T. H. B. ROBERSON.

RADIATOR.

APPLICATION FILED APR. 22, 1916.

1,235,057. Patented July 31, 1917.

Fig. 1.

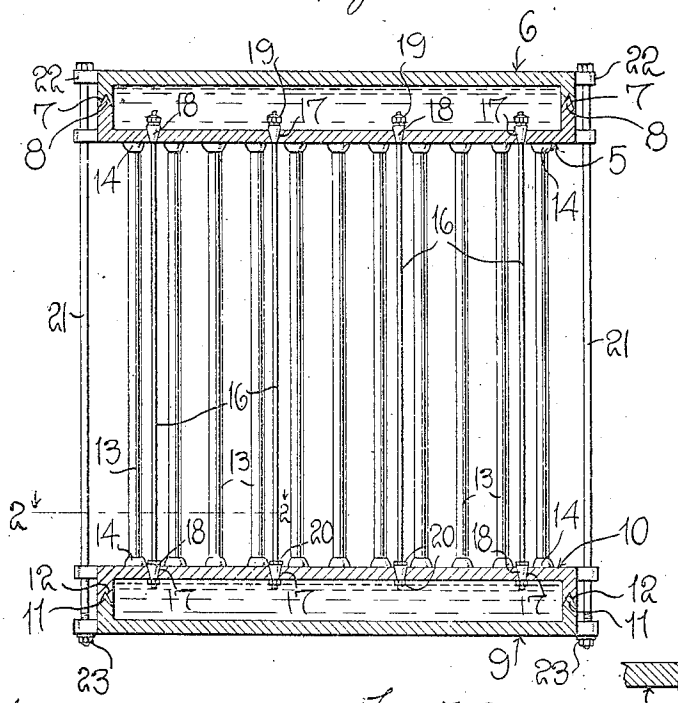


Fig. 2.

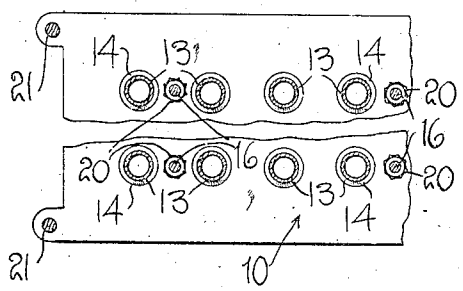


Fig. 4.

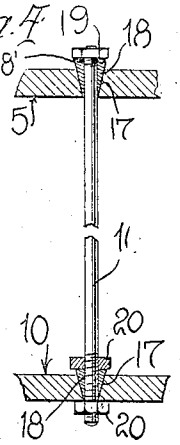
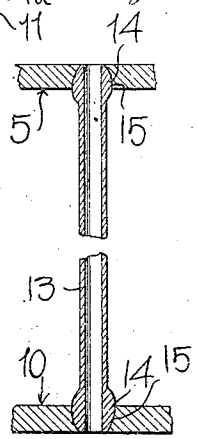


Fig. 3.



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RADIATOR.

1,235,057. Specification of Letters Patent. Patented July 31, 1917.

Application filed April 22, 1916. Serial No. 92,983.

To all whom it may concern:

Be it known that I, THOMAS H. B. ROBERSON, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Radiators, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to radiators and more particularly to radiators of that type commonly found upon automobiles, traction engines, and similar machines, for the purpose of cooling the water which is supplied to the jackets of the engine cylinders by circuitous radiation thereof in juxtaposition to a multiplicity of air passages.

It is one of the primary objects of the present invention to devise improved means for connecting the vertical tubes to the upper and lower chambers of a radiator so as to permit of a certain amount of vibration or movement of the water chambers without breaking the connection between the walls of said chambers and the tubes, and thereby effectively obviating possible leakage of the water.

It is a further important object of the invention to provide an improved sectional construction of the water chambers and means for securely holding the same, with the vertical tubes constituting the radiator core together in assembled relation.

It is an additional general object of the invention to simplify and improve the construction of radiators of the above character whereby the several parts thereof are rendered easily accessible for the purpose of repair, while at the same time the structure as a whole is rendered exceedingly durable and capable of manufacture at relatively small cost.

With the above and other objects in view, my invention consists in the novel features of construction, combination and arrangement of parts to be hereinafter more fully described, claimed and illustrated in the accompanying drawing, in which,

Figure 1 is a vertical sectional view of an automobile radiator constructed in accordance with the preferred embodiment of my invention;

Fig. 2 is a horizontal section through one end of the radiator taken on the line 2—2 of Fig. 1;

Fig. 3 is an enlarged detail sectional view illustrating the joint connection between one of the radiator tubes and the water chambers; and

Fig. 4 is a similar view showing the manner of connecting the vertical bolts to the upper and lower water chambers.

