

No. 845,304.

PATENTED FEB. 26, 1907.

W. R. KINNEAR.

METHOD OF MAKING SHEET METAL RADIATORS.

APPLICATION FILED FEB. 15, 1905.

2 SHEETS—SHEET 1.

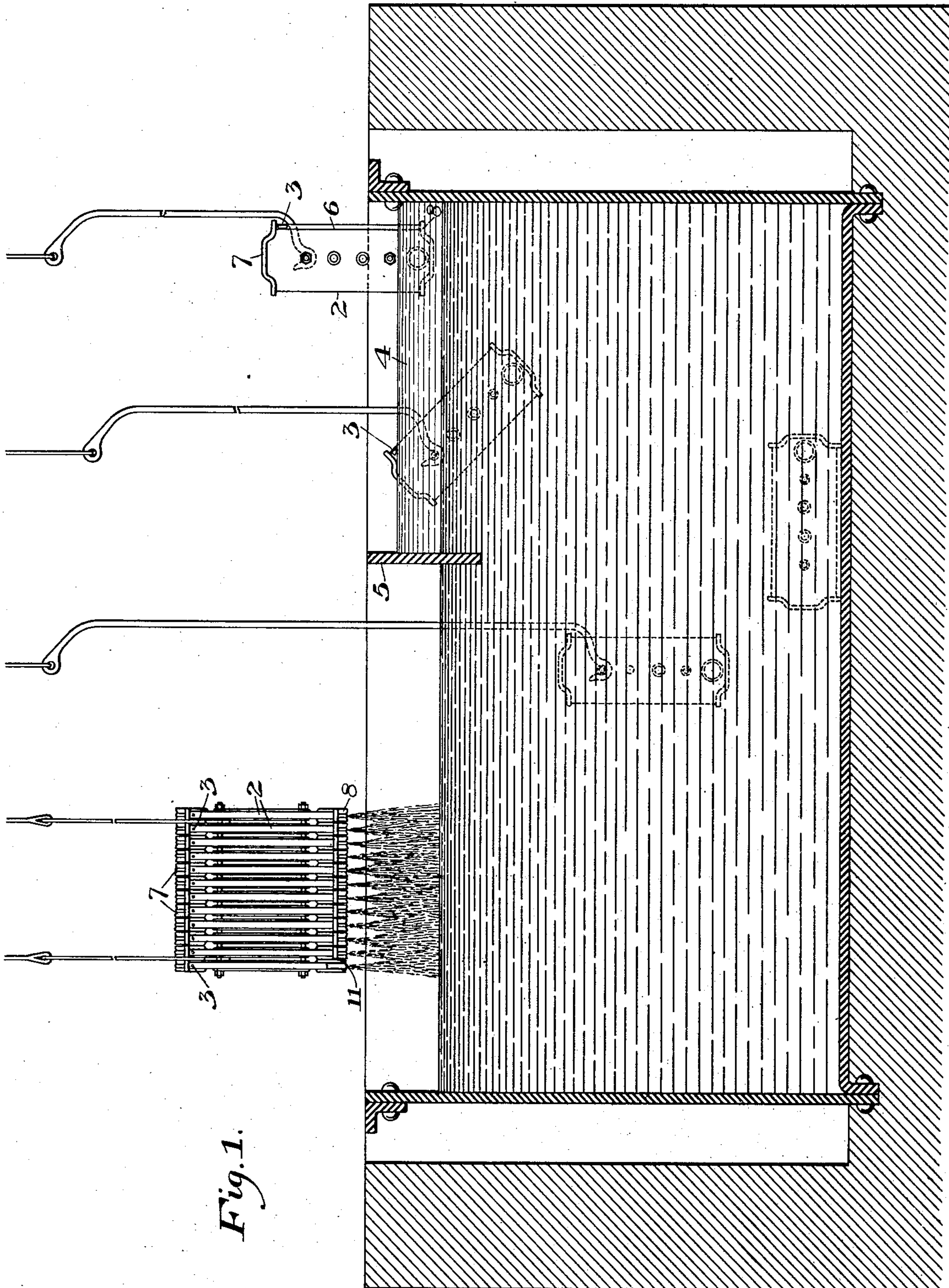


Fig. 1.

