

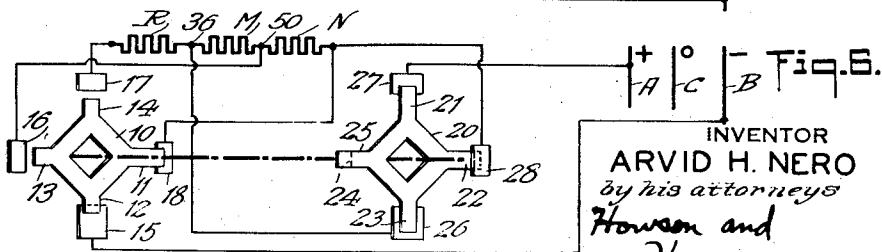
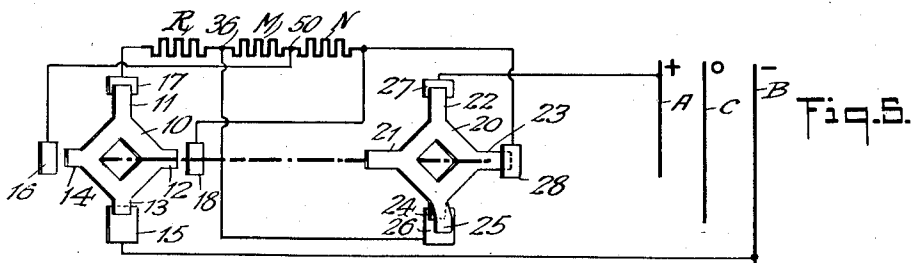
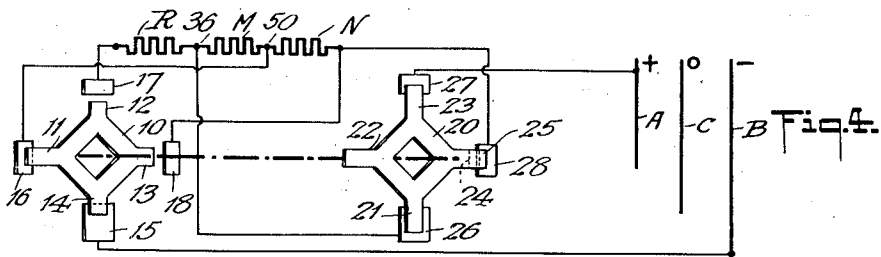
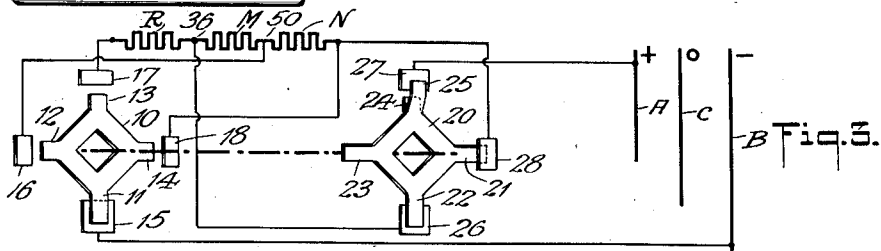
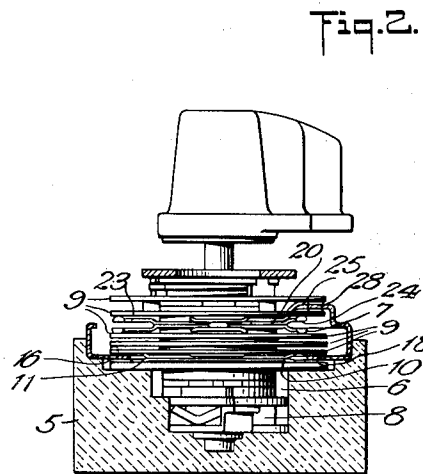
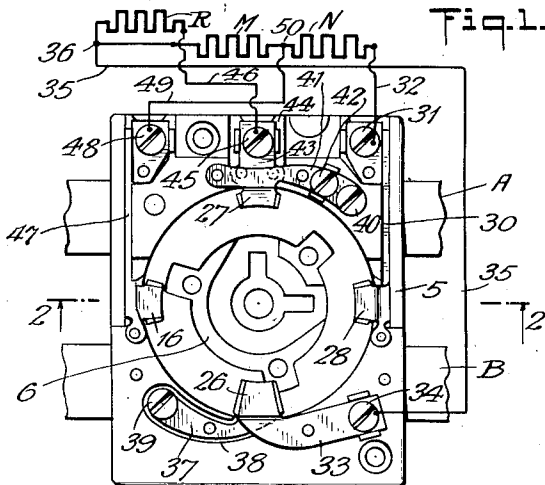
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SELECTIVE HEATING CONTROL

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SELECTIVE HEATING CONTROL

Application filed March 29, 1929. Serial No. 351,053.

