July 29, 1958 J. C. McEACHRON 2,845,527

ELECTRICAL RESISTANCE SPACE HEATERS

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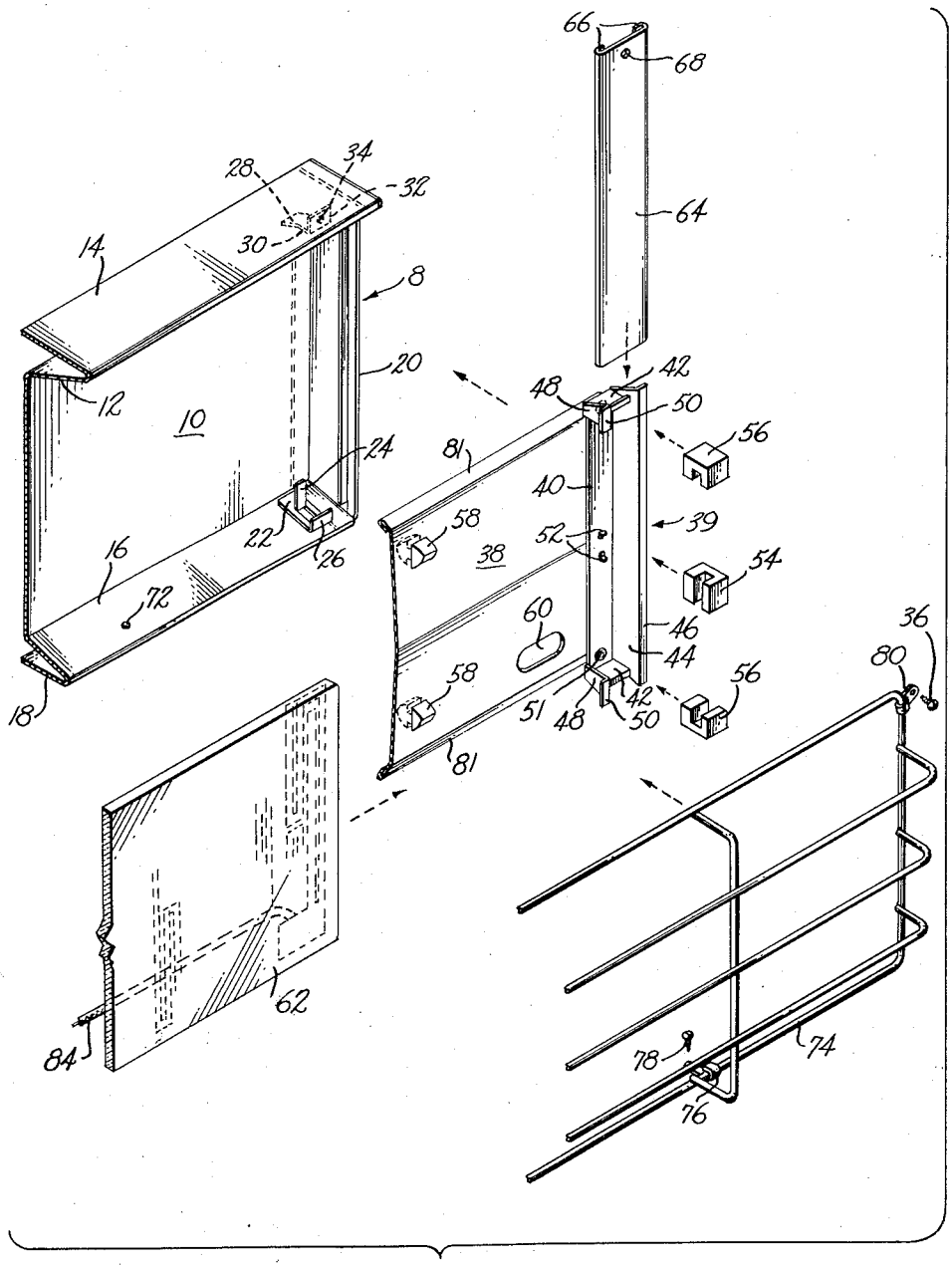


Fig. 1.

