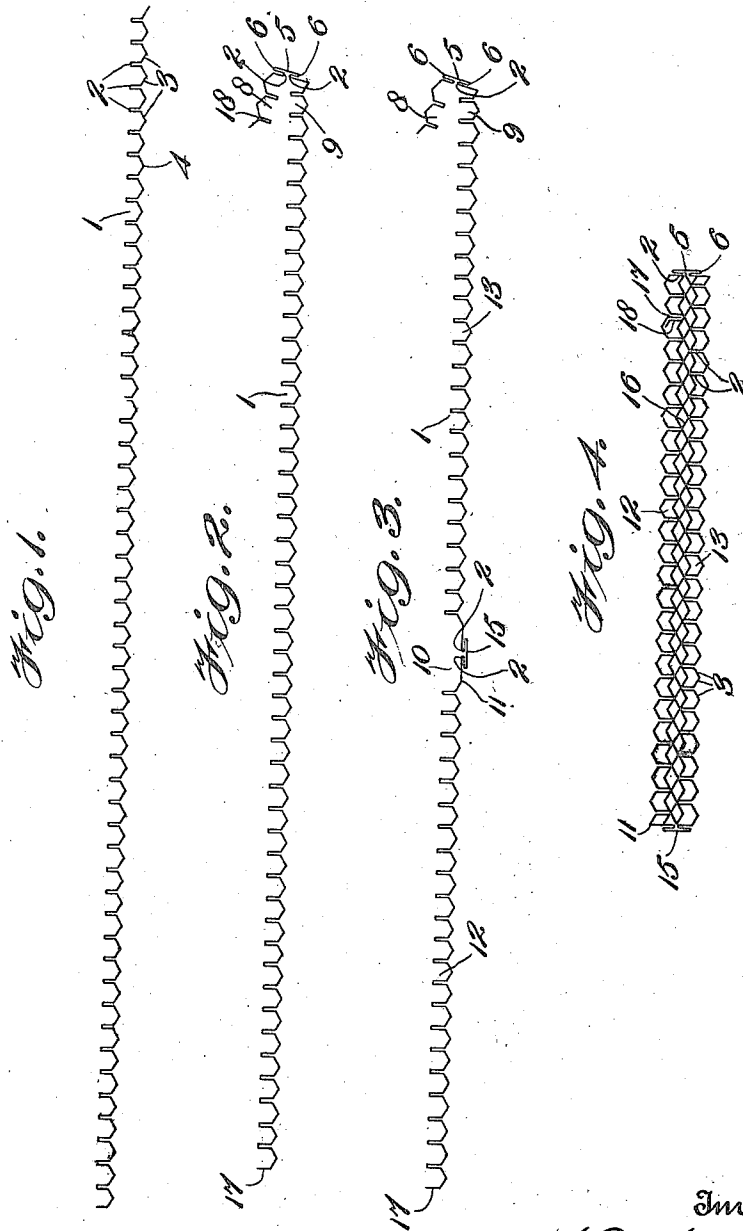


1,220,745.

Patented Mar. 27, 1917.
2 SHEETS—SHEET 1.



Witness
Byron B. Collings

Inventor
H. C. Harrison
McNichols & Co.
Attorneys

1,220,745.

Patented Mar. 27, 1917.
 2 SHEETS—SHEET 2.

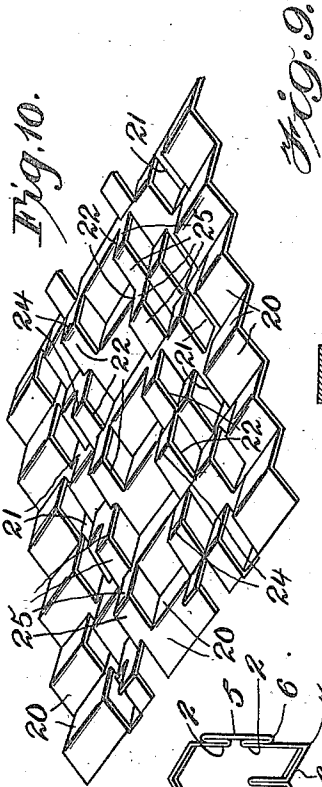


Fig. 9.

