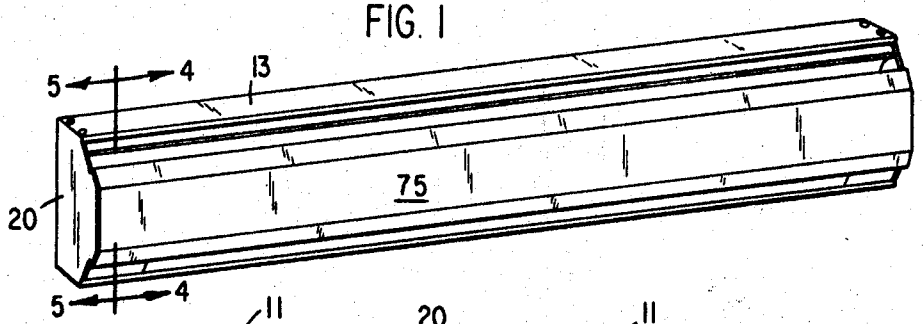
June 3, 1969 E. C. RIPPLE 3,448,243

BASEBOARD HEATER

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FIG. 1



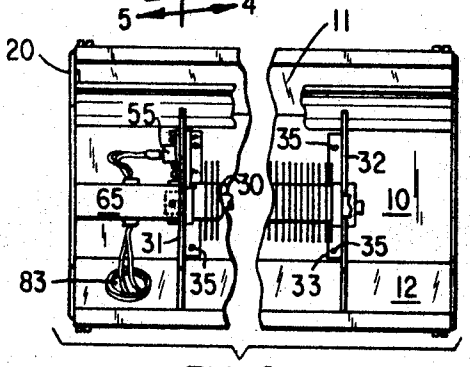


FIG. 2

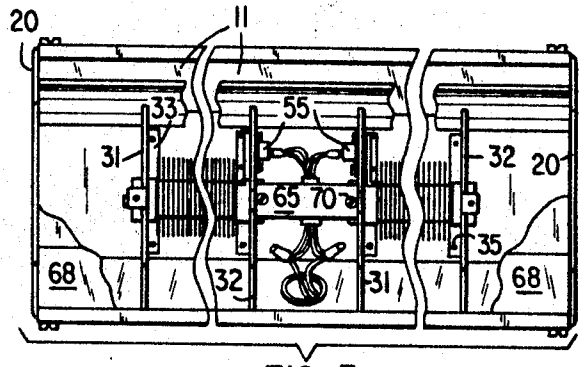


FIG. 3

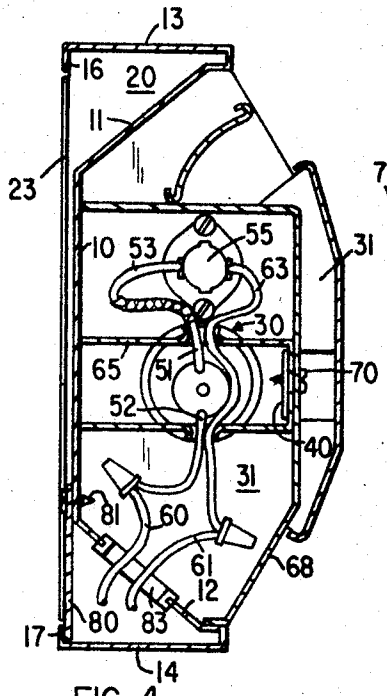


FIG. 4

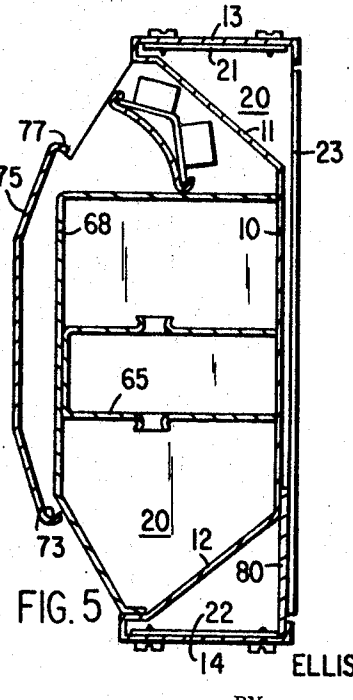


FIG. 5

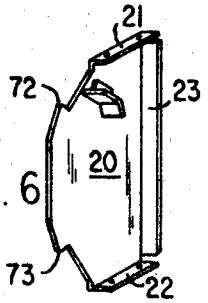


FIG. 6

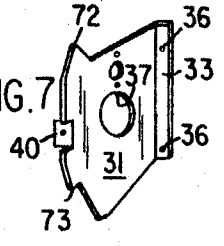


FIG. 7

INVENTOR.
ELLIS C. RIPPLE.

