July 22, 1941. E. CHALLET 2,250,357

ELECTRIC RANGE

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FIG.1.

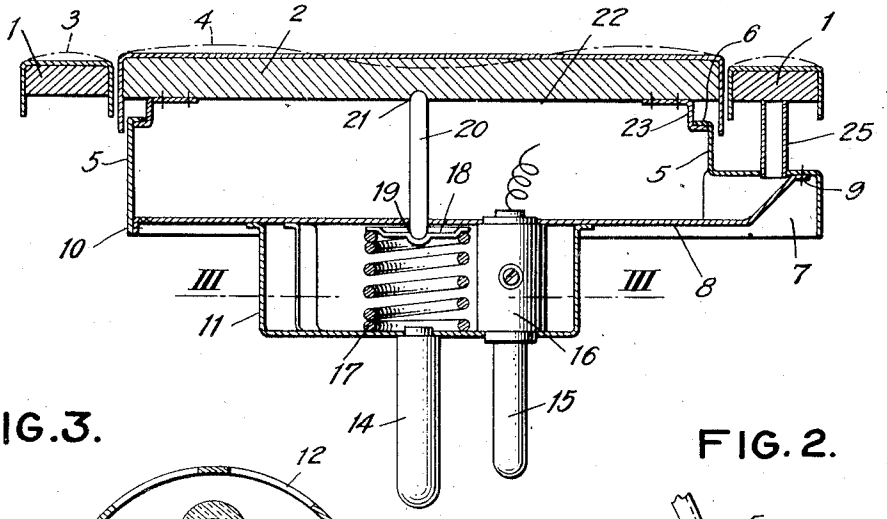


FIG.3.

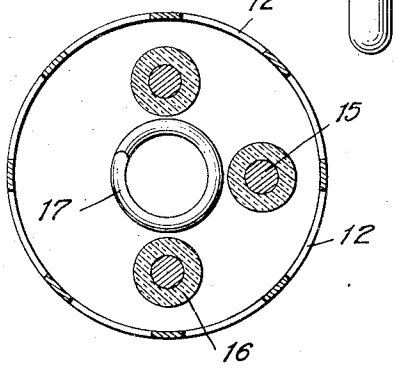
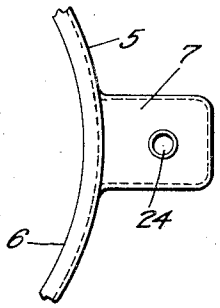


FIG. 2.



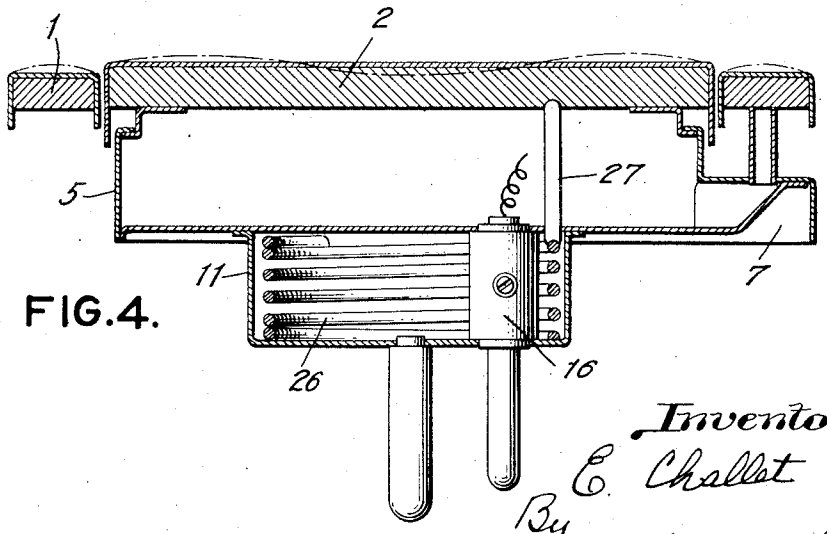


FIG.4.

