Dec. 27, 1949 C. M. OSTERHELD 2,492,315

AIR HEATER

Filed July 27, 1946

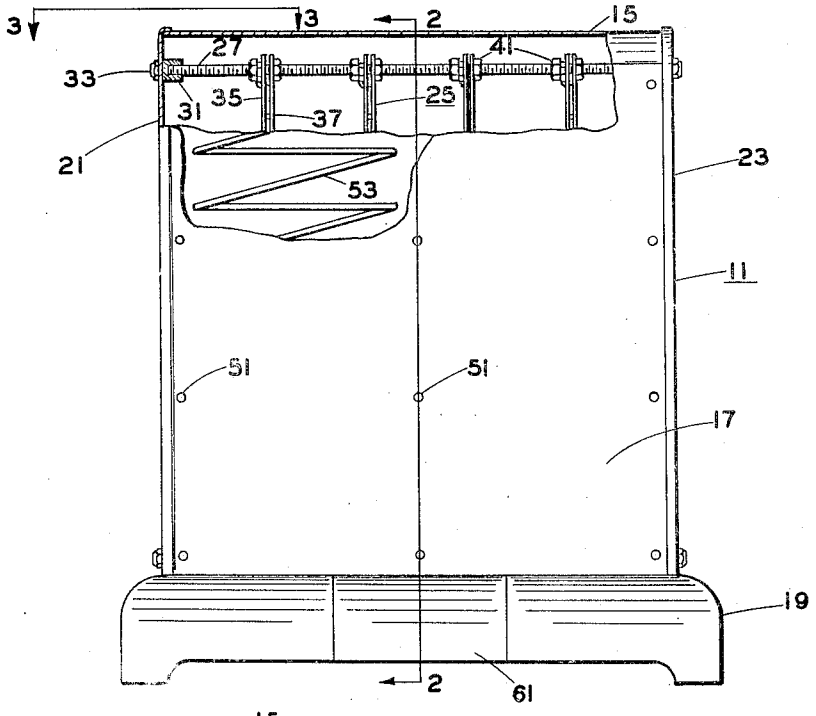


Fig - 1

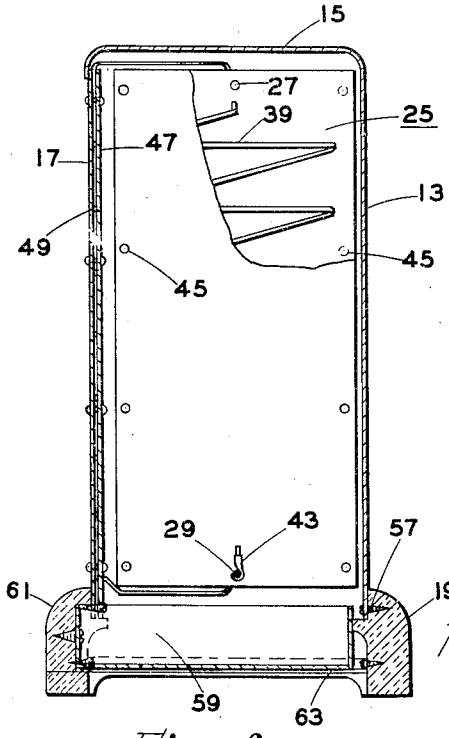


Fig - 2

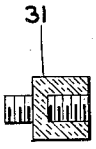


Fig - 4

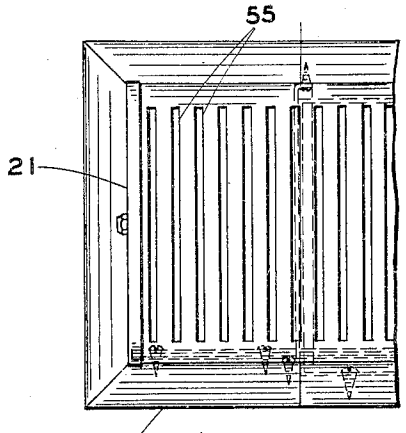


Fig - 3

INVENTOR.
CLARK M. OSTERHELD
BY
H M Bichel
ATTY

Patented Dec. 27, 1949 2,492,315

UNITED STATES PATENT OFFICE

2,492,315

AIR HEATER

Clark M. Osterheld, Stoughton, Wis., assignor to McGraw Electric Company, Elgin, Ill., a corporation of Delaware

Application July 27, 1946, Serial No. 686,755

2 Claims. (Cl. 219—38)

1

My invention relates to electric heaters and particularly to portable electric room and air heaters.

One object of my invention is to provide a novel metallic resistor member for a room heater.

Another object of my invention is to provide a novel support for the metallic resistor of a room heater.

Other objects of my invention will either be apparent from a description of one form of device embodying my invention or will be set forth in the course of such description and particularly in the appended claims.

In the drawings,

Figure 1 is a view mainly in front elevation with parts cut away of an electric room or air heater embodying my invention,

Fig. 2 is a transverse sectional view therethrough taken on the line 2—2 of Fig. 1,

Fig. 3 is a fragmentary, horizontal view thereof taken on the line 3—3 of Fig. 1, and

Fig. 4 is a cross-sectional view of a supporting means.

An electric air or room heater 11 comprises a casing consisting of a rear wall 13 which is integral with a top wall or cover 15. The casing comprises further a front wall 17 as well as a supporting means 19 which I may make of a suitable heat-resisting plastic such as Bakelite. The casing includes further side walls 21 and 23 and it is to be understood that the walls overlap in such manner as to form a pleasing appearance.

Within the casing I provide a plurality of electric heating units 25 here shown as four in number although I do not desire to be limited to such number since there is only a question of the amount of heat to be generated by the heating elements in my improved heater. Thus, for instance, the distance between the individual heaters 25 may be on the order of 3'' to 5'' so that the width of the heater would vary from 15'' to 25''.

