

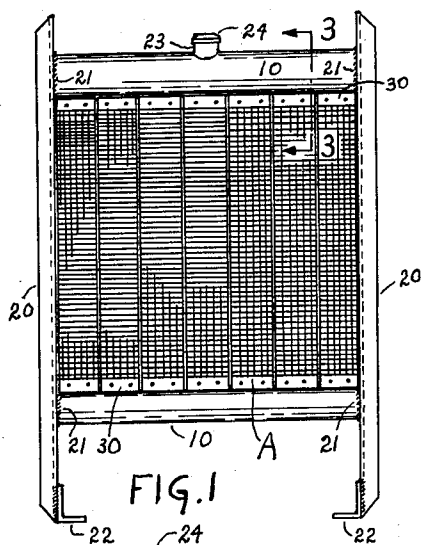
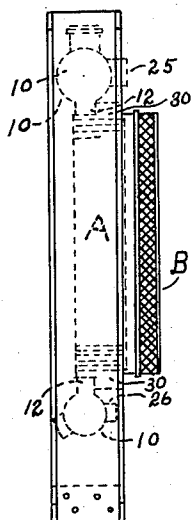
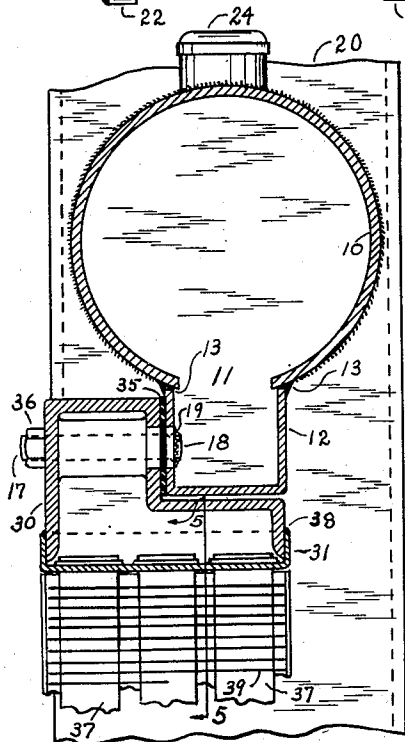
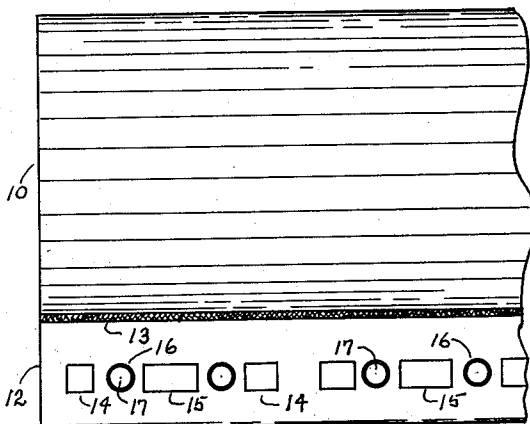
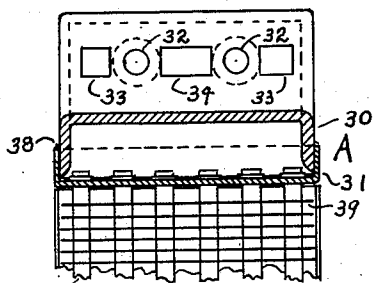
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F. M. YOUNG

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HEAT EXCHANGER

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INVENTOR
FRED M. YOUNG
BY *A. S. Kroh*
ATTORNEY

UNITED STATES PATENT OFFICE

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HEAT EXCHANGER

Fred M. Young, Racine, Wis.

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1 Claim. (Cl. 257—154)

The present invention relates to a structure having a number of individual radiator cores which are removably secured to common headers and has for its object, providing a structure which will weigh and cost considerably less and operate more efficiently than former devices of the kind.

In former devices of the class, the ends of the individual cores are secured to cast headers. Such headers are heavy, expensive, very rigid and apt therefore to crack or cause the tubes to fracture because of unequal expansion and contraction. Furthermore, such headers are expensive and are frequently porous or have cold shut cracks.

The present invention relates to a built-up header of suitable material which, when completed, weighs and costs but a fraction of the weight and cost of a cast header. The headers or tanks are made preferably of sheet steel and the joints suitably electrical welded together, thus presenting maximum strength and flexibility at minimum cost.

One of the novelties of the present invention is the manner of supplying end closures for the headers wherein the supporting frame members are welded to the open ends of the headers, thus a unitary and strong structure is provided which is not easily injured and is sufficiently flexible to provide a break-proof, light, inexpensive core supporting frame.

I accomplish the foregoing objects and results by a combination of parts or their equivalents as hereinafter described and claimed and shown in the accompanying drawing in which:

Fig. 1 is a front elevation of a complete radiator or heat exchanger constructed in accordance with my invention.

Fig. 2 is a side elevation of the radiator shown in Figure 1.

Fig. 3 is an enlarged fragmentary transverse section taken on lines 3—3 of Figure 1.

Fig. 4 is an enlarged fragmentary front elevation of the top header.

