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AIR HEATER

Filed July 5, 1927

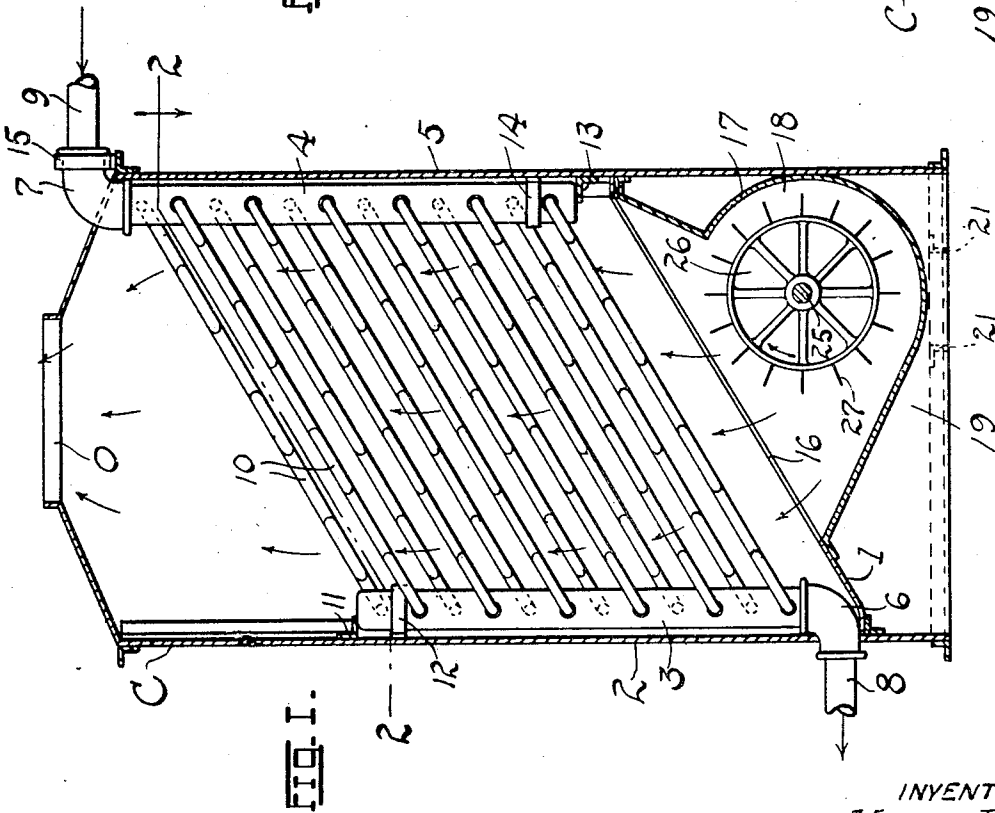


FIG. 1.

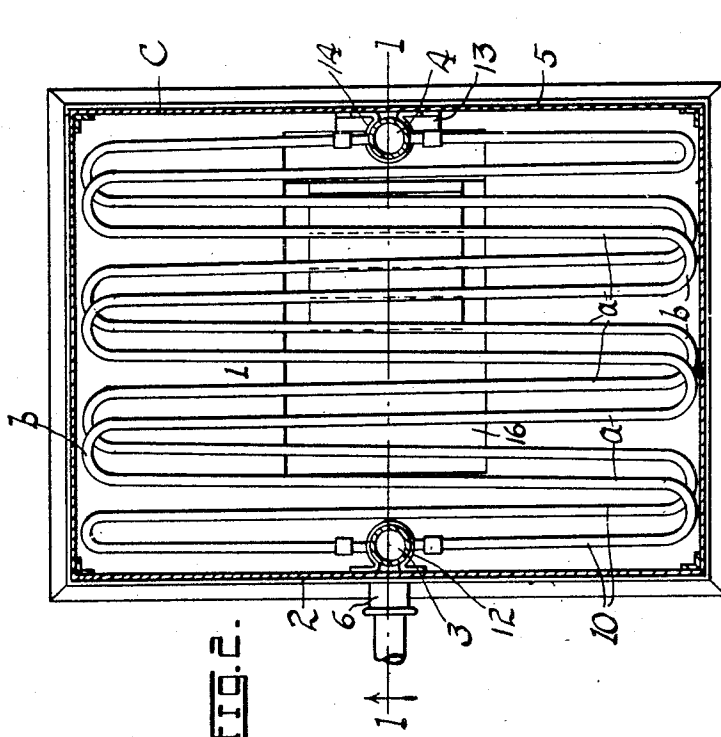


FIG. 2.

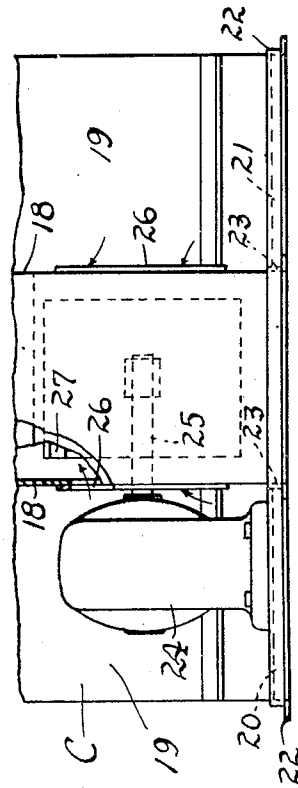


FIG. 3.

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AIR HEATER

Application filed July 5, 1927. Serial No. 203,454.

My invention has relation to improvements in air heaters and it consists in the novel features of construction more fully set forth in the specification and pointed out in the claims.

5 The principal object of the invention is to provide a radiator for the heater comprising a return bend steam coil from which the water of condensation will drain by gravity when the radiator is either in a vertical or
10 horizontal position.

