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E. MATTA ET AL

2,847,191

RADIATOR FOR MOTOR VEHICLES

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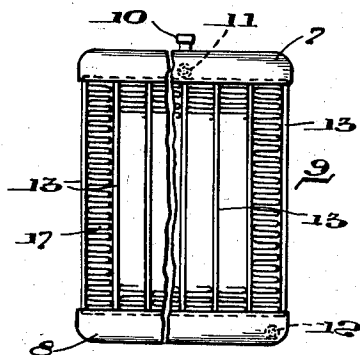


Fig. 1.

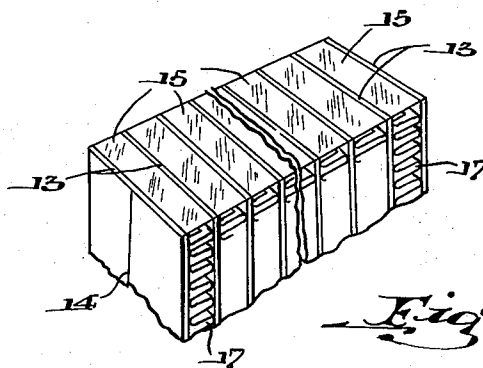


Fig. 2.

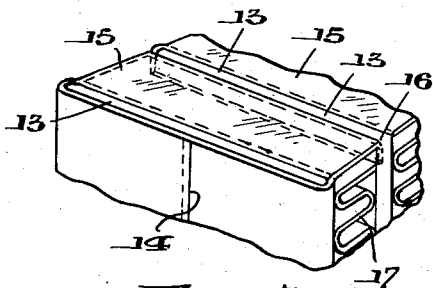


Fig. 3.

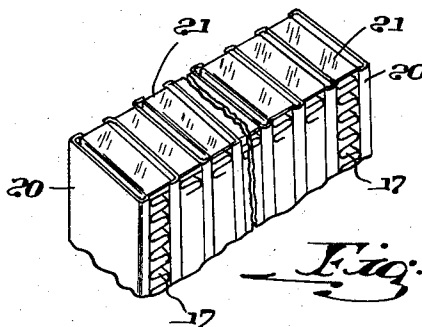


Fig. 4.

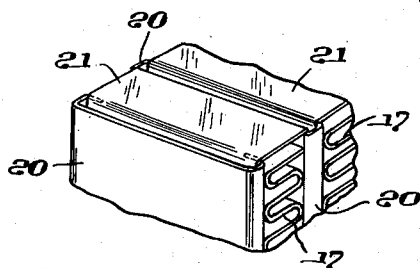


Fig. 5.

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1

2,847,191

RADIATOR FOR MOTOR VEHICLES

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2 Claims. (Cl. 257—130)

Our invention relates to radiators for internal combustion engines of the water jacketed type, such as those commonly employed on motor vehicles. In water-cooling systems of the type employed on automobiles, there are upper and lower chambers frequently designated as "tanks," between which the radiator tubes and air-cooled fins, that comprise the core, are positioned, the vertical tubes being connected to headers or header plates which are in turn connected into the upper and lower chambers.

Our invention has for one of its objects, the provision of a radiator core of the type referred to wherein no headers or header plates are required in order to mount the core in position to receive a flow of water from one tank and directed to the other tank, during circulation of the water through the water jacket of the motor, thus making for simplicity of structure and saving in material.

Another object of our invention is to provide a radiator core with water-conducting tubes so arranged as to accommodate a larger volume of water than is possible with the water tubes in other forms of radiator cores, and wherein a maximum cooling effect of the streams of water through the tubes is effected, by reason of the shape of the tubes.

Still another object of our invention is to provide a core that can readily be adapted to radiators of various sizes, by simply detaching some tubes from the core, and wherein repairs can conveniently be made in case of damage or leakage at some of the tubes.

Some of the forms which our invention may take are shown in the accompanying drawing wherein:

Figure 1 is a front view of a conventional arrangement of certain radiator elements used on motor vehicles, but with our improvement embodied therein.

Figure 2 is a perspective view of a portion of the core of Fig. 1.

Fig. 3 is a view on an enlarged scale of a portion of the core, showing certain details of structure.

