June 30, 1953 A. P. CHARBONNEAU 2,644,071

MOUNTING DEVICE FOR WALL OPENING IN ELECTRIC HEATING DEVICES

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Fig. 1

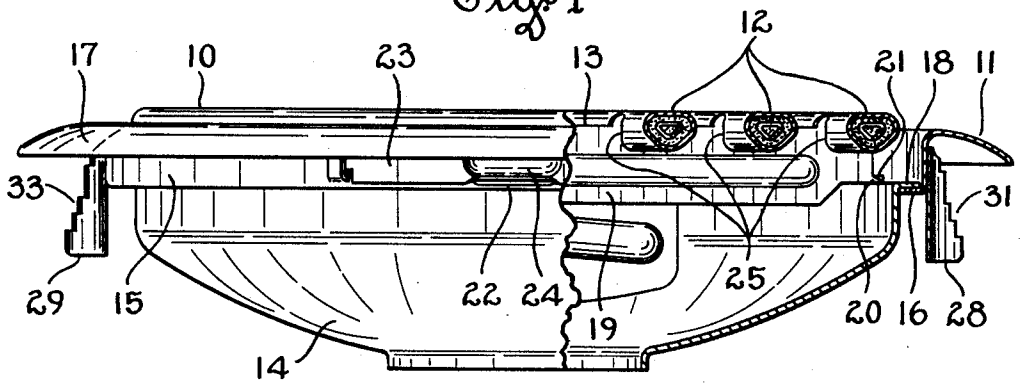
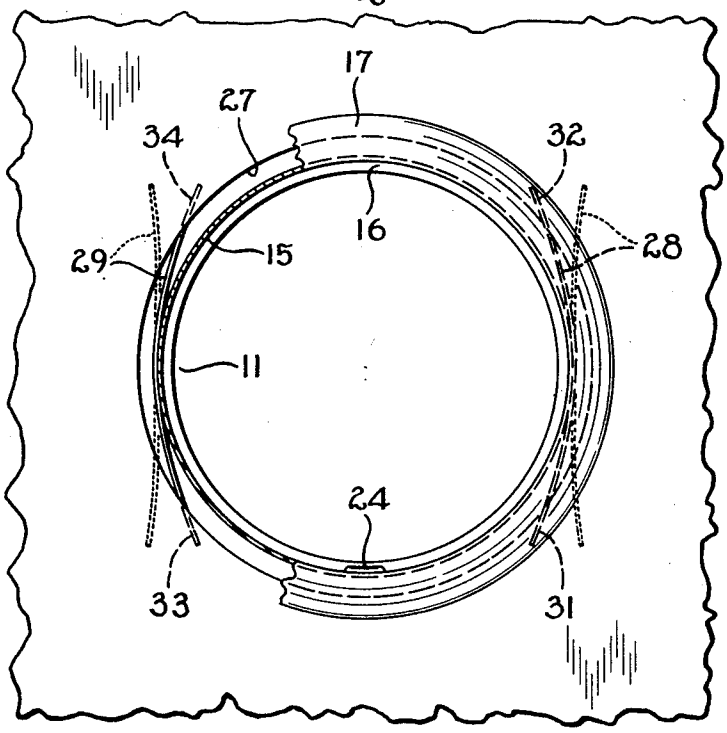