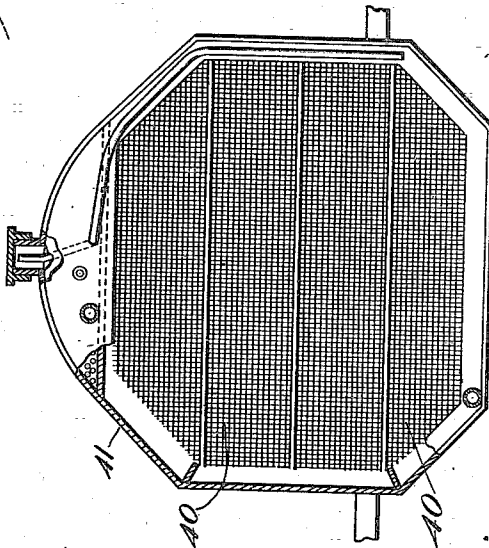


Fig. 5.

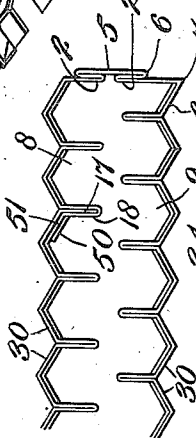


Fig. 6.

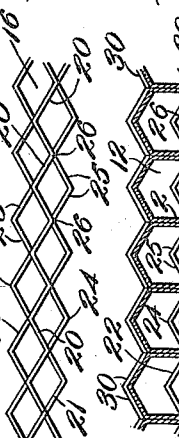
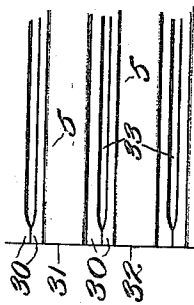


Fig. 7.



Witness
 Byron B. Collings.

Inventor
 H. C. Harrison
 By
 M. W. Harrison
 Attorney

UNITED STATES PATENT OFFICE.

HERBERT CHAMPION HARRISON, OF LOCKPORT, NEW YORK.

AUTOMOBILE-RADIATOR.

1,220,745.

Specification of Letters Patent.

Patented Mar. 27, 1917.

Original application filed March 1, 1915, Serial No. 11,387. Patented January 25, 1916, No. 1,169,481.

Divided and this application filed October 20, 1915. Serial No. 56,914.

To all whom it may concern:

Be it known that I, HERBERT CHAMPION HARRISON, a subject of the King of Great Britain, residing at Lockport, in the county of Niagara and State of New York, United States of America, have invented certain new and useful Improvements in Automobile-Radiators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to radiator units for automobiles and has for its object to produce a better unit for the same cost than has been possible with the prior methods.

With this and other objects in view the invention consists in the novel construction and combination of parts constituting the unit all as will be more fully hereinafter disclosed and particularly pointed out in the claims.

Referring to the accompanying drawings forming a part of this specification in which like numerals designate like parts in all the views—

Figure 1 is a diagrammatic edge view of a radiator strip employed for the outer walls of the radiator unit;

Fig. 2 is a view similar to Fig. 1 but showing one end of the strip folded upon itself to partially form the two sides of the radiator unit;

Fig. 3 is a view similar to Fig. 2, but showing the strip treated or bent in about its middle portion to enable it to be folded back upon itself to form the outside walls of the radiator unit;

Fig. 4 is a diagrammatic view illustrating the strip shown in Fig. 3 folded back upon itself to form the outer walls of the radiator unit and provided between said walls with a separating or division plate;

Fig. 5 is an enlarged edge view of the outer walls of the radiator unit shown in Fig. 4 with the division plate omitted and illustrating the construction of the edges of said outer walls;

Fig. 6 is an enlarged edge view of a portion of the division plate shown in Fig. 4;

Fig. 7 is an enlarged sectional view of a portion of the parts shown in Fig. 4 contacting with one of the walls of an adjacent unit, to form a water passage between the units;

Fig. 8 is an end view of a plurality of units contacting with each other and illustrating the construction of the edges of the outer plates of each unit and also the water passages between the units; and

Fig. 9 is an elevational view partly in section of a complete radiator made in accordance with this invention; and Fig. 10 is a perspective view of the division plate illustrated in Fig. 6.

