Sept. 3, 1968 G. P. DEACON 3,400,247

ELECTRICAL RADIANT HEATING PANELS

Filed Oct. 12, 1965

FIG. 1.

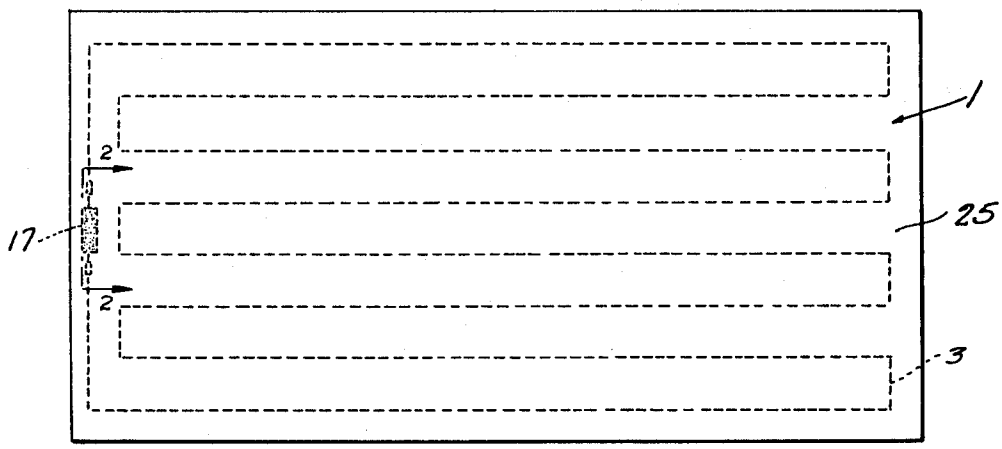


FIG. 2.

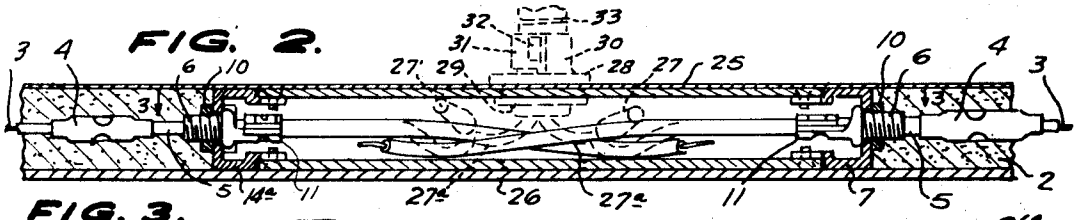


FIG. 3.

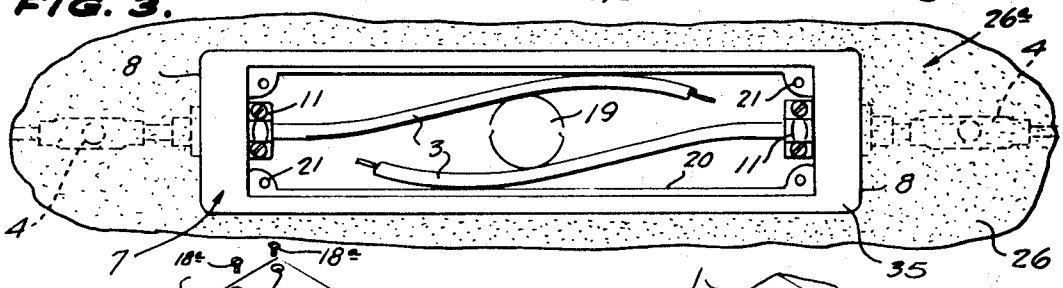
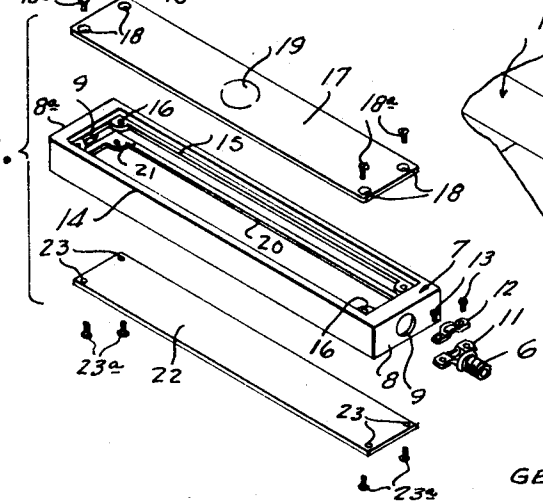


FIG. 4.



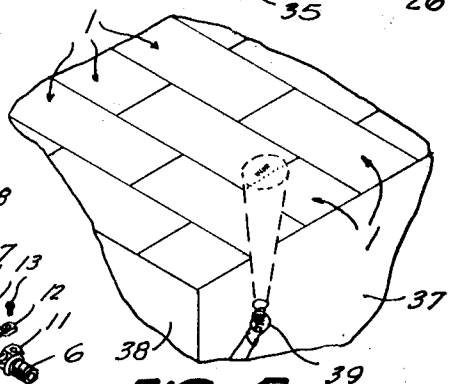


FIG. 5.