Fig. 2



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Fig. 3

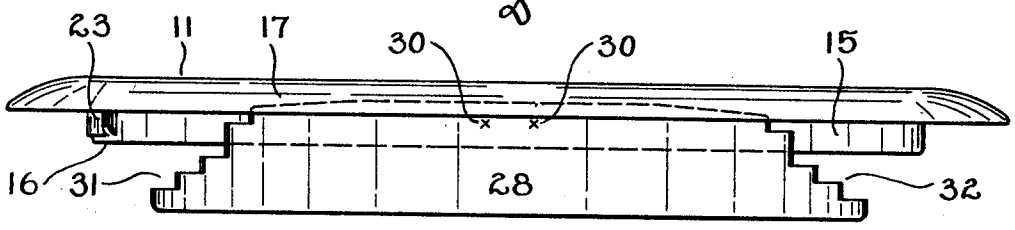


Fig. 4

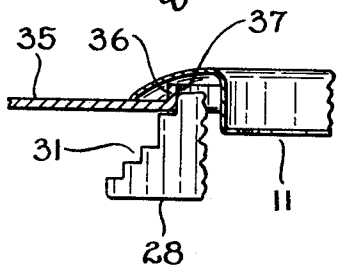


Fig. 5

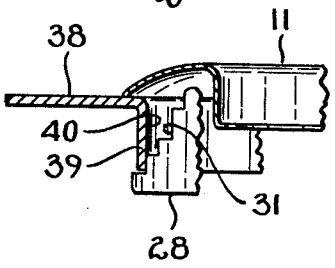
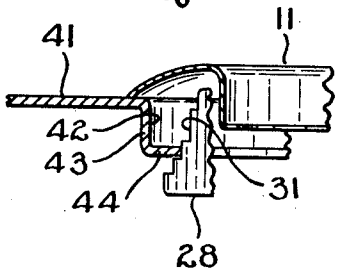


Fig. 6



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MOUNTING DEVICE FOR WALL OPENINGS IN ELECTRIC HEATING DEVICES

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10 Claims. (Cl. 219—37)

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This invention relates to a mounting device for use in conjunction with openings in walls or the like.

While not limited thereto, the present invention is particularly adapted for supporting electric heating units in openings in stove-top walls. The formation of stove-top walls surrounding such openings varies depending upon the particular stove manufacture and the design of the electric heating units supplied by the manufacturer. The size of such openings varies somewhat between stoves of different manufacture, even though the heating units accommodated by the openings are of approximately the same wattage rating. It is a primary object of the present invention to provide a universal type of mounting device which will be suitable for supporting heating units in circular openings in top walls of stoves of different manufacture, regardless of the particular wall formation surrounding such openings, and which are adapted for use in conjunction with openings of various sizes within limits, and

Another object is to provide a mounting device of the aforementioned character which may be readily mounted within openings in stovetops or the like in centered and anchored relation to such openings without the need for use of tools or auxiliary fastening devices.

Other objects and advantages of the invention will hereinafter appear.

The accompanying drawings illustrate one embodiment of the invention which will now be described, it being understood that the embodiment illustrated is susceptible of various modifications in respect of its details without departing from the scope of the appended claims.

In the drawings:

Figure 1 is a view in front elevation, partially in section, of an electric range surface heating unit together with a mounting device therefor.

Fig. 2 is a top plan view showing a portion of a stovetop wall together with the mounting device shown in Fig. 1 in seated and anchored relation to an opening in the wall.

Fig. 3 is a view in side elevation of the mounting device shown in Figs. 1 and 2.

Fig. 4 is a fragmentary view, partially in front elevation and partially in section, of a portion of the mounting device shown in Figs. 1 to 3, inclusive, together with a stove-top wall of modified form.

Fig. 5 is like Fig. 4, but showing a second modified form of stove-top wall, and

Fig. 6 is like Fig. 4, but showing a third modified form of stove-top wall.

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Referring to Fig. 1, it shows, in assembled relation, a preferred type of electric range surface heating unit 10 suitable for use in electric stoves or ranges together with a preferred form of mounting device 11 for supporting the same in openings in a stove-top. More particularly, heating unit 10 comprises an electric heating element 12 of the tubular sheathed type, a supporting grid or spider 13 to which the element 12 is secured, and a reflector pan 14.

