

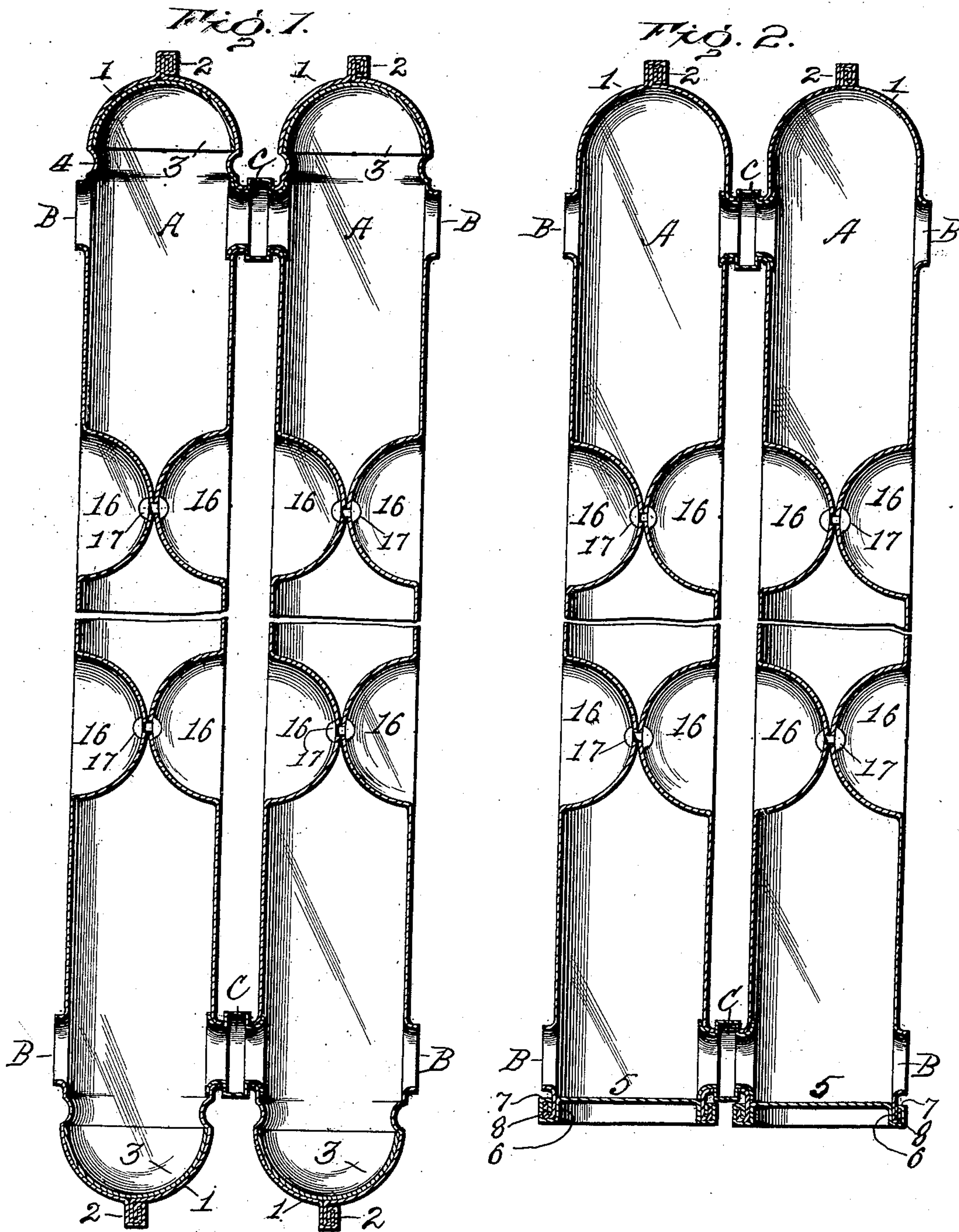
No. 742,673.

PATENTED OCT. 27, 1903.

W. R. KINNEAR.
SHEET METAL RADIATOR.
APPLICATION FILED MAR. 18, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:

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By *his* Attorneys

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2 SHEETS—SHEET 2.

