjustment lever 36 to the shaft 33 in any desired direction is thus made.

The adjustment lever 36 is provided with a rounded portion to enclose the insert or hub 121 and the rounded portion is provided with a flange 126 upon which indicia 127 are provided which indicate the goods (wool, silk, etc.) upon which the iron can be used to advantage when the heat corresponds to that setting of the thermostat. At one extreme of the indicia, the word "off" is placed and at the other extreme the word "high."

The sadiron is provided with a handle 130 which is secured to the housing before the housing is put in place. The handle has two uprights; the forward upright, shown in section at 131 in Fig. 2, is provided on the rear surface thereof with a rib which forms a point 132 where it terminates at the surface of the iron. This point is closely adjacent to the flange 126 and so serves as an indicator point for the indicia 127.

In the operation of the device, when the iron is not in use, the current is switched off. This is done by rotating the adjustment lever 36 counterclockwise until it is stopped. The stopping is effected by the projecting piece 67 coming into contact with the post 69. As it comes into this posi-

tion, it pushes the arm 56 toward the rear of the iron which moves the lever 56 into the position shown in Fig. 5, in which the contact 54 is separated from the contact 50.

To the operator it would appear that the adjustment lever 36 was stopped by the interference of the forward upright of the handle 130 in its rotation, because, when the adjustment lever 36 has reached the position in which the current is shut off, which is the position in which the point 132 is opposite the index mark "off," the adjustment lever 36 will have nearly contacted with the upright in question. This is the position in which the adjustment lever 36 is left when the iron is not in use. Normally it is not disturbed after the current is shut off.

When the iron is to be put to use, the end of the cord 155 is connected to a source of power (not shown) in the usual way; by a wall socket, for example. Current then flows through one conductor of the cord to one of the terminal connectors 100, say, for example, to that associated with the upper upright 99 in Fig. 8. Current flows along this upright to the conductor 98 and thence to the screw 92 and so to the ribbon 77. It descends this ribbon to the contact member 54 and is there interrupted, unless the adjustment lever 36 has been moved from the last-described position.

When the adjustment lever 36 is moved, it is necessarily in a clockwise rotation (Fig. 2), since it was at its extreme counter-clockwise position. Movement of the adjustment lever 36 in clockwise direction causes the cross piece 67 to depart from the post 69 and release the upright 66. This causes the spring 60 to move the apex of the triangular part 59 of the lever upward. The screws 62 causes the movement of the lever to be about the heads of the screws 62 as a pivot. The contact 54, therefore, descends and meets the rivet head 50. Thence current passes through the rivet 50 to contact 45 and abutting contact 43, thence through conducting strips 38 and 37 to the other contact 43 which cooperates with the lower end of rivet 49. This brings the current to the ribbon 70 which is connected at the screw 91 with the conductor 90. Current passes along conductor 90 to the other end of it where the conductor is fastened by a screw 180 to a ribbon 181, leading to a terminal of the heater. The current passes through the heater to the other terminal thereof where it is received by a ribbon 182 and follows up this ribbon to the conductor 89. The upright part 99 of this conductor leads to the other terminal 100 from which it passes into the other conductor of the cord 155 and so back to the power supply.

As the base of the iron is heated, the thermostat being located in the well 23 and, therefore, well connected thermally to the base, is also heated. The foundation plate 29, because it covers the well 23, shuts in the heat within the well, so that the disk 31 quickly takes the temperature of the base. The bimetallic structure of the disk 31 causes it, when heated, to tend to become concave upon its lower face with a snap action.

An elastic stress in the disk 31 is produced by the pull of the shaft 33 against the center of the disk and the resistance of contacts like 45 to the upward movement of the disk-carried contacts such as 43. The greater this elastic stress, the less the change in configuration which must be produced by the bimetallic action in response to the heat. Thus, the higher the shaft 33, that is, the higher the central part of the disk before it

is heated, the smaller the temperature change through which it must be heated to cause it to pass that configuration at which it snaps, becoming concave downward. When the snap occurs, the contacts 43 open and current to the heater is shut off at two points adjacent the separated end of conductors 37 and 38.