Referring to Figs. 1 to 3, inclusive, mounting device 11, generally considered, is of ring form and comprises a cylindrical portion 15, an integral flange 16 which projects radially inwardly at a right angle from the portion 15 about the circumference of the latter adjacent its lower end, and an integral flange 17 which projects radially outwardly from the portion 15 about the circumference of the latter adjacent the upper end thereof. In the preferred form of the device shown, the flange 17 is convexly curved in transverse cross section with the outer marginal edge thereof being below the upper end of the portion 15, whereas such flange may have other preferred forms in transverse cross section. It is desirable that the radial span of flange 17 be appreciable so that the device will be adapted for use in conjunction with openings of various diameters within limits. Device 11 as thus far described is preferably formed by the punching and stamping of sheet stainless steel stock. The flange 17 on the upper surface thereof is preferably chromium or nickel plated to afford a finished appearance.

Reflector pan 14 is provided with a peripheral flange 18 which is adapted to seat on the flange 16 of device 11 for support of said pan within said device. The grid 13 comprises a plurality of radially extending legs, like the leg 19 thereof, and although not shown these legs may be assumed to be connected to each other adjacent the vertical center line of heating unit 10 as viewed in Fig. 1. Each leg of grid 13, at the outer end thereof, is provided with a short rectangular lug or extension 20 and such lugs, with the exception of that carried by one leg not shown, fit within openings 21 formed at spaced intervals in the portion 15 of device 11 adjacent the flange 16. As shown in Fig. 1, portion 15 of device 11 is provided with a rectangular opening 22 of appreciable length and a curved strip 23 of spring steel is fitted within said opening with the ends thereof suitably secured to the portion 15 adjacent the two ends of the opening. Strip 23 is provided with an elongated bulged portion 24 within which the end lug of said one leg of grid 13 is

accommodated. The legs of grid 13 adjacent the outer ends thereof are suitably formed for seating on the flange 18 of pan 14 and when the legs are so seated with their end lugs 20 projecting into portion 15 of device 11 as aforedescribed, they lock pan 14 against upward displacement. Also, the legs of grid 13 are provided with notches 25 in the upper edges thereof within which turns of the heating element 12 are accommodated, and said legs on opposite sides of the notches 25 are clinched over the turns of heating element 12 to secure the latter in fixed position on the grid 13. When the grid 13 is secured within device 11 as aforedescribed, it is secured against rotary movement and upward or downward displacement relative to said device. Grid 13 may be quickly removed from device 11 by effecting disengagement of the end lug of said one leg thereof from the bulged portion 24 of strip 23 and by withdrawal of the end lugs of the other legs from the openings 21, whereupon said grid and its associated heating element 12 may be withdrawn from device 11. With grid 13 and heating element 12 withdrawn from device 11, reflector pan 14 may be withdrawn through the upper side of the device.

The heating unit 10 is exemplary only of one type of electric heating unit that can be supported within the device 11. The herein shown securing and attaching arrangement used for securing the components of the heating unit 10 within device 11 is particularly adapted to the construction and arrangement of its components, but it will be apparent that other securing arrangements can be used depending upon the construction of the particular electric heating unit supported within device 11.

Referring particularly to Fig. 2, it shows a portion of a stove-top wall 26 having formed therein a circular opening 27 and a device 11, like that of Fig. 1, positioned within opening 27 in anchored relation to wall 26. It may here be assumed that the top and bottom surfaces of wall 26 are flush with the top and bottom edges of opening 27. The heating unit 10 is omitted here for the sake of clarity and because the device is preferably installed prior to insertion of the heating unit. As will now be described in detail, the device 11 is provided with means which affords centering of said device within opening 27 and which in cooperation with the flange 17 anchors the device in centered relation to the wall 26.

