

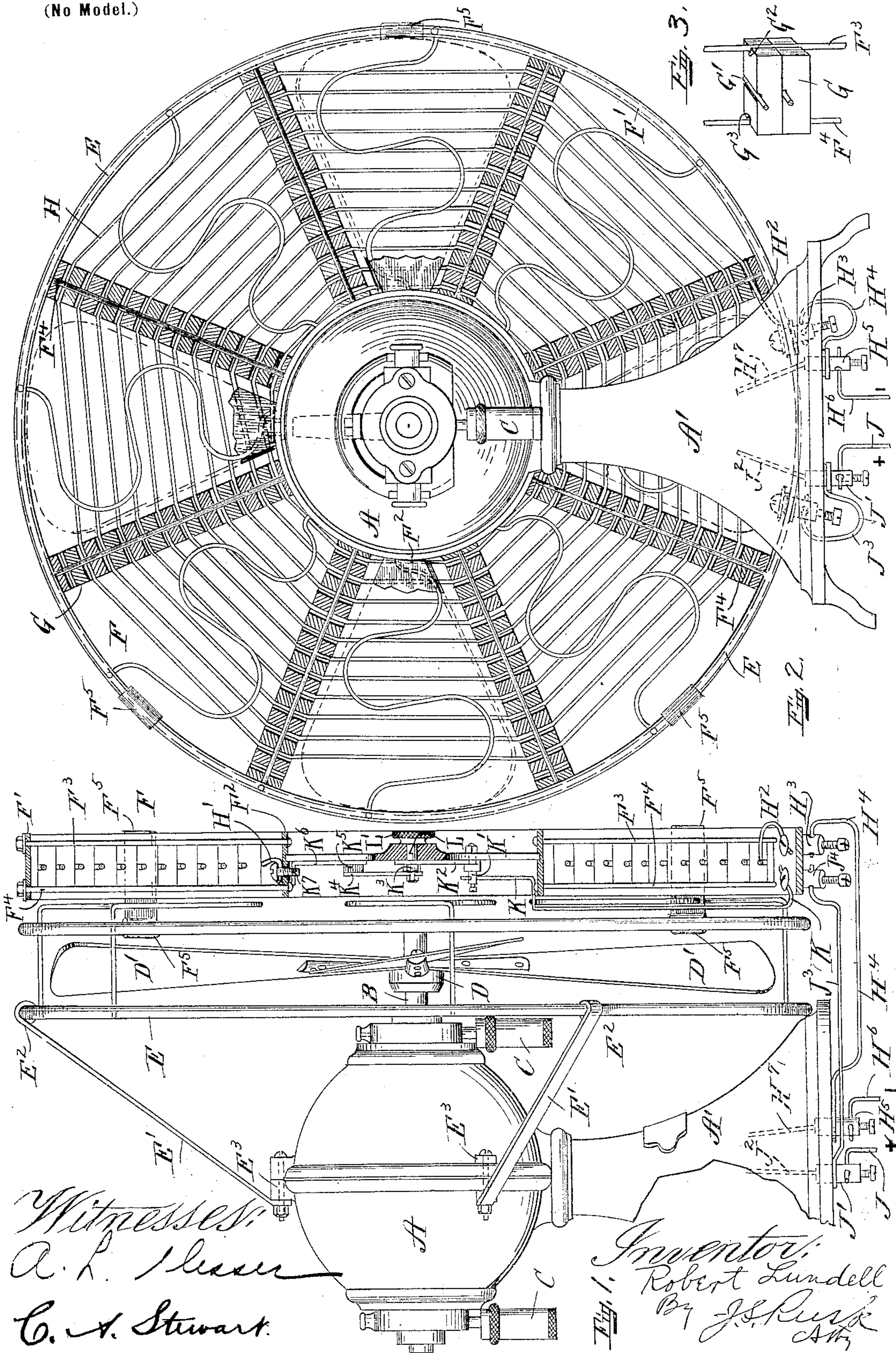
No. 640,143.