WITNESSES

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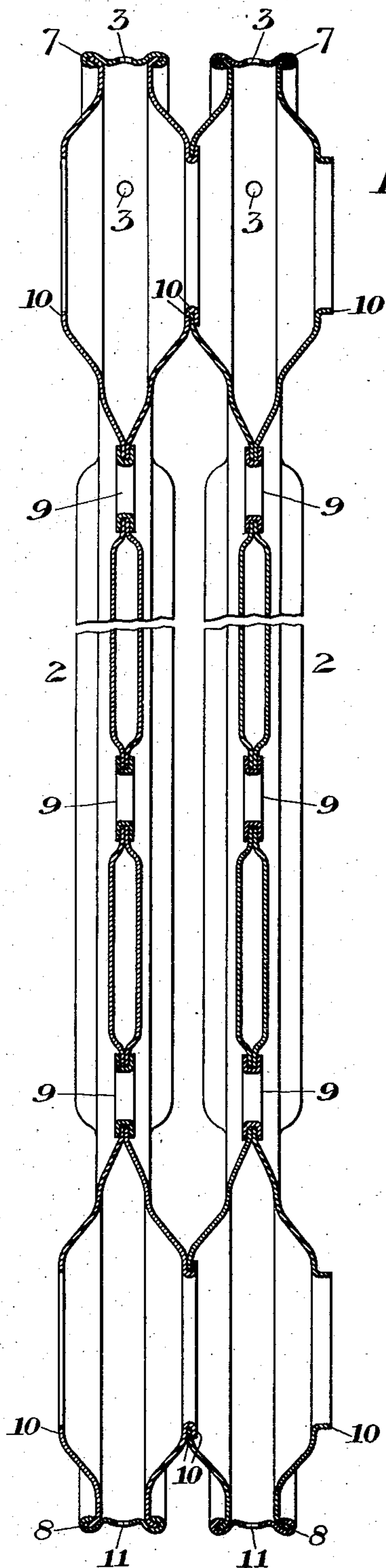


Fig. 2.

