Feb. 8, 1949. D. W. CHRISTENSEN 2,461,409

UNIT HEATER CONSTRUCTION

Filed June 10, 1946

Fig. 1

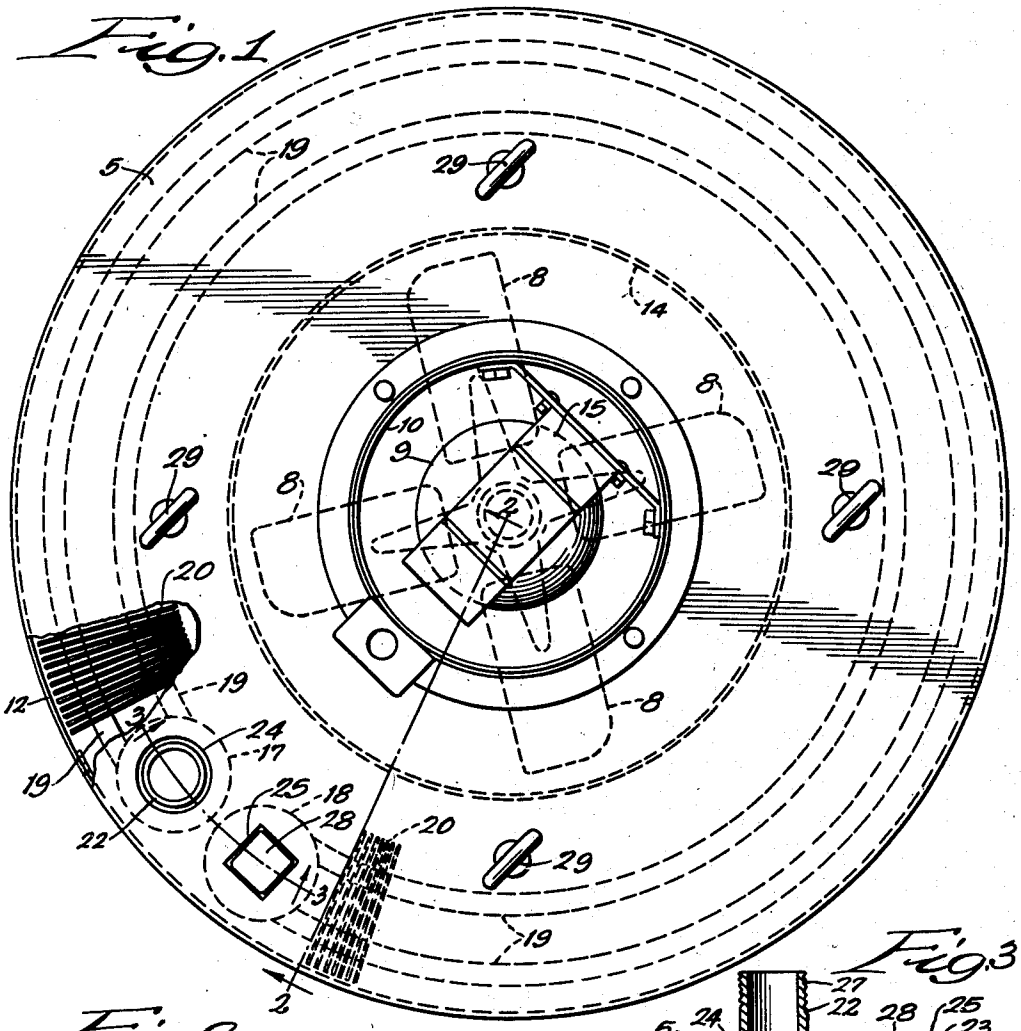


Fig. 2

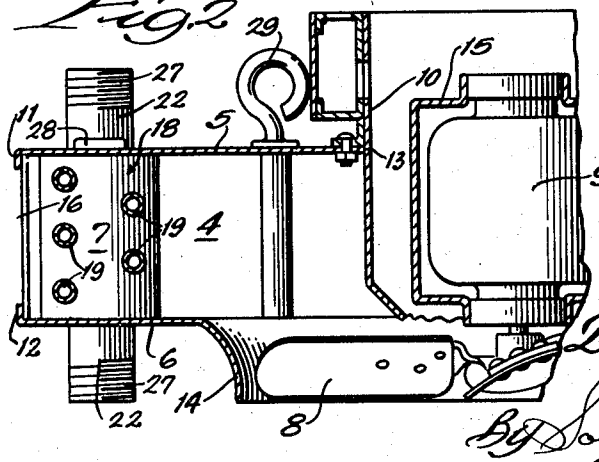
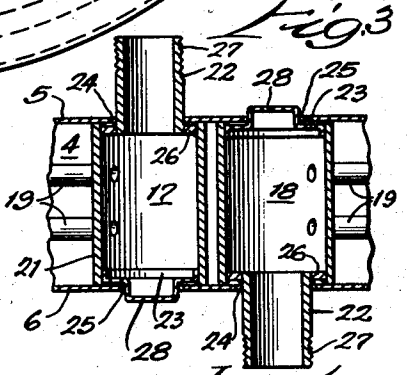


Fig. 3



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UNIT HEATER CONSTRUCTION

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1 Claim. (Cl. 257—137)

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The main object of this invention is to provide improved anchoring means for securing in proper position and against subsequent displacement the heating coil headers for a unit heater construction of the type disclosed in co-pending application Serial No. 646,660, filed February 9, 1946.

