

March 16, 1937.

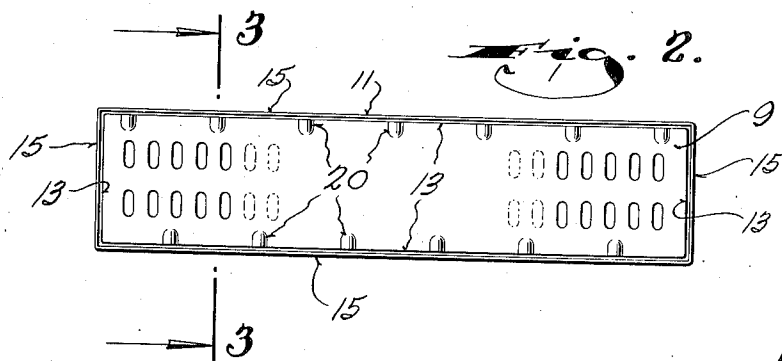
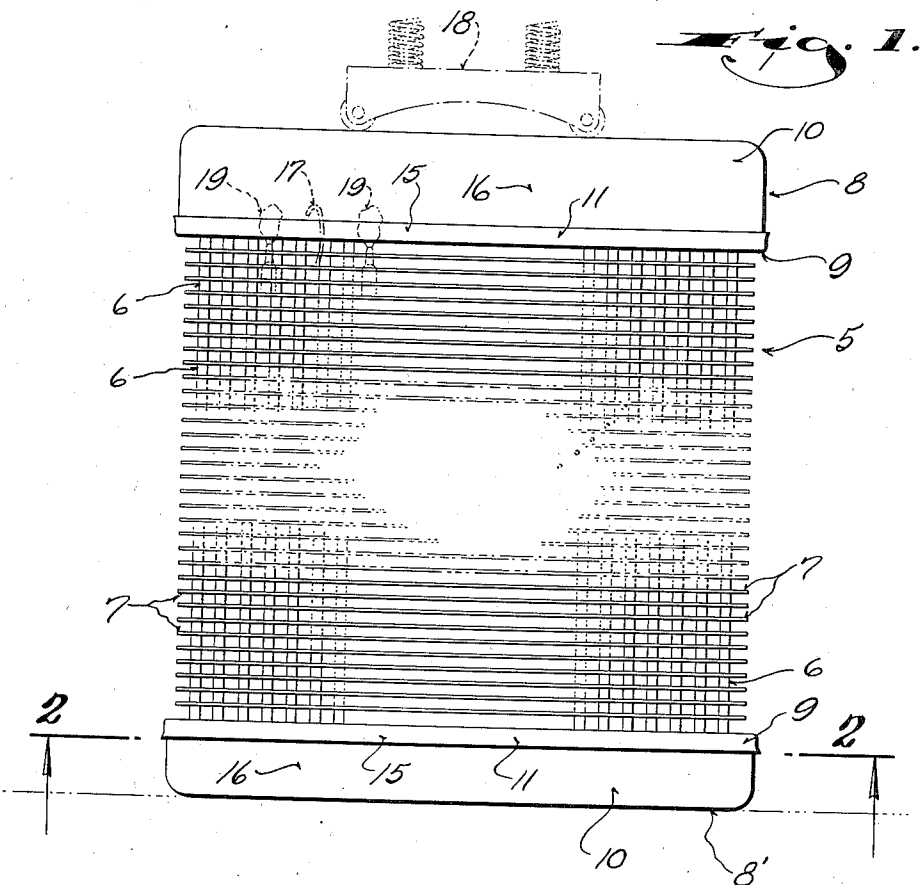
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2,073,778

