F. W. MARTIN.

AUTOMOBILE RADIATOR.

APPLICATION FILED APR. 15, 1919.

1,365,930. **Patented Jan. 18, 1921.**

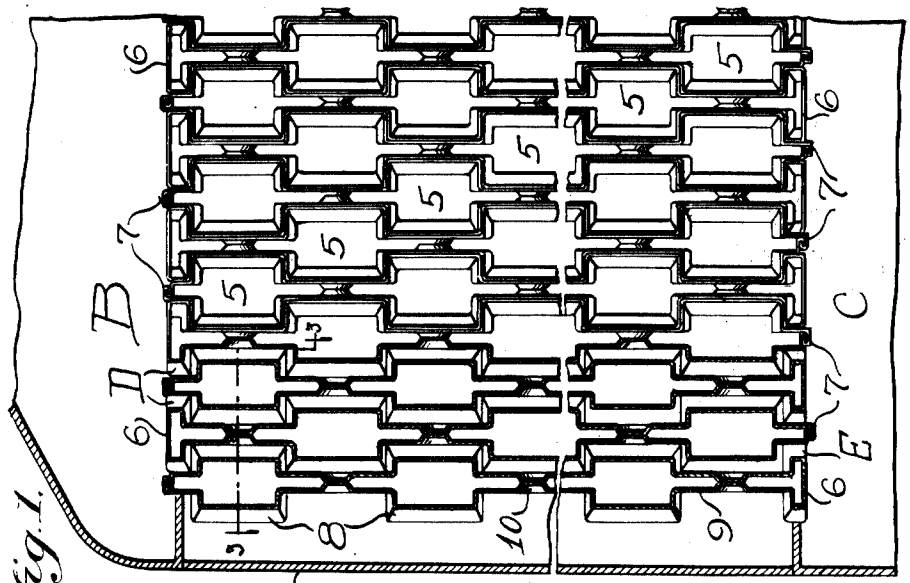


Fig. 1.

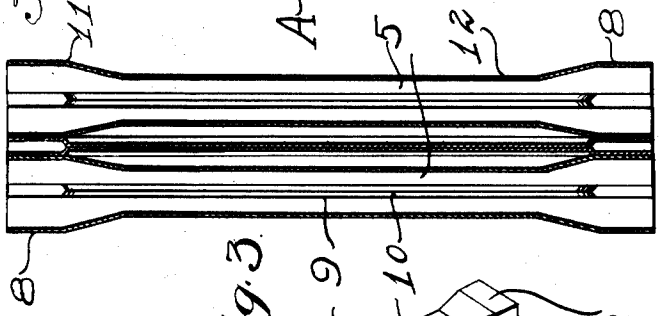


Fig. 3.

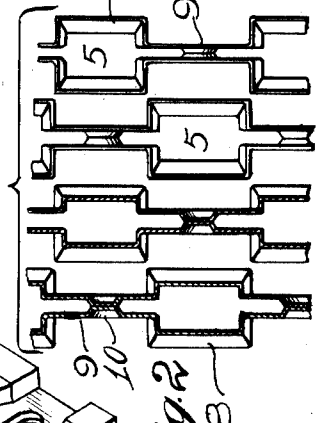


Fig. 2.

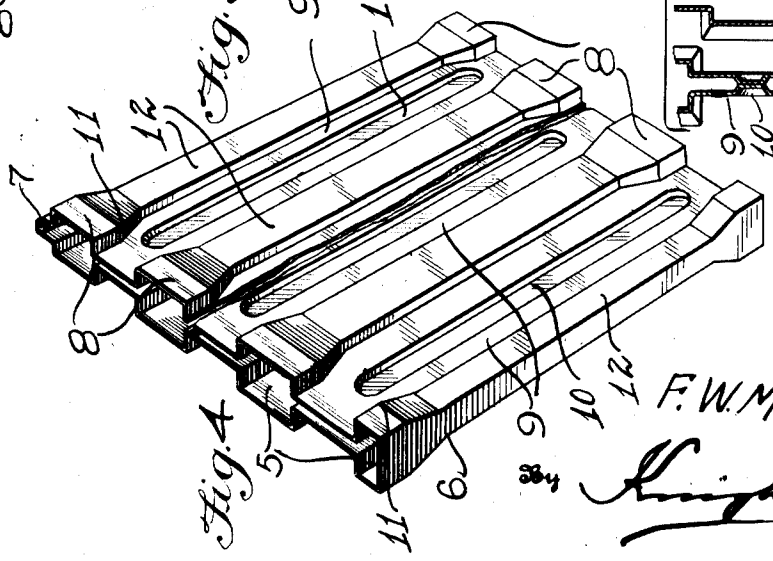


Fig. 4.

Inventor

F. W. MARTIN

By Knight Bros

Attorneys

UNITED STATES PATENT OFFICE.

FREDERICK W. MARTIN, OF WICHITA, KANSAS.

AUTOMOBILE-RADIATOR.

1,365,930. Specification of Letters Patent. Patented Jan. 18, 1921.

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To all whom it may concern:

Be it known that I, FREDERICK W. MARTIN, a citizen of the United States, residing at Wichita, in the county of Sedgwick and State of Kansas, have invented certain new and useful Improvements in Automobile-Radiators, of which the following is a specification.

This invention relates primarily to automobile radiators, as shown in the accompanying drawing, and more particularly pointed out in the following specification, the novelty being set forth in the sub-joined claim.

In said drawing—

Figure 1 is a front elevation of a part of an automobile radiator, partly in section, constructed in acordance with the present invention;

Fig. 2 is a fragmentary view, showing the relative position of the elements or sections;

Fig. 3 is a cross-section on the line 3—3 of Fig. 1; and

Fig. 4 is a perspective view of a section or element.

The invention has for its primary object to improve the construction of what is known in the art as the horizontal air tube type of radiator, to which end one feature consists in so arranging the different elements or sections as to increase the heat exchange surface thereof, as well as to retard to a certain degree the flow of water through the tortuous passage.

Other features relate to certain manufacturing advantages, which will become apparent with reference to the drawings, in which A designates a conventional type of automobile radiator casing, having the usual reservoirs B and C in the top and bottom, respectively, thereof. According to the invention, the heat exchange part of the radiator comprises a multiple-unit construction of the horizontal air tubes 5, formed of a sheet of metal folded upon itself, as at 6, with its meeting edges joined together, as at 7. The opposite ends of each unit or tube 5 are formed with enlarged heads 8, and the webs 9 between the units are formed with relatively long indentations 10, which lay substantially parallel with the units and terminate at each end at points substantially opposite the shoulders 11 on the enlarged heads 8. The intermediate portions 12 of each unit are of reduced diameter and provide tortuous water passages on each side of the tubes. The indentations in the webs, aside from equalizing the distortion of metal incident to the forming of the enlarged heads, will also act to retard the flow of water through the passages, offer an increased heat exchange, and separate the tubes. This retardation of flow is caused by eddies set up in the water due to the enlargement of the water passage produced by the indentations. In making up a radiator the several sections are nested together (see Figs. 1 and 2), the water from the reservoir B will enter the passage, as at D, on both sides of the tubes, and will be discharged into the reservoir C, as at E. The enlarged ends of the tubes are joined together in any suitable manner, preferably by soldering to close the ends of the water passages.

Claim.

A multiple-unit heat exchange element, formed of sheet metal, the ends of each unit formed with enlarged heads, and the webs between the units being formed with indentations lying substantially parallel with the units and terminating at each end at points substantially opposite the shoulders on the enlarged heads, whereby the distortion of metal is equalized.

FREDERICK W. MARTIN.