Nov. 14, 1961 H. DOEHLER 3,009,044

ELECTRIC RESISTANCE ELEMENT FOR SPACE HEATERS

Filed July 11, 1960

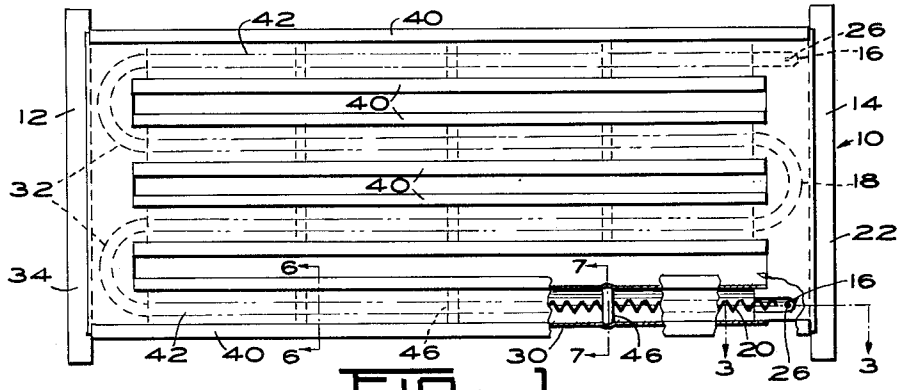


FIG. 1

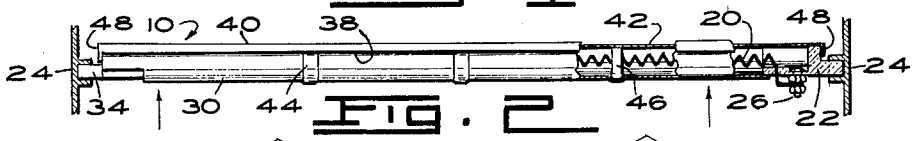


FIG. 2

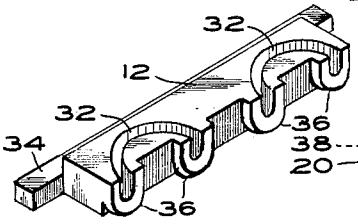


FIG. 4

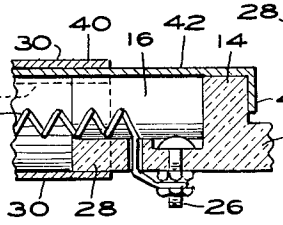


FIG. 3

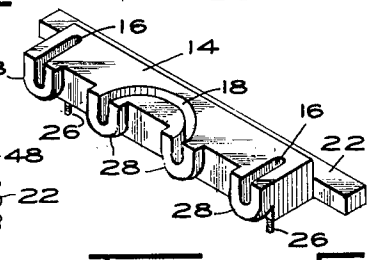


FIG. 5

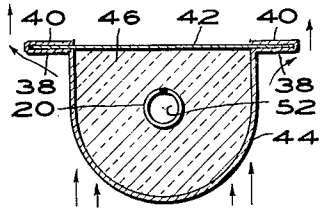


FIG. 7

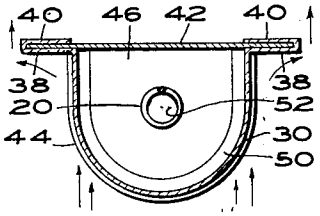


FIG. 6

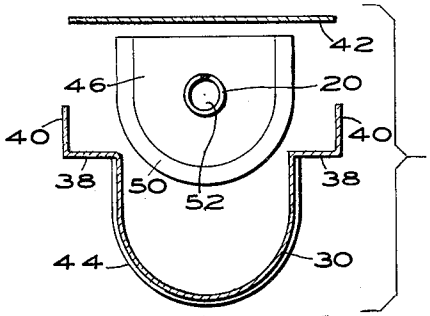


FIG. 8

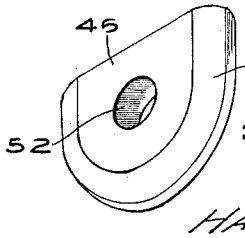


FIG. 9

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ELECTRIC RESISTANCE ELEMENT FOR SPACE HEATERS

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3 Claims. (Cl. 219—19)

The present invention generally relates to an improved and novel heating element for use in a space heater having a novel structural arrangement which enables the heating element to be readily assembled and disassembled for ease of manufacture and also a heating element which is quite efficient in operation.

The primary object of the present invention is to provide an electrical heating element for a unit heater or space heater incorporating a plurality of heating coils enclosed within a casing of black iron or the like which absorb heat from the coils and heats circulating air in an efficient manner thereby producing a relatively high heat transfer.

Another feature of the present invention is to provide an electrical heating element adapted to be used in tiers, one above the other whereby a relatively large air volume may be heated.

The foregoing and other objectives, advantages, and features of construction will become apparent from a consideration of the following description and the appended drawings.