Inventor.
E. Challet
By
E. F. Wenderoth
Atty.

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FIG. 5

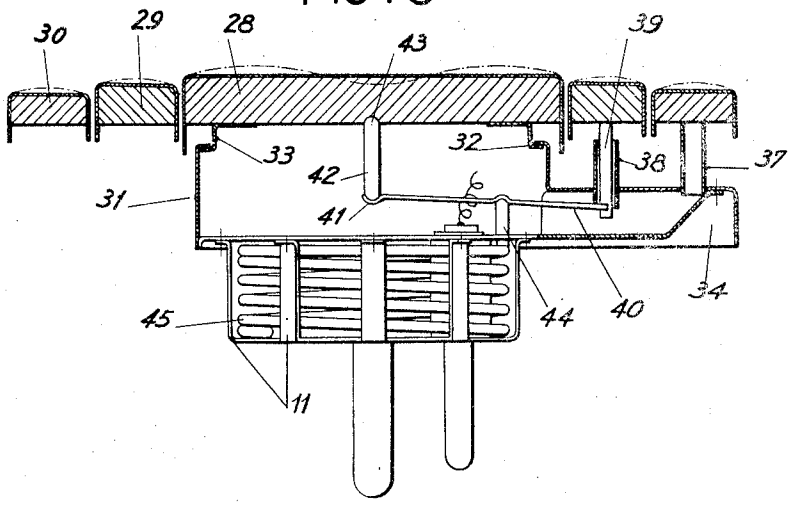


FIG. 6

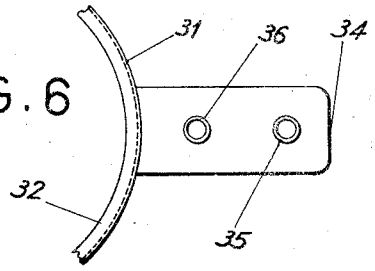
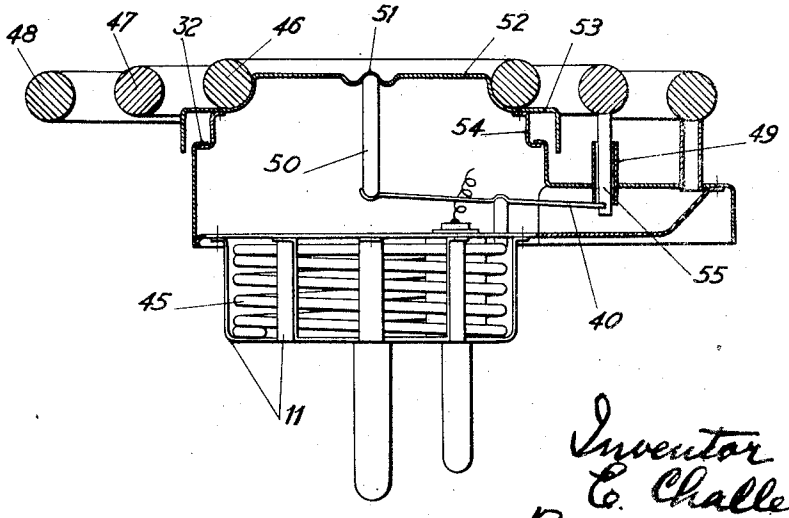


FIG. 7



Inventor
E. Challet
By
C. F. Wenderoth
Atty.

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ELECTRIC RANGE

Etienne Challet, Paris, France, assignor of one-fourth to Entreprises Electriques Fribourgeoises, Fribourg, France

Application January 3, 1939, Serial No. 249,132
In France November 24, 1938

4 Claims. (Cl. 219—37)

It is known to use plates made of a plurality of parts which are adapted to be depressed more or less when a receptacle having a more or less deformed bottom is placed on them. Plates of this type are described in Swiss Patent No. 193,023 and Swiss patent of addition No. 199,640.

