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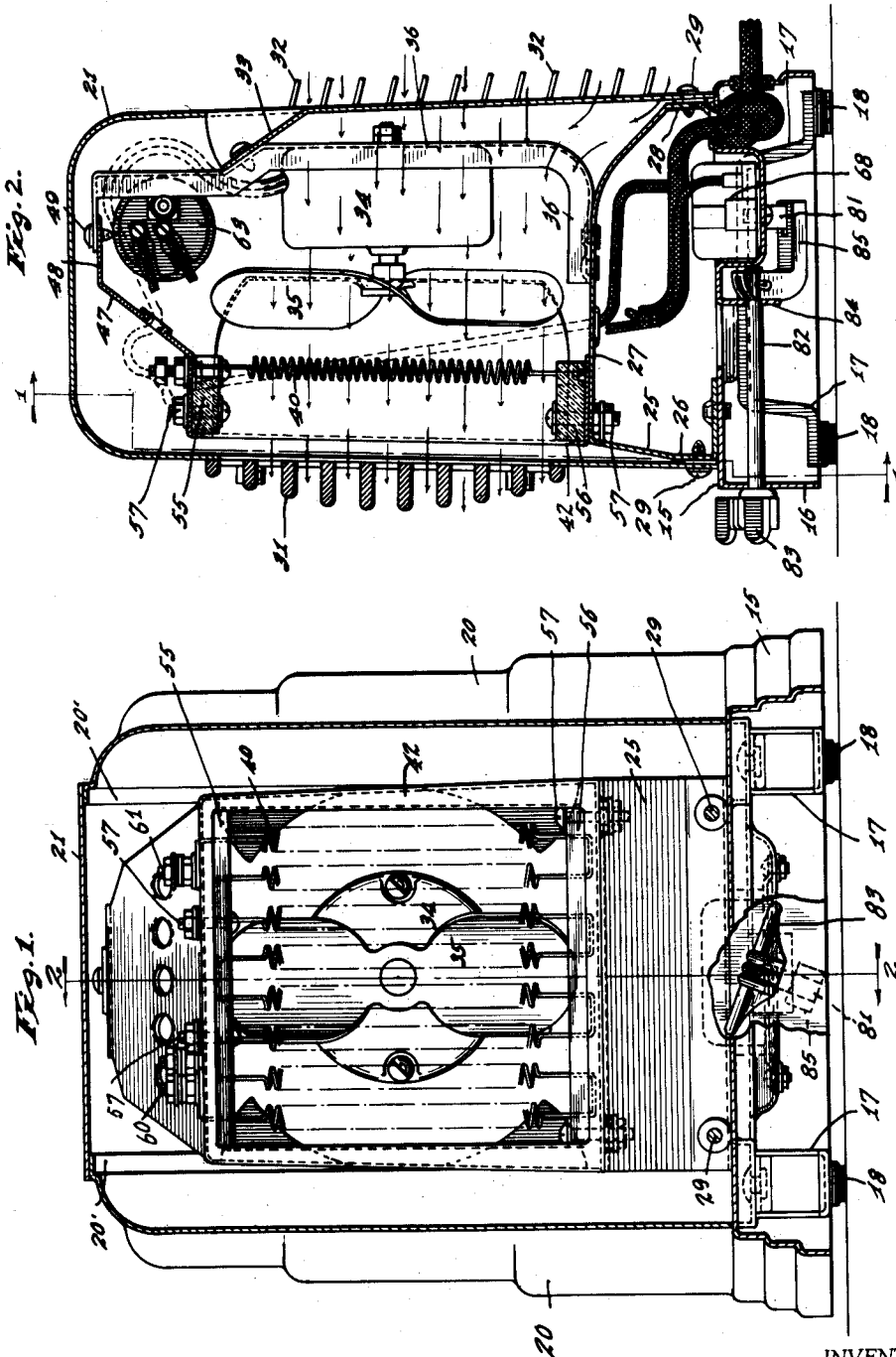
E. C. BOOTH

