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REVERSIBLE ELECTRIC FIN-TYPE BASEBOARD HEATER

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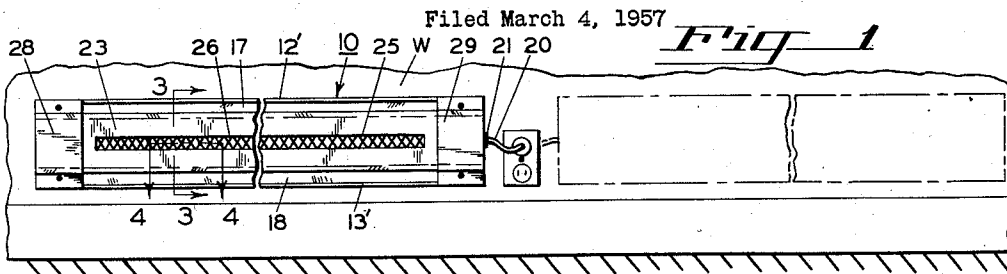


Fig 1

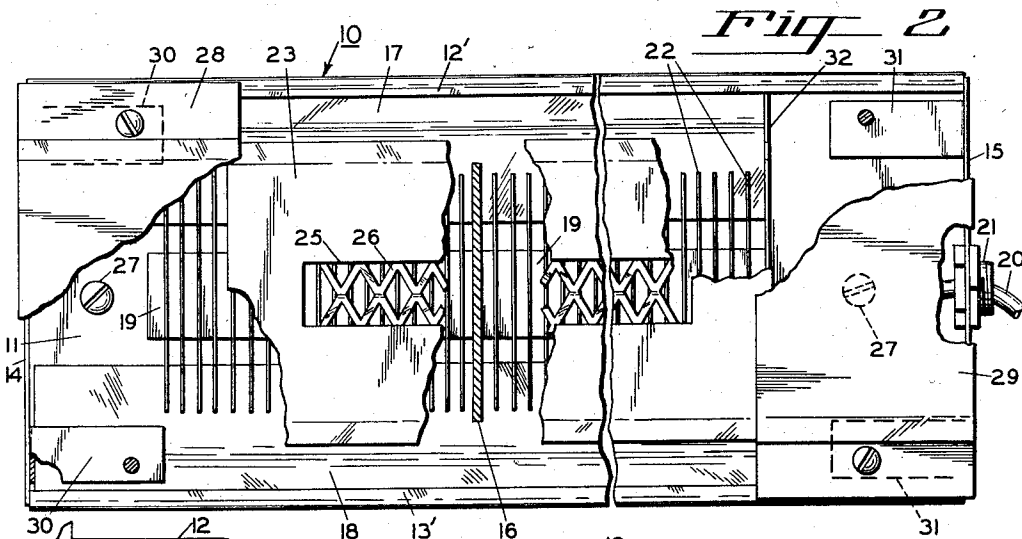


Fig 2

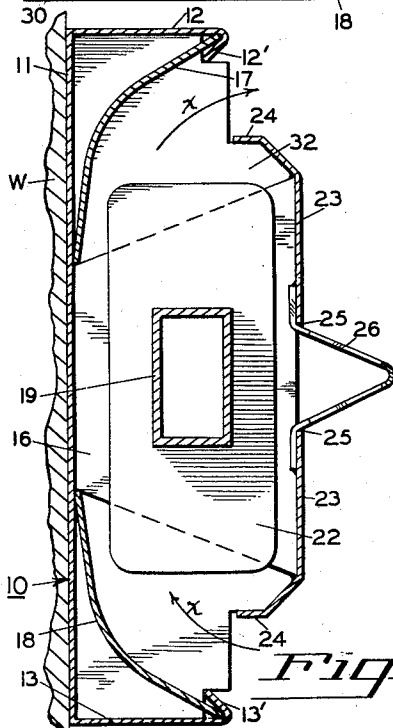


Fig 3

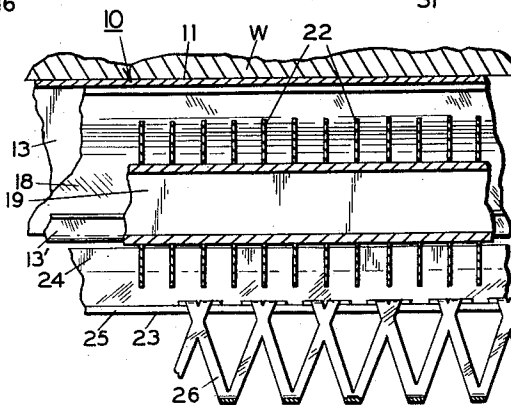


Fig 4

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REVERSIBLE ELECTRIC FIN-TYPE BASEBOARD HEATER

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2 Claims. (Cl. 219—34)

This invention relates in general to electric heaters for building interiors, and, more particularly, to the type of electric heaters which are adapted to be mounted on interior wall surfaces, especially near the bottom of such wall surfaces, or along the baseboard. The invention also relates specifically to the so-called fin-type heaters in which a plurality of parallel, spaced, heat-conducting fins extend outwardly from the heating element or heating means.

An object of the invention is to provide an improved electric heater of the type above indicated which can be removably connected to any suitable electric outlet in a wall or wall baseboard of a room and which can extend in either direction from such outlet as preferred.

A related, more specific, object of the invention is to provide an improved fin-type heater, the top and bottom half portions of which will be identical, so that, as far as the heater is concerned, it will make no difference which half portion is uppermost.

Another object of the invention is to provide an improved reversible heater through which a maximum free flow of air can take place when the heater is mounted on a wall or baseboard, regardless of the position in which the heater is mounted.

An important object of this invention is to provide an efficient electric heater in which no easily accessible portion will become heated to such degree as to be capable of harming any person or animal inadvertently contacting the heater in operation.

A further object of the invention is to provide an improved electric baseboard heater which will include a specially formed protecting grid so arranged that articles of furniture, when moved into contact with the heater, will be prevented by the grid from receiving any heat damage.

An additional object of the invention is to provide a heater which will serve the purposes above indicated and at the same time be simple and practical in construction and capable of being placed on the market at moderate cost.