Patented Dec. 26, 1899.

R. LUNDELL.
ELECTRIC HEATER.

(Application filed May 24, 1898.)

(No Model.)



UNITED STATES PATENT OFFICE.

ROBERT LUNDELL, OF NEW YORK, N. Y., ASSIGNOR TO THE BAY STATE ELECTRIC HEAT AND LIGHT COMPANY, OF JERSEY CITY, NEW JERSEY.

ELECTRIC HEATER.

SPECIFICATION forming part of Letters Patent No. 640,143, dated December 26, 1899.

Application filed May 24, 1898. Serial No. 681,595. (No model.)

To all whom it may concern:

Be it known that I, ROBERT LUNDELL, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Electric Heaters, of which the following is a specification.

My invention relates to that class of electric heating apparatus disclosed and broadly claimed in United States Letters Patent issued to The Dewey Corporation as assignor of Mark W. Dewey, No. 449,404, dated March 31, 1891; and my invention consists in certain improvements thereon, as hereinafter fully described, and particularly pointed out in the claims.

The object of my invention is to rapidly radiate or diffuse the heat from the heat-developing electric conductors or resistances by means of an air-agitating body, such as a fan, so that the heat will be evenly diffused throughout the apartment or room in which the apparatus is located.

In the ordinary stationary electric heaters which are used in apartments and cars for heating purposes the heat is imperfectly diffused by the ordinary circulation of the heated air rising from the heated electrical resistances or conductors. To obviate this imperfect diffusion and to render the atmosphere more even, I show a fan in connection with the electric heat-developing surfaces, whereby through the agitation of the air the heat is prevented from directly rising and is diffused evenly throughout the apartment, whereas in the present form of electric heaters a great amount of heat is stored and wasted at the ceiling.

In carrying out my invention I employ the usual ventilating-fan and electric motor and locate the heat-developing electric resistances or conductors upon a guard directly in front of the fan. By this arrangement, the electric current being turned on, the fan revolves, throwing the air in the usual manner, and the electric heating resistances or conductors are heated by said current, and the heat is removed or displaced from said conductors or resistances rapidly by the fan, as the air passes over said resistances or conductors and is diffused in a horizontal direction.

In the accompanying drawings, which illus-

trate a construction embodying my invention, Figure 1 is a side view of a fan and a partial sectional view of the heater mounted on the guard of the fan. Fig. 2 is a view looking from the rear of the motor and showing the insulated porcelain supporting-blocks of the heater and which support the conductors or resistances in their proper positions. Fig. 3 is a detail perspective view of two of the blocks and the retaining-rods.

Like letters of reference refer to like parts throughout the several views.

A represents the usual electric motor, supported on the base A' and having the usual shaft B and suitable oil-cups C for lubricating the shaft B. Mounted on said shaft B, at its front end, is a fan D, having four blades D'. Located around said fan is a guard E, held in place by the braces E', secured to the guard at E² and to the motor at E³. On the front side of the guard E there is located the electric heater F, which is constructed with an outer metallic ring F' and an inner metallic ring F², connected radially by the outer and inner retaining-rods F³ F⁴. Located between said rods and held in place by them are a series of porcelain insulating-blocks G, provided at their outer sides with the recess G' and at their opposite ends with the grooves G² G³, in which grooves G² G³ are respectively located the retaining-rods F³ F⁴, and by means of this construction said insulated blocks are held rigidly in position between the outer and inner rods F³ F⁴. The clamps F⁵ are secured at one end to the front of the guard and at the opposite end to the outer metallic ring F', and by means of said clamps the electric heater F is held firmly in its position with relation to the fan-guard.

