March 21, 1933. E. F. HOLINGER 1,902,074

ELECTRIC HOUSE HEATER

Filed May 27, 1930 2 Sheets-Sheet 1

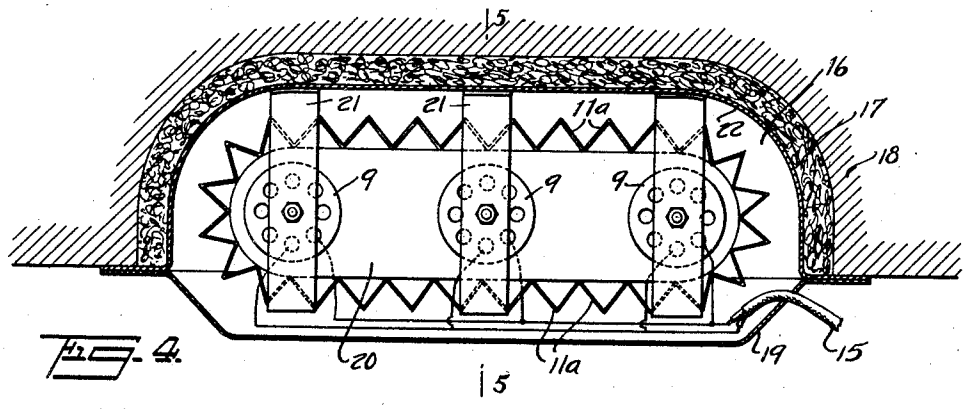


FIG. 4.

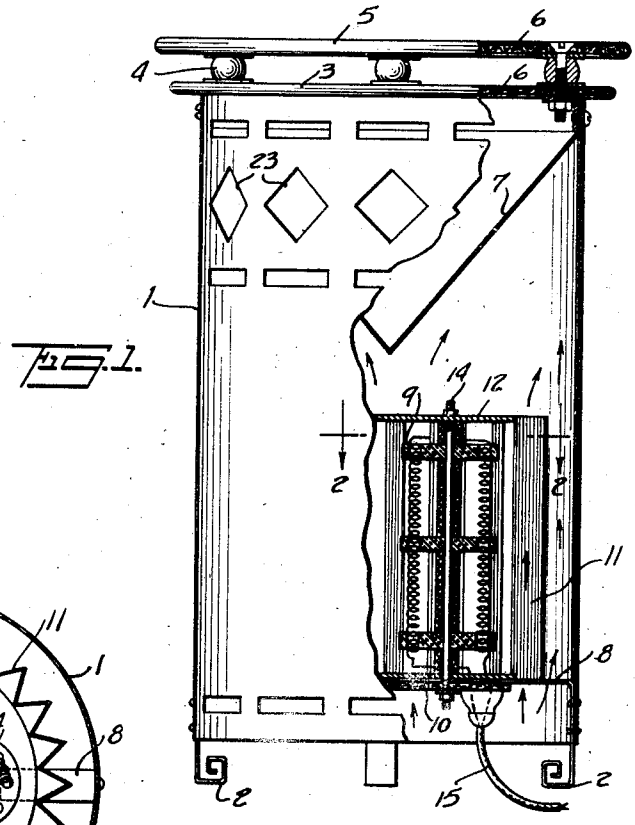


FIG. 1.

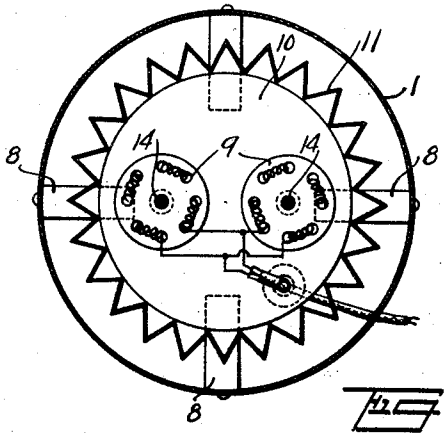


FIG. 2.

