

UNITED STATES PATENT OFFICE

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RADIATOR

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2 Claims. (Cl. 257—136)

This invention relates to certain new and useful improvements in radiators, and refers more particularly to radiator core units for concealed radiation.

8 Radiator core units for this type of radiation comprise a plurality of tubes through which the heating medium circulates and a multiplicity of thin sheet metal fins mounted on the tubes to effect an efficient heat transfer from the
10 tubes to the air which is circulated through the unit in any suitable manner.

The radiating fins, being formed of very thin gage metal are easily bent and therefore subject to substantial injury unless protected, especially during the period of installation when the units are apt to be roughly handled.

15 It is therefore an object of this invention to provide a radiator core unit having provision for protecting the fins against deformation by contact with external objects.

A more specific object of this invention is to provide a protecting outer shell including side walls which extend across the opposite side marginal edges of the fins and are so mounted
25 that expansion and contraction thereof does not impart disturbing stresses to the fins.

Another object of this invention is to provide a protection for the endmost fins of the core unit against the intensive heat which is applied during the brazing of the usual headers to the ends of the tubes.

30 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 herein disclosed invention
40 may be made as come within the scope of the claims.

In the accompanying drawing, one complete example of the physical embodiment of this invention is illustrated constructed according to the best mode so far devised for the practical application of the principles thereof, and in which:

50 Figure 1 is a top plan view of a radiator unit equipped with the protecting shell of this invention;

Figure 2 is a side elevation thereof with portions broken away to illustrate structural details; and

55 Figure 3 is a fragmentary perspective view with parts broken away and in section illustrating

the manner in which the headers are secured to the unit.

Referring now more particularly to the accompanying drawing, the numerals 4, 5, 6 and 7 represent the tubes of the core unit which extend longitudinally throughout its entire length. These tubes, as best illustrated in Figure 3, are preferably of elliptical cross section and the ends thereof are secured to headers 8.

60 Mounted on the tubes is a plurality of thin gage sheet metal fins 9 crimped vertically as at 10 between adjacent tubes to strengthen the same. The fins 8 are assembled on the tubes and secured thereto in any suitable manner and are preferably of rectangular shape.

The exposed edges of the fins are protected against damage by a pair of side plates 11 which extend along the entire length of the core unit and are slightly wider than the fins to project above and beneath the same. These side plates 11 are held in proper position by being attached to end plates 12 and an intermediate cross plate 13. The intermediate cross plate 13 is preferably located centrally of the length of the core except in instances where the core is of excessive length where several intermediate cross plates may be employed.

The end plates and the cross plate 13 are suitably apertured to receive the tubes 4, 5, 6 and 7 and have substantially the same area as the fins 8 with their marginal end edges lying in the plane of the adjacent ends of the fins.

Extended from the ends of the plates 12 and 13 are tangs 14 which are received in suitable apertures 15 in the side plates and then struck over, to hold the side plates in position in a simple but efficient manner. The apertures 15 through which the tangs 14 project are slightly wider than the tangs to facilitate the application of the side plates thereto.

It is observed that this manner of mounting the side plates permits independent movement on the part of the side plates with respect to the fins, effected by expansion and contraction so that any such movement of the side plates does not disturb the fins and does not set up undesirable strains in the core unit.

Further protection against internal stresses resulting from expansion and contraction of the various elements of the unit, and particularly between the side walls and the radiating fins is obviated by reason of the fact that the cross plates 12 and 13 being directly attached to the tubes and having substantially the same area as the fins, expand and contract practically in har-

mony with the expansion and contraction of the fins. Any differential in expansion of the cross plates and fins is accommodated by the vertical crimps or beads 10 in the fins which act substantially as expansion joints. As a result, the side plates 11 may be said to "breathe" with the expansion and contraction of the radiator unit.

The end plates 12 further serve to protect the endmost fins against the excessive heat incidental to brazing the tube ends to the headers, the end plates being of substantial weight to absorb the heat and keep it from the fins.

From the foregoing description taken in connection with the accompanying drawing, it will be readily apparent to those skilled in the art to which an invention of the character described appertains, that this invention affords a novel and efficient protection for the fins of the radiator core unit, in which expansion and contraction of the protecting sides does not set up disturbing strains in the fins, and in which protection is also afforded against the excessive heat incidental to brazing the tubes to their headers.

What I claim as my invention is:

1. In combination with a radiator core including a tube, and radiating fins connected with the tube and extending therebeyond, side plates extending across the opposite marginal

edges of the fins, transverse plates carried by the tube and connected with the side plates to hold the same in position adjacent to the said opposite marginal edges of the fins, but independently thereof, said transverse plates being formed of sheet metal and expanding and contracting substantially in harmony with the expansion and contraction of the fins, and compensating means formed in the fins to compensate for any differential in expansion and contraction between the transverse plates and fins.

2. In combination with a radiator core including a tube and radiating fins connected with the tube and extending therebeyond, side plates extending across the opposite marginal edges of the fins, transverse plates carried by the tube, tangs extended from the transverse plates and passed through and bent over the edges of openings in the side plates whereby the transverse plates hold the side plates in a position adjacent to the opposite marginal edges of the fins but independently thereof, said transverse plates being formed of sheet metal and expanding and contracting substantially in harmony with the expansion and contraction of the fins, and compensating means formed in the fins to compensate for any differential in expansion and contraction between the transverse plates and fins.

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