Because of this construction enabling the coil or coils to drain by gravity, it is possible to place the same heater in various positions.

15 The heaters are installed to give the best results under the conditions encountered, and it is of great advantage if they may be located either at the ceiling, on the floor, or walls, in either upright or horizontal position without alteration or deficiency in operation. I
20 accomplish these objects by arranging within the casing parallel tubular headers in subjacent planes, between which are connected a series of steam coils. As one header is disposed below the other the coils are inclined,
25 and since the headers are parallel with the casing walls the coils will always be inclined with respect to the casing walls. Hence, it matters not whether the casing be inverted or horizontal so far as the inclination of the
30 coils is concerned. Thus, irrespective of the position of the casing the bank of coils will always drain by gravity.

Another object of the invention is to maintain a blast of air across the coils which is
35 accomplished by disposing a fan, or blower, in one corner of the casing so that the general direction of the air currents is always co-extensive with the length of the headers. Other advantages will be better apparent
40 from a detailed description of the invention in connection with the accompanying drawings, in which—

45 Figure 1 is a vertical longitudinal section taken through the heater casing taken on the plane indicated by the line 1—1 in Fig. 2,

the coil bank remaining in elevation; Fig. 2 is a horizontal transverse section taken on the plane indicated by the line 2—2 in Fig. 1; Fig. 3 is a side elevation of the lower part of the casing looking toward the fan housing. 50

Referring to the drawings, C represents a casing having an outlet O at the top and a partition 1 inclined upwardly from the bottom of side wall 2. A pair of headers 3, 4, are disposed within the casing on different levels, the header 3 in close proximity and parallel to wall 2 and header 4 in close proximity and parallel to wall 5. In the present instance the headers 3, 4 are tubular in shape and have elbows 6, 7 connected to the lower end of header 3 and the upper end of header 4 respectively to receive pipes 8, 9 of a steam supply system. A bank of return bend or serpentine steam coils 10 are connected between headers 3 and 4, the coils lying in parallel planes and being disposed in staggered relation, and alternate coils 10 entering opposite sides of the headers. The header 4 is disposed above the header 3 (when the casing C is positioned as shown in Fig. 1) and the
70 coil bank inclines downwardly from header 4 to header 3. In other words the plane of each coil intersects a plane at right angles to the vertical plane in which both headers lie. The straight lengths a of each coil 10 are spread apart or diverge sufficiently from bends b so that, considering the inclination of the coil, each coil will drain by gravity throughout its length from the upper end to the lower end. 80

The inclination of the coils need be only sufficient to cause them to drain by gravity when the radiator is in either a vertical or horizontal position and the common plane intersecting the headers is vertical. Thus the heater may occupy any one of four positions, i. e., on either side adjacent to a header and either upright or inverted. 85

Therefore, when the casing is installed in the position shown in the drawings, the pipe 90

9 will serve as the steam inlet and the pipe 8 into which all the coils 10 drain, as the steam outlet. Should the heater be installed in an inverted position the inlet and outlet will, of course, be reversed. Even if the heater is installed with the casing C in a horizontal position all of the coils will drain into the header which is on the bottom. Thus it is apparent that my heater is of practically universal application without special adaptation.

Header 3 is confined between the partition 1 and an angle bracket 11 and held to the wall 2 by a strap 12, and header 4 is held in place by a bracket 13 and straps 14 and 15. However, the manner of securing the heating elements in place is optional with the manufacturer.

The partition 1 is provided with a rectangular opening 16, centrally located with respect to its breadth, and a fan scroll 17 is arranged beneath this opening in the space between the partition and wall 5. The sides 18, 18 of the fan scroll extend downwardly from the lateral margins of opening 16, thus leaving triangular spaces 19, 19 on both sides of the fan scroll. Short angles 20, 20 and 21, 21 are secured in these spaces 19, 19 between reinforcing angles 22, 23, and a motor 24 is mounted on either pair of angles 20, 20 or 21, 21 as desired. The motor shaft 25 extends through one of the fan intake openings 26, 26 in the side walls 18, 18 of the fan scroll and carries a multi-vaned fan 27 for rotation in the scroll 17. Thus currents of air are forced through the casing and across the steam heated coils 10 to the casing outlet O.

Having described my invention, I claim:

1. A steam radiator comprising a bank of juxtaposed return bend pipe coils disposed in parallel inclined planes, adjacent sections of each coil being spread sufficiently to cause the coil to drain by gravity, each coil having a steam inlet at its upper end and a steam and water outlet at its lower end, the steam inlets and outlets of each coil respectively being substantially in alinement and the position line of said inlets and outlets being parallel.

2. A steam radiator comprising a bank of juxtaposed return bend pipe coils disposed in parallel inclined planes, adjacent sections of each coil being spread sufficiently to cause the coil to drain by gravity, each coil having a steam inlet at its upper end and a steam and water outlet at its lower end, the inlets and outlets of the coils lying in a common vertical plane, and the inclination of the coils being with respect to a line lying in this plane and at right angles thereto.

3. A steam radiator comprising a bank of juxtaposed return bend pipe coils disposed in parallel inclined planes, adjacent sections of each coil being spread sufficiently to cause the coil to drain by gravity, and each coil hav-

ing a steam inlet at its upper end and a steam and water outlet at its lower end.

4. An air heater comprising a casing, a steam radiator therein comprising a return bend pipe coil disposed in an inclined plane with respect to the casing, adjacent sections of said coil being spread sufficiently to cause the coil to drain by gravity, and said coil having a steam inlet at one end and a steam outlet at the other end.

In testimony whereof I hereunto affix my signature.

HENRY BAETZ.