INVENTOR
Emil F. Holinger.
BY
ATTORNEY

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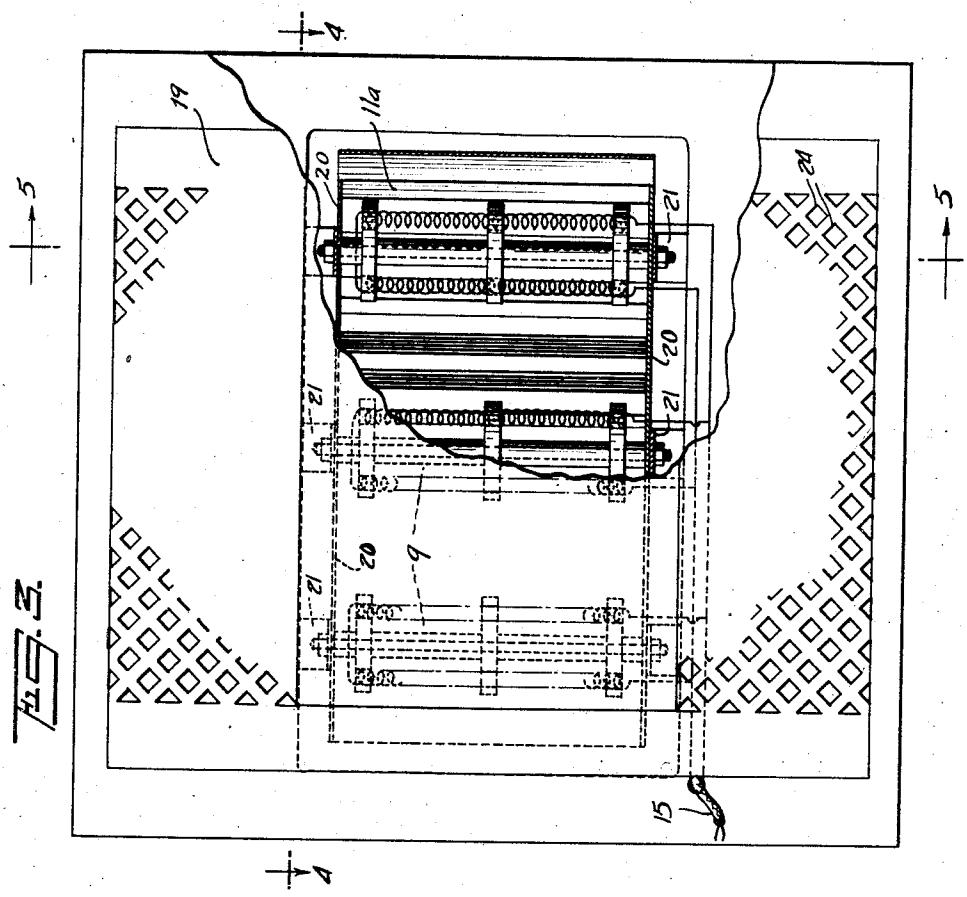


Fig. 4.

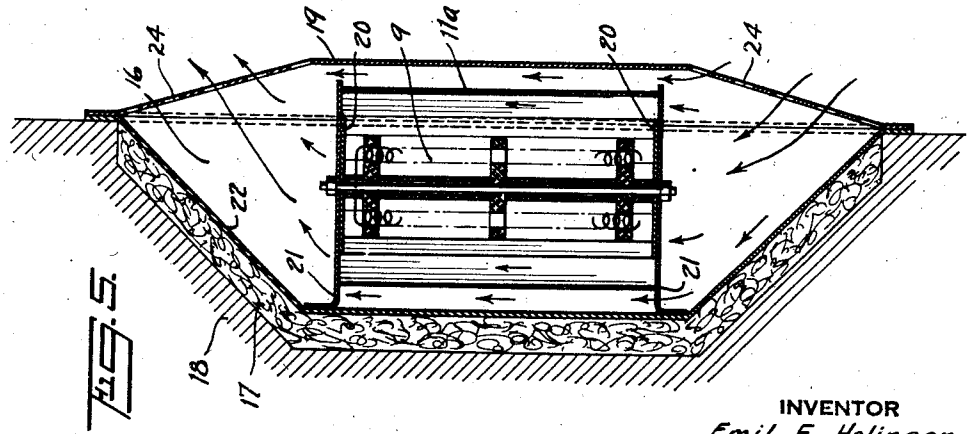


Fig. 5.

INVENTOR
Emil F. Holinger.
BY
ATTORNEY

Patented Mar. 21, 1933

1,902,074

UNITED STATES PATENT OFFICE

EMIL F. HOLINGER, OF NEW YORK, N. Y., ASSIGNOR TO HUDSON ELECTRICAL HEATING CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

ELECTRIC HOUSE HEATER

Application filed May 27, 1930. Serial No. 456,033.