The present invention has for its object a device which permits of the simple arrangement of the spring system that serves for retracting the movable plate element or elements of this kind, for the purpose of shielding said spring system from the action of the heat evolved by the plate and consequently of enabling it to retain its resilient properties, while ensuring a perfect operation.

The device according to the invention is characterized by the fact that the spring system is lodged below the plate proper and in the space normally reserved for an earthenware part or parts from which the connecting prongs emerge.

According to the type of plate used, one or a plurality of springs may be employed, and at the same time connecting rods, equalizing bars, bearing members are provided for the various movable elements, so as to connect same to the spring which constantly tends to bring said elements back to their upper position.

By way of example, various embodiments of plates equipped with springs according to the invention have been shown in the accompanying drawings.

In said drawings:

Fig. 1 shows a section of a plate, the central part or head of which is movable, with a fixed annular part and a single central spring inside the insulating parts of the plugs.

Fig. 2 shows a partial plan view of the detail of an arm of the shell.

Fig. 3 is a section along III—III of Fig. 1.

Fig. 4 shows the section of a similar plate to that of Fig. 1, but with a spring of larger diameter located outside the insulating parts of the plugs.

Fig. 5 is a section of a plate having a movable central head, a movable intermediate annular part and a fixed outer ring, the whole arrangement being adapted to heat.

Fig. 6 is a partial plan view showing an arm of the shell for a plate having three heating sections.

Fig. 7 is a section of a plate similar to that of Fig. 5, but in which the resistance elements are shaped like toruses.

As shown in Fig. 1, the plate comprises a fixed outer ring 1 and a movable central head 2, the tops of which will advantageously be shaped like an annular crest as shown at 3 and 4 in dotted lines, according to the device described in Swiss Patent 188,832 and Swiss patents of addition Nos. 196,128 and 195,213.

These heating elements are arranged on an annular shell 5 having a circular flange 6 which is intended to hold the head in the vertical direction, said shell 5 possessing three arms 7 which support the ring 1 and are arranged at 120° with respect to each other.

The purpose of said arms is also to hold the heating plate on the cooker in a correct plane.

Said annular shell is closed at the bottom by a disc 8 which is fixed at 9 under the three arms, one of which is shown at 7, and at 10, against the shell.

Under the lower part of the disc 8 is fixed a squirrel cage, the holes of which are visible at 12 in Fig. 13 and which is closed by a continuous bottom 13. On the bottom of said squirrel cage is fixed the earth plug. The connecting plugs such as 15 are arranged in separate insulating parts 16 which are held between the bottom 8 and the plate 13 of the squirrel cage.

The spring 17 is located at the centre of the space between the insulating parts 16: it is surmounted by a cap 18 having a hollow 19, so as to receive a push rod 20, the other end of which bears at 21 under the head 2.

It will be understood that when a receptacle filled with liquid or other substance is placed on the head, the same tends to be depressed and compresses the spring 17 through the intermediary of the rod 20. The lower part 22 of the head 2 limits the downward travel of said head, since it abuts against the flange 6. On the contrary, when the head moves upwards again, the travel of same is limited by means of tongues such as 23 which are bent and abut under the flange 6 of the shell.

The shell 5 is provided with a hole 24 (Fig. 2) in order to enable a tube 25, which supports the ring, to be fixed therein.

In Fig. 4 there is the same device formed by the outer ring 1 and the movable head 2; all the other parts are identical, including the squirrel cage 11, but the spring 26 is outside the insulating parts 16. It is therefore of larger diameter and is better ventilated. A plurality of push rods, preferably three, are interposed between the spring and the head. One of said rods is shown at 27.

Both in Fig. 1 and in Fig. 4 it will therefore be seen that the springs are open to the atmos-

phere and are as remote as possible from the heating parts. Owing to the holes 12 of the squirrel cage, they can disperse the small amount of heat they may still collect.

Fig. 5 shows a plate comprising a movable head 28, a movable intermediate ring 29, and a fixed outer ring 30. Abutment tongues 33 have also been provided.