This invention relates to an electric circuit including a resistance and a switch, and to the control of the circuit to give different degrees of heating selectively. The invention is shown and is described as it is used with a translating device such as an electric stove wherein the heating apparatus is made up of a broiling element at the top of an oven and two heating elements for baking and for general use, one at the upper and one at the lower part of the oven. The control, effected by a suitable arrangement of switch contacts and connections therefrom to the supply line and to the resistance elements, gives two degrees of baking heat by encircuiting both baking elements in series in one position of the switch, and in parallel in another position, and gives a broiling heat by encircuiting the broiler element alone in a third position of the switch. The switch also has an "off" position.

The current supply may be by a two wire line or by an Edison three wire system having a neutral wire. The load in either case is put across the positive and negative buses. There is therefore no unbalancing of the three wire system when such is used.

The invention is directed to the control of a circuit including a plurality of resistance elements by means of a single switch and, in particular, by a rotary switch having but two blades mutually insulated and turned in unison through four positions, for the purpose described.

In the accompanying drawings, to which reference is made in the following description,

Figure 1 is a plan view of a switch base, with the switch movement removed, showing the connections between the fixed contacts, the supply buses and a three element resistance.

Figure 2 is a view in section of the same base but with the switch movement in place and shown in elevation, the section being on the line 2-2 of Figure 1.

Figure 3 is a diagram of the circuit showing the connections between the resistance, the supply line and the fixed contacts, and

showing the two switch blades in open circuit position.

Figure 4 is a diagram similar to Figure 3 but showing the switch blades one quarter turn in advance clockwise, thus establishing the circuit for high baking heat, two resistance elements being in parallel.

Figure 5 is a similar diagram showing the blades in position one quarter turn farther in advance clockwise, this position being the one for broiling wherein the third resistance element is in circuit alone.

Figure 6, another similar diagram, represents the position of the blades for low baking heat with two resistance elements in series, the blades here being 90° ahead clockwise of the position of Figure 5.

Referring to the drawings, the heating apparatus comprises a resistance element R for broiling, and two resistance elements M, N for baking. These resistances are electrically connected end to end, R to M and M to N, the junction between the baking element M and the broiler element R being designated 36, and the intermediate connection point between the baking elements M and N being designated 50. Viewed in another way the heating apparatus may be considered as comprising a resistor R for giving a broiling heat and a sectional resistance M, N, for giving baking heats, this resistance having an intermediate connection point 50. As indicated one end of the resistor R is connected electrically with one end of the resistance, as at 36. For controlling the circuits I provide a switch device which will now be described.

The switch base 5 is of insulating material and has a central well 6 shaped to receive a unitary rotary switch movement 7 which turns with a snap action through successive quarter turns in either direction due to an escapement mechanism 8 of any suitable form. This general type of switch is known and except as to the features which are involved in this invention and are described herein in detail, it may be of any suitable construction, e. g. that shown in the Carlson Patents 1,690,052, 1,669,283 and 1,506,563. With respect to the features with which the invention is directly concerned, there may be

variations from the particular form and use herein described, subject to the limitations of what is operable for the purpose and of the scope of the invention as set forth in the claims.

At four quarter points of the base there are fixed contacts extending into the central well 6 in position to be engaged by the contact arms of the two switch blades. In the plane of the lower blade 10 which has a long arm 11 and three short arms 12, 13, 14, there are four fixed contacts, one a long one 15 and three short ones 16, 17, 18. As usual, a long fixed contact can be engaged by either a long or a short blade arm turning in its plane but a short contact can be engaged only by a long arm.

The upper blade 20 has three long arms 21, 22, 23 and a short arm 24 in one plane and a fifth arm 25, a long one, in a plane above, this fifth arm being in register with the short arm 24. The blades are mounted on a common spindle in any suitable way to cause them to be mutually insulated and to turn in unison. The blades are so arranged, as shown in Figures 3-6, that the long arm 11 of the lower blade registers with the long arm 22 of the upper blade that is opposite the short arm 24 and the off-set long arm 25. Micarta discs 9 between the blades and between the plane of the four arms of the upper blade and the plane of the fifth arm prevent arcing between the arms.

In the plane of the four arms of the upper blade there are two fixed contacts 26-27, one long and one short, on opposite sides of the central well, the long one 26 being in register with the lower long contact 15. A short contact 28 is mounted midway between these two upper contacts 26-27, a quarter turn in advance clockwise of the short upper contact 27, and in the plane of the fifth or off-set arm 25 of the upper blade.

As shown in Figure 1, the fixed contacts are integral parts of conductive straps which connect the contacts electrically with the terminals. The contacts 18 and 28 are formed as off-sets from the same strap 30 which extends to one end of the base where it forms a terminal 31 for the wire 32 which leads to one outside end of the heating apparatus viz. to the end of the resistance element N, which is not connected with the element M. The upper long contact 26 is integral with a strap 33 extending to a binding screw forming a terminal 34 for the wire 35 leading from the junction 36 between the resistance elements R and M. The long contact 15 just below this is a part of the strap 37 which lies in a recess 38 in the base to space it from the strap 33 and receives the screw 39 which extends through the base and into the negative bus B.

