Oct. 9, 1923.

1,470,033

P. D. SCHENCK

RADIATOR

Filed May 6, 1921

2 Sheets-Sheet 1

FIG. 1.

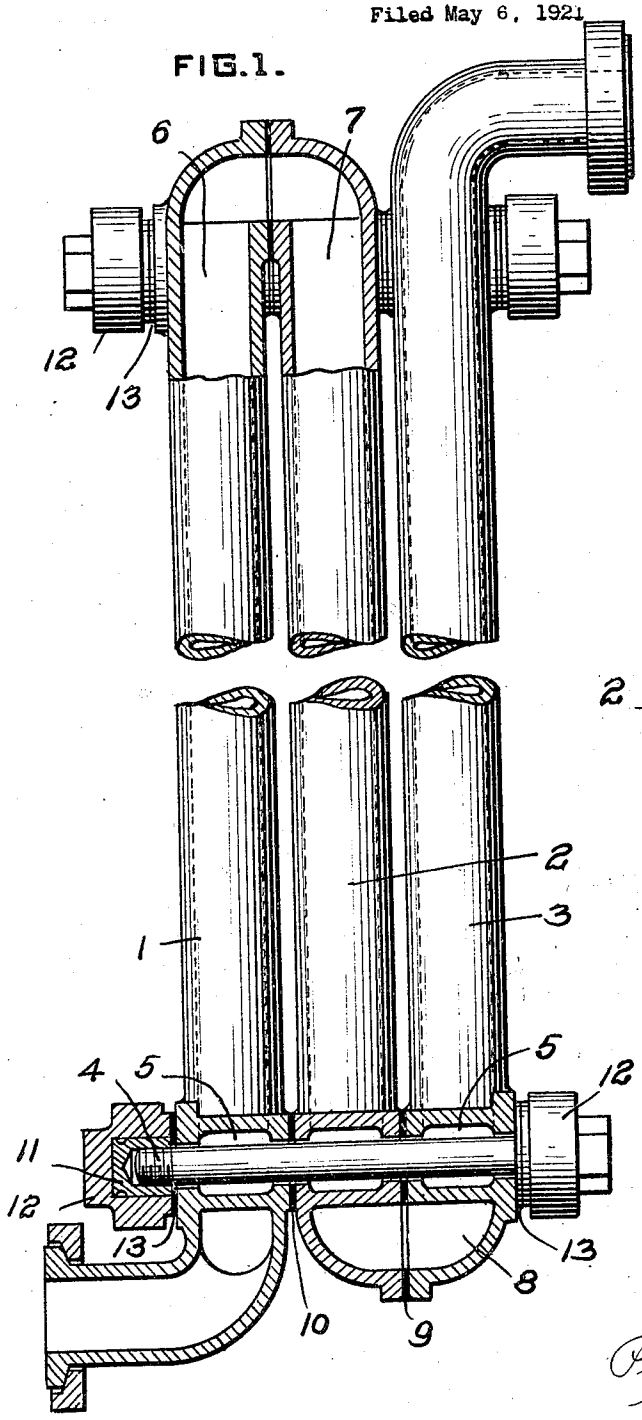
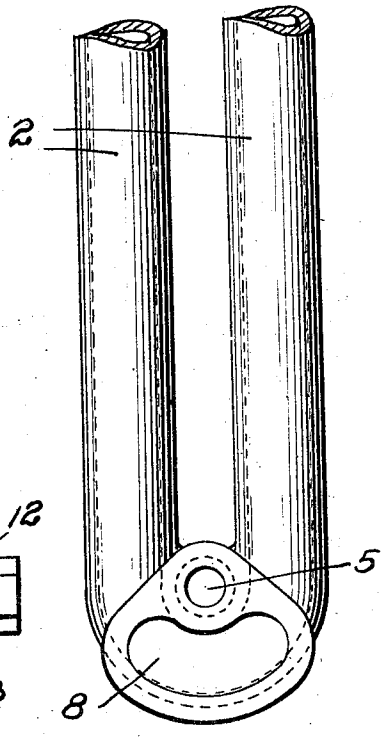


FIG. 2.



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FIG.3.

