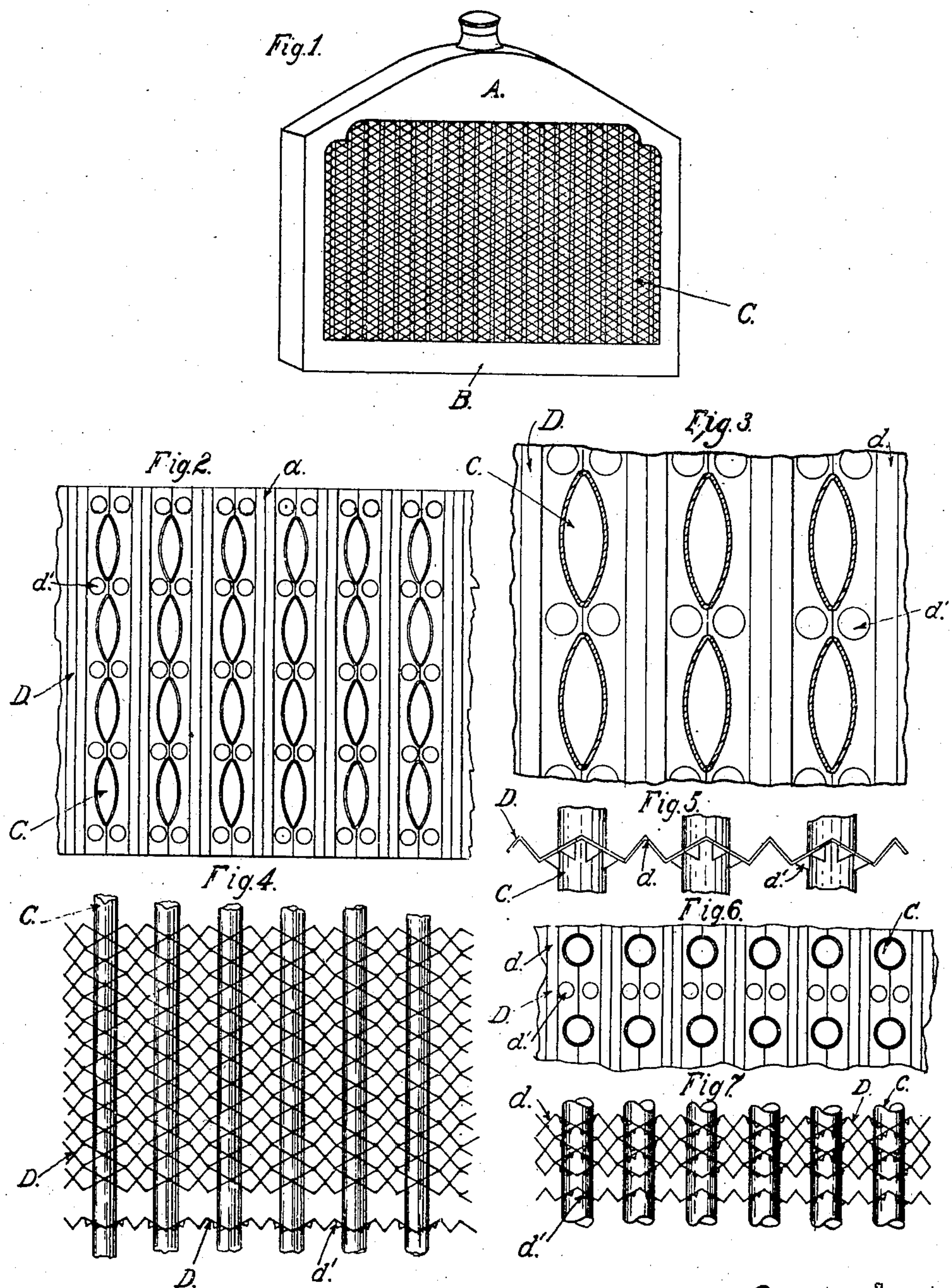


No. 898,237.

PATENTED SEPT. 8, 1908.

J. B. LONG & C. WRIGHT.
RADIATOR FOR AUTOMOBILES.
APPLICATION FILED OCT. 23, 1905.



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RADIATOR FOR AUTOMOBILES.

No. 898,237.

Specification of Letters Patent.

Patented Sept. 8, 1908.

Application filed October 23, 1905. Serial No. 284,099.

To all whom it may concern:

Be it known that we, JOSEPH B. LONG and CHRISTOPHER WRIGHT, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Radiators for Automobiles, of which the following is a specification.

Our primary aim was to provide an efficient and slightly radiator for use on automobiles, and while the following description will be limited thereto, still we desire to have it understood that we reserve to ourselves, the exclusive right to use the several features of the invention for any and all purposes for which they may be found to be useful.

In a radiator for automobiles, efficiency, from a mechanical view point is, of course, of prime importance, but appearance is scarcely less so, from the standpoint of commercial success. Occupying, as it usually does, the front and most conspicuous place on the machine, it gives character thereto, to a certain extent, and must be ornamental or else it cannot be a commercial or practical success. There are now in use, many types, presenting many appearances and one type, which is in high favor, from the standpoint of appearance is what is known as the "honey comb" or "cellular".