FIGURE 1 is a plan view of the heating element of the present invention with parts shown in section;

FIGURE 2 is a side elevational view of the construction of FIGURE 1 with parts being shown in section and illustrating the relationship of the mounting tracks or guides therefor;

FIGURE 3 is a detailed sectional view taken substantially upon a plane passing along section line 3—3 of FIGURE 1 illustrating the manner in which the coils are terminally connected to a supply of electrical energy together with the connection between the troughs and the end insulator;

FIGURE 4 is a perspective view of a blank end insulator;

FIGURE 5 is a perspective view of a terminal end insulator;

FIGURE 6 is a detailed sectional view taken substantially upon a plane passing along section line 6—6 of FIGURE 1 illustrating the relationship of the troughs to the heating coil;

FIGURE 7 is a detailed sectional view taken substantially upon a plane passing along section lines 7—7 of FIGURE 1 illustrating the construction of one of the porcelain end insulators disposed in the trough;

FIGURE 8 is an exploded sectional view similar to FIGURE 6 illustrating the relationship of components; and

FIGURE 9 is a perspective view of one of the insulators.

Referring now specifically to the drawings, the numeral **10** generally designates the heating element of the present invention which includes a blank end insulator **12** and a terminal end insulator **14**.

The terminal end insulator **14** is provided with two parallel slots **16** and an arcuate return slot **18** all of which receive the resistance heating coil wire **20**. The outer end of the terminal insulator **14** is provided with an elongated projecting arm **22** which acts as a supporting arm for sliding engagement in slides or guides on the walls **24** of the space heater. This construction will enable the heating element **10** to be assembled in relation to the space heater.

The terminal end insulator **14** is also provided with two depending terminal posts **26** which protrude through the insulator to supply electric current to the heating

coil **20**. Also, the terminal end insulator **14** is provided with a plurality of inwardly extending shoulders **28** in alignment with the slots **16** and **18** respectively for receiving the end of a U-shaped trough **30**.

The blank end terminal **12** is provided with two arcuate return slots **32** and a projecting arm **34** for reception in the slides on the walls **24** of the space heater. The arm **34** is similar to the arm **22** and coacts therewith to support the heating element **10** in position. Also, the blank end insulator is provided with shoulders **36** at the entrance to each of the slots **32** for supporting the other ends of the troughs **30**.

Each trough **30** is basically U-shaped in configuration and is provided with an outwardly extending flange **38** along each top edge. Each flange **38** is provided with an upturned and inwardly extending flange or edge **40** which forms substantially opposing channels for receiving and holding a closure lid **42** in position.

At longitudinally spaced points on the trough **30** there is provided outward bulges **44** for receiving insulator blocks **46**. Also, the lid **42** is provided with downturned ends **48** which extend downwardly over the end edges of the insulators **12** and **14** to hold the unit in place. The insulator **46** is a generally flat U-shaped configuration as illustrated in FIGURE 9 and is provided with a curved bottom and side **50** in order to fit the bulged out trough **44**. The insulator **46** is flat on top to receive and engage the lid **42**. Centrally disposed in the insulator **46** is an opening **52** for enabling the heating coil **20** to pass therethrough and also supporting heating coil **20**.

The heating element **20** may be constructed of any suitable resistance type wire and the trough and lid are constructed of black iron which absorbs the heat radiated from the resistance coil **20** and when the air is passed over the troughs in the direction indicated by the arrows when the heating units are mounted above each other, a very high temperature is attained, thus enabling the relatively small heating element to heat a relatively large volume of air so that such air may be circulated throughout a room in which the heater is placed.

While this invention has been described in a specific form and as operating in a specific manner for the purpose of illustration, it is to be understood that the invention is not limited thereto, since various modifications will suggest themselves to those skilled in the art without departing from the spirit of this invention, the scope of which is set forth in the annexed claims.

I claim:

1. A heating element for space heaters comprising a pair of end insulators disposed in alignment with each other, a plurality of U-shaped troughs interconnecting said insulators, the upper edge of each trough being provided with an outwardly extending flange having a reversely turned free edge portion defining inwardly facing channels, a resistance heating wire within each said trough, a cover for each said trough disposed with the side edges thereof received in said channels, said cover having downturned end portions engaged with the end insulators, and intermediate insulator spacers disposed in the trough and retaining the heating wire in spaced relation to the trough, said trough and lid being constructed of black iron for absorbing heat from the heating wire and heating air passing over the trough and lid.

2. A heating element for space heaters comprising a pair of end insulators disposed in alignment with each other and each provided with a plurality of inwardly extending U-shaped projections, a plurality of U-shaped troughs interconnecting said insulators, the ends of said troughs being received by said U-shaped projections, the upper edge of each trough being provided with an

outwardly extending flange having a reversely turned free edge portion defining inwardly facing channels, a resistance heating wire within each said trough, a cover for each said trough disposed with the side edges thereof received in said channels, said cover having downturned end portions engaged with the end insulators, and intermediate insulator spacers disposed in the trough and retaining the heating wire in spaced relation to the trough, said trough and lid being constructed of black iron for absorbing heat from the heating wire and heating air passing over the trough and lid.

3. A heating element for space heaters comprising a pair of end insulators disposed in alignment with each other, each insulator being provided with an extension for sliding engagement with the walls of the space heater for maintaining the heating elements in spaced relation, a plurality of U-shaped troughs interconnecting said insulators, the upper edge of each trough being provided with an outwardly extending flange having a

reversely turned free edge portion defining inwardly facing channels, a resistance heating wire within each said trough, a cover for each said trough disposed with the side edges thereof received in said channels, said cover having downturned end portions engaged with the end insulators, and intermediate insulator spacers disposed in the trough and retaining the heating wire in spaced relation to the trough, said trough and lid being constructed of black iron for absorbing heat from the heating wire and heating air passing over the trough and lid.

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