Feb. 13, 1951 H. W. SCHULZE 2,541,892

ELECTRIC SWITCH POSITION INDICATOR

Filed Feb. 7, 1948

FIG. 1

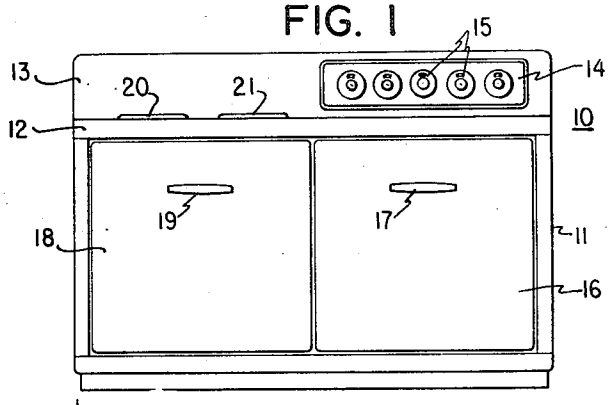


FIG. 2

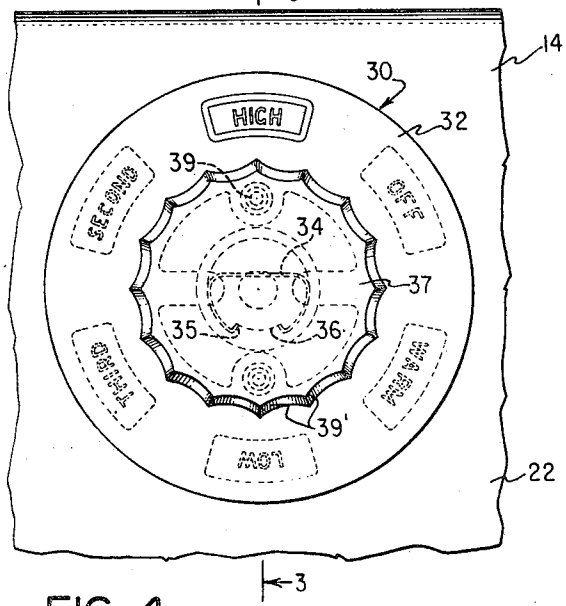


FIG. 3

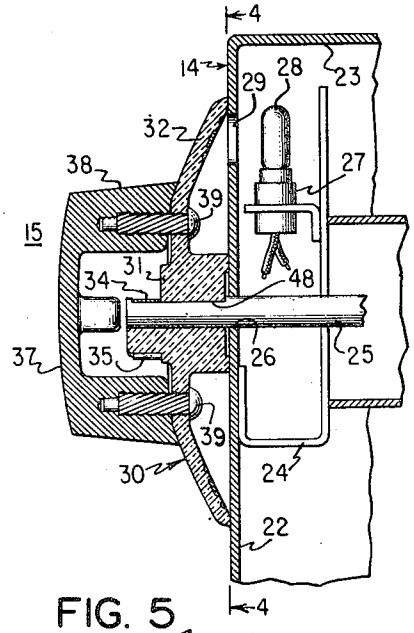


FIG. 4

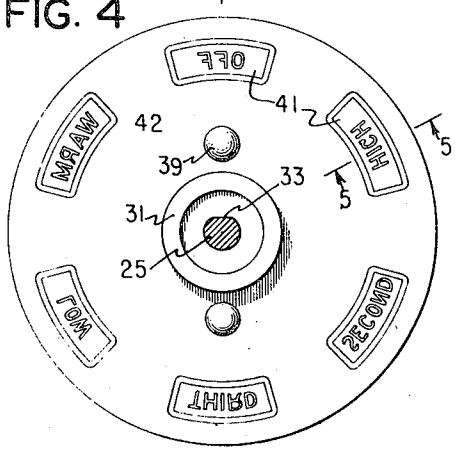
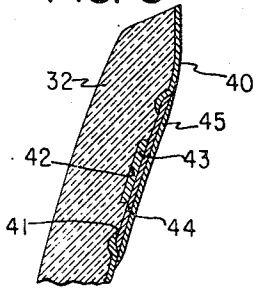


FIG. 5



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Patented Feb. 13, 1951 2,541,892

UNITED STATES PATENT OFFIC

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ELECTRIC SWITCH POSITION INDICATOR

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Application February 7, 1948, Serial No. 6,937

8 Claims. (Cl. 116—129)

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The present invention relates to electric switches of the multi-position type that are especially suitable for use in electric ranges and other appliances, and more particularly to such switches incorporating arrangements for selectively indicating the different control positions thereof.

