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2,606,992

AIR HEATER

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Fig. 1

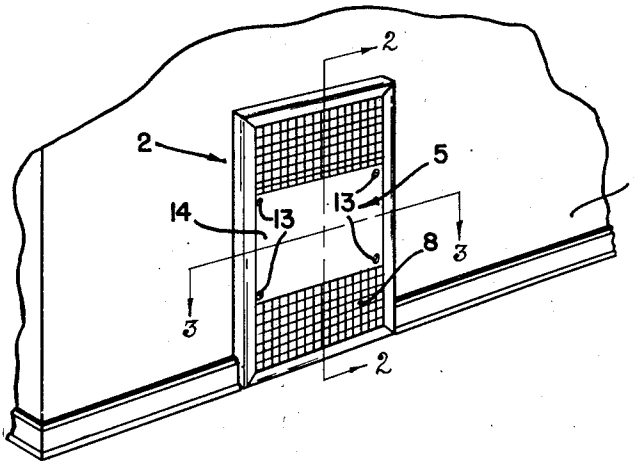


Fig. 2

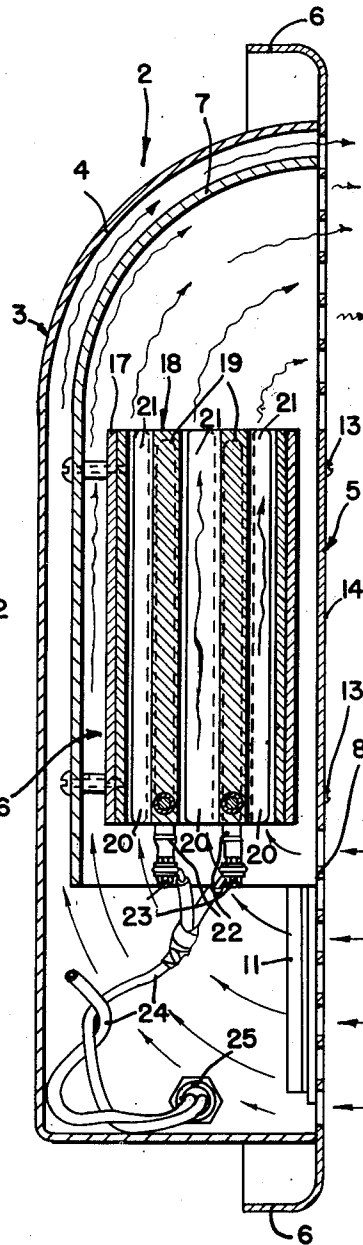


Fig. 3

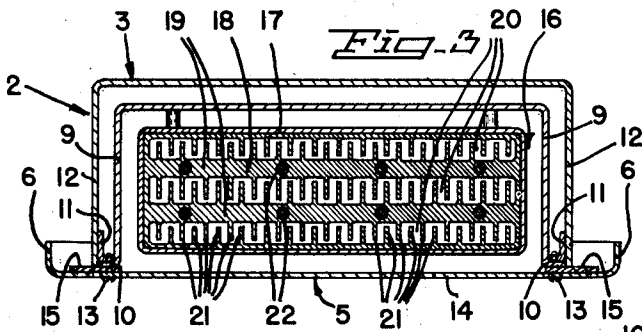
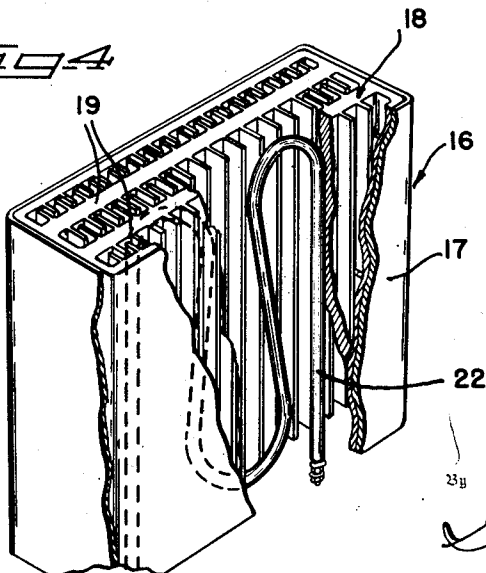


Fig. 4



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AIR HEATER

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1 Claim. (Cl. 219—34)

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This invention relates to an air heater by means of which air may be heated and circulated in a room of a house or other enclosed structure.

One object of the invention is to provide a heater of such construction that it may be mounted in a wall of a room in such position that cold air may be withdrawn from the room into the heater where it is heated and then discharged into the room to heat the room.

Another object of the invention is to provide an air heater having a casing including a front wall provided with upper and lower perforated portions through which air passes, the intermediate portion of the front wall being unperforated so that air entering the casing through the perforated lower portion of the front wall will flow upwardly therein in order to flow out through the perforated upper portion of the front wall and in so doing be heated by a heating unit mounted in the casing back of the unperforated intermediate portion of the front wall.

Another object of the invention is to provide an air heater wherein a heating unit is mounted in a casing having a front wall formed with air passages in its upper and lower portions, the heating unit being enclosed in a shell serving as a deflector for guiding air towards the outlets in the upper portion of the front wall and also as a support for the heating unit.

