April 21, 1936. F. M. YOUNG 2,037,845

RADIATOR

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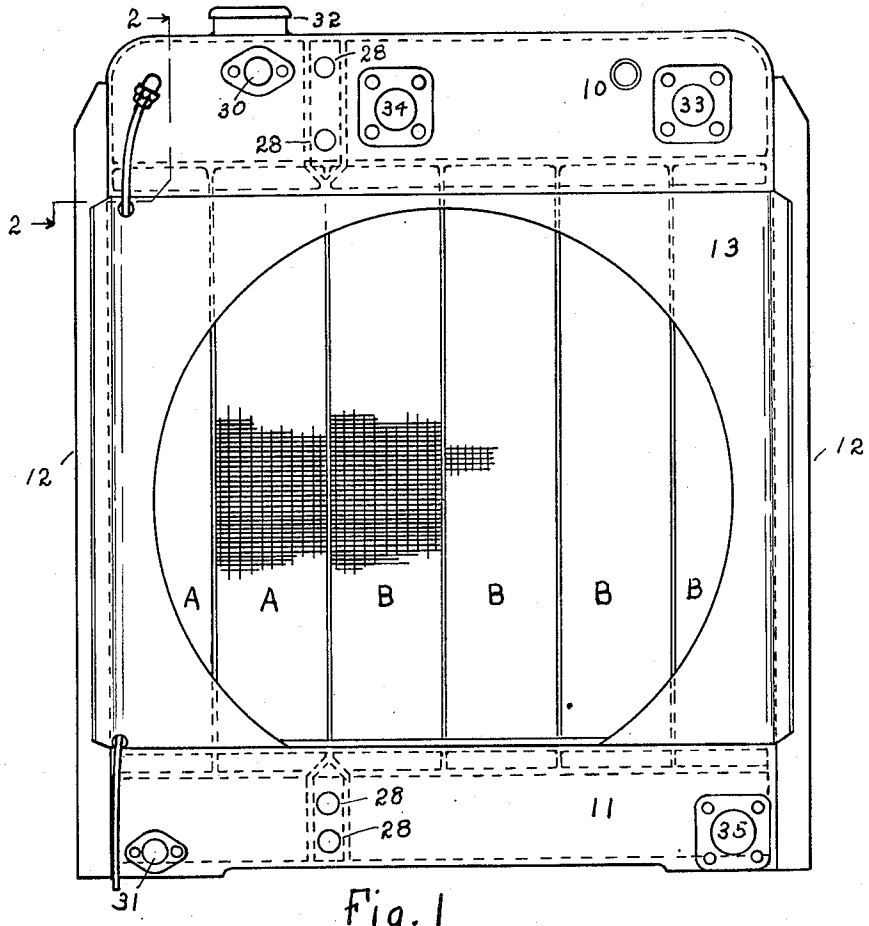


Fig. 1

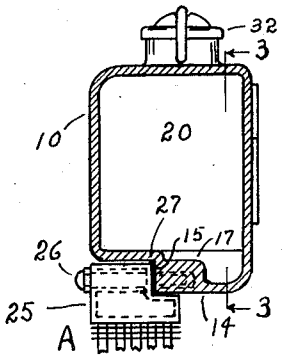


Fig. 2

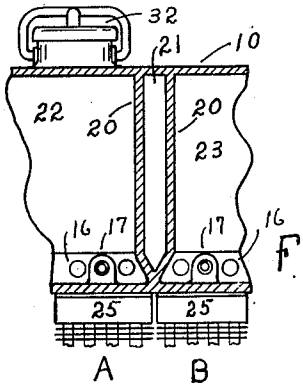


Fig. 3

Inventor
Fred M. Young
By A. S. Krotz
attorney

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RADIATOR

Fred M. Young, Racine, Wis., assignor to Young Radiator Company, Racine, Wis.

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3 Claims. (Cl. 257—125)

This invention relates to a radiator having two separate cores and two headers, each header having a transverse partition forming two compartments therein and the entire assembly formed in a unitary structure. One of said cores is adapted to cool the jacket liquid of an internal combustion engine and the other core being adapted to cool the compressed air from a compressor receiving its power from the engine.

An object of my invention is to provide a dual purpose unit radiator which has a neat and conventional appearance and is suitable for mounting similar to radiators used for cooling the engine liquid only.

A further object of the present invention is to provide detachable cores, each of which may consist of a number of core units.

Another object of my invention is to provide two closely spaced transverse partition walls in the headers, forming two header chambers, the space between the two walls having permanent openings through the rear walls of the headers, whereby when the unit is immersed in liquid and air pressure is used for testing, if there is a leak in either wall, air bubbles will appear through the permanent openings. Further, if a leak should develop after the radiator is placed in service, it would be readily detected because of the permanent openings, whereas a leak in a single transverse wall would at any time be difficult to detect, particularly so after the device had been placed in service.

To these and other useful ends my invention consists in matter hereinafter set forth and claimed and shown in the accompanying drawing in which:

Figure 1 is a rear elevation of my improved radiator indicating a conventional fan shroud and other parts common to radiators of the class.