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Fig. 5.

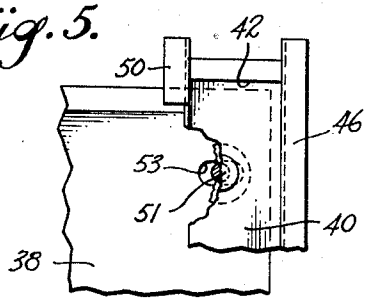
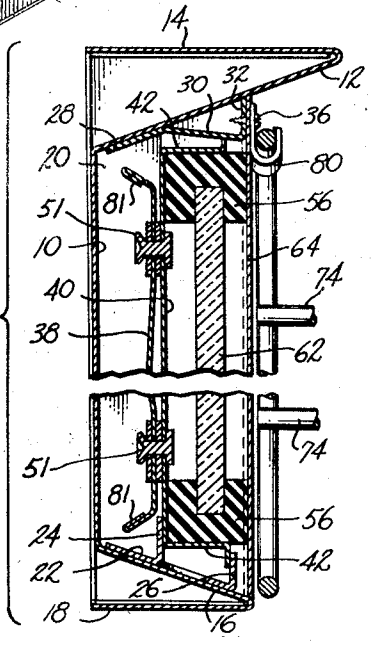


Fig. 2.

Fig. 4.



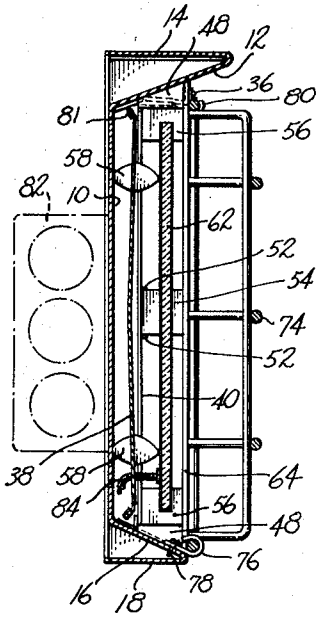


Fig. 3.

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ELECTRICAL RESISTANCE SPACE HEATERS

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6 Claims. (219—34)

This invention relates to electrical resistance space heaters and particularly to panel heaters which may be of the type depicted by a tempered glass plate which is heated by the passage of electrical current through a thin electrical resistance element bonded thereto and which converts the heat reecived into heating rays which are radiated into space.

An object of my invention is to provide improved mounting means for utilizing the heat radiating panel.

An object of my invention is to provide a heating device comprising a heat radiating panel and which device can be readily assembled or disassembled.

A further object of my invention is to provide improved means for preventing accidental breakage of the glass heating panel by reason of expansion and contracting due to heat and due to incidental jarring during handling and shipping.

A further object of my invention is to provide improved designs of the heater which will drastically reduce the cost of production, installation, and repair.

Another object of my invention is to provide a heater of the character described having a baffle or reflector plate and end channels secured to each end portion of said plate and which end channels mount the radiating panel.

It is a further object of my invention to provide said end channels and dispose therein U-shaped heat insulators which are of an elastic or resilient character and which mount the radiating panel and which in turn are secured in place by the said end channels.

It is a further object of my invention to provide insulators formed of a siliceous product which are sold under the trade-name of "Silastic," and which will protect a glass panel type heater from physical shock incurred during shipment and which shocks cause minor fractures—leading to heater plate failure during expansion and contraction during a heating cycle. Such insulators protect the aluminum heater element from abrasion which is commonly present when usual ceramics are used. Also such insulators prevent the noises normally present when the glass of a panel heater expands or contracts during the heating cycle and such noises are present when ceramic or metal heat insulators are employed. Also such insulators of my invention prevent accidental damage by blows that the glass panel heater may receive during abnormal operation.

