

Feb. 12, 1952

H. W. SCHULZE
SELECTOR SWITCH SIGNALING SYSTEM FOR
ELECTRIC RANGES AND THE LIKE

2,585,503

Filed Nov. 29, 1950

2 SHEETS—SHEET 1

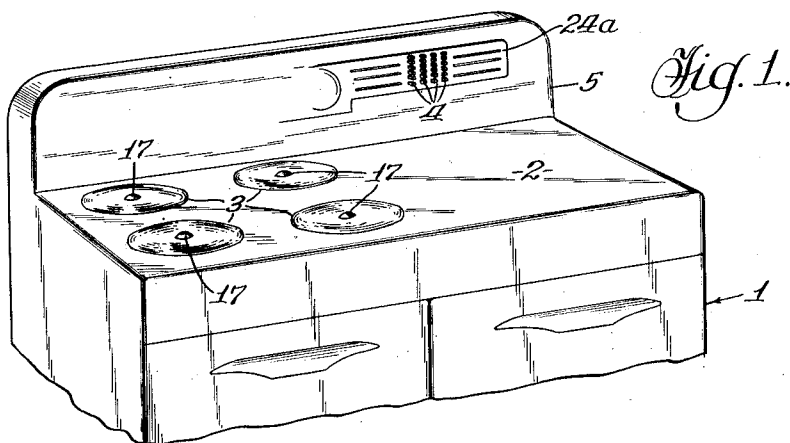


Fig. 1.

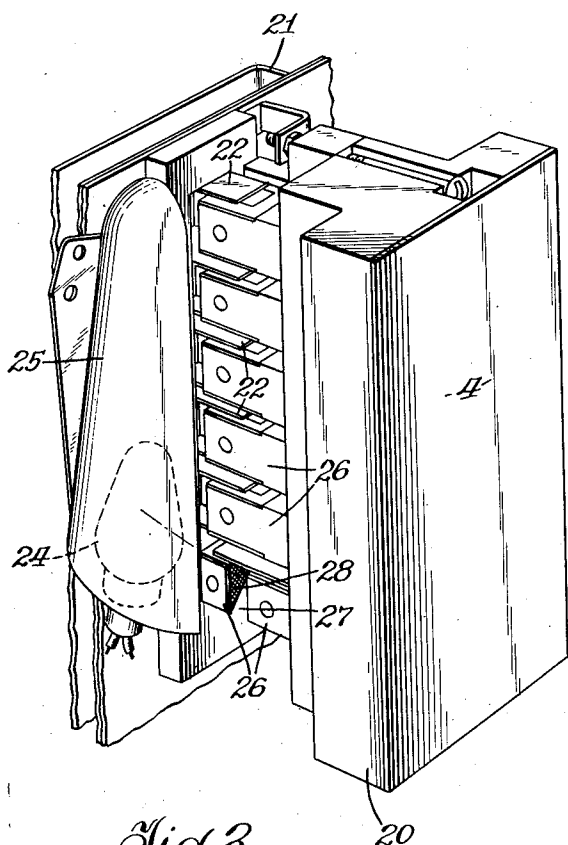


Fig. 3.

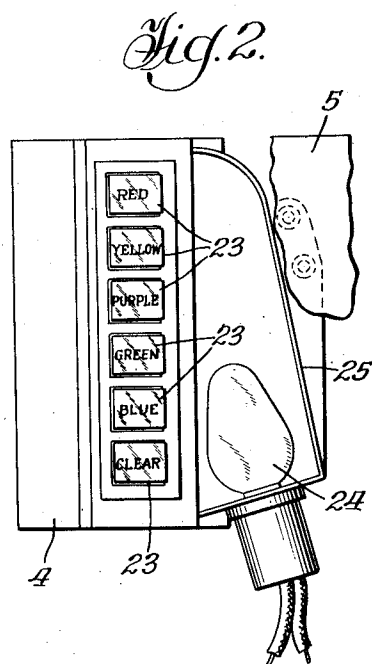


Fig. 2.

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2 SHEETS—SHEET 2

Fig. 4.

