

E. T. BIRDSALL.
HEAT RADIATING PIPE OR TUBE.

(Application filed June 20, 1900.)

(No Model.)

Fig. 1.

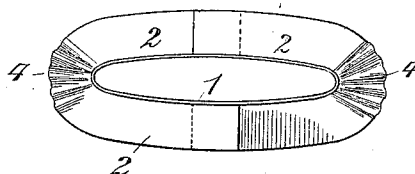


Fig. 2.

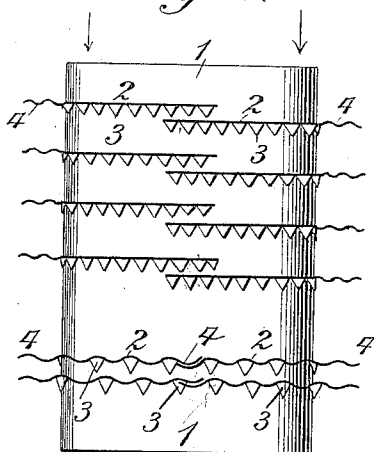
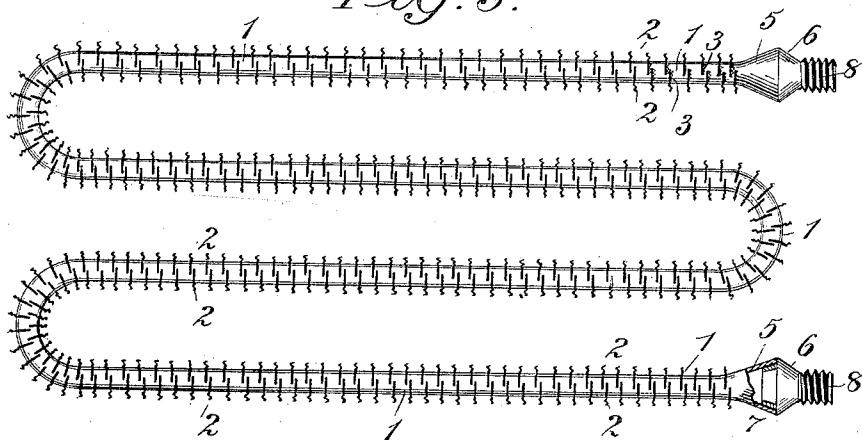


Fig. 3.



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UNITED STATES PATENT OFFICE.

EDWARD T. BIRDSALL, OF NEW ROCHELLE, NEW YORK, ASSIGNOR TO
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HEAT-RADIATING PIPE OR TUBE.

SPECIFICATION forming part of Letters Patent No. 672,412, dated April 16, 1901.

Application filed June 20, 1900. Serial No. 20,920. (No model.)

To all whom it may concern:

Be it known that I, EDWARD T. BIRDSALL, a citizen of the United States, residing at New Rochelle, in the county of Westchester and State of New York, have made a new and useful Invention in Heat-Radiating Pipes or Tubes, of which the following is a specification.

My invention is directed particularly to improvements in heat-radiating pipes or tubes adapted for use in connection with the cooling apparatus of explosive-engines or steam-engines used for propelling automobiles or motor-vehicles; and its objects are, first, to provide for this class of pipes or tubes resilient heat-radiating gills which will not be ruptured in the event of abnormal lateral expansion of the pipes or tubes; second, to so construct the resilient heat-radiating gills for such pipes or tubes that they may be readily put in position thereupon after the latter are bent or given their final conformation ready for use in a completed radiator, and, third, to simplify and to lessen the expense of applying such heat-radiating gills for the purpose specified.

For a full and clear understanding of the invention, such as will enable others skilled in the art to construct and use the same, reference is had to the accompanying drawings, in which—

Figure 1 represents an end elevational view of my novel form of expansible radiating pipe or tube with my novel form of resilient heat-radiating gills applied thereto and as seen looking at Fig. 2 from the top toward the bottom of the drawings in the direction of the arrows, Fig. 2 being a plan view of the same structure. Fig. 3 represents one form of a completed "radiator" constructed in accordance with my novel invention and embodying my novel form of heat-radiating gills, said radiator being adapted for use in connection with such engines as are ordinarily used with automobiles or motor-vehicles.