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ELECTRICAL RADIANT HEATING PANELS

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ABSTRACT OF THE DISCLOSURE

A plaster board having a plaster core, a layer of sheet material on each side of the core and an electric heating wire distributed through the core forms a heating panel. Positioned flush in the core is a junction box having removable top and bottom access plates covered over by the layers. A readily detectable but normally invisible indicating coating is provided on one layer at the location of the removable plate so that the box can be easily located even when the panel is installed. The heating wires are connected to a source of power by means of the wires extending through the other access plate of the box.

The present invention is concerned with an improvement in electrical radiant heating panels.

The principal object of the present invention is to provide a combination radiant heating panel and wall board for use with similar wall boards for providing room ceilings and which wall boards can be safely, quickly and readily connected to an electrical circuit for receiving electrical currents therefrom and which panel includes a junction box as part thereof which boxes can be readily located for inspection purposes even when the panel is a part of a complete ceiling.

A further and important object of the present invention is to provide a flat relatively thin electrical radiant heating panel having a heating wire extending throughout the same connected to non-heating lead wires in such a manner that the heating wires and lead wires will not be disconnected even though a considerable pull is placed upon either or both of these wires.

Further objects of the present invention will be in part pointed out and in part obvious from the following detailed description of the accompanying drawings in which:

FIG. 1 is a top view of an electrical radiant heating panel according to the present invention.

FIG. 2 is an enlarged cross-sectional view taken on line 2—2 of FIG. 1.

FIG. 3 is an enlarged top view of the junction box portion of the heating panel with a cover removed.

FIG. 4 is an exploded perspective view of the junction box, and FIG. 5 is an illustrative perspective view of a portion of a room including the present heating panels in the ceiling thereof.

Refering now more particularly to the accompanying drawings wherein like and corresponding parts are indicated by similar reference characters numeral **1** generally indicates an electrical radiant heating panel having a sheet of gypsum plaster board **2** of a generally elongated, rectangular configuration, but which may be of various shapes or of various sizes as desired for any particular use. An electrical heating wire **3** as best shown in FIG. 1 extends in a serpentine pattern throughout the length and width of said plaster board. Said heating wire **3** may be of Nichrome resistance wire having a resistance sufficient to produce 2.55 watts per foot of wire and the amount of wattage to be provided by said wire can be determined by the amount of wire extending throughout said plaster board. The opposite ends of wire **3** are connected to a pair of connectors **4** each of which in turn is connected

to one of the non-heating leads **5** and said connectors are crimped or compressed joining wires **3** and **5** together. The non-heating wires **5** each extend through one of the threaded nipples **6** extending from the opposite end walls **8** and **8***a* of the junction box generally indicated as **7**.

Said junction box **7** is positioned entirely within a corresponding shaped opening within the plaster board **2** at one end portion of the heating panel as shown in FIG. 1. Said junction box has a pair of openings **9** each in the opposite end walls **8** and **8***a* of said junction box with a threaded nipple **6** extending through each of said openings. A pair of nuts are each mounted in threaded engagement with one of said threaded nipples **6** drawing the flanged ends **11** integral with each nipple against the inner side of the junction box end walls **8** and **8***a*. A pair of clamps are each mounted on one of said flanged ends **11** and retained by screws **13** extending through the clamps into threaded engagement with the flanged end **11** therebelow whereby each clamp grips and holds the non-heating lead **5** therebeneath.

Top **14** of the junction box has an opening with a recessed flange **15** extending laterally therefrom and thereabout and which flange has threaded corner openings **16**.

A cover plate **17** is shaped for fitting upon flange **15** and has corner openings **18** corresponding to flange openings **16** through which extend screws **18***a* into threaded connection with opening **16** for detachably retaining plate **17** flush with top **14**. Said plate **17** has a punch-out plug **19** in the center thereof.

A second recessed flange **20** extends laterally from and around an opening in the bottom **14***a* of said junction box and has threaded corner openings **21** while a second cover plate **22** is shaped for fitting within bottom **14***a* against flange **20** thus closing said junction box and being flush with bottom **14***a*. Said second plate has corner openings **23** corresponding to openings **21** in flange **20** through which screws **23***a* extend in threaded engagement with openings **21** for retaining said second plate against the junction box.

Thus top **14** and bottom **14***a* of said junction box are flush with the top and bottom faces of gypsum core of board **2**. Said junction box **7** is retained within said gypsum board **2** by coating the sides of the junction box with electrical wax, conventional adhesive or wet plaster which when dry will retain the junction box within the plaster board.

