June 3, 1952 C. H. TURNER ET AL 2,599,029

ELECTRIC HEATER

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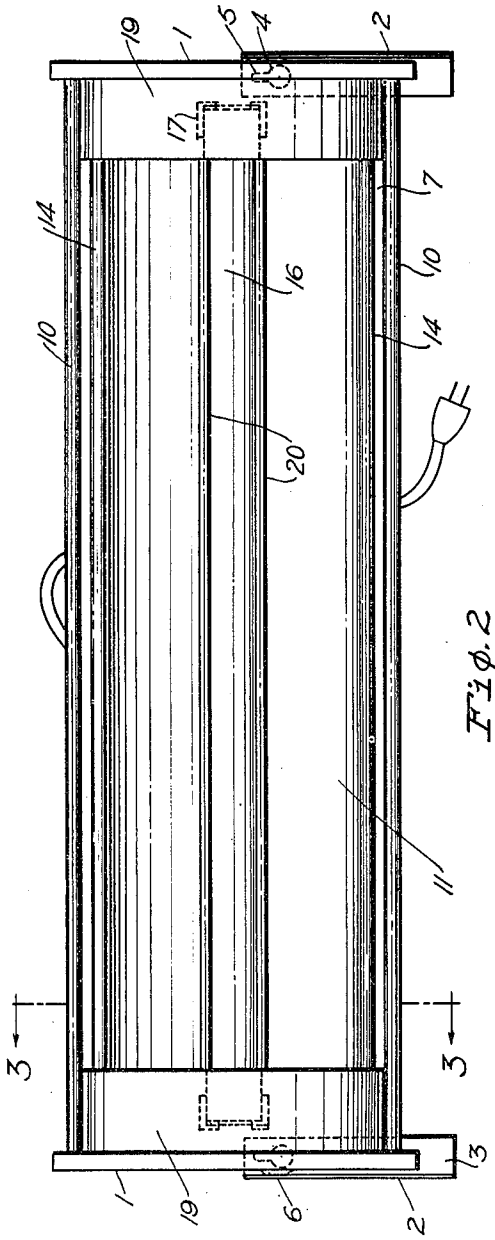


Fig. 2

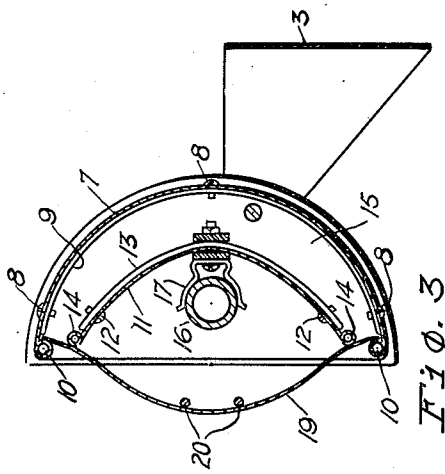


Fig. 3

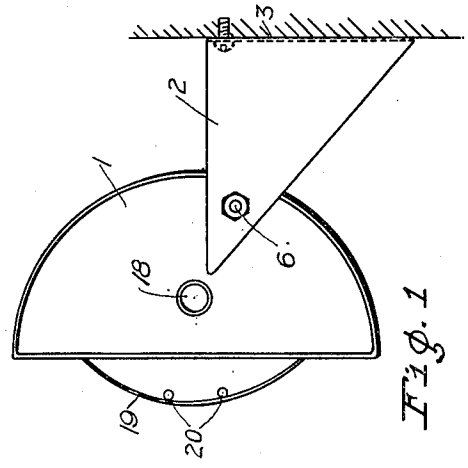


Fig. 1

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ELECTRIC HEATER

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4 Claims. (Cl. 219—34)

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The present invention relates to improvements in electric heaters, and its principal object is to provide a heater of the character described that is convenient, economic and efficient in use and may be employed for long periods of time with safety and at low cost.

It is further proposed to provide a heater of the character described that is adapted for attachment to any convenient support such as a wall surface and may be swung through a large angle so as to direct the rays of heat either upwardly or horizontally or downwardly, or in substantially any direction desired.

It is further proposed to use a heater of the character described employing a low temperature heating element the rays of which are substantially confined to the infra-red range of the spectrum.

