

Dec. 11, 1923.

1,477,209

W. B. COWAN

RADIATOR FOR AUTOMOBILES

Filed May 5, 1919

3 Sheets-Sheet 1

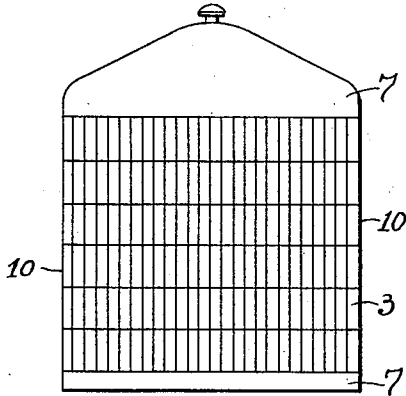


Fig. 1.

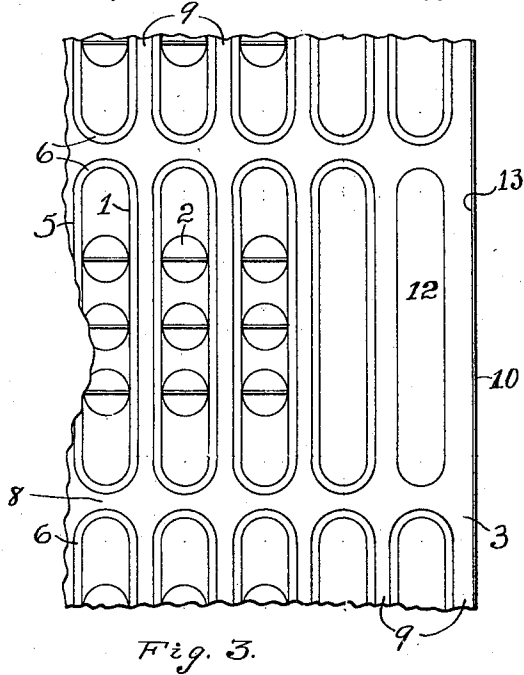


Fig. 3.



Fig. 2.

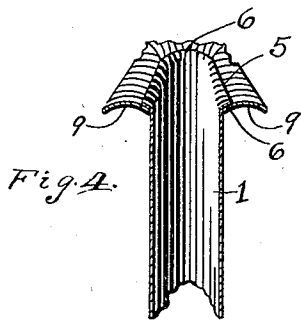


Fig. 4.

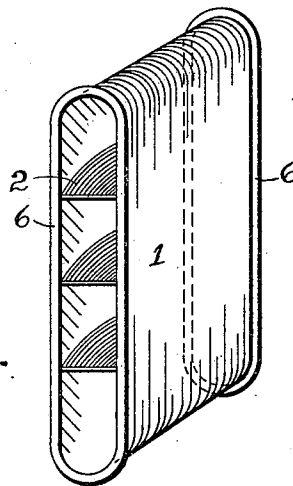


Fig. 5.

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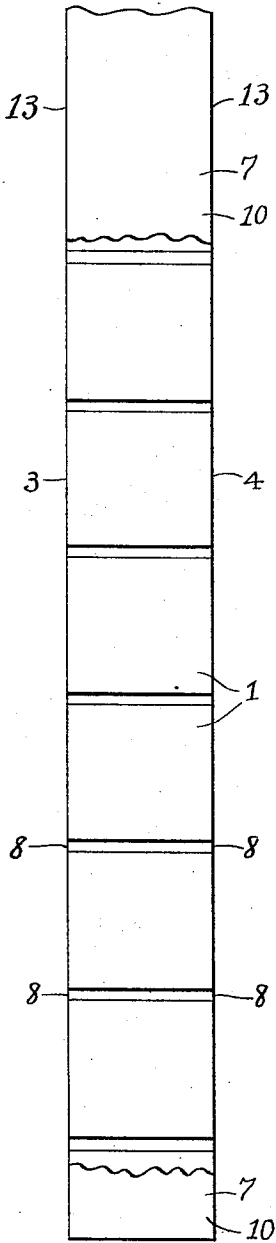


Fig. 6.

