Mar. 3, 1925.

1,528,461

A. E. WOOLFE

AUTOMOBILE RADIATOR

Filed Dec. 27, 1923

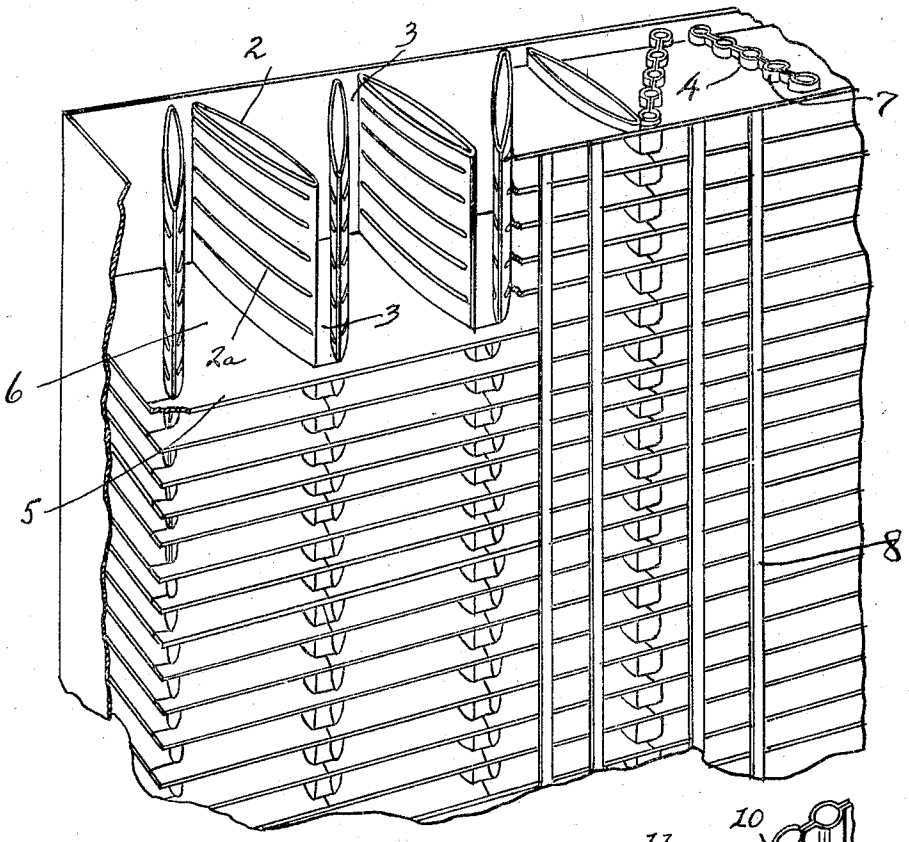


Fig. 1.

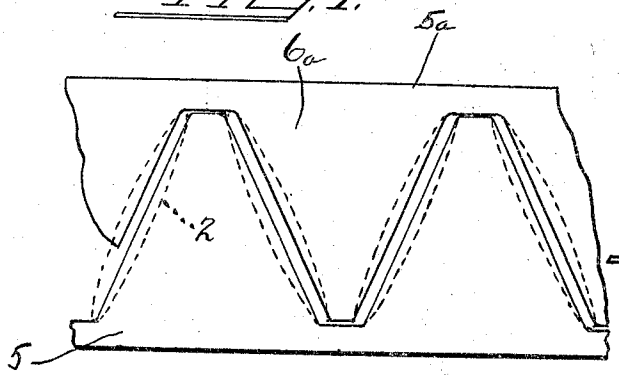


Fig. 2.

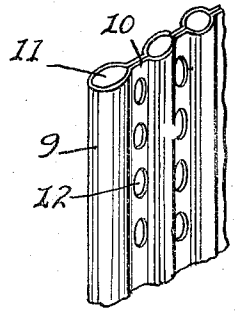


Fig. 3.

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Patented Mar. 3, 1925. 1,528,461

UNITED STATES PATENT OFFICE.

AARON E. WOOLFE, OF CALGARY, ALBERTA, CANADA.

AUTOMOBILE RADIATOR.

Application filed December 27, 1923. Serial No. 683,024.

