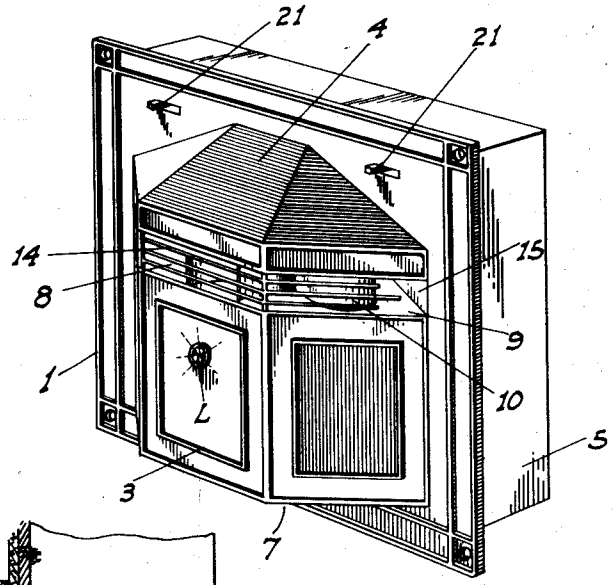
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ELECTRIC WALL HEATER

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Fig. 1



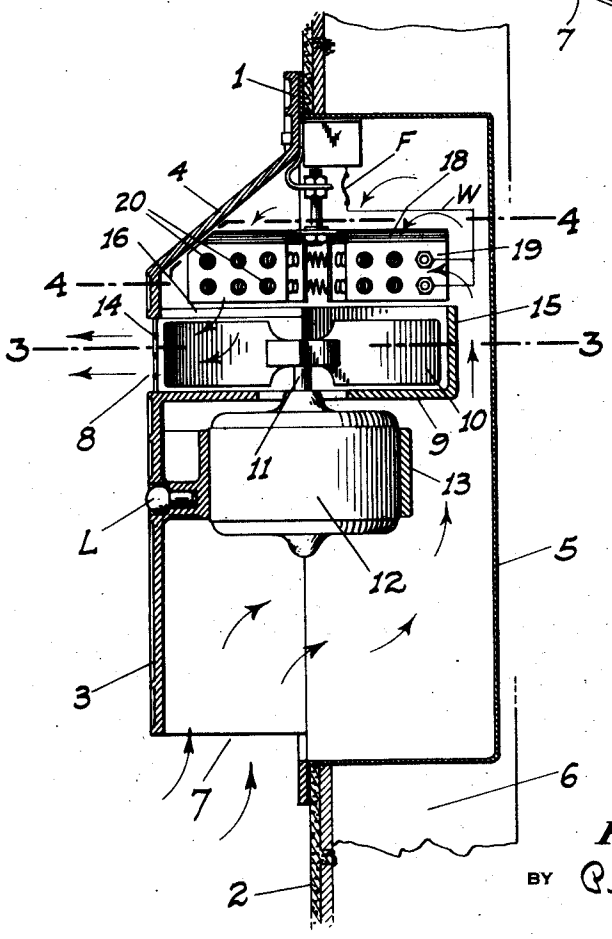


Fig. 2

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Fig. 3

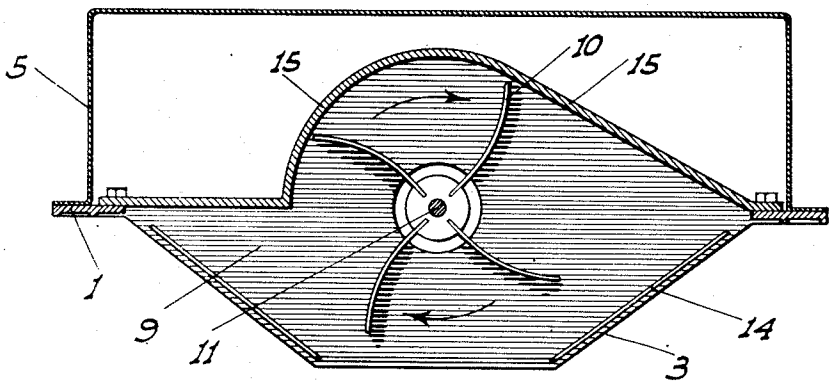


Fig. 4

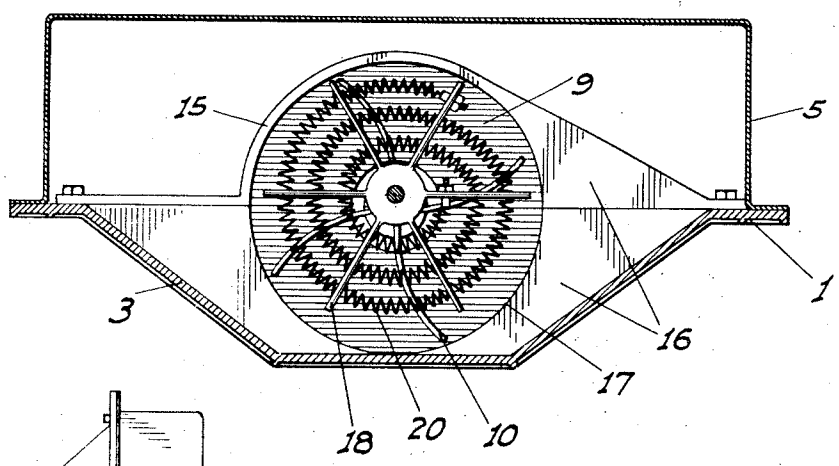
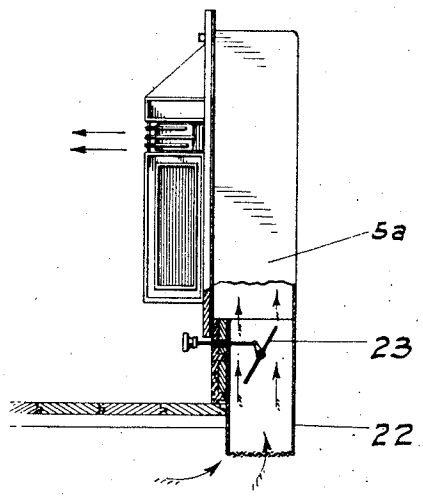


Fig. 5



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UNITED STATES PATENT OFFICE

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ELECTRIC WALL HEATER

Application filed November 2, 1929. Serial No. 404,303.

This invention relates to electric room heaters, having certain features in common, as far as the principle of operation is concerned, with the heater shown in my copending application for Patent Serial No. 379,433, dated July 19, 1929.

The apparatus in said copending application however is of a portable nature, and the principal object of the present invention is to provide a heater of this general character which is adapted to be permanently mounted in connection with the wall of a room, and in which the operating parts are so arranged that a horizontally directed fan shaped current of heated air will be thrown into the room from practically the entire width of the heater. Also said operating parts are so arranged that the heater does not project into the room sufficiently to-present a bulky appearance or interfere to any extent with the furniture or fittings, nor does it project back of the wall surface a greater distance than the width of a normal wooden-building wall. The heater as a whole may be easily mounted in place in such a house of standard construction, either when the same is being erected or after it is completed, without having to alter the standard spacing of the studding or other constructional features of the building.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purpose for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Fig. 1 is a perspective view of my improved heater detached.

Fig. 2 is a vertical transverse section of the same as erected in place.

Fig. 3 is a sectional plan taken on the line 3—3 of Fig. 2.

Fig. 4 is a similar view taken on the line 4—4 of Fig. 2.

Fig. 5 is an end view of the heater showing a modified form of air intake arrangement of the same.