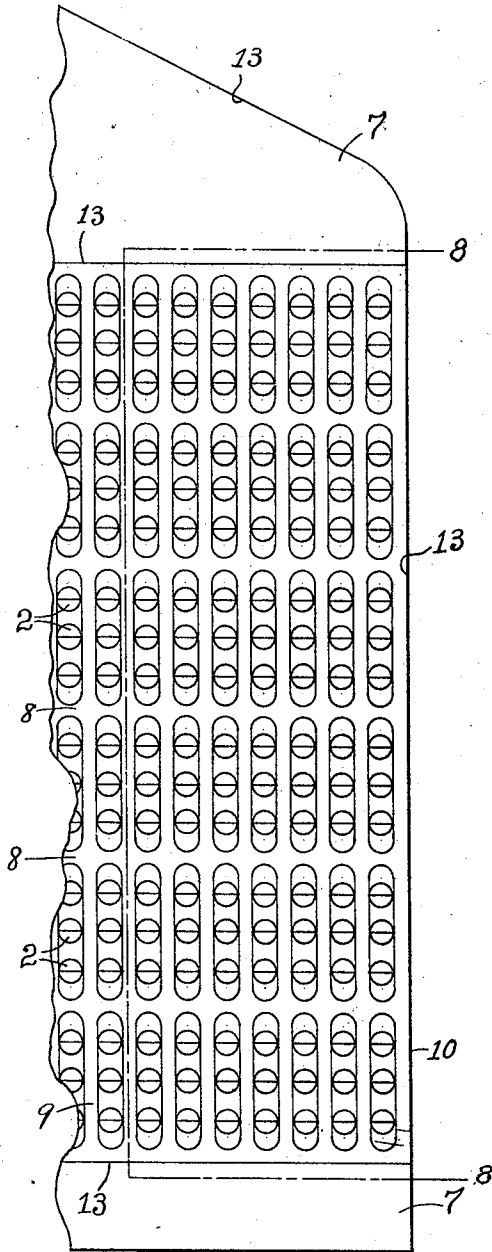


Fig. 7.

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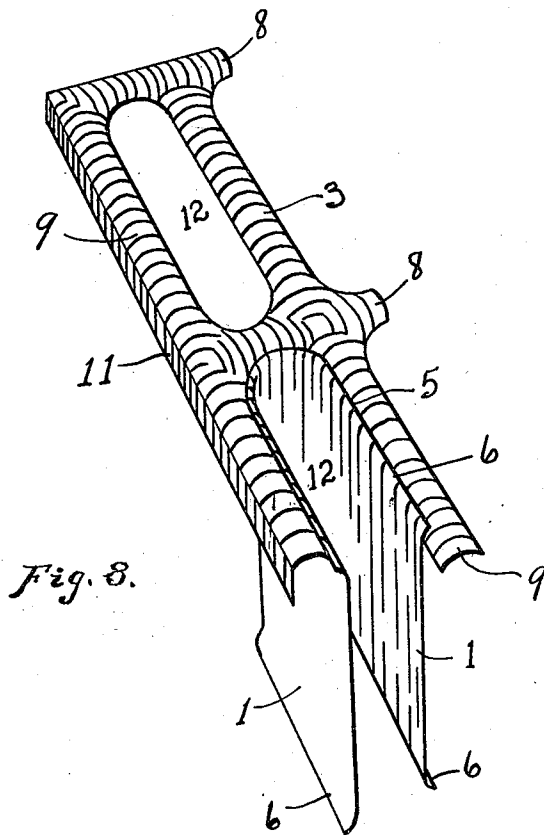
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RADIATOR FOR AUTOMOBILES

Filed May 5, 1919

3 Sheets-Sheet 3



WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLIS BYRON COWAN, OF COLORADO SPRINGS, COLORADO, ASSIGNOR OF ONE-FOURTH TO GEORGE HENRY DE VORE, OF COLORADO SPRINGS, COLORADO.

RADIATOR FOR AUTOMOBILES.

Application filed May 5, 1919. Serial No. 294,912.

To all whom it may concern:

Be it known that I, WILLIS BYRON COWAN, a citizen of the United States, residing at Colorado Springs, in the county of El Paso and State of Colorado, have invented a new and Improved Radiator for Automobiles, of which the following is a specification.

One object of my invention is to provide a radiator for automobiles wherein the chances of bursting by freezing are minimized. A second object of my invention is to have all soldered joints exposed exteriorly so that should the radiator, from any cause, spring a leak the seams may be accessible for mending without tearing the radiator to pieces to expose the leaks.

I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Fig. 1 is a diagrammatic elevation of the front of the radiator. Fig. 2 is an elevation of one of the spiral fins shown in Figs. 3 and 5. Fig. 3 is a detailed elevation of part of the radiator showing some of the spiral fins, shown in Fig. 2, inserted. Fig. 4 is a perspective of a part of one of the air tubes shown in Fig. 3 and shown in detail in Fig. 5. Fig. 5 is a perspective in detail of one of the air tubes shown in Fig. 3 and in Fig. 7 on the line 8—8. Fig. 6 is a sectional elevation of Fig. 7 on the line 8—8. Fig. 7 is a detail front elevation of part of the radiator shown in Fig. 1. Fig. 8 is a perspective detail of part of an air tube 1, and part of the face plate 3.