RADIATOR

Filed Sept. 16, 1936

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

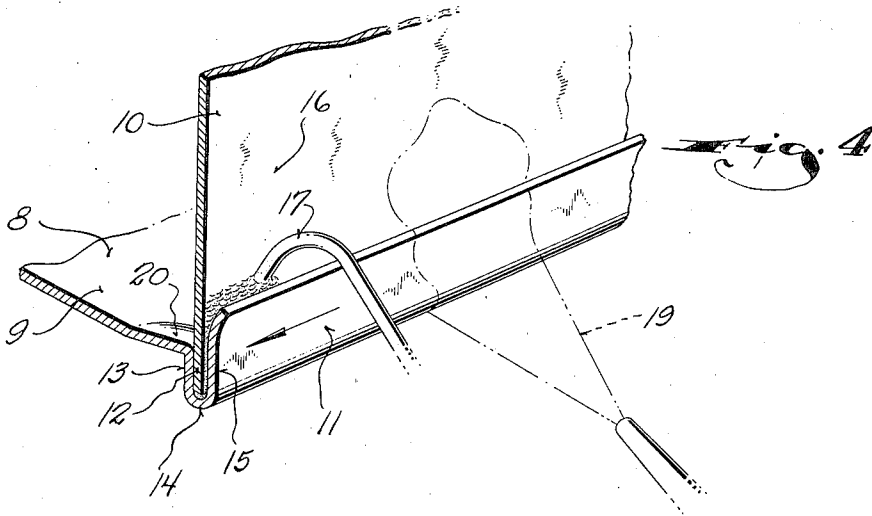
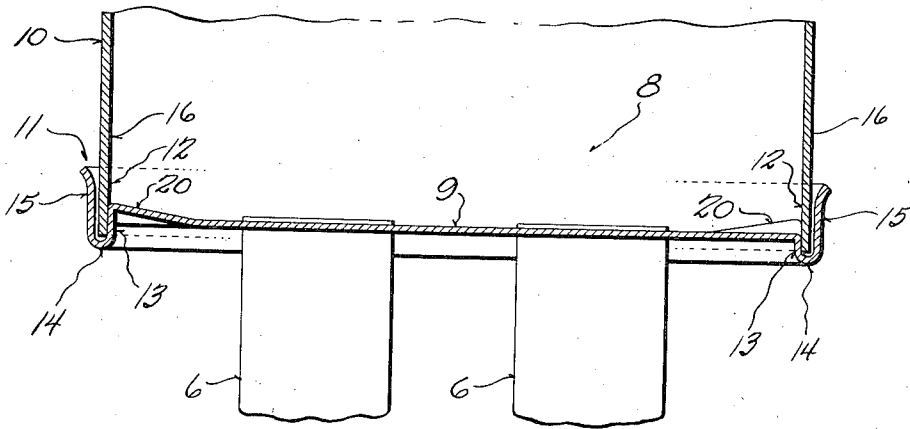


Fig. 3.



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UNITED STATES PATENT OFFICE

2,073,778

RADIATOR

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Application September 16, 1936, Serial No. 101,124

4 Claims. (Cl. 257—154)

This invention relates to improvements in radiators and refers particularly to radiators of the type having fabricated sheet metal headers.

Radiators of this character consist of a core having tubes and hollow headers communicating with the tubes, the headers being composed of plates fixed to the tubes, and hollow heads soldered or otherwise joined to the peripheral edges of the plates.

In fabricating the hollow heads the marginal edges thereof often do not lie in exactly the same plane and as a consequence it has been difficult to obtain a secure junction between these edges and the periphery of the plates. In production methods of manufacture where the soldering of the junction is done automatically on machines this objection is particularly troublesome.

It is therefore an object of this invention to provide an improved manner of joining the component parts of fabricated sheet metal headers which is so designed that during the soldering operation the parts will be held in their proper relative positions even though inward pressure is applied to the relatively flexible side walls of the hollow heads.

Another object of this invention is to provide an improved construction for the headers for radiators of the character described which is so designed that the assembling of the component parts of the header is materially facilitated by effecting automatic alignment between the parts.

With the above and other objects in view which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

The accompanying drawings illustrate a complete example of the physical embodiment of the invention constructed according to the best mode so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a view in front elevation of a radiator constructed in accordance with this invention;

Figure 2 is a bottom view of the radiator taken on the plane of the line 2—2 with the lower head removed from its respective plate;

Figure 3 is an enlarged cross section view illustrating in detail the junction between the component parts of the header; and

Figure 4 is a fragmentary perspective view illustrating the manner in which the junction is made.

Referring now particularly to the accompanying drawings in which like numerals indicate like parts throughout the several views, the numeral 5 designates the core of a radiator which as is customary comprises a plurality of tubes 6 with radiating fins 7 mounted thereon.

