Oct. 28, 1941. L. C. PFOST 2,260,638

SECTIONAL CORE HEAT EXCHANGER

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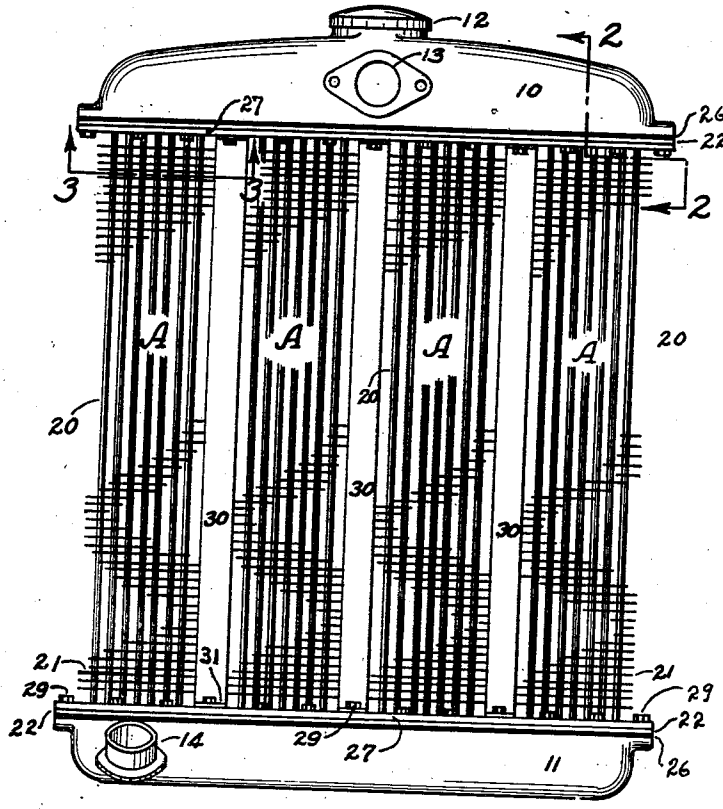


FIG. 1

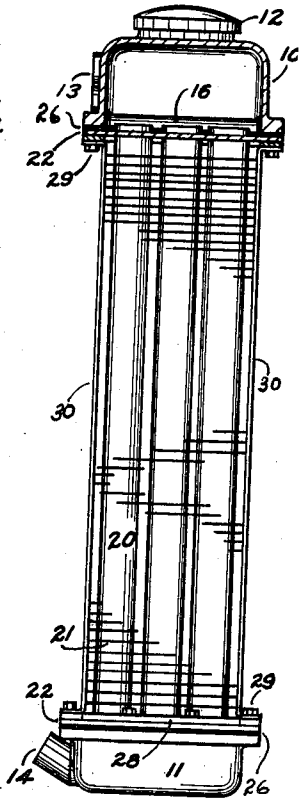


FIG. 2

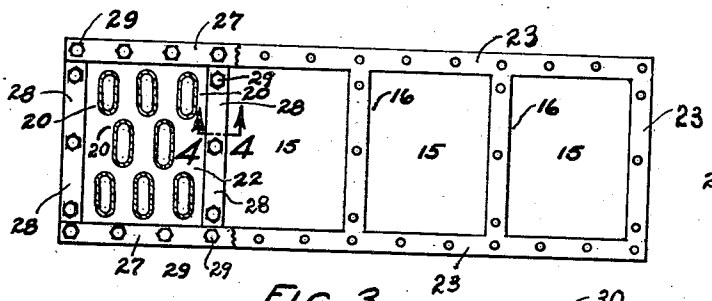


FIG. 3

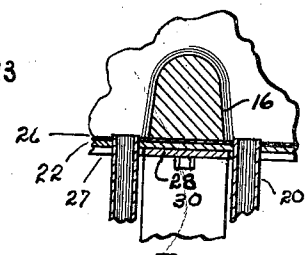


FIG. 4

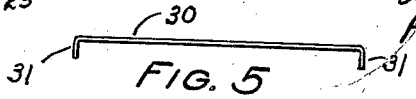


FIG. 5

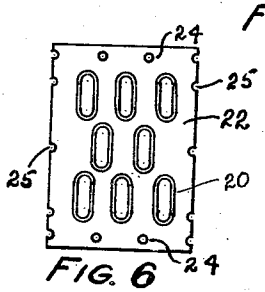


FIG. 6

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SECTIONAL CORE HEAT EXCHANGER

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2 Claims. (Cl. 257—129)

The present invention relates to heat exchangers having a number of cores which are removably attached to the headers.

