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C. DEMUTH
HOT-AIR SPACE HEATER

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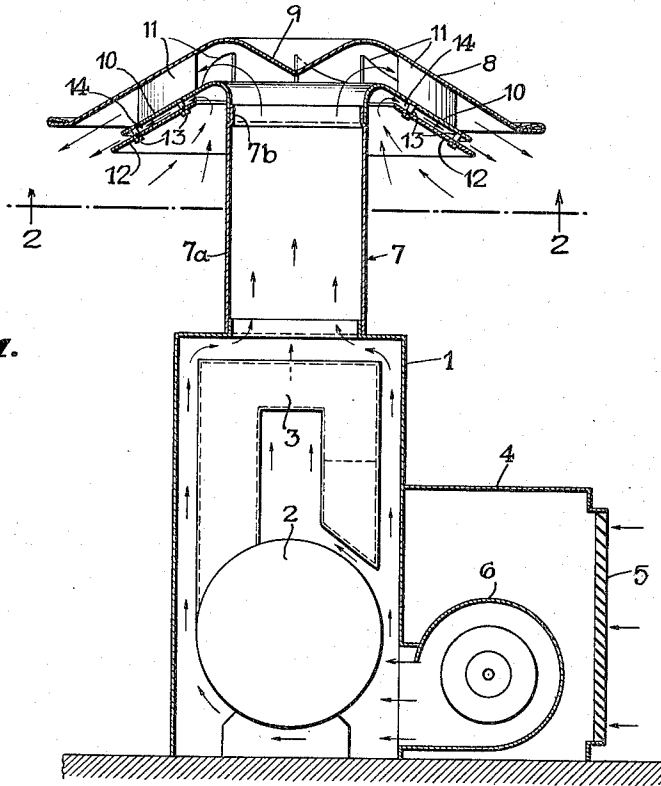
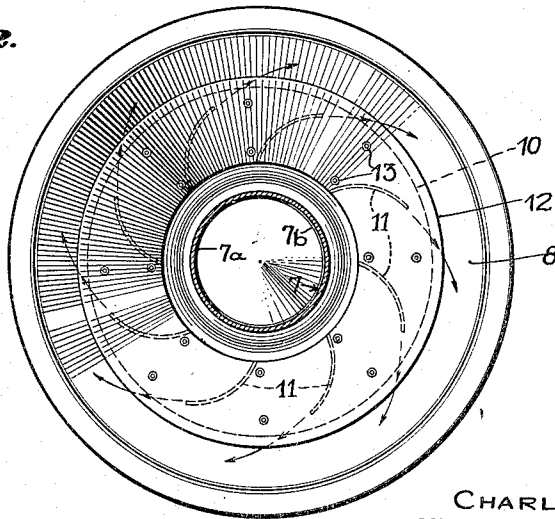


Fig. 1.

Fig. 2.



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HOT-AIR SPACE HEATER

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This invention relates to improvements in space heaters of the type commonly referred to as hot air pipeless heaters and comprising unitary structures for heating enclosed spaces.

Pipeless heaters or furnaces are relatively small, portable or semi-portable stoves or the like devices which are comparatively inexpensive and can readily be installed in any desired place. Such stoves as constructed in the past are convenient but are inefficient from the point of view of heating a space uniformly as the hot air from the stove rises vertically above it and does not mingle efficiently or effectively with the surrounding air to accomplish heating of more than a very small volume of the space. My invention as described herein overcomes this deficiency.

One object of my invention is to provide a pipeless heater of unitary structure which will heat a space uniformly and efficiently.

Another object of my invention is to provide a pipeless stove or heater which is simple in construction and thermally efficient.

Other objects will be obvious from a reading of the following description in connection with the accompanying drawing in which:

Fig. 1 represents a vertical section of an embodiment of the invention; and

Fig. 2 is a cross-sectional view taken along the line 2—2 of Fig. 1.

Similar reference numerals refer to similar parts throughout the figures of the drawing.

In the drawing, 1 is the casing of a stove which contains a heating unit 2 of suitable type, such, for example as an oil burning unit. The heating unit has a flue 3 through which the products of combustion pass on the way to a chimney, not shown. The furnace construction may be of any desired kind, one suitable type being shown in my Patent No. 2,286,719, issued June 16, 1942. Air from the space to be heated or, if desirable, fresh air from outside the space is drawn into a chamber 4 through an inlet 5, which preferably is provided with suitable filter or air conditioning screening, by a blower or fan 6 of any desired construction. The air is forced by the fan into the casing 1 of the heater where it is heated by contact with heating unit 2 and the surfaces of the flue 3. After being heated, the air passes upward through a comparatively short pipe or duct 7 which is mounted on top of casing 1. At the top of duct 7 there is mounted, by means presently to be described, a mushroom or deflection hood 8 having in its center an inverted cone 9 which directs the air outwardly until it strikes the surface of hood 8, which slopes down-

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wardly and outwardly. Duct 7 at its upper end is flared outwardly and downwardly into a flange 10, whose surface is substantially parallel to that of hood 8. Between hood 8 and flange 10 are mounted by appropriate means, such as welding or by bolts, a plurality of curved vanes 11. These vanes serve as supports for hood 8. Air deflected between hood 8 and flange 10 impinges on curved vanes 11, which cause it to flow in a substantially tangential or spiral direction about the axis of duct 7, as well as downwardly due to the downward slope of hood 8 and flange 10, as indicated by the arrows in Fig. 2. This directed flow of the heated air outwardly and downwardly prevents it from rising vertically above the heater and thus assures that the heat is imparted, by mixing of the hot air with room air, to a large space about the heater. The swirling flow imparted to the heated air by curved vanes 11 further promotes mixing of the heated air with room air.