Fig. 3.

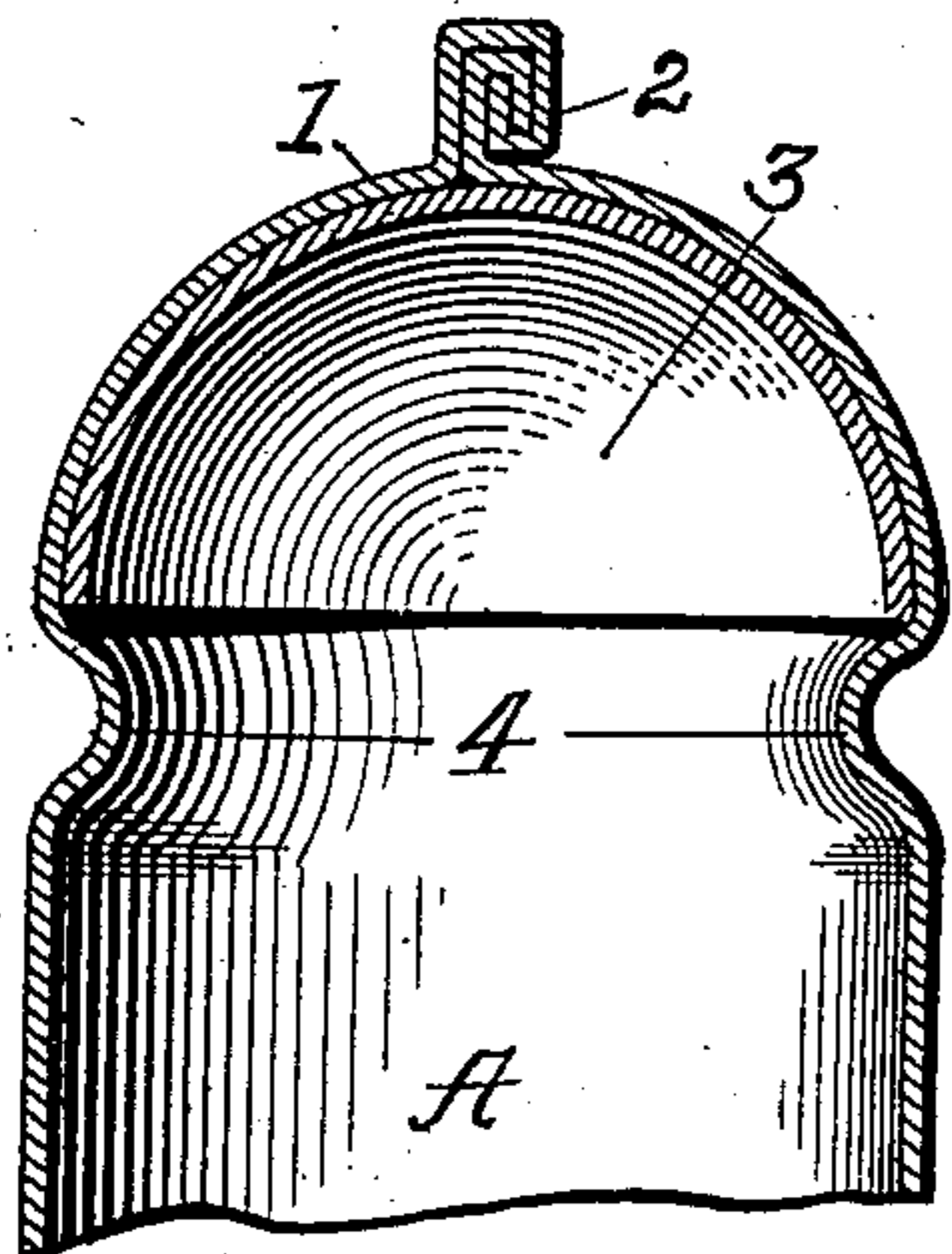


Fig. 4.

