Nov. 1, 1938. C. E. MEYERHOEFER 2,135,089

HEATER

Filed May 18, 1937

Fig. 1

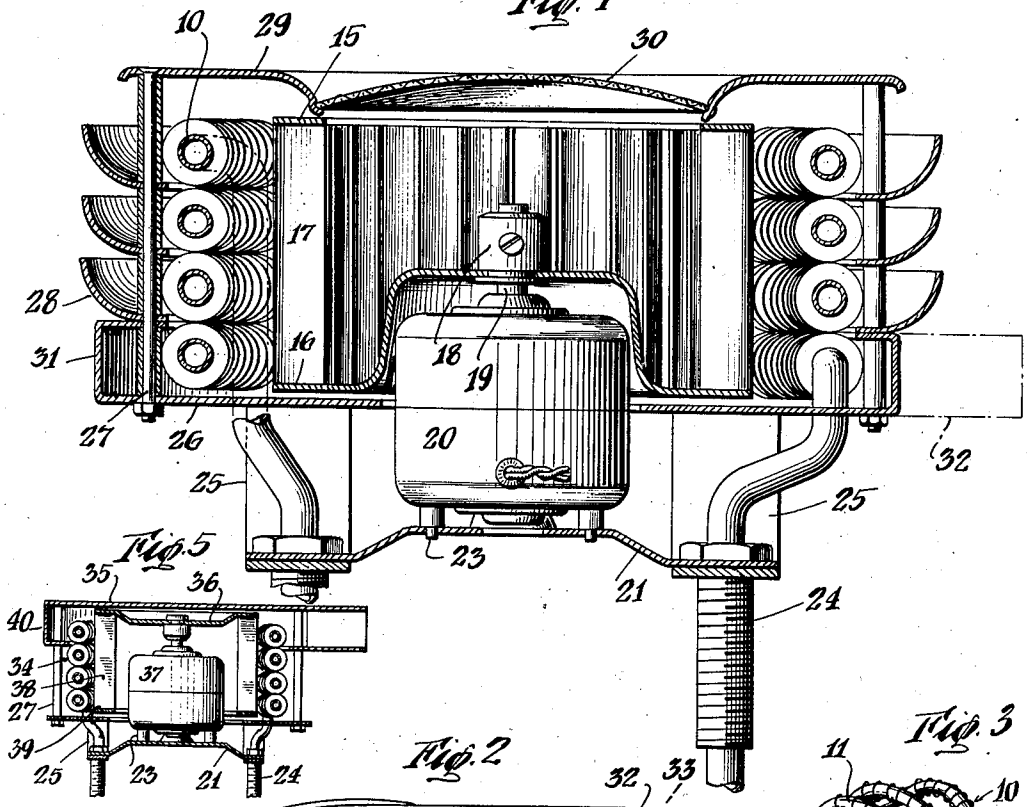


Fig. 5

Fig. 2

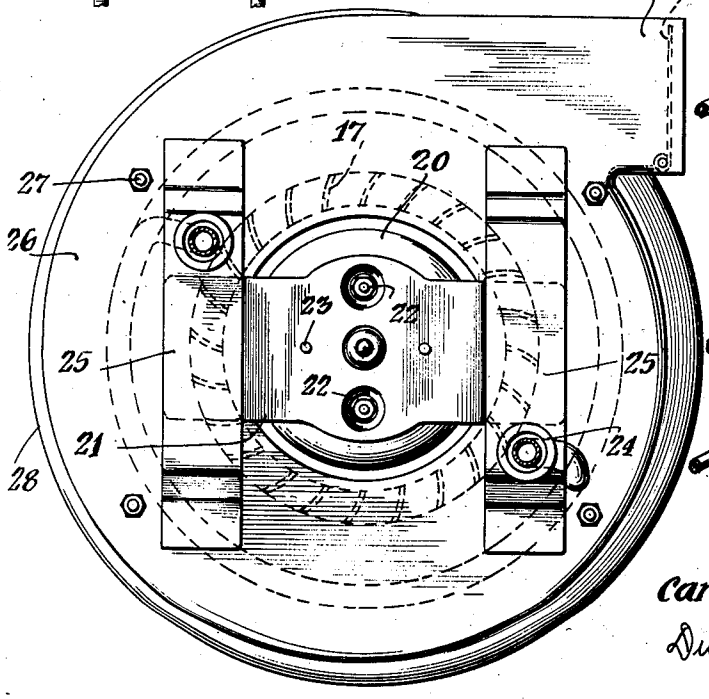


Fig. 3

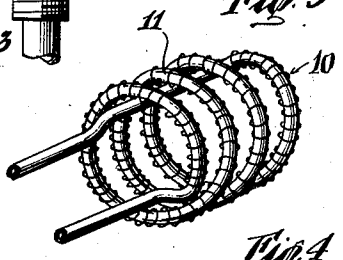
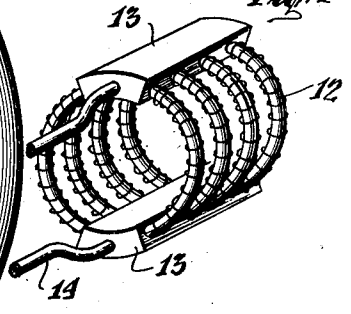


Fig. 4



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HEATER

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Application May 18, 1937, Serial No. 143,321

2 Claims. (Cl. 257—137)

This invention relates to a heat exchange device capable of use in numerous different associations but primarily intended to be employed in, for example, motor vehicles and for the purpose of conditioning air within such vehicles. Ordinarily this unit will, of course, function to heat or raise the temperature of the air, in which case the unit core may conveniently be connected to the cooling system of the motor.

It is an object of the invention to provide a functionally and structurally improved unit which will occupy but a minimum amount of space and which, moreover, may, with facility, be associated with any proper type of mounting surface.

A further object of the invention is that of providing a heat exchange unit which will conveniently include a blower wheel type of impeller for the purpose of circulating the air. Thus, full benefit may be had as a consequence of the high efficiency with which an impeller of this type operates. Accordingly, while the unit may be of relatively small size, it will be feasible to circulate the same volume of air as has been heretofore circulated by only much larger type units.

Still another object is that of providing a heat exchange unit which will preferably employ but a single impeller even if in addition to generally circulating the air in a given space a separate duct or passage is furnished for specialized distribution of a certain amount of air.

Another object is that of constructing a unit of this character which will embody relatively few parts, each individually simple and rugged in construction and capable of manufacture to a large extent without employing manual labor.

