April 19, 1955 T. W. GLYNN 2,706,763

ELECTRIC WALL HEATER

Filed Sept. 16, 1953 2 Sheets-Sheet 1

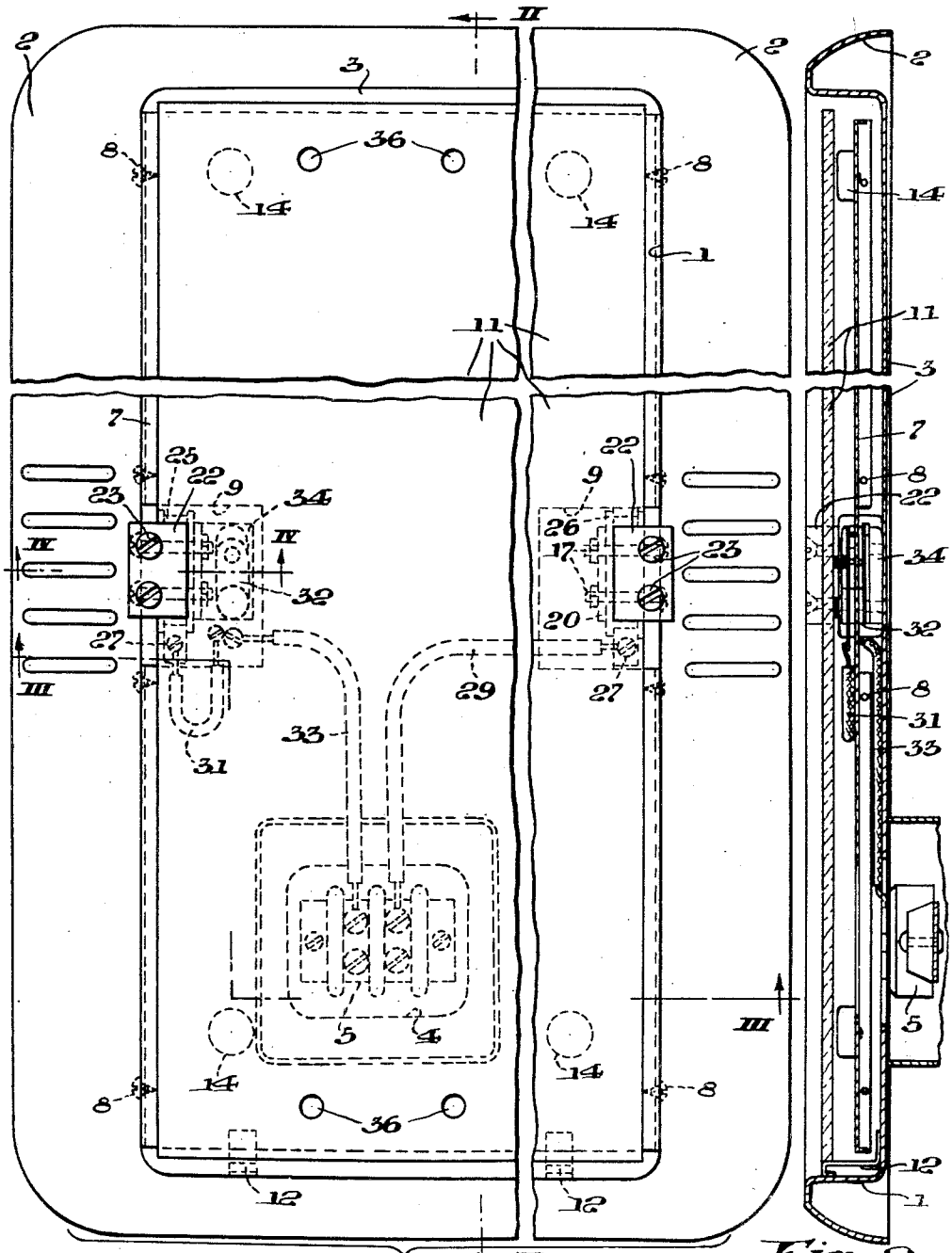



Fig. 1.




Fig. 2.

INVENTOR.
THEODORE W. GLYNN
BY
Brown, Critchlow, Flick & Peckham
HIS ATTORNEYS.

