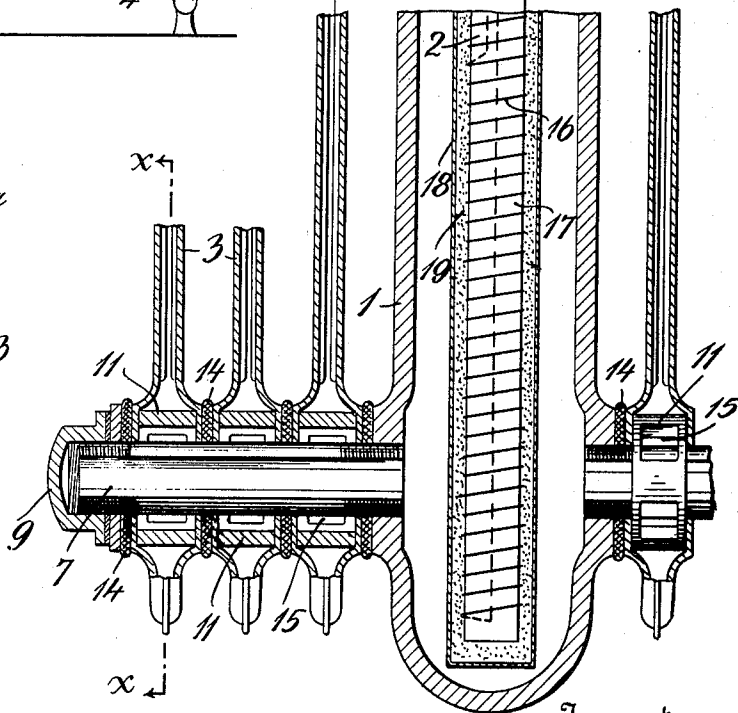
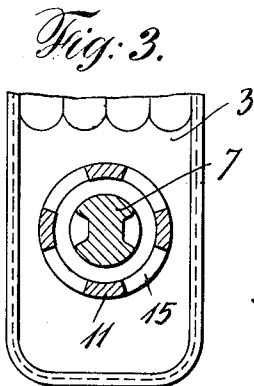
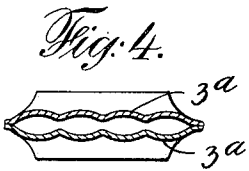
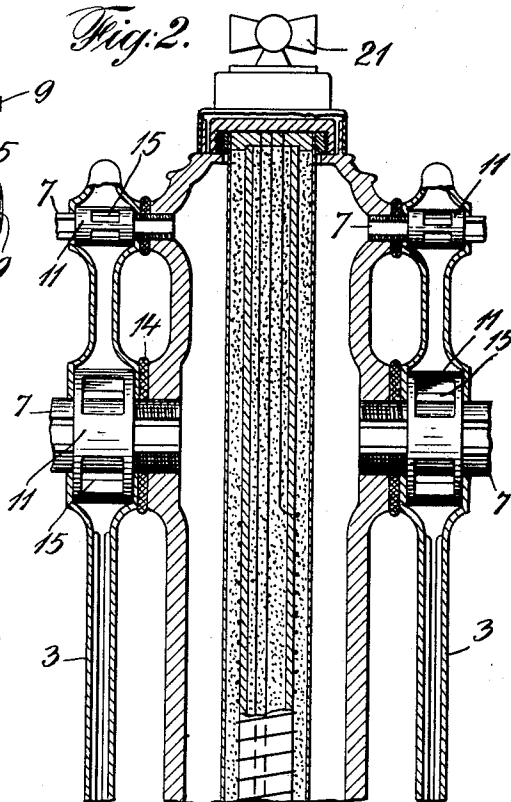
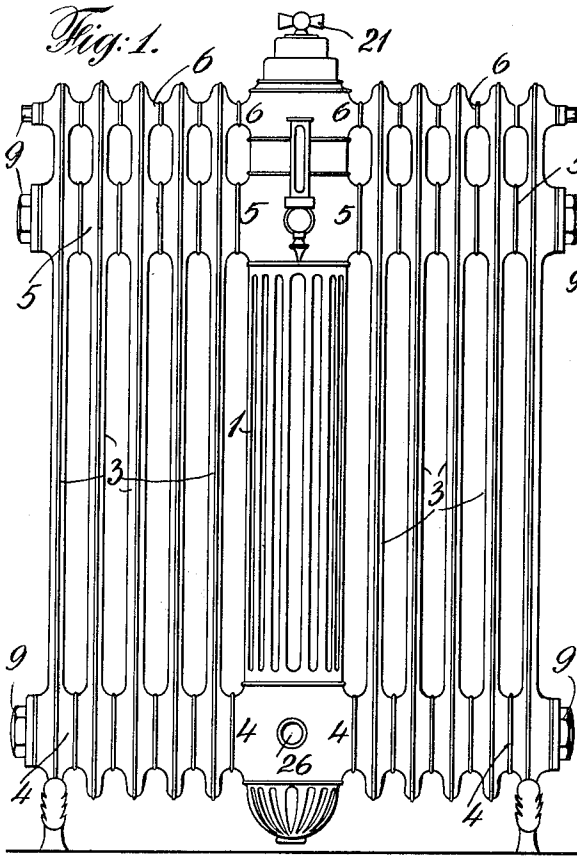