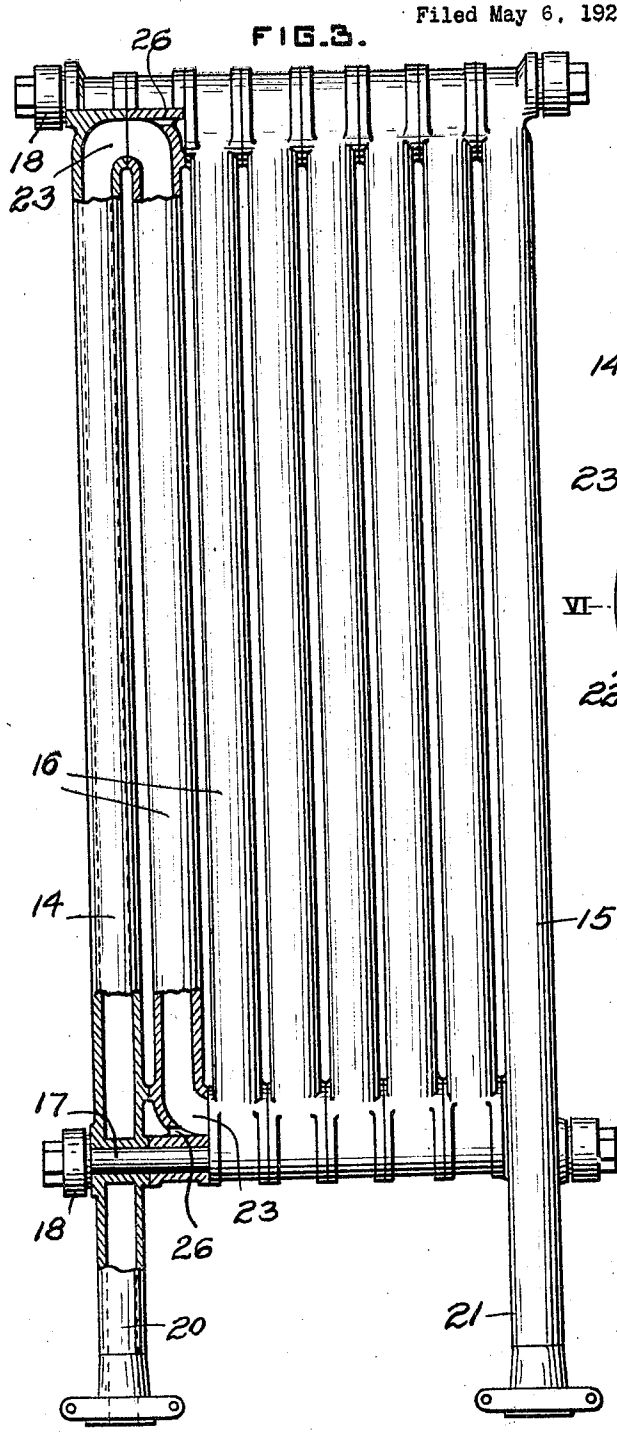


FIG.4.

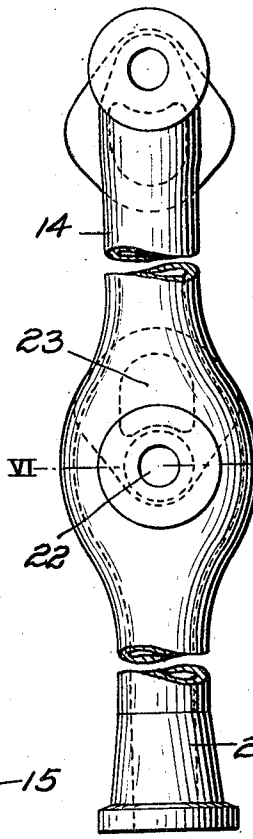


FIG.5.

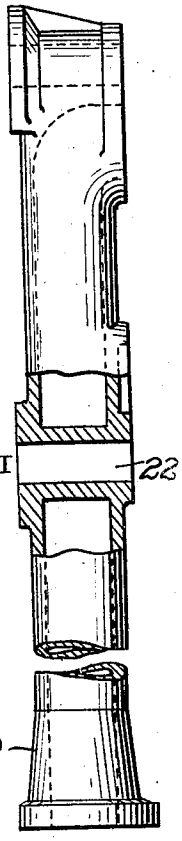
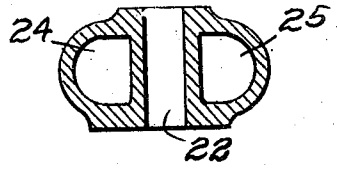


FIG.6.



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Patented Oct. 9, 1923. 1,470,033

UNITED STATES PATENT OFFICE.

PIERCE D. SCHENCK, OF DAYTON, OHIO, ASSIGNOR TO THE DURIRON COMPANY INC., A CORPORATION OF NEW YORK.

RADIATOR.

Application filed May 6, 1921. Serial No. 467,309.

To all whom it may concern:

Be it known that I, PIERCE D. SCHENCK, a citizen of the United States, and a resident of Dayton, in the county of Montgomery and State of Ohio, have made a new and useful Invention in Radiators, of which the following is a specification.

The invention relates to radiators designed for use with corrosive liquids. It has for its principal objects; the provision of a radiator of improved construction, (1) which may be used either to carry the corrosive liquid or which may be immersed in the liquid; (2) in which those parts of the construction used for securing the sections together and calling for material having relatively high tensile strength and consequently of metal readily acted upon by the corrosive liquid, are protected from such liquid in a simple and effective manner; (3) and in which the sections are assembled and disassembled without difficulty and in which no machine work upon the section (of very hard resistant composition) is necessary. Certain embodiments of the invention are illustrated in the accompanying drawings wherein:

Figure 1 is a side elevation partially in section showing a radiator made of three sections involving my improvement. Fig. 2 is a partial end elevation of one of the sections disassembled. Fig. 3 is a side elevation partially in section of a modified radiator construction involving a larger number of sections. Fig. 4 is an end elevation of one of the end sections. Fig. 5 is a partial side elevation and partial section through the section of Fig. 4. And Fig. 6 is a transverse section through the section of Fig. 4 on the line VI—VI.

