Oct. 23, 1928. 1,688,929

G. HORVATH

CELLULAR RADIATOR

Filed May 6, 1925

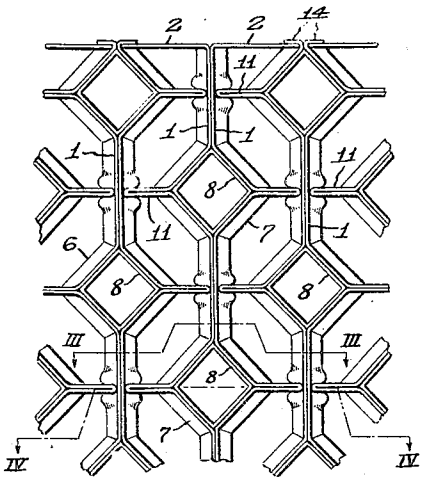


Fig. 1.

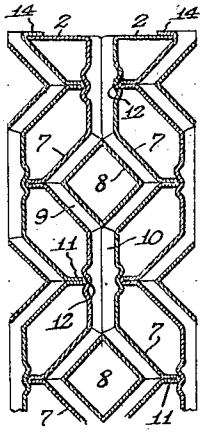


Fig. 2.

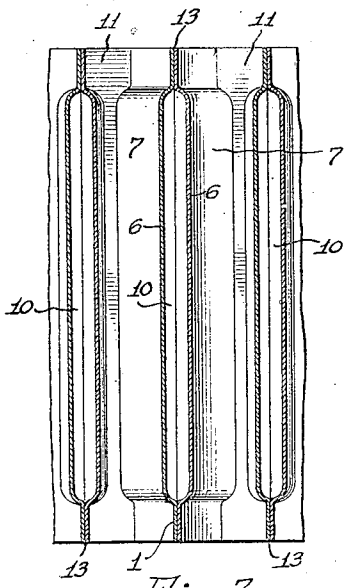


Fig. 3.

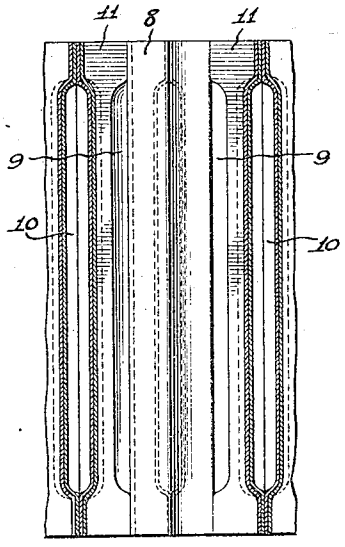


Fig. 4.

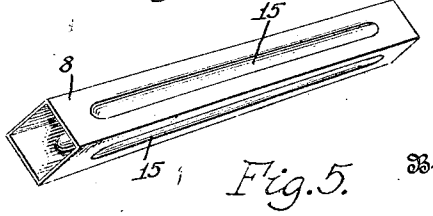


Fig. 5.

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UNITED STATES PATENT OFFICE.

GEZA HORVATH, OF HIGHLAND PARK, MICHIGAN.

CELLULAR RADIATOR.

Application filed May 6, 1925. Serial No. 28,411.

This invention relates to a cellular radiator and includes somewhat similar spacing members to those disclosed in my pending companion application filed May 6, 1925, Serial No. 28,410. The present invention may be characterized in the following particulars.

First, water tube members are employed of such configuration as to form the outer walls of water tubes or passages and the inner walls of such tubes or passages are formed by air tubes firmly anchored between the water tube members. This provides a cellular formation for an automobile radiator core and the configuration of the air tubes and water tube members lends a degree of ornamentation to the complete radiator core.

Second, fin and web spacing members may be employed between the water tube members to assist in the radiation of heat from the water tubes or passages, and these spacing members will also cooperate with the air tubes in lending a symmetrical design to the radiator core.

Third, fin and web spacing members may be cut and stamped from sheet metal and arranged to firmly brace water tubes and disseminate heat therefrom, and in cutting and stamping the spacing members a desired configuration may be imparted to the outstruck fins or webs formed from the sheet metal.

Fourth, the water tube members may have a shape imparted thereto for the support of air tubes of various cross sectional shapes and this with novel spacing members further contributed to the production of a radiator core having an ornamental and geometrical design.

