May 21, 1929. R. H. MacINNES 1,714,175

ELECTRIC COOKING PLATE

Filed Aug. 29, 1927 2 Sheets-Sheet 1

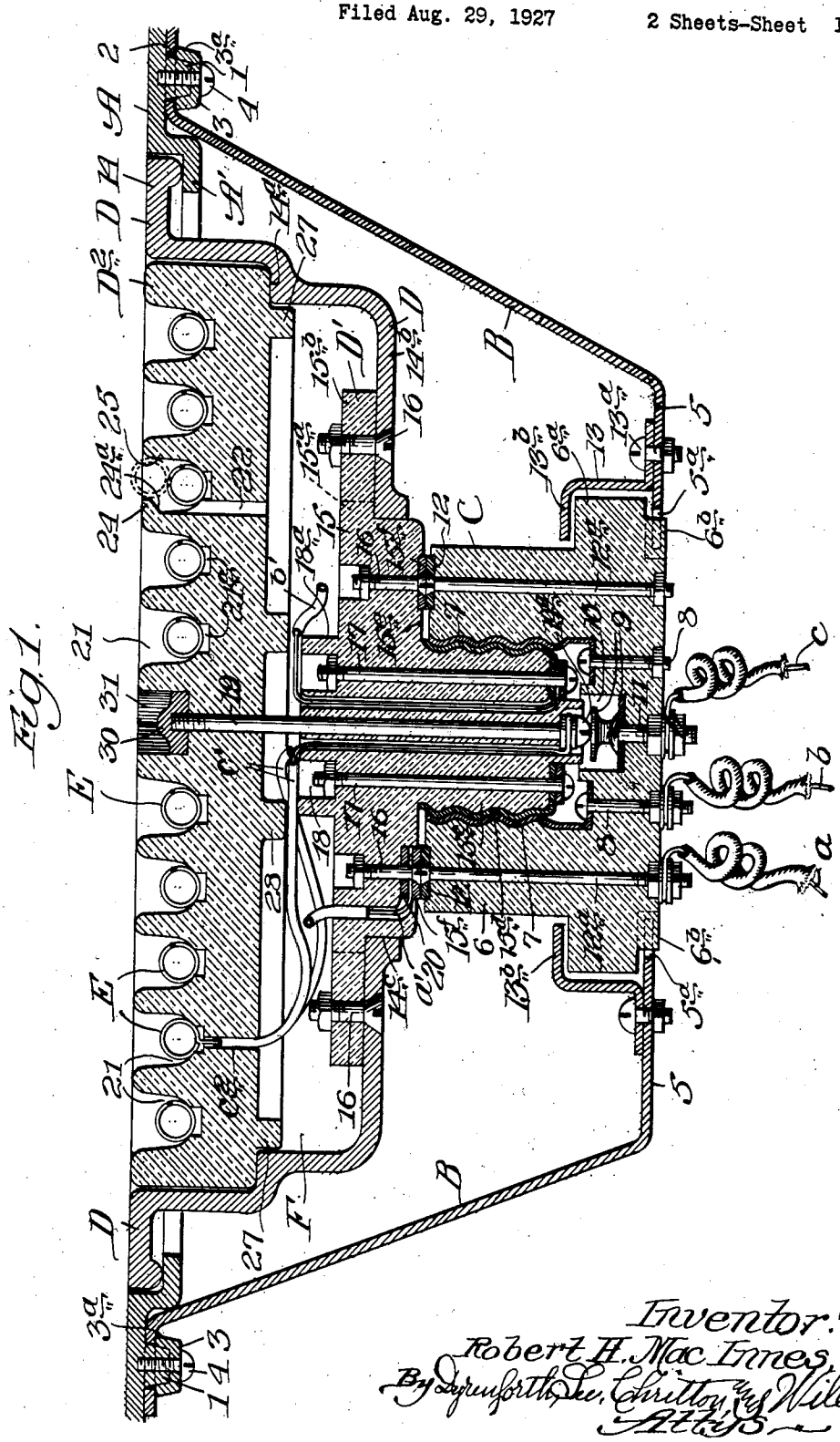


Fig. 1.