It is a further object of my invention to provide a panel heater and mounting means as described and to hingedly mount the same to a back pan and which hinge means are of a separable character so that with a minimum number of parts, a panel can be readily swung into the back pan or readily removed therefrom.

Other objects and advantages of my invention will become apparent as the description of the same proceeds and the invention will be best understood from the consideration of the accompanying detailed description, taken in connection with the accompanying drawings

forming a part of the specification, with the understanding, however, that the invention is not to be limited to the exact details of construction shown and described since obvious modifications will occur to a person skilled in the art.

Figure 1 is an exploded perspective view of a heater embodying my invention;

Fig. 2 is a perspective view of an assembled view thereof;

Fig. 3 is a view partly in section and partly in elevation taken substantially on broken line 3—3 of Fig. 2;

Fig. 4 is a view partly in section and partly in elevation taken substantially on broken line 4—4 of Fig. 2; and

Fig. 5 is a fragmentary view, on an enlarged scale, showing the manner of attachment of the end channels with the reflector or baffle plate.

Referring to the drawings, a back pan 8 has a bottom 10 which connects with upper wall 12 at an obtuse angle. The upper wall 12 connects with a second upper wall 14 and the upper wall 14 is at right angles to the bottom 10. Similarly, lower wall 16 connects with the bottom 10 at an obtuse angle and the lower wall 16 connects with a second lower wall 18 at an acute angle, and the lower wall 18 is at right angles to the bottom 10. There are two end walls 20 and each of said end walls may be a continuation of the metal in the bottom 10 and bent at right angles thereto and in turn secured to the upper walls 12 and 14 and to the lower walls 16 and 18.

At each end of the structure, there is a lower mounting lug comprising a flat portion 22 secured, as by welding, to the lower wall 16 and lug portions 24 and 26 project away from the flat portion 22 at acute angles so that the said lugs 24 and 26 are parallel to each other and parallel to the back pan bottom 10.

There is an upper mounting lug at each end of the device and said upper mounting lug comprises a portion 28 which is secured to the upper wall 12, as by welding, a portion 30 which is disposed at an obtuse angle to the portion 28 and a flat portion 32 which is substantially at right angles to the portion 30 and the portion 32 is parallel to the back pan bottom 10. A hole 34 is disposed in the portion 32 for the reception therein of a locking screw 36.

A baffle 38 carries at each end thereof an end channel 39 and each end channel 39 comprises a base wall 40, end walls 42, a side wall 44 carrying a track 46, and two spaced apart relatively short side walls 48 carrying tracks 50. The base wall 40 of each end channel is secured to the reflector 38 by rivets 51.

Elongated slots 53 are in the baffle 38 (see Fig. 5) and the rivets 51 are only snugly pressed to permit relative motion between an end channel 39 and the baffle 38. This permits elongation of the glass panel heater 62 without restraint. Baffle 38 may be in the nature of a reflector or it may be colored so that the same functions merely as a baffle as desired.

The end walls 42 are of a lesser elevation than the side wall 44 and the side walls 48. There are two punched up portions 52 in the base wall 40 and when an insulator 54 is disposed therebetween, the insulator 54 cannot move vertically of the base wall 40. The top and bottom insulators 56 are prevented from moving up and down respectively by the end walls 42.

Baffle 38 carries a plurality of spacer members 58 which maintain the baffle 38 properly spaced between the back pan bottom 10 and the glass panel type of electrical heater 62.

Also baffle 38 is provided with suitable openings 60 so that electrical conductors 84 (fragmentarily shown in Figs. 1 and 3) may be passed through said opening and be connected with the heater 62. Also preferably baffle 38

has its edges turned to provide for the desired longitudinal stiffness.

