

C. G. BOECK.
 AUTOMOBILE RADIATOR.
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1,036,549.

Patented Aug. 27, 1912.

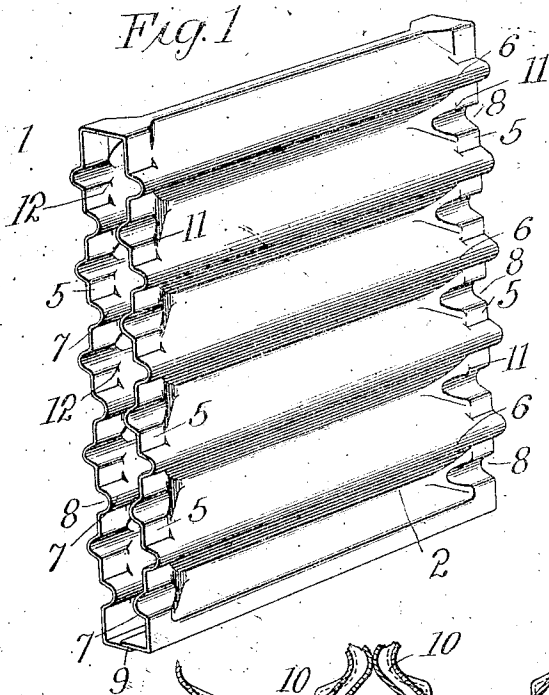


Fig. 2

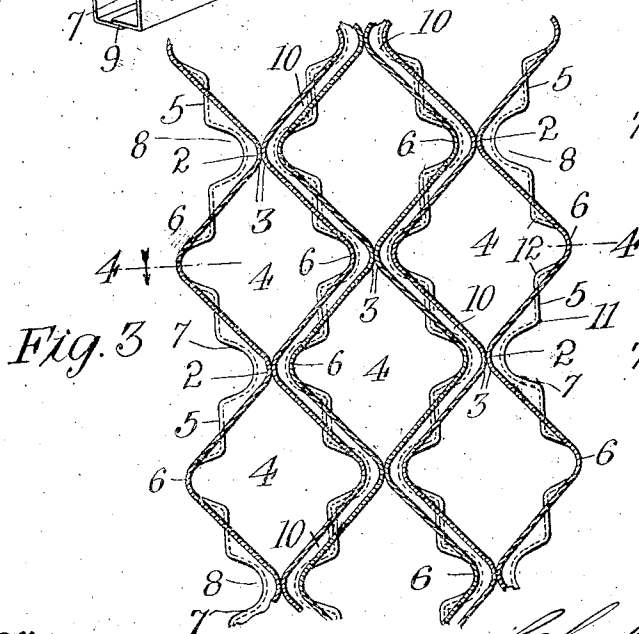
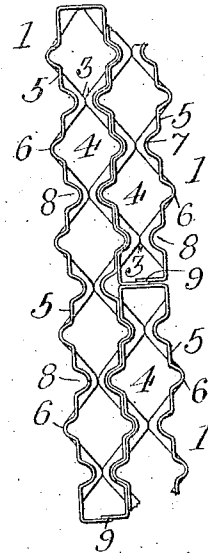
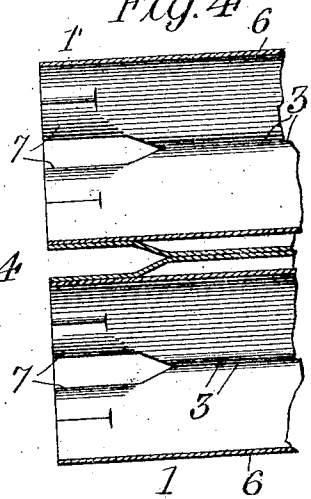


Fig. 4



Witnesses
 Joseph C. Stack.

R. W. Bishop

Inventor
 Charles G. Boeck
 By Julian C. Dowell
 his Attorney

UNITED STATES PATENT OFFICE.

CHARLES GEORGE BOECK, OF JACKSON, MICHIGAN, ASSIGNOR TO NOVELTY MANUFACTURING COMPANY, OF JACKSON, MICHIGAN, A CORPORATION OF MICHIGAN.

AUTOMOBILE-RADIATOR.

1,036,549.

Specification of Letters Patent.

Patented Aug. 27, 1912.

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To all whom it may concern:

Be it known that I, CHARLES G. BOECK, a citizen of the United States of America, residing at Jackson, in the county of Jackson and State of Michigan, have invented certain new and useful Improvements in Automobile-Radiators, of which the following is a specification.

My invention relates to radiators of the type covered by Letters Patent No. 970,297, granted September 13, 1910, and consists in certain novel structural features which are hereinafter first fully described and then distinctly pointed out in the claims.

In the accompanying drawings, which illustrate a practical embodiment of my present improvement, Figure 1 is a perspective view of a single radiator section or tubular element; Fig. 2 is an end elevation showing the relative arrangement of the sections to form a radiator; Fig. 3 is an enlarged vertical section of the structure shown in Fig. 2; Fig. 4 is a horizontal section on line 4-4 of Fig. 3.

