

Dec. 29, 1959

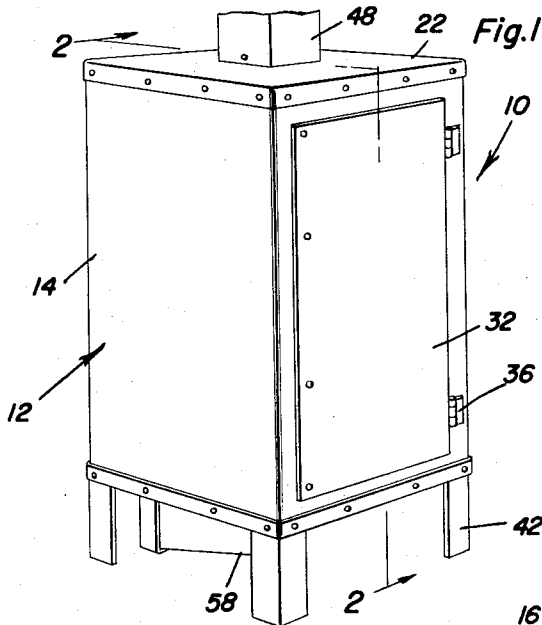
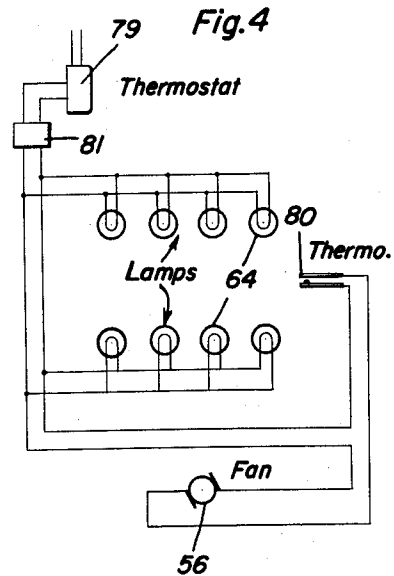
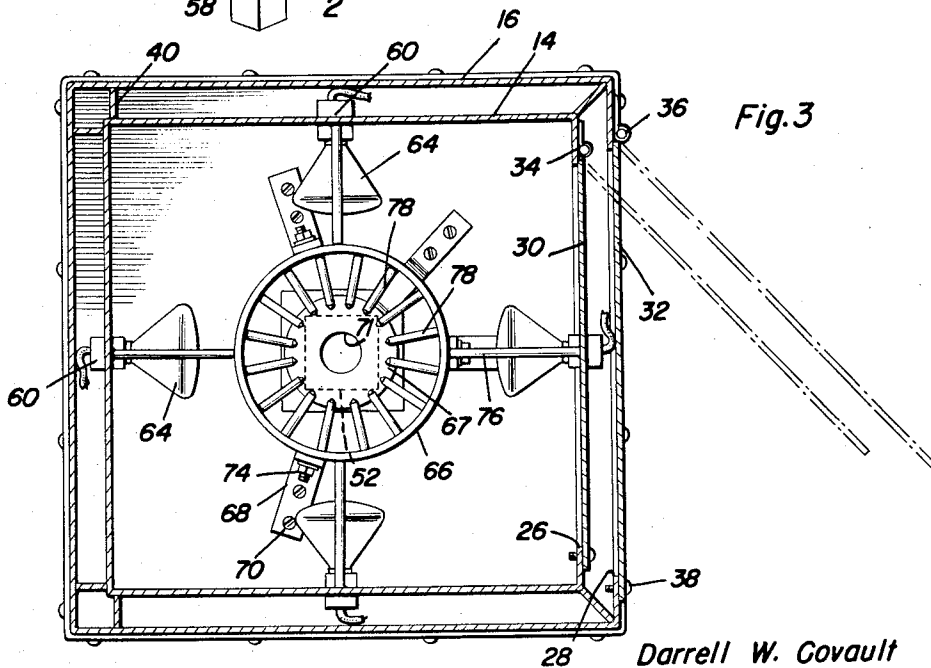
D. W. COVAULT ET AL