BY D. Emmett Thompson

ATTORNEY.

June 3, 1969 E. C. RIPPLE 3,448,243

BASEBOARD HEATER

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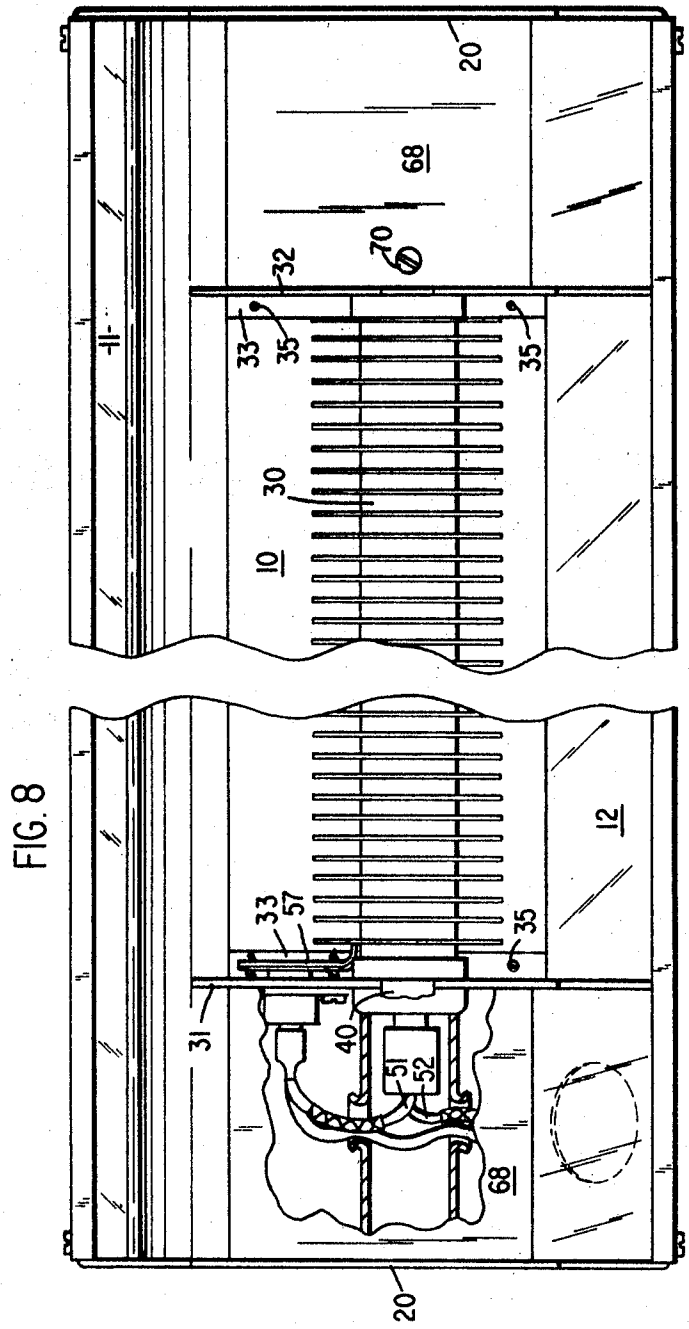


FIG. 8

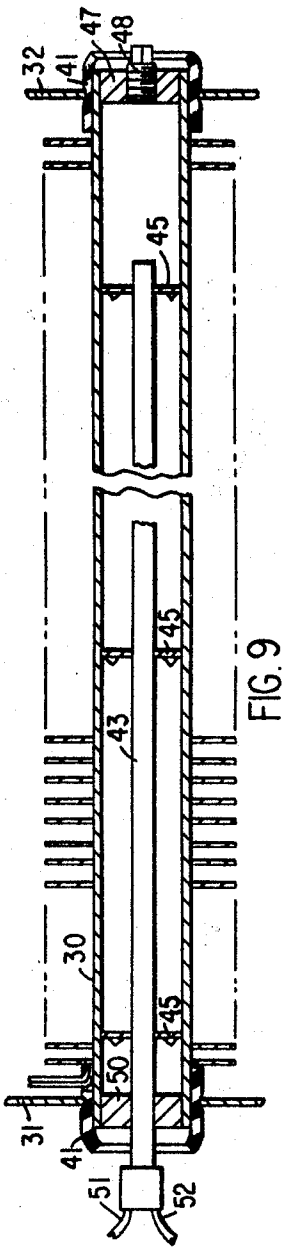


FIG. 9

INVENTOR.
ELLIS C. RIPPLE.

BY
D. Emmett Thompson.
ATTORNEY.