J. F. MONNOT.
RADIATOR.

APPLICATION FILED APR. 14, 1911.

1,064,924.

Patented June 17, 1913.



Witnesses:
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UNITED STATES PATENT OFFICE.

JOHN F. MONNOT, OF PARIS, FRANCE.

RADIATOR.

1,064,924.

Specification of Letters Patent.

Patented June 17, 1913.

Original application filed December 10, 1910, Serial No. 596,707. Divided and this application filed April 14, 1911. Serial No. 621,084.

To all whom it may concern:

Be it known that I, JOHN F. MONNOT, a citizen of the United States, residing at Paris, France, have invented certain new and useful Improvements in Radiators, of which the following is a specification.

My invention relates to improvements in radiators and consists in a novel sectional construction.

The objects of my invention are to improve the construction of sectional radiators.

I will now proceed to describe my invention with reference to the accompanying drawings, which show a radiator constructed in accordance with my invention, and also in accordance with the invention of my application filed December 10, 1910, Sr. No. 596,707, of which this is a division, and will then point out the novel features in claims.

In said drawings: Figure 1 shows a front elevation of one form of radiator embodying my invention; Fig. 2 shows a fragmentary longitudinal section of the radiator on a larger scale; Fig. 3 shows a transverse section of one of the elements of the radiator on the line $x-x$ of Fig. 2; Fig. 4 shows a transverse section of one of the sections of the radiator.

Referring now to the drawings, the radiator there shown comprises a column 1 and two series of radiator sections 3, connected to this column at points 4, 5 and 6 and similarly connected to each other. In the particular construction shown the column 1 is between the two series of radiator sections, but this particular location of the column 1 is optional, as it will be apparent to those skilled in the art that various other arrangements of the column with respect to the radiator sections are practicable; for example, that the column 1 may be located at the end of a series of radiator sections. Indeed, in the construction shown, such radiator column is at the end of either of the two series of radiator sections, taken separately. The construction of the column 1 is such that it may be formed either as a casting or it may be pressed by familiar pressing methods. As is the case in ordinary sectional radiator constructions, there may be few or many of the radiator sections 3, as desired or required. These sections 3 are of sheet metal construction, comprising

side plates 3^a, usually corrugated, as shown, both for strength and stiffness, and to give increased heating surface, and are joined at the edges by brazing, welding, or in any other suitable manner. The facility with which, at the present day, such parts may be welded together by the acetylene welding process, the electric welding process, or similar processes, makes the welding of these plates together at their edges a very practicable and simple matter.

