March 25, 1958 G. E. AMMERMAN 2,828,403

HEATER MOUNTING MEANS

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Fig. 1

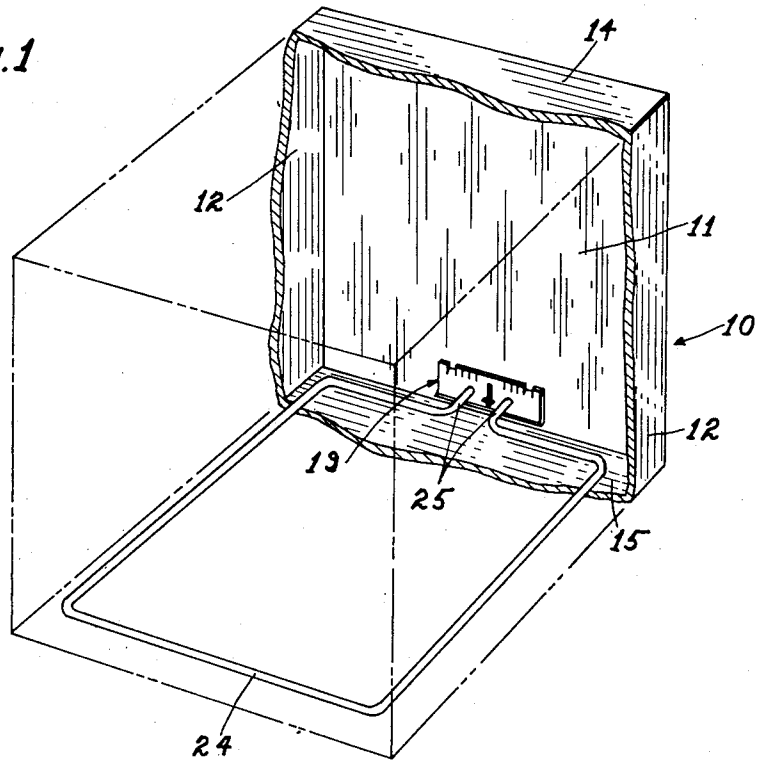
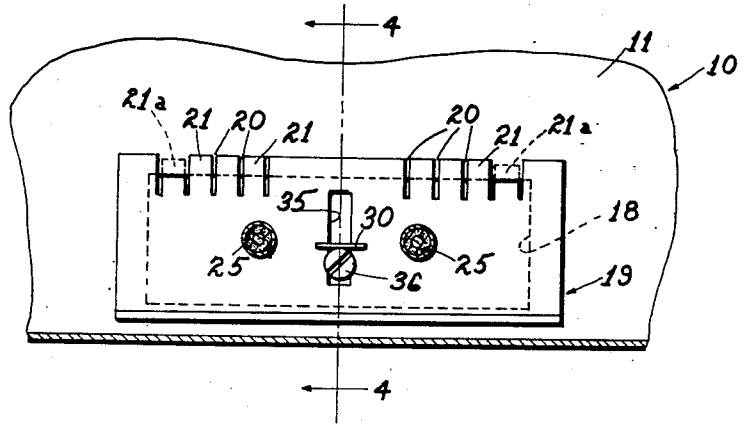


Fig. 2



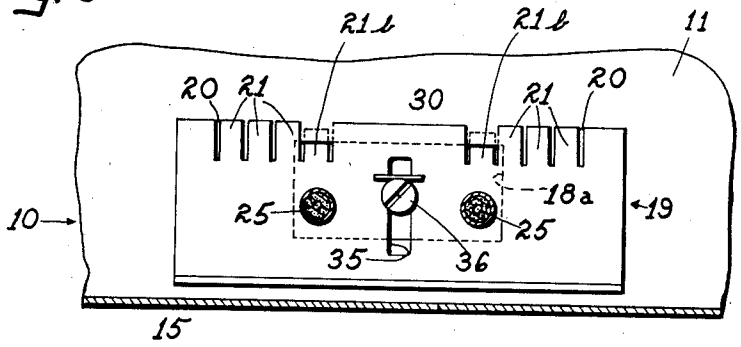
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HEATER MOUNTING MEANS