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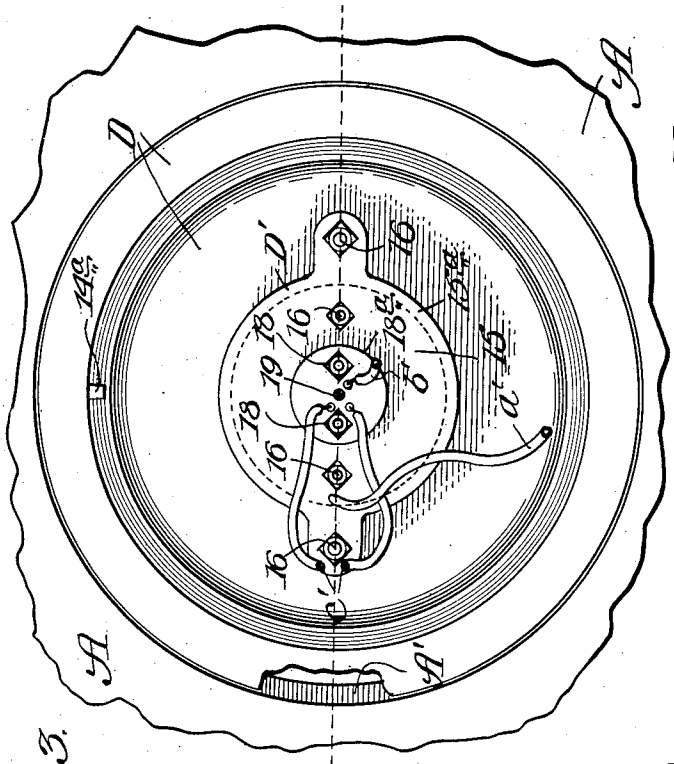


Fig. 5.

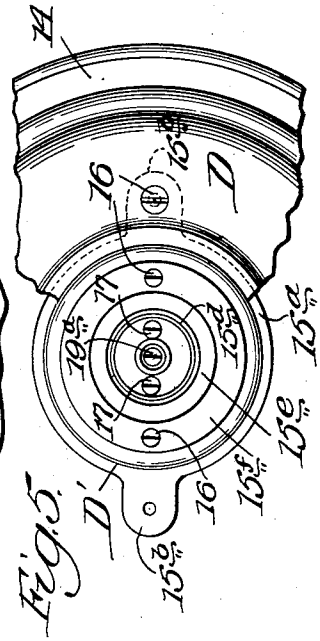


Fig. 5.

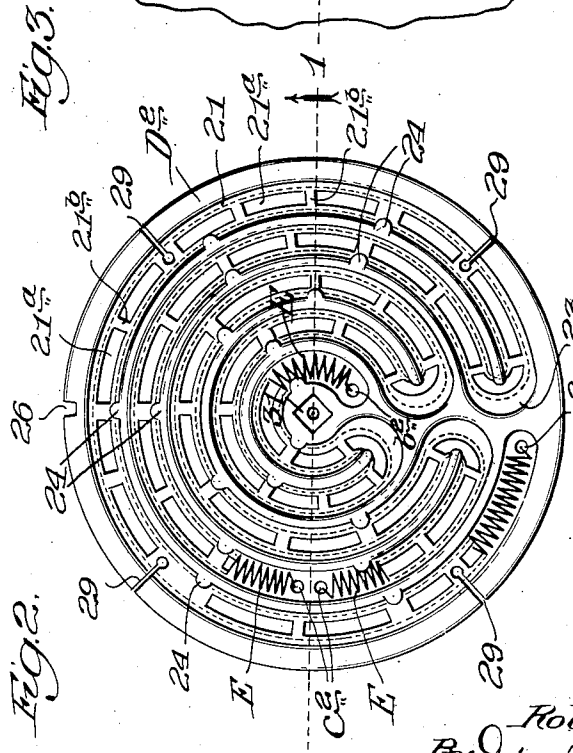


Fig. 2.

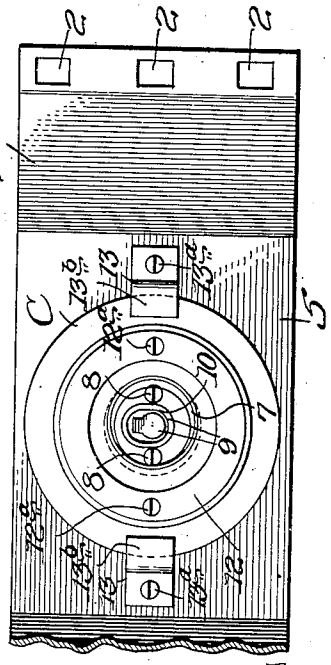


Fig. 4.

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UNITED STATES PATENT OFFICE.

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ELECTRIC COOKING PLATE.

Application filed August 29, 1927. Serial No. 216,139.