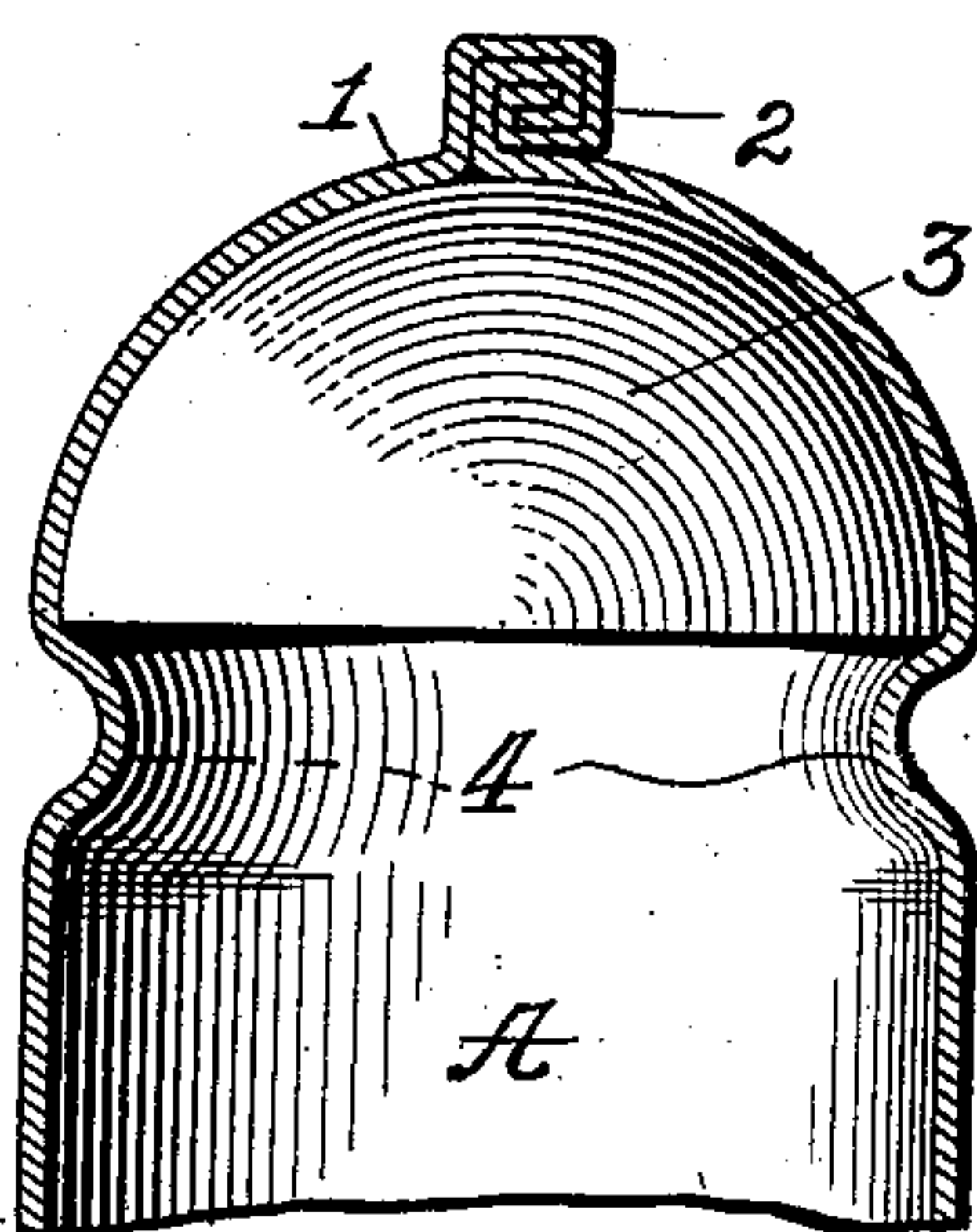


Fig. 5.

