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CONTROL SYSTEM FOR ELECTRIC COOKING OVENS

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Fig. 3

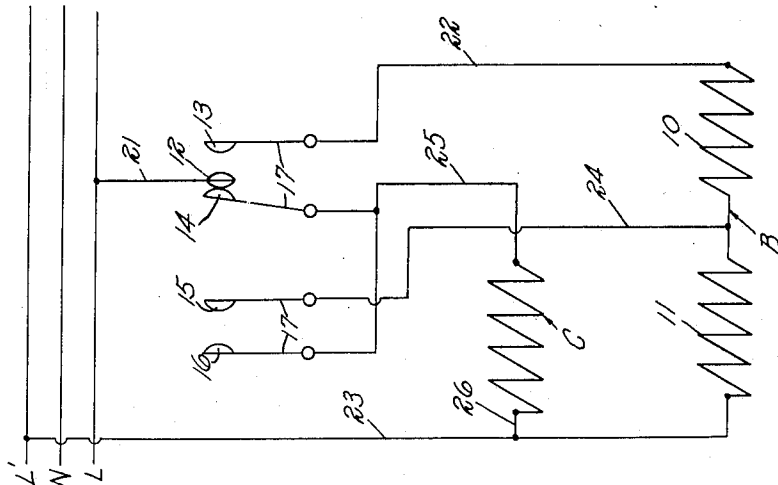


Fig. 2

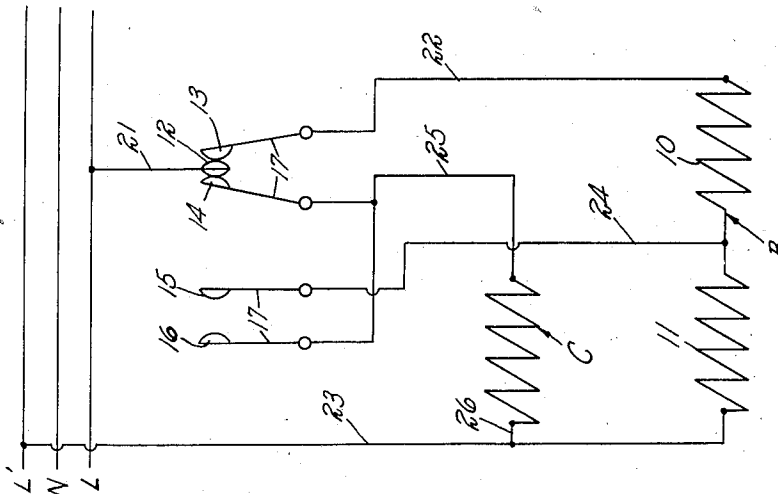
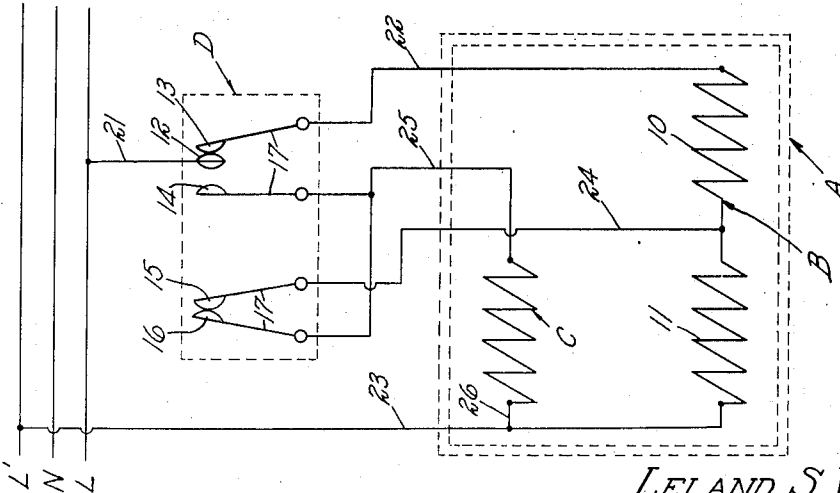


Fig. 1



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CONTROL SYSTEM FOR ELECTRIC COOKING OVENS

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4 Claims. (Cl. 219—20)

This invention relates to a system of control for electric cooking ovens of the type having a lower heating element and an upper heating element adapted to be selectively connected in circuit for meeting the requirements of "bake," "pre-heat," and "broil" conditions.

In one old system now in use, in order to obtain "pre-heat" conditions, both of the elements are connected across the outside lines of a three-wire system so that 220 volts are impressed upon each of the elements, and, in order to obtain "broil" conditions, only the upper element is so connected. In order to obtain "bake" conditions, which require a high heat emanation from the lower element and a reduced rate from the upper element, the lower element is connected across the outside or live lines and the upper element, together with a resistor in series therewith, is connected across one outside line and the neutral wire. This old system has been found objectionable in that when the switch, through which the elements are selectively controlled, is operated from "bake" to "pre-heat" positions, or vice versa, the polarity of the contacts of the switch are reversed, objectionable arcing at the switch contacts results; and short circuiting sometimes occurs. The use of a resistor or rheostat is also objectionable in that it is an additional expense and results in the wasting of wattage.

In another system now in use, a baking element is located in the bottom of the oven, and a baking element of less capacity and also a broil element is located in the top of the oven, and the top baking element is somewhat shielded from below. That arrangement is a more or less expensive one.