When the adjusting lever 36 is rotated clockwise, it rotates the shaft 33 which, cooperating with the nut 71, descends and thus decreases the elastic strain in the disk. To decrease the elastic strain is to increase the strain which must be introduced by the bimetallic differential expansion, that is to increase the temperature to which the iron must be heated before the disk snaps.

The graduations 127 upon the flange 126 are such that, as the adjusting lever is rotated clockwise, first the mark "off" departs from the point 132 and the mark "rayon" comes into register with that point. Upon further rotation in the same direction, the mark "silk" comes into register with the point 132 and so on. Rayon is goods with respect to which only a low temperature of the iron is required. Silk calls for somewhat higher temperature; and so on, the highest temperature being required by linen.

The marks on the dial 126 thus indicate progressively higher temperatures as the dial is rotated clockwise and the mark "high," representing the limit of motion in the clockwise direction, corresponds to goods requiring a higher temperature than anything mentioned upon the dial. When the dial is rotated in the opposite direction successively, lower temperatures are called for to produce the snap action of the thermostat, until the mark "rayon" is in register with the point 132.

A further counter-clockwise movement of the adjusting lever 36 operates the switch lever 64 in the way already described and causes it to assume the position shown in Fig. 16 with the contact 54 open.

Various modifications may be made in the device embodying my invention without departing from the spirit and scope thereof, and I desire, therefore, that only such limitations shall be placed thereon as are imposed by the prior art and the appended claims.

I claim as my invention:

1. In combination, a thermostat and circuit interrupter comprising, a supporting plate, a bimetallic member, an adjusting shaft threadedly engaging the plate and attached at its lower end to the bimetallic member for adjusting the operations thereof, main contact means including a stationary contact on the plate and a cooperating movable contact on the member, secondary contact means including a stationary contact attached to the plate and a cooperative movable contact movably attached to the plate by a lever, and a lug attached to the shaft for cooperating with the lever and operating the secondary contacts in response to the movements of such adjusting shaft.

2. In combination, a thermostat and circuit interrupter comprising a support, a thermostatic member mounted thereon, a rotatable shaft for adjusting said thermostatic member, first contact means including a stationary contact on said support and a cooperating contact movable with said member, second contact means including a stationary contact on said support and a cooperative movable contact having a movable mounting on said support, and means movable with said shaft for intermittently engaging said

mounting to cause operation of said second contact means in response to movements of such adjusting shaft.

3. In combination, a thermostat and circuit interrupter comprising a support, a thermostatic member mounted thereon, a rotatable shaft for adjusting said thermostatic member, first contact means including a stationary contact on said support and a cooperating contact movable with said member, second contact means including a stationary contact on said support and a cooperative movable contact movably attached to said support by a lever, and a lug attached to said shaft for cooperating with the lever and operating said second contact means in response to movement of such adjusting shaft.

4. In combination, a thermostat and circuit interrupter comprising a support, a thermostatic member mounted thereon, a rotatable shaft for adjusting said thermostatic member, first contact means including a stationary contact on said support and a cooperating contact movable with said member, second contact means including a stationary contact on said support and a cooperative movable contact, a lever carrying said movable contact and pivotally mounted on said support, and means movable with said shaft for intermittently engaging said lever to cause operation of said second contact means in response to movements of such adjusting shaft.

5. In combination, a thermostat and circuit interrupter comprising a support, a thermostatic member mounted thereon, a rotatable shaft for adjusting said thermostatic member, first contact means including a stationary contact on said support and a cooperating contact movable with said member, second contact means including a stationary contact on said support and a cooperative movable contact, means carrying said movable contact and biased to closed position, and means movable with said shaft for intermittently engaging said biased means to cause operation of said second contact means in response to movements of such adjusting shaft.

6. In combination, a thermostat and circuit interrupter comprising a support, a thermostatic member mounted thereon, a rotatable shaft for adjusting said thermostatic member, first contact means including a stationary contact on said support and a cooperating contact movable with said member, second contact means including a stationary contact on said support and a cooperative movable contact, means carrying said movable contact and biased to closed position, a stop on said support, and means movable with said shaft for engaging said biased means to close and open said movable contact means just after leaving and just before reaching said stop, respectively.

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