Referring now more particularly to the characters of reference on the drawings, and particularly at present to Figs. 1 to 4, the numeral 1 denotes the front panel of the heater—preferably a cast plate of rectangular outline and ornamental appearance, adapted to be abutted against the outer face of a wall 2 and to be secured in place adjacent its corners by suitable means.

This panel is formed with an outwardly projecting swell or hood 3 of polygonal sided or other suitable contour in a horizontal plane, and extending nearly the entire width of the panel. The bottom of the hood is near the bottom of the panel and is freely open to the area back of the same, while the walls of said hood at their upper end converge to a junction with the panel adjacent its top, as shown at 4, so that the hood is closed at its upper end. Abutting against the back of the panel all along the same adjacent its periphery is an air box 5 of sheet metal or the like which projects into the wall between adjacent studs 6 of the same and of slightly lesser depth than the width of the studding. Said panel (of which the hood is an integral part) and the air box therefore form an air chamber, the intake to which lies in a horizontal plane at the bottom of the hood and for its full width, as shown at 7.

Intermediate the top and bottom of the hood but near the top and a short distance below the converging walls 4, said hood is formed with a horizontal slot-like opening 8 extending from end to end of the hood; the opening itself being of course in a vertical plane. Projecting inwardly from the lower edge of said opening from end to end thereof is a horizontal wall 9, above which is disposed a centrifugal fan 10, the plates of which are substantially the same height as the opening 8 and lying in the same horizontal plane as said opening. This fan is fixed on a vertical shaft 11 symmetrically disposed relative to the width of the hood and panel and depending through an opening in the wall 9 to a direct connection with

an electric motor 12. This motor is disposed just under the wall 9 and is held against movement by a suitable clamping saddle 13 mounted in connection with the panel. The diameter of the fan is such that the circle of the outer edges of the blades approach close to the opening 8 at one point, which opening is protected by spaced wires 14 or similar screening means arranged so that there is no danger of a person inserting a finger into the opening and being struck by the revolving fan blades.