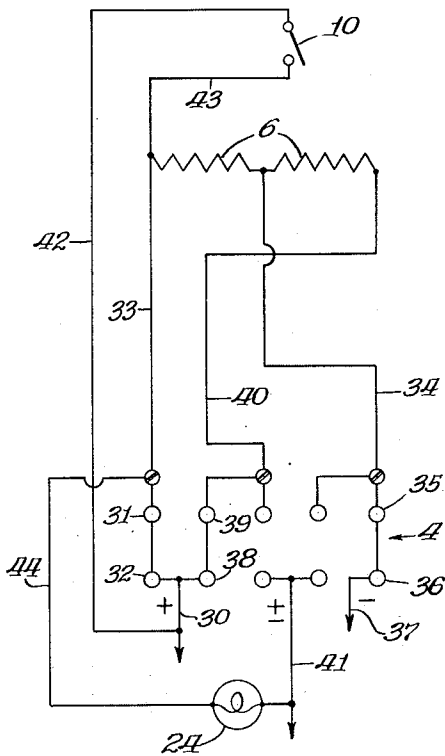
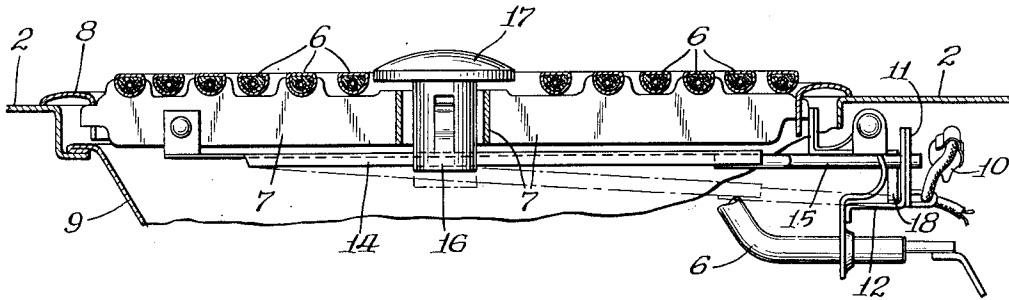


Fig. 5.

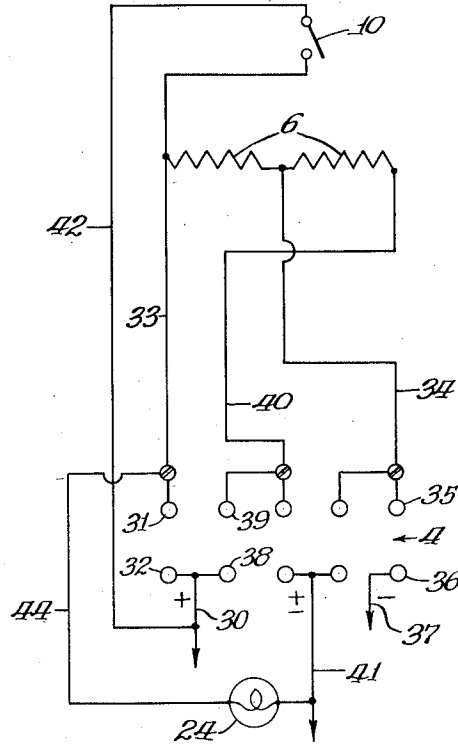


Fig. 6.

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UNITED STATES PATENT OFFICE

2,585,503

SELECTOR SWITCH SIGNALING SYSTEM
FOR ELECTRIC RANGES AND THE LIKEHerman W. Schulze, Elmwood Park, Ill., assignor
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Application November 29, 1950, Serial No. 198,152

4 Claims. (Cl. 177-311)

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This invention relates to improvements in electric ranges and the like, and in particular to an improved means for visually identifying the control switch associated with each of the several heating units of the range.

In modern electric range design it is considered preferable to locate the various control switches on the upstanding wall or "backsplash" at the rear of the cooking top, rather than on a panel or the like at the front of the range. Switches mounted on the backsplash are protected against high ambient temperatures during cooking and are out of the reach of a small child who might be tempted to play with the switch knobs or the like with danger to himself or to empty cooking vessels which may have been left on the cooking units of the range. A disadvantage of positioning the control switches at the rear, however, is that although the various switches are marked to associate them with their respective surface units, it is easy to mistake one for another and to actuate the wrong switch. This is particularly true when the surface units are grouped at one side of the range and the switches are arranged on the backsplash to the right or left of the surface unit group.

It is therefore a principal object of my invention to provide means which will positively identify the switch associated with the range surface unit on which a cooking vessel has been placed.