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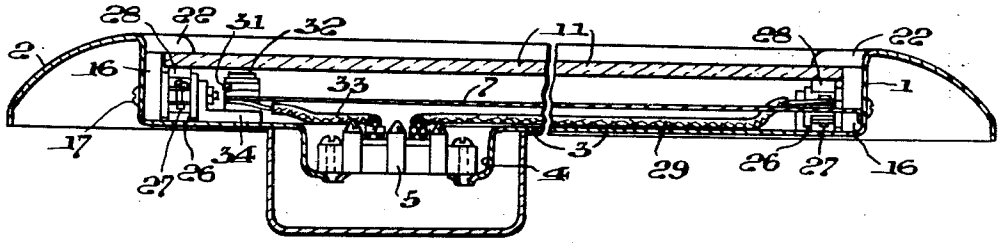



Fig. 3.

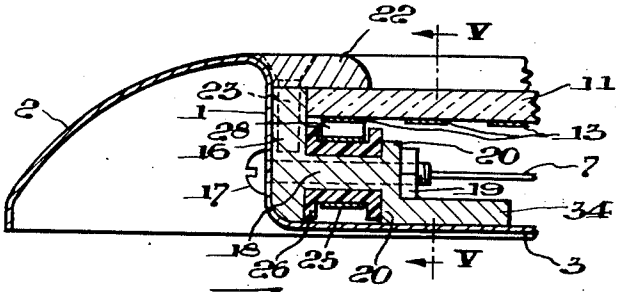



Fig. 4.

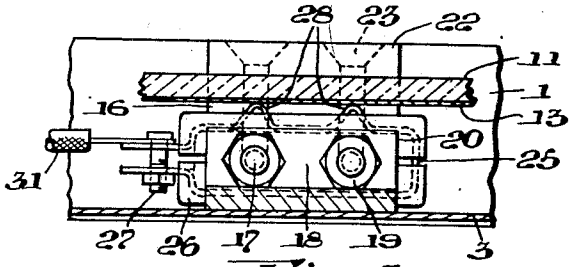



Fig. 5.

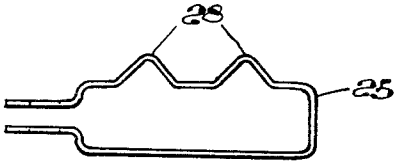



Fig. 6

INVENTOR.
THEODORE W. GLYNN
BY
Brown, Critchlow, Flick & Peckham
HIS ATTORNEYS.

United States Patent Office 2,706,763 Patented Apr. 19, 1955



2,706,763

# ELECTRIC WALL HEATER

Theodore W. Glynn, Kingsport, Tenn., assignor to Blue Ridge Glass Corporation, Kingsport, Tenn., a corporation of New York

Application September 16, 1953, Serial No. 380,458

8 Claims. (Cl. 219—19)

This invention relates to electric wall heaters in which a resistance heating element is mounted on a glass plate in a metal frame, and more particularly to the way in which the plate is held in the frame.

In a well known type of such heater the glass plate is supported in a metal tray by means of recessed ceramic blocks at its four corners. The tray is mounted in the usual frame. In order to avoid damage to the corners of the plate in shipment, it has been the practice to insert a pellet of a suitable resilient material between the corners of the glass and the corner blocks to hold the plate firmly in the blocks. Such an arrangement has been relatively expensive, and it requires the glass plate and tray to be shipped together as a unit. Furthermore, the services of an electrician generally are required when it is necessary to replace a plate in the home.

It is an object of this invention to reduce the cost of such a heater by using an improved way of holding the glass plate in the frame. Other objects are to eliminate soldering of electrical connectors to the resistance element, to make it possible to ship the glass separately from the frame and tray, and to make it easy for the home owner himself to replace a broken plate.

In accordance with this invention a glass heater plate, which has its rear face provided with an electric resistance heating element, is mounted in a frame. Behind the opposite ends of the plate there are brackets connected to the frame. A lug is detachably connected to each bracket and overlies a small area of the outer face of the plate. A spring member is compressed between each bracket and the back of the plate and preferably engages the resistance element, in which case the spring is adapted to be connected in an electric circuit. The springs hold the plate against the lugs in front of it.

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

Fig. 1 is a front view of my wall heater with portions broken away to reduce its height and length;

Fig. 2 is a vertical section taken on the line II—II of Fig. 1;

Fig. 3 is a horizontal section taken on the line III—III of Fig. 1;

Fig. 4 is an enlarged horizontal section through the left-hand clamp taken on the line IV—IV of Fig. 1, but not showing the thermostat;

Fig. 5 is a fragmentary cross section taken on the line V—V of Fig. 4; and

Fig. 6 is a side view of one of the springs.