The manner in which these objects are attained, and the construction and arrangement of the component parts of the heater, will be readily understood from the following brief description with reference to the accompanying drawings, wherein:

Figure 1 is a fore-shortened elevation showing, in full lines, the heater mounted in one position on a wall baseboard and connected with an electric outlet or socket, and indicating in broken lines, the mounting of the heater in reversed position and connected with the same socket;

Figure 2 is an enlarged fore-shortened elevation of the heater corresponding to Figure 1 but with various portions of the heater broken away for the sake of clarity;

Figure 3 is a sectional elevation drawn to a still larger scale, the section being taken on the line indicated at 3—3 in Figure 1; and

Figure 4 is a fragmentary horizontal section, drawn to the same scale as Figure 3, and taken on the line indicated at 4—4 in Figures 1 and 3.

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In the drawings, 10 indicates in general the open-faced rectangularly-shaped housing in which the other parts of the heater are mounted, or from which they are supported. In Figures 2 and 3 this open-faced housing is shown as comprising a back wall 11, identical top and bottom walls 12 and 13, extending at right angles to the back wall, and end walls 14 and 15.

Two or more spaced, identical bracket plates, the number depending upon the length of the heater, are secured to the back wall 11 equidistant from the top and bottom walls 12 and 13 and arranged in substantially vertical planes, that is to say, in planes perpendicular to the plane of the back wall 11. One of these bracket plates is shown at 15 in Figure 3. These bracket plates are rigidly secured to the back wall by any suitable means (not shown) and preferably have the shape of isosceles trapezoids, with the longer parallel edge being outermost.

The outer edges of the top and bottom walls 12 and 13 terminate in inwardly-extending flanges 12' and 13' respectively and a pair of identical, curved heat reflecting and deflecting surface members 17 and 18, shown best in Figure 3, are held between the flanges 12' and 13' respectively and the adjacent edges of the bracket plates 16. These reflecting surface members extend for nearly the entire length of the housing 10.