I provide a pair of metallic rods 27 and 29, metallic rod 27 being supported by a bushing member 31 of electric-insulating material shown in section in Fig. 4 of the drawings, at each of its ends. The bushing members 31 are held by the side walls 21 and 23 as by individual capped nuts 33 or any other suitable holding means which may be of pleasing appearance.

Each of the heating units 25 comprises a pair of metal sheets 35 and 37 which may be held in proper operative and relatively closely adjacent positions relatively to each other so as to properly hold a resistor conductor 39 therebetween.

2

While I may make resistor conductor 39 of aluminum resistor material, I do not desire to be limited thereto since I may use any metallic resistor member now in use. While I have shown the resistance conductor 39 as comprising a strip I do not desire to be limited to the use of such strip since I may also use a round conductor wire. The resistance conductor 39 extends in zigzag shape from the upper rod 27 to the lower rod 29 and the distance between the individual zigzags as well as the height of the casing of the heater 11 is made such that in combination with a resistance conductor of a given width and thickness, will translate the desired amount of electrical energy into heat.

The nuts 41, one on each side of the pairs of plates 35 and 37, are also used to effect an electric conducting connection between the ends of the resistor 39 as by bending the resistance or a connector 43 around each of the rods 27 and 29.

Means for holding the metallic electric resistor conductor in the proper desired position between each pair of plates 35 and 37 may comprise a plurality of rivets 45 which extend through the two plates 35 and 37 at a number of spaced points particularly at or close to the side edges thereof.

If desired, I may provide another heating unit adjacent to the front surface of the heater by providing a metal plate 47 which is spaced from the front plate 17 by a resistor member 49, a plurality of rivets 51 being provided to hold plates 17 and 47 in tightly assembled positions relatively to each other. In case a relatively small width of electric air heater is made up, the resistance conductor 53 positioned between plates 17 and 47 may extend entirely across the front surface of the heater, but I have shown each convolution of the resistor 53 as extending only across one-half of the total width of the front surface. The material as well as the shape of resistor 53 is the same as is resistor 39.

The material constituting the casing plates as well as the plates 35 and 37 and 47 may be, and preferably is, aluminum and, for example, I may mention that the thickness of a plate may be on the order of .035'' to .06''. While I may make all of these plates of aluminum, I do not desire to be limited thereto since other metals will respond in the desired manner to treatments hereinafter mentioned to provide an electric-insulating coating on the outside surface of said plates.

On the entire outer surface of the resistance conductors 39 and 53 I may provide a coating

comprising an inorganic, integral, high-temperature-resisting, heat-conducting, as well as electric-insulating kind which may be generated on aluminum as by the use of the method set forth in Patent No. 1,526,127. I may also, or as an alternative, provide such a coating on either the inner surfaces of the respective plates **35** and **37** or over their entire outer surface as well as on either the inner surface of plates **17** and **47** although plate **47** may have its entire outer surface covered by such a coating. Generally speaking, the thickness of the coating is on the order of .001'' and will withstand several thousand volts breakdown voltage. The temperature differential between the temperature of the resistor conductor and the outside surface of either of the plates **35** and **37** or of plates **17** and **47** is on the order of 400° F.

The cover portion **15** may be provided with a plurality of slots **55** so as to permit of an upward flow of heated air from the bottom of the heater through the heater, past the heating elements and upwardly and outwardly. Rear plate **13** may be held in proper operative position relatively to support **19** as by a plurality of short screws **57**.

I provide a pan **59** which may be secured to a portion **61** of base member **19** so as to permit of pulling out the pan **59** for the purpose of filling it with water. Means for supporting pan **59** comprises a sheet or a plurality of bars **63** interfitting with base **19**.

The air heater embodying my invention thus provides an electric air heater having a totally encased resistor member in which the heat is transmitted to the metal plates and is radiated by these plates to the air.

While I may provide an electric-insulating coating on only the outer surface of the resistor or on the resistor-engaging surface of the metal plates, I may also provide such coating on both the resistor and the entire outer surface of the metal clamping plates.

Various modifications may be made in the device embodying my invention without departing from the spirit or scope thereof, and all such modifications coming clearly within the scope of the appended claims shall be considered as part of my invention.

I claim as my invention:

1. An electric air heater comprising a substantially rectangular casing, a plurality of spaced metal rods within said casing and supported thereby, a plurality of metallic resistor members, pairs of thin rectangular sheet metal members mounted on said rods and supporting said resistor members, means for clamping each pair of sheet metal members together for supporting a resistor member between them, and an insulating layer between each resistor member and its supporting sheet member comprising an integral, inorganic, high-temperature-resisting, heat-conducting, electric-insulating coating on one of said members.

2. An electric heater comprising a substantially rectangular casing, a pair of spaced metal rods within said casing and supported thereby, a plurality of spaced pairs of thin plates mounted on said rods, a resistor member between the plates of each pair, said resistor extending in zig-zag shape between said rods and having its ends electrically connected to said rods, and means for clamping each pair of plates against the resistors therebetween, the material of said plates and resistors including aluminum, said plates and resistors having thereon an integral, inorganic, heat-conducting, high-temperature-resisting, electrically insulating coating which includes an oxidation product of aluminum.

CLARK M. OSTERHELD.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
768,764	Leonard	Aug. 30, 1904
791,691	Hadaway, Jr.	June 6, 1905
1,305,532	Fulton	June 3, 1919
1,598,753	Spackman	Sept. 7, 1926
1,610,116	Woods et al.	Dec. 7, 1926
2,357,288	Ricard	Sept. 5, 1944
2,360,265	Osterheld	Oct. 10, 1944