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ROOM HEATER

Filed Aug. 2, 1940

2 Sheets-Sheet 1



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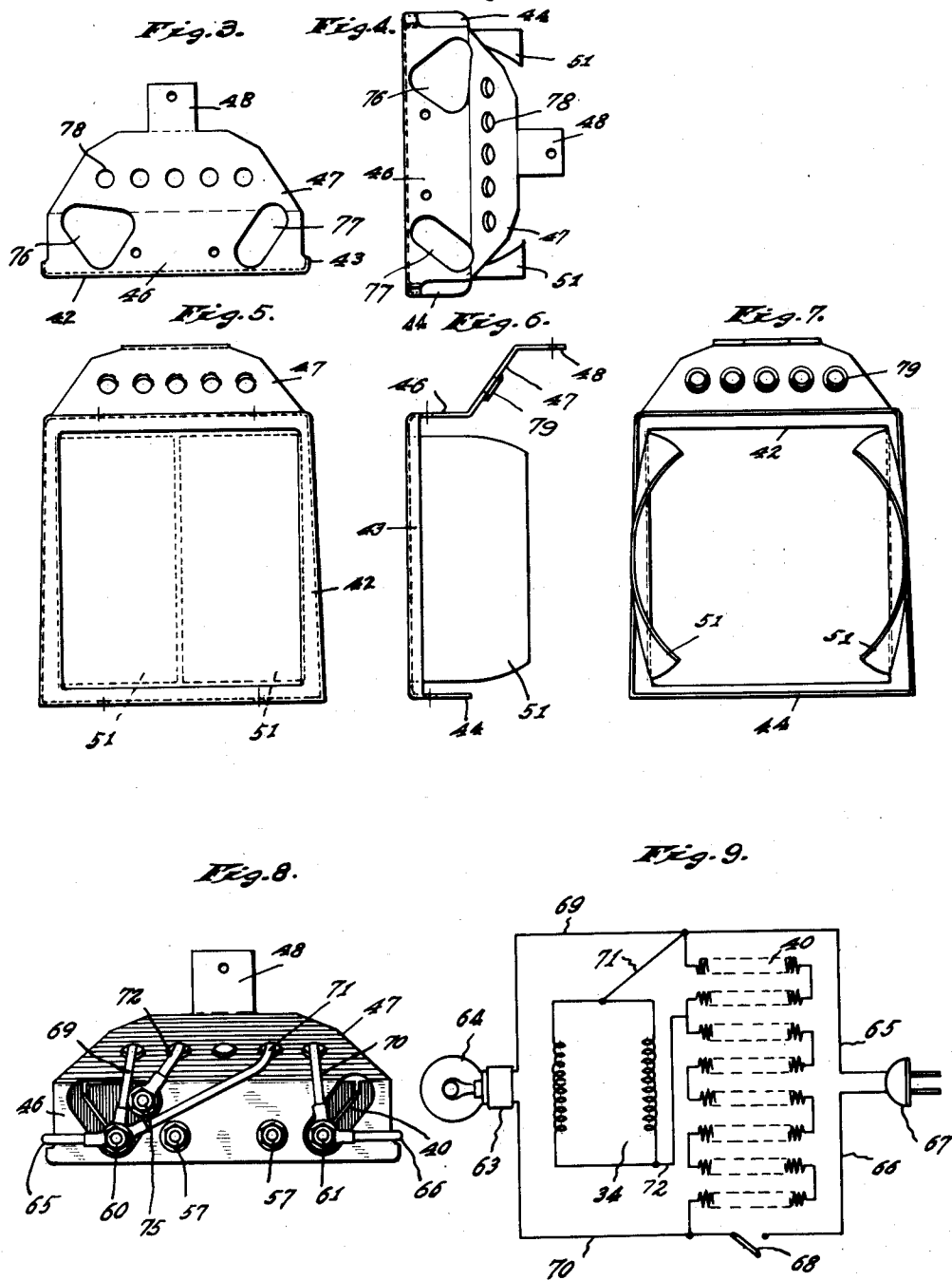
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## UNITED STATES PATENT OFFICE