This invention relates generally to the heating of rooms or compartments of any kind, but is more specifically designed for the production of an efficient form of heater which may be either built in portable form or installed in a wall cavity, and in either case heat the adjacent air almost entirely by convection. As is well known, a fine wire or ribbon resistor in an electric heater gives off a considerable percentage of its liberated heat by radiation, the warming effect of which decreases as the square of the distance from the source. The result is that persons near such heater are liable to have their garments scorched, while those a little distance away do not get sufficient heat. The object of the present invention is to apply all such radiant heat to the warming of air currents thereby produced, so that the entire atmosphere of the room to be heated is raised in temperature to an equable degree by convection. To this end the resistor, preferably arranged in vertically elongated form, is surrounded by a sheet of corrugated metal, or other heat absorbing material, which is looped about the resistor so as to form a short, open ended, vertically arranged conduit with corrugations running lengthwise of the walls thereof. This sheathing receives the radiant heat and transmits it to the divided currents of air flowing up along said corrugations and then spreading about the room in which the heater is located, evenly warming the same.

In the accompanying two sheets of drawings are illustrated two arrangements of the invention, one forming a portable heater which stands on the floor, and the other adapted to be installed in a wall cavity. In said drawings:

Fig. 1 is a side elevation of the portable heater with parts broken away and others shown in section.

Fig. 2 is a horizontal section on line 2—2 of Fig. 1.

Fig. 3 is a front elevation of a wall heater with parts broken away and others shown in section.

Fig. 4 is a horizontal section on line 4—4 of Fig. 3, and

Fig. 5 is a vertical section on line 5—5 of either Fig. 3 or 4.

Throughout the drawings like reference characters indicate like parts. Referring to Figs. 1 and 2, a tabouret heater is there shown having the vertically arranged cylindrical outer shell 1, the lower end of which is supported away from the floor by feet 2, 2. There is a top plate 3 preferably made hollow and filled with asbestos or other non-heat-conducting material. Also a similar plate 5 may be supported above and spaced away from plate 3 by ornamental spacing elements 4, 4. This may serve as a tabouret top.

The cylinder 1 has openings 23, 23, in its walls near either end which may be given an ornamental outline. Copper, polished brass or chromium plated steel may be used for also making exposed parts of the structure combine to produce an artistic effect. Within the shell 1 are located one or more elongated resistor units of any preferred construction, as indicated generally at 9, 9. These units are held together by top and bottom baffle plates 10 and 12, and are supported by projections 8, 8, from the shell interior. These projections may be metal strips also bent downward to form the legs 2, 2, as shown in Fig. 1.

11 is a piece of corrugated sheathing, of heat absorbing and conducting material, such as metal, looped to form a substantially cylindrical, open-ended, short, vertically extending conduit in which the resistor units 9, 9, are placed. The top and bottom baffle plates 10 and 12 do not extend beyond the inner apices of the corrugations so that there are formed a series of vertical, open-ended channels surrounding the resistor units, through which channels air may flow as indicated by the arrows in Fig. 1 and thereby receive heat radiated from the resistors and absorbed by the corrugated sheathing, to be promptly given up to the air so passing along both the inner and outer channels formed by such corrugations.

7 is an inverted cone, preferably made of polished metal, the base of which fills the top of the cylindrical shell 1 and serves to deflect the rising air currents to the openings

23 in the top of the shell through which the warmed air is distributed about the room. As this cone prevents direct access of heat to the top plate 3, and the spaced away top plate 5 is separated from plate 3 by an air space, little heat is carried to plate 5, so that objects may be placed on it, as on an ordinary tabouret, without being heated above room temperature. Current is supplied to the resistors 9, 9, by cable 15, so that the heater may be moved about the room as a unit and placed in whatever location is most desirable, or which is to be more effectively heated.

Referring to Figs. 3, 4 and 5, a similar elongated resistor unit 9, or series thereof, may be installed in a cavity 16 in the building wall 18 and hidden from view by an ornamental cover plate 19. Preferably such plate is bulged outwardly from the cavity 16, as clearly shown in Figs. 4 and 5, and provided with air passage openings 24, near its upper and lower edges, this bringing said openings in the inclined portions of the plate 19. As shown, the three resistor units 9, 9, are here supported by brackets 21, 21, which may be riveted or welded to the metal lining 22, of cavity 16. The space between said lining 22 and the wall 18 may be filled with loose asbestos fibre or other heat insulating material, as indicated at 17 in Figs. 4 and 5.