It is another object of my invention to provide an identification system by which an element of the heat selector switch of a surface heating unit will be illuminated whenever a cooking vessel is placed on the heating unit, the said identification means being extinguished when the heat selector switch is operated to any one of its closed circuit positions.

In a presently preferred embodiment, I apply my invention to heat selector switches of the type shown in Rees U. S. Patent No. 2,437,555 granted March 9, 1948, for "Pushbutton Switch." Such switches have a bank of pushbuttons, each controlling a circuit which provides a different thermal output of the surface unit. The switch has an electric lamp which lights whenever one of the heat selector buttons is operated to closed switch position. Each circuit-controlling switch button is arranged to transmit a different colored light when it is operated so that it, and therefore the degree of heat controlled by it, is ascertainable from a distance. An "off" button restores the entire circuit-controlling switch button system to open circuit position. I have provided means whereby the "off" button is illuminated

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when a pan is placed on the associated surface heating unit, but becomes dark when one of the circuit closing buttons is operated.

Other features and advantages will be apparent from the following detailed description of a presently preferred embodiment of my invention, read in conjunction with the accompanying drawings in which Fig. 1 is a fragmentary perspective showing an electric range to which my invention has been applied; Fig. 2 is a side elevation of a surface unit control switch as used in the range of Fig. 1; Fig. 3 is a perspective of the switch of Fig. 2 looking at the rear of the switch and indicating schematically how the single light source illuminates the respective switch buttons when they are depressed; Fig. 4 is a side sectional elevation of a control switch applied to a surface unit of the range; and Figs. 5 and 6 are schematic wiring diagrams showing a range switch in an "on" and an "off" position respectively.

Referring first to Fig. 1, an electric range 1 has a cooking top 2 with the conventional group of four surface units 3 arranged at the left hand side of the cooking top. A group of four push-button switches 4 is disposed on the backsplash 5 at the right hand side of the cooking top. These switches control the surface unit circuits to provide the desired heat condition, and are known in the art as "heat selector" switches. As is well understood, there is a switch for each of the surface units. Each surface unit 3 may have the usual complement of one or more sheathed tubular heating elements of the type and arrangement illustrated in Sharp reissue Patent No. 22,177 reissued September 8, 1942, for "Heating Device." Said surface units, as shown in said patent and in side sectional elevation in Fig. 4 usually comprise a pair of heating elements 6 coiled so as to nest one within the other and supported on the upper edge of a plurality of arms 7 arranged to form a grid. The ends of the arms are secured to a ring 8 which supports the assembly within a well provided in the cooking top. A reflector pan 9 reflects heat against the bottom of a cooking vessel (not shown) placed on the heating unit in contact with the flattened upper surfaces of the elements 6.

Each surface unit may be equipped with a switch of the type shown in the presently pending application of Kemper M. Hammell, Ser. No. 193,258 filed Oct. 31, 1950 for Indicator Switch Mechanism for Electric Ranges and the Like and assigned to my present assignee. Said switch includes an enclosed switch element 10 of the mercury in glass type carried on a bracket

11 which is pivotally mounted on a hinge member 12 carried by the frame of the range. Said bracket 11 is biased to rotate the switch element to open circuit position, and to operate the switch to closed circuit position there is employed a lever 14 pivotally affixed to an arm 7 of the support grid and having an extension 15 in operative engagement with the switch mounting bracket 11. A post 16 fixed to lever 14 extends upwardly through the central portion of the surface unit and presents a convex head 17 above the plane thereof. The lever 14 is biased for counterclockwise rotation by a leaf spring 18. It will be apparent that when a cooking vessel is placed on the surface unit, its weight will urge the post 16 downwardly to rotate lever 14 clockwise. This movement operates switch 10 to closed circuit position, as explained in said Hammell application.