Figure 2 is a transverse section of the upper header taken on line 2—2 of Figure 1.

Figure 3 is a horizontal fractional section of the top header taken on line 3—3 of Figure 2.

As thus illustrated the top header is designated by numeral 10 and the bottom header by numeral 11. These headers are held in spaced relation by substantial side housing members 12—12, thus forming a unitary frame to which the usual fan shroud 13 may be attached.

Header 10 is, at its bottom, provided with a depending portion 14, thus supplying a face 15 which may be machined to provide a suitable gasket surface. This face 15 extends preferably for the length of the header and is provided with a row of openings 16. A number of lugs 17 are provided which are drilled and tapped as indicated by dotted lines in Figure 2. The purpose of the depending portion 14, surface 15, openings 16 and lugs 17 will hereinafter appear.

I provide a suitably positioned partition in each header and in the same relative position, each comprising two walls 20—20 forming a narrow compartment 21. These walls are illustrated by dotted lines in Figure 1; thus a short chamber 22 and a long chamber 23 are formed in each header. I provide permanent openings 28, extending from chamber 21 through the rear wall of the housings.

In the assembly shown I provide six separate core units, two of these units being liquid cooling units, each in their entirety designated by reference character A.

These cores A, are adapted to be served by the short header compartment as indicated by dotted lines in Figure 1. The other core units, designated in their entirety by reference character B, are adapted to be served by the long compartments.

Each core unit comprises a suitable number of finned tubes, the ends of the tubes having a suitable operating connection to core headers 25. Each core header has a suitable chamber which is provided with openings which register with openings 16, and also an opening through a suitable sleeve which registers with the threaded openings in lugs 17. I provide a suitable cap screw 26 and a gasket 27, whereby the headers may be removably secured and sealed to face 15, the gasket having openings which register with openings 16, whereby the coolant may pass from one header to the other.

Header 11, is similar to header 10, except in minor details. Thus when the units A are securely attached to headers 10 and 11 the engine coolant may enter inlet 30 and pass from one short chamber to the other through the cores A. I provide the usual filler cap 32 and other necessary appurtenances, the use for which will be understood without further description.

It will be noted that I provide four cores B and only two cores A. This ratio or relative capacity may be changed. It has, however, been found in practice, that this combination is suitable for the usual engine and compressor installation.

Cores B are, as clearly indicated, attached to the long chambers of each header exactly as cores A are connected to the short chambers. The usual compressor served by applicant's device, is provided with two outlets. I provide two inlets 33 and 34 to which the compressor outlets may be connected; thus the heated compressed air

will enter the long chamber in the top header, pass from this chamber into and through cores B, into the long chamber in header 11 and out through outlet 35.

A suitable fan, usually having a direct connection to the engine, is made to force an air current through the cores in the usual manner. Thus the engine coolant and compressed air will be cooled, in a manner which is efficient, by a unit having a pleasing appearance and a structure which is simple and compact.

Clearly, units A may be made into a single core of twice the width and units B may conceivably be made into fewer cores or in one core only. I prefer however to make use of the design shown but it will be understood, that various sized units and any number of cores and of any suitable capacity or ratio may be used and that many detail changes in the shape of the elements may be made without departing from the spirit and scope of this invention as recited in the appended claims.

Having thus shown and described my invention I claim:

1. A radiator of the class described, comprising two headers each having transverse partitions comprising two closely spaced walls having an outlet therebetween through the walls of said headers, said partitions being positioned to provide a long and a short compartment in each header, means between the ends of said headers to thereby form a unitary frame, two or more narrow cores each comprising headers and a number of tubes and a multiplicity of closely spaced fins through which said tubes extend, said core headers having removable operating connections to said short compartments, three or more narrow cores each comprising headers and a number of tubes and a multiplicity of closely spaced fins through which said tubes extend, said last headers having removable operating connections with said long compartments.

2. A radiator of the class described, comprising two headers each having transverse partitions to thereby provide two compartments, said partitions comprising two closely spaced transverse walls having an outlet therebetween through the walls of said headers, means between the ends of said headers to thereby form a unitary frame, a core comprising headers, a number of tubes and a multiplicity of closely spaced fins through which said tubes extend, said core headers having detachable operating connections to corresponding compartments in said headers, a second core comprising headers, a number of tubes and a multiplicity of closely spaced fins through which said tubes extend, said second core headers having detachable operating connections to the other compartments in said headers.

3. A heat transfer device of the class described, comprising an upper and a lower header having means between their ends to thereby form a frame, said headers having two closely spaced transverse partition walls forming two compartments in said headers and narrow transverse spaces therebetween, said narrow spaces having outlets through the walls of said headers, a core comprising tubes and fins having operating connections to corresponding compartments in said headers, a second core comprising tubes and fins having operating connections to the other compartments of said headers, said partition walls converging at a point near the inner walls of said headers forming a single narrow thin wall between said header compartments whereby the adjacent openings to said cores may be closely spaced.

FRED M. YOUNG.