

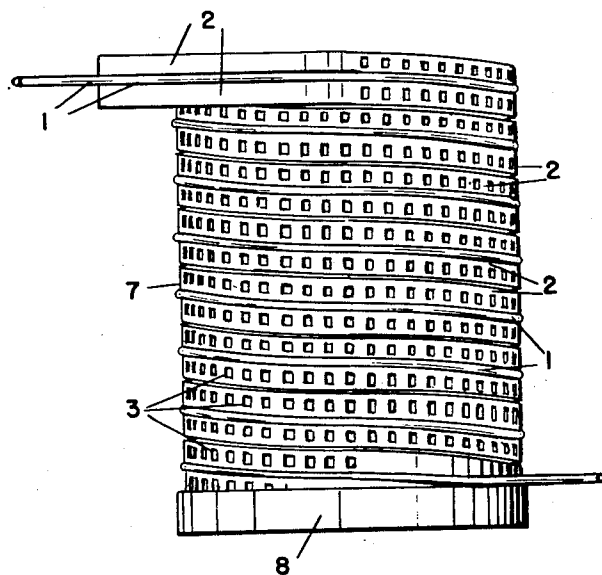
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HEAT EXCHANGER

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HEAT EXCHANGER

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1 Claim. (Cl. 257—124)

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The invention relates to a radiator for room heating of the type in which one or more metal tubes as conduits for the heat transmitting fluid are provided with fins extended in the longitudinal direction of the tube or tubes and having over at least part of their area transversal perforations or slots.

It is a principal object of the invention to provide fully equalized thermic conductivity in the metallic system of the heat exchanger and simultaneously to reduce manufacturing costs by avoiding any welded or soldered seams or joints in the tube-fin system.

The radiator of the invention thus comprises a linearly extended element constituted by a seamless tube with a pair of oppositely arranged fins integral therewith and extended longitudinally thereof. This element is shaped into a coil, adjacent convolutions of the coil substantially lying with their fins edge to edge in close proximity to one another so as to form a cylindrical hollow body. The hollow body is open at its top and closed at its lower end by a bottom cover. The fins are perforated over at least part of their area by transverse openings or slots so as to allow the hollow body to draw in, as a flue, air to be heated in subdivided fine streams through the slots and discharge the heated air at and through the open top of the hollow body.

The metal tube may be made by the methods which are usually employed in the manufacture of pipes and metal strips, namely, by pressing, rolling and drawing or by a combination of these methods. The metal tube is preferably made in a single operation from an ingot, this being possible because the fins or ribs extend in the longitudinal direction of the tube. The term "single operation" means that the pipe or tube is made simultaneously with the fins.

The oppositely arranged fins may be disposed in a diametrical or a tangential plane. The perforations of the fins may be in the form of slots or in the form of louvres suitably formed by slitting the fins transversely, leaving a narrow slit between them and bending the strips out from the plane of the fins.

Since fins and pipe are of one piece thermic discontinuities from welded or soldered seams are avoided and thus causes for irregularities in

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the flow of the medium to, from, and along the metallic heat transfer system.

An embodiment of the invention is illustrated by way of example in the accompanying drawing.

The figure of the drawing is a front view of a coil.

The coil 7 is wound from a seamless fin tube 1, the fins 2 of which are provided at least on part of the circumferential surface with transversal slots 3, or louvres. Adjacent convolutions of the coil are lying with their edges in close proximity to one another so as to form a quasi-closed cylindrical surface. The base of the cylinder 7 is closed by means of a bottom 8. The air heated by the inner medium, e. g. water flowing in tube 1, will, owing to the difference in specific gravity, flow out at the upper end of the coil 7 which thus acts as a flue.

The fresh air to be heated is compelled to pass into the interior of the cylinder through the apertures 3. Owing to the flue action the velocity of the warm air is increased. The apparatus thus represents a very effective radiator of small size.

The heating medium which flows through the coil may be hot water or steam; the medium to be heated will be the air of the room to be heated.

Experiments have proved that, whereas a cast iron radiator of 1 sq. m. area which is supplied with hot water at a temperature of 90° C. which is reduced to 70° C. delivers about 400 calories and weighs 28-32 kgs., the weight of a coiled tube radiator of the kind shown in the figure with the same delivery of heat amounts to 1.20 to 2.00 kgs. Such a radiator requires no welding or packing and is, therefore, more reliable than a cast iron radiator.

Since the flowing air is in contact with the radiator along a distance of only ½ to 2 mm., any deposit of particles of dust, suspended in the air, on the heating surface is avoided. For this reason the heat exchanger is very advantageous also from a hygienic point of view.

I claim:

A radiator for room heating comprising a linearly extended element constituted by a seamless tube with a pair of oppositely arranged fins integral therewith and extended longitudinally thereof, said element being shaped into a coil, adjacent convolutions of said coil substantially lying with their fins edge to edge in close proxim-

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ity to one another so as to form a cylindrical hollow body, said hollow body being open at its top, a bottom cover closing said hollow body at its lower end; said fins having transversal slots therethrough, thereby to allow said hollow body to draw in, as a flue, air to be heated in subdivided fine streams through said slots and discharge the heated air at and through the open top of said hollow body.

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