Projecting upwardly from the back wall 9 is a vertical wall 15, substantially the same height as the opening 8 and extending the full length of the opening and hood. This wall from one end extends parallel to and adjacent the plane of the panel 1 to adjacent the plane of the fan-blade circle, then extends concentric with said fan, and finally extends tangent to said circular portion to the opposite end of the hood and opening 8, as shown in Fig. 3.

Another horizontal wall 16 projects inwardly from the hood at the top of the opening 8, said wall 16 extending to the wall 15 and being provided with a central opening 17 substantially the same size as the fan and concentric therewith.

It will therefore be seen that said different walls form a housing for the fan, so that air to reach the fan from the intake 7 must pass above the walls 9, 15 and 16 and through the opening 17, but will be discharged throughout the length of the opening 8. The contour of the wall 15 is arranged in the particular manner above set forth and relative to the direction of rotation of the fan, so that the air as thrown centrifugally by the fan will be discharged in a horizontal layer and of fan-shaped form of substantially equal volume throughout the length of the opening 8. This avoids uneven air pressures or volumes being had on one side or the other of the plane of the fan which would cause a lesser amount of air to be thrown from one side of the opening than from the other.

Suspended from behind the panel above and substantially concentric with the opening 7 is a horizontal spider 18 from the arms of which radially disposed mica sheets 19 depend. These sheets support a bare electric heating element coil 20, which is disposed in as close relation to the opening 17 as possible. The air as drawn upwardly from the opening 7 by the rotation of the fan and passing to the fan from above the wall 16 as above stated, therefore comes in contact with the element coil before being discharged into the room.

The wiring circuits for the fan motor and heating coil are intended to be separate from each other so that they can be operated separately; a pilot or signal light L being preferably arranged in the element circuit and located on the outside of the panel, as shown, so as to indicate to the operator whether the element is functioning or not. Hand operated switches 21 of suitable form project from the front of the panel as shown in Fig. 1 so that the circuits can be independently controlled, as may be desired. The above mentioned wiring is not shown herein, however, since it obviously may be of a very simple nature, such as any electrician can arrange, and such showing is not necessary nor would it aid in an understanding of the structural features of the apparatus.

One of the wires W to the element however, between the switch and element and in the zone of heat generated by the element, would preferably have a fuse link F interposed therein. This would cause the circuit to the element to be broken if excessive heat were present in the box above the element, as would occur if the fan failed to function, and which might be a source of fire hazard.

By reason of the provision of the outwardly projecting hood, a motor and fan unit of considerable size may be used without the device having to project so far back of the panel as to be incapable of being mounted in a wall of standard width.

It will be noted that the air is thrown in a horizontal layer through the slot 8 over a wide area, while the cold air is drawn into the heater from below said layer. A tendency to vacuum is therefore induced in the room below the heated layer, which remains in the form of a stratum of substantially definite depth, and does not materially tend to rise toward the ceiling, but is distributed where it is of the most benefit to those in the room.

In the structure as above described the heated air is projected into the room in a horizontal layer some distance above the floor and is returned to the heater by the action of the fan, only through the discharge opening 8. If desired, however, the device may be used for cooling purposes in warm weather without using the heating element and depending only on the circulation of air in the room as induced by the operation of the fan. This cooling action is increased if the modified structure shown in Fig. 5 is used. In this structure the air box 5a has an intake passage member 22 depending into the cellar or basement, where the air is usually cooler than on the main floor, and which air is of course drawn up to the fan by the rotative action thereof and thrown into the room. With this arrangement a damper 23 is preferably provided so as to shut off the passage 22 when it is desired to operate the device for room-air circulating and heating purposes only.

From the foregoing specification it will be readily seen that I have produced such a de-

vice as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention what I claim as new and useful and desire to secure by Letters Patent is:

1. An electric wall heater including a front panel adapted to abut against and be secured to a wall, means forming with said panel an air chamber behind the same, the panel having an air discharge opening disposed in a vertical plane, and an air intake opening below the discharge opening, means in the chamber for positively circulating air from the intake to the discharge opening, and a heating element in said chamber to which the air is subjected during its passage through the chamber.