Referring to the drawings, a rectangular vertical metal frame, which is adapted to be set in a wall recess has the front edge of its side wall 1 surrounded by an integral flange 2 that curves rearwardly in order to overlie the edge of the wall recess to provide a finished appearance. The frame also has an integral back wall 3 that is provided near one corner with a recess 4, in which an electric terminal block 5 is mounted. Inside the frame there is a rectangular metal tray 7 that is as long as the back wall of the frame and almost as high. The opposite ends of the tray are turned back to provide flanges that are connected to the adjoining side walls of the frame by screws 8. The tray is located in the back part of the frame and serves as a heat reflector. The top and bottom of the tray are spaced from the top and bottom of the frame so that air can pass by convection upward between the tray and back of the frame. Each end of the tray is provided centrally with a rectangular recess 9, through which



extends a clamp used in holding a glass plate in the frame and spaced from the tray.

The glass plate 11 is rectangular and is made of tempered glass. It sets within the front part of the frame, but is slightly smaller so that it can be spaced a short distance from the surrounding walls of the frame. The plate is supported above the lower side wall of the frame by means of metal strips 12 secured to the frame. The rear surface of the plate is provided with the usual electric resistance heating element 13 as indicated in Figs. 4 and 5, preferably made of aluminum or aluminum alloy sprayed onto the glass in a predetermined pattern. To prevent the resistance element from grounding against the reflector tray in case the latter becomes warped or bent, several ceramic buttons 14 are attached to the front of the tray to act as insulating spacers.

Each of the clamps disposed in the tray recesses includes a metal bracket which has a side wall 16 that rests flat against the adjoining side wall 1 of the frame and extends from the back wall of the frame forward across the end of the glass plate to a point flush with its outer surface. The bracket is fastened to the frame by a pair of bolts 17 extending through the side wall of the frame and side wall 16 of the bracket. Projecting inward from the side wall of the bracket is an integral block or seat 18 parallel to the back wall of the frame but spaced from it as well as from the glass plate. The bolts 17 extend through this seat and have nuts 19 on their ends. The inner end of the seat has front and rear flanges 20. The rear flange preferably engages the back wall of the frame to strengthen the bracket.

Each clamp also includes a generally rectangular lug 22 that rests against the front end of side wall 16 of the bracket, to which it is detachably connected by countersunk screws 23. The lug projects inwardly over a very small area of the outer surface of the glass plate. The clamps therefore prevent the plate from moving lengthwise, or forward out of the frame.

To hold the glass plate tightly in the clamps so that it will always be in the correct position and will not vibrate or shake around, a metal spring 25 is compressed between the back of the plate and the front of seat 18, as shown in Figs. 4 and 5. This spring presses the plate forward tightly against the lug 22 in front of the plate. To prevent the spring from grounding the electric resistance element through the metal bracket and frame, the spring is spaced from the bracket by insulation. Preferably, this insulation takes the form of a two part ceramic bushing 26 which surrounds seat 18 between side wall 16 and flanges 20. Half of the bushing extends through the space between the seat and the back of the frame, and the other half extends between the seat and the glass plate. The halves of the bushing have ends that overlap the top and bottom of the seat. Also, the bushing has parallel flanges around its opposite edges. To hold the bushing, as well as the spring in place, the spring is formed from a metal band that is bent into a rectangular loop (Fig. 6) which extends around the bushing in the space between its side flanges. The ends of the loop extend in parallel relation away from the bottom of the bushing and are fastened together by a screw 27 so that the band clamps the two halves of the bushing against the opposite sides of the bracket seat. The band serves as a spring, because its front part is provided with a pair of vertically spaced projections 28 that are formed by providing the band with V-shape crimps. They are flattened slightly when the glass plate is pressed against them when lug 22 is fastened to the bracket behind it.

The spring also has a second purpose, which is to serve as an electrical connection with the resistance element 13. Thus, the pair of resilient projections 28 at the front of the spring band press tightly against the adjoining end of the resistance element. An electric wire 29 connects the band screw 27 at one end of the plate to terminal block 5. The band screw at the other end of the plate preferably is connected by a wire 31 to a thermostat 32 which in turn is connected by a wire 33 to the terminal block. The thermostat preferably is fastened to the front of an inner extension 34 of the bracket integral with rear flange 20. Therefore, the bracket and thermostat can be connected to the frame at the same time.