Fifth, the water tube members, air tubes, and spacing members are all assembled to provide a rigid, durable and nonleakable structure which is highly efficient for water cooling purposes in connection with an automobile radiator.

My invention will be hereinafter described by aid of the drawings, wherein

Figure 1 is a front elevation of a portion of one form of radiator core showing rows of air tubes with the tubes of one row staggered with relation to the tubes of an adjacent row;

Fig. 2 is a vertical longitudinal sectional view of a portion of the same;

Fig. 3 is a horizontal sectional view taken on the line III—III of Fig. 1;

Fig. 4 is a similar view taken on the line IV—IV of Fig. 1; and

Fig. 5 is a perspective view of a detached air tube.

Reverting to Figs 1 to 5, the reference numerals 1 denote water tube members arranged back to back with the upper and lower ends thereof provided with lateral flanges 2 and these flanges are adapted to form the bottom wall of an upper radiator tank and the top wall of a lower radiator tank, said tanks being arranged in a radiator frame.

The water tube members 1, for the greater part of their width, are pressed out to form the outer walls 6 of water passages and at intervals throughout the height of said water tube members there are formed holders 7 for the ends of air tubes 8 which form the inner walls of the water tubes. These water tubes are shown as rectangular in cross section and the holders 7 cooperate with the air tubes 8 in forming substantially rectangular water passages 9. Since the holders 7 are spaced apart there will be vertical water passages 10 between the water passages 9 and this causes circulation of water about the side walls of the air tubes. In other words, the straight water tubes are interrupted at intervals and divided into two water passages about each air tube, and this is in contradistinction to a straight water passage extending from the top of the core to the bottom thereof. In forming the holders 7 the water passage walls 6 are formed with two-ply lateral webs 11 and the walls 6 of the vertical water passages 10 are corrugated to provide transverse seats 12.

With the water tube members 1 so formed and connected at the front and rear sides of the radiator core, as at 13, a set of water tube members may be staggered relative to an adjacent set, so that the webs 11 will engage the seats 12, thus placing the air tubes 8 of one row in staggered relation to the air tubes of an adjacent row. Alternating sets of water tube members have the lateral flanges 2 and the other sets of water tube members have flanges 14 overlying the flanges 2 so that all of the water tube members can be secured together in the usual and well known manner to form practically a homogeneous rigid structure.

With the ends of the air tubes 8 firmly held between the water tube members 1, at the front and rear sides of the radiator core,

water may circulate about the greater part of said air tubes, because the branch water passages 9 are practically the same length as the air tubes and with the webs of one set of water tube members bracing adjacent sets of water tube members it is obvious that a very rigid and durable cellular construction is formed for the radiator core.

As shown in Figs. 1 to 4 inclusive, the air tubes 8 have straight uninterrupted walls but said tubes may be longitudinally fluted, intermediate their ends, as at 15, with the flutes pressed inwardly as shown in Fig. 5, consequently the area of the branch water passage 9 will be increased. The expansion of the tube walls to form the flutes 15 increases the wall area and consequently provides a greater radiating surface against which air may impinge when passing through the tubes 8.

It is possible to work out various combinations for desired designs and for this reason I do not care to confine my invention to the shape of the cooling tubes or the shape of the fins forming the greater part of the spacing members. As all of these members are made from light and durable sheet metal, it is obvious that the metal may be rolled, sheared, expanded or otherwise formed to a desired configuration and it is practically as easy to assemble the parts of one form of radiator as another. It is obvious that other cooling agents than air may be used, for instance, when the radiator is submerged in a cooling bath, and in view of the above, I do not care to confine my invention to any construction or arrangement other than defined by the appended claim.

What I claim is:

A radiator core comprising vertical rows of air tube holders with the holders of one row staggered relatively to the holders of an adjacent row, each row of tube holders being composed of channel-shaped members arranged face to face and forming walled passages between said holders, the members of said rows having the ends thereof laterally disposed and connected to the ends of members in adjacent rows, said holders having lateral webs engaging in the walled passages between said holders of adjacent rows and the webs of alternate rows being in perpendicular planes so that said webs may cooperate with the walled passages between said holders of adjacent rows in providing cross formations between adjacent holders, and tubes in said holders.

In testimony whereof I affix my signature.

GEZA HORVATH.