To all whom it may concern:

Be it known that I, AARON E. WOOLFE, a subject of the King of Great Britain, and a resident of Calgary, in the Province of Alberta, Dominion of Canada, have invented certain new and useful Improvements in Automobile Radiators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification.

My invention relates to radiators for automobiles or other uses where an air cooling for water is desired.

In the construction of radiators for motor vehicles the art has been directed more to the provision of efficiency in cooling and economy of construction than toward rendering the water passages quickly and easily available for removal or repair.

It is the object of my invention to provide a radiator in which availability of the water tubes is fully provided, and to this end I have arranged the water tubes in a series of V-shaped vertically extending rows, so that leaks in the tubes will either be faced to the front or the back of a radiator core, and can be reached directly for repairs. To this end also, I have provided for spacers and heat convection fins in the form of removable pieces, which may, if desired, be removable as a single unit.

The above and other objects to be noted, I accomplish by that certain construction and arrangement of parts to be hereinafter more specifically pointed out and claimed.

In the drawing:

Figure 1 is a perspective view of a radiator core, illustrating several modifications in the way of tubes and spacer devices.

Figure 2 is a plan view illustrating the mode of spacing.

Figure 3 is a perspective detail of a special form of corrugated metal water and air passage tube structure, which can be employed in my new radiator.

It should be noted primarily, that the exact form of water tube in my radiator is a non-essential, since it is the tube arrangement whereby the main point of my invention is accomplished.

In Figure 1 is shown a radiator core, which will be set between two tanks, as in the usual motor vehicle radiator. To the left are shown water tubes 2, formed of folds of sheet metal to provide wide, thin tubes, the length of the core. These tubes may be formed with corrugations or channels 2^a impressed in their sides, and are arranged in the core, when assembling the same, in V-shaped position with relation to each other, leaving at the apices of the several V's, a space 3 for passage of air.

Instead of the wide flat tubes, I may employ a series of individual round tubes, as shown at 4, and these are arranged in a like V-shaped manner.

To make the core rigid, and provide heat convection fins, I provide for the horizontal plates 5, having interspaced V-shaped projections 6, which fit the spaces between the lengthwise water tubes. The channels 2^a are arranged so that the tongues or projections 6 will slide into them, and there may be as many plates 5 as there are channels in the water tubes.

In the case of the rows of round tubes 4, the projections 6 will be formed with notches 7 to fit the walls of the tubes.

As indicated by the vertical straps or bars 8, the assembly of plates 5 may be held together as a unit, and thrust into or withdrawn from the tube assembly, whenever desired to make the tubes available. Or else the plates 5 may be made separate, as indicated at the left hand side of Figure 1.

The plates 5 may be duplicated at the front and back of the core, where the best rigidity of the core is desired, as indicated in Figure 2, where the inner plate is indicated at 5^a with projections 6^a.

One way of forming the water tubes will be to corrugate a sheet of metal and bend it through the middle of one corrugation as at 9, bringing the corrugation walls into contact at points 10, and into tubular formation at points 11. In the act of folding the corrugated metal, the webs, where the walls contact, as at 10 may be punched out into holes 12. Thus a single sheet metal can be made up into the equivalent of a series of vertical tubes 4, with radiating and convection fins, through which fins currents of air may pass.

When a radiator has been built up with the ends of the tubes inserted through proper slots in the top and bottom tanks, and the plates 5 set in place at front and back, the repair man can take out the plates 5, and get at any tube he desires to repair a leak, or if the whole assembly is soldered

fast together, still every point of each tube will be available for application of solder to patch up a leak, due to the V-shaped arrangement.

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

1. In a radiator core, a water passage element comprising a series of water tubes extending lengthwise of the core, and arranged in V-shape, so as to expose the faces of the tubes at the front and back of the core.

2. In a radiator core, a water passage element comprising a series of water tubes extending lengthwise of the core, and arranged in V-shape, so as to expose the faces of the tubes at the front and back of the core, and spacers in the form of plates having V-shaped projections adapted to engage between the rows of tubes.

3. In a radiator core, a water passage element comprising a series of water tubes extending lengthwise of the core, and arranged in V-shape, so as to expose the faces of the tubes at the front and back of the core, and spacers in the form of plates having V-shaped projections adapted to engage between the rows of tubes, and projecting inwardly from the front and back of the core.

AARON E. WOOLFE.