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Fig. 3



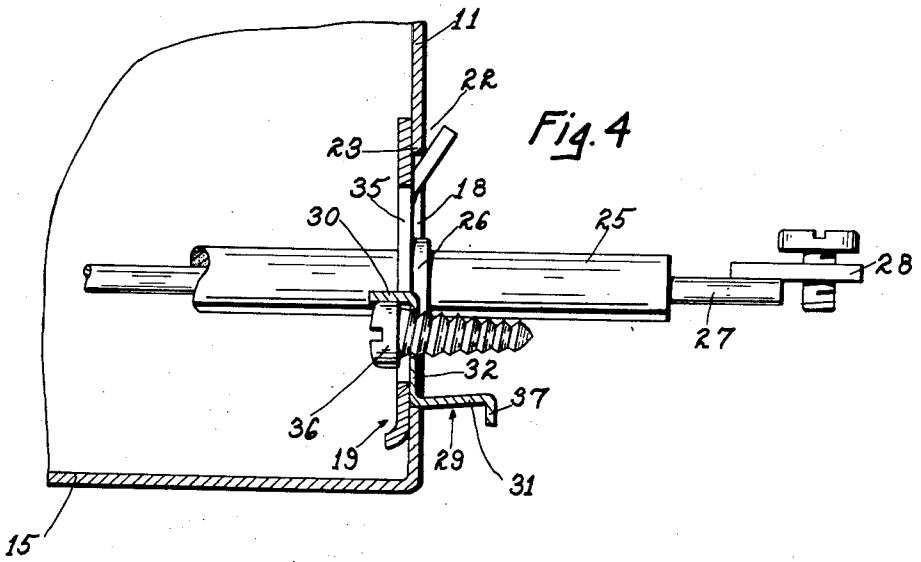


Fig. 4

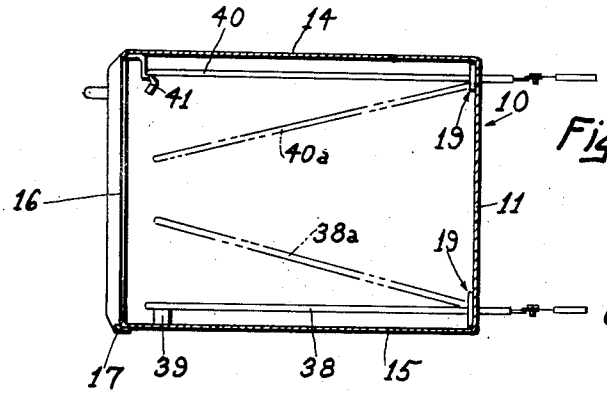


Fig. 7

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HEATER MOUNTING MEANS

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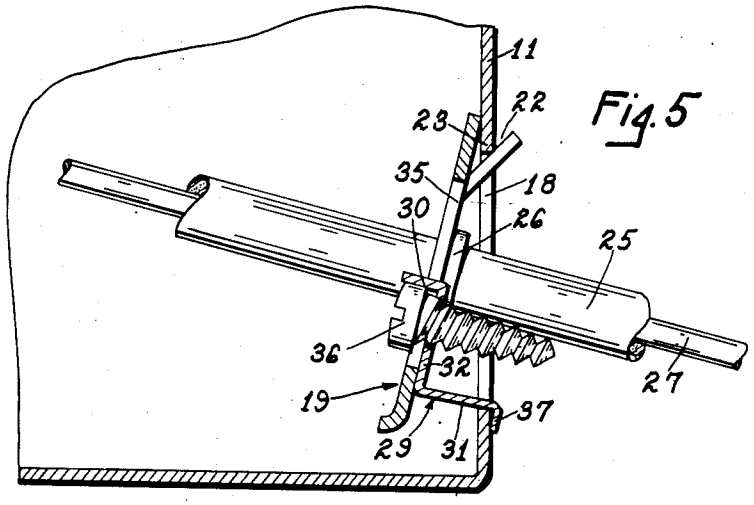