This invention relates to an electric cooking-plate adapted to be employed as a hot-plate mounted in the cooking-top of an electric range, or in any suitable supporting-plate.

The primary object is to provide an improved device of this character which is staunch and durable and the parts of which can be readily assembled.

The invention is illustrated in a preferred embodiment in the accompanying drawings, in which—

Fig. 1 is a broken vertical sectional view showing the improved device mounted in a hole, or socket, of an electric-range top-plate, for example; Fig. 2 is a plan view of the refractory grid-plate proper which is employed; Fig. 3, a broken plan view of the construction shown in Fig. 1, but with the grid-plate proper removed and the wires leading from the resistance-coil cut; Fig. 4, a broken plan view of the hanger, or stirrup, which depends from the top-plate, or supporting-plate, and the socket mounted thereon; and Fig. 5, a broken bottom view of the heating unit which includes an adapter, a socket-member mounted therein, and the grid-plate proper.

In the construction illustrated, A designates a supporting-plate which may constitute, for example, the top-plate of an electric-range; B, a hanger depending from said plate; C, a socket with which the hanger, or stirrup B is equipped; D, an adapter mounted in a hole, or socket, A′, with which the supporting-plate A is provided; D′, a socket-member carried by the adapter D and fixedly secured thereto; D^2 a grid-plate proper mounted in the adapter above the member D′; and E, an electric heating element, or resistance-coil, mounted in the member D^2.

The supporting-plate A is shown provided on opposite sides of the socket A′ with depending lugs 1 over which fit the perforations 2 with which the end-portions of the stirrup B are provided. A clip 3 serves to secure the parts together. This clip is secured to the plate A by screws 4 connected with tapped openings in the lugs 1. The clip 3 has upturned flanges 3^a which support the flanges of the stirrup B.

The stirrup B has a web-portion 5 spaced a considerable distance below the plane of the plate A and provided with a central opening 5^a.

The socket-member C which is carried by the stirrup B comprises an insulation-block 6 having at its lower end an external flange 6^a and having in its upper portion a large central bore in which is mounted a spirally corrugated, or threaded, socket-member 7; bolts 8 connected with the lower end of the member 7 and extending through perforations in the base of the disk, or block, 6; a central spring contact 9 disposed in a recess 10 extending below the main socket-member 7, the contact 9 being in the form of a resilient strip bent into U-form and being secured in the socket 10 by a bolt 11 which extends through a central perforation in the base portion of the block 6; and an annular contact-ring 12 mounted in a corresponding recess in the upper portion of the block 6 and secured in position by bolts 12^a which extend through perforations in the block 6.

The block 6 has its base provided with a reduced portion 6^b which extends freely through the perforation 5^a of the stirrup. Clips 13 secured to the upper side of the web 5 of the stirrup by means of screws 13^a serve to prevent dislodgment of the block 6, it being noted that the clips 13 are provided with inturned flanges 13^b which extend over the flange 6^a of the insulation-block.

Wires *a*, *b* and *c* are connected, respectively, with one of the bolts 12^a, one of the bolts 8, and the central bolt 11. These wires may be connected with line wires through the medium of suitable switches (not shown), and thus the energizing-circuit may be connected with the contact-ring 12, the socket-member 7, and the central contact 9, in any desired manner.

The adapter D preferably is in the form of a dished annular member which may be of cast-metal. It affords a shell in which the socket-member D′ and the grid-plate D^2 are mounted. The adapter is provided at its upper portion with an annular flange 14 which rests in the socket A′. The adapter has an annular stepped form, which provides an internal shoulder 14^a adapted to support the grid-plate, and a bottom portion 14^b adapted to support the socket D′. The adapter is provided also with a central perforation 14^c through which the socket-member D′ protrudes. Also, the adapter is

provided in its upper portion with an internal lug 14^d adapted to engage a peripheral notch with which the grid-plate is provided.

The socket-member D′ has a body-portion 15 of insulating material. This body-portion protrudes through the central opening 14^c of the adapter and is equipped with a flange 15^a which rests upon the upper surface of the bottom wall 14^b. The flange 15^a is equipped with lugs 15^b which are secured to the bottom 14^b by means of bolts 16.

The body-portion 15 of the socket-member D′ is provided with a central depending portion 15^c which has secured thereon a spirally corrugated contact-sleeve 15^d which is adapted to screw into the member 7. The body 15 is provided with a bottom surface 15^e having an annular recess in which is inset a contact-ring 15^f. The ring 15^f is secured to the body 15 by means of bolts 16 extending therethrough. The contact-member 15^d may be screwed onto the projecting portion 15^c. Preferably, bolts 17 extend vertically through the body 15 and connect an inturned flange on the lower end of the member 15^d to the body-portion. The upper ends of the bolts 17 are shown equipped with nuts located in sockets 18 which are provided in an upward extension 18^a of the body 15.