Each of the bracket plates 16 has a central rectangular opening through which an elongated, rectangular, channel housing 19 extends and in which the housing 19 is secured. This channel housing 19 extends almost the entire length of the heater, terminating a short distance from the end wall 14 and terminating at the transverse wall or bulkhead wall 33 near the opposite end wall 15. The housing 19 contains the electric heating element (not shown), which extends throughout the length of the housing 19, the heating element having a suitable connection (not shown) with a short length of conductor cable 20 (Figure 2) which extends through an opening in the end wall 15, the opening being fitted with a protecting thimble 21. The outer end of the cable 20 carries the usual plug for insertion in a standard electric outlet socket as illustrated in Figure 1.

A series of identical, rectangular, heat-conducting fins 22, having central rectangular openings corresponding to the size of the channel housing 19, are mounted on this channel housing and are equidistantly spaced apart along the entire length of the channel housing, preferably being spaced apart only a fraction of an inch. As shown in Figure 3, the rear or inner edges of these fins 22 do not extend to the back wall but are spaced a short distance from the back wall. Also their front edges do not extend out as far as the corresponding front edges of the bracket plates 16.

A front cover plate 23 is rigidly secured to the front edges of the bracket plates 16 and extends along approximately the same distance as the channel housing 19 for the heating element. As shown best in Figure 3, in addition to being spaced a slight distance beyond the front edges of the heat-conducting fins 22, the front cover plate 23 turns inwardly along its longitudinal edges, forming the pair of inturned flanges 24, 24 extending around and spaced a slight distance from the front corner portions of the fins 22.

The front cover plate 23 has a central elongated cut-away portion or rectangular slot 25, terminating a short distance from the ends of the cover plate 23. As shown in Figures 2 and 3, the width of this opening 25 preferably does not exceed the width of the channel housing 19 which contains the heating element. A protecting, specially shaped, expanded metal grid 26 is mounted in the opening 25 and extends forwardly therefrom. The edge portions 26' of this protecting grid extend in the same plane and are secured to the inside face of the front cover plate

23 along the top and bottom of the opening 25, as shown in Figure 3. The intervening portion of the grid is projected forwardly in a series of connected identical open pyramids (Figures 3 and 4).

It will be evident from Figure 3 that, when the heater is mounted in desired location on the wall or baseboard, the forwardly extending grid 26 prevents any object, and particularly a piece of furniture, from being shoved any closer to the heating element than the outer series of ridges on the protecting grid 26 will permit. Due to the fact that considerable portion of the heat from the walls of the housing channel 19 is conducted away from the channel housing 19 by the fins 22 and to the fact that the front edges of these fins do not touch the cover plate 23, and also of course due to the fact that there will be a constant circulation of air up and around as well as through this assembly of fins, the front plate 23 never becomes too hot to touch. Furthermore, the opening 25 in the front plate 23 and the metal grid 26, extending from the opening, act to reduce the temperature of the front plate 23.

Even though this front cover plate 23 is not too hot to touch there still might be the possibility that if a piece of furniture were allowed to remain in actual contact with this front plate 23 for any length of time the finish on the furniture in the area of contact would suffer some damage. However, the forwardly protruding grid 26, by keeping such piece of furniture spaced from the plate 23 to a minimum distance equal to the extent to which the protecting grid protrudes, keeps the piece of furniture from contact with the plate 23.

In Figure 3 the arrows X indicate the direction of air flow and the usual course which the air currents will take through the heater, the cool air entering at the bottom and passing mainly upwardly through the fin assembly and then leaving the heater at the top. While some air will pass through and from the grid 26 this will be a relatively small amount, although of course some amount of heat radiation will take place through the grid.

The reflecting and deflecting curved surface members 17 and 18, and the fact that the fins 22 are spaced from the rear wall 11, prevent the rear wall 11 from becoming excessively warm, so that the heater can safely be set in place on the wall or baseboard as indicated in Figures 1 and 3.

