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HEAT EXCHANGERS
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Fig. 1

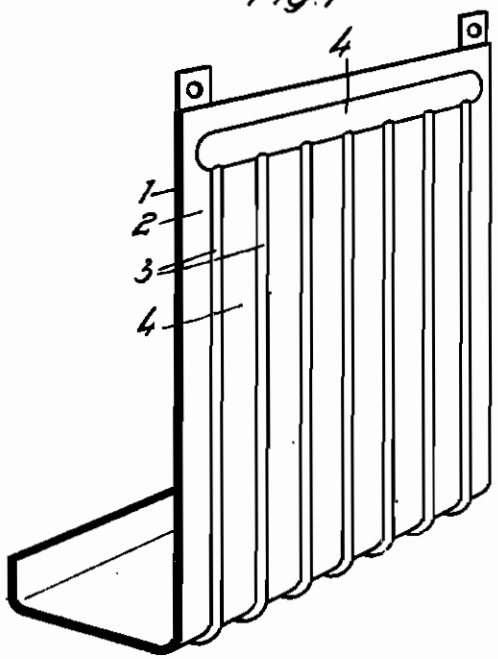


Fig. 2

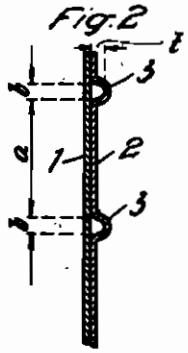
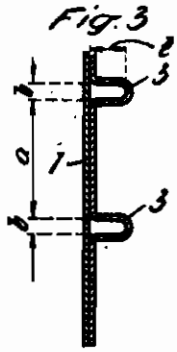


Fig. 3



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ALIEN PROPERTY CUSTODIAN

HEAT EXCHANGERS

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vested in the Alien Property Custodian

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This invention relates to improvements in heat exchangers.

In heating or cooling systems, heat exchangers are often employed consisting of two metal sheets held together in flat condition and provided with grooves through which flows a heat transfer medium. Heat exchangers of this type are adapted for use in refrigerating apparatus as condensers or evaporators. Heat exchangers of the above-mentioned character had hitherto been, as a rule, so manufactured that the two plates provided with grooves were secured together around their edges by welding, various welding seams being also employed in the sheet portions between the single grooves. If heat exchangers exposed to a great inner pressure as this is, for instance, the case with condensers for refrigerating apparatus are employed in such systems, relatively great wall thicknesses for the metal sheets have to be used, since the inner surfaces of the two metal sheets lying between the single welding seams are exposed to a great pressure. If a great thickness of the sheets should be avoided this could only be attained by reducing the operating pressure. This requirement cannot always be readily fulfilled.

The object of the invention is to remove the above drawback and to provide a heat exchanger of the above-indicated character in which a very small sheet thickness may be employed for high inner pressures. This may be accomplished according to the invention by copper plating the two sheets forming the heat exchanger and by brazing them together by the copper coating thus formed, preferably in a protective gas atmosphere. In this manner a very high resistance to the gas pressure existing between the two sheets is attained so that only relatively narrow refrigerant grooves are stressed by the inner overpressure of the heat exchanger, whereas all surfaces of the two metal sheets being normally in contact with one another are not under the influence of the inner overpressure by the fact that they are secured together by brazing. By the invention it is possible to manufacture heat exchangers, for instance, evaporators for refrigerating apparatus from metal sheets having each a wall thickness of 0.5 mm or less.

The heat exchanger may be manufactured according to the invention in such a manner that the two sheets are copper plated and are brazed together at their contact surfaces by the copper coating thus formed, in a protective atmosphere according to a known method. The outer surface of evaporators or similar heat exchangers made of sheet metal are protected against corrosion by hard zinc plating the same or providing them with a varnish coating.

The invention may be applied to heat exchangers of any type, to all pressure vessels having great heat radiating surfaces, and particularly to evaporators for refrigerating apparatus for domestic refrigerators.

In the accompanying drawings is shown an embodiment of an evaporator manufactured according to the invention.

Fig. 1 shows an L-shaped evaporator manufactured of two sheets 1 and 2 provided with grooves 3 and a depression 4. The two evaporator sheets are not secured together as has hitherto been usual around their edges by welding, but the surfaces of the two sheets are brazed together in a gas-tight manner as described above.

Fig. 2 shows a sectional view through a part of a heat-exchanger. The two sheets 1 and 2 consist of sheet metal of, for instance, a wall thickness of 0.5 mm. The surface portions 4 of the width a (Fig. 2) are brazed to the corresponding surface portions of the opposite sheet wall. According to the invention it is therefore not possible that the surfaces of the evaporator sheets intimately in contact with each other offer great surfaces to the inner pressure, but only the grooves 3 of the novel heat exchanger are exposed to the inner overpressure.

If a larger tubular cross-section is to be chosen the form shown diagrammatically in Fig. 3 may be employed in which the depth t of the grooves in greater than the width b. This form of the grooves is particularly advantageous, since in the case of a relatively small distance a between the grooves the greatest possible outer heat exchange surface may be attained.

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