With these and other objects in mind, reference is had to the attached sheet of drawings, illustrating practical embodiments of the invention, and in which:

Fig. 1 is a sectional plan view of a unit;

Fig. 2 is a rear view thereof;

Figs. 3 and 4 are perspective views showing in general terms types of heating cores which may be employed, and

Fig. 5 is a view similar to Fig. 1 but showing a slightly different form of construction.

In these views the numeral 10 indicates a core through which fluid is to circulate. This core may embrace any number of well known constructions. For example, as shown in Fig. 3, a finned tube 11 is coiled to provide a body through which hot or chilled fluid may be circulated. In Fig. 4, tubes 12 which may also be provided with outwardly extending fin portions, are connected to upper and lower tanks or headers 13 from which tubes 14 extend. It will be understood that in both Figs. 3 and 4, a somewhat schematic showing has been resorted to in the interest of simplicity. Obviously, any desired number of convolutions may be included in the body and these convolutions or tubes are preferably arranged immediately adjacent each other. Moreover, in lieu of tubing, other types of core material may be employed.

In any event, it will be understood that the core provides passages or spaces through which air may flow and that contrary to conventional construction this core presents a central opening or space. Such space, as shown, is annular, but it is apparent that it might include any desired configuration. Within this space is arranged a blower wheel, preferably including, as shown in Figs. 1 and 2, an outer ring 15 and an inner plate 16, between which are disposed transversely curved blades 17. The plate is centrally depressed to furnish a cup-shaped portion. The base of this portion is apertured and has secured to it a hub 18 attached to motor shaft 19. The shaft is driven by a motor 20 which conveniently extends into the depressed portion of plate 16 so that only minimum space is required for accommodation of the parts.