As later explained, the surface unit heating elements are in circuit with the heat selector switch 4 of the individual surface unit. The following brief description of the heat selector switch may be amplified by reference to the said Rees Patent No. 2,437,555 and the patent to J. L. Andrews No. 2,431,904 granted December 2, 1947, for "Pushbutton Switch." Said switches have a body 20 containing a plurality of switch contact elements (not shown) and a front panel 21 which cooperates with the pairs of guide fingers 22 to provide means for guiding the several pushbuttons 23, which are arranged in a vertical row in the embodiment shown. When the switch body is affixed behind the back-splasher 5, the switch buttons project through openings in a suitable escutcheon plate 24^a affixed to the back-splasher. As explained in said Andrews patent, the switch buttons and contacts are associated by a mechanism embodying a plurality of cam plates which whenever any switch button is pushed inwardly, operate to move outwardly any other button which had previously been pushed in. The switch contacts are closed when a switch button in the heating circuit is depressed, and open when the button is in its outwardly projected position. It is obvious that since a button moves out to open circuit position only when another button is pushed inwardly, there must be an "off" button which when pushed in makes no contact but releases any other previously depressed button to clear all of the switch circuits. Thus it will be seen that when any surface heating unit is "off," the "off" button of its associated heat selector switch 4 will be in depressed position. It is the usual practice to provide means whereby the heating-circuit control buttons glow with individual colors when the button is depressed. The "off" button of the conventional switch has no illumination in either its extended or depressed position. The color of the switch button indicates its service; of the five degrees of heat the topmost button represents the maximum thermal output and will show red when pushed into its "on" position; the button which will show blue when depressed represents the least heat output of the thermal unit; and the yellow-, purple-, and green-illuminated buttons represent intermediate heats. In the adaptation of the conventional surface unit switch to my invention, I reposition the bulb 24 and reflector 25 to encompass the entire row of switch buttons, and form all of the buttons from a clear plastic material, such as polystyrene which has light conducting properties. Each button is secured within a metallic frame 26 which is light impervious. The respec-

tive frames are suitably guided for sliding movement within the switch body and actuate the switch operating cam devices not shown. The side wall of each frame 26 adjacent the light source, is slotted to provide an opening 27 which affords a light path to a prismatic rear wall 28 at the base of each pushbutton. Each said rear wall is preferably formed with a diamond knurled surface to pick up the light beams from the bulb 24, and the properties of the plastic material are such that the entire button appears illuminated when viewed from the front of the stove. The several colors shown in Fig. 2 may be obtained by coating the prism surface with color or by placing appropriate color screens (not shown) in front of each side wall opening 27; the "clear" color of the "off" button will be the unchanged color of the bulb 24 itself. The buttons are arranged so that until they are pushed in to their switch-closing position—or in the case of the "off" button to switch-clearing position—the side wall openings are effectively concealed by the switch body and the respective switch buttons receive no illumination. Therefore, only the depressed button receives and transmits light and the user of the stove can tell which button is "in" by the color which it transmits.

Figs. 5 and 6 respectively show the circuits resulting from operation of the high heat switch button and the "off" switch button. In Fig. 5 heat coils 6 are in parallel across a 230 volt Edison system in a circuit which includes plus lead 30, switch contacts 31, 32, conductor 33, the left-hand heat coil 6, conductor 34, and switch contacts 35, 36, to negative lead 37. The right-hand coil is energized by plus lead 30, switch contacts 38, 39, conductor 40, conductor 34, switch contacts 35, 36, and negative lead 37. Other heat circuit arrangements are well known to those skilled in the art and may be briefly summarized as follows: in second heat position which is provided when the "yellow" pushbutton is depressed, 230 volts are applied only to the left-hand heat coil 6 by a circuit which includes the first named portion of the previously described circuit. For the third heat, identified by the "purple" pushbutton, both of the heat coils are arranged in parallel across 115 volts and accordingly, each of the heat coils is connected to the plus-minus lead 41. For low heat, typified by the "green" button, 115 volts are applied across the left-hand coil 6 and the right-hand coil is inoperative. For "warm," which is provided when the "blue" button is depressed, both coils are connected in series across 115 volts. All of these heat circuits have in common the fact that the heat selector switch is closed across contacts 31 and 32. I have applied the switch 10 of each of the surface heating units across contacts 31 and 32 by a circuit which includes plus lead 30, conductor 42, switch 10, conductor 43, conductor 33, conductor 44, lamp 24, and the plus-minus conductor 41. It is apparent, therefore that the "off" button of any heat selector switch 4 will be illuminated in clear color whenever a cooking vessel is placed on the surface unit associated with said switch. When one of the circuit closing buttons is depressed to activate the heating unit, that button will show its distinctive color and the "off" button, which will be forwardly projected upon depression of the other, will no longer receive light and will have the same neutral coloration of the remaining switch buttons. Before the surface unit is energized, therefore, the illuminated "off" button provides the identification of the surface heating

unit on which the cooking vessel was placed, and when the unit is energized, one of the other buttons by its illumination performs its usual function of visually indicating the heating status of the active unit. The possibility of confusion arising from having two buttons illuminated at the same time on the same switch is avoided.