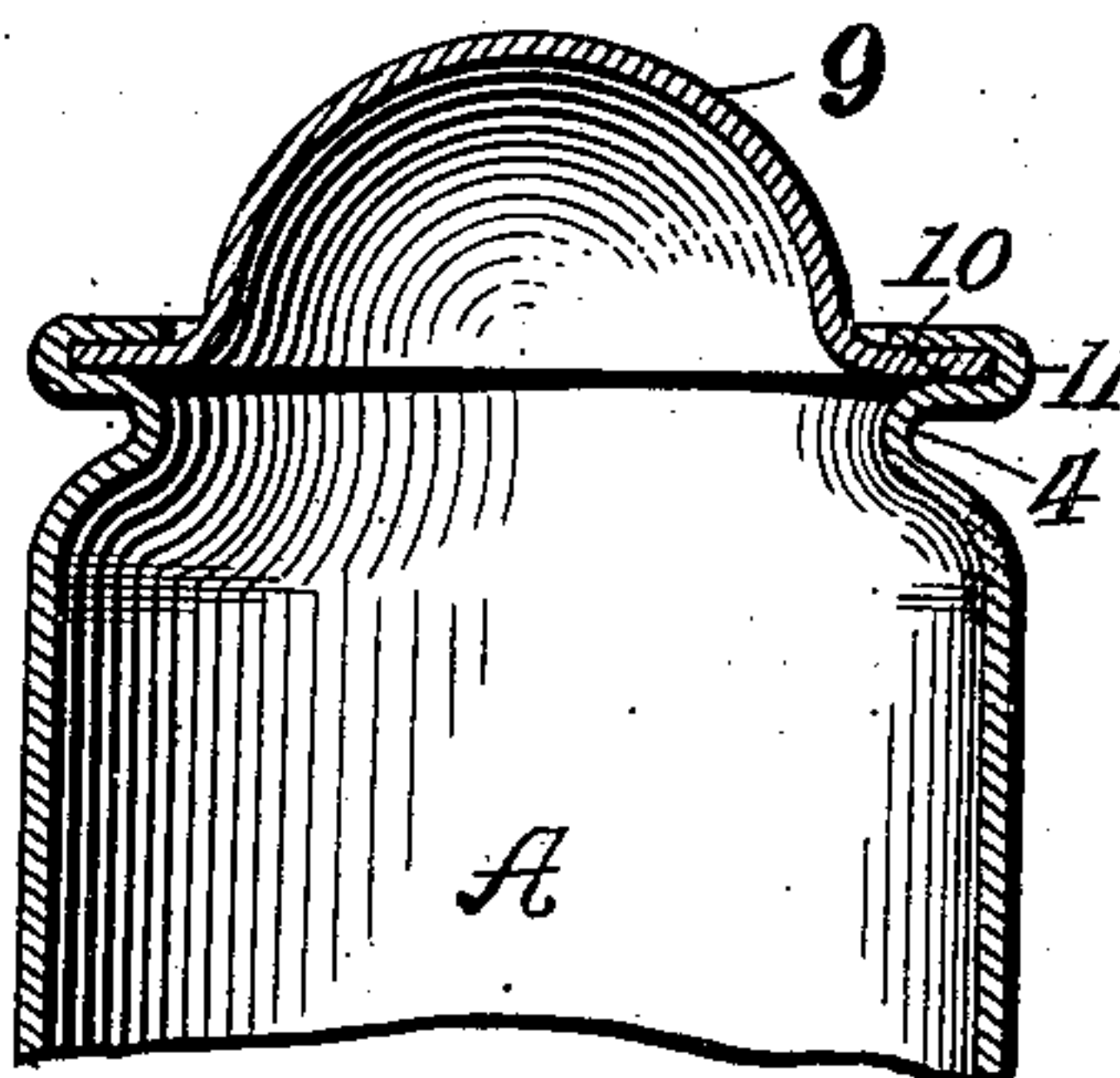


Fig. 6.