It is a further object of the invention to provide a heater in which the heating element is well ventilated to provide for efficient heat exchange and is well insulated from its support so as to eliminate all danger of over-heating the latter.

And, finally it is contemplated in the present invention to use a non-metallic, hollow open-ended resistor tube, the material and resistance of the tube being related to the voltage across the tube so as to cause the latter to emit rays substantially confined to the infra-red range of the spectrum, the said tube being mounted in a parabolic reflector adapted to reflect the rays in substantially parallel relation.

Further objects and advantages of our invention will appear as the specification proceeds, and the novel features of our invention will be fully defined in the claims attached hereto.

The preferred form of our invention is illustrated in the accompanying drawing, in which

Figure 1 shows an end of our electric heater,

Figure 2, a front view of the same, and

Figure 3, a section taken along line 3—3 of Figure 2.

While we have shown only the preferred form of our invention, we wish to have it understood that various changes and modifications may be made within the scope of the claims attached hereto without departing from the spirit of the invention.

Referring to the drawing in detail, our electric heater is supported between two semi-circular end pieces 1 which latter again are supported with freedom of swinging movement in substantially triangular brackets 2 having lateral flanges 3 provided with circular holes 4 terminating in

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vertical slots 5 by means of which the brackets may be suspended from a wall surface having suitable nails or screws secured therein.

The end pieces are pivoted in the extremities of the triangular brackets as at 6, the pivots engaging the end pieces near the peripheries thereof as shown particularly clear in Figure 1 so as to allow of swinging movement of the end pieces through an arc approaching 180° as will clearly appear from the drawing.

A semi-cylindrical housing 7 is mounted between the end pieces so as to register with the outline thereof, the housing being secured in place by means of screws 8 threaded into semi-cylindrical flanges 9 projecting from the inner faces of the end pieces near the peripheries thereof.

The housing may be made of any suitable metal or other material and the upper and lower edges of the housing are rolled as at 10 to provide reinforcing beads and to provide an attractive appearance.

An elongated reflector 11 is mounted between the end pieces inside of the housing, the reflector being made in the form of a true parabola and being secured between the end pieces by means of screws 12 threaded into flanges 13 projecting from the inner faces of the end pieces. The upper and lower edges of the reflector are preferably curled upon themselves as at 14 to provide reinforcing beads intended to also give an attractive appearance to the heater.

The reflector and the housing cooperate in forming an insulating chamber 15, which due to the differences in shape between the parabolic reflector and the cylindrical housing tends to increase in thickness from the upper and lower edges of the heater toward the central plane.

A resistor tube 16 is mounted inside of the reflector, with its axis located preferably in the focus of the latter. The ends of the resistor tube are mounted in clamps 17 secured upon the rear wall of the reflector as shown in Figure 3 and adapted for connection into a suitable electrical circuit.

The tube is non-metallic, hollow and open at both ends, and the material and resistance of the tube are related to the voltage across the tube in such a manner as to cause the latter to emit rays substantially confined to the infra-red range of the spectrum.

The tube may be made of any suitable material adapted for the purpose, and is intended for connection into a conventional house cir-

cuit of approximately 110 volts and should have a resistance of approximately 21 ohms.

While different materials may be available for this tube we preferably use a resistor formed principally of silicon carbide with a binder and other ingredients. One material particularly available for this purpose is a product of the Carborundum Company known as CX carborundum tube, the length of the tube being approximately 18 inches, the wall thickness ⅛th of an inch, the outside diameter approximately 1 inch and the resisitance slightly more than 1 ohm per inch.

A resistor tube of these specifications, when connected into a house circuit of approximately 110 volts, operates at a temperature of 340° to 420° Fahrenheit, will provide heat at a very low power consumption and emit rays substantially confined to the infra-red range of the spectrum.

The ends of the tube are open to admit of ventilation, and the end pieces 1 are formed with holes 18 opposite the ends of the tube to admit of access of air to facilitate heat exchange between the inside of the tube and the space to be heated.

A pair of outwardly curved shields 19 may be provided at the ends of the heater to project forwardly as shown, the upper and lower edges of the shields being suitably shaped to clamp between the beads 10 and 14 of the housing and the reflector. The shields may be interconnected by rods 20 extending lengthwise of the heater in forwardly spaced relation to the resistor tube 16.

