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N. KRAMER

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RADIATOR TUBE AND METHOD OF MAKING THE SAME

Filed Aug. 25, 1926

Fig. 1.

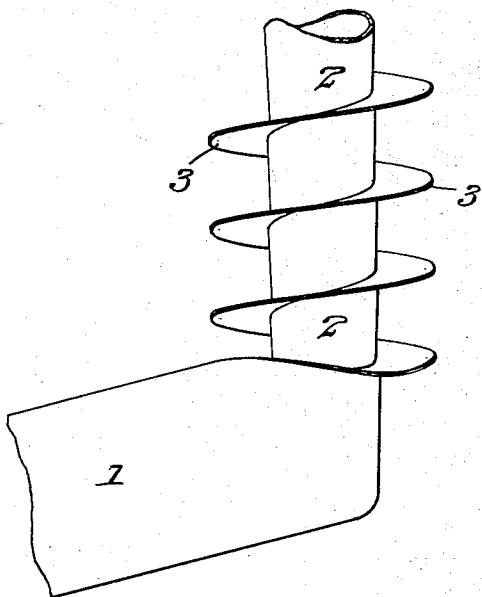


Fig. 2.

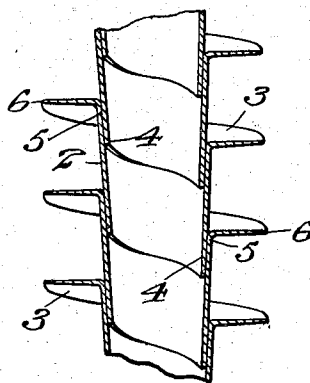


Fig. 3.

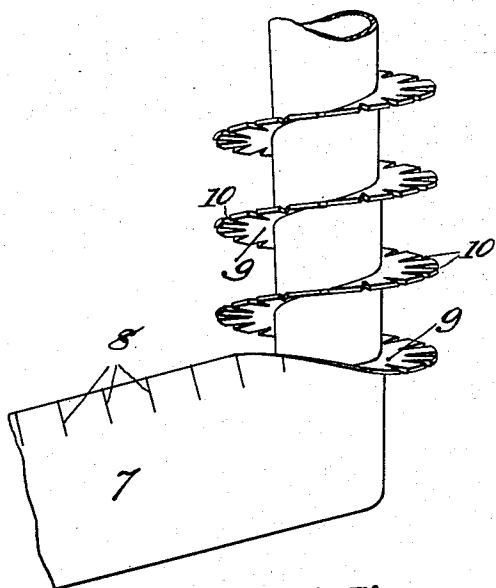


Fig. 4.

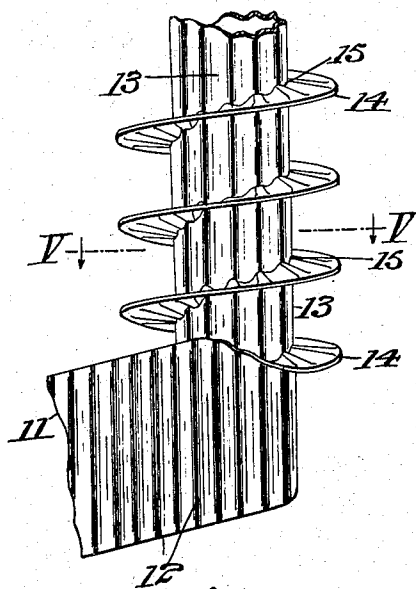
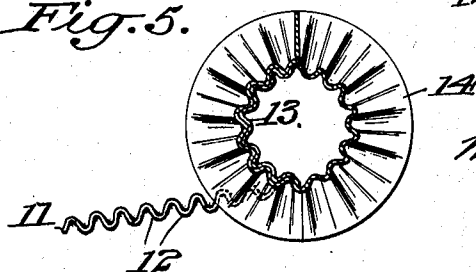


Fig. 5.



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RADIATOR TUBE AND METHOD OF MAKING THE SAME

Application filed August 25, 1926. Serial No. 131,474.

My invention relates to an improvement in radiator tubes and method of making the same, and has for its object to provide an efficient and economical structure capable of resisting relatively great internal and external strains.

Another object is to produce a tube from a strip of sheet metal, which tube is formed with a spirally wound body portion and a laterally projecting fin formed integral therewith.

Another object is to produce a tube by winding a strip of sheet metal into spiral formation and simultaneously turning one edge outwardly to form a continuous fin.