Referring particularly to Figs. 2 and 3, device 11 is provided with a pair of like members 28 and 29 which are preferably formed of flat strips of spring steel. Members 28 and 29 are fastened, respectively, substantially midway between the ends thereof to the outer surface of portion 15 at diametrically opposed points as by spot welding, indicated at 30, 30 in Fig. 3. As best shown in Fig. 3, the member 28 adjacent its ends is provided with like stepped edges 31 and 32, respectively, which are inclined from the ends toward the flange 17. Preferably the horizontal dimensions of the steps in the edges 31 and 32 are equal and the rise or vertical dimensions between steps are also equal, except the rise to the upper-most step from the one below it which is preferably about twice the rise between other steps. The member 29 is of like construction being provided with stepped edges 33 and 34. Preferably members 28 and 29 are arcuately bowed so, that on both sides of their points of attachment with portion 15 of device 11, they

curve tangentially outwardly and away from said portion. While members 28 and 29 in their preferred form are shown as having stepped edges adjacent the ends thereof, they may alternatively be provided with straight inclined edges if desired.

The members 28 and 29 are for insertion through opening 27 in a manner hereinafter indicated, member 28 then being as shown in long broken lines and member 29 then being as shown in full lines in Fig. 2, both being concavely bowed toward portion 15 of device 11. In such relation the stepped edges of members 28 and 29 extend beyond the circumferential margin of opening 27 into engagement with the under surface of wall 26, while risers of the stepped edges abut the thin wall of opening 27. Thus members 28 and 29 effectively center device 11 within opening 27 and prevent its withdrawal upwardly through said opening; the flange 17 seating against the upper surface of wall 26 about opening 27 preventing withdrawal of the device downwardly through said opening.

The short broken line showings of members 28 and 29 in Fig. 2 depict the positions they normally assume prior to insertion of the device 11 into the opening 27. Device 11 may be readily inserted in an opening in a stove-top wall or the like and brought into centered and anchored relation, such as shown in Fig. 2, without the need of tools. This may be done by the following procedure:

(*a*) With device 11 held in an inclined position, the ends of member 29 are inserted within opening 27 with portions of the stepped edges extending beyond the lower marginal edge of opening 27 in overlapping relation to the lower surface of wall 26.

(*b*) Device 11 is then pressed against member 29, thereby deflecting the ends of the latter towards the cylindrical portion 15 and device 11 as a whole towards one side of opening 27.

(*c*) The ends of member 28 are then grasped by inserting hands through the opening in device 11 and the ends are deflected towards the cylindrical portion 15 so that member 28 as a whole lies within opening 27.

(*d*) Device 11 is then pulled downwardly so that the flange 17 rests upon the upper surface of wall 26 and the ends of member 28 are then released to permit engagement of the latter along its stepped edges with wall 26; portions of said stepped edges extending beyond the lower marginal edge of opening 27 in overlapping relation to the lower surface of wall 26.

If the radial span of the flange 17 is appreciable and the length of members 28 and 29 is correspondingly appreciable, the device 11 will be adapted to openings having different diameters, the limits being determined by the outer diameter of portion 15 and outer diameter of flange 17. The bowed formation and resilient character of members 28 and 29 of device 11, afford self-centering action of the device within the openings and the stepped inclined edges of such members in cooperation with the flange 17 provide for anchoring of the device to the wall.

The device 11, besides being adapted for use in conjunction with openings of different diameters, is adapted for use in conjunction with openings having a wide variety of wall formations. Figs. 4 to 6 exemplify other common types of stove-top wall formations found in electric ranges and how the stepped edges of members 28 and 29 cooperate therewith.

Fig. 4 shows a portion of a wall **35** having a short upstanding flange **36** about the margin of an opening **37**. Fig. 5 shows a wall **38** having a relatively long downwardly turned flange **39** portion about an opening **40** therein. Fig. 6 shows a wall **41** having a flanged formation surrounding an opening **42** therein which comprises a downwardly turned portion **43** and a portion **44** extending at a right angle to the portion **43**. It will be noted that the stepped edges of members **28** and **29** will engage the walls at various positions therealong according to the particular wall formation surrounding the openings as depicted by the edge **33** of member **29** in Figs. 4 to 6, inclusive.