It is a general object of the present invention to provide an electric switch of the character noted that incorporates an improved indicating arrangement of the illuminated type, wherein light of different colors is produced in accordance with the different control positions thereof.

Another object of the invention is to provide an electric switch of the character noted, that is of extremely simple construction and arrangement.

Further features of the invention pertain to the particular arrangement of the elements of the electric switch, whereby the above-outlined and additional operating features thereof are attained.

The invention, both as to its organization and method of operation, together with further objects and advantages thereof, will best be understood by reference to the following specification taken in connection with the accompanying drawing, in which Figure 1 is a front view of an electric range provided with a control panel carrying a plurality of electric switches embodying the present invention; Fig. 2 is an enlarged fragmentary front view of the control panel shown in Fig. 1, illustrating the details of one of the electric switches carried thereby; Fig. 3 is an enlarged fragmentary sectional view of the electric switch, taken in the direction of the arrows along the line 3—3 in Fig. 2; Fig. 4 is an enlarged sectional view of the electric switch, taken in the direction of the arrows along the line 4—4 in Fig. 3, showing the rear surface of the control dial incorporated therein; and Fig. 5 is a greatly enlarged fragmentary sectional view of the control dial, taken in the direction of the arrows along the line 5—5 in Fig. 4.

Referring now to the drawing, the electric range 10 there illustrated comprises an upstanding frame or body 11 provided with a substantially horizontally disposed cooking top 12 carrying adjacent to the rear thereof upwardly extending back-splash structure 13 supporting on the right-hand side thereof a control panel 14 carrying a plurality of electric switches 15 embodying the features of the present invention. The body 11 comprises an oven disposed in the right-hand portion thereof below the cooking top 12 and having an open front closed by a suitable door 16, the

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door 16 being hinged adjacent to the lower edge thereof in a manner not shown and provided with an operating handle 17 positioned adjacent to the upper edge thereof. Also the body 11 comprises a storage space disposed in the left-hand portion thereof below the cooking top 12 and having an open front closed by a suitable door 18, the door 18 being hinged adjacent to the left-hand edge thereof in a manner not shown and provided with an operating handle 19 positioned adjacent to the upper edge thereof.

Also the cooking top 12 has a plurality of openings formed in the left-hand surface thereof in which corresponding surface heating units are removably secured in place. Specifically the left-hand surface of the cooking top 12 has four openings formed therein arranged both front and rear and left and right and removably carrying corresponding surface heating units. For convenience, the four surface heating units will be referred to hereinafter as the left front, the right front, the left rear and the right rear surface heating units. The left front and the right front surface heating units are respectively indicated at 20 and 21, while the left rear and the right rear surface heating units are concealed by other structure. Also the oven comprises the usual heating elements, not shown.

Specifically, the control panel 14 carries five of the electric switches 15, the first four of the electric switches 15 being employed for the purpose of controlling the circuits of the respective four surface heating units, and the fifth electric switch 15 being employed for the purpose of controlling the circuit of the oven heating elements. The first four electric switches 15 employed for controlling the circuits of the respective four surface heating elements are identical, each being of the multi-position type provided with six individual control positions; while the fifth electric switch 15 employed for controlling the circuit of the oven heating elements is substantially identical to the first four mentioned, it also being of the multi-position type and provided with only four control positions.

Referring now more particularly to Figs. 2 to 5, inclusive, of the drawing, it will be observed that the control panel 14 comprises a substantially vertically disposed front wall 22 and a substantially horizontally disposed top wall 23, as well as structure 24, directly supporting the electric switch 15. Specifically, the electric switch 15 illustrated in the figures noted of the drawing, is of the multi-position type including six individual control positions and is utilized for the

purpose of controlling the circuit of one of the surface heating units 20, etc. More particularly, the switch 15 comprises a control shaft 25 supported by the structure 24 and extending through an opening 26 formed in the front wall 22. The rear end of the control shaft 25 is directly connected to contact controlling mechanism, not shown, also supported by the structure 24, which contact controlling mechanism is arranged directly to control the electric circuit of the associated surface heating unit and may be of the general character of that disclosed in U. S. Patent No. 2,203,236, granted June 4, 1940, to Charles P. Randolph. Also the structure 24 carries a socket 27 supporting a small electric lamp 28 arranged behind and directly in line with an opening 29 formed in the front wall 22 just below the top wall 23.