Referring to the drawing 1 indicates a strip of thin sheet metal which is substantially twice as long as the finished radiator unit, and said strip is repeatedly folded upon itself as indicated at 2 to form internal division walls between the cells, and it is repeatedly bent at an angle to itself between said division walls as indicated at 3 to form the outer thin walls of the radiator unit as will more clearly appear below.

The operation of imparting to the strip 1, the corrugations or walls 2 and 3 is well known in this art, and need not be further disclosed.

After the long strip 1 is thus corrugated or produced, one of the bent walls 3, preferably the third or fourth wall 3 from the extreme end of the strip, is flattened out so as to eliminate the angular or bent portion 4, and to provide the straight portion 5 shown in Figs. 2, 3, 4 and 5. The said portion 5 is best bent flat down upon the adjacent folded portions 2 as indicated at 6, so as to form the integral end of the radiator unit which is best illustrated in Fig. 5. In order to better form this said integral end the strip 1 is further sharply bent at the adjacent wall 3 as indicated at 7 in the drawings. This permits the folded over end portion 8 to lie parallel with the longer body portion 9 as indicated in Figs. 2 and 3. The next step in the formation of the radiator unit is to further flatten out one of the walls 3 located at such a point in the length of the strip 1 as will permit the parts to be folded over upon each other and to complete the outer walls of the unit as will presently appear.

The second point selected for flattening out the walls 3 is indicated at 10 in Fig. 3, and the flattened wall 3 is there indicated by the numeral 15, and said member 15 is flattened down upon the adjacent folded members 2 as will be clear from the drawings.

The next step in the forming of the radiator unit is the bending of an adjacent wall 3 sharply upon itself as indicated at 11 so as to permit the member 12 of the strip 1 to be folded back upon the member 13 of the said strip to form the outer walls of the unit as indicated in Fig. 4.

Before this folding action occurs, however, a separating or division plate 16 is inserted between the walls 12 and 13, as is also indicated in Fig. 4, whereupon the extreme end 17 of the member or wall 12 is inserted in the loop 18 of the bent over end 8, as is clearly disclosed in Figs. 4 and 5. The said members 17 and 18 may be permanently secured together by a drop of solder or by a soldering step itself later to be disclosed.

The division plate 16 which is inserted between the outer walls 12 and 13 of the radiator unit is best shown in Figs. 6 and 7, and it consists of a body portion 20 from which is struck out, or punched out, on one side thereof the guide flanges or strips 21 and on the other side thereof similar guide flanges or strips 22. These said strips 21 and 22 are each provided with the angular or bent portion 24, and said angular portions 24, as well as the guide members 21 and 22 are preferably so located that they are in staggered relation to each other as will be clear from the drawings. In other words it will be clear that each strip 21 and 22 is thus provided with a pair of inclined surfaces 25 against which the edges of the folded over internal wall members 2 strike and are guided to the points 26 on the main body plate 20 from which each pair of surfaces 25 were struck. It therefore follows that if before the extreme end members 17 and 18 of the wall 12 are secured together, the wall 13 is laid flat with its members 3 resting upon a support and the division plate 16 is laid in on top of the inner folded walls 2 of said outer wall 13, that the guide members 25 of the said division plate 16 will cause the said plate 16 to be guided relatively to the folded members 2 into the proper position so that the edge of each folded member 2 will automatically, so to speak, find its own point 26 and will therefore in a sense center itself. Further if now the other outer wall 12 of the radiator unit is folded back upon the said division plate 16 its inner folded members 2 will likewise automatically find their points 26 and therefore automatically center themselves. It results from this that the problem of properly centering the parts while assembling the same is greatly lessened. Further since the division plate 16 is provided with guide members 21 and 22 on each side thereof, which are staggered in relation to each other, the folded members 2 of the one wall 13 are staggered in relation to the folded members 2 of the other wall 12, so that there is a

wider space between the walls 12 and 13 than there would be if the one set of members 21 or 22 were employed and the folded members 2 of the respective walls 12 and 13 came opposite each other or contacted on opposite sides of the same points 26. By constructing the division plate 16 as described, the radiator units can be made of a wider cross section and therefore they can accommodate more cooling air, or fluid, than would otherwise be the case. In addition to the above the staggered relation of the members 21 and 22 more effectually break up the air as it passes through the radiator units than would be the case if only one set of members 21 or 22 was provided.

