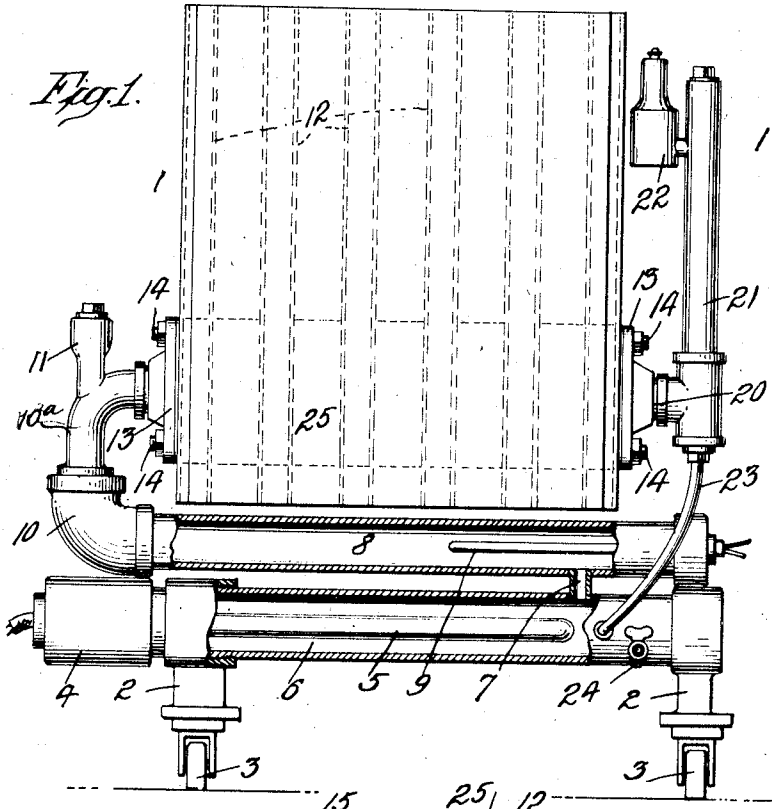
Jan. 9, 1934. L. LITHMAN 1,942,559

RADIATOR

Filed Oct. 19, 1932

Fig. 1.



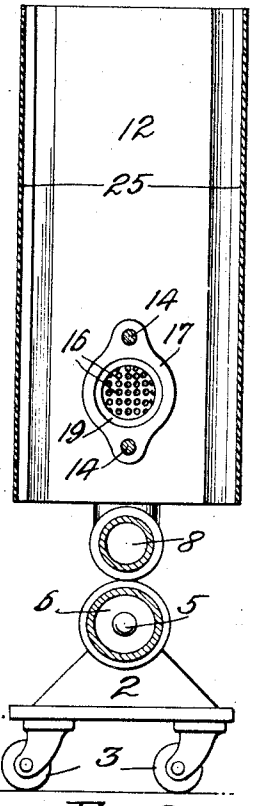


Fig. 2.

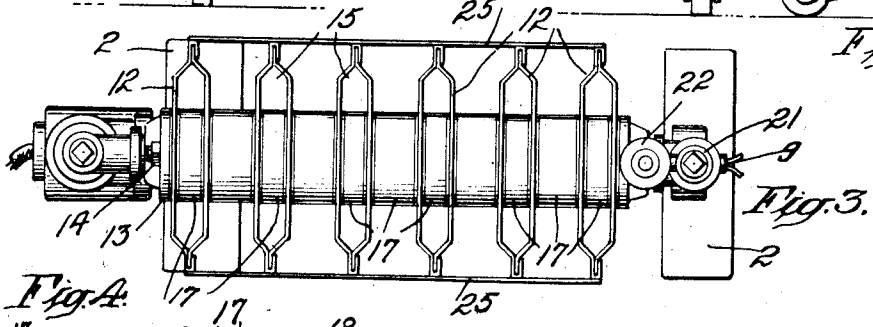
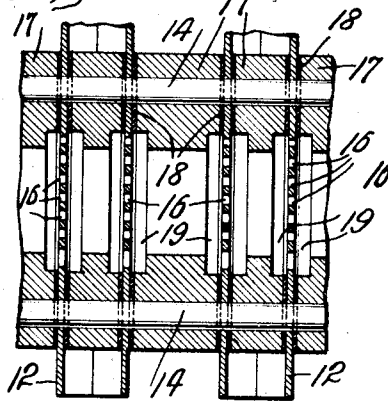


Fig. 3.

Fig. 4.



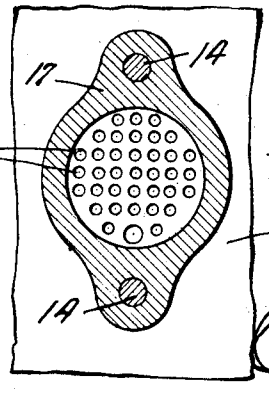


Fig. 5.

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RADIATOR

Leopold Lithman, New York, N. Y.

Application October 19, 1932. Serial No. 638,471

8 Claims. (Cl. 257—141)

The object of my invention is to provide a portable radiator which is a self contained unit, that may be transported from one place to another to heat a room. This and other objects are accomplished by my invention, one embodiment of which is hereinafter more particularly set forth.

For a more detailed description of my invention, reference is to be had to the accompanying drawing, forming a part hereof, in which

Figure 1 is a side elevation, partially in section, of a radiator embodying my invention;

Figure 2 is a vertical section of the same;

Figure 3 is a plan view of the same; and

Figures 4 and 5 show details of construction.

