

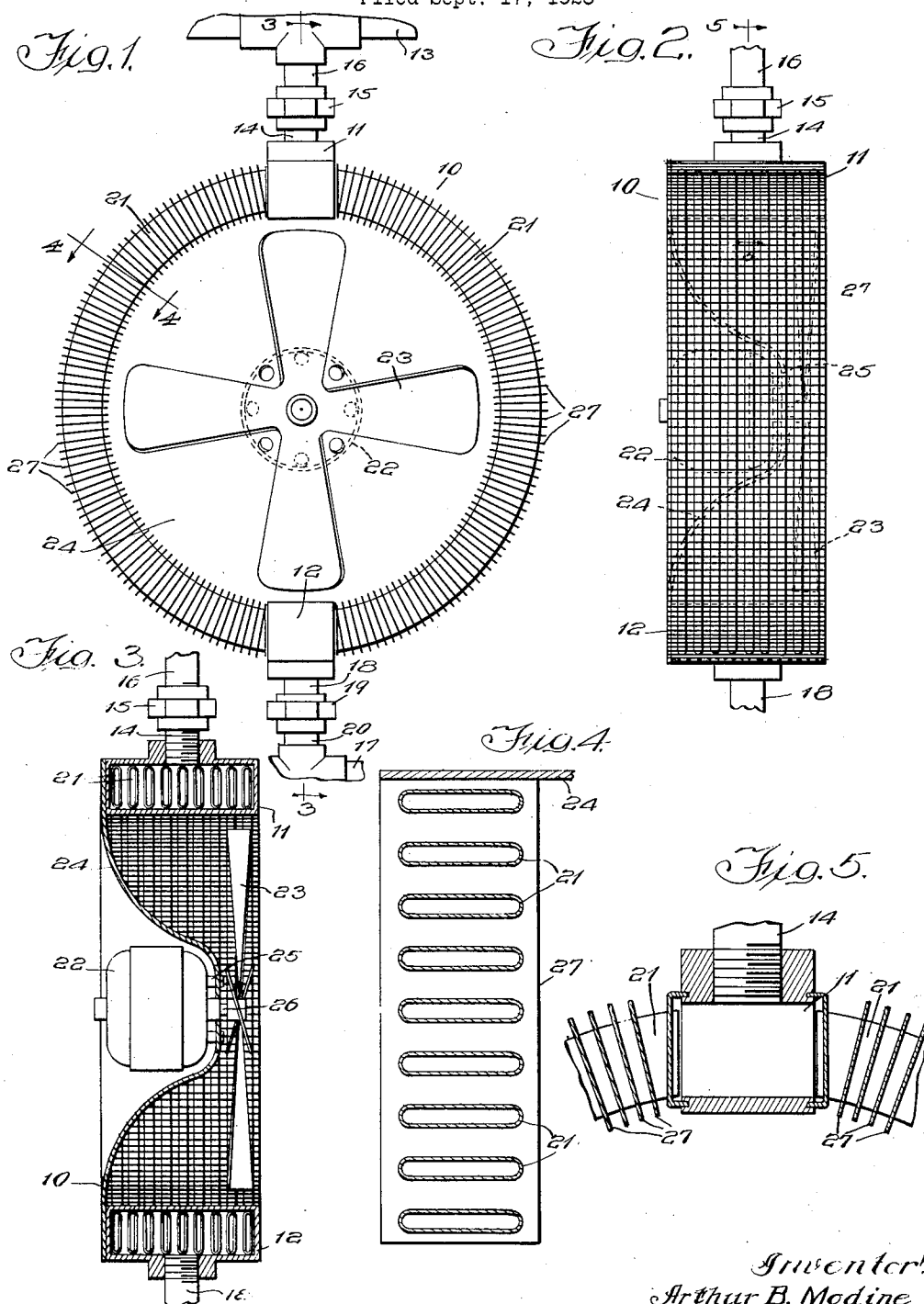
Jan. 10, 1933.