Further the switch 15 comprises a transparent element or dial 30 including a centrally disposed body 31 and a surrounding annular skirt 32. Preferably, the dial 30 is molded from a clear colorless transparent plastic, such for example, as Lucite, Polystyrene, etc., and has a central opening 48 formed therein that receives the outer end of the control shaft 25. The control shaft 25 is provided with a notch or flattened surface 33 adjacent to the outer end thereof that cooperates with a similar part provided in the opening 48 formed in the body 31 in order that the dial 30 may rotate the control shaft 25. Also the extreme outer end of the notch 31 receives the intermediate portion of a flat ribbon-like spring 34, the ends of the spring 34 being turned inwardly, as indicated at 35, and arranged in a recess 36 formed in the outer surface of the body 31, in order detachably to secure the dial 30 on the outer end of the control shaft 25. Also the outer marginal rim of the annular skirt 32 projects radially from the center line of the control shaft 25 beyond the opening 29 formed in the front wall 22 toward the top wall 23; whereby the annular portion of the skirt 32 covers the opening 29 formed in the front wall 22.

Also the switch 15 comprises a manually rotatable member or knob 37 carried by the dial 30 and covering the body 31, as well as the end of the control shaft 25. Preferably, the knob 37 is formed of a suitable die-cast metal and is provided with a bright chromium plated outer coating for the purpose of enhancing the appearance thereof. The knob 37 is of hollow construction and is provided with a cylindrical side wall 38 that may be secured to the dial 30 by two drive screws 39 in the manner indicated. Also the outer cylindrical surface of the knob 37 may be suitably fluted as illustrated at 39 in order to facilitate gripping thereof and the consequent operation of the switch 15. In view of the foregoing, it will be understood that the dial 30 is rigidly, although removably, secured to the control shaft 25 and that the knob 37 is rigidly secured to the dial 30. Accordingly, by selectively rotating the knob 37, the dial 30 and consequently the control shaft 25 may be selectively rotated in order selectively to set the control position of the electric switch 15; whereby the electric switch 15 may be selectively set into any one of its six control positions in order to cause the contact controlling mechanism, not shown, correspondingly to govern the electric circuit of the associated surface heating unit.

As best shown in Fig. 5, the interior surface of the annular skirt 32 and the associated surface of the body 31 disposed adjacent to the front wall 22 are provided with an opaque coating 40 that may comprise a suitable rather thick layer of aluminum paint; which coating 40 has six substantially equally angularly disposed indicating areas or windows 41 formed therein. The six indicating areas 41 formed in the opaque coating 40 respectively correspond to the six control positions of the switch 15; and specifically, correspond to the respective "Off," "High," "Second," "Third," "Low" and "Warm" control positions thereof. The indicating areas 41 have a plurality of depressions 42 formed in the central portions thereof and respectively corresponding to the characters or letters of the respective legends "Off," "High," etc.; which depressions 42 are filled with opaque material 43 forming the corresponding letters. Thus as illustrated in Fig. 5, the particular indicating area 41 there shown has depressions 42 formed therein in accordance with the legend "High," which depressions 42 are filled with opaque material 43 forming the opaque letters "H," "I," "G," and "H." This opaque material 43 forming the letters mentioned may comprise a suitable rather thick layer of aluminum paint.

Further the six indicating areas 41 are respectively provided with a translucent coating 44 covering the opaque letters 43, which translucent coatings 44 may comprise a suitable rather thin layer of aluminum pait. Finally, the six indicating areas 41 are respectively provided with different colored translucent coatings 45, covering the translucent coatings 44, which translucent coatings 45 may comprise suitable rather thin layers of colored paints. Specifically, the six different colored translucent coatings are matched with respect to the legends "High," etc., and consequently with respect to the corresponding control positions of the switch 15. Preferably the colors are matched as indicated below. A red translucent coating backs the legend "High"; a yellow translucent coating backs the legend "Second"; a purple translucent coating backs the legend "Third"; a green translucent coating backs the legend "Low"; a blue translucent coating backs the legend "Warm"; and a silver translucent coating backs the legend "Off." In fact if desired, the coating backing the legend "Off" may be opaque instead of translucent merely by utilizing a relatively thick layer of aluminum paint as the outer coating.