United States Patent Office

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BASEBOARD HEATER

Ellis C. Ripple, Syracuse, N.Y., assignor, by mesne assignments, to Space Conditioning, Inc., Harrisonburg, Va., a corporation of Maryland

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Int. Cl. F24h 9/02
U.S. Cl. 219—366
3 Claims

ABSTRACT OF THE DISCLOSURE

An integral elongated frame piece shaped to form a rear wall connecting with top and bottom walls by diverging walls. End closures are fixed to the end of the frame piece. Supporting plates are fixed to the back wall for supporting a straight line radiator tube at its ends. A thermal limit switch is mounted on a support plate with a heat sensing element thermally connected to the radiator tube. Resiliently deformable annular sleeves encircle the opposite end portions of the radiator tube and are interposed between the supporting plates and the tube ends.

Summary of the invention

The invention relates to baseboard room heaters having a finned radiator tube containing a liquid heated by an electrical heater. This type of heater is used extensively for home heating. Many designs of this type of heater have been created, but such designs embody a complicated structural arrangement expensive to manufacture.

The object of this invention is a baseboard heater embodying a greatly simplified structural arrangement manufactured at low cost.

Brief description of the drawings

FIGURE 1 is a perspective view of a baseboard heater embodying my invention.

FIGURE 2 is an enlarged view of the heater with the front cover removed.

FIGURE 3 is a view, similar to FIGURE 2, illustrating the heater assembled with two radiator tubes.

FIGURE 4 is a view taken on line 4—4, FIGURE 1.

FIGURE 5 is a view taken on line 5—5, FIGURE 1.

FIGURE 6 is a perspective view of one of the end closures.

FIGURE 7 is a perspective view of one of the radiator tube supporting plates.

FIGURE 8 is an enlarged view of the heater with the front cover removed and with the covers for the electrical connections in place.

FIGURE 9 is a lengthwise sectional view through the radiator tube.

Detailed description

The main frame piece of the heater is formed from sheet metal and shaped to provide a vertically disposed back wall **10**, the upper and lower edges of which merge with upper and lower forwardly diverging walls **11**, **12**. The diverging walls **11**, **12**, are bent along their upper and lower edges to form top and bottom walls **13**, **14**, which extend rearwardly in a direction normal to the rear wall **10**. The rear edges of the top and bottom walls **13**, **14**, are bent downwardly and upwardly to form flanges **16**, **17**, located a short distance rearwardly of the rear wall **10**.

An end closure **20** is fixed to each end of the frame piece. The end closures **20** are in the form of flat plates provided with inwardly extending upper and lower flanges **21**, **22**, which are positioned inside of the top and bottom walls **13**, **14**, see FIGURE 5. The end enclosures are also formed at their rear edges with a flange **23** which is disposed coplanar with the flanges **16**, **17**.

The finned radiator tube **30** is mounted at its ends in supporting plates **31**, **32**. These plates are formed, at their rear edges, with flanges **33** affixed to the back wall **10**, as by screws **35** extending through the rear wall **10** and threading into apertures **36** formed in the flanges **33**. The supporting plates **31** are formed with central apertures **37** to receive the ends of the radiator tube **30**. The plates **31**, **32**, are of identical form, with the exception of the direction of the flanges **33** and tabs **40**. This, because the plates are made right and left-handed. With the mounting arrangement shown in FIGURE 9, both ends of the radiator tube **30** extend through the supporting plates **31**, **32**, the ends of the tube being encircled by resilient sleeves **41**. The electric heating element **43** is of the conventional metal jacketed type. It extends axially of the tube for the greater portion of the length thereof, and is maintained in axial position by spiders **45**. One end of the tube is closed by a disk **47** brazed into the tube and having a threaded aperture to receive a plug **48** which, in turn, is apertured and filled with a fusible metal to provide for the release of excessive pressure within the tube. A disk **50** is brazed to the heater element **43** and to the opposite end of the tube, the heater element extending outwardly from the tube and being provided with terminals **51**, **52**. The terminal **51** is connected by conductors **53**, FIGURE 4, to a terminal limit switch **55** mounted on the plate **31**. This switch has a heat sensing element **57** thermally connected to the radiator tube **30**. The terminal **52** is connected to side **60** of the power supply. The opposite side **61** of the supply is connected by conductor **63** to the switch **55**.

The terminals **51**, **52**, are enclosed by a U-shaped barrier **65**. The electrical connections in switch **55** are enclosed by a cover member **68**. The members **65**, **68**, are mounted on the tab **40** and secured thereo as by screw **70**.