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## ROOM HEATER

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5 Claims. (Cl. 219—39)

My invention relates to space heaters of the type in which air is acted upon by a fan and caused to pass over an electrical resistance heating element. Broadly, it is the object of my invention to simplify the construction and operation of such heating elements and to lessen the cost of their manufacture. More specifically, it is my object to provide for such a heater a sheet-metal support for the heating element, which support will include portions forming a shroud for the fan. Another object of my invention is to simplify and lessen the cost of manufacture of the casing within which the heating element and fan are enclosed. A further object of my invention is to provide the heater with an improved form of switch-operating mechanism which can readily be operated by the foot of the user.

In carrying out my invention, I form the casing of four sheet-metal parts, namely a base, two opposed side walls, and a strip of sheet metal bent into a general U-shape forming the back, top, and the front walls of the casing, the back and front walls being provided respectively with air admission and air discharge openings. Within the casing I mount a sheet-metal heating-element support which is generally rectangular in shape and has a correspondingly shaped central opening across which the heating-element extends. This opening is formed by bending rearwardly two tongues of sheet-metal which are subsequently curved to form a shroud for a motor-driven fan located in the rear of the heating element. The switch controlling operation of the fan and heating element is of the tumbler type and is mounted in the casing-base with the axis of the tumbler generally horizontal and coaxial with an operating rock-shaft which is connected to the tumbler and extends outwardly through the base where it is provided with an operating pedal by means of which it can readily be rocked either to open or close the switch.

The accompanying drawings illustrate my invention: Fig. 1 is a vertical section through the heater on the line 1—1 of Fig. 2; Fig. 2 is a vertical axial section on the line 2—2 of Fig. 1; Fig. 3 is a top plan view of the heating-element support in partially finished condition; Figs. 4 to 7 inclusive are, respectively, a top plan view, a front elevation, a side elevation, and a rear elevation of the finished heating-element support; Fig. 8 is a view similar to Fig. 4 showing the connections to the heating element mounted in the support; and Fig. 9 is a diagrammatic view illustrating electrical connections.

As will be apparent from Figs. 1 and 2, the heater casing comprises a base 15 having a depending peripheral flange 16 forming front, rear, and side walls. The base is supported from the floor or other supporting surface through the medium of legs 17 which are secured to the lower surface of the base and which are desirably provided with feet 18 of rubber or other resilient material. The upper or main portion of the casing comprises two sides 20 and a single strip of sheet-metal 21 bent into a general inverted U-shape and forming the back, top, and front walls of the casing. Desirably, the sides 20 are provided with inwardly extending flanges 20' which are overlapped by the strip 21 and secured thereto as by spot welding.

For the purpose of attaching the upper portion 20—21 of the casing to the base 15, there is attached to the base a bracket 25 bent from sheet metal into a generally inverted U-shape and having a front wall 26, a top wall 27, and a rear wall 28. The lower ends of the front and rear walls 26 and 28 of the bracket 25 are bent inwardly and secured to the upper wall of the base 15 in any desired manner. The upper portion 20—21 of the casing fits over the bracket 25 and is secured to the front and rear walls 26 and 28 thereof as by means of screws 29.

The front wall of the casing 20—21 is provided with an air outlet opening desirably covered by a grill 31, as shown in Fig. 2; while the rear wall of the casing is provided with a series of louvers 32 affording openings for the entrance of air. For the purpose of facilitating handling of the heater, a tongue 33 in the rear wall of the heater may be bent inwardly to leave an opening for the insertion of the fingers.