With particular reference to Fig. 5, it will be understood the opaque coating 40 does not permit the passage of light therethrough; whereby the indicating area 41 formed in the coating 40 is sharply defined. However, light may pass through the red translucent coating 45 and the silver translucent coating 44 and thence through the transparent skirt 32 of the dial 30. Finally, light cannot pass through the opaque letters 43; whereby the legend "High" is sharply defined. Accordingly, it will be understood that when the knob 37 of the switch 15 is rotated to move the contact controlling mechanism, not shown, into its corresponding "high" control position, the corresponding indicating area 41 formed in the coating 40 carried by the skirt 32 of the dial 30 is rotated into alignment with respect to the opening 29 formed in the front wall 22. Hence light from the electric lamp 28 proceeding through the opening 29 formed in the front wall 22 and impinges upon the adjacent surface of the indicating area 41 bearing the legend "High." Accordingly, the legend "High" is sharply out-

lined by the flood of surrounding red light, thereby indicating the control position of the switch 15. The "high" position of the switch 15 is not only indicated by the flood of red light, but also by the sharply defined legend "High." Further it is noted that when the switch 15 is operated from its "off" control position to any of its other five control positions, a circuit, not shown, is completed for illuminating the electric light 28; whereby the electric light 28 is illuminated when the switch 15 occupies any of its control positions with the exception of its "off" control position.

In view of the foregoing it will be understood that when the switch 15 occupies its "second," etc., control positions, the electric lamp 28 is illuminated, the corresponding yellow, etc., flood of light proceeds through the aligned indicating area 41 formed in the coating 40 carried by the skirt 32 of the dial 30 and the corresponding legend "Second," etc., is framed in the flood of colored light.

Moreover, when the switch 15 is operated to its "off" control position any external light proceeding from the front through the annular skirt 32 of the dial 30 will be reflected equally well by the opaque silver coating 40 and the translucent silver coatings 45; whereby the colored coatings 44 are not visible from the front of the dial 30. Thus when the switch 15 occupies its "off" control position, the front of the dial 30 presents a substantially uniform silver appearance.

In view of the foregoing it is apparent that there has been provided an electric switch of the multi-position type incorporating an improved illuminated arrangement for indicating the control position thereof.

While there has been described what is at present considered to be the preferred embodiment of the invention, it will be understood that various modifications may be made therein, and it is intended to cover in the appended claims all such modifications as fall within the true spirit and scope of the invention.

What is claimed is:

1. An electric switch of the multi-position type comprising a manually movable member for selectively setting the different control positions thereof, an indicating element formed of transparent material and secured to said member, an illumination source positioned adjacent to said element, an opaque coating carried on the surface of said element disposed adjacent to said illumination source, said opaque coating having a plurality of spaced-apart indicating areas formed therein and respectively corresponding to the different control positions of said switch, and a plurality of different colored translucent coatings respectively carried by said indicating areas, said indicating areas being selectively moved immediately adjacent to said illumination source as said member is moved selectively to set the different control positions of said switch.

2. An electric switch of the multi-position type comprising a manually movable member for selectively setting the different control positions thereof, an indicating element formed of transparent material and secured to said member, an illumination source positioned adjacent to said element, an opaque coating carried on the surface of said element disposed adjacent to said illumination source, said opaque coating having a plurality of spaced-apart indicating areas formed therein and respectively corresponding to the different control positions of said switch, a plurality of different opaque characters respectively carried by said indicating areas and respectively identifying the different control positions of said switch, and a plurality of different colored translucent coatings respectively carried by said indicating areas and respectively surrounding said opaque characters carried thereby, said indicating areas being selectively moved adjacent to said illumination source as said member is moved selectively to set the different control positions of said switch.