A central bolt 19 extends through the body 15 and is provided at its lower end with a contact-head 19^a. Wires a', b' and c' extend through vertical perforations with which the body 15 is provided and connect with the lower ends of the bolts 16, 17 and 19. Thus, these wires are adapted to be placed in circuit respectively with the wires a, b and c of the socket-member C which is mounted on the stirrup B. The wire a', is shown interposed between the contact-ring 15^f and a washer 20 placed on one of the bolts 16.

The grid-plate D^2 is pressed, or molded, from insulation material of refractory character. The plate is provided in its upper portion with suitably curved grooves 21 which are open at their upper sides. At the bottom of these grooves are narrower grooves 21^a which are crossed at intervals by walls 21^b. Vertical perforations 22 extend from the lower surface of the grid-plate and intersect the grooves 21.

The grooves 21 are struck on arcs from the axis of the grid-plate and are suitably connected at their ends by reversal grooves 23 which enable the resistance-coil to be wound back and forth in a general manner known in the art. The inner walls of the grooves 21 are provided at intervals with overhanging lips 24 which are beveled on their under sides as indicated at 24^a in Fig. 1. The opposite or outer wall of the groove is outwardly sloping somewhat, as indicated at 25. This arrangement permits the resistance-coil to be inserted into the groove quite readily, and the lip 24 serves as a retainer, preventing dislodgment of the resistance coil. The construction described renders it unnecessary to notch the ridges between the grooves for the purpose of enabling the resistance-coil to be slipped under or past the retainer-lip.

The wires a', b' and c' mentioned above extend through perforations with which the grid-plate is provided and connect with the resistance-coil at the points a^2, b^2 and c^2. It will be noted that the wire c' is a double wire, corresponding with a loop in the resistance-coil. By means of suitable switches, any one of three different heats may be imparted to the grid-plate. Thus, the portions of the resistance-coil may operate in parallel, in series, or a single portion of the coil may be used. Such a method of operating the resistance-coil is known in the art.

It will be noted that the arrangement of the grid-plate D^2 with reference to the socket-member D′ is such as to provide an intervening space F. This enables the wires to be taken from the grid-plate through the socket-member 15 and also provides an air-space between the socket-member D′ and the grid-plate.

The grid-plate is provided at its periphery with a notch 26 which is adapted to engage the lug 14^d of the adapter D. The grid-plate is provided at its lower surface near its periphery with an annular flange 27 which fits within the reduced portion of the adapter D. Also, the grid-plate is provided at its lower surface with a central annular rib 28. These ribs serve as reinforcing ribs. The circumferential portion of the grid-plate preferably is provided with radial notches 29 in a manner known to the art.

After the wires a', b' and c' leading from the resistance-coil have been passed through the perforations provided therefor in the insulation-body 15 and suitably secured to the contacts, the central bolt 19 is screwed into a nut 30 located in a central socket 31 with which the grid-plate is provided, and thus the grid-plate is secured within the upper portion of the adapter D, where it is clamped against the annular shoulder 14^a.

From the description given, it will be understood that electricity may be taken from a suitable source through the wires a, b and c, and thus lead to the contact ring 12, the screw-socket 7, and the central spring-contact 9 of the socket-member C. When the burner-unit which comprises the adapter D, the socket D′, and the grid-plate D^2 are introduced into the hole of the supporting-plate A, connections are established by turning the burner-unit about its axis, thus causing the socket-member D′ to be screwed into the socket-member C. Thus, contacts are established between the threaded contacts 15^d and 7; between the central post 19 and

central spring-contact 9; and between the annular contact 12 and the annular contact 15^f.

By forming the members D′ and D^2 independently, it is possible to mold, or die-press, the parts and to make the connections for the contacts with requisite facility; also, such construction provides for better uniformity in the walls of the insulation bodies; also, the construction provides for isolating the socket-member D′, in a measure, from the highly heated grid-plate; also, in case of breakage, the expense of replacement is reduced to a minimum; also, the grid-plate itself is mounted with a certain degree of freedom in the upper socket of the adapter D; and, finally, the socket-member D′ is secured with the necessary firmness to the adapter to insure proper connections when the threaded plug-portion 15^e is screwed into the socket-member 7.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible, in view of the prior art.