Within the upper portion 20—21 of the casing there are disposed an electric motor 34 and a fan 35 driven thereby. The motor is mounted upon a support 36 in the form of a sheet-metal stamping which is secured to the upper wall 27 of the bracket 25 and to the inwardly bent tongue 33.

Also disposed within the casing is an electrical resistance heating element comprising a plurality of parallel, helically coiled stretches of resistance wire 40. The heating element 40 is supported in front of the fan 35 by means of a sheet-metal support illustrated in detail in Figs. 3 to 7 inclusive. This support is in the form of a stamping having a generally rectangular body portion 42 the vertical side edges of which are turned rearwardly to form stiffening flanges 43 and the lower edge of which is turned rearwardly to

form a flange 44 overlying the top wall 27 of the bracket 25.

The upper portion of the heating-element support is bent rearwardly to form a flange having a front portion 46 parallel with the flange 44, an upwardly and rearwardly extending intermediate portion 47, and a generally horizontal rear portion 48 adapted to be attached to the upper end of the motor-bracket 36 as by means of a screw or bolt 49 (Fig. 2). The rear portion 48 may be materially narrower than the body portion of the heater support, and the intermediate portion 47 may taper more or less gradually inwardly toward the rear portion 48.

In the center of the body portion 42 of the heating-element support, I provide a relatively large air-passing opening formed by bending rearwardly out of the plane of the body portion 42 two generally rectangular tongues 51 of sheet-metal. In the operation of cutting out the heating element support, the top, bottom, and inner edges of the tongues 51 are freed from the balance of the blank, but are integrally joined thereto at their outer vertical edges. These tongues, after having been bent to extend rearwardly as indicated in Fig. 4, are curved vertically as shown in Fig. 7 to form a shroud partly encircling the fan 35.

The heating element 40 is carried in the heating-element support through the medium of upper and lower strips of insulating material 55 and 56 secured respectively to the flanges 46 and 44 as by means of bolts 57. The two strips 55 and 56 are provided with a series of aligned slots which receive straight portions of the several stretches of the wire forming the heating element 40, the ends of such heating element being connected to binding posts 60 and 61 mounted in the upper strip 55.

Mounted on the motor bracket 36, conveniently near the top thereof is a socket 63 for an electric light bulb 64 shown in Fig. 9. By employing a red light bulb in the socket 63, a certain amount of red light will emanate from the opening in the front wall of the heating casing, adding to the appearance of the heater when in operation. The pleasing appearance just referred to is enhanced if the socket 63 is mounted above the opening in the front wall of the heater-casing and if the grill 31 is formed of horizontally extending bars having generally horizontal upper surfaces disposed to reflect upwardly and outwardly light from the lamp bulb in the socket 63.

Current for the heater is supplied through wires 65 and 66 leading from a conventional connecting plug 67. These supply wires are connected to the terminals of the heating element 40, one of the supply wires, shown in Fig. 9 as the wire 66, including a switch 68. The lamp socket 63 is connected to the supply wires 65 and 66 by wires 69 and 70. In the particular heater illustrated in the drawing, the motor 34 operates at a voltage materially less than that which is imposed upon the heating element 40, and the heating element 40 is therefore used as voltage-reducer, the motor being connected by wires 71 and 72 across only a portion of the heating element.

Desirably, the connection of the lamp socket 63 and the motor to the supply wires 65 and 66 is effected in the upper heating-element supporting member 55, as will be clear from Fig. 8. To this end, the binding posts 60 and 61, to which the ends of the heating element are respectively connected, project upwardly through the flange-

portion 46, where they receive the ends of the supply wires 65 and 66, respectively. The two wires 69 and 70 leading to the lamp socket 63 are also connected to the two binding posts 60 and 61. The two wires 71 and 72 extending to the motor 34 are connected respectively to the binding post 60 and to a third binding post 75 which is mounted in the insulating member 55 and which is connected to an intermediate point of the heating element 40. The intermediate flange-portion 46 is provided with openings 76 and 77 providing clearance for the several binding posts 60, 61, and 75 and for the terminal portions of the heating element 40.