2. A wall air circulating device including a front panel adapted to abut against and be secured to a wall, means forming with said panel an air chamber behind the same, the panel having a transverse air discharge slot toward its upper end disposed in a vertical plane, and an air intake opening below the slot, and means in the chamber for positively drawing air upwardly from the intake opening and discharging it horizontally through the slot.

3. A wall air circulating device including a front panel adapted to abut against and be secured to a wall, means forming with said panel an air chamber behind the same, the chamber having an air discharge opening cut in the panel and having also an air intake opening below the discharge opening, and means in the chamber for drawing air upwardly through the intake and projecting it through the discharge opening.

4. A wall air circulating device including a front panel adapted to abut against and be secured to a wall, means forming with said panel an air chamber behind the same, the panel having a transverse air discharge slot toward its upper end disposed in a vertical plane and an air intake opening below the slot, a horizontal centrifugal fan in the chamber in the plane of the slot to discharge air therethrough, an electric heating element in the chamber, and a wall structure arranged in connection with the fan, element and panel to cause air drawn toward the fan from the intake opening with the operation of the fan to contact with the element before it can be discharged through the slot.

5. A wall air circulating device including a front panel adapted to abut against and be secured to a wall, means forming with said panel an air chamber behind the same, the panel having a transverse air discharge slot toward its upper end disposed in a vertical plane and an air intake opening below the slot, a horizontal centrifugal fan in the chamber in the plane of the slot to discharge air therethrough, an electric heating element in the chamber, a wall structure arranged in connection with the fan and slot to cause the air as thrown centrifugally by the fan to be distributed evenly over the full length of the slot, and a heating element in the chamber in the path of the air passing to the fan from the intake opening.

6. A wall air circulating device including a front panel adapted to abut against and be secured to a wall, means forming with said panel an air chamber behind the same, the panel having a transverse air discharge slot toward its upper end disposed in a vertical plane and an air intake opening below the slot, a horizontal centrifugal fan in the chamber in the plane of the slot to discharge air therethrough, an electric heating coil in the chamber above and substantially axial with the fan, and a housing for the fan of which the slot is the discharge opening and which is provided with a top opening below the coil.

7. A wall air circulating device including a front panel adapted to abut against and be secured to a wall, means forming with said panel an air chamber behind the same, the panel having a transverse air discharge slot toward its upper end disposed in a vertical plane and an air intake opening below the slot, a horizontal centrifugal fan in the chamber in the plane of the slot to discharge air therethrough, an electric heating element in the chamber directly above the fan and exposed to the air in the chamber, and a housing structure about the fan arranged to cause air drawn upwardly from the intake to come in contact with the element before it can be engaged by the fan and discharged through the slot.

8. A wall air circulating device including a front panel adapted to abut against and be secured to a wall, means forming with said panel an air chamber behind the same, the panel having a transverse air discharge slot toward its upper end disposed in a vertical plane and an air intake opening below the slot, a horizontal centrifugal fan in the chamber in the plane of the slot to discharge air therethrough, an electric heating element in the chamber directly above the fan and exposed to the air in the chamber, a horizontal wall extending into the chamber from the bottom of the slot and under the fan to the back of the same, another horizontal wall extending into the chamber from the top of the of the slot between the fan and element and having an opening centrally of the fan to provide an air communicating passage therebetween, and a vertical wall extending from end to end of the slot and between the back

edges of the horizontal walls behind the fan.

9. An electric air heater comprising a structure forming an air chamber, said chamber having spaced air intake and outlet openings, a fan in the chamber arranged to cause air to be circulated from the intake to the outlet, an electric heater in the chamber positioned so that the circulating air will come in contact with the heater before reaching the outlet, a circuit for the heater, and a fuse link adapted to be affected by radiant heat above a predetermined degree interposed in the circuit and positioned in the chamber adjacent the heater.

10. An electric wall heater comprising a front panel having a flat edge portion adapted to abut against and be secured to a wall, said panel having an air outlet opening and an intake opening below the outlet, an electric heater behind the panel, means directly supporting the heater from the panel, an electric fan and motor unit behind the panel, means directly mounting said unit from the panel, and a box member separate from the panel and forming, with said panel, an enclosure for the heater and fan unit.

11. An electric wall heater comprising a front panel having a flat edge portion adapted to abut against and be secured to a wall, said panel being formed intermediate its edges with an outward bulge portion freely open only at the bottom to the area behind the panel, said bulge having a transversely extending slot toward its upper end, an electric heater disposed behind the panel partly within the bulge area and partly within the wall area back of the panel, and a similarly disposed fan and motor unit mounted in connection with the panel.

In testimony whereof I affix my signature.

HUGH G. LANDIS.