In addition to the effect of the direction of motion of the heated air in promoting its admixture with air already present in the space to be heated, a still further feature of my invention adds to this effect. On the underneath side of the flange 10 I attach another flange 12, as by bolts 13. This flange 12 extends circumferentially about the upper portion of duct 7 in an outward and downward direction, substantially parallel to and spaced from the flange 10 a suitable distance, forming an air space 14. As will be seen from Fig. 2, flange 12 extends outward a short distance farther than flange 10 but does not extend all the way in toward duct 7, thus leaving the space 14 between flanges 10 and 12 open on both inner and outer sides. Heated air passing outward between hood 8 and flange 10 creates suction in space 14. This space 14 being open at both ends, the suction draws air from the room into the inner side of space 14 and thence through that space, causing the air to be heated somewhat by contact with duct 7 and flange 10. The air so drawn into space 14 passes outwardly therefrom and intermingles with the heated air flowing outwardly between hood 8 and flange 10.

The above described means for causing mixture of the heated air with the atmosphere of the space being heated, is facilitated and positively effected by the velocity imparted to the air by fan 6. For purposes of convenience in fabricating and assembling the parts, the duct 7 preferably comprises a conduit section 7a secured at its lower end to a vertical upwardly extending outlet passage provided in the top of the housing

1 and secured at its upper end to a cooperating part 7b of the separately formed distributor head comprising the parts 8-13, inclusive.

It will be seen, therefore, that I have provided a novel and practical unitary space heater for conditioning the air of an enclosure in a thoroughly efficient manner. It will be apparent that this invention comprises a unit which will heat a given space far more thoroughly than any pipeless furnaces now in use.

Having described my invention with particularity with reference to a presently preferred form of the same, it will be obvious to those skilled in the art after understanding the invention, that various changes and modifications may be made therein without departing from the scope of the invention, and it is my intention to cover in the appended claims such changes as come within the scope of the invention.

What I claim is:

1. A unitary space heater comprising a casing containing a heating unit, a relatively short outlet conduit extending upwardly from said casing, an air distributor head in axial communication with the upper end of said conduit, said head comprising an inverted conical wall disposed over the outer end of said conduit in substantially axial alignment therewith and having its outer diameter spaced upwardly from said outer conduit end, a first peripheral wall disposed in outward radial continuation of said conical wall in a downward direction, a second peripheral wall disposed in outward radial continuation of said outer conduit end in spaced relation to said first peripheral wall, and upwardly and downwardly extending spirally disposed baffles interposed in the space between said first and second peripheral walls, means for forcefully moving air to be heated into said casing and past said heating unit and through said conduit and head, whereby the flows of said heated air is reversed from an upward direction and is caused to flow outwardly, downwardly and substantially tangentially in the vicinity of said heater.

2. In an air heating furnace having a casing provided with an inlet passage and an upwardly extending outlet passage at the top and a heating unit intermediate said passages and a blower for forcing air through said casing past said heating unit and upwardly through said outlet passage, the combination with said upwardly extending outlet passage of a hot air distributor comprising a vertical air duct in communication with said outlet passage, a hood supported by and disposed above the top of said duct and having in its center an inverted cone, a circumferential flange adjoined to the top of said duct and sloping downwardly toward its outer edge, the surface of said hood being substantially parallel to said flange and providing therewith a peripherally disposed downwardly extending outlet for said vertical air duct, and a second circum-

ferential flange affixed to said first flange substantially parallel thereto and providing therewith a peripherally disposed air space exterior said air duct outlet.

3. An air distributor adapted to be mounted vertically over a forced feed, unitary heater, comprising a vertical air duct, a hood supported by and disposed above the top of said duct and having in its center an inverted cone, a circumferential flange adjoined to the top of said duct and sloping downwardly toward its outer edge, the surface of said hood being substantially parallel to said flange and providing therewith a peripherally disposed downwardly extending outlet for said vertical air duct, and a second circumferential flange affixed to said first flange substantially parallel thereto and providing therewith a peripherally disposed air space exterior said air duct outlet.

4. In a pipeless space heater, the combination of a furnace, means for drawing air into heat transfer relationship with said furnace, said furnace having an upwardly extending duct providing an outlet for heated air, a distributor head disposed immediately above and carried by said furnace having a central throat in communication with said outlet duct and an upper end wall flaring upwardly and outwardly from the axis of said throat and thence outwardly and downwardly to provide a circumferential flange exterior the diameter of said throat and a second flange substantially parallel to said first flange and spiral baffles interposed between said first and second flanges for directing the heated air outwardly, downwardly and tangentially, and a third circumferential flange in spaced relation beneath said second flange and providing therewith means for drawing unheated air into parallel flow with the heated air whereby the heated air is mixed with the unheated air in the space to be heated.

CHARLES DEMUTH.

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