For the purpose of supporting the wires 69, 70, 71, and 72 free from any possibility of contact with the heating element 40 or the fan 35, these wires desirably extend through openings 78 in the intermediate flange-portion 47. Such openings are formed before the blank is bent to its final form, and their edges are desirably rolled as indicated at 79 to prevent abrasion of the wires which pass through them.

The switch 68, which controls the supply of current to the fan-motor 34, heating element 40, and light socket 63 is desirably a switch of the tumbler type, and is mounted in a recess in the upper wall of the casing-base 15 with its actuating member 81 extending downwardly through a slot in such wall, as will be clear from Figs. 1 and 2. A rock shaft 82, coaxial with the tumbler 81, is supported in the casing-base and projects forwardly through the front-wall thereof, where it is provided with an operating pedal 83. The rear end of the shaft 82 may be supported in a tongue 84 bent downwardly from the upper wall of the casing-base. In rear of the tongue 84, there is pinned to the rock shaft 82 a yoke 85 formed to embrace the tumbler 81 of the switch 68. By employing the foot to rock the pedal 83 in one direction or the other, the switch 68 may be opened and closed at will.

I claim as my invention:

1. In a device of the class described, a casing, said casing comprising a base portion and an upper portion, said upper portion having two opposite side walls formed as sheet-metal stampings provided with inwardly directed flanges at their front, rear, and top edges and an intermediate portion formed as a generally U-shaped strip of sheet metal, the side edges of said intermediate portion overlapping and being secured to said side-wall flanges, said intermediate casing portion being provided in its rear and front walls with air-inlet and air-outlet openings respectively, a fan and fan-driving motor supported from said base within the upper-casing portion, said fan being operable to cause air-flow through such upper casing-portion, and an electrical resistance heating element also supported from said base within the upper casing portion and disposed in the path of air moved by said fan.

2. In a device of the type described, a casing having a base portion and an upper portion, said upper portion having an open lower end, a top wall, side walls, and rear and front walls, the latter walls having air-inlet and air-discharge openings, a fan and fan motor supported from said base, an electrical resistance heating element also supported from said base in the path of air moved by said fan, said upper casing-portion being vertically movable relative to said base alternatively to expose and enclose said fan and heating element, and means for releasably hold-

ing the upper portion of said casing in association with the base.

3. In a device of the type described, a casing having air inlet and discharge openings, a fan for moving air through said casing and disposed therein, an electrical resistance heating element mounted in said casing in the path of air moved by said fan, an electric motor driving said fan, a tumbler switch for controlling the supply of current to said heating element and motor, said switch being mounted in the lower portion of said casing with its axis substantially horizontal, a rock shaft co-axial with said switch and projecting from said casing, an operating pedal on the projecting portion of said rock shaft and having two arms projecting oppositely from the axis thereof, and an operative connection between said rock shaft and switch whereby the latter may be alternatively opened and closed by manipulation of said pedal.

4. In a device of the class described, a combined heating-element support and fan-shroud, said support being in the form of a sheet-metal stamping having an approximately plane main

portion provided with a generally rectangular central opening across which a heating element is adapted to extend, the opening in said support being formed by the rearward bending of two tongues joined to the balance of the support at opposite sides of the central opening therein, said tongues being bent to form a shroud adapted partially to encircle a rotatable fan.

5. In a device of the class described, a combined heating-element support and fan-shroud, said support being in the form of a sheet-metal stamping having an approximately plane main portion provided with a generally rectangular central opening, said support having at the top and bottom of said opening provisions for the mounting of a heating element extending across the opening, said opening being formed by the rearward bending of two tongues joined to the balance of the support at the opposite vertical side edges of the central opening therein, said tongues being bent to form a shroud adapted partially to encircle a rotatable fan.

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