What I regard as new, and desire to secure by Letters Patent, is:

1. An electric burner comprising in combination, a supporting plate having an opening therein, an adapter-shell designed to be positioned in the opening in the supporting plate, a central socket-member mounted therein and projecting therethrough and equipped with contacts, a grid-plate supported in the upper portion of said shell, a resistance-coil mounted on said grid-plate, and connecting wires joining said resistance-coil to said contacts.

2. An electric burner comprising a dished annular adapter-shell having a stepped-form providing a bottom and an internal shoulder some distance above said bottom, a socket-member secured to said bottom and having a plug-portion extending through the central opening therein and equipped with contacts, a grid-plate mounted in the upper portion of the adapter and resting on the internal shoulder thereof, a resistance-coil mounted in said grid-plate, wires connecting said resistance-coil with said contacts, and bolt-connections between said socket-member and said grid-plate.

3. An electric burner comprising an adapter-shell and a grid-plate mounted therein and equipped with a socket-member having a central contact, a screw-contact, and a ring-contact; and a resistance-coil mounted in said grid-plate and having wires leading therefrom and connected with said contacts.

4. In combination, a supporting-plate, a stirrup depending therefrom, a socket-member mounted on said stirrup and provided with a central recess containing an annular threaded contact-member and equipped also with a central contact and a ring-contact of larger diameter than said annular threaded contact, and wires connected with said contact-members; an adapter-shell; a grid-plate mounted in said shell and equipped with a plug extending through the bottom of the shell, said plug being equipped with an annular threaded contact, a central contact, and a ring-contact; means securing the grid-plate and plug to said shell; and a resistance-coil mounted in said grid-plate and having wires extending therefrom and connected with said second-mentioned contacts.

5. In combination, a supporting-plate provided with a hole and equipped with a hanger having a bottom member provided with a central opening; a socket-member mounted on said hanger, said socket-member comprising an insulation-body equipped at its upper end with a ring-contact and having a central socket equipped with an annular threaded contact and equipped also with a central contact at the bottom of said socket; and a burner-unit comprising an adapter and a grid-plate mounted in said adapter and provided with a plug extending through the adapter, said plug being equipped with contact-members adapted to engage said first-named contact-members when the burner-unit is screwed into the first-mentioned socket-member.

6. An electric burner comprising a hanger equipped with a socket provided with three contacts, one of which is an annular threaded contact and another of which is a central yielding contact; and a burner-unit comprising an adapter having mounted therein a grid-plate provided with a plug extending through the central portion of the adapter and equipped with three contacts adapted to engage said first-mentioned contacts, the contacts being brought into engagement by screwing the plug into the socket.

7. In combination: a supporting-plate provided with a socket and equipped with a depending hanger; a socket mounted on the web-portion of said hanger and equipped with a threaded female contact-member and at a lower plane with a central yielding contact-member and at a higher plane with a ring contact-member; and a burner-unit comprising an annular adapter-shell, a plug secured in the lower portion of said shell and equipped with contacts registering with said first-named contacts, one of the contacts of said plug being an annular threaded contact adapted to screw into said first-mentioned annular threaded contact, a separately formed grid-plate mounted in the upper portion of said adapter and secured to said plug, a resistance-coil mounted in said grid-plate and wires connecting said coil with the contacts of said plug.

8. In means of the character set forth, a supporting-plate equipped with a hanger, a socket-member mounted on said hanger and provided with a recess containing an annular threaded contact and with a smaller recess at the bottom of the first recess and containing a resilient contact, said socket-member being equipped at its upper end outside of said threaded contact with another contact; and a burner-unit comprising an adapter, a plug secured in the bottom of said adapter and equipped with a central contact-post and with other contacts corresponding with the other contacts of said socket-member, and a grid-plate secured to said post.

9. In means of the character set forth, a supporting-plate, a hanger depending therefrom, a socket mounted in said hanger and equipped with contacts; and a burner-unit comprising an adapter-shell, a plug secured to the bottom portion thereof and equipped with contacts, a separately formed grid-plate mounted in said adapter-shell, with an intervening space between said grid-plate and said plug; a resistance-coil mounted in said grid-plate and having wires connected with the contact-members of said plug; and means connecting together said grid-plate plug and adapter-shell.

10. An electric burner comprising, a supporting plate, a hanger depending therefrom and equipped with a socket provided with contacts, and a surmounting burner-unit comprising an adapter having mounted therein a grid-plate provided with a plug equipped with contacts, said plug being provided with a threaded portion depending through the adapter and adapted to screw into said socket.

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