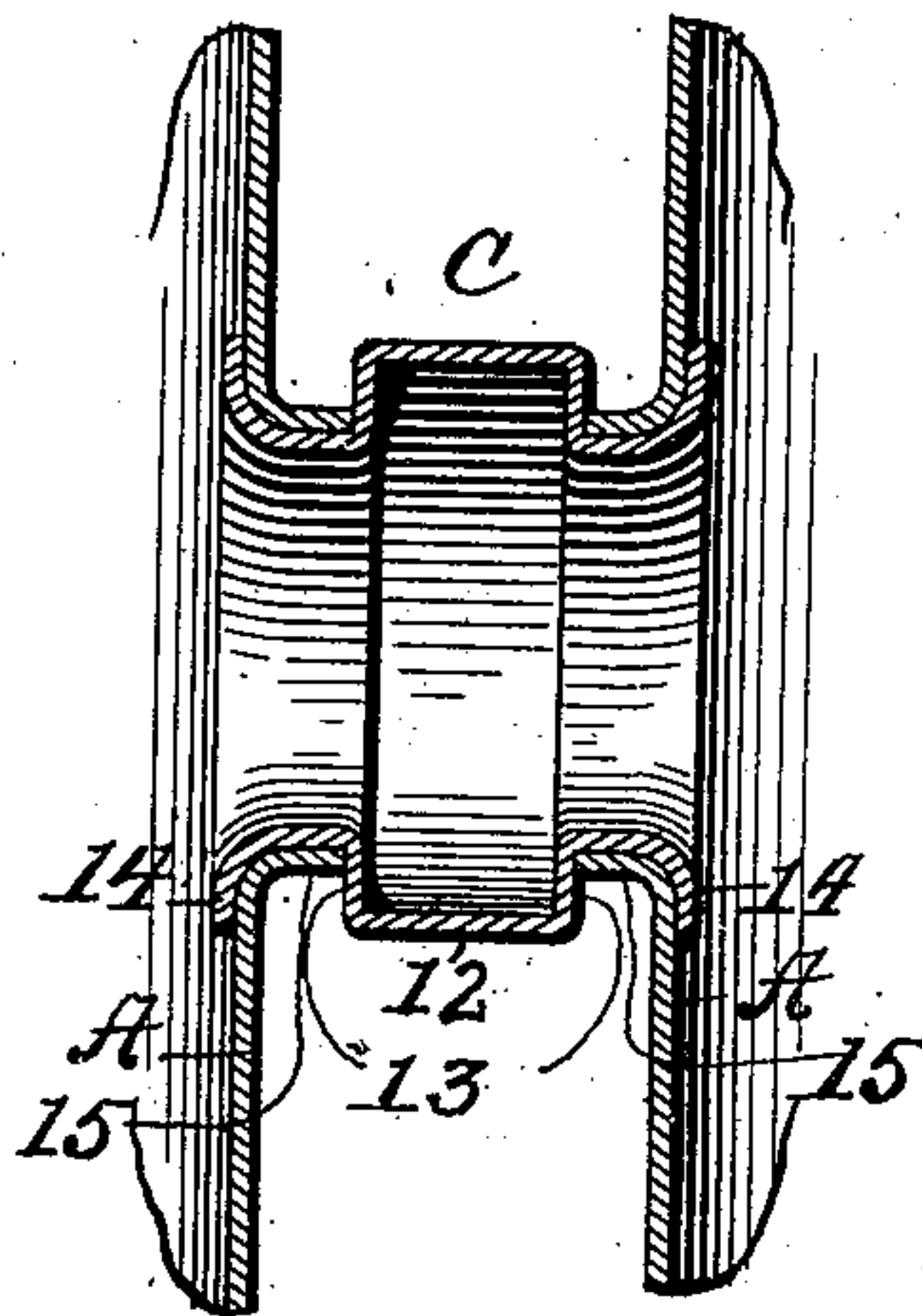


Fig. 7.