In the use of gas and other explosive engines in connection with automobiles or motor-vehicles it is customary to cool the heated parts of the engine by causing cold water to flow continuously therearound, said water being cooled after its journey around the en-

gine by heat-radiators in the nature of thin cylindrical coiled tubes constructed of sheet-copper and surrounded by thin metallic radiating-gills, the latter being in the nature of circular disks, each provided with a central opening or hole and laterally-arranged teeth and slipped in position endwise upon the pipe or tube before the latter is bent into the coiled position which it ultimately assumes in the completed radiator. Such pipes or tubes when subjected to extremely low temperatures in the winter season often burst by reason of the freezing of the water therein, as do also the surrounding gills, thereby necessitating the replacing of an entirely new radiator. It was with the object of overcoming these objectionable features that the present invention was devised and also with a view of providing heat-radiating gills which may be put in place upon the pipe or tube after the latter is bent or curved to suit the conditions for which it is to be used. I overcome the evil effects of expansion due to the freezing of the water in such a radiator pipe or tube by making the same of thin-drawn copper or other wrought metal and of elliptical form, as shown by the number 1, Fig. 1, as it will be understood that when the water freezes within such a pipe or tube the major portion of the expansive action will be in the direction of the smaller axis of the ellipse, and this to such an extent that no damaging effect is had when the water therein freezes solid.

For the purpose of providing a heat-radiating gill which will not rupture by the freezing of water in the pipe or tube I provide resilient semicircular or semi-elliptical gills 2 2, made of thin sheet-copper or like wrought metal, corrugated at 4 4, as shown in Fig. 1, and provided with laterally-extending teeth 3 and overlapping ends, as shown in Fig. 2 of the drawings, these gills being alternately located on opposite sides of the tube in the manner shown and afterward secured directly to the pipe or tube 1, about which they are slipped laterally, by tinning or brazing in the usual manner. The corrugations 4 4 at the curved parts of the gills will not only counteract any evil effects from expansion by the freezing of the water in the pipe or tube 1, but will give increased heat-radiating surface.

In fact, I may corrugate these gills throughout their entire length, as shown at the lower end of Fig. 2, uniting the corrugations together at their adjacent ends by tinning or
5 brazing. It will be understood that these heat-radiating gills may be any desired configuration or shape to adapt themselves to the configuration or shape of the pipe or tube to which they are to be attached so long as
10 they are constructed in such manner as to be placed therearound after the pipe or tube is bent to its final shape with overlapping ends, as shown in Figs. 1 and 2.

In Fig. 3 I have illustrated the application
15 of my novel form of resilient heat-radiating gills to the usual coil arrangement of radiator utilized in connection with motor-vehicles. In this figure of the drawings the elliptical tube 1 is flattened at its ends, as shown at 5,
20 and is provided with cone-shaped nozzles 6 6, screw-threaded at 8 and secured to the inner surface of the flattened end of the tube, as shown at 7, the screw-threaded ends adapting it for connection in the usual manner.

25 I believe it is broadly new with me to provide a radiator pipe or tube of any shape whatever with expansible heat-radiating gills made in one or more resilient sections or detachable parts adapted to be placed in position
30 laterally by slipping the same around the tube, as described, and so located that when in position they are in planes substantially at right angles to the axis of the pipe, with their adjacent ends overlapping, as illustrated in the drawings, and my claims are
35 generic as to this feature; nor do I limit myself to the use of my invention in connection with radiator-tubes for motor-vehicles,

as the several features thereof may be utilized elsewhere in the arts where like functions result from such uses. To illustrate, the heat-radiating gills hereinbefore described may be utilized in connection with steam-engines for radiating the heat of the exhaust-
45 steam or in connection with refrigerating machines, where such gills are sometimes used for the purpose of concentrating and freezing moisture around the condensing-pipes, or in any place where heat is to be transferred from one medium to another, and my claims are
50 designed to include all such uses.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A heat-radiating pipe or tube having a
55 cross-section, one diameter of which is greater than the other; in combination with resilient sectional heat-radiating gills secured thereto from opposite sides.

2. A heat-radiating pipe or tube of substantially elliptical form, in combination with
60 resilient semi-elliptical gills secured thereto.

3. A heat-radiating pipe or tube of substantially elliptical form; in combination with resilient sectional heat-radiating gills secured
65 thereto, said gills having overlapping ends.

4. A heat-radiating pipe or tube of substantially elliptical form; in combination with resilient heat-radiating gills secured thereto,
70 said gills being provided with corrugations.

In testimony whereof I hereunto subscribe my name this 18th day of June, 1900.

EDWARD T. BIRDSALL.

Witnesses:

M. F. KEATING,
C. J. KINTNER.