Referring in detail to the drawing, 5 designates the base section of the upper water chamber of the radiator and 6 the top section thereof. Each of these chamber sections is formed with vertically disposed marginal walls, and the edges of the marginal walls on the top section 6 are provided with longitudinally extending, V-shaped grooves or channels 7 to receive the V-shaped ribs or edges 8 on the marginal walls of the lower chamber section 5.

The lower water chamber also consists of a base section 9 and a top section 10, the latter section being formed upon its marginal edges with the longitudinal V-shaped ribs 11 to seat in the correspondingly shaped channels or grooves 12 formed on the vertical marginal walls of the base section 9.

The radiator core consists of a plurality of spaced, vertically disposed copper tubes 13. On the opposite ends of each tube, a reinforcement 14 is cast, having a convex peripheral face. The wall of the bottom section 5 of the top water chamber and the wall of the top section 10 of the lower water chamber are each provided with a plurality of equidistantly spaced openings which are reamed or ground out, as at 15, to produce a perfect fit for the reinforcements or enlargements 14 on the ends of the core tubes.

The sections 5 and 10 of the upper and lower water chambers are also connected by means of a plurality of vertical bolts 16 threaded upon their opposite ends and extending through tapering openings indicated at 17, formed in the walls of the water chamber sections. Frusto-conical, soft metal bushings or gaskets 18 are fitted into these openings around the rods 16. On the upper end of each bolt, a spring washer 18′ is engaged and rests upon the upper larger end of the gasket 18. A nut 19 threaded upon the upper end of the bolt bears against said washer to force the same downwardly upon the gasket to produce a water-tight joint around the upper end of the rod 16. Nuts 20 are also threaded upon the lower end of each of the rods 16 above and below the wall of the lower water chamber and the upper nut 19 forces the metal gasket 18 tightly into the opening in

the chamber wall. Thus, possibility of leakage of the water from the chambers around the connecting bolts is avoided.

A vertically disposed bolt or rod 21 has its lower end engaged through apertured lugs on the sections 9 and 10 of the lower water chamber. One of these rods is arranged at each corner of the radiator, the upper ends of the rods being connected to lugs 22 on the corners of the top section 6 of the water chamber. By adjusting the nuts 23 on the lower ends of said rods, the upper chamber section 6 may be drawn down tightly upon the V-shaped ribs 8 upon the marginal walls of the lower chamber section, and through the medium of the connecting tubes 13, the upper and lower sections of the lower water chamber will also be tightly clamped together. In this manner, all parts of the radiator may be easily and quickly assembled, and the reinforcements on the ends of the vertical tubes 13 tightly engaged in the openings of the chamber wall to produce a water-tight joint though permitting of the free passage of the water between said chambers.

From the foregoing description, taken in connection with the accompanying drawing, the construction, manner of operation and several advantages of the invention will be clearly and fully understood. By mounting the core tubes in the walls of the water chambers in the manner above stated, it will be apparent that the torsional strains to which the radiator is subjected in the vibration of the vehicle, will not result in the breaking of the ends of the core tubes, but on the contrary, the reinforcements 14 thereof will oscillate in the openings of the chamber walls to permit of a limited flexibility or relative movement of the spaced water chambers without completely disconnecting the tubes therefrom or interrupting the continuous flow of the water. It will also be seen that whenever it becomes necessary to repair the radiator or insert new tubes therein, the several parts may be readily disconnected by loosening the lower bolts 21 so that the core tubes can be quickly removed and replaced by new ones. The radiator as a whole is simple and durable in construction, highly serviceable and convenient in practical use and may be manufactured at relatively small cost.

While I have shown and described the preferred construction and arrangement of the several parts, it is to be understood that the invention is susceptible of considerable modification therein and I, therefore, reserve the privilege of adopting all such legitimate changes as may be fairly embodied within the spirit and scope of the invention as claimed.

Having thus fully described my invention, what I desire to claim and secure by Letters Patent is:—

A radiator including upper and lower water chambers having openings in their opposed walls provided with concave seating surfaces extending from one face to the other of the chamber wall, a plurality of vertical water tubes each provided with terminal reinforcements having convex, peripheral surfaces for oscillatable engagement upon said concave seating faces, and detachable connecting means between the ends of the water chambers to hold the same and the water tubes in assembled relation.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

THOMAS H. B. ROBERSON.

Witnesses:
JOHN F. BROWN,
G. A. VETTER, Jr