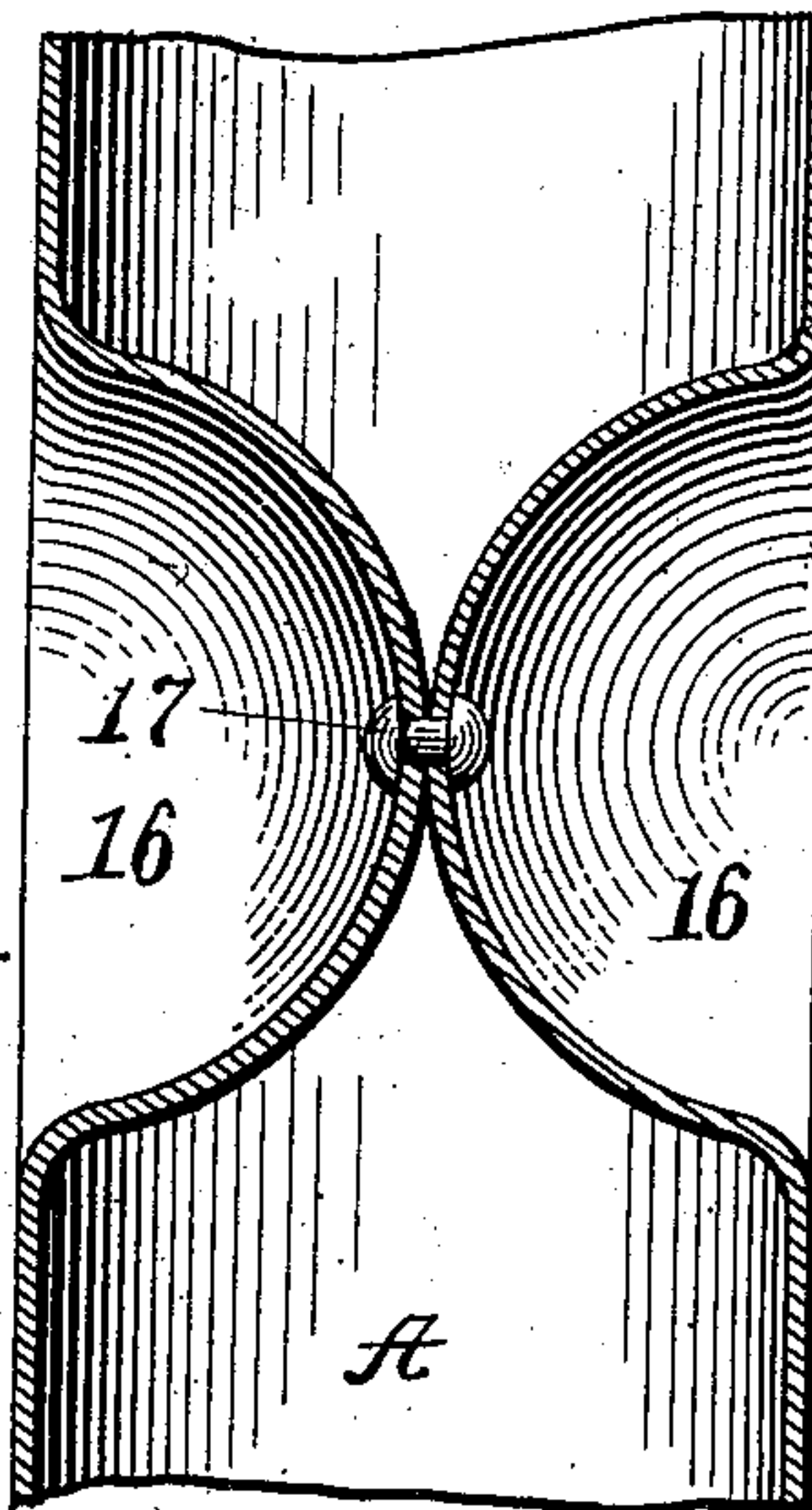