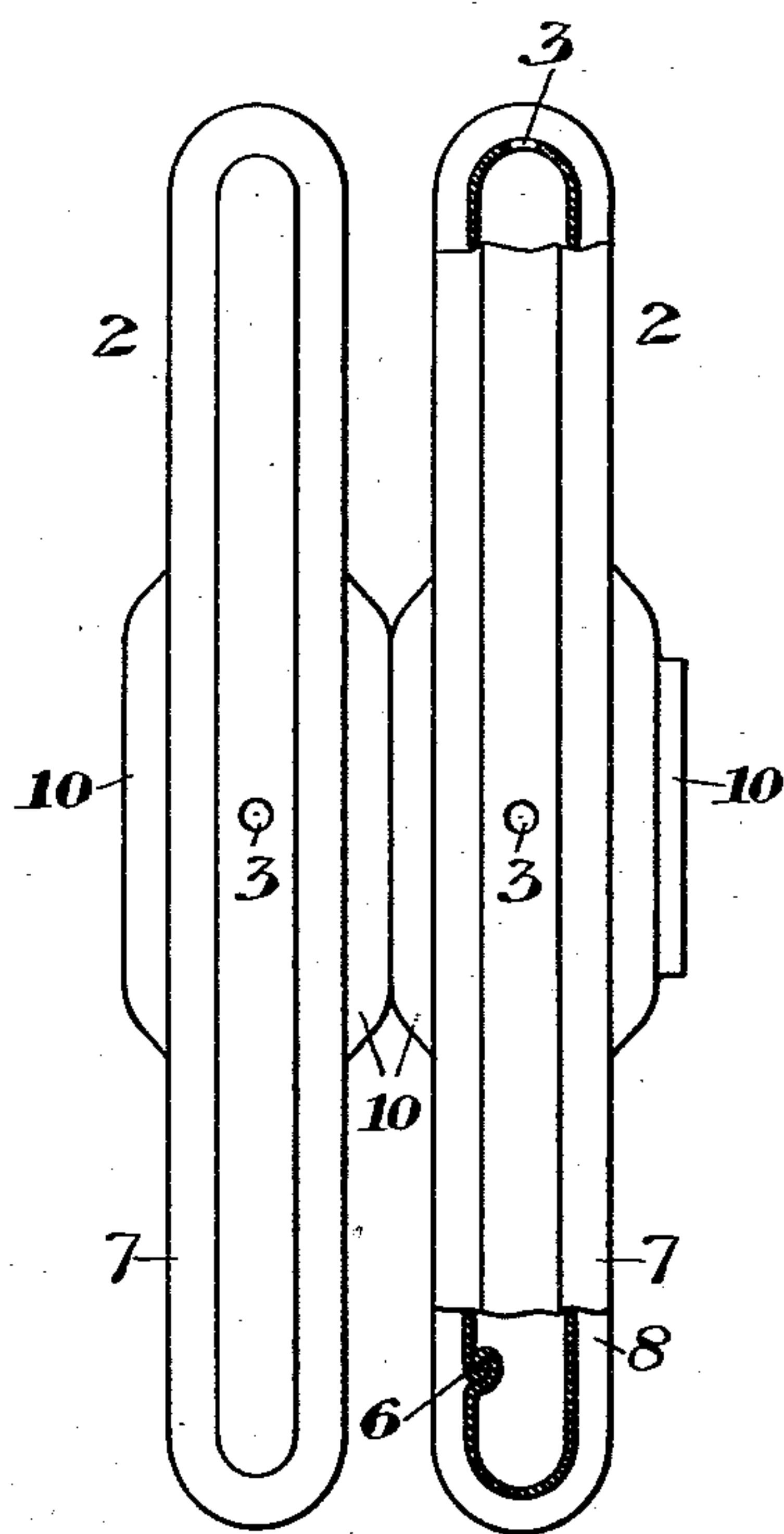


Fig. 3.

WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM R. KINNEAR, OF NEW YORK, N. Y.

METHOD OF MAKING SHEET-METAL RADIATORS.

No. 845,304.

Specification of Letters Patent.

Patented Feb. 26, 1907.

Application filed February 15, 1905. Serial No. 245,744.

To all whom it may concern:

Be it known that I, WILLIAM R. KINNEAR, of New York city, in the county of New York and State of New York, have invented a new and useful Method of Making Sheet-Metal Radiators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—
Figure 1 is a view showing the dipping of the radiator in the bath of coating-metal. Fig. 2 is a detail view showing two assembled sections of a radiator, showing the vent-holes and the coating inlet-holes; and Fig. 3 is a sectional plan view of Fig. 2.

My invention relates to the manufacture of sheet-metal radiators as distinguished from those of cast metal, and is designed to provide a new and improved method of coating such radiators with a protective metallic covering, such as zinc or brass, and, further, to effectually seal the joints and provide an attractive and long-lived article.

Heretofore in the manufacture of sheet-metal radiators it has been proposed to coat the sheets with the protective metal or zinc and then form the sheet or sheets into the radiator-sections. This method is disadvantageous, in that the metal coating is cracked and flaked off during the shaping and assembling. Such method also necessitates the separate brazing or soldering of the joints in each section.

My invention overcomes these difficulties; and it consists in the novel method herein-after described and claimed.

In carrying out my process I form a series of radiator-sections out of sheet metal, each section being seamed in any desirable manner. If the section is made up of a sheet or sheets, it will be provided with longitudinal seams and end seams, or if made of seamless tubing it may be provided with end seams only. The section may also be formed by drawing up sheet metal into cup form for the top and bottom of the section and then securing an intermediate section or sections by transverse seams.

The sections will preferably have incoming holes at or near the bottoms to provide for the circulation of the heating fluid, such as steam or water, and the form and construction of the section can be widely varied so far as the present invention is concerned.