Not only does the close spacing of the fins make it impossible for a child or household pet to have any contact with the channel housing 19 in which the heating element is located, but the position and shape of the cover plate 23 make even contact with the edges of the fins 22 difficult, and furthermore the edges of the fins do not become dangerously hot.

It will be apparent from Figure 3 that it makes absolutely no difference, as far as the operation and efficiency of the heater are concerned, whether the heater is secured to the wall or baseboard W with the side 13 and curved surface member 18 at the bottom, as illustrated, or whether the position of the heater is reversed with the side 12 and curved surface member 17 at the bottom. Thus, if the baseboard electric outlet socket is so located that it is not convenient to place the heater to the left of the socket, in the manner illustrated in Figures 1 and 2, the heater can just as satisfactorily be placed to the right of the socket as indicated by the broken lines in Figure 1.

The heater is attached in place on the wall or baseboard in any suitable manner, as, for example, by a pair of screws 27 (Figure 2) passing through holes in the rear wall 11 of the heater near the opposite ends of the housing 10. End cover plates 28 and 29 extend over the spaces in the respective ends of the heater beyond the termination of the channel housing 19 and main cover plate 23. These end cover plates 28 and 29 are removably secured by means of screws, as shown, to pairs of mounting brackets 30, 30 and 31, 31, respectively, which in turn are secured to the end walls 14 and 15 respectively.

I claim:

1. In a reversible electric baseboard heater, an open-faced rectangular housing having a rear wall and identical top and bottom walls, a heating element container extending horizontally and centrally along in said housing, brackets mounted on said rear wall of said housing supporting said container, a series of identical vertical fins mounted on said container and extending from the open face of said housing, the rear edges of said fins spaced from said rear wall, the top and bottom ends of said fins spaced equal distances below and above said top and bottom walls respectively of said housing, the front edges of said fins lying in a plane parallel to but spaced in front of the plane of the front edges of said top and bottom walls of said housing, a vertical front cover plate extending over the front edges of said fins and spaced from said front edges, said cover plate supported by said brackets, said cover plate having a central elongated horizontal slot substantially co-extensive with said container and located at the same height as said container, a protruding protector grid extending forwardly from said cover plate opening, whereby to prevent articles of furniture and the like from being brought into actual contact with said cover plate, said protector grid formed with converging top and bottom walls, and a pair of identical reflecting surface members in said housing extending from the front edges of said top and bottom walls respectively to said rear wall, said container, said fins, said cover plate, and said protector grid being symmetrically positioned with respect to the longitudinal center line of said housing, whereby said heater will function with equal efficiency if the position of said top and bottom walls is reversed.

2. A reversible electric baseboard heater including an open-faced, rectangular housing having a rear wall, end walls, and identical top and bottom walls, a heating element container extending longitudinally and centrally along said housing, bracket plates having the shape of isosceles trapezoids secured in said housing and supporting said container, a series of identical, substantially rectangular fins mounted on said container, said fins lying in planes substantially perpendicular to said rear wall of said housing, the edges of said fins spaced from said rear wall, the top and bottom ends of said fins spaced equal distances below and above said top and bottom walls respectively of said housing, a front cover plate extending over the front edges of said fins and spaced from said front edges, said cover plate supported by said bracket plates, the longitudinal edges of said cover plate turned inwardly and extending a short distance over the edge of said fins and spaced a slight distance from said fin ends, said cover plate having a central, elongated opening, a protruding protector grid extending forwardly from said cover plate opening, whereby to prevent articles of furniture and the like from being brought into actual contact with said cover plate, and a pair of identical, curved reflecting surface members in said housing extending from the front edges of said top and bottom walls respectively to the edges of said bracket plates at said rear wall, said container, said fins, said cover plate and said protector grid being symmetrically positioned with respect to the longitudinal center line of said housing, whereby said heater will function with equal efficiency if the position of said top and bottom walls is reversed.

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