In stamping the plates 3^a for the sections 3, ported bosses are formed at the points 4, 5 and 6, where the radiator sections are to be joined together, or to the column 1, the ports of these bosses permitting communication between the sections of the radiator, and also permitting the passage of the hereinafter mentioned through-bolts 7. To join these sections together and to the column 1, through-bolts 7 are provided, these bolts being of I-section approximately, *i. e.*, having grooves in their sides, constituting circulation passages. Said bolts are threaded at their ends, one end screwing into the column 1, while on the other end screws a nut 9, whereby the several sections are pressed together.

Within the bosses 4, 5 and 6 of the radiator sections, spacing bushings 11 are provided. I customarily provide suitable joint-making material 14 between the bossed portions of adjacent radiator sections, to form tight joints; this packing material being either a suitable elastic packing material, or a suitable metallic packing material, or a suitable cement; or in fact any other joint-making material suitable for the purpose. The spacing bushings 11 are provided with ports 15 for the flow of liquid or vapor, free circulation of such liquid or vapor being thereby permitted.

It will be noted that the sectional radiator construction just described is at once simple, inexpensive, and very effective, insuring tight joints, and permitting if desired, a very light construction of the sections, through the employment of very thin metal. It further permits the construction of these sections of metal of much higher heat conductivity, than iron or steel, such for example as copper, brass, or even aluminum.

While the radiator above described is adapted for use in the same manner as ordi-

nary steam or hot water radiators, and to that end is provided with a connection 26, whereby it may be connected to the supply pipe of the heating system, I particularly intend this radiator for use as an electric radiator, that is to say, a radiator having within it an electric heating element, the heat generated by which is imparted to water or other liquid within the radiator.

2 in Fig. 2, designates the said heating element, comprising a metallic resistance wire 16 wound around a support 17 of refractory material, and inclosed in a suitable envelop 18, the latter being customarily, though not necessarily, a metallic tube; and between the said envelop 18 and said resistance walls there is customarily a refractory spacing and insulating material 19, which may conveniently be a pulverulent material, such as chalk, plaster of Paris, talc or other suitable material. This heating element is suspended within the column 1 from the upper portion of said column and above it a switch 21 is provided for regulating the action of the heating element.

In my application Sr. No. 596,707, of which the present application is a division, I have claimed the radiator in its combination with heat generating means, and in another application, filed December 10, 1910, Sr. No. 596,708 I have claimed a heating element such as above described. Therefore the claims of this present application are restricted to the sectional structure of the radiator.

Since the top and bottom flanges of the I-section through-bolts 7 fit closely within the ports of the bosses 4, 5 and 6, of the sections of the radiator, these through-bolts not only tie the sections of the radiator together, but center corresponding parts of the several sections and support the intermediate sections 3 and the central section 1.

What I claim is:—

1. A radiator comprising in combination

a plurality of radiating sections, the said radiating sections having registering apertures for the flow of fluid from one to another, and means for holding said sections together, comprising rods provided with circulation passages in their sides, said rods passing through said registering apertures and substantially filling same, except for said side passages, clamping means on said rods for forcing the radiating sections together, and ported spacing bushings of an interior diameter greater than that of said rods within said radiating sections and surrounding said rods, and serving to prevent collapse of the radiating sections.

2. A radiator comprising in combination a column and a plurality of radiating sections, the said column and radiating sections having registering apertures for the flow of fluid from one to another, and means for holding said column and sections together, comprising rods provided with circulation passages in their sides, said rods passing through said registering apertures and substantially filling same, except for said side passages, the inner end of each rod secured to the said column, the outer end of each rod provided with means to force the radiating sections together, and ported spacing bushings of an internal diameter greater than the diameter of said rods within said radiating sections and surrounding said rods and spaced away therefrom, whereby free circulation of the fluid within the radiator between the column and the said radiating sections is permitted, said bushings serving to prevent collapse of the radiating sections.

In testimony whereof I affix my signature, in the presence of two witnesses.

JOHN F. MONNOT.

Witnesses:

H. M. MARBLE,
D. A. DAVIES.