From the foregoing it will be apparent that the preferred mounting device is particularly suited for replacement service where it is desired to replace electric heating units in electric ranges of various designs and manufacture with an electric heating unit of a single manufacturer. With an electric heating unit of a particular rating it will only be necessary to carry a few sizes of the device **11** to enable the mounting of the heating unit within stove-top wall openings of various sizes and with various marginal formations of the wall surrounding such openings.

I claim:

1. In a mounting ring for supporting an electric heating unit in a circular opening in a stove-top wall or the like, a cylindrical portion, a flange extending radially outwardly about the circumference of said cylindrical portion, and means affording centering of said ring within a wall opening and in cooperation with said flange anchoring of said ring to the wall, said means comprising a plurality of resilient members which are attached to said cylindrical portion in spaced apart relation around the latter and which respectively from their points of attachment extend tangentially outwardly and away from said cylindrical portion, said members each having a free end portion with an edge having steps formed therein inclined from a point adjacent said flange outwardly with respect to said cylindrical portion.

2. In a mounting ring for supporting an electric heating unit in a circular opening in a stove-top wall or the like, a cylindrical portion, a flange extending radially outwardly about the circumference of said cylindrical portion, and means affording centering of said ring within a wall opening and in cooperation with said flange anchoring of said ring to the wall, said means comprising a pair of arcuately bowed resilient members which are respectively attached at a point substantially midway between the ends thereof to said cylindrical portion on opposite sides of the latter and which bow outwardly and away from said cylindrical portion, said members each having adjacent each end thereof a stepped edge inclined from a point adjacent said flange outwardly with respect to said cylindrical portion.

3. In a mounting ring for supporting an electric heating unit in a circular opening in a stove-top wall or the like, a cylindrical portion, a flange extending radially outwardly about the circumference of said cylindrical portion, and means affording centering of said ring within a wall opening and in cooperation with said flange anchoring of said ring to the wall, said means comprising a pair of arcuately bowed resilient members which are respectively attached at a point substantially midway between the ends thereof to said cylindrical portion on opposite sides of the latter and which curve tangentially outwardly and away from said cylindrical portion, said members each having adjacent each end a stepped edge inclined from a point adjacent said flange outwardly with respect to said cylindrical portion, the rise between certain steps being greater than the rise between certain other steps.

4. A device for supporting and anchoring an electric heating unit in circular openings of different sizes and different marginal wall formations in a stove-top wall or the like, comprising a cylindrical portion to fit within the opening, a flange extending radially outwardly about the circumference of said cylindrical portion to overlap and seat against a surface of the wall, and a plurality of resilient members which are attached to said cylindrical portion in spaced apart relation around the latter and which respectively from their points of attachment extend tangentially outwardly and away from said cylindrical portion, said members each having an edge having steps formed therein inclined from a point adjacent said flange outwardly with respect to said cylindrical portion which edges extend to overlap and engage another surface of the wall to afford centering of the device within the wall opening and in cooperation with said flange anchoring of the device to the wall.

5. A device for supporting and anchoring an electric heating unit in circular openings of different sizes and different marginal wall formations in a stove-top wall or the like, comprising a cylindrical portion to fit within the opening, a flange extending radially outwardly about the circumference of said cylindrical portion to overlap and seat against a surface of the wall, and a pair of arcuately bowed members formed of strips of flat spring steel which are respectively welded at a point substantially midway between the ends thereof to said cylindrical portion on opposite sides of the latter and which respectively, on both sides of their points of attachment, curve tangentially outwardly and away from said cylindrical portion to their extremities, said members having adjacent their ends stepped edges inclined from a point adjacent said flange outwardly with respect to said cylindrical portion which edges extend to overlap and engage another surface of the wall to afford centering of said device in the wall opening and in cooperation with the flange anchoring of the device to the wall.

