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J. H. CARMEAN

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HEATER

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Fig. 2.

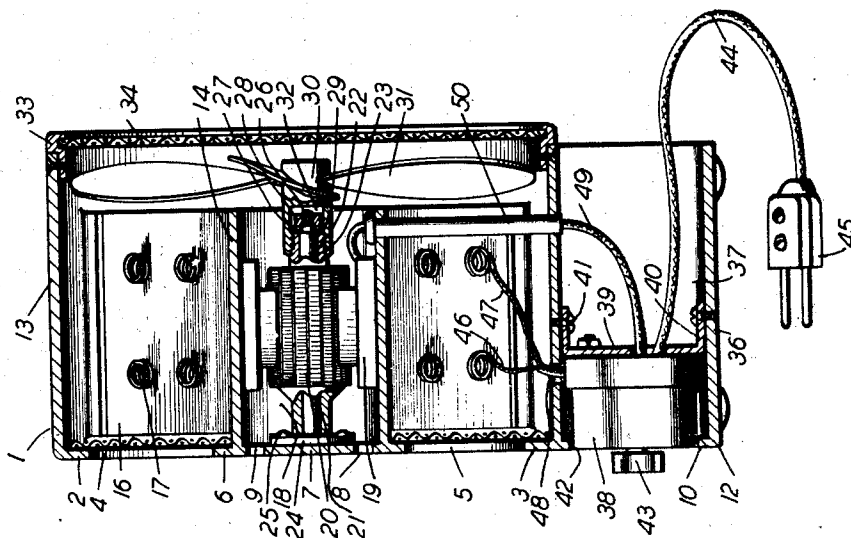
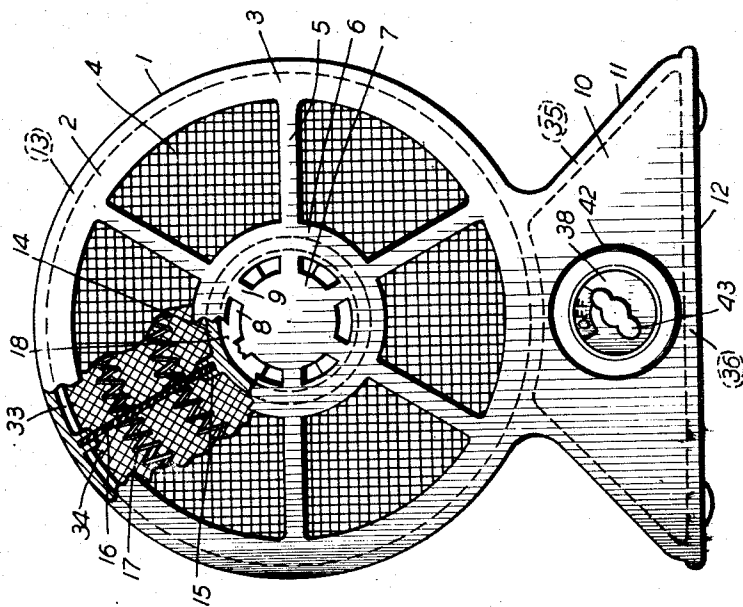


Fig. 1.



INVENTOR.
James H. Carmean
BY *William B. Brown*
ATTORNEYS.

UNITED STATES PATENT OFFICE

JAMES H. CARMAN, OF KANSAS CITY, MISSOURI

HEATER

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My invention relates to heaters and more particularly to electrically energized heaters including supporting casings, heating elements mounted in the casings, and fans for propelling air over the heating elements.

Devices of this character have required a relatively large number of parts to provide the suitable supports for the heating elements, fans, fan motors, and switches, involving excessive time and labor for assembly and relatively high cost for numerous parts, producing an assembly bound together by bolts, and therefore relatively unstable, and representing mere juxtaposition of fans, motors, heaters, switches, and the like, without unitary character.

The principal objects of my invention therefore are to provide a unitary structure having parts formed to cooperate with each other, to provide a casing adapted to receive and support the several operating elements of a heater to form a unitary integrated device, to form a casing having integral parts for receiving the several operating elements, and to reduce the number of parts required for assembling a heater, whereby the stability and rigidity of heaters may be increased, and the cost and upkeep of heaters may be reduced.