The preferred embodiment of this invention is shown in the accompanying drawings, wherein:

Fig. 1 is a plan view of a unit heater, constructed in accordance with the disclosure shown in the aforesaid copending application, and wherein is incorporated a heating-unit anchoring means embodying this invention;

Fig. 2 is a fragmentary, sectional detail taken on the line 2—2 of Fig. 1; and

Fig. 3 is a fragmentary, sectional detail taken on the line 3—3 of Fig. 1.

A vertical-type unit heater, constructed in accordance with the disclosure made in the aforesaid application and equipped with a heating-coil anchoring means embodying this invention, comprises a chamber 4, formed between the plates 5 and 6, wherein is arranged a heating coil 7 through and around which air is drawn and directed downwardly by means of a fan 8 driven by a motor 9 protectively mounted in a stack or duct 10, supported on the plates 5 and 6.

The housing plates 5 and 6, which form the chamber 4, are stamped sheet-metal discs having flanges 11 and 12 formed along their respective outer perimeters to provide appropriate strength. The upper housing plate 5 has a central opening formed therein through which extends the stack 10. The lower housing plate 6 is likewise provided with a central opening bounded by an axially-disposed flange 14 spun from the plate 6 to form a shroud wherein is mounted the fan 8.

The fan 8 is secured to the motor 9 which is mounted on a bracket 15 and suspended in the stack 10 whereby the fan is positioned to draw air in through the perimetrical housing opening 16 and through and around the heating coil 7.

The heating coil 7, with which has been incorporated the improved anchoring means embodying this invention, comprises a pair of headers 17 and 18 to which are bonded the ends of a plurality of tubes 19 whereon are supported the conventional, closely-spaced heat-dissipating fins 20.

These several parts of the heating coil are assembled by first placing the fins 20 on the tubes 19 and expanding the tubes slightly by drawing balls axially through the tubes. This is commonly referred to as a "balling" process. The tubes 19 are then bent into annulus form, to fit

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within the chamber 4 adjacent to and directly inward from the perimetrical opening 16, whereupon the tube ends are welded or brazed into the headers 17 and 18.

In order to secure the heating coil 7, of such construction, in proper concentric position in the housing 4 and against subsequent displacement the headers 17 and 18 and the plates 5 and 6 have specially-constructed interfitting parts.

The headers 17 and 18 each comprise a tubular member 21 in one end of which is secured a nipple 22 and in the other end a cap 23. The nipple 22 and cap 23 extend through and have interfitting engagement with axially-alined openings 24 and 25 formed in the housing plates 5 and 6, respectively. The nipples 22 are bonded into the ends of the tubes 21 by means of a plate 26, and are threaded at 27 to permit the attachment of steam inlet and condensation outlet conduits leading to and from the respective headers 17 and 18. The caps 23 are likewise bonded into the tubes 21 and are formed with rectangular or other non-circular shaped hubs 28, which fit in the similarly-shaped openings 25 in the plates 5 and 6.

By reason of the fact that the nipples 22 and the hubs 28, on the caps 23, extend through the respective openings 24 and 25 in the plates 5 and 6, the heating unit 7 is supported and retained in proper concentric position within the chamber 4 between the plates 5 and 6, as clearly shown in Fig. 1. The headers 17 and 18 being thus anchored top and bottom, there is no likelihood of any displacement of these headers radially of the members 5 and 6 notwithstanding the tension of the tubes 19 resulting from their being bent into the form of an annulus. Moreover, by reason of the rectangular hubs 28 extending through and fitting the similarly-shaped openings 25 in the plates 5 and 6, the headers 17 and 18 are secured against rotation on their respective axes. Therefore, the connecting of inlet and outlet conduits to or the disconnecting of them from the nipples 22 will not have a tendency to cause any turning of the headers 17 and 18 to produce a consequent strain on the pipes 19 especially at the point of their bonding to said headers.

Eye bolts 29 are suitably secured to the plates 5 and 6 whereby the unit heater may be suspended in operative position from a ceiling.

Variations and modifications in the details of structure and arrangement of the parts may be resorted to within the spirit and coverage of the appended claim.

I claim:

In a device of the class described, the combination of a pair of annular members spaced to provide a chamber between them communicating exteriorly of said members at the perimeters thereof, each of said members having a pair of openings formed therein, the openings in one member being alined with the openings in the other member transversely to the planes of said members, said openings being located contiguous to each other near the perimeters of said members, one opening of each of said pair of openings being non-circular, and an annular coil located in said chamber, said coil comprising a pair of headers connected by a plurality of tubes bent to approximate a circle of slightly less diameter than the outside diameter of said members so as to locate said headers in parallel juxtaposition perpendicular to said members in registration with said alined openings, said headers having a projection on each end thereof adapted to be received in the opening in the adjacent

member whereby said headers are held against displacement radially of said members and said coil is supported between said members wholly by the seating of said projections in said openings, one of said projections on each of said headers being of non-circular form so as to interfit with the non-circular opening in one of said members whereby said headers are positively held against rotation on their axes.

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REFERENCES CITED

The following references are of record in the file of this patent:

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