Fig. 4 shows a modification of the structure of Fig. 2.

Fig. 5 is a perspective view of a portion of the structure of Fig. 4, on an enlarged scale.

Referring first to Figures 1 to 3, conventional types of upper and lower tanks or chambers 7 and 8, respectively, have secured thereto by soldering or otherwise, a core 9. The tank 7 has the usual filling cap 10 and water inlet 11 that is in communication with the water jacket of the engine. The water flows down through the core tubes into the chamber 8 and thence back to the water jacket of the engine, through the usual hose-like pipe connection at 12.

The core 9 comprises vertical tubes 13 of flattened contour at their sides and spaced apart in parallel planes, each tube being formed by bending the sheet metal to a generally oval form with the edges overlapped and secured together at 14. One vertical wall of the tube is extended in wing-like form at its ends and bent horizontally to form web members 15 which are also bent as at 16 and welded or soldered against one side wall of the next tube 13 at its upper and lower ends, which tubes are formed

2

similarly to the first named tube. The tubes successively have wing portions 15 that serve as webs for sealing the other spaces between tubes, thus preventing flow of water downwardly past the air-cooled fins 17. These fins are formed of folded strip metal and lightly soldered into place against the walls of the tubes.

The tubes may conveniently be of any thickness to fit various standard types of radiator tanks 7 and 8. These wide wall areas of the tubes give greater cooling capacity through transfer of heat to the air that flows past the fins 17.

The use of header plates is rendered unnecessary because of the generally rectangular shape or contour of the core at its upper and lower ends, since it can be inserted a slight distance into the chambers 7 and 8 and soldered or welded therein along its perimeter, as indicated by the dash lines in Figure 1.

Referring now to Figs. 4 and 5, I show a core structure which will be mounted in a motor vehicle or other cooling system in a manner similar to that as shown in Figure 1. In this case, however, the tubes 20 do not have vertically extended sidewalls that are bent laterally to serve as webs for closing the spaces between the tubes, as is the case with the webs 15. The spaces between the tubes 20 are closed or sealed by webs 21 that are in the form of channel shaped cover plates whose edges are bent downwardly and welded or soldered to the vertical walls of the tubes to thus seal off the fins 17 from the water spaces in the tanks, at the upper and lower ends of the tubes.

It will be understood that the fins are formed from strip metal of quite light gauge, as is usual in structures of this kind and that the tubes 13 and 20 will be of a somewhat heavier gauge.

We claim as our invention:

1. The combination with upper and lower water chambers of a water-cooled radiator system for motor vehicles, the chambers having oppositely disposed openings that are of generally rectangular shape, of a radiator core generally rectangular in form, which comprises individually-formed vertical tubes that have flat side walls which extend forwardly and rearwardly approximately the full depth of the core, the tubes being spaced apart in parallel planes, and each having relatively narrow end walls that are integral with both side walls, each of the spaces between the tubes at the spaced areas being closed at its upper and lower ends by flat horizontal web-like members each of which is integral with one of the tube walls and is welded to the adjacent wall of another tube, at the sides of each space, the upper and lower ends of the core extending into the respective water-flow chambers, which are soldered to the ends of the web-like members and to the said end walls along approximately straight lines at the sides and ends of the chamber edges, the spaces between the various tubes being open forwardly and rearwardly for the flow of air therethrough.

2. The combination with upper and lower water chambers of a water-cooled radiator system for motor vehicles, the chambers having oppositely disposed openings that are of generally rectangular shape, of a radiator core generally rectangular in form, which comprises individually-formed vertical tubes that have flat side walls which extend forwardly and rearwardly approximately the full depth of the core, the tubes being spaced apart in parallel planes, and each having relatively narrow end walls that are integral with both side walls, each of the spaces between the tubes at the spaced areas being closed at its upper and lower ends by flat horizontal web-like members that are of channel form, with the flanges of each member soldered to the adjacent side walls of tubes that are adjacent to one another, at the sides of each space, the upper and lower ends of the core extending into the

respective water-flow chambers, which are soldered to the ends of the web-like members and to the said end walls along approximately straight lines at the sides and ends of the chamber edges, the spaces between the various tubes being open forwardly and rearwardly for the flow of air therethrough. 5

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