It will be noted that this heater is extremely practical and economic in use. It may be readily attached to a wall or any other surface and swung through a wide arc to emit rays in any desired direction. Its power consumption is very low, probably about 500 watts when used in the conventional house circuit, and it is well insulated from the supporting surface by means of the air chamber 15 and the arrangement of the supporting brackets. The tube being open at both ends and alined with the openings 18 in the end pieces, air is free to circulate through the tube so as to permit of heat exchange from the inside of the tube as well as from the outside, it being observed that the inside of the tube has a tendency to develop a higher temperature than the outside.

While our device is principally intended for a space heater it is also exceptionally well adapted for drying clothes and for a hair drier. The heater also has a certain therapeutic value being confined to pure infra-red rays, and the heat issuing from the device is warm and penetrating. There is absolutely no danger of fire or burning and the heater is sufficiently safe in its use that it may be left on for long time periods in the absence of any attendant.

It is, for instance, perfectly safe to keep the heater in operation in a weekend cottage throughout the week to keep the house dry and to maintain a pleasing warmth therein.

We claim:

1. An electric heater comprising a pair of semi-circular end pieces arranged in spaced and registering relation and having inwardly presented, registering circular flanges near the periphery thereof and inwardly presented, registering parabolic flanges spaced from the circular flanges, all the flanges being made to stop short of the straight edges of the end pieces, a semi-cylindrical housing secured upon the outer faces

of the circular flanges and having ends projecting beyond the flanges and curled to form longitudinal beads, a parabolic reflector secured upon the inner faces of the parabolic flanges and having its ends projecting beyond the flanges and curled to form longitudinal beads set back slightly with respect to the former beads, a resistor tube supported in the reflector with its axis substantially in the focus of the reflector, means for connecting opposite ends of the tube into an electrical circuit for heating the tube, and a pair of vertically disposed and outwardly curved shields arranged adjacent the end pieces and shaped for anchoring between the beads.

2. An electric heater comprising a pair of semi-circular end pieces arranged in spaced and registering relation and having inwardly presented, registering circular flanges near the periphery thereof and inwardly presented, registering parabolic flanges spaced from the circular flanges, all the flanges being made to stop short of the straight edges of the end pieces, a semi-cylindrical housing secured upon the outer faces of the circular flanges and having ends projecting beyond the flanges and curled to form longitudinal beads, a parabolic reflector secured upon the inner faces of the parabolic flanges and having its ends projecting beyond the flanges and curled to form longitudinal beads set back slightly with respect to the former beads, a resistor tube supported in the reflector with its axis substantially in the focus of the reflector, means for connecting opposite ends of the tube into an electrical circuit for heating the tube, and a pair of vertically disposed and outwardly curved shields arranged adjacent the end pieces and shaped for anchoring between the beads, with a pair of rods connecting the shields and extending lengthwise of the heater in forwardly spaced relation with respect to the heating tube.

3. An electric heater comprising a pair of semi-circular end pieces arranged in spaced and registering relation, a semi-cylindrical housing secured upon the end pieces near the periphery thereof and having ends curled to form beads connecting the end pieces, a parabolic reflector secured upon the end pieces inwardly of the housing and spaced therefrom and having its ends curled to form longitudinal beads set back slightly with respect to the former beads, a resistor tube supported in the reflector with its axis substantially in the focus of the reflector, means for connecting opposite ends of the tube into an electric circuit for heating the tube, and a pair of vertically disposed and outwardly curved shields arranged adjacent the end pieces and shaped for anchoring between the beads.

4. An electric heater comprising a pair of semi-circular end pieces arranged in spaced and registering relation, a semi-cylindrical housing secured upon the end pieces near the periphery thereof and having ends curled to form beads connecting the end pieces, a parabolic reflector secured upon the end pieces inwardly of the housing and spaced therefrom and having its ends curled to form longitudinal beads set back slightly with respect to the former beads, a resistor tube supported in the reflector with its axis substantially in the focus of the reflector, means for connecting opposite ends of the tube into an electric circuit for heating the tube, and a pair of vertically disposed and outwardly curved shields arranged adjacent the end pieces and shaped for anchoring between the beads, with a pair of rods connecting the shields and extending lengthwise

of the heater in forwardly spaced relation with respect to the heating tube.

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