A sheet **25** of paper, or paper board, extends completely across the upper face of the gypsum board **2** including top **14** and plate **17** of the junction box and is affixed thereto by an adhesive or the like.

A sheet material **26** for example as paper board extends completely across the bottom face of said gypsum board **2** as well as bottom **14***a* and plate **22** of said junction box. Said sheet material **26** has coating material **26***a*, for example, such as a paint, varnish or other coating material containing a magnetic material such as iron filing compound or said coating **26***a* may contain a radioactive containing a minute amount of radium or uranium tracer capable of being detected by a Geiger-counter or may be a fluorescent material as, for example, fluorescin, cosin, sulfate or quinine, aesculin or other material suitable for such indicating purposes. It is to be appreciated coating **26***a* can as well be applied to the junction box **7** or plate **22** or the adjacent face of plaster board **2**.

The present heating panel can be stored or shipped for use when constructed as hereinbefore described and as shown in FIGS. 1 and 2. The panel board **1** when used to form a ceiling is affixed in any conventional manner to the lower face of beams or joists by nails or the like fasteners (not shown) together with additional similar panels generally in the manner disclosed in FIG.

5 with said material **26** providing the bottom face of the ceiling. Plug **19** is removed from plate **17** and said plate temporarily detached from the junction box so that the clamp connector shown in dotted lines in FIG. 2 can be added thereto. That is, the non-heating lead wires **5** are each joined by means of conventional plastic connectors **27** to wires **27***a* of an electrical circuit which wires extend through a threaded nipple **28** extending through the opening left by plug **19** while a nut **29** is in threaded engagement with said nipple on the inner face of plate **17** and said plate is reaffixed to the junction box by screws **18***a*. Said nipple has an integral flange **30** to which is affixed a clamp **31** by screws **32** and surrounds a cable **33** through which the circuit wires **27***a* extend.

Thus when electrical current is supplied to the circuit wires **27***a* and thus to the wires **5** and heating wires **3** a radiant heat is directed through the bottom face of sheet material **26** of the panel board.

It is to be apparent that when the panel boards are affixed to form a ceiling as shown in FIG. 5 that it is difficult to locate the various junction boxes of the various heating panels which is sometimes necessary for inspection purposes. Therefore, an inspector using an instrument **39** can direct the same towards the ceiling supported by the walls **37** and **38**, for locating the coating **36** around each junction box **7**. For example, using a Geiger-counter as the instrument **39** he could detect the radioactive tracer material when used in coating **36** or a magnetic as instrument **39** for detecting coating **36** when it contains a magnetic material or instruments **39** may be electrical arc producer for locating material **26***a* when it is fluorescent or instrument **39** may be a thermopile or radiomicrometer for tracing the infra-red radiation from the heating wires **3** up to the block **7**. Coat **26***a* may likewise be detected when it contains one of the alkali metals which would give off a photo-electric emission when subjected to ultra-violet rays from an instrument for producing an electrical arc which can be used as the instrument **39**.

Once a junction box **7** is thus located, an opening **35** can be cut in said material **26** and bottom plate **22** detached from the junction box exposing the interior thereof for inspection or repairs.

By using the clamp connectors **6–13** and **28–32**, a 60 pound pull can be placed on the wires connected to the heating panel and yet the same will not be pulled loose. Further, said materials **25** and **26** also assist in retaining the junction box **7** in its position within the gypsum board **2** at all times and imparts considerable strength thereto.

As an example of a radiant heating panel according to the present invention a gypsum board **2** having a thickness of ½″ or ⅝″ can be employed and a plastic fiber or metal junction box **7** can be used having a depth of ½″, a length of 8″ and a width of 2″.

The present invention is capable of considerable modification and such changes thereto as come within the scope of the appended claims is deemed to be a part thereof.

I claim:

1. An electric heating panel board comprising a plaster board including a plaster core and a pair of covering layers of sheet material each attached to and covering one side of said plaster core, an electrical heating wire positioned in said plaster core, a junction box positioned in said plaster core and having an open top and bottom and side walls with bore therethrough, a pair of plates each detachably mounted on and closing said junction box open top and bottom and positioned flush with one of said plaster core sides and beneath one of said covering layers, at least one of said plates having a knock-out plug and non-heating wires each extending through one of said junction box side wall bores and connected to said heating wire.

2. An electric heating panel board comprising a plaster board including a plaster core and a pair of covering layers of sheet material each attached to and covering one side of said plaster core, an electrical heating wire positioned in said plaster core, a junction box positioned in said plaster core and having an open top and bottom and side walls with bores therethrough, a pair of plates each detachably mounted on and closing said junction box open top and bottom, one of said plates being positioned beneath one of said covering layers, the other of said plates having a knock-out plug and non-heating wires each extending through one of said junction box side wall bores and connected to said heating wire.

3. An electric heating panel board as claimed in claim **2** wherein an indicating coating is provided on said one of said covering layers at the location of said one of said plates.

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