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1,893,650

HEAT EXCHANGE UNIT

Filed Sept. 17, 1928



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HEAT EXCHANGE UNIT

Application filed September 17, 1928. Serial No. 306,476.

My invention relates to heat exchange units and its object is broadly to provide an improved heating apparatus which is convenient and efficient in operation.

A particular object of the invention is to provide improved construction for that class of heating devices which comprises radiator units adapted to be suspended from steam or hot water pipes by means providing a conduit through which the steam or hot water flows to the radiator unit.

Another object is the provision of a heat exchange unit of the class described which is equally adapted to radiate heat over a large area or to concentrate the heat on a relatively small area without changing the position of the unit.

Many other objects and advantages of the construction herein shown and described will be obvious to those skilled in the art from the disclosure herein given.

To this end my invention consists in the novel construction, arrangement and combination of parts herein shown and described, and more particularly pointed out in the claims.

In the drawing, wherein like reference characters indicate like or corresponding parts:

Fig. 1 is the front view of a preferred embodiment of my invention;

Fig. 2 is a side elevational view of the same;

Fig. 3 is a view along the line 3—3 of

Fig. 1;

Fig. 4 is a view along the line 4—4 of Fig. 1; and

Fig. 5 is a view along the line 5—5 of Fig. 2 drawn to a larger scale.

In the drawing, wherein I have illustrated the preferred embodiment of my invention, the numeral 10 designates generally my improved heating unit which is adapted to be suspended from a steam or hot water pipe 13 and has an outlet connection with a vent or a return pipe 17. The heating unit 10 includes oppositely positioned tanks 11 and 12, the tank 11 being connected with a supply pipe 13 by a nipple 14, a union 15 and a nipple 16. The tank 12, which is shown as diametrically opposite to the tank 11, is

connected with the vent or return pipe 17 by a nipple 18, a union 19 and a nipple 20. The tanks 11 and 12 being diametrically opposed, the axial lines of the respective nipples and unions connected therewith are in alignment and permit the rotation of the unit by adjusting the relative positions of the nipples and the union.

The tanks 11 and 12 are connected by a plurality of arcuate tubes 21 forming a radiator unit. The tubes 21 are connected by radially extending plates or fins 27. The steam or hot water which comes from the supply pipe 13 passes into the tank 11 and flows to the tank 12, traveling through the tubes 21 on either side of the unit and passing from the tank 12 into the vent or return pipe.

A motor 22 and a fan 23 which is operatively connected with the motor, are mounted centrally within the heating unit and on the transverse axial line thereof. The motor 22 and fan 23 are supported in their central position by a plate member 24, the motor being connected to the member 24 by a plurality of bolts 25 and the fan being directly connected to the motor shaft 26, the motor and the fan being positioned on opposite sides of the plate member. The plate member 24 has its outer periphery circular and substantially aligned with the outer periphery of the radiator tubes 21, and is connected to one edge of the tanks by bolts (not shown) or by any other suitable means. The plate member 24 not only provides a mounting for the motor 22 and fan 23 but serves as a deflecting means which changes the direction of the currents of air set up by the fan. For this purpose, the outer portion of the plate member 24 is concave and the central portion is convex on the side adjacent the fan 23, with the convex portion closely adjacent to the fan. The convex central portion of the plate member 24 is so positioned as to permit the motor 22 to lie entirely within the radiator unit on the one side of the member and the fan 23 likewise to be entirely contained within the radiator unit.

The motor and fan are capable of being operated in either direction of rotation. Upon rotating the fan in clockwise direc-

tion as observed in Fig. 1, air will be drawn through the radiator unit between the tubes 21, striking the concave portion of the plate member 24 so as to be concentrated over a relatively small area in the general direction of the axis of the fan. Rotation of the fan in an anti-clockwise direction will operate to drive air outwardly through the cylindrical radiator unit between the tubes 21, the air coming through the fan and striking the plate member 24 on the concave face thereof and then being deflected radially outwardly in all directions. When it is desired to heat a relatively small surface quickly, the heating unit can be turned in the direction of the object to be heated and the fan operated in clockwise direction, thereby concentrating the heat on the object. In the event the object to be heated is large or it is desirable to heat a large number of articles slowly, the unit can be placed within the large article to be heated or the numerous small articles can be positioned radially around the heating unit in a rack or similar contrivance and the heated air forced outwardly from the unit to produce the desired results. If the heating unit is to be used to change the temperature in a room or a portion of the room, operation of the fan in a clockwise direction will serve to distribute the radiation over a large volume of space.