The object of the present invention is to provide a radiator of this "honey comb" or "cellular" appearance and efficiency, having at the same time, the advantages of a tubular radiator from a functional standpoint and to provide a radiator having certain other advantages that are not found in either the "honey comb" or the tubular, strictly so called, as these are found on the market to-day.

To these ends the invention consists in the features of novelty that are hereinafter described, with reference to the accompanying drawings, which are made a part of this specification and in which:

Figure 1 is a conventional representation of a radiator on a small scale, embodying the invention. Fig. 2 is a horizontal section on the line 2—2 Fig. 4, of a portion of a radiator embodying the invention. Fig. 3 is a horizontal section of a fragment thereof on a larger scale on the line 3—3, Fig. 5. Fig. 4 is a front elevation of what is shown in Fig. 2. Fig. 5 is a front elevation of what is shown

in Fig. 3. Fig. 6 is a horizontal section on the line 6—6 Fig. 7 and Fig. 7 a front elevation of fragments showing a modification.

The radiator, as a whole, may be of any desired shape or configuration, but comprises, as usual, an inlet chamber, or header A into which the water to be cooled is introduced through a suitable connection, coming from the cylinder jacket and an outlet chamber, or header B from which it is returned to said jacket, through a suitable connection, having meanwhile passed from the inlet chamber to the outlet chamber through a bank or series of pipes or tubes C. In the drawings, we have shown these tubes as being vertical, with one header above the other, but the horizontal arrangement of tubes with the headers on opposite sides of the radiator is within the scope of the invention and so familiar to radiator and automobile builders and users as to require no illustration.

The term "headers" is used in this specification in the sense in which it is customarily used by those skilled in the practical art of making, using and selling radiators for automobiles, as well as for other purposes, and steam boilers. They consist of boxes, tubes, or other chambers into and from which the circulating medium is delivered, respectively.

In Figs. 6 and 7 we have shown the tubes as being of cylindrical cross section, while in Figs. 2, 3, 4, and 5, we have shown them as being of oval or elliptical cross section, with their major axes disposed forward and backward. In other words, they are "edgewise" to the direction of travel. The elliptical or oval tube has an advantage over the cylindrical tube in that it has a greater radiating efficiency and this efficiency is increased by the described arrangement of tubes, with their major axes forward and backward, thereby presenting broad (almost flat) surfaces, over which the air currents pass and with which they have contact as the car advances. It should be borne in mind, however, that in its broadest aspect, cylindrical tubes are within the scope of the invention.

In the drawings we have shown the tubes as being arranged in rows extending from side to side of the radiator. These tubes alone would not provide the necessary radiating surface and, of course, would not present the desired honey-combed appearance at the front of the radiator. To accomplish

both of these things we use, in connection with the tubes, a plurality of sheet metal strips D which extend from side to side of the radiator and are crimped or corrugated transversely of their length. Each of these strips is provided with an opening through which each of the tubes passes so that each strip embraces all the tubes. Thus arranged, each of the tubes is braced against other tubes and the result is an extremely rigid structure. All of the strips are similarly corrugated and are strung on to the tubes in such manner that similar corrugations of adjacent strips are reversely presented (upward and downward alternately) and so that in the completed structure the summits of the corrugations of adjacent strips contact with each other, leaving between the strips openings of square, diamond, or other shape, depending upon the shape of the crimps or corrugations. The openings through which the tubes pass extend through the summits of some of the corrugations and in addition to these corrugations the strips have other corrugations *d* between the tubes. The several corrugations afford the necessary extended radiating surface and when arranged as described present the desired honey-combed appearance. The strips are perforated at numerous points as shown at *d'* for the purpose of permitting the heated air to pass upward through them.

What we claim as new and desire to secure by Letters Patent is:

1. In a radiator, the combination with the headers, of a plurality of tubes connecting them and arranged in a row extending from side to side of the radiator, and a plurality of

strips extending from side to side of the radiator, said strips having openings through which said tubes pass, said strips being corrugated transversely of their length from edge to edge and so arranged that the summits of the corrugations of adjacent strips contact with each other.

2. In a radiator, the combination with the headers of a plurality of tubes connecting them and arranged in a plurality of rows extending from side to side of the radiator, and a plurality of strips extending from side to side of the radiator, each of said strips having openings through which all of said tubes pass, said strips being corrugated transversely of their length from edge to edge and so arranged that the summits of the corrugations of adjacent strips contact with each other.

3. In a radiator, the combination with the headers, of a plurality of tubes connecting them and arranged in a row extending from side to side of the radiator, and a plurality of strips extending from side to side of the radiator, said strips being corrugated transversely of their length and having openings extending through the summits of some of the corrugations, through which openings the tubes pass, while other of the corrugations are located between the tubes, the strips being so arranged that the summits of the corrugations of adjacent strips contact with each other.

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