The arms such as 34 are in this case provided with two holes 35 and 36; the hole 35 receives a fixed tube 37 which supports the outer ring 30, the hole 36 receives a sheath 3 in which is adapted to slide a piston 39 which is fixed under the movable ring 29. An equalizer bar 40 is pivoted at one of its ends, on the lower part of the piston 39, and bears at its other end under the head 28 through the intermediary of a push rod 42 which is held in recesses 41 and 43. There are preferably three equalizer equipments at 120° to each other, controlled by the same push rod 42.

Each equalizer rests on a rod 44 which is opposite the convolutions of the spring, of which it receives ⅓ of the thrust; the lever arms of an equalizer are calculated according to the respective weights of the head 28 and of the movable ring 29. Advantageously also the head and the annular elements are provided with annular crests, as shown in dotted lines.

Fig. 7 is similar to Fig. 5, but the central head is replaced by a heating torus 46, the movable annular element is replaced by the movable torus 47, the fixed outer element is replaced by the torus 48; there are again the same equalizer systems 40 with a rod 55 passing through a sheath 49, each equalizer supporting at the other end a rod 50 which abuts at the upper part in the hollow 51 of a plate 52 having an edge 53, so as to support the torus 46.

Tongues 54 serve as abutments, for the upward travel, against the flange 52, whereas in the downward movement, the travel of the torus 46 is limited by the edge 53 under the flange 32. The arrangement of the spring 45 in the squirrel cage 11 is also seen, as it is moreover in Fig. 5.

The cross-section of the torus is not necessarily round, it may be flattened at the top, be of elliptical shape or bean-shaped, etc.; instead of one torus, there may be two or three toruses which more or less touch each other, as indicated in the aforesaid Swiss patent and patent of addition.

The spring mounting device for an electric heating plate having at least one movable element can be adapted to any other kind of electric heating plates which are not shown in the drawings which have only been given by way of example, and in particular to plates in which all the elements are movable.

Said device can also be advantageously adapted to plates having connecting plugs or pins arranged elsewhere than at the centre and underneath; in this case said device remains located in the central part and underneath.

I claim:

1. In an electric range, a hot plate comprising a central movable mushroom-shaped heating element, a movable intermediate heating ring, a fixed outer heating ring, a central push rod bearing at one end against said central heating element in order to support the same, push rods located below said movable ring for supporting the same, diametrically opposed equalizer bars cooperating with said central push rod and said push rods cooperating with said movable ring, a spring located below said hot plate and push rods reacting with said equalizers and said spring so as to support said central heating element and said movable ring.

2. In an electric range, a hot plate comprising a central movable mushroom-shaped heating element, a movable intermediate heating ring and a fixed outer heating ring, a central push rod located below said central heating element for supporting said element at its center, three push rods cooperating with said movable ring and spaced 120° from one another, equalizer bars cooperating with said central push rod and said three push rods, a spring located below said hot plate, connecting rods cooperating with the upper convolution of said spring and said equalizers so as to support said central heating element and said intermediate movable ring.

3. In an electric range, a hot plate comprising a central movable mushroom-shaped heating element, a movable intermediate heating ring and a fixed outer heating ring, a central push rod located below said central heating element to support the same, a plurality of push rods cooperating with said intermediate heating ring, a plurality of equalizers extending between said central push rod and said plurality of push rods cooperating with said intermediate heating ring, a helical spring located below said hot plate and a connecting rod for each equalizer cooperating with the upper convolution of said spring and said equalizers so as to support said central heating element and said intermediate heating ring.

4. In an electric range, a hot plate comprising a central movable heating torus, a movable medial torus and a fixed outer heating torus, a central plate supporting said central torus, a push rod cooperating with said central plate, a push rod cooperating with said medial torus, an equalizer cooperating with said central push rod and said push rod cooperating with said medial torus, a spring located below said hot plate and a connecting rod cooperating with said spring and said equalizer.

ETIENNE CHALLET.