March 9, 1926. 1,575,864

C. W. OWSTON

AUTOMOBILE RADIATOR CORE

Filed Oct. 19, 1922

FIG. 1.

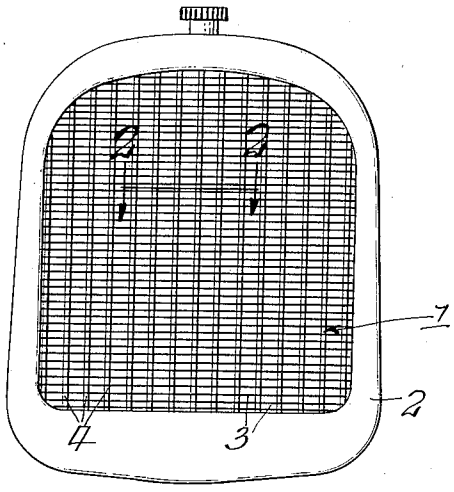


FIG. 2.

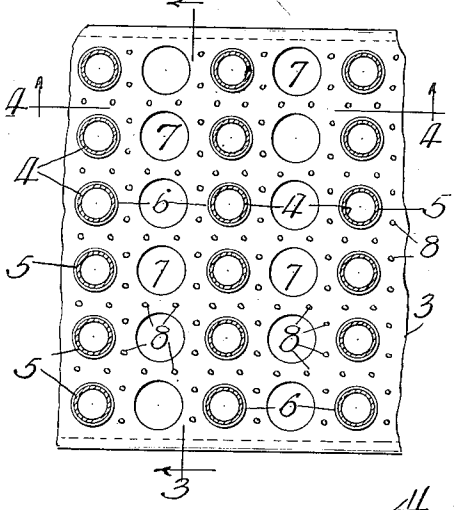


FIG. 3.

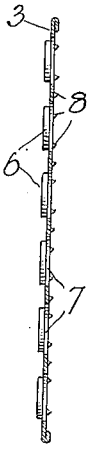


FIG. 4.

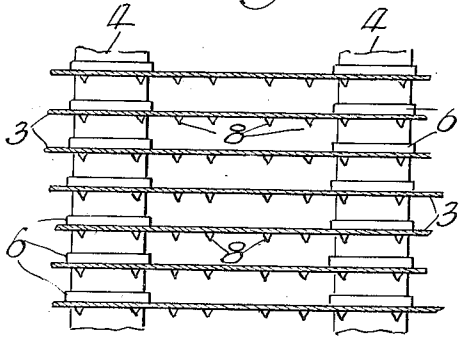


FIG. 5.

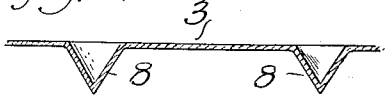


FIG. 6.

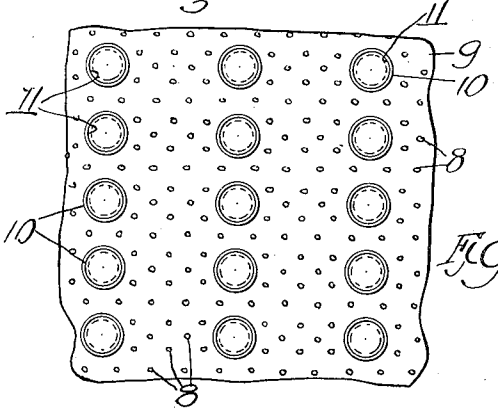
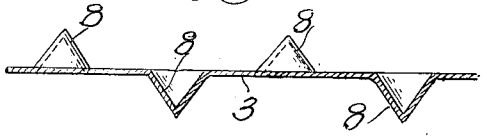


FIG. 7.



Inventor
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by Eugene Swan Atty.

Patented Mar. 9, 1926.

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UNITED STATES PATENT OFFICE.

CHARLES WM. OWSTON, OF DETROIT, MICHIGAN, ASSIGNOR, BY MESNE ASSIGNMENTS, TO McCORD RADIATOR & MFG. CO., OF DETROIT, MICHIGAN, A CORPORATION OF MAINE.

AUTOMOBILE RADIATOR CORE.

Application filed October 19, 1922. Serial No. 595,488.

To all whom it may concern:

Be it known that I, CHARLES WM. OWSTON, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented new and useful Improvements in Automobile Radiator Cores, of which the following is a specification.

This invention relates to automobile radiator cores and more particularly of the fin and tube type.

The object of my invention is to provide the fin strips or plates with a plurality of relatively small projections distributed over the surfaces of said plates to increase the number of points on the plates from which heat may be rapidly radiated, and also to roughen said surfaces in order to increase the turbulence of the air in its passage over the plates and turn the colder air against the heated metal.

The invention consists further in the matters hereinafter described and more particularly set forth in the appended claims.