An object of the present invention is to increase the efficiency, reduce cost and weight and produce a device wherein the individual sections may be easily removed and replaced.

I accomplish the results sought by providing a number of spaced cores which are secured to the headers similar to heat exchangers of the single core type having tube plates which are bound and sealed to the inner surface of the header.

To these and other useful ends, my invention consists of parts, combinations of parts, or their equivalents, as hereinafter set forth and claimed and shown in the accompanying drawing in which:

Fig. 1 is a rear elevational view of the preferred form of my invention.

Fig. 2 is a side elevation of the device as shown in Figure 1, the upper header being sectioned on lines 2—2 of Figure 1.

Fig. 3 is an under side view of the top header, one of the sections being shown on line 3—3 of Figure 1.

Fig. 4 is a fractional section of the header taken on line 4—4 of Figure 3.

Fig. 5 illustrates the preferred means provided for preventing air from passing between the cores.

Fig. 6 illustrates an end view of one of the cores.

As thus illustrated, my device comprises upper and lower headers 10 and 11, the upper header having, if necessary, the usual filler cap 12 and inlet connection 13, the lower header having an outlet connection 14. The headers are each made flat on their inner surfaces and have a number of rectangular openings 15 instead of a single opening as is the custom in headers served by a single core. These openings are formed by means of transverse bridges 16.

In the drawing, I illustrate a heat exchanger having four cores. The cores are designated in their entirety by reference character A each comprising a number of tubes 20 and a multiplicity of closely spaced fins 21 through which the tubes extend.

The tube ends of each core are provided with tube plates 22. Each plate is adapted to register with outer surfaces 23 of the headers and overlap half of the width of members 16. The tube plates are provided with apertures 24 and cut-away portions 25 thus when they are assembled on the headers, members 25 register with the same member on the adjacent tube plate.

I provide a gasket 26 and steel strips 27 and 28 by means of which the tube plates are bound and sealed against the headers by spaced bolts 29.

It will be seen by scrutinizing the drawing that steel plates 27 rest on the front and rear edges of plates 22 and that the strips 28 fill the space between members 27 resting on the edges of members 22. The end plates 28 lie on one edge only of tube plates 22 therefore the sides of plates 22 may be identical so as to provide openings for bolts 29 which extend through plates 28. This construction requires that the cores be spaced a short distance apart, therefore strips 30 are provided to prevent air from passing through this space. End flanges 31 are provided on strips 30 having apertures for the reception of bolts 29 so strips 30 may be held into the position shown in Figures 1 and 2.

Thus it will be seen that headers 10 and 11 are operatively connected together by means of cores A, that the tubes have a direct connection or passageway into the headers and that the strips 27 and 28 cooperate with bolts 29 to hold the tube plates against members 16. Strips 28 provide a space between the cores for the insertion of a wrench with which to tighten bolts 29.

Thus it will be seen that I have provided a heat exchanger having a number of cores all or any one of which may be conveniently removed and replaced and that the device is simple, efficient and easily and cheaply manufactured.

Having thus shown and described my invention, I claim:

1. A device of the class described, comprising spaced headers having flat uniform inner faces, a number of spaced cores each operatively connecting said headers, said cores comprising rectangular in cross section bundles of tubes and a multiplicity of closely spaced fins through which the tubes extend, said operating connections including rectangular tube plates through which the ends of the tubes extend and being bonded thereto, the protruding ends of said tubes adapted to register with openings in said flat faces, the edges of said tube plates adapted to lie on said flat faces, their adjacent edges being in juxtaposition and having registering notches cut therein, gaskets positioned between said tube plate edges and flat surfaces, binder plates positioned on said edges and having bolts adapted to bind and seal the tube plates to said headers, the adjacent edges of said tube plates being covered by a single binder plate, the bolts of which extend through the openings formed by said notches.

2. A device as recited in claim 1 including; plates having a width substantially equal to the space between said cores positioned in alignment therewith and having flanges at their ends with openings for the reception of the adjacent binder plate bolts to thereby provide air locks between said cores.

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