Similar numerals refer to similar parts throughout the several views.

The air tubes 1, 1 passing from front to rear of the radiator, the spiral fins 2, 2 located in the said air tubes, the front face-plate 3, the rear face-plate 4 and the enclosing radiator shell member 7 constitute the principal parts and framework of the said radiator. The body of the tube 1 is adapted to fit the perforation 12 in the face-plates 3 and 4. The flange 6 on the tube 1 is adapted to lie upon the exterior edge of the perforation 12 and is soldered at the joint 5. The flange 11 on the said face-plate is adapted to be soldered to the side-plates 10 of the radiator shell 7. The horizontal expandible connecting ribs 8 and the upright expandible connecting ribs 9 of the face-plates 3 and 4 admit of expansion of

the said face-plates adapted to equal the expansion of the water in the radiator when freezing as shown by the convex surfaces of said ribs, which in their aggregate form the face plates, at 9 in Fig. 2, and at 8 in Fig. 4, showing the curved embossed ribs susceptible of expansion. The flattened tubes 1 admit of a great degree of compression and are therefore adapted to relieve strains in other directions. The spiral fins 2, 2 are placed in the air tubes 1, 1 to transmit heat from the walls of the said air tubes, and are formed spirally in order to impart a whirling motion to the air and bring a greater volume of it in contact with the walls of the said air tubes. Said air tubes 1, 1, are made of seamless tubing cut long enough to extend past through the face plates 3 and 4 and are flanged as shown at 6, 6, outside of the face plates and are soldered between the said flanges and the outside of the face plates. It will be noted that there are no internal seams, that all joints 5, 13 are external and accessible for mending.

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

1. In a radiator of the class described, a combination of front and rear expandible face-plates, a plurality of flattened compressible air tubes secured to and extending thru said face-plates and at an angle thereto both upright and horizontal corrugations in said face plates, and spirally formed flat fins extending through said air tubes.

2. In an automobile radiator of the class described, provided to withstand freezing and heating, the combination of a front plate and a back plate, having registering holes in the two said plates provided to receive the ends of connecting air-tubes, flattened compressible air tubes passing through said holes and connecting said plates, impressed embossed ribs in said plates extending uprightly and transversely across said plates between the termini of said tubes, and provided to allow the expansion of said plates by frost without bursting the plates, outwardly turned flanges on the ends of said tubes provided to form a tight head for said holes and to form a recess for solder, and spirally formed flat fins extending through said tubes and attached to the sides thereof and provided to transmit the heat of the tubes to the atmosphere.

3. An automobile radiator comprising a face plate and a back plate of the same size and provided with an equal number of registering elongated slot holes, a multiplicity
 5 of flattened seamless tubes extending through said holes and maintaining said plates at a distance apart, an enclosing shell member securing tightly the outer edges of
 10 said plates and forming a tight chamber between said plates, impressed embossed ribs extending across said plates in transverse directions between said tubes and provided to allow the expansion of said plates without
 15 rupture, and spirally formed flat fin members extending through said tubes and provided to transmit heat from said tubes to the engaging air.

4. In an automobile radiator of the class described, the combination of a face plate
 20 and a back plate, an enclosing shell member tightly secured at its enclaspings edges to the edges of said plates and forming a chamber between them, a multiplicity of flattened seamless tubes passing through
 25 both of said plates and uniting them, outwardly projecting turned flanges on the ends of the tubes engaging said plates and forming a head and a recess for solder, deeply impressed curved embossed ribs extending
 30 across said plates in transverse directions between said tubes and provided to allow the expansion of said plates without rupture,

and spirally formed flat fin members extending through said tubes and provided to transmit heat from said tubes to the passing
 35 air.

5. In an automobile radiator of the class described having all of its uniting seams on the outside of the chamber, the combination
 40 of a face plate and a back plate of the same size of sheet metal, an enclosing shell member secured at its edges to the edges of said plates and forming a tight chamber between them, a multiplicity of flattened seamless
 45 tubes of metal extending through registering holes in said plates, a multiplicity of spirally twisted flat fin members extending through said tubes and provided to engage the cooling air to conduct the heat from said
 50 tubes, outwardly extended flange members formed on the ends of the tubes and forced against the outer surfaces of said plates and forming a recess for solder, and a multiplicity of impressed embossed ribs in said
 55 plates and extending in transverse directions to each other between said tubes and provided to allow for expansion without rupture.

Witness my hand this 29 day of April, 1919.

WILLIS BYRON COWAN.

Witnesses:

JOHN N. RICHARDS,
 GEO. DE VORE.