It should be understood that I do not limit the application of my invention to switches in which all of the switch buttons are arranged to be illuminated. Only the "off" button need be of light-transmitting material and arranged to be illuminated when it is depressed; the others may be conventional switch buttons of light-impervious material. In a switch in which only one button is capable of illumination, it is preferable that the "off" button be selected for identification because that button is in position to receive illumination when the switch unit is de-energized, and its extinguishment when the unit is energized will avoid confusion with adjacent selector switches.

It should also be understood that the present invention is not limited to switches of the mercury-in-glass type, such a switch having been shown by way of example and illustration only. Further, it will be appreciated that the heat selector switches need not be of the pushbutton type; for example, a rotary switch of the type shown in my U. S. Patent No. 2,541,892 granted February 13, 1951, for "Electric Switch Position Indicator" and assigned to my present assignee, may readily be adapted to the present invention.

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.

I claim:

1. In an electric range having a plurality of heating units each having at least one heating element and a selector switch for each unit, said selector switch being operable to an "off" position in which the heating is de-energized and to any of a plurality of other positions for closing circuits to the heating element of the associated heating unit to produce a desired thermal output, the combination of lamp means arranged to illuminate said switch in its "off" position and in any of its circuit closing positions, a circuit including said selector switch and said heating element circuits to energize said lamp whenever said switch is in any of its heating element circuit closing positions, a second circuit for illuminating said lamp means, and a switch disposed at each said heating unit to close said second circuit when a cooking vessel is placed on said unit, whereby to energize said lamp means of the selector switch associated with said unit when the selector switch is in "off" position.

2. In an electric range having a plurality of heating units each comprising a plurality of heating elements and a selector switch individual to each said unit, each switch having a plurality of light-transmitting actuator buttons individually operable when depressed to close a circuit including one or more of the heating elements of the associated heating unit to produce a desired thermal output at the unit and when returned to projected position to open said circuit, said switch having an "off" button effective when de-

pressed to restore to open circuit position any previously depressed button, the combination of lamp means and light-transmitting means arranged to illuminate any of said switch buttons by transmission of light through said button when the same is in depressed position only, a circuit including said selector switch for illuminating said lamp means when any actuator button is depressed to close one of the heating element circuits controlled thereby a second circuit for illuminating said lamp means, and a switch associated with each said heating unit to close said second circuit when a cooking vessel is placed on said unit, whereby said lamp may be energized to illuminate said "off" switch button when the same is in its depressed position and the respective actuating buttons are in their projected position in which none of the heating element switch circuits is closed.

3. In an electric range having a plurality of heating units each comprising a plurality of heating elements and a selector switch individual to each said unit, each switch having a plurality of actuator buttons individually operable when depressed to close a circuit including one or more of the heating elements of the associated heating unit to produce a desired thermal output at the unit and when restored to projected position to open said circuit, said switch having an "off" button effective when depressed to restore to open circuit position any previously depressed button, at least one of said actuator buttons and said "off" button being of light-transmitting material, the combination of lamp means and light-transmitting means arranged to illuminate said last named switch buttons only when they are in depressed position, a circuit including the circuit controlled by said light-transmitting actuator button to illuminate said lamp means when said light-transmitting actuator button is in circuit-closing position, a second circuit for illuminating said lamp means, and a switch associated with each said heating unit to close said second circuit when a cooking vessel is placed on said unit, whereby to illuminate said lamp and the "off" button when the latter is in depressed position and the said actuator buttons are in their projected position in which none of the selector switch circuits is closed.

4. In an electric range having a heating unit comprising a heating element and a switch for said unit, said switch having an actuator button operable when depressed to close a circuit including said heating element and when returned to projected position to open said circuit, said switch having an "off" button effective when depressed to restore said actuator button to open-circuit position, said "off" button being of light-transmitting material, the combination of lamp means arranged to illuminate said "off" button when the same is in depressed position, a circuit for illuminating said lamp means, and a switch associated with said heating unit to close said second circuit when a cooking vessel is placed on said unit, whereby said lamp may be energized to illuminate said "off" button when the same is in its depressed position and the actuating button is thereby in its open circuit position.

HERMAN W. SCHULZE.

No references cited.