Another object is to produce a tube by winding a strip of sheet metal having corrugations disposed at an angle to its longitudinal direction into spiral formation, simultaneously turning one edge outwardly to form a continuous fin and straightening the outer corrugated periphery of the turned edge during the process of bending.

Another object is to produce a tube by winding a strip of sheet metal coated with a fusible material into spiral formation, simultaneously turning one edge outwardly to form a continuous fin, subjecting the structure to heat sufficient to melt the fusible coating, and allowing the structure to cool.

Another object consists in providing certain improvements in the form, construction and method of producing the same, whereby the above named and other objects may be effectively attained.

A practical embodiment of my invention is represented in the accompanying drawings, in which

Fig. 1 represents a detail side elevation of a portion of a radiator tube constructed from a strip of sheet metal by my improved method;

Fig. 2 represents a detail vertical central section of the same;

Fig. 3 represents a detail side elevation of a modified form of fin developed on the tube;

Fig. 4 represents a similar view of a tube formed from a strip of corrugated sheet metal; and

Fig. 5 represents a horizontal section taken

in the plane of the line V—V of Fig. 4 looking in the direction of the arrows.

In Figs. 1 and 2 the strip of sheet metal is denoted by 1 and it is simultaneously wound spirally to form a body portion 2 of the tube having a fin 3 which projects laterally from the body and is continuous throughout its length. The mechanism for developing the strip of sheet metal into the spirally wound tube with its continuous fin is well known by those skilled in the metal bending art and I do not deem it necessary to describe the same herein.

In winding the strip of sheet metal to form the body portion, the walls of the body portion, as seen in Fig. 2, are caused to assume a slight inclination so that the lower portion 4 will fit within the upper portion 5. This coaction of the walls provides a substantially tight joint therebetween, which joint is readily soldered or sealed to prevent leakage when in use. In forming the continuous fin the outer edge 6 is reduced in thickness by stretching the same to conform to the circular contour of the fin, as clearly shown in Fig. 2.

In the form shown in Fig. 3 one edge of the strip of metal 7 is slit as shown at 8, which slits extend inwardly so that when this edge is developed into a fin 9 the slits will be spread apart as shown at 10, thereby maintaining a uniform thickness throughout the fin.

In the form shown in Fig. 4 the strip of metal 11 is corrugated as shown at 12, which corrugations are disposed at an angle to the longitudinal direction of the strip. In forming the body portion 13 of this structure certain portions of the corrugations will be brought into intimate contact with the adjacent corrugations, as shown in Fig. 5. The corrugations at the junction 15 of the fin 14 and the body portion 13 will be slightly contracted, while in order to compensate for the outer edge of the fin 14, and to obviate stretching the metal, the corrugations from the junction to the outer edge will be progressively tapered or diminished.

The strip of sheet metal, in each of the forms above described, may be coated with a

suitable fusible material and after the tube with its continuous fin is constructed, it is subjected to heat sufficient to melt the coating, and then allowed to cool.

5 As another means of sealing the joint of the tube, I also contemplate immersing the completed structure in a bath of molten solder, and after being removed it is allowed to cool.

10 It is obvious that various changes may be effected in the form, construction and assembly of the elements, without departing from the spirit and scope of my invention; and hence I do not intend to be limited to the details herein shown and described, except as
15 they may be included in the claims.

The tube of this invention is essentially one for effecting heat transference; it has been described in the specification and it is
20 termed in some of the claims appended hereto, as a radiator tube. It is desired that it be understood, however, that the tube is not limited in its use in a specific article which is commonly termed a radiator, but that this
25 tube is for heat exchange purposes generally, and it is useful for radiators for heating buildings, radiators for automotive vehicles, heat exchange devices in mechanical refrigerators, mechanical air cooling devices, and the like.
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What I claim is:

1. A tube for radiators comprising, a corrugated sheet metal spirally wound body portion having a laterally projecting spiral fin
35 formed integral therewith.

2. A tube for radiators comprising, a corrugated sheet metal spirally wound body portion having a laterally projecting continuous spiral fin formed integral therewith.

40 3. The method of producing sheet metal tubes consisting of winding a corrugated strip of sheet metal in spiral formation and turning one edge outwardly to form a fin.

4. The method of producing sheet metal
45 tubes consisting of winding a corrugated strip of sheet metal in spiral formation and simultaneously turning one edge outwardly to form a continuous fin.