2,919,338

ELECTRIC FURNACE

Filed April 1, 1958

2 Sheets-Sheet 1



Darrell W. Covault
Lawrence C. Poindexter
INVENTORS

BY *Alance A. O'Brien*
and *Harvey B. Jackson*
Attorneys

Dec. 29, 1959

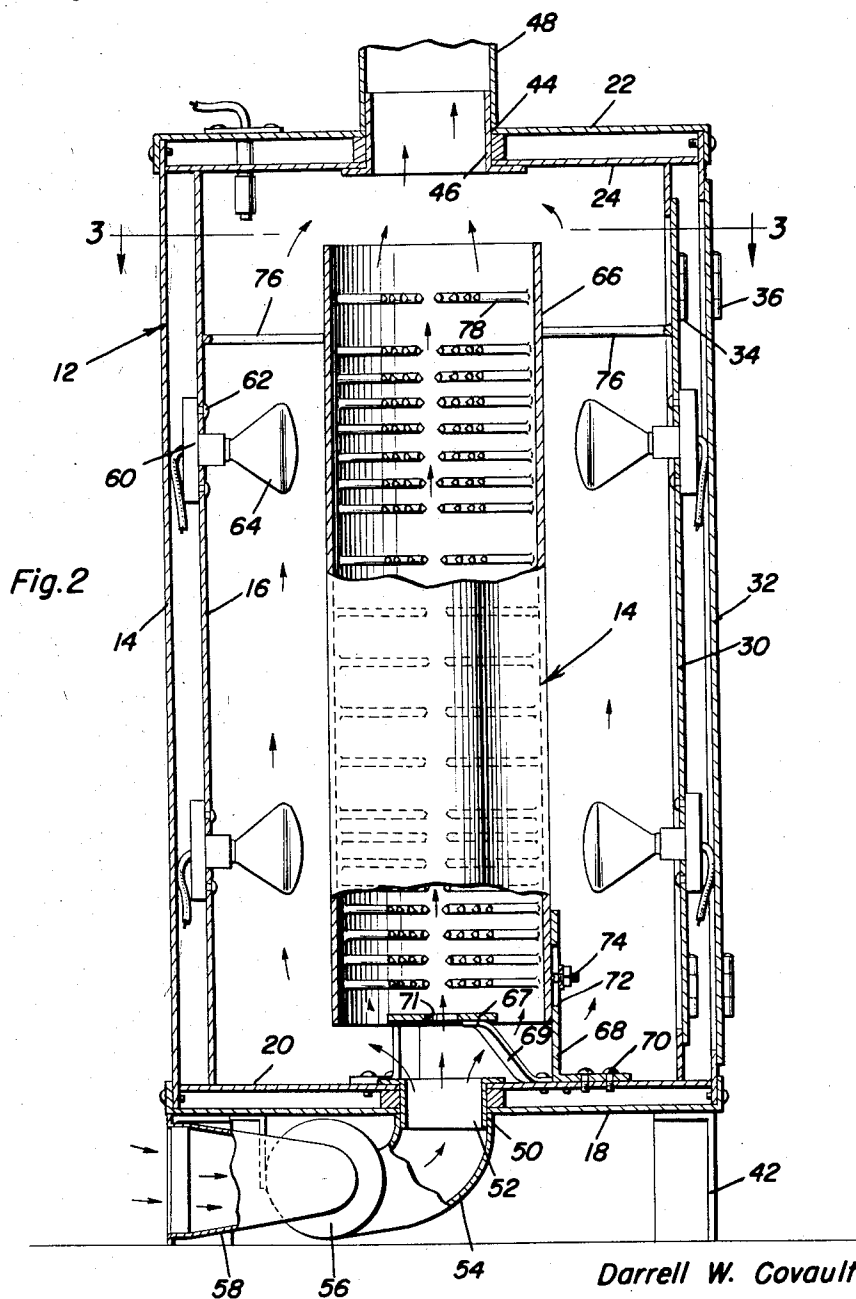
D. W. COVAULT ET AL

2,919,338

ELECTRIC FURNACE

Filed April 1, 1958

2 Sheets-Sheet 2



Darrell W. Covault
Lawrence C. Poindexter
INVENTORS

BY *Almonce A. O'Brien*
and *Harvey B. Jacobson*
Attorneys

1

2,919,338

ELECTRIC FURNACE

Darrell W. Covault, Veedersburg, and Lawrence C. Poin-
dexter, Fowler, Ind.