The connection from the positive bus A is by the screw 40 which passes through the

base and through the strap 41 on the top thereof. This strap 41 carries the binding screw 42, to which a pilot light may be connected if desired, and the upper short contact 27. Below this contact 27 is the short contact 17 integral with a short strap 43 that is set in a recess 44 in the base and carries a binding screw terminal 45 for the lead wire 46 connecting to the other outside end of the heating apparatus, that is, to the outside end of the element R, which is not connected to the element M. A long strap 47 carries at one end the terminal 48 for the wire 49 leading to the intermediate connection point 50 between the two baking elements M and N and, at its other end, carries the short low contact 16.

The connections just described are illustrated diagrammatically in Figures 3 to 6 inclusive in which the two blades are shown as being spaced on a common axis. From these figures it will be seen that the upper short contact 27 is positive and that the lower long contact 15 is negative. As these contacts are on opposite sides of the base there is no danger of arcing between them. Both the lower short contact 18 and the uppermost contact 28 are connected to the outside end of the element N and thus to one outside end of the heating apparatus. The upper long contact 26 is connected to the junction 36 between the broiling element R and the baking element M and the lower short contact 16 is in connection with the intermediate point 50. The other outside end of the heating apparatus, i. e., the outside end of the broiling element R, is connected with the lower short contact 17.

As the two blades are given a quarter turn clockwise from the open circuit position (Figure 3) to the "high baking heat" position (Figure 4) a connection is established through the upper blade from the positive terminal to the outside end of the element N by way of the offset arm 25 and the uppermost contact 28, and by the arms 21 to the junction 36, or, in other words, to the other end of the baking resistance made up of the elements M, N. The circuit is completed from the intermediate point 50 of the M, N resistance by the lower blade arms 11 and 14. Thus the elements M and N are in parallel across the outside wires A, B of the three wire system shown.

Another quarter turn clockwise gives the "broiling heat" position (Figure 5) in which only the element R is in circuit. The upper blade 20 makes a connection from the positive terminal to the junction 36 at one end of the element R by way of the arms 22 and 24. The lower blade completes the circuit from the outer end of the element R by way of the arms 11 and 13.

For the "low baking heat" position (Figure 6) the blades are advanced by a quarter

turn clockwise from the broiling position. The upper blade then connects the positive terminal with the junction 36, which is also one outer end of the resistance M N, by way of the arms 21 and 23 while the lower blade 10 through its arms 11 and 12 connects the other end of the resistance M N with the negative terminal, thus putting the baking elements M N in series across the outside wires A, B.

From the description above and from the drawings, it will be seen that the function of the upper blade with its associated contacts is to control connections from the positive terminal to the outside ends of the resistance M, N and to one end of the broiling element R, or, considering the whole heating apparatus R M N, to control connections from the positive terminal to one outside end of the resistance and to the junction 36 remote from that end. The lower blade with its contacts is to control connections from the other terminal to the other end of the apparatus and to the intermediate connection point 50. Stated differently, its function is to control connections from the negative side to the end of the broiling element R other than that controlled by the upper blade, and to the intermediate point 50 of the baking resistance formed by the elements M, N.

The invention provides a simple control, by a single switch, of a multi-part resistance to give different sorts of heating selectively and without unbalancing the supply line. An underlying thought in the use of a two blade switch or two switch means for this purpose is the allocation to one blade of the function of controlling connections from one terminal or side of the line to certain connection points of the heating apparatus, and, to the other blade, of the function of completing the circuit to the other terminal from the other connection points concerned in putting the desired parts of the heating apparatus in circuit in the proper manner.

I claim—

1. In combination, three resistance elements and a single rotary snap switch adapted to connect two of said elements in parallel in one of its positions, to connect two of said elements in series in another position and to encircuit a single one of said elements in a third position.

2. In combination, three resistance elements and a single rotary snap switch adapted to connect two of said elements in parallel in one position of the switch, in series in another position, and to encircuit the third one of said elements in a third position.

3. In combination, three resistance elements, two feed lines and a single rotary snap switch adapted to connect two of said elements in parallel across the said lines in one position of the switch, in series in another position and to connect the third one of said

elements across the same lines in a third position.

4. In combination, a translating device comprising a resistor and a sectional resistance, said sectional resistance having an intermediate connection point, current supply terminals, and switch means for connecting one terminal with both ends of said resistance in one position, with one end of said resistor in a second position, and with one end of said resistance in a third position, together with other switch means adapted to assume corresponding positions to connect the other terminal with said intermediate point in said one position, with the other end of said resistor in the said second position and with the other end of said resistance in the said third position.

5. In combination, a translating device comprising a resistor and a sectional resistance, said sectional resistance having an intermediate connection point, current supply terminals, and a rotary switch having two blades turnable in unison to any one of three circuit closing positions, one blade serving with its associated contacts to connect one terminal with both ends of said resistance in one position, with one end of said resistor in a second position and with one end of said resistance in a third position, the other blade serving to connect the other terminal with said intermediate connection point in said one position, with the other end of said resistor in said second position, and with the other end of said resistance in said third position.

In testimony whereof I have signed my name to this specification.

ARVID H. NERO.