Fig. 5

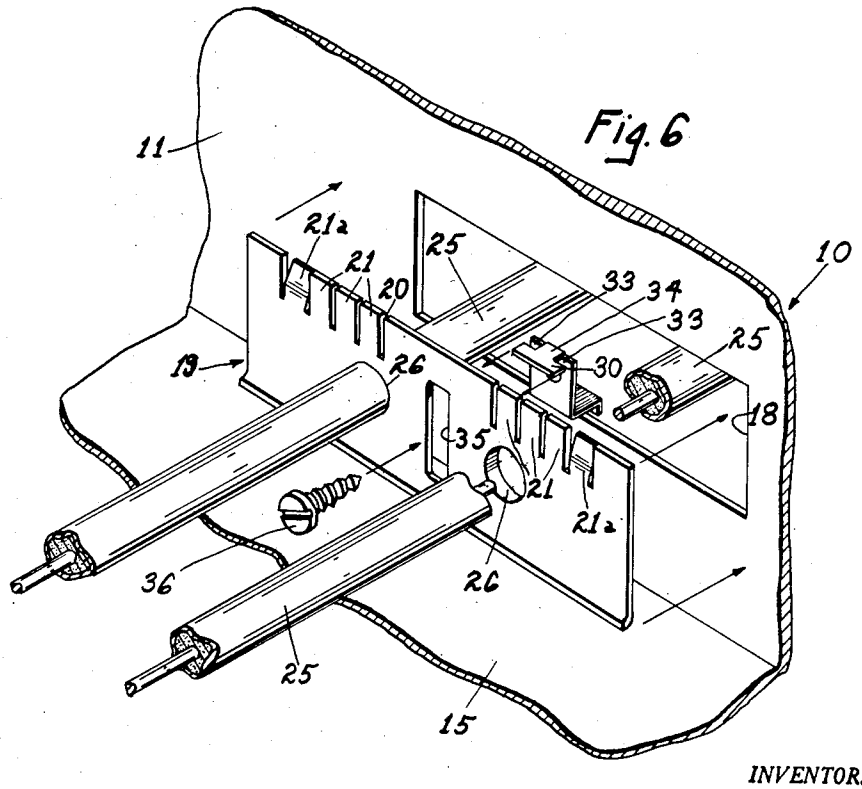


Fig. 6

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HEATER MOUNTING MEANS

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Application June 22, 1955, Serial No. 517,347

14 Claims. (Cl. 219—37)

My invention relates to means for mounting a heater on the wall of a body, particularly to means for mounting a tubular sheathed electric resistance heater on the wall of an oven of an electric range, and the principal object of my invention is to provide new and improved means of this character.

Heretofore, the ovens of electric ranges had heating elements provided with male projections which plugged in and frictionally fit with female receptacles carried by a dielectric block supported from the rear wall of the oven. This necessitated the unplugging of the element in order to remove it for replacement or cleaning purposes and quite frequently the elements were not properly plugged into the receptacles, thus setting up dangerous conditions.

Further, it was difficult to make electrical connections between the heater and the wiring at the rear portion of the range which connected to a source of energy since such connections had to be made from the rear of the oven. Also, replacement for ranges of various types presented quite a problem since the method of connection to the supporting wall of the oven varied, as did the dielectric blocks and the wall openings for receiving such blocks.

My invention has overcome the foregoing disadvantages by producing a mounting for an oven heater which may be entirely assembled with the oven supporting wall from within the oven without requiring that any access, even for electrical connections, be required to that portion of the range to the rear of the oven. Further, my invention eliminates the need for a relatively expensive dielectric block and provides a heater mount whereby the heater may be swung clear of the adjacent oven wall for cleaning purposes. Additionally, my invention provides a heater mount which may be assembled with any one of a number of different types of ovens and thus is ideal for replacement purposes.

In the drawings accompanying this specification and forming a part of this application, there is shown, for purposes of illustration, an embodiment which my invention may assume, and in these drawings:

Figure 1 is a broken perspective view of an enclosure, such as formed by the oven of an electric range, showing an embodiment of my invention supported from an oven wall,

Figure 2 is an enlarged fragmentary view taken through the terminal portions of the heater shown in Figure 1 and looking toward the rear wall of the oven, showing the embodiment used with an over wall opening of a relatively large size,

Figure 3 is a view similar to Figure 2 showing the embodiment used with an oven wall opening of a relatively small size,

Figure 4 is an enlarged, fragmentary sectional view corresponding generally to the line 4—4 of Figure 2,

Figure 5 is a view similar to Figure 4 but showing the heater swung upwardly,

Figure 6 is a fragmentary perspective view of the embodiment showing it in disassembled relation and,

Figure 7 is a sectional view through an oven and schematically showing baking and broiler elements in position.