In the accompanying drawings—

Fig. 1 is a front view of an automobile radiator having a core of the fin and tube type embodying the features of my invention;

Fig. 2 is an enlarged fragmentary horizontal sectional view taken on line 2—2 of Fig. 1;

Fig. 3 is a transverse sectional view taken on line 3—3 of Fig. 2;

Fig. 4 is an enlarged fragmentary longitudinal view taken on line 4—4 of Fig. 2;

Fig. 5 is an enlarged sectional view taken through a fin strip or plate to show in detail several of the cone shaped projections thereon; and

Figs. 6 and 7 are views showing modified forms of strips or plates to be hereinafter described.

In Fig. 1 of the drawings, I have shown an automobile radiator having a core 1 embodying the features of my invention and contained within an outer casing or shell 2, as usual in radiator construction.

The core 1 is of the fin and tube type and comprises a plurality of relatively flat fin strips or plates 3, 3, preferably made of copper. These strips or plates, when the core is assembled as in Fig. 1, are horizontally arranged, one above the other, in vertical spaced relation to allow air to pass through the core from front to rear to cool the water flowing through the vertical tubes 4, 4.

To accommodate the tubes 4, the strips or plates 3 are provided with holes or apertures 5, 5. In the particular form of structure shown in the drawings, these tube holes are arranged in rows both transverse and lengthwise of the strips. At the tube holes 5 the strips or plates 3 are provided with integral ferrules 6, which engage about the water tubes 4 and are secured thereto by solder in building the radiator. In the form of plate or strip 3 in Figs. 2 to 4, each strip is provided with a plurality of holes 7, 7 arranged across the plate between each row of tubes 4, 4 to permit air to circulate through the strips.

To increase the heat radiating capacity of the core, each strip or plate 3 is provided with a plurality of projections 8, 8. These extend outward beyond the plate and are distributed over the entire area of the strip between the tube holes 5 and the air holes 7. Said projections 8 may all extend from one side of the plate or strip, as shown in Figs. 2, 3, and 4, or may project from opposite sides of the strip or plate, as shown in Fig. 7. These projections 8, 8 are preferably made conical in shape, as illustrated in detail in Figs. 5 and 7, and are closed at their outer ends or apexes, as shown in these figures.

The projections 8, 8 are preferably formed by punch pricking or raising the same from one or both sides of the strips as described. The cones 8, 8 in projecting from the flat surface of the strips or plates 3, 3 increase the number of points on the plates from which heat is more rapidly radiated than from flat surfaces and thus increase the heat radiating capacity of the core. Said projections 8, 8 also roughen the surface of the plates 3 and thus increase the turbulence of the air as it flows over said plates and effects turning of colder air against the heated metal. This increases the efficiency of the core in that it provides for more efficient and rapid heat dissipation.

Instead of providing the fin strips or plates with ventilating holes 7, 7 as in Figs. 2, 3, and 4, I may eliminate said holes and have the projections distributed over the

entire surface of the plates between the tube holes. This construction is shown in Fig. 6. There the fin strip or plate is indicated by 9, the tube holes by 10, the tubes in dotted lines by 11, and the projections by 8 the same as in the preceding figures. In Fig. 6, the cones 8, 8 all project from one side of the strip or plate, and in Fig. 7 from opposite sides of the strip or plate.

I claim as my invention:

1. A radiator core, having spaced flat sheet metal heat radiating plates, and water tubes extending through the flat portions of the plates and in contact therewith, said plates being provided with a plurality of relatively small conical projections forced out from the metal of the plates and distributed over substantially the entire area thereof and between and about the tubes to roughen the plates and increase the heat radiating points thereon, said projections having their apexes pointed and closed.

2. A radiator core, having spaced flat sheet metal heat radiating plates, and water tubes extending through the flat portions of the plates and in contact therewith, said plates having air holes between said tubes, said plates being provided with a plurality of relatively small conical projections forced out from the metal of the plates and distributed over substantially the entire area thereof and between and about the tubes and air holes to roughen the plates and increase the heat radiating points thereon, said projections having their apexes pointed and closed.

3. A radiator core, having spaced flat sheet metal heat radiating plates, and water tubes extending through the flat portions of the plates and in contact therewith, said plates being provided with a plurality of relatively small conical projections forced out from the metal of the plates on opposite sides thereof and distributed over substantially the entire area of the plates to roughen the flat surfaces of the plates on both sides and increase the heat radiating points thereon, said projections having their apexes pointed and closed.

4. A substantially flat sheet metal heat radiating plate for automobile radiator cores, said plate having holes therein for the passage of water tubes, and a plurality of conical projections forced out of the metal of the plate and distributed over substantially the entire area thereof and about the tube holes to roughen the plate and increase the heat radiating points thereon, said projections having their apexes pointed and closed.

5. A radiator core, having substantially flat sheet metal heat radiating plates horizontally disposed and in vertically spaced relation, and vertical water tubes extending through said plates and arranged in rows both from front to rear and side to side of the core, said plates being provided with a plurality of relatively small projections forced out from the metal of the plates and distributed over substantially the entire area thereof and around and between the tubes to roughen the plates and increase the heat radiating points thereon, said projections terminating in points at their apexes.

In testimony that I claim the foregoing as my invention, I affix my signature this fourteenth day of October, A. D. 1922.

CHARLES WM. OWSTON.