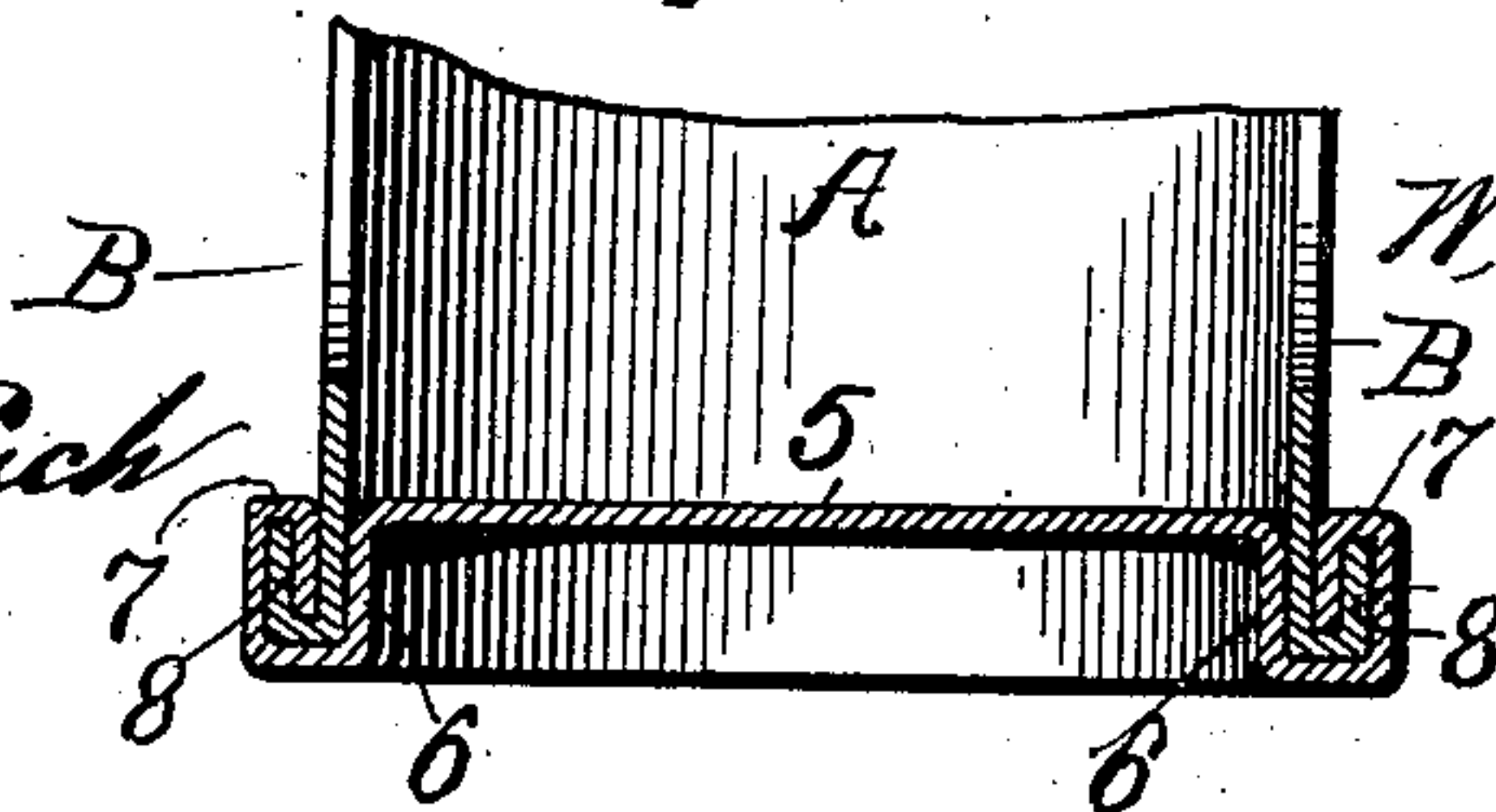