A complete radiator of the type to which my invention relates, comprises an assemblage of flat or flattish tubular elements 1 of sheet-metal having the general form of thin quadrangular prisms, the opposite walls or lateral faces of said elements being stamped or formed with longitudinal depressions 2 thereby making internal confronting projections 3, which divide the elements interiorly into parallel open-ended air flues 4. The longitudinal depressions do not extend to the edges of the elements, the front and rear portions of which are thus left flat-sided, as shown at 5, but the inclined walls of the depressions are extended outwardly beyond the planes of the flat edge portions to form exterior ribs or projections 6, which are carried across the flat edge portions of the elements, as clearly shown in Fig. 1. Inwardly projecting beads 7 are formed on the flat-sided edge portions of the elements thereby presenting short external grooves 8 in alinement with the bases of the depressions 2.

The tubular elements are preferably each made from a continuous strip of sheet-metal, the ends thereof being joined by a soldered lap-joint 9 or other suitable seam, any well-known method of working sheet-metal being employed in the formation of the depres-

sions and projections as set forth by me in the hereinbefore-mentioned Letters Patent. As stated in said patent, the radiator is formed by arranging the elements in tiers immediately adjacent one another, side by side, and joined at their edges by soldering. The elements or flue-sections are arranged so that the longitudinal depressions 2 of one section have a staggered relation to the depressions of the adjacent sections thus providing the restricted serpentine water-passages 10 which extend transversely of the air-flues and are sealed at the front and back of the radiator by the soldering of the edges of the sections. It will be readily understood that the intervening water-passages are provided by assembling the sections or elements with the external rib or projection 6 of one element extending into the depression 2 of the adjoining element, as shown most clearly in Figs. 2 and 3, the flat-sided edge portions permitting the elements to be held firmly together while being soldered.

It will be noted that the ribs 6 and grooves 8 alternate symmetrically on each section so that, when the sections are assembled, the ribs will engage the grooves. The ribs of one section will, consequently, extend through the plane of the flat-sided end portion of the adjoining section, the result being that the water-passage will have a width no greater than the distance between the base of grooves 8 and the base of a depression 2 with which they are alined. The water-passages are, consequently, very restricted, compared with the transverse area of the air-flues, so that the water will be quickly and thoroughly cooled. Moreover, the construction provides small external and internal projections or shoulders 11, 12, along the inner margins of the flat-edge portions 5 which interengage when the elements are assembled, the external projections on one element fitting in the external depressions or recesses presented by the internal projections on the adjacent sections. The engagement of these projections, together with the engagement of the ribs 6 and grooves 8 facilitates the assembling of the elements and the holding of the same in proper assembled relation prior to permanently uniting them to form the finished radiator, displacement edgewise being pre-

vented by the said projections and vertical displacement being prevented by the ribs and grooves.

It will be understood, of course, that the elements need not be arranged vertically but may be arranged horizontally, or otherwise, so that the water-passages may be disposed in such manner as may best serve the requirements of any particular case.

It will be understood, of course, that I make no claims herein to the generic invention disclosed, the same having been claimed by me in the Letters Patent aforesaid. I desire, however, to have it understood that I do not restrict myself to the exact details of form and arrangement illustrated, but reserve the right to such changes as may be made therein within the scope of the invention as the same is defined in the appended claims.

Having thus described my invention, what I consider as novel and desire to secure by Letters Patent is:

1. A radiator comprising an assemblage of prismatic tubular air-flue sections having open rectangular ends and flat-sided end portions, said sections being placed immediately adjacent one another and joined at their edges, the lateral faces of the sections being formed with longitudinal recesses and alternating longitudinal projections, said recesses lying between the flat-sided end portions and the projections extending across said portions, and the adjacent sections being so disposed that the projections on one section extend into the recesses in adjoining sections thereby providing restricted intervening serpentine water-passages.

2. For a sheet-metal radiator structure of the character described, a flue-section or element constructed from a continuous strip of sheet-metal in the form of a thin quadrangular prism the opposite walls of which are stamped with longitudinal indentations forming exterior recesses and ribs and interior projections dividing the flue-section interiorly into a number of open-ended air-spaces, the indentations terminating short of the front and rear edges of the flue-section which are left flat-sided, the ribs extending across said flat-sided end portions,

and external grooves of less depth than the depressions being formed in the flat-sided edge portions in alinement with the depressions.

3. The combination of sheet-metal flue sections arranged immediately adjacent one another and joined at their edges, said flue sections having the form of quadrangular prisms with flat-sided end portions, the opposite sides of the sections being formed with longitudinal depressions intermediate said flat-sided end portions, longitudinal projections alternating with said depressions and extending across the flat-sided end portions and grooves in said end portions in alinement with said longitudinal depressions, and laterally adjacent sections being arranged with the exterior projections of one section engaging the grooves in the adjoining sections and extending into the depressions in said sections whereby restricted serpentine water-passages are provided between the sections.

4. The combination of sheet-metal flue sections arranged immediately adjacent one another and joined at their edges, said flue sections having the form of quadrangular prisms with flat-sided end portions, the opposite sides of the sections being formed with longitudinal depressions intermediate said flat-sided end portions, longitudinal projections alternating with said depressions and extending across said end portions, grooves in the end portions in alinement with the depressions and internal and external shoulders along the inner margins of the flat-sided end portions, and laterally adjacent sections having the projections on one section engaging the grooves and extending into the depressions of adjoining sections with the shoulders along the margins of the end portions in engagement whereby restricted serpentine water-passages are provided between the sections.

In testimony whereof I affix my signature, in presence of two witnesses.

CHARLES GEORGE BOECK.

Witnesses:

D. R. TARBELL,
DAN HAEFNER.