11*a* is corrugated sheathing looped about the resistor units, as previously described with reference to Figs. 1 and 2, and 20, 20, are elongated top and bottom baffle plates, the outer edges of which do not extend beyond the inner apices of the corrugations. This leaves, as before, a plurality of vertical air channels open at the top and bottom formed by the corrugations of sheathing 11*a* along which air may flow in passing from the lower cover plate openings 24 up to the upper openings 24, as shown by the arrows in Fig. 5. Either of the above described embodiments of the invention will form an efficient heater for raising the temperature of the entire atmosphere of the room to an effective extent, while no unpleasantly high temperature is produced in the immediate neighborhood of the heater.

Various changes could be made in the details of construction described and illustrated without departing from the underlying principle of the invention, as hereinbefore explained. Other forms of resistor unit could be employed, the form of outer casing varied, and the manner of supporting the units modified so long as the feature of the corrugated sheathing surrounding said units is retained and so disposed as to form inner and outer channels for upwardly flowing currents of heated air.

Having described my invention, I claim:

1. An electric heater comprising a resistor unit and a surrounding casing therefor comprising a substantially continuous loop of corrugated sheathing, the corrugations of which are arranged vertically to form air passages open at the top and bottom combined with baffle plates located at the top and bottom of said sheathing but not extending beyond the inner apices of the corrugations therein.

2. An electric heater apparatus comprising, in combination, an outer envelope having perforations in its walls near the upper and lower edges thereof, and an inner casing of corrugated sheathing arranged to form a conduit with longitudinally corrugated walls, said corrugations extending vertically and said conduit having its upper end below the level of the openings in the upper portion of the outer envelope wall and its lower end above the openings in the lower portion of said walls, together with a resistor unit mounted in said corrugated conduit; whereby air entering the lower wall openings of the outer envelope may flow up along the channels on both the inside and outside of said conduit formed by corrugations therein, and escape through the upper opening in the envelope wall.

3. A structure such as defined in claim 2 combined with an inclined baffle member located above the upper end of said conduit and adapted to guide the heated air currents to said exit openings in the envelope wall.

4. A structure such as defined in claim 2 combined with baffle plates located at the ends of said conduit but not extending beyond the inner apices of the corrugations therein.

5. In an electric heater the combination of a resistor unit, a surrounding casing therefor comprising a substantially continuous loop of corrugated sheathing the corrugations of which are arranged vertically to form air passages open at the top and bottom and a second exterior casing spaced away from the first and having tapering top and bottom portions whereby it is adapted to be partially nested in a recess in the wall of a building, the upper and lower then exposed portions of said second casing having perforations for the passage of air therethrough to and from the vertical heating channels formed by the hereinbefore described structure.

6. In a portable electric heater the combination of a cylindrical outer shell having openings near each end, an inner casing of corrugated sheathing arranged to form a substantially cylindrical, longitudinally corrugated conduit, with open ends, extending lengthwise of said cylindrical shell, an elongated resistor unit located in said conduit and extending substantially parallel to the axis thereof, and baffle plates extending part way across each end of said conduit, but leaving the ends of channels formed by the corrugations therein open.

7. In a portable electrical heater the combination of a vertically disposed cylindrical outer shell having its upper end closed, and openings near each end thereof, an inner casing of corrugated sheathing arranged to form a substantially cylindrical, longitudinally corrugated conduit, with open ends, extending lengthwise of said cylindrical shell, an elongated resistor unit located in said conduit and extending substantially parallel to the axis thereof, and a disc supported, but spaced away from, the upper end of said outer cylindrical shell, and short supporting legs attached to its other end; whereby the structure may also be used as a stool.

8. In a portable electric heater the combination of a cylindrical outer shell having openings near each end, an inner casing of corrugated sheathing arranged to form a substantially cylindrical, longitudinally corrugated conduit, with open ends, extending lengthwise of said cylindrical shell, an elongated resistor unit located in said conduit and extending substantially parallel to the axis thereof, and a reentrant cone located in one end of said cylindrical shell; whereby, when the structure is supported in position with that end uppermost, upwardly flowing currents of air will be deflected by said cone to the openings in the wall of the shell located near the base of the inverted cone, together with a disc supported and spaced away from the same end of said shell.

Signed at New York city in the county of New York and State of New York this 10th day of May, A. D. 1930.

EMIL F. HOLINGER.