In accomplishing these and other objects of my invention, I have provided improved details of structure, the preferred forms of which are illustrated in the accompanying drawing, wherein:

Fig. 1 is a front view of a heater constructed in accordance with my invention, the front wall and screen being partly broken away to show details of construction.

Fig. 2 is a central vertical section of the heater from front to back.

Referring in detail to the drawing:

1 designates a casing including a vertical facing plate or front cover wall 2 including a circular portion 3 provided with segmental openings 4 leaving bars or ribs 5 radiating from a ring 6 formed on the axis of the plate, and a solid disk-like central portion 7 spaced from the ring by openings 8 and connected to the ring by webs 9 preferably aligned with the bars 5.

The portion 3 of the front plate thus comprises a spider-like structure consisting of the ring-like outer edge portion of the plate, the inner ring, and the axial disk, all connected by the bars and webs to form a rigid frame. The plate further includes a footing or base portion 10 forming a guard or stabilizing leg member integral with the circular portion 3, and connected to the periphery thereof, having downwardly diverging side edges 11 and a lower edge 12 adapted to engage a surface on which the heater may be located.

Extending rearwardly from the circular outer edge of the front wall portion 3 is a cylindrical wall or drum 13 forming a tubular heater housing, and extending rearwardly from the ring 6 concentrically of the drum 13 is a tubular wall or drum 14 having longitudinal pairs of parallel ribs 15 spaced to provide grooves to receive blades 16 circularly arranged and connected by resistance wires 17 to form an annular heater adapted to be mounted in the housing. The outer surface of the drum 14 is spaced sufficiently from the inner surface of the drum 13 to form an annular chamber in which the heater assembly will fit relatively snugly.

The drum 13 has internal ribs forming grooves cooperating with the grooves of the drum 14 to receive and retain the heater.

The wall 14 further provides a cylindrical chamber 18 concentric with the heater for receiving and supporting a motor adapted according to my invention to be installed in the chamber including a casing or field member 19 and a rotor or armature 20 having hollow stub shafts 21 and 22 at opposite ends. The rotor is mounted on a shaft 23 and a plate 24 fixed to the inner end of said shaft 23 is adapted to be attached to the disk 7 by suitable means such as rivets 25. A reduced threaded outer end 26 is formed on the shaft to receive a washer 27 and nut 28 for retaining the rotor on the shaft.

The outer or rear stub shaft 22 is threaded to receive the internally threaded hollow extension 29 of a fan hub 30 having blades 31, the hub extension being elongated to form a chamber 32 for the nut and washer where-

by the fan hub may rotate freely over the securing members.

The hub extension is further adapted to support the fan blades adjacent the rear end edge of the tubular wall 14, and said wall is limited in length to space the plane of the end edge thereof inwardly from the end edge of the cylindrical wall 13, thus forming a space within the casing wherein the fan may be located, and affording opportunity for mounting a ring 33 on the rear end edge of the outer wall 13 to support a screen 34 in spaced and covering relation with the fan.

The casing further includes side walls 35 engaging the periphery of the drum 13 and extending rearwardly from the side edges of the base portion 10 of the front plate to form leg-like side supports for the casing, and a bottom wall or floor 36 extending rearwardly from the lower edge 12, and connected to the side walls 35. The walls 35 and 36 cooperate with a portion of the wall 13 to form a switch chamber 37. A switch 38 is mounted in the chamber on a bracket 39 having flanges 40 forming wings adapted to be secured to casing walls such as the walls 13 and 36 by bolts 41.

The front wall portion 10 is provided with an opening 42 to receive the cylindrical end of the switch housing for stabilizing the housing and whereby the button 43 thereon is rendered accessible from the front of the heater.

A conducting cable 44 provided with a plug 45 adapted to be mounted in a service socket connected to a house electrical circuit, is extended through the switch chamber to the switch, and wires 46 and 47 are led from the switch through an opening 48 provided therefor in the casing wall 13 to the heater coils, while a cable 49 is led through an insulating tube 50 mounted in registering openings 51 and 52 in the casing wall 13 and motor chamber wall 14 respectively to the motor, for supplying current to the heater and fan motor under control of the switch.