The electrical conductor or resistance H, composed of suitable resistance-wire and by which the heat is developed by its resistance to the passage of the electric current, is arranged in a convolute and held in position by the grooves G' in the insulating-blocks G. By this arrangement an open screen is formed in front of the fan, which screen heats the air from the fan and allows, by its construction, the free passage of the same. The air from the fan takes up the heat from the conductor or resistance H and removes or dis-

places the same in a horizontal direction instead of allowing it to rise directly to the ceiling. By this diffusion of the air by the fan the temperature of the room is rendered more equable than by the ordinary methods of heating. The electric current passes in through the wire J to the binding-post J', where the current is divided, and part of said current passes to the motor A in the usual manner through the wire J², and the other part of the current passes through the wire J³ to the binding-post J⁴, secured to the outer metallic ring F', insulated therefrom. The current then passes by the wire K to the binding-post K', then to the metallic strip K² through the washer K³, to the switch-arm K⁴, to the switch-contact K⁵, through the metallic strip K⁶, and to the screw K⁷ in the inner metallic ring F², insulated therefrom. From said screw the current passes at H' to the conductor or resistance H at its inner end. The current passes through all the convolutions of the conductor or resistance H, which is secured at its outer end H² to the binding-post H³, secured in the outer metallic ring F' and insulated therefrom. The current passes through said binding-post to the wire H⁴, to the binding-post H⁵, and out through the wire H⁶, which is also the exit of the part of the current coming from the motor through the wire H⁷.

The switch-arm K⁴ is mounted on the shaft L, which is operated by the button L'.

This apparatus is designed to be used part of the time as an ordinary summer or cooling fan. When it is desired to use it as a heater, the current is turned into the conductor or resistance H by manipulating the button L' to bring the switch-arm K⁴ over the contact-point K⁵, which position is shown in the drawings, and in which position the current passes through the conductor H, and the fan becomes a heater by reason of the air from the fan taking up the heat developed in the conductor or resistance H by the passage of the electric current. Among the various advantages of this method of heating may be mentioned the fact that the life of the heating resistances or conductors is greatly prolonged by the rapid removal or displacement of the heated air from the surfaces of the conductors or resistances, because said conductors or resistances are kept at a low temperature, although they are giving off a great amount of heat to the rapidly-moving air.

In the drawings but one convolution of the resistance-wire H is shown; but in actual practice I have found it advisable to use more than one convolution for the purpose of increasing the resistance and the heating-surface.

I do not limit myself to the arrangement and construction shown, as the same may be varied without departing from the spirit of my invention.

Having thus ascertained the nature of my

invention and set forth a construction embodying the same, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In an electric heating apparatus, a fan, a motor for operating said fan, an electric heater located in front of said fan and consisting of one or more heat-developing electrical conductors or resistances forming an open screen through which the air from said fan passes, insulating-blocks having grooves in which the conductors or resistances are located and supported, an inner and an outer ring between which said insulating-blocks are located and rods located in grooves in the ends of said insulating-blocks and connected to said rings for holding said blocks in position.

2. In an electric heating apparatus, a fan, a motor for operating said fan, an electric heater located in front of said fan and consisting of one or more heat-developing electrical conductors or resistances forming an open screen through which the air from said fan passes, insulating-blocks for supporting the electrical conductors or resistances, an inner and an outer ring between which said insulating-blocks are located, and rods located on the ends of said blocks and connected to said rings for holding said blocks in position.

3. In an electric heating apparatus, a fan, a motor for operating said fan, an electric heater consisting of one or more heat-developing electrical conductors or resistances forming an open screen through which the air to be heated passes, insulating-blocks for supporting the electrical conductors or resistances, an inner and an outer ring between which said insulating-blocks are located, and rods located on the ends of said blocks and connected to said rings for holding said blocks in position.

4. In an electric heating apparatus, a fan, a motor for operating said fan, an electric heater mounted upon the same support as the fan and consisting of one or more heat-developing electrical conductors or resistances forming an open screen through which the air to be heated passes, insulating-blocks for supporting the electrical conductors or resistances, an inner and an outer ring between which said insulating-blocks are located, and rods located on the ends of said blocks and connected to said rings for holding said rings in position.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 20th day of May, A. D. 1898.

ROBERT LUNDELL.

Witnesses:

D. C. DURLAND,
GEORGE S. WESTON, 2d.