By turning the unions 15 and 19, the radiator unit can be threaded on or off the intermediate nipples 16 and 18 so as to direct the radiation in any desired direction.

Thus it will be seen that I have provided a heating unit of the class described which is compact, neat in appearance, easily affixed, and capable of being mounted in any portion of a room, and also adapted for generally distributing radiation evenly over a large space or of concentrating the radiation upon a small area for rapid heating or drying.

Having thus described my invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence I do not wish to be understood as limiting myself to the exact form, construction, arrangement and combination of parts herein shown and described or uses mentioned.

What I claim as new and desire to secure by Letters Patent is:

1. In apparatus of the class described, a radiator unit comprising a pair of diametrically positioned tanks, an inlet tube for one of said tanks, an outlet tube for the other of said tanks, a plurality of arcuate tubes connecting said tanks, a generally disc shaped plate mounted interiorly of the radiator unit, said plate having its outer peripheral portion concave on one side and its inner portion convex on the same side, and a motor and a fan mounted on said plate with their axis

of rotation in substantial alignment with the transverse central line of said radiator unit.

2. In apparatus of the class described, a pair of diametrically positioned tanks, one of said tanks having an inlet pipe and the other of said tanks having an outlet pipe, a plurality of arcuate tubes connecting said tanks, a generally disc shaped plate positioned interiorly of said radiator unit with its outer periphery in substantial alignment with the outer periphery of said tubes, said plate having its outer peripheral portion concave on one side and its inner portion convex on the same side, a motor mounted on the interior side of said convex portion with its axis of rotation in substantial alignment with the transverse axis of the radiator unit, and a fan positioned on the opposite side of said plate, said fan being operatively connected with the motor for the purpose described.

3. In apparatus of the kind described, a radiator unit comprising a pair of spaced tanks, a plurality of oppositely positioned outwardly turned tubes connecting said tanks, a motor mounted within said radiator unit, a fan operatively connected with said motor and positioned within said radiator unit, a substantially disc shaped plate mounted interiorly of said radiator unit with its external periphery in substantial alignment with the external periphery of said tubes, said plate being generally concave towards the fan for the purpose described.

4. In apparatus of the class described, a radiator unit comprising a plurality of connected arcuate tubes, air advancing means including a motor and fan located within a space defined by said tubes, means for supporting said air advancing means, said motor and fan being respectively located upon opposite sides of said supporting means, said means being connected at and extending inwardly of the periphery of said tubes, and a fluid inlet and outlet for said tubes.

5. In apparatus of the kind described comprising a plurality of connected arcuate tubes, fins provided upon said tubes, an inlet and outlet for said tubes, air advancing means arranged concentrically of said tubes, a bell-shaped member providing a support for the air advancing means and cooperating therewith to provide means for deflecting air relatively to said tubes, and providing means protecting an element of said air advancing means against the air passing between said tubes.

6. In apparatus of the class described, a radiator unit comprising a plurality of spaced arcuate connected tubes having fins, an axially aligned inlet and outlet for the tubes, air advancing means arranged axially of said arcuate tubes, a member extending across the diameter of said unit comprised of said tubes and providing a closure for one

end of the unit, and providing a support for the air advancing means, said member having a portion which projects toward the open end of said unit and terminates adjacent to the open end, an element of the air advancing means being located at one side of said member and having another element thereof located upon the opposite side thereof.

In testimony whereof, I have hereunto signed my name.

ARTHUR B. MODINE.