It will be seen that with this invention the glass plate will be securely clamped in the frame at all times without the use of auxiliary resilient members, whether the heater is in use or is being shipped. On the other hand, if desired, the plate can be shipped separately from the rest of the heater because it can quickly and easily be installed in the frame at its destination by merely screwing lugs 22 to bracket walls 16. In the same manner a damaged plate can be replaced readily by the owner without requiring the services of an electrician. Mounting of the plate in the frame automatically connects it into the electric circuit through spring contacts 25. There are no electrical connections to solder.

The holes 36 in the top and bottom of the tray are for purpose of providing openings for the screws or nails used in attaching the heater frame to the wall of a room. Otherwise, it would be necessary to remove the tray from the frame before the latter could be attached to the wall. The large number of holes permit the proper holes to be selected to match the stud spacing of the wall.

According to the provisions of the patent statutes, I have explained the principle of my invention and have illustrated and described what I now consider to represent its best embodiment. However, I desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. In an electric heater, a panel-like glass heater plate having a rear face provided with an electric resistance heating element, a frame for the plate, a bracket behind each end of the plate, means connecting the bracket to the frame, a lug detachably connected to each bracket and overlying a small area of the outer face of the plate to hold the plate in the frame, and springs compressed between the brackets and the back of the plate and pressing the plate forward against the lugs.

2. In an electric heater in accordance with claim 1, in which said springs engage the resistance element and are adapted to be connected in an electric circuit to supply electric current to said element.

3. In an electric heater, a panel-like glass heater plate having a rear face provided with an electric resistance heating element, a frame for the plate, a bracket behind each end of the plate, the brackets having side walls extending forward across the ends of the plate and provided with rearwardly extending threaded holes, means connecting the brackets to the frame, a lug at each end of the plate overlying a small area of its outer face to hold the plate in the frame, screws extending through the lugs and into said holes to fasten the lugs to the brackets, and springs compressed between the brackets and the back of the plate and pressing the plate forward against said lugs.

4. In an electric heater, a panel-like glass heater plate having a rear face provided with an electric resistance heating element, a frame for the plate, a metal bracket behind each end of the plate, means connecting the brackets to the frame, insulating members engaging the front of said brackets and spaced from the plate, a lug detachably connected to each bracket and overlying a small area of the outer face of the plate to hold the plate in the frame, and metal springs compressed between the insulating members and the back of the plate and pressing the plate forward against said lugs.



5. In an electric heater, a panel-like glass heater plate having a rear face provided with an electric resistance heating element, a frame for the plate extending behind it, a metal bracket at each end of the plate between the back of it and the frame, means connecting the brackets to the frame, each bracket having a seat spaced from the back of the frame, insulating means extending across the back and front of said seat, a lug detachably connected to each bracket and overlying a small area of the outer face of the plate to hold the plate in the frame, and a metal spring surrounding said insulating means and holding said means against said seat, said spring being compressed between said insulating means and the back of the plate and pressing the plate forward against the adjoining lug.

6. In an electric heater, a panel-like glass heater plate having a rear face provided with an electric resistance heating element, a frame for the plate extending behind it, a metal bracket at each end of the plate between the back of it and the frame, means connecting the brackets to the frame, each bracket having a seat spaced from the back of the frame, an insulating member extending between the seat and the frame, a second insulating member extending across the front of the seat, a lug detachably connected to each bracket and overlying a small area of the outer face of the plate to hold the plate in the frame, and a metal band surrounding each seat and holding the insulating members against it, the front of the band having a resilient portion pressing the plate against the adjoining lug.

7. In an electric heater in accordance with the preceding claim, in which said resilient portion of each band presses tightly against the resistance element and is adapted to be connected in an electric circuit.

8. An electric heater comprising a glass heater plate having a rear face provided with an electric resistance heating element, a frame around the plate, a metal bracket behind each end of the plate, a lug detachably connected to each bracket and overlying a small area of the outer face of the plate, each bracket having a seat extending inward from the side of the frame and provided with a passage therethrough also extending inward from the side of the frame, a fastening member extending through the passage and the side of the frame to fasten the bracket to the frame, a metal band surrounding said seat and adapted to be connected in an electric circuit, and insulating means spacing the band from the seat, the band having a forwardly projecting resilient portion pressing tightly against said resistance element to make electrical contact therewith and to hold the plate against the adjoining lug.


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