The motor is conveniently mounted on a plate 21 by any suitable means such as bolts 22, it being moreover observed that shock absorbing elements 23 may be interposed between the motor and plate 21 to prevent undue vibration and noise being transmitted from one part to the other. Plate 21 may provide a mounting for the entire unit by, for example, including sleeves 24 in association therewith and which sleeves are exteriorly threaded to receive clamping nuts (not shown). The ends of tube 11 or tubes 14 may pass through sleeves 24 should this be desired.

Also extending from plate 21 are brackets 25 which project outwardly towards the core and are secured to a plate 26 positioned inwardly of the core. Bolts 27 may have their ends mounted by plate 25, their bodies supporting a series of deflector rings or members 28 which provide in aggregate a casing enclosing the sides of the core. The bolts 27 at their outer ends may mount a centrally apertured plate 29, the opening of which may normally be covered by a perforated member 30.

In operation this type of unit will, of course, function to draw air through the openings of member 30 and will radially distribute the air between blades 17. The air will accordingly flow

in contact with the core surface and heat exchange will be effected. Incident to the fact that the deflector rings or members **28** extend outwardly and forwardly, the discharged air will have a corresponding path of movement.

It is to be noted that plate **26** may present adjacent its outer edges a U-shaped channel **31**. This channel is, of course, concentrically disposed with reference to the core and air impeller and there extends therefrom, as shown in Fig. 2, a tangentially projecting duct **32** within which a control valve **33** may be positioned. In this manner a separate outlet is furnished and to which a tube may be connected so as to effect a discharge of air to the inner surface of a windshield, the rear portion of a vehicle, or in fact any other desired location. Of course, if ring **31** is not employed, a deflector such as **28** may be substituted therefor.

In certain forms of construction it may be desired to have the entering air cool the motor and/or to further condense the structure. If such expedients are to be resorted to a structure such as suggested in Fig. 5 may be employed in which the numeral **34** identifies the core and the front face of which may conveniently be closed by plate **35**. Disposed within the space defined by the core is a blower wheel comprising an imperforate outer plate **36** which is operatively coupled to the shaft of motor **37**. This plate supports the outer ends of a series of blades **38**, the inner ends of which may be connected by a ring **39**. In this type of unit air will be drawn in from the rear side, pass over the motor surfaces, and be propelled outwardly through the interstices of the core and thus be distributed and controlled as desired.

In all forms of construction, however, it will be observed that a unit is presented which will occupy only a minimum amount of space without such constriction, however, resulting in any impairment of output. This is especially true because a blower wheel type of impeller is conveniently employed and which is compactly housed in proper operative association with respect to the core. Obviously if a separate duct is to be associated with the unit as viewed in Fig. 5, then a ring-shaped channel, as indicated at **40**, may enclose any desired portion of the core to achieve this result, and this channel may communicate with a tangentially extending discharge orifice.

Obviously, numerous changes in construction and rearrangement of the parts might be resorted to without departing from the spirit of the invention as defined by the claims.

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

1. A heater including a heat transfer core presenting an opening of substantial area through its body, an air impeller disposed within said opening, a motor for driving said air impeller to draw air from a point beyond said core and to radially distribute such air in heat transferring contact with said core, a channel member concentrically disposed with respect to said core and enclosing only a portion of the latter to receive a part of the air radially flowing therefrom, and a duct coupled to said member to tangentially conduct the air received from said member the remainder of the air flowing outwardly beyond said core and to one side of said channel member.

2. A heater including a heat transfer core presenting an opening of substantial area through its body, an air impeller disposed within said opening, a motor for driving said air impeller to draw air from a point beyond said core and to radially distribute such air in heat transferring contact with said core and beyond the latter, a channel member encircling a portion of said core to receive a part of the air radially flowing therefrom, a duct coupled to said member to tangentially conduct the air received from said member, and deflecting means disposed to one side of said member and also encircling said core to distribute the balance of the air flowing therefrom in a predetermined direction.

CARL E. MEYERHOEFER.