Another object of the invention is to provide an improved heating unit which consists of a metal jacket surrounding a core formed with vertically extending air passages through which extend fins which assist in heating air passing upwardly through the air passages.

Another object of the invention is to provide the heating unit with heating coils so mounted and arranged that they will serve very effectively to heat the core and its fins and thus cause upwardly moving air to be heated in a very efficient manner.

The invention is illustrated in the accompanying drawings wherein:

Fig. 1 is a perspective view showing the improved air heater mounted in a wall of a room in position for use.

Fig. 2 is a sectional view upon an enlarged scale taken vertically through the air heater upon the line 2—2 of Figure 1.

Fig. 3 is a horizontal sectional view taken along the line 3—3 of Figure 1.

Fig. 4 is a perspective view of the heating unit with portions in section.

This improved air heater is primarily intended for heating air in a house or room of a house but

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it will be understood that it may be used for heating other enclosed structures. In Figure 1 there has been shown a portion of a room of a house having a wall 1, and referring to this figure it will be seen that the heater, which is indicated in general by the number 2, is mounted in the wall and located close to the floor of the room so that cold air may readily enter the heater where it is heated and returned to the room. The heater is preferably located between vertical studdings of the wall but may be mounted in a recess formed therein in the case of a solid wall.

This heater 1 has a casing 3 which is formed of metal and is open at its front; the upper portion 4 of the rear wall of the casing being curved forwardly as shown in Figure 2. The front of the casing is closed by a removable front wall 5 which is of greater dimensions than the casing and has marginal portions formed with rearwardly projecting flanges 6 which are spaced from side edges and upper and lower ends of the casing and bear against the wall in spaced relation to an opening in the wall through which the heater is mounted. The marginal portions of the front wall form an ornamental border for this wall and impart a pleasing appearance to the heater when it is installed in a wall.

Within the casing is a shell 7 which is formed of aluminum or other suitable sheet metal and conforms to the shape of the casing. This shell is open at its front and also at its lower end, the lower end of the shell being disposed in slightly overlapping relation to the perforated lower portion 8 of the front wall 5 and the upper end portion of the shell substantially enclosing the perforated upper portion 8 of the front wall. The side walls 9 of the shell have their front edge portions bent to form outstanding flanges 10 which bear against front faces of the inwardly extending flanges of angle metal strips 11 carried by and extending vertically along inner surfaces of the side walls 12 of the casing 3 and when screws 13 are passed through openings in opposite side edge portions of the unperforated intermediate portion 14 of the front wall 5 and screws into threaded openings formed in the flanges of the strips 11 the front wall will be firmly held in closing relation to the front of the casing and the shell 7 supported in the casing in spaced relation to the walls of the casing. Since the upper portion of the rear wall of the shell is curved forwardly in conformity to the curvature of the upper portion 4 of the rear wall of the casing it will serve very effectively to direct upwardly moving air in the casing and the shell towards the perforated outlet portion of

the front wall. Portions of the front wall through which the screws pass and against which the flanges 10 bear are reinforced by metal plates or strips 15 which are preferably strips extending along inner surfaces of the side portions of the front wall. When the screws are removed the front wall is released and may be removed from the casing.

Within the shell is mounted a heating unit 16 having a jacket 17 formed of steel. The jacket is elongated vertically and open at its upper and lower ends, and within this jacket fits a core 18 which is also preferably formed of aluminum which is a good heat carrier. The core has side walls and front and rear walls which fit closely against corresponding walls of the jacket, and between its side walls extend webs or partitions 19 which extend the full height of the core and divide the core into a plurality of air passages 20 open at their upper and lower ends so that cold air entering the casing 3 through the perforated lower portion of the front wall 5 may flow upwardly through these passages and be heated and then flow outwardly through the perforated upper portion of the front wall. Fins or strips 21 project laterally from the webs 19 and the front and rear walls of the core and are so arranged that the fins projecting from opposite walls of each air passage are disposed in spaced and staggered relation to each other. These fins become highly heated by heat given off by the webs and the walls of the core and greatly increase the heating effect of the core upon air flowing upwardly through the air passages.

The heating element for the core consists of resistance coils 22 formed of conductive metal and having interconnected portions extending upwardly and downwardly in the webs or partitions 19 with their ends protruding from the lower end of the core and provided with terminals 23 to which power wires 24 are attached. The power wires are threaded through a sleeve 25 mounted through the lower portion of one side wall of the casing and may be of any desired length and have their outer ends suitably connected with a wiring system of a house.

Having thus described the invention, what is claimed is:

A heating unit for an air unit comprising a

vertically disposed metal jacket open at its top and bottom and having side walls and end walls, a core of heat conducting material fitting snugly within said jacket and corresponding to the internal dimensions of the jacket and having side walls and end walls in close fitting engagement with inner surfaces of the side walls and end walls of the jacket, vertical partitions spaced transversely from each other and from the side walls of the core and defining vertical air passages between and at opposite sides of the partitions, said partitions being of greater thickness than the said side walls of the core and extending between the end walls of the core and having their ends integrally united with the said end walls of the core, fins integral with the partitions and the side walls of the core and projecting laterally therefrom for their full depth across said air passages in overlapping relation to each other and having free outer side edges and electrically energized heating means consisting of resistance coils embedded in said partitions and each having interconnected portions spaced transversely from each other, said coils having ends protruding from the partitions and adapted for connection with power wires.

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