When the heater 62 has each end portion between the U-shaped insulators 54 and 56, the top and bottom insulators 56 prevent the glass from moving vertically relative to reflector 38 and the insulator 54 prevents the heater 62 from moving toward an end wall 42. When the insulators and the heater 62 are in said position, then the channel lock 64, having turned edges to provide grooves 66 which mate with the tracks 46 and 48, is slid in the direction indicated by the arrow in Fig. 1. Each channel lock 68 will maintain a set of insulators 54 and 56 in an end channel 39. Also each channel lock 68 is provided with an opening 70 which eventually will match with the hold 32 and receive a screw 36.

There are spaced apart holes 72 (see Fig. 1) in the lower wall 16 of the back pan 8. A grill 74 may be of any suitable configuration and the said grill 74 has hinge means 76 carried thereby and the hinge means 76 is connected with the lower wall 16 of the back pan 18 by screws 78 passing through the holes 72.

After the heater 62 has been connected to the end channels 39 which are connected to the baffle 38, the said heater assembly can be readily connected to the back pan. The heater unit is turned to an acute angle relative to the back pan 10 and the space between the turned portion 81 of the baffle 38 and the bottom 40 of an end channel 39 is positioned upon a lug portion 24. The end walls 42 of an end channel 38 are of less elevation than the side wall 44 and the side walls 48, and thus there is the opening between a channel lock 64 and an end wall 42. As the top of the heater assembly is rotated toward the back pan 8, the lug 26 will be disposed under channel lock 64 and above an end wall 42 of an end channel 39. Also upon such rotation, the other ends of the channel lock 64 rest upon lug portions 32 of the upper lug members.

A sleeve member 80 is carried at each end of the device and slidable on one of the rods of the grill 74. There is a hole in each of the sleeve members 80 and a screw 36 may be inserted through said opening, through the opening 68 of a channel lock 64 and into a hole 34 in an upper lug. The screws 36 and 72 may be of the metal screw type so that it will not be necessary to thread the various holes mentioned. Thus the heater unit can be swung into place as indicated and by employing two screws the grill, the heater assembly, and the back pan 8 are connected together. This is obviously a construction which permits ready access to parts when desired, as well as ease in assembly.

The panel glass electrical heating unit 62 may be of standard construction and in view of the fact that heat is involved, all metal parts will be used with the exception of the insulators 54 and 56. The said insulators 54 and 56 are formed of a siliceous product sold under the trade-name of "Silastic." This material is somewhat elastic and will withstand relatively high temperatures and at the same time is an excellent insulator. The insulators so formed have the "feel" of rubber automobile tires and they have highly desired expansion and contraction characteristics. The said insulators because of the last mentioned property eliminate breakage of the glass panel heaters 62 as was common in prior art glass panel heater installations.

In Figs. 2 and 3 of the drawings I have shown an electrical junction box so that electrical conductor, as conductor 84, from the panel heater 62 may pass through opening 60 and thence to said junction box 82 and there appropriate electrical make-up connections can be made to any suitable source of electrical energy.

From the foregoing it will now be apparent that I have illustrated a heat radiating panel 62; a baffle 38; an end channel 39 secured to each end portion of said baffle and which end channel preferably is trough shaped with one of the side walls partially broken away and having the shorter side walls 48 so as to leave room for the reception of a panel heater 62.

Next I provide U-shaped heat insulators 54 and 56 in each of the end channels 39. The legs of the U-shaped insulators 54 and 56 are parallel with the faces of the panel heater 62 and the said insulators support the panel 62. The insulators 54 and 56 are of a siliceous material and are somewhat elastic. This, in conjunction with elongated slots 53, solves the problem of expansion and contraction normally present by reason of the use of a panel heater 62. Next the side walls of the end channels 39 are preferably provided with tracks 46 and 50 so that the channel lock cover plate 64 can be slid into place and thus secure the heat insulators 54 and 56 in the end channels 39. Next I have shown means to secure the lugs 26 to the mating openings in the end channels 39 which are provided by having the end walls 42 of the end channels 39 of less elevation than the side walls 44 and 48 of the end channels 39. Next I have illustrated a rotatable grill 74 rotatably carrying sleeve 80 so that the opening in said sleeve 80, and the opening 68 in the channel lock 64 can be aligned with the opening 34 in lower lugs 22—24—26 and then a single screw 36 can be inserted through the registering openings and each end portion of the assembly can be completed by the use of a single screw.