I further preferably form the casing as a single casting, the cylindrical wall 13 being integral with the front wall 3, the front wall portions 3 and 10 being preferably integral, the cylindrical wall 14 and the leg-like side walls 35 and bottom 36 being further preferably cast integrally with the front and outer casing walls whereby a rigid structure is provided, and a single integral casing member is formed to receive the operating elements.

An annular screen 53 is further installed in the heater housing to engage the front wall, and may be retained therein by the blades of the heater.

In producing a device of the character described, the casing is preferably cast as an integral body having the concentric chambers to receive the heater and motor, and the chamber to receive the switch and cables.

An annular screen is first inserted in the heater chamber, and a heater is then installed, the blades thereof sliding in the circumferentially spaced grooves of the wall 14 and engaging the drum 13, and having substantially the same length as said wall to locate the rear ends of the blades adjacent the rear end of said wall.

The fan motor shaft may then be mounted in the central chamber, and the end plate thereof fixed to the disk portion of the front wall, and the rotor may then be mounted on the shaft, the field member engaging the inner surface of the wall 14, being supported thereby. The nut may then be applied to retain the motor on the shaft, and the fan may be attached to the stub shaft.

The conductors may easily be passed through the wall openings to the switch chamber, the switch connected to the conductors and inserted in the chamber, the bracket attached to the switch housing and to adjacent walls, and the rear screen mounted on the rear end of the casing wall 13.

What I claim and desire to secure by Letters Patent is:

1. In a device of the character described including a heater, a heater casing including a drum, a base supporting the drum, a face plate integral with the drum and having a depending portion forming the end of the base, and means supported by the face plate and spaced from the drum to form a housing for said heater.

2. In a device of the character described including a heater and a motor, a casing including a face plate, a drum extending rearwardly from the face plate, a second drum adapted to contain said motor and located in the first named drum to form therewith a chamber containing the heater, and a base including an extension of the plate.

3. In a device of the character described, an integral casing including a horizontal drum, a vertical face plate integral with the drum, a second drum integral with said face plate and located in the first named drum, and a motor casing mounted in said second named drum.

4. In a device of the character described, a support including a face plate comprising outer and inner concentric rings, bars connecting the rings, a central disk connected with the inner ring, and a downward extension forming a foot member for said plate, and a plurality of wall members extending rearwardly from the plate to form a plurality of chambers.

5. In a device of the character described, a support including a face plate extending in a vertical plane and including outer and inner spaced rings, bars connecting the rings, and a central disk connected with the inner ring, drums extending rearwardly respectively from the outer and inner rings, and

operating elements mounted in the respective drums including a motor supporting shaft fixed to said disk.

6. In a device of the character described, a support including a face plate and a plurality of concentric drums extending rearwardly therefrom to form a plurality of chambers, a shaft fixed to said plate, operating elements mounted in the respective chambers including an armature mounted on the shaft, and means for retaining said elements in the drums.

7. In a heater of the character described including a casing comprising a face plate, and a horizontally positioned drum fixed to the face plate, a shaft fixed to the face plate in said drum, and a motor mounted on said shaft.

8. In a heater of the character described, a casing comprising a vertical face plate, a drum extending rearwardly from the outer edge of the face plate, a second drum fixed to the face plate within the first named drum having a rear edge spaced inwardly from the rear edge of the first named drum to form a fan chamber, a shaft fixed to the face plate in said second named drum, a motor rotatable on said shaft, and a fan located in said chamber and operable by the motor.

9. A device of the character described including a face plate extending in a vertical plane, a footing member extending rearwardly from the lower edge of the face plate, a drum extending rearwardly from the plate and fixed thereto above said footing member, a housing extending rearwardly from the plate and fixed thereto within the drum, and a motor mounted in the housing.

10. A device of the character described including concentric spaced drums forming a cylindrical chamber and an annular chamber around the inner drum, a motor, means in the inner drum supporting the motor therein, a coil mounted in the annular chamber, and means including wires extending through the walls of said drums for energizing the motor and coils.

11. In combination with heating apparatus including a circularly arranged electrically energized heating element, a fan motor carrying a fan for moving air over said heating element, and means including a switch for energizing and controlling the heating element and motor, a unitary casing including a vertical face plate having rearwardly extending walls forming individual chambers for respectively receiving the heating element, motor and switch.

In testimony whereof I affix my signature.
JAMES H. CARMEAN.