PUBLISHED
MAY 25, 1943.
BY A. P. C.

E. NANZ
HEAT EXCHANGER
Filed July 16, 1941

Serial No.
402,669

Fig.1.

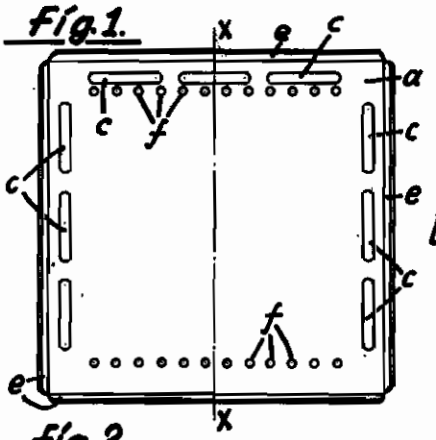


Fig.4.

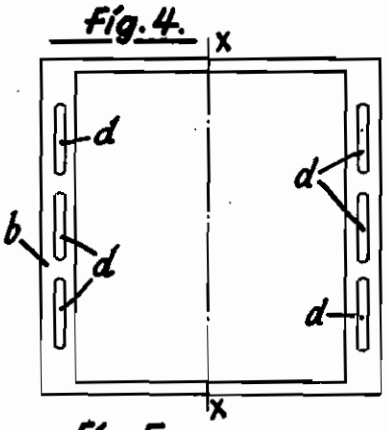


Fig.2.

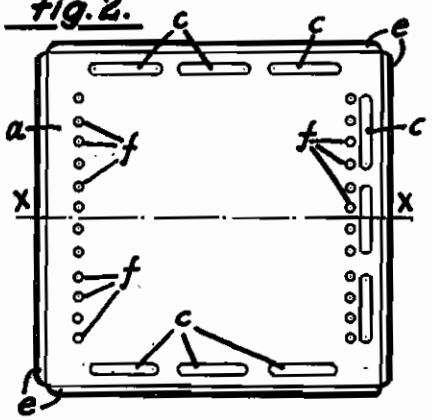


Fig.5.

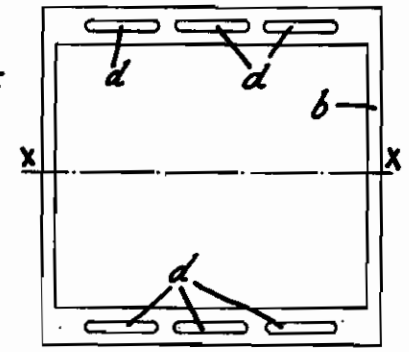


Fig.3.

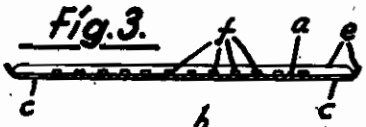


Fig.6.

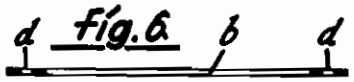


Fig.7.

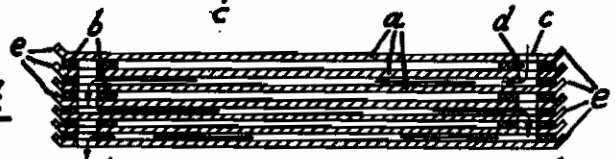
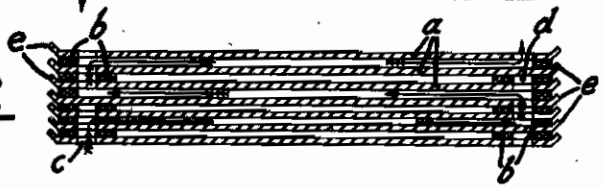


Fig.8.



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Published May 25, 1943 Serial No. 402,669

ALIEN PROPERTY CUSTODIAN

HEAT EXCHANGER

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Application filed July 16, 1941

This invention relates to a heat exchanger in which the heat exchanging media cross each other in countercurrent and the chambers for the flow of these media comprise thin square metallic sheets of equal size and interposed thin elastic framelike scaling members also of equal size.

The feature of the invention resides in providing the sheets with upturned edges and equipping both the sheets and sealing members near their edges with narrow slots forming registering passages which in the sheets appear on three sides thereof while the sealing frames are fitted therewith only on two opposite sides, the other two sides thereof forming narrow strips positioned outside the slots of the sheets and acting as sealing means.

The heat exchanger according to the invention is of simple construction, can be easily manufactured, is highly efficient, since the heat exchanging media intersect on a large surface, and insures good heat transfer owing to the thinness of the sheets. Furthermore, notwithstanding the elasticity of the sealing means the chambers are nevertheless quite low.

The invention is illustrated by way of example in the accompanying drawing, in which

Figures 1 and 2 are top views of two sheets in different positions of use;

Fig. 3 is a cross section of a sheet;

Figs. 4, 5 and 6 are, respectively, two top views and a cross section of a sealing member; and

Figs. 7 and 8 are two vertical sections, displaced 90°, of a number of chamber units formed of sheets and sealing members.

Each chamber of the heat exchanger according to the invention comprises flat square thin-gage metallic sheets *a* of equal size, which are elastic and made for instance of rubber. The sheets *a* possess on three sides near their edges slotlike passages c, and the sealing members *b* are fitted with similar passages *d* near the edges of two opposite sides, the size and position of the passages being such that the passages *d* of the members *b* register with the passages c of the sheets *a* when the members *b* are placed on the sheets *a*.

The passages *c* and *d* are symmetrically arranged relative to the axes *x*—*y*, as indicated particularly in Figs. 1, 2 and 4, 5, so as to register at the proper position of the members *b* and sheets *a*.

To insure proper positioning of the sheets *a* and sealing members *b* during assembly of the heat exchanger the edges *e* of the sheets *a* are slightly bent up in such manner that they do not interfere with the compression of the sealing members *b* when the units are fitted together.

To protect the sheets *a* from bulging out due to the pressure of the heat exchanging media and to prevent a reduction of the height of the flow spaces, which is low per se, spacing members *f* are provided on the sheets *a*, which in the example shown are placed near the passages *c*. though they might be differently arranged and distributed for instance over the entire space.

In the construction illustrated every heat exchanging medium flows through every other exchange space, as indicated in Figs. 7 and 8, but it is possible of course to let one of the media flow through several adjacent exchange spaces.

ERNST NANZ.