Obviously changes may be made in the forms, dimensions, and arrangements of the parts of my invention without departing from the principle thereof, the foregoing setting forth only a preferred form of embodiment of my invention.

I claim:

1. In a heater of the character described, a substantially vertical heat radiating panel; a trough-like end channel at each end of said heat radiating panel, each end channel comprising a substantially U-shaped end member having an opening in one side leg thereof receiving an end portion of the heat radiating panel and having rail means on the edge portions of the side legs; resilient U-shaped heat insulators disposed in said end channels and confined against vertical and endwise movement away from said heat radiating panel by said end channel, said U-shaped heat insulators engaging, between the legs thereof, the top, bottom and end edge portions of said heat radiating panels; a slide cover plate for each end channel and engaging said rail means and confining outward movement of said U-shaped heat insulators from said end channels; and means limiting endwise movement of said end channels away from each other.

2. In a heater of the character described, a substantially vertical heat radiating panel; a trough-like end channel at each end of said heat radiating panel, each end channel comprising a substantially U-shaped end channel having an opening in one side leg thereof receiving an end portion of the heat radiating panel and having rail means on the edge portions of the side legs; resilient U-shaped heat insulators disposed in said end channels and confined against vertical and endwise movement away from said heat radiating panel by said end channel, said U-shaped heat insulators engaging, between the legs thereof, the top, bottom and end edge portions of said heat radiating panels; a slide cover plate for each end channel and engaging said rail means and confining outward movement of said U-shaped heat insulators from said end channels; and a frame mounting said end channels and limiting endwise movement of said end channels away from each other.

3. In a heater of the character described, a substantially vertical heat radiating panel; a trough-like end channel at each end of said heat radiating panel, each end channel comprising a substantially U-shaped end member having an opening in one side leg thereof receiving an end portion of the heat radiating panel and having rail means on the edge portions of the side legs; resilient U-shaped heat insulators disposed in said end channels and

confined against vertical and endwise movement away from said heat radiating panel by said end channel, said U-shaped heat insulators engaging, between the legs thereof, the top, bottom and end edge portions of said heat radiating panels; a slide cover plate for each channel and engaging said rail means and confining outward movement of said U-shaped heat insulators from said end channels; a baffle plate slidingly mounted between said end channels; and means limiting endwise movement of said end channels away from each other.

4. In a heater of the character described, a substantially vertical heat radiating panel; a trough-like end channel at each end of said heat radiating panel, each end channel comprising a substantially U-shaped end member having an opening in one side leg thereof receiving an end portion of the heat radiating panel; resilient U-shaped heat insulators disposed in said end channels and confined against vertical and endwise movement away from said heat radiating panel by said end channel, said U-shaped heat insulators engaging, between the legs thereof, the top, bottom and end edge portions of said heat radiating panels; a cover plate for each end channel and detachably secured to the side legs thereof and confining outward movement of said U-shaped heat insulators from said end channels; and means limiting endwise movement of said end channels away from each other.

5. In a heater of the chaarcter described, a heat radiating panel; end channels resiliently connected with opposite ends of said heat radiating panel; a back pan supporting said end channels; and a baffle plate disposed between said heat radiating panel and said back pan and slidingly mounted as respects said end channels, thereby permitting independent movement of said baffle plate upon expansion and contraction thereof due to heat from said heat radiating panel.

6. The combination of claim 5 wherein the resilient mounting between the end channels and the heat radiating panel comprises U-shaped resilient insulator blocks with the heat radiating panel disposed between the side legs of the U-shaped resilient insulator blocks.

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