Referring particularly to Figures 1 and 7 of the drawings, the embodiment of my invention is particularly suitable for use with an enclosure, such as the oven **10** herein shown. An oven usually includes a rear wall **11**, side walls **12—12**, top and bottom walls **14** and **15**, respectively, and a door **16** for closing the front opening into the oven, the door being hinged at **17** to provide for access into the oven.

In usual oven construction, the rear wall **11** is formed with an opening **18**, usually rectangular in shape as shown, for the reception of a dielectric block which carries the female receptacles for receiving the plug terminals of the heaters heretofore produced. My invention does not alter standard oven construction in that the oven may be made as before with the opening **18**; however, the need for a dielectric block is eliminated, thus reducing cost of manufacture. Further, my invention enables replacements to be easily made to ovens which were originally manufactured with a dielectric block.

Various range manufacturers have established production with openings **18** of varying sizes and, since no attempt has been made to standardize the size of such openings, my invention provides a heater mount which may be used with a relatively large opening **18**, as shown in Figure 2, or with a relatively small opening **18*a***, as shown in Figure 3.

The invention comprises a plate member **19** preferably of a size to accommodate a larger opening (such as opening **18** of Figure 2) and preferably of rectangular shape to overlie and substantially close the opening and thus prevent heat loss therefrom.

A plurality of slots **20** are formed to enter a margin of the plate member **19** (here shown to be the upper long margin of such member) to provide a plurality of tabs **21** spaced along such margin. The tabs provide connecting means or securing devices suitable for engaging the plate member **19** with walls having various sized openings.

In the case of an opening of the size shown in Figure 2, tabs **21*a*—21*a*** may be displaced from the plane of the plate member **19** to form spaced V-shaped grooves **22** (see Figure 4) for receiving a portion **23** of the wall **11** margining the opening **18**. The V-shaped grooves form upwardly opening sockets to receive tongue means in the form of the wall portion **23**, and provide hinge members for swinging movement of the plate member **19** from a position abutting the rear wall **11** (Figure 4) to a position pivotally shifted from the wall.

In the case of a smaller opening, such as opening **18*a*** shown in Figure 3, closely spaced tabs **21*b*—21*b*** are displaced from the plane of plate member **19** to provide the sockets for receiving the tongue means as before described. Thus, it will be appreciated that the plate member may be pivotally mounted in openings of a size as long as the slotted margin of the plate member, and smaller, and it is merely necessary to select tabs in correspondence to the wall opening.

The heater in the embodiment herein disclosed is in the form of a usual type of baking or broiler unit and comprises a metallic sheathed element enclosing a resistance conductor (not shown) the resistance conductor being insulated from the sheath in the usual manner by heat-conducting electrical-insulating material.

In Figure 1, the sheath of the heater has an active heating portion **24** of generally rectangular outline and

the terminal portions 25—25 of the heater are brought close together and pass through flanged openings 26 in the plate member 19. The terminal portions may be secured within the openings 26 in any suitable manner so that the heater is carried by the plate member.

Terminal pins 27 are connected to opposite ends of the resistance conductor and extend outwardly of ends of the sheath for electrical connection to current conductors leading from a source of electrical energy. As seen in Figure 4, the terminal portions 25 of the heater extend through the opening 18 and rearwardly beyond the rear surface of the oven wall 11. A lug 28 may be welded to each terminal pin 27 and a connecting screw is threaded through an aperture in the lug for the purpose of removably clamping a current conductor to the terminal pin. It will be noted that the spacing of the terminal portions 25 is such that they will clear the side margins of the smaller opening 18*a*.

Means are provided to engage a wall abutment and oppose edgewise shifting of the plate member 19 in a direction to effect disassembly of the hinge joint formed by the V-shaped grooves 22 and the wall portions 23, and yet provide for pivoting action of the plate member. In the present embodiment, a retaining member 29 is carried by the plate member 19 and slidably bears against a marginal edge portion defining the wall opening 18 or 18*a*.