6. The combination with a stove-top wall or the like having a circular opening formed therein, of mounting means for supporting an electric heating unit within said opening, comprising a cylindrical portion fitting into said opening, a flange extending radially outwardly about the circumference of said cylindrical portion and engaging with the outer face of said wall, and a plurality of resilient members having attachment with said cylindrical portion in spaced apart relation on the latter and respectively extending tangentially outwardly from said cylindrical portion to at least one free end, said members each having adjacent a free end an edge inclined from a point adjacent said flange outwardly with respect to said cylindrical portion which edges extend from within said wall opening into engagement with points spaced thereabout on the inner face of said wall to

thereby afford centering of said means within said opening and in cooperation with said flange anchoring of said mounting means to said wall.

7. The combination with a stove-top wall or the like having a circular opening therein, of mounting means for supporting an electric heating unit within said opening, comprising a cylindrical portion fitting into said opening, a flange extending radially outwardly about the circumference of said cylindrical portion and engaging with the outer face of said wall, and a plurality of resilient members having attachment with said cylindrical portion in spaced apart relation on the latter and respectively extending tangentially outwardly from said cylindrical portion to at least one free end, said members each having adjacent a free end a stepped edge inclined from a point adjacent said flange outwardly with respect to said cylindrical portion which edges extend within said wall opening into engagement with points spaced thereabout on the inner face of said wall at said opening and the under surface of said wall to thereby afford centering of said mounting means within said opening and in cooperation with said flange anchoring of said means to said wall.

8. The combination with a wall or the like having a circular opening formed therein, of a ring comprising a cylindrical portion fitting into said opening, a flange extending radially outwardly about the circumference of said cylindrical portion and engaging with one face of said wall, and a pair of arcuately bowed resilient members which are respectively attached at a point substantially midway between the ends thereof to said cylindrical portion on opposite sides of the latter and which curve tangentially outwardly and away from said cylindrical portion, said members each having adjacent each end a stepped edge inclined from a point adjacent said flange outwardly with respect to said cylindrical portion which edges extend from within said wall opening into engagement with the other face of said wall to thereby afford centering of said ring within said opening and in cooperation with said flange anchoring of said ring to said wall.

9. In an electric range, the combination with a top wall having a circular opening formed therein and an electric heating unit, of a mounting ring for supporting said heating unit within said opening, comprising a cylindrical portion fitting into said wall opening, a flange extending radially outwardly from said cylindrical portion and engaging with the outer face of said wall, and a pair of arcuately bowed resilient members which are respectively attached substantially midway between the ends thereof to said cylindrical portion on opposite sides of the latter and which curve tangentially outwardly and away from said cylindrical portion, said members each having adjacent each end a stepped edge inclined from a point adjacent said flange outwardly with respect to said cylindrical portion which edges extend from within said wall opening into engagement with the inner face of said wall to thereby afford centering of said ring within said opening and in cooperation with said first mentioned flange anchoring of said ring to said wall, said heating unit and said mounting ring having cooperating means affording securement of said heating unit in position within said cylindrical portion of said ring.

10. In an electric range, the combination with a top wall having a circular opening formed therein, an electric heating element of the tubular sheathed type, a grid supporting said heating element and a reflector pan, of a mounting ring for supporting said grid and heating element and said reflector pan within said opening, comprising a cylindrical portion fitting into said wall opening, a flange extending radially outwardly from said cylindrical portion and engaging the outer face of said wall, a flange extending radially inwardly about the circumference of said cylindrical portion, and a pair of arcuately bowed resilient members which are respectively attached substantially midway between the ends thereof to said cylindrical portion on opposite sides of the latter and which curve tangentially outwardly and away from said cylindrical portion, said members each having adjacent each end a stepped edge inclined from a point adjacent the first mentioned flange outwardly with respect to said cylindrical portion which edges extend from within said wall opening into engagement with the inner face of said wall to thereby afford centering of said ring within said opening and in cooperation with said first mentioned flange anchoring of said ring to said wall, said reflector pan having a flange engaging with the other flange of said ring for supporting said pan within said ring, and said grid and said ring having cooperating means affording securement of said grid and heating element in position within said cylindrical portion of said ring above said reflector pan.

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