Fig. 8.



Witnesses

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SHEET-METAL RADIATOR.

SPECIFICATION forming part of Letters Patent No. 742,673, dated October 27, 1903.

Application filed March 18, 1903. Serial No. 148,397. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. KINNEAR, a citizen of the United States, residing at Columbus, in the county of Franklin, State of Ohio, have invented certain new and useful Improvements in Sheet-Metal Radiators, of which the following is a specification.

My invention relates to that type of radiators constructed of sheet metal in which the units are made from tubes or tubular bodies having the ends closed to form tight chambers for the heating medium, the tubes being either in the form of seamless drawn tubing or being constructed from sheet metal having opposite edges joined together in a suitable manner.

One feature of my present invention relates to the method of closing the ends of tubes to form the closed chamber.

Another feature relates to a means for connecting the opposed walls of adjacent units in building up radiators of any desired number of units.

A third feature of my present invention relates to a novel method of tying together opposite walls of a heating unit in order to prevent the walls from bulging under internal pressure.

My invention will be fully understood upon reference to the accompanying drawings, in which—

Figures 1 and 2 are vertical sections through two radiators consisting of two units each and embodying features of my present invention. Figs. 3, 4, and 5 are sectional detail views showing on an enlarged scale several forms of end closures. Fig. 6 is a sectional detail view, on an enlarged scale, showing the preferred construction of the connection between units forming one of the features of my present invention. Fig. 7 is a sectional view, on an enlarged scale, of the means for tying together opposite walls of a unit; and Fig. 8 is sectional detail view of a form of bottom closure for a tubular unit which may be used to advantage in connection with the form of top closure shown in Fig. 2.

As shown in Figs. 1, 3, 4, and 5, the end closure is constructed by closing the metal of the member A around a filling-piece or cap-piece. In Figs. 1, 3, and 4 the metal of the member A is condensed and bent inward, as

shown at 1, and its meeting edges united in a seam 2, a filling or cap piece 3 being introduced and held in such position by shoulders 4, formed in the wall of the member A, that it will sustain the end while the metal is being formed, as at 1, and seamed, as at 2. This filling or cap piece 3 is preferably made of a struck-up hemispherical or concavo-convex piece corresponding to the form which it is desired that the end of the unit shall have. According to Fig. 5 a similar cap-piece 9, having a flange 10, has the metal closed around it by forming a groove 11, the shoulder 4 being also provided for sustaining the cap-piece and the upper lip of the groove being approximately coextensive with the flange of the cap-piece.

According to Fig. 2 the end of the member A is closed in a manner corresponding to that shown in Figs. 1, 3, and 4 by forming in the metal at 1 and uniting the edges by a seam 2; but in this construction the filling or cap piece 3 is omitted, the end being sustained while it is being formed by a suitable tool introduced from the opposite end of the unit. Said opposite end is thereafter closed, as shown at the bottom of Fig. 2 and in Fig. 8, by inserting a bottom piece 5, bent to form the longitudinal portion 6 and the double-seam groove 7, which coöperates with an upturned flange 8 on the lower end of the unit. The shoulder thus formed at 6 affords means for working the joint and making a tight closure without the necessity of sustaining the parts from within.

In order to join the opposed walls of adjacent units and to provide the necessary circulation-passage between them, I employ a tubular portion C and connect the same at its respective ends with the walls to be joined. This is accomplished by providing the tubular member C with shoulders 13, formed by a central enlargement 12, as shown in Fig. 6, and flaring its opposite ends, as shown at 14, so as to engage around the interior of the openings B, which are formed with outturned flanges 15. The flanges 15 abut against the opposite shoulders 13 of the enlargement 12 and are there tightly held by the flared portions 14. These shoulders 13 in Fig. 6 afford abutments to sustain the radiator-walls against expansion under internal pressure.

The flared portions 14 are forced into the position shown by suitable tools introduced through the opposite openings B of the respective units and form locking portions for tying the units together.

To tie the opposite walls of the radiator units together to prevent them bulging under internal pressure at intermediate points, said walls have pressed in them hemispherical bosses 16 of sufficient depth to cause them to meet in the middle plane of the unit, where they are securely united by rivets 17. By having these bosses struck in from both sides said sides are alike stiffened and sustained, and the convex faces of the bosses coming together offers less obstruction to free circulation within the chamber than if the boss were formed on one side only and were made to abut against a flat surface on the opposite side. After the several joints or connections are made the radiator or unit is preferably dipped in a suitable soldering or galvanizing bath to firmly unite the parts and make tight closures at the joints.

Having thus described the invention, the following is what I claim as new therein:

1. A tubular radiator unit having at its end a filling or cap piece, and having its metal closed around and secured to said filling or cap piece to form a tight closure.

2. A tubular radiator unit having at its end a filling or cap piece, and having its metal

closed around and secured to said filling or cap piece to form a tight closure, and formed with a shoulder beneath said piece to sustain it.

3. A tubular radiator unit having at its end a filling or cap piece and having the metal of its sides formed in over said filling or cap piece with the edges united in a seam above the same.

4. A tubular radiator unit