Fig. 5 is an enlarged fragmentary rear view of one of the radiator sections, taken on line 5—5 of Figure 3.

As thus illustrated, I provide circular tubes 10—10 which are preferably made from sheet steel being cut-away or formed so as to provide an opening or openings as at 11. A U-shaped member 12 which is preferably made from steel is welded to member 10 as at 13.

Members 10 and 12 terminate on the same vertical plane. Member 12 is provided with a

number of spaced openings 14 and 15 and having therebetween at certain positions preferably screw threaded openings 16. These openings preferably have threads made by means of a pipe tap.

I provide suitably threaded studs 17 which are screwed tightly into openings 16, the ends protruding as at 18. After this assembling operation, the studs are preferably electric welded to member 12 as at 19.

Thus it will be seen that the studs, which are preferably steel, are firmly secured to member 12 and that the front face of member 12 will be suitable for gasketed contact to the core heads without machining. While I illustrate member 12 as rectangular in shape, the stud side only need be flat. It will be understood that the studs are secured to member 12 before this member is secured to member 10. Two of these headers or tank assemblies are spaced with members 12 pointing inwardly as illustrated in the various figures.

In Figure 1 the circular portion of the lower header is shown as somewhat smaller than the upper header. They may obviously be made in duplicate.

I provide two end frame channel irons 20—20 the flanges preferably pointing outwardly, the headers being secured in spaced relation to these channels by welding as at 21 thus to form closures for the ends of members 10 and 12 and a substantial supporting frame.

The bottom ends of members 20 may extend a distance below the bottom header as illustrated in Figure 1 and are preferably provided with L-shaped supporting seats 22 being riveted or welded to members 20 as illustrated. Thus it will be seen that headers 10 and members 20 form a light but very strong support for the individual cores.

The upper tank may be provided with a filler opening 23 having a cap 24 as is the custom in heat exchangers of the class. The top header is provided with an inlet connection 25 and the bottom header is provided with an outlet 26. These inlets and outlets may obviously be variously positioned and shaped.

In Figure 1 I have illustrated a heat exchanger having seven individual cores which in their entirety are designated by reference character A. It will be understood that more or less of these cores may be supplied depending upon the size of the unit or for that matter, a single core may be secured to the assembly. I prefer

however to provide the device with a number of individual cores about as illustrated.

5 Cores A each comprise a header member 30 having a tube plate cap 31. Member 30 is provided with openings 32 for the reception of studs 17 preferably two for each header (see Figure 5). Each header is also provided with openings 33 and 34 which register with openings 14 and 15 in member 12.

10 Thus it will be seen that by providing gaskets 35 and nuts 36, members 30 may be securely bound and sealed to members 12. Members 30 are L-shaped in cross section (see Figure 3) and chambered out as indicated so as to form a suitable support for the tube plate caps 31. These caps are preferably formed from sheet brass and members 30 are preferably made from cast steel.

15 I provide a suitable number of tubes 37 which are inserted into suitable openings in the tube plates and bonded or brazed thereto. The tube plates are bonded or brazed to members 30 as at 38. I provide a multiplicity of closely spaced fins 39 through which tubes 37 extend and to which the tubes are bonded in the usual manner.

20 Thus it will be seen that members 12 may be provided with suitable studs and openings to accommodate the desired number and widths of units A and that headers and frame members may be positioned at different distances from each other to accommodate different lengths of cores A.

Obviously therefore, the present invention presents a very desirable reduction problem in addition to having unusual utility as to weight, cost and durability. Clearly the entire assembly will have a pleasing appearance and is easily manufactured.

40 It will be seen that when desired, suitable decorative coverings may be provided. In Figure 2 I illustrate a decorative fan shroud which in its entirety is designated by reference character B. It will also be seen that the headers or tanks

may be made of different sizes in cross section and of different thicknesses of material so as to provide for any desired pressure. I prefer however, to provide the same sized openings 11 in all headers and provide members 12 of the same size for all headers thus to simplify manufacture and standardize core units.

Clearly members A are independent units and may be removed or replaced at will. Obviously, if desired, a single core may be adapted to fill the entire space between members 20.

Clearly many minor detail changes may be made without departing from the spirit and scope of the present invention as recited in the appended claim. For example, members 10 may be made from tubes and openings 11 consist of spaced orifices punched or drilled into the tubes.

Having thus shown and described my invention, I claim:

A device of the class described, comprising 20 spaced side frame members and spaced open end tubes positioned therebetween, said tubes having openings on their adjacent sides, relatively small channels having the free edges of their flanges welded to said tubes and on opposite sides of said openings, said side frame members being welded 25 to the tubes and channel ends to thereby form headers and an integrally formed frame, at least the front flanges of said channels being flat and having spaced openings, a number of heat exchange cores forming operating connections between said front flanges, said cores comprising 30 spaced headers and a number of tubes forming an operating connection therebetween, a multiplicity of closely spaced fins through which said tubes extend, said headers having faces adapted to lie on said front flanges and having openings which register with said spaced openings, and means whereby said header faces are removably 40 bound and sealed to said front flanges.

FRED M. YOUNG.