The ends of the tubes 6 open into headers 8 and 8' which are identical except for size. Each header consists of a plate 9 and a hollow head 10 having its marginal edges joined to the plate.

The junction between the marginal edges of the head and the plate as best illustrated in Figure 3 includes a channel 11 extending about the entire peripheral edge of the plate and into which the marginal edge portions 12 of the head extend.

To form the channel 11 the plate 9 is offset inwardly of the core a slight distance to form the inner walls 13 of the channel and then directed outwardly to provide the bottom 14 and outer walls 15 of the channel.

It is objectionable to form too great an offset and as a consequence the inner walls of the channel are not nearly as high as the outer walls 15, and inasmuch as the marginal edges of the head do not always lie in a common plane it is possible that portions thereof will be displaced inwardly out of the channel, even though the head is properly seated down onto the plate 9.

This condition is obviously objectionable for in soldering the marginal edges of the head into the channel, sufficient pressure is often applied to the comparatively flexible side walls 16 of the head to push them inwardly out of the channels. This is particularly so when the soldering of the junction is done on an automatic soldering machine which feeds the solder 17 against the side walls 16 above the outwardly flared upper edge of the channel wall 15 as shown in Figure 4.

In such soldering machines the cores travel along a conveyor and are carried under presser members 18 indicated in construction lines in Figure 1 which serve to hold the upper head down onto the plate during the formation of the junction therebetween. At the same time heating flames 19 are projected against the side walls of the head and the channels on the plate 9 and the solder 17 is fed against the side walls 16 to melt and flow down into the channels as clearly shown in Figure 4.

To guard against inward displacement of the marginal edge portions 12 of the head during this soldering operation, the plate 9 has a plurality of

projections 20 pressed into the same at spaced intervals along the inner walls 13 of the channel to increase the effective height thereof. While in the present embodiment these projections 20 are formed by pressing the material of the plate upwardly, the same result may be obtained in many other ways as by welding or otherwise securing separate members to the surface of the plate 9 with portions thereof forming in effect continuations of the inner walls 13.

In any event the important consideration is that the height of the inner walls of the channel is effectually increased without entailing an additional offset of the bottom of the channel with respect to the plane of the plate.

What I claim as my invention is:

1. In a radiator having a hollow header including a plate and a hollow head joined at its marginal edges to the plate, the junction between the plate and the marginal edges of the head comprising a peripheral channel about the plate so disposed with respect to the plane of the plate that the inner wall of the channel is low while the outer wall of the channel is high, the marginal edges of the head being disposed in the channel, a fusible metal filling the channel and securing the marginal edges of the head therein, and means on said plate to increase the height of the inner wall of the channel at spaced points and thereby guard against inward displacement of the marginal edges of the head out of the channel during the securement thereof regardless of unevenness of said edges.

2. In a radiator having a core including tubes, a header communicated with the tubes and comprising a plate fixed to the tubes and a hollow head joined to the plate, the junction between the plate and the hollow head comprising an

offset channel extending about the peripheral edges of the plate and having an outer wall of substantial height and an inner wall of less height so as not to require too great an offset, the marginal edges of the head being disposed in the channel, means on the plate for increasing the effective height of the inner wall of the channel to guard against inward displacement of the wall of the head during the formation of the junction, and solder filling the channel around the marginal edges of the head to secure the same in the channel.

3. In a radiator having a core including tubes, a header communicated with the tubes and comprising a plate fixed to the tubes and a hollow head having a soldered junction at its marginal edges to the plate, said junction including an offset channel extending about the periphery of the plate to receive the marginal edges of the head, and means on the plate to increase the effective depth of the channel at its inner wall to preclude inward displacement of the marginal edges of the head out of the channel during the soldering of the junction.

4. In a radiator having a core including a header communicated with the tubes and comprising a plate fixed to the tubes and a hollow head having a soldered junction at its marginal edges to the plate, said junction including an offset channel extending about the periphery of the plate to receive the marginal edges of the head, and abutments pressed up from said plate to increase the effective height of the inner walls of the channel and thereby guard against inward displacement of the marginal edge portions of the head during the soldering of the junction.

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