Application April 1, 1958, Serial No. 725,642

3 Claims. (Cl. 219—34)

The present invention generally relates to a furnace construction and more particularly to an electric furnace in which the heat is supplied by electrical energy, there being provided a novel arrangement of structure for providing an efficient furnace which is extremely economical in manufacture and easy to maintain and also inexpensive to operate.

The primary object of the present invention is to provide an electric furnace in which heat is generated by a plurality of electric heat bulbs mounted in facing relation to and adjacent a central heat exchange assembly, all of which is housed within a casing providing a multiple path flow of air for effectively and efficiently transferring the heat produced by the heat bulbs to the air.

A further object of the present invention is to provide an electric furnace in accordance with the preceding object in which the heat exchange assembly includes a central cylindrical chimney-like member having a plurality of radially inwardly extending pointed rods, the number of pointed rods being greater in regions adjacent the heat lamps for further increasing the heat transfer qualities of the chimney member.

Another important feature of the present invention is to provide an electric furnace having a forced air supply together with means for permitting ready disassembly and replacement of parts and which employs conventional heat lamps for converting electrical energy into heat and employs conduction absorption, radiation and convection for transferring the heat to air for circulation in a room, building or the like.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a perspective view of the electric furnace of the present invention;

Figure 2 is a vertical sectional view taken substantially upon a plane passing along section line 2—2 of Figure 1 illustrating the internal structural details of the furnace;

Figure 3 is a transverse, sectional view taken substantially upon a plane passing along section line 3—3 of Figure 2 and illustrating further structural details of the furnace; and

Figure 4 is a wiring diagram of the electrical components of the furnace.

Referring now specifically to the drawings, the numeral 10 generally designates the electric furnace of the present invention which includes a casing generally designated by the numeral 12 and a central cylindrical chimney member generally designated by the numeral 14 which is disposed within the casing 12.

As clearly shown in Figures 2 and 3, the casing 12 includes an outer jacket 14 and an inner jacket 16 as well as an outer bottom 18, an inner bottom 20, an outer top 22 and an inner top 24. As shown in Figure 2 and also in Figure 1, the casing 12 is generally square

2

in cross-section and is vertically elongated. One side wall of the inner jacket 16 is provided with an opening 26 and the same side wall of the outer jacket 14 is provided with an opening 28. The openings 26 and 28 are each provided with a closure door designated by the numerals 30 and 32 respectively which are hingedly attached to one edge of the respective openings 26 and 28 by hinge members 34 and 36 respectively. The free edges of the closure doors 30 and 32 are retained in closed position by fastening bolts 38 or any other suitable retaining means. The inner jacket 16 is spaced from the outer jacket by spacer plates 40 which may extend in any desired manner and the space between the inner and outer jackets 14 and 16 provides a dead air space for insulating the casing 12 so that the same will not become dangerously hot. The bottom of the casing 12 is provided with a set of legs 42 which support the casing above a floor. The length of the legs 42 may vary and there may be provided levelling means for levelling the casing 12.

The top members 24 and 22 are provided with openings 44 receiving a cylindrical outlet adapter 46 which in turn may receive a hot air duct 48 for distribution of hot air to several rooms in a house or the duct 48 may direct the discharged hot air in any desired direction.

The bottom members 20 and 18 are provided with similar aligned openings 50 for receiving a cold air inlet adapter 52 for an inlet duct 54 which is illustrated as being provided with a fan 56 for forcing air through the furnace. The fan 56 may be provided with an intake duct 58 which may either be provided with a register or connected with a cold air ductwork for providing circulation of air through several rooms.

The inner jacket 16 and the inner door 30 are provided with two vertically spaced sets of light sockets 60 which are mounted in place by fasteners 62 and extend through the inner jacket and door for receiving heat bulbs 64 whereby the enlarged ends of the heat bulbs 64 will be disposed adjacent to but in slightly spaced relation from the chimney member 14 for permitting changing of the bulbs. The access doors 30 and 32 which may be opened permit changing and replacement of the light bulbs 64 when needed.