Referring to Fig. 1, the numerals 1, 2 and 3 represent radiator sections secured together by means of tie rods 4 located in passage 5 adjacent the ends of the sections, only the tie rod at the lower end of the sections being shown in Fig. 1 but the other end being of similar construction and similarly arranged.

The sections 1, 2 and 3 are of acid resisting metal preferably of the composition known by the trade name of "Duriron" and comprising a high silicon iron which is exceedingly resistant to the corrosive action of liquids such as the various acids and alkalis. This radiator is designed either to carry the corrosive liquid which is to be heated or cooled or else to carry the heating or cooling liquid and be immersed in the corrosive liquid to be heated or cooled. The radiator is so constructed that in either case the tie rods 4 and the threaded parts which cooperate therewith are perfectly protected from the action of the corrosive liquid. This is desirable and in fact necessary since a relatively high degree of tensile strength is required in the tie rods and their nuts and metal suitable for this purpose having the necessary degree of tensile strength and readily machinable is not acid resisting. The tie rods and bolts are of ordinary wrought material such as wrought iron or steel.

The various sections of the radiator are provided with the passages 6, 7 and 8 which communicate at their ends as illustrated while the sections are fitted together, suitable packing discs 9 being employed at the joints in order to prevent leakage, such discs being made of packing material which will resist the corrosive action of the particular liquid to which the radiator is to be exposed. The tie rod passages 5 are placed relatively close to the ends of the radiator sections and the packing discs 9 and 10 serve to prevent any leakage into the recesses 5 either from the interior of the radiator or from the exterior thereof. The ends of the tie rods are engaged by wrought metal nuts 11 around which are cast the protecting caps 12 preferably of the same acid resisting material as the radiator sections. Suitable packing discs 13 are provided between these nuts and the adjacent surfaces of the radiator sections so that when the nuts are screwed up tight no leakage can occur to the recesses or passages 5.

In the construction shown in Figs. 3 to 6 there are eight radiator sections including the end sections 14 and 15 and the intermediate sections 16, the entire set being held together by means of the tie rods 17 provided with wrought metal nuts and protecting caps 18 corresponding to the caps 12 of the construction of Fig. 1. The sections 14 and 15 have their ends straight as indicated at 20, 21 instead of turned laterally as in the construction of Fig. 1 and these inlet and outlet portions are placed at the same ends of the radiator instead of at the opposite ends. The tie rod passages 22 (Figs. 4 and 5)

are located somewhat differently from the construction of Fig. 1, being placed below the ends of the radiator passage 23 instead of above as in the construction of Fig. 1. At the inlet and outlet ends of the sections 14 and 15 the radiator passage divides into the two branches 24 and 25 as indicated in Figs. 4 and 6 in order to pass around the tie rod passages or perforations 22. In both constructions the tie rods are placed close to the extreme ends of the radiator where they will be most effective in giving the necessary tightness to the joints and in each case the tie rods or bolts with their nuts are protected from the corrosive action of any liquid either inside or outside the radiator. The packing construction which is not illustrated in the second form of the construction is similar to that described in connection with the first form.

Another distinction over the construction of Figs. 1 and 2 resides in the fact that each of the sections 14, 15, 16, consists of one vertical pipe, while in the construction of Figs. 1 and 2 the sections 1, 2 and 3 all consist of two vertical pipes (see Fig. 2).

In order to prevent air bind and consequently water hammer for moist steam or liquors going through the radiator, the vent holes 26 (Fig. 3) are provided at the ends of the sections. This feature of the construction adds greatly to the effectiveness and value of the construction and constitutes one of the important details of my invention.

What I claim is:

1. In combination in a radiator, a plurality of hollow parallel cast sections of non-corrosive metal with lateral openings in the ends so as to form a continuous passage when the sections are fitted together, and each provided with transverse perforations lying to one side of said lateral openings in the ends and adapted to aline and provide tie rod passages when the sections are fitted together, packing means between the sections around the openings in said ends and around the ends of the perforations adapted to seal off the radiator passage from the tie rod passages, tie rods of wrought metal extending through said passages for clamping the sections together, and means for preventing access of the corrosive liquid to the ends of said tie rod passages.

2. In combination in a radiator, a plurality of hollow parallel cast sections of non-corrosive metal with lateral openings in the ends so as to form a continuous passage when the sections are fitted together, and each provided with transverse perforations lying to one side of said lateral openings in the ends and adapted to aline and provide tie rod passages when the sections are fitted together, packing means between the sections around the openings in said ends and around the ends of the perforations adapted to seal off the radiator passage from the tie rod passages, tie rods of wrought metal extending through said passages for clamping the sections together, and nut members protected by non-corrosive material for engaging the ends of the tie rods and forming closures for the ends of said tie rod passages.

In testimony whereof, I have hereunto subscribed my name this 2nd day of May, 1921.

PIERCE D. SCHENCK.

Witnesses:
JOSEPH DWIGHT,
O. JACOBSEN.