3. An electric switch of the multi-position type comprising a manually movable member for selectively setting the different control positions thereof, an indicating element formed of transparent material and secured to said member, an illumination source positioned adjacent to said element, an opaque coating carried on the surface of said element disposed adjacent to said illumination source, said opaque coating having a plurality of spaced-apart indicating areas formed therein and respectively corresponding to the different control positions of said switch, a plurality of background colored translucent coatings respectively carried by said indicating areas, and a plurality of different colored translucent coatings respectively carried by said background colored translucent coatings, said indicating areas being selectively moved adjacent to said illumination source as said member is moved selectively to set the different control positions of said switch.

4. An electric switch of the multi-position type comprising a manually rotatable knob for selectively setting the different control positions thereof, an indicating dial formed of transparent material and secured to said knob, an illumination source positioned adjacent to said dial, an opaque coating carried on the surface of said dial disposed adjacent to said illumination source, said opaque coating having a plurality of angularly spaced-apart indicating areas formed therein and respectively corresponding to the different control positions of said switch, and a plurality of different colored translucent coatings respectively carried by said indicating areas, said indicating areas being selectively moved immediately adjacent to said illumination source as said knob is rotated selectively to set the different control positions of said switch.

5. An electric switch of the multi-position type comprising a rotatable control shaft for selectively setting the different control positions thereof, a dial carried by said shaft and provided with an annular skirt formed of transparent material, an illumination source positioned adjacent to said skirt, an opaque coating carried on the surface of said skirt disposed adjacent to said illumination source, said opaque coating having a plurality of angularly spaced-apart indicating areas formed therein and respectively corresponding to the different control positions of said switch, and a plurality of different colored translucent coatings respectively carried by said indicating areas, said indicating areas being selectively moved immediately adjacent to said illumination source as said dial is rotated selectively to set the different control positions of said switch.

6. In combination, a support having openings formed therein, an electric switch of the multi-position type carried by said support and provided with a rotatable control shaft for selectively setting the different control positions thereof, one end of said shaft projecting through one of

said openings and carrying a dial disposed adjacent to said support, said dial being provided with an annular skirt formed of transparent material and covering one face of said other opening, a source of illumination carried by said support and positioned adjacent to the other face of said other opening, an opaque coating carried on the surface of said skirt disposed adjacent to said support, said opaque coating having a plurality of angularly spaced-apart indicating areas formed therein and respectively corresponding to the different control positions of said switch, and a plurality of different colored translucent coatings respectively carried by said indicating areas, said indicating areas being selectively moved in substantial registry with said other opening as said dial is rotated selectively to set the different control positions of said switch.

7. An electric switch of the multi-position type comprising a manually movable member for selectively setting the different control positions thereof, an indicating element formed of transparent material and secured to said member, an illumination source positioned adjacent to said element, an opaque mirror-like coating carried on the surface of said element disposed adjacent to said illumination source, said opaque mirror-like coating having a plurality of spaced-apart indicating areas formed therein and respectively corresponding to the different control positions of said switch, said indicating areas being selectively moved immediately adjacent to said illumination source as said member is moved selectively to set the different control positions of said switch, a plurality of different colored translucent coatings respectively carried by said indicating areas, and a plurality of translucent mirror-like coatings respectively carried by said colored translucent coatings, light proceeding from said illumination source passing through the translucent mirror-like coating and the colored translucent coating carried by the immediately adjacent one of said indicating areas and external light proceeding through said element being reflected by said opaque mirror-like coating and by said translucent mirror-like coatings carried by the remainder of said indicating areas.

8. An electric switch of the multi-position type

comprising a rotatable control shaft for selectively setting the different control positions thereof, a dial carried by said shaft and provided with an annular skirt formed of transparent material an illumination source positioned adjacent to said skirt, an opaque mirror-like coating carried on the surface of said skirt disposed adjacent to said illumination source, said opaque mirror-like coating having a plurality of annular spaced-apart indicating areas formed therein and respectively corresponding to the different control positions of said switch, said indicating areas being selectively moved immediately adjacent to said illumination source as said dial is rotated selectively to set the different control positions of said switch, a plurality of different colored translucent coatings respectively carried by said indicating areas, and a plurality of translucent mirror-like coatings respectively carried by said colored translucent coatings, light proceeding from said illumination source passing through the translucent mirror-like coating and the colored translucent coating carried by the immediately adjacent one of said indicating areas and external light proceeding through said skirt being reflected by said opaque mirror-like coating and by said translucent mirror-like coatings carried by the remainder of said indicating areas.

HERMAN W. SCHULZE.

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