The chimney member 14 is in the form of an elongated cylindrical member 66 having supporting legs 68 at the bottom end thereof secured to the inner bottom member 20 by fasteners 70. The legs 68 are provided with slots 72 for receiving fasteners 74 connected to the cylindrical member 66 thus providing variation in the space between the bottom and top of the cylindrical member 66 in relation to the top and bottom of the casing. The cylindrical member 66 is spaced from but longitudinally aligned with the adapters 52, 46, whereby air coming in through the inlet adapter 52 will spread around and go up through the cylindrical member 66. Adjacent the upper end of the cylindrical member, the inner jacket 16 and the inner door 30 may be provided with inwardly extending spacer or positioning rods 76 for steadying the cylindrical member 66 but yet permitting opening of the door.

Extending radially inwardly from the interior surface of the cylindrical member 66 is a plurality of pointed conductor rods 78 which are arranged in vertically spaced rows with the rods in each row being circumferentially spaced. As illustrated in Figure 2, the concentration of rods is greater immediately adjacent the heat lamps 64 for increasing the dissipation of heat at its source. The cylindrical member 66 is preferably constructed of a dark metal or colored dark, preferably black, for better heat absorption and conduction.

The bottom of the cylindrical member 66 is provided with an apertured deflector plate 67 supported concen-

3

trically therein by a bracket 69. The aperture 71 lets the draft go up the chimney member while the plate deflects air against the interior surface of the member 66.

The furnace may be controlled by a thermostat 79 which will control a relay switch 81 of any conventional type for supplying current from a power supply line to the heat lamps and to the fan motor with the thermostat operation on low current, and the fan motor may be operated through a thermal switch for cutting in the fan after predetermined temperature has been reached and cutting out the fan after the temperature in the interior of the casing has been reduced to a predetermined amount. The thermal switch is indicated by the numeral 80 and may be placed in any convenient location within the casing.

The flow of air through the furnace is shown by arrows in Figure 2 whereby the heat dissipation of the rods 78 combined with the heat dissipation into the air by the bulbs 64 will provide an efficient transfer of heat to air passing through the furnace.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. In an electric furnace, the combination of a vertically elongated casing including a set of side walls and a top and bottom provided with an air inlet and an air outlet opening respectively, an elongated tubular member mounted vertically in said casing in longitudinal alignment with said openings and having its upper and lower ends spaced from the respective top and bottom of the casing whereby to facilitate flow of air from the inlet to the outlet opening both interiorly and exteriorly of said tubular member, electric heating means mounted on inner surfaces of said side walls and oriented toward said

4

tubular member for simultaneously heating the latter and the air flowing exteriorly of the same, a plurality of prong-shaped heat transmitting elements secured in the interior of said tubular member for heating the air flowing interiorly thereof, and a deflector plate provided at the lower end of said tubular member in alignment with but spaced from said air inlet opening whereby to distribute air both interiorly and exteriorly of said tubular member, said deflector plate being larger than said air inlet opening but substantially smaller than the diameter of said tubular member and being provided with a centrally disposed air aperture communicating with the interior of said tubular member.

2. The device as defined in claim 1 together with vertically adjustable bracket means securing the lower end of said tubular member to the bottom of said casing whereby the spacing of the upper and lower ends of the tubular member from the top and bottom of the casing may be varied.

3. The device as defined in claim 1 wherein said electric heating means comprise two sets of heat producing elements spaced vertically in said casing, said heat transmitting elements in said tubular member being arranged in vertically spaced sets with the sets of heat transmitting elements disposed closer together in the regions of said heat producing elements than in the region therebetween.

References Cited in the file of this patent

UNITED STATES PATENTS

950,599	McGerry	Mar. 1, 1910
1,706,515	Barber	Mar. 26, 1929
2,520,830	Borzner	Aug. 29, 1950
2,533,672	Kossovitch	Dec. 12, 1950
2,607,877	Stevens	Aug. 19, 1952

FOREIGN PATENTS

226,660	Switzerland	July 16, 1943
---------	-------------	---------------