The aim of the present invention is to provide an improved and economical arrangement wherein the desired conditions for "pre-heat," "broil," and "bake" are effectively established and maintained across the same two lines of the power source so that there is no switching from one voltage to another, which means that changing of polarity of the switch contacts and objectionable arcing at the contacts is avoided. With my improved arrangement, the use of resistors and the like are eliminated.

Other objects will be in part obvious and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements, and arrangement of parts which will be exemplified in the construction hereafter set forth and the scope of the application of which will be indicated in the appended claims.

In the accompanying drawing, wherein is shown for illustrative purposes one embodiment which the present invention may take;

Figures 1, 2, and 3 are diagrammatic views illustrating the circuits of the system for providing conditions of "bake," "pre-heat," and "broil," respectively.

Referring to the drawing in detail, A designates the oven of an electric range or the like; the same being shown in outline as the particular construction thereof forms no part of the present invention. B designates a two-part heating element located in the bottom of the oven; the parts of this element being respectively designated by the numerals 10 and 11. C designates the "broil" element located in the upper portion of the oven. The switch D for controlling the elements may be of any suitable type, the one shown in the drawing being for illustrative purposes only. The switch in the present instance has a terminal contact 12 with which cooperates a pair of movable contacts 13 and 14. The switch further has a pair of contacts 15 and 16 adapted to be moved into and out of engagement with one another. The contacts may be carried by suitable switch arms or members 17. Suitable means, such as a switch handle or the like, is, of course, provided for selectively moving the switch arms. This means is not shown in the present instance as its form is immaterial to the invention.

The terminal 12 is connected to one of the outside lines L of the power source by a wire 21. The switch arm carrying the contact 13 is connected by a wire 22 to one end of the "bake" element B. The other end of this element is connected by a wire 23 to the other outside line L'. A neutral or third wire N is shown in the drawing to indicate that if a three-wire circuit is utilized instead of a two-wire one, the third wire is not required. The arm carrying the contact 15 is connected to the element B between the parts 10 and 11 thereof by a wire 24. The arms which carry the contacts 14 and 16 are connected to one end of the broil unit C by a wire 25, and the other end of this element C is connected by a wire 26 and the wire 23 to the line L'.

With the arrangement described, it will be understood that when it is desired to pre-heat the oven, both elements are connected through the outside lines, as illustrated in Figure 2, so that a 220 voltage (for example) is impressed upon each unit, with the result that the oven is brought up quickly to the desired tempera-

ture. In this instance, the two contacts 13 and 14 engage the terminal 12, and the two contacts 15 and 16 are separated from one another. When a broiling operation is required, the switch is moved to the position shown in Fig. 3, and in which position the contact 14 engages the terminal 12, the other contacts being in open positions so that the broil unit C is connected across the outside lines and the bake unit is out of circuit. When a baking condition is desired, the switch is moved to the position shown in Fig. 1, wherein the contact 13 engages the terminal 12, the contacts 15 and 16 are in engagement with one another, and the contact 14 is in open position.

It will be observed from Fig. 1 that when the switch is in the "bake" position, the part 11 of the "bake" element and the "broil" unit C are in parallel with each other and in series with the part 10. The current flows from the line L through the engaged contacts 12 and 13, through the part 10 of the "bake" element, and it then splits, part going through the part 11 and part going through the "broil" unit, and thence the current flows through wires 23 and 26 to the other outside line L'.

It is, of course, understood that by changing the tap point at which the wire 24, leading to the contact 15, is connected to the "bake" element B, the amount of current passing through the "broil" element during "baking" can be controlled by varying the size of the portion 11 of the "bake" element B with respect to the broil element C.

It will be observed from the foregoing disclosures taken in connection with the accompanying drawing that in each operative position of the switch the element or elements in operation are connected across the same two supply lines, and in no instance is there a switching from one supply voltage to another or a reversal of polarity. Thus the objectionable arcing of the switch contacts is prevented, and, as stated, with my improved arrangement, resistors or the like are eliminated.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompany-

ing drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

I claim as my invention:

1. In a control system for electric ovens, a pair of supply conductors, a two-part baking element, a broil element, and switch means constructed and arranged to connect both of said elements in parallel across said conductors; the broil element only across said conductors; and one part of said bake element and said broil element in parallel and the other part of said bake element in series therewith across said supply conductors.

2. In a control system for electric ovens, a pair of supply conductors, a two-part baking element, a broil element, and switch means constructed and arranged when in one position to connect the bake element and the broil element in parallel across said lines to obtain pre-heat conditions within the oven, to connect in another position the broil element across the two said lines to obtain broil conditions, and, in a third or bake position, to connect both parts of the bake element across said lines in series, and said broil element between said parts and one of said lines, whereby said broil element is in parallel with one part of said bake element.

3. In a control system for electric ovens, a pair of supply conductors, a two-part baking element, a broil element, and switch means arranged to selectively connect said elements across said lines, in one position of said switch both parts of said bake elements being connected in series across said lines and said broil element being connected in parallel with only one part of said bake element.

4. In an electric circuit for an electric oven, a pair of supply lines, a multi-part heating element, a second heating element, and means for selectively connecting said elements across said lines, in one position of said switch one part of said multi-part heating element being connected in parallel with said second element and another part of said multi-part element in series therewith.

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