After the section has been formed and seamed it is preferably provided with a small

vent-hole at one end in order to allow the escape of the air during the dipping, and thus provide for flowing of the flux and coating-metal throughout its surfaces, both internal and external. I have shown these vent-holes at 3 on each section 2. The section is then lowered into the floating flux 4 on the top of the coating-bath at one side of the partition 5 and is moved so as to cause the flux to flow throughout the surfaces of the section. After the surfaces are thus treated with flux the section is lowered into the bath of coating-metal and is preferably tilted and moved about therein so as to cause the metal to pour or flow throughout the section, and thus provide a coating of the zinc, brass, or other coating-metal throughout the internal and external surfaces, and throughout the seams and whatever holes there are in the section. In the form shown the sections are dropped and then picked up on the other side of the partition. The cut edges of the sheets or other metal of the section are thus covered with the coating-metal, and there is no liability to cracking or flaking off of the section after it is taken out, since there is no bending, seaming, or other work done on the section which would have this effect. The sections may then be assembled and secured in any desirable manner.

Instead of dipping the sections one by one I prefer to form them to final shape, nest them together, and secure them to form the complete radiator except for the feet, which are preferably secured after the coating of the radiator-body. This radiator-body is then dipped in the flux, the sections being provided with the vent holes. It is then lowered into the coating-bath and moved about to cause the metal to thoroughly coat all portions. In this case the coating-metal serves to seal or solder the joints between the successive sections. The radiator-body may then be taken out to cool, when the vent-holes are closed up, preferably by inserting rivets, which are headed and soldered or brazed. The feet may then be applied, when the radiator is complete.

In Fig. 2 I show one form of radiator-section, which is built up from one sheet having longitudinal seam 6, with top and bottom caps 7 and 8 secured by suitable seams. In this form the sides are pinched together at separated points, where eyelets 9 are secured for through-rod holding the sections together. This also aids in sustaining the

bursting-pressure. In this form the sections are provided at the top and bottom with lateral bosses 10, the boss of one section being seamed to the boss of the next section in assembling the sections before galvanizing. These bosses may of course be connected by intermediate collars, if desired.

In order to drain the coating-metal from the section, I preferably form drainage-holes 11 at the bottom of the sections, since the holes for passage of heating fluid are usually above the bottom. I am thus enabled to drain out all the surplus coating-metal from the sections. This drainage-hole will usually be placed at the lowest point of each section.

In case the section is provided with holes for the passage of the heating fluid at both the top and bottom, as in radiators for hot water, the vent-holes at the top may consist of these holes for the passage of fluid. I also prefer to sprinkle or drift salamoniac or some flux upon the section or radiator-body as it is drawn out of the bath to cause the surplus metal to flow back into the bath.

The advantages of my invention will be apparent to those skilled in the art. The process does away with all liability of bending or cracking the coating by working the metal after galvanizing. It effectually coats the seams and cut edges, and in case the radiator-body is dipped as a whole it seals and solders the joints between the sections. The danger of oxidation or rusting of the parts is overcome, and an attractive article is obtained.

Many changes may be made in the form of

the radiator-section, the feet, the method of securing the sections together, &c., without departing from my invention.

I claim—

1. The method of making sheet-metal radiators which consists in providing a plurality of hollow units or sections, connected near one end by means which establish free circulation among them, and provided with individual vents near their ends opposite the circulation connection, and dipping them in position to admit flux and coating metal through the circulation-opening and cause it to flow through the units or sections; substantially as described.

2. The method of making sheet-metal radiators which consists in providing a plurality of hollow units or sections, connected near one end by means which establish free circulation among them, and provided with individual vents near their ends opposite the circulation connection and with individual drainage-openings below the circulation connection, dipping them in position to admit flux and coating metal through the circulation-opening and cause it to flow through the units or sections, withdrawing the radiator in position to drain the surplus metal through the drainage-openings, and finally closing the vents and drainage-openings; substantially as described.

In testimony whereof I have hereunto set my hand.

WILLIAM R. KINNEAR.

Witnesses:

E. C. SMITH,
WM. P. HAMMOND.