After a radiator unit is constructed as just disclosed, the parts are held in the position indicated in Fig. 4, whereupon another similarly constructed radiator unit is brought up to it so that the outer edges of each unit will contact as illustrated in Fig. 8. That is to say the side edges of the strips 1 are offset as indicated at 30 in Figs. 5, 7 and 8, and when two units such as 31 and 32 are brought together as indicated in Fig. 8, the offset walls 30 of each unit contact with each other to leave a space 33 running at right angles to the cells illustrated in Figs. 4 and 7, and which space 33 constitutes a water passage. The construction will be clear from Fig. 7 wherein the wall 35 of a unit such as 32 is shown in contact with the wall 36 of a unit such as 31, and wherein the offset side edges 30 of the contacting units meet along the zigzag line 37 to form a zigzag water passage 33 running at right angles to the air cells. A plurality of units may be thus suitably assembled, the parts secured, or clamped, together, in any desired manner, when the edges embracing the offset members 30 are dipped in a bath of solder whereupon the parts are firmly secured together.

A suitable number of units 31 and 32 will constitute a radiator section 40, and a suitable number of radiator sections may be assembled into any suitable casing such as 41 and the radiator otherwise completed.

It will thus be seen that by first bending over an end such as 8 shown in Fig. 2 to leave the folded pocket 18 for the reception of the extreme end 17 of the strip 1, and by bending out or flattening out the wall members 3 in the strip 1 to form the integral end portions 5 and 15 of the unit, I am enabled to do away with the necessity of putting in individual strips and soldering them in place in order to secure the outer walls 12 and 13 of the units together as has been heretofore necessary. I therefore avoid the making of at least one solder joint, to secure said walls in place and avoid the danger of leakage due to such joints, and provide a better and less costly radiator unit due to its integral ends.

Further it will be seen that by making the joint of the character afforded by the end members 17 and 18, an exceedingly strong joint is made in that the extreme bent member 50 of the end 8 fits up against the inside of the bent member 51 of the extreme end 17, and therefore serves to brace the same. In addition to this the folded loop 18 fits the sort of trough for the reception of solder and therefore the joint is exceedingly strong and fluid tight. In other words, it will be appreciated by those skilled in the art that these radiators after they are completed must be tested for leaks, that since the soldering is done by the dipping process it is very difficult indeed to prevent leaks in one or more places, and that the expense of finding these leaks and soldering them up by hand is often quite great. Therefore, the getting rid of the special joints which have been heretofore necessary at the points 5 and 15 and substituting only the joint afforded by the parts 17 and 18 has a very decided advantage in the construction of radiator sections.

It will further be appreciated by those skilled in the art, that the provision of a division plate such as 16 which is not only self centering but which affords the wide separation of the outer walls 12 and 13 of each radiator unit is a decided advantage, while it does not add materially to the total weight of the radiator unit. As a matter of fact all of the parts are made of very thin sheet metal and a radiator made in accordance with the above disclosure is comparatively very light and exceedingly strong.

In other words, by simply flattening out the bent or uniformly corrugated wall mem-

ber 3 to form the integral end members 5 and 15 and proceeding as above disclosed, I not only save a great deal of time and expense in the making of the radiator units, but I provide a much better radiator than is possible by following the methods heretofore proposed.

The method of producing this radiator unit is claimed in my copending application #11387, filed March 1, 1915, for process of making automobile radiator sections, of which this application is a division.

It is obvious that those skilled in the art may vary the details of the construction without departing from the spirit of the invention and therefore I do not wish to be limited to the above disclosure, except as may be required by the claims.

What I claim is:

1. The herein described radiator unit comprising outer walls made from a single strip having folded internal wall members and offset side edges, with its ends secured together; and a division plate of a single thickness of metal located between said walls and forming therewith a double row of communicating cells; said single plate also provided with perforations and projections between said folded wall members, substantially as described.

2. The herein described radiator unit comprising a single strip of corrugated material constituting the outer walls of the unit, said strip provided with folded internal wall members; and a division plate of a single thickness of metal having offset guiding and holding surfaces between said folded members, substantially as described.

In testimony whereof I affix my signature.
HERBERT CHAMPION HARRISON.