Throughout the various views of the drawing, similar reference characters designate similar parts.

My improved radiator 1 is mounted in any suitable way, as on a supporting frame 2 resting on castors 3. Said frame supports a tube or boiler 6 within which is located a heating device, such as an electric heating unit 5, of the conventional kind. A passage 7 extends upwardly from the tube 6 to connect said tube with an upper tube 8 extending substantially parallel with the tube 6. Thus, water heated in the lower tube or boiler 6 by the heating unit 5 may circulate to reach the upper tube 8 wherein a thermostat 9 is located to regulate the temperature of the heater. One end of the tube 8 is connected to an elbow 10 joined to an upwardly extending portion 10*a* which is formed with a filling pipe 11 through which water may be inserted or removed. The portion 10*a* connects to a number of radiator cells 12 which are all identical, and at each end of the cell assembly is placed a flange connection 13, the two connections 13 being joined by the tie-bolts 14.

Each cell 12 is composed of a radiating chamber 15, which may be a casting, a forging or a stamping, or any other suitable device, and the walls of this chamber have areas of perforations 16 or are foraminous to permit a flow of heating fluid through the walls of the centre of each cell. Between the cells 12 are placed spacers 17 and the cells 12 and tubular spacers are tied together by means of the bolts 14 so as to make one rigid structure. If desired, suitable packing 18 may be employed to make a fluid tight joint and this is the preferred construction.

It is essential that the radiator, when in use, should be noiseless, and this result is secured by providing recesses 19 in the spacers at each side of the perforations 16. This structure makes a slight enlargement at the perforated part 16, so as to facilitate a proper flow of heating fluid at all times when the apparatus is in use. The enlargements also act as mufflers to cause the radiator to function quietly when in use. There is a further object in having perforations in the walls of the cells. Through this construction the metal will absorb the heat units and accelerate the passage of heat in each cell but not retard the circulation in any cell of the radiator. The vertical longitudinal edges of each cell are bent together to interlock and thus close the sides of the cell, forming it into a tubular flue.

A nipple 20 connects one end of the radiator with an expansion pipe 21 having an air valve 22 at its upper end, and the lower end of the nipple 20 is connected to a drain tube 23 which runs to the bottom of the heating chamber 6. A petcock 24 is also provided to permit a draining of the heater whenever desired.

The ends of the flues 15 are preferably connected by protecting plates 25, one at each side, and these run from the top to the bottom, so as to provide vertical chambers through which the heated air travels when the radiator is in use.

In view of the foregoing, the operation of my improved radiator will be readily understood. Assuming that power is applied through a conductor in the conventional way, and regulated by thermostatic control, water is heated in the boiler 6 at the bottom of the radiator to any desired temperature, and passes upwardly, and thereafter passes back to the bottom through the tube 23 to the neighborhood of the heating element 5 where it is again heated and this process is repeated indefinitely. Any air that may get into the apparatus passes out through the pipe 21 and the air valve 22. From time to time fresh water may be added through the pipe 11. When desired, the entire apparatus may be drained through the petcock 24.

While I have shown and described one embodiment of my invention, it is obvious that it is broad enough to cover all structures that may come within the scope of the annexed claims.

Having thus described my invention, what I claim is:

1. In a device of the class described, a radiating structure composed of parallel cells having foraminous wall portions disposed between them to stop the acceleration of fluid through the cells and to eliminate noise when the radiator is operating.

2. In a device of the class described, a radiat-

ing structure provided with spaced cells, said cells having vertically disposed walls formed with groups of localized perforations, the cells being held together so that the perforated areas in all of the cell walls are in alignment, and tubular spacers disposed between the cell walls with the central openings in said spacers in alignment with the perforated areas in the cell walls.

3. In a radiator assembly, a plurality of tubular members connected together to form a continuous passage, a plurality of flues located in spaced relationship, with the tubular members interposed between them, parts of the flues being disposed in the passage formed by said members, said parts of the flues being foraminous.

4. In a radiator assembly, a plurality of spaced tubular flues disposed vertically, tubular spacing members interposed between the walls of said flues, said tubular members co-operating to form a heating chamber, the portions of the walls of the flues located between the tubular members being provided with a plurality of perforations.

5. In a radiator assembly, a heating fluid passage composed of a number of connected tubular elements, tubular flues having their walls interposed between the tubular elements with parts of said walls disposed within the passage formed by said elements, said parts of the flue walls being foraminous, parts of the passage on opposite sides of the foraminous portions of the flue walls being enlarged.

6. In a radiator a heating fluid passage formed of a number of vertical tubular flues, spacing members disposed between the flues and holding the flues separated from one another, the flues having foraminous portions disposed between the spacing members.

7. In a device of the class described, a radiating structure having spaced flues, tubular spacing members disposed between the flues and abutting against the walls thereof, each of said spacing members having a central bore formed with enlarged recesses adjacent the walls of the flues so that liquid can accelerate between the flue walls without noise.

8. In a radiator assembly, a plurality of apertured spacing members placed together with their apertures in registration to form a continuous heating fluid passage, a plurality of flues having portions of their walls located and clamped between the spacing members, one of said spacing members being located between the walls of each flue, the other of said spacing members being located between the walls of adjacent flues, the walls of the flues having openings aligned with the apertures in the spacing members, and means for clamping the flues and spacing members together.

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