5. A tube for radiators comprising, a strip
50 of sheet metal having corrugations disposed at an angle to its longitudinal direction, said strip being wound in spiral formation to form a body portion and having a laterally projecting fin formed integral therewith.

6. A tube for radiators comprising, a strip
55 of sheet metal having corrugations disposed at an angle to its longitudinal direction, said strip being wound in spiral formation to form a body portion and having a laterally projecting spiral fin formed integral therewith.

7. A tube for radiators comprising, a strip
60 of sheet metal having corrugations disposed at an angle to its longitudinal direction, said strip being wound in spiral formation to form a body portion and having a laterally projecting continuous spiral fin formed integral therewith.

jecting continuous spiral fin formed integral therewith.

8. The method of producing sheet metal tubes consisting of winding a strip of sheet metal coated with a fusible material in spiral
70 formation, turning one edge outwardly to form a fin, subjecting the structure to heat sufficient to melt the coating, and then allowing the structure to cool.

9. The method of producing sheet metal
75 tubes consisting of winding a strip of sheet metal coated with a fusible material in spiral formation, simultaneously turning one edge outwardly to form a continuous fin, subjecting the structure to heat sufficient to melt the coating, and then allowing the structure to cool.
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10. The method of producing sheet metal tubes consisting of winding a corrugated strip of sheet metal coated with a fusible material in spiral formation, turning one edge
85 outwardly to form a fin, subjecting the structure to heat sufficient to melt the coating, and then allowing the structure to cool.

11. The method of producing sheet metal
90 tubes consisting of winding a corrugated strip of sheet metal coated with a fusible material in spiral formation, simultaneously turning one edge outwardly to form a continuous fin, subjecting the structure to heat sufficient to melt the coating, and then allowing the structure to cool.
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12. A tube for radiators comprising, a body portion composed of a spirally wound longitudinally overlapping strip of sheet metal, one edge of said strip being bent laterally to form a spiral projecting fin.
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13. A tube for radiators comprising, a body portion composed of a strip of sheet metal spirally wound and having one edge arranged
105 to telescopically overlap substantially in vertical alignment, and the other edge bent laterally to form a spiral projecting fin.

14. A tube of the class described formed from a single strip of material having a flange projecting laterally from its main body and spirally wound, the flange forming a spirally directed, radially extending fin on the periphery of the tube.
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15. A tube formed from a single strip of material having a main body and a flange directed laterally thereto, the main body being wound spirally to form the body of the tube, and overlapping at its edges and the flange extending radially outwardly from the periphery thereof.
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16. The method of making spiral-finned tubing, which consists in shaping a continuous length of flat strip stock into angle form, winding the thus-shaped stock spirally into the form of overlapping and secured together convolutions to form a tubing with one of the legs of the angle forming a fin on the tube.
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17. The method of making spiral-finned tubing, which comprises folding a continuous
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length of strip stock longitudinally so that one portion of the stock is substantially perpendicular to another portion, winding the stock spirally whereby one of the portions forms spiral overlapped and adhering convolutions which form the body of the tube and the other of the portions forms a continuous spiral fin on the tubing.

18. The method of making spiral-finned tubing, which consists in spirally winding stock which is angular in section and having a horizontal portion and an upright portion, and overlapping and securing together the adjacent convolutions of the horizontal portion to form the body of the tube.

19. The method of making spiral-finned tubing, which consists in drawing flat strip stock from a supply, turning up one edge of the stock to form an upright portion leaving a horizontal portion, spirally winding the thus-formed stock with the adjacent convolutions of the horizontal portion overlapped to form the body of the tube, and with the upright portion projecting outwardly from the body of the tube to form an integral spiral fin on the tube.

20. The method of making spiral-finned tubing, which consists in drawing flat strip stock from a supply, bending the stock longitudinally to form an upright portion and to leave a substantially horizontal portion, winding the stock spirally, overlapping each convolution of the horizontal portion substantially one-half the distance of the adjacent convolution to form the body of the tube with the upright portion forming an integral spiral fin on the tube.

21. The method of making spiral-finned tubing, which consists in drawing flat strip stock from a supply, bending the stock longitudinally to form an upright portion and leaving a horizontal portion, spirally winding the stock with each convolution of the horizontal section overlapping substantially one-half of the next adjacent convolution to form a tube with a double wall, and with the upright portion forming a continuous spiral fin on the tube.

In testimony, that I claim the foregoing as my invention, I have signed my name this 17th day of August, 1926.

NATHAN KRAMER.

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