The end closure members **20** and the tube supporting plates **31**, **32** are formed with vertically spaced apart projections **72**, **73**. A sheet metal cover **75** is formed along its upper and lower edges with inwardly bent flanges **77** which engage the projections **72**, **73**, snap fashion. The upper and lower edges of the cover **75** are disposed in spaced relation from the upper and lower walls **13**, **14**. This arrangement provides for the movement of air upwardly about the finned heater tube **30**.

A strip **80** is secured at its upper edge, as by screws **81**, to the lower portion of the flat back wall **10**, see FIGURES 4 and 5. The strip **80** extends downwardly to the bottom wall **14** and forms, in conjunction therewith and with the lower diverging wall **12**, a triangular shaped raceway for the feed conductors, the inclined wall **12** being formed with an aperture **83** to permit the supply conductors to be brought into the terminal wiring compartment.

The heater unit may be of substantial length in the order of ten or twelve feet, in which case two of the radiator tubes are mounted in the frame piece and the heater elements **43** are connected to the power supply at the center of the heater, as illustrated in FIGURE 3.

It will be apparent that the component parts of the heater are all economically formed of sheet metal. The end closures **20** and mounting plates **31** are simply blocked and formed from flat stock by punch press operation, as also the front cover **75**, the barrier **65** and the wiring compartment cover **68**. The main frame piece is formed from a continuous strip in a roll forming machine. The radiator tube **30** consists only of a length of straight finned tubing. It is not equipped with any plumbing accessories, such as valves, expansion chambers, and the like, yet the heater performs equally as well as those presently available and embodying expensive and complicated structural arrangements.

I claim:

1. A baseboard heater unit comprising an integral frame piece formed of sheet metal bent along horizontal bend lines to define a vertically disposed planar back wall panel, upper and lower imperforate forwardly diverging panels extending from the upper and lower edges of said back wall panel and imperforate top and bottom horizontal rearwardly extending wall panels joined at their forwardmost edges to the upper and lower edge portions of said diverging panels and terminating rearwardly in vertical flanges extending toward each other and lying in a common vertical plane spaced rearwardly of said back wall panel; a pair of end closure sheet metal members fixed to the respective opposite ends of said frame piece and having inwardly projecting top and bottom flanges secured in inwardly lapping relation against the inner surfaces of said top and bottom horizontal wall panels and inwardly projecting vertical rear flanges disposed in coplanar relationship with the flanges of said top and bottom wall panels, a pair of radiator tube supporting plates affixed to said rear wall and spaced inwardly from the respective end closure members, said supporting plates each having a central aperture therein and extending forwardly from said back wall panel to define forward edge portions spaced forwardly from the forwardmost edges of said top and bottom horizontal wall panels, an axially elongated liquid containing finned radiator tube having resiliently deformable annular sleeves encircling the opposite end portions thereof supported in the apertures of said supporting plates by engagement of the bounding surfaces of said apertures in inwardly deforming relation with exterior surface portions of said sleeves, an axially elongated metal jacketed electric heating element extending through the greater portion of the length of said radiator tube and having terminals protruding beyond one end of said radiator tube into the space between the adjacent supporting plate and end closure member, a thermal limit switch mounted on said adjacent supporting plate within said space and having a heat sensing element thermally connected to said radiator tube contiguous to said adjacent supporting plate, a cover member secured to said adjacent supporting plate and extending between the same and the adjacent end closure member to form an enclosure for said terminals and said thermal limit switch, said enclosure members and said supporting plates having vertically spaced and oppositely protruding upper and lower rounded projections at their forward edges and an imperforate front cover member of sheet metal coextensive in length with said frame piece and having inturned flanges along its upper and lower edges to be removably assembled in a snap-latch relation on said rounded projections with the upper and lower edges of said front cover member being disposed in spaced relation to said upper and lower horizontal wall panels of said frame piece.

2. A baseboard heater unit as defined in claim 1, including an elongated plate member fixed adjacent its uppermost edge to said back wall panel and extending downwardly into engagement with said bottom horizontal wall panel defining with the latter and with the lowermost of said forwardly diverging panels a triangular cross section electrical conductor raceway extending lengthwise of the heater unit.

3. A baseboard heater unit as defined in claim 1, including a channel-shaped barrier member within said space having a forwardmost vertical bight portion secured against the inner surface of said cover member to said adjacent supporting plate and having upper and lower horizontal channel sides extending rearwardly to said back wall panel and longitudinally of the heater between said adjacent supporting plate and the adjacent end closure member in planes spaced slightly above and below said terminals, said channel side members having apertures therein for passage of electrical wires therethrough from said terminals.

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ANTHONY BARTIS, *Primary Examiner.*

M. C. FLIESLER, *Assistant Examiner.*

U.S. Cl. X.R.

165—55; 219—364, 365, 540; 237—79