The retaining member, as presently preferred, is formed of a strip of metal and bent to Z-shape, providing end legs 30, 31 and an intermediate leg 32. The leg 30 is provided with notches 33 extending inwardly from opposite margins to form a neck 34 of a width slightly less than the width of an elongated slot 35 formed in the central portion of the plate member 19. Thus, the retaining member 29 may be easily assembled with the plate member 19 merely by turning the former so that the leg 30 is extended lengthwise through the slot 35 and then righted so that the neck 34 fits within the slot 35 with the terminal head portion of the leg 30 disposed on one side (the oven side) of the plate member 19 and the legs 31 and 32 disposed on the rear side of the plate member.

The retaining member 29 is thus held to assembly with the plate member 19 and is adjustable lengthwise of the slot 35. A holding screw 36 passes through the slot 35 and threads into an aperture formed in the leg 32 of the retaining member 29. When the screw 36 is drawn tight it holds the retaining member 29 in adjusted position lengthwise of the slot 35. Thus, as best shown in Figures 4 and 5, the retaining member may be held in adjusted position wherein the leg 31 slidably bears against the wall abutment formed by the adjacent marginal edge defining the slot 18.

The plate member 19 may, accordingly, be swung between the positions shown in Figures 4 and 5 without affecting the assembly of the hinge joint parts since the retaining member opposes movement of the plate member in a direction which would cause disassembly of such parts. The leg 31 of the retaining member 29 is formed with a foot portion 37 which engages the rear side of the wall 11 and limits swinging movement of the plate member as shown in Figure 5.

Assembly and disassembly of the heater mounting may be effected entirely from the oven side of the wall 11 and access to the oven may be gained by opening the oven door 16.

The dielectric mounting blocks heretofore used were commonly mounted on the wall 11 by means of screws threaded into holes (not shown) at the four corners of the opening 18. Thus, to replace a heating element and its block support, it is necessary to remove the screws holding the block and draw the element and support into the oven so that the electric current conductors may be removed from the female receptacles carried by the dielectric block.

My improved heating unit and mount assembly may be then easily positioned on the wall 11. First, it is preferable to connect the current conductors directly to respective terminal lugs 28, thus avoiding the slide connection of the prior prong and receptacle construction. The terminal portions 25 of the heater may be then disposed through the opening 18 (or 18*a*) sufficiently so that the plate member 19 may be bodily shifted to position the wall portions 23 within the V-shaped sockets or grooves, it being assumed that the screw 36 is loosened to permit shifting of the retaining member 29 so that the foot portion 37 clears the adjacent margin of the opening. The retaining member is thereafter shifted along the slot 35 so that the leg 31 bears against the adjacent margin of the opening and the screw 36 is tightened.

The foregoing completes the assembly of the heater and mount on the wall 11, and the simple assembly steps described hold true whether the heater is a replacement for a prior block supported unit or the heater is an initial installation. It will be seen that the pivoted plate member 19 permits shifting of the heating element so that its active heating portion may be removed from an oven wall a sufficient distance to provide for ready cleaning of the wall and element. It will be appreciated that a reversal of the simple assembly steps will provide easy removal of the heater and mounting plate assembly from its position on the wall 11.

Figure 7 shows a heater 38 mounted on the wall 11 of the oven 10 in accordance with my invention, with the active heating portion of the heater slightly spaced from and substantially parallel with the bottom wall 15 of the oven, to provide the usual oven baking unit. Although the plate member 19, by abutment with the inner surface of the wall 11, may be used to hold the heater in its desired operating position relative to the bottom wall 15, it is preferable to provide a spacer 39 to relieve the plate member of strain. The dot-dash lines 38*a* show the active heating portion of the heater swung clear of the bottom oven wall 15, for cleaning purposes.

The heater mount of my invention may also be used to mount the heater for broiling purposes, and the heater 40 in Figure 7 is mounted spaced from and generally parallel with the upper oven wall 14. In such case, the plate member will be assembled with an opening in the upper part of oven wall 11 by disposing the V-shaped grooves over the lower marginal edge portion of the opening and adjusting the retaining member to bear against the edge of a wall portion corresponding to portion 23 of opening 18. A spring hook 41 is preferably provided to hold the heater 40 in its operating position, and the heater may be easily disengaged from the hook so that its active portion may swing to the position shown by dot-dash lines 40*a* to provide for easy cleaning of the oven wall and the heater.

In view of the foregoing it will be apparent to those skilled in the art that I have accomplished at least the principal object of my invention and it will also be apparent to those skilled in the art that the embodiment herein described may be variously changed and modified, without departing from the spirit of the invention, and that the invention is capable of uses and has advantages not herein specifically described, hence it will be appreciated that the herein disclosed embodiment is illustrative only, and that my invention is not limited thereto.

I claim:

1. Means for mounting a heater on the wall of a body and for generally overlying an opening in said wall, comprising a support member supporting said heater and having means engageable with support means adjacent to said opening for securing said support member in position generally overlying said wall opening, said engageable means comprising a plurality of securing members selectively usable to provide for assembly of said support member with body walls having various sized openings.

2. Means for mounting a heater on the wall of a body and in position with respect to an opening in said body, comprising a support member supporting said heater and having means engageable with a wall surface margining said opening for securing said support member to said wall, said engageable means comprising a plurality of securing devices providing for assembly of said support member with body walls having various sized openings, said devices being spaced in accordance with various sized openings and being selectively engageable with marginal surfaces of respective openings.

3. Means for mounting an electric heater on the wall of a body in position adjacent to an opening in said wall, comprising a plate member secured to said heater for supporting the same, said plate member having a plurality of slots entering from one margin to provide a plurality of tab means spaced along said margin whereby the plate member may be assembled with oven walls having openings of various sizes, assembly being effected by selecting tab means corresponding to an opening size and displacing said tab means from the plane of said plate member to provide socket means for receiving a portion of said wall margining said opening.

4. Means for mounting an electric heater on the wall of a body adjacent to an opening in said wall, comprising a plate member secured to said heater for supporting the same, said plate member having socket means adjacent a marginal portion providing spaced parts for receiving therebetween tongue means carried by said wall and about which said plate member is swingable in a flatwise direction, and said plate member having a retaining member spaced from and in opposed relation with said marginal portion and engageable with an abutment carried by said wall to restrain said plate member from movement in a direction wherein said tongue means and socket means become disengaged.

5. Means for mounting an electric heater on the wall of a body in position wherein said heater extends through an opening in said wall, comprising a plate member secured to said heater for supporting the same, said plate member having socket means at one marginal portion for receiving a portion of said wall margining said opening to provide a hinge-like support about which said plate member may be swung, and said plate member having a retaining member at an opposite marginal portion engageable with a portion of said wall margining said opening to retain said plate member in position on said wall and to limit swinging movement of said plate member.

6. Means for mounting an electric heater on the wall of a body in position adjacent to an opening in said wall, comprising a plate member secured to said heater for supporting the same, said plate member at its upper portion having spaced parts providing an outwardly opening socket for receiving therein tongue means carried by said wall and about which said plate member is swingable in a flatwise direction, and means carried by said plate member in spaced opposed relation to said socket for engagement with an abutment carried by said wall to oppose displacement of said tongue means from said socket.

7. Means for mounting an electric heater on the wall of a body in position adjacent to an opening in said wall, comprising a plate member secured to said heater for supporting the same, said plate member at one marginal portion having spaced parts providing a socket for receiving therein tongue means carried by said wall and providing for swinging movement of said plate member thereabout in a flatwise direction, and means carried by said plate member in opposed relation to said socket, said means being engageable with an abutment carried by said wall to oppose displacement of said tongue means from said socket and to limit swinging movement of said plate member.

8. Means for mounting an electric heater on the wall of a body in position adjacent to an opening in said wall, comprising a plate member secured to said heater for supporting the same, one marginal portion of said plate member being provided with a groove for receiving a marginal portion defining said wall opening, and said plate member at an opposite marginal portion having a retaining member bearing against a marginal edge portion defining said wall opening to oppose displacement of said plate member in a direction to disassemble said wall marginal portion from said groove.

9. Means for mounting an electric heater on the wall of a body in position adjacent to an opening in said wall, comprising a plate member secured to said heater for supporting the same, one marginal portion of said plate member being provided with a groove for receiving a marginal portion defining said wall opening to provide a hinge joint whereby said plate member is mounted for swinging movement in a flat-wise direction, and said plate member at an opposite marginal portion having a retaining member slidably bearing against a marginal edge portion defining said wall opening to oppose displacement of said plate member in a direction to disassemble its hinge joint, said retaining member having a foot portion abuttable with said wall to limit swinging movement of said plate member.

10. Means for mounting an electric heater on a wall in position adjacent to an opening in said wall, comprising a plate member secured to said heater for supporting the same, said plate member having a plurality of slots entering from one margin to provide a plurality of tab means spaced along said margin whereby said plate member may be assembled with walls having openings of a size as long as said margin and smaller, assembly being effected by selecting tab means corresponding to an opening size and displacing said tab means from the plane of said plate member to provide a socket for receiving a marginal portion defining said wall opening.

11. Means for mounting an electric heater on a wall in position adjacent to an opening in said wall, comprising a plate member secured to said heater for supporting the same, said plate member having a plurality of slots entering from one margin to provide a plurality of tab means spaced along said margin whereby said plate member may be assembled with walls having openings of a size as long as said margin and smaller, assembly being effected by selecting tab means corresponding to an opening size and displacing said tab means from the plane of said plate member to provide a socket for receiving a marginal portion defining said wall opening, and means carried by said plate member and abutting a portion of said wall to restrain displacement of said marginal portion defining said wall opening from said socket.

12. Means for mounting an electric heater on a wall in position adjacent to an opening in said wall, comprising a plate member secured to said heater for supporting the same, said plate member having a plurality of slots entering from one margin to provide a plurality of tab means spaced along said margin whereby said plate member may be assembled with walls having openings of a size as long as said margin and smaller, assembly being effected by selecting tab means corresponding to an opening size and displacing said tab means from the plane of said plate member to provide a V-shaped groove for receiving a marginal portion defining said wall opening and thereby forming a hinge joint whereby said plate member is mounted for swinging movement, and a retaining member carried by said plate member and slidably bearing against a marginal edge of said wall opening to oppose displacement of said plate member in a direction to disassemble its hinge joint, said retaining member having a foot portion abuttable with said wall to limit swinging movement of said plate member.

13. Means for mounting a tubular sheathed electric heating element on the wall of an oven in position wherein the active sheath portion of the heater is within the

oven and its terminal portion extends through an opening in the oven wall, assembly of the mounting being made entirely from the oven side of said wall, comprising a plate member secured to the sheath of said heater adjacent to said terminal portion for supporting said heater, said plate member having a plurality of slots entering from one margin to provide a plurality of tab means spaced along said margin whereby said plate member may be assembled with oven walls having openings of a size as long as said margin and smaller, assembly being effected by selecting tab means corresponding to an opening size and displacing said tab means from the plane of said plate member to provide a V-shaped groove for receiving a marginal portion defining said wall opening and thereby forming a hinge joint whereby said plate member is mounted for swinging movement, and a restraining member carried by said plate member and slidably bearing against a marginal edge of said wall opening to oppose displacement of said plate member in a direction to disassemble its hinge joint, said restraining member having a foot portion abuttable with the wall surface defining the outside of said oven to limit swinging movement of said plate member, said restraining member being shiftably carried by said plate member so that it may be moved to clear through said opening from the oven side of said wall and thereafter moved to position said foot portion in position for abutment with said wall.

14. In electric heating apparatus, the combination comprising an apertured wall, a sheathed electric resistance heating element extending through the aperture in said apertured wall to dispose a heat generating portion of said element on one side of said wall and a terminal connector portion thereof on the other side of said wall, a generally flat plate member secured to and extending radially of said element and in one position covering at least a portion of the wall aperture, and a tab structurally integral with said plate member and extending transversely of the latter and from a marginal portion thereof, said tab extending through the wall aperture and pivotally supporting said plate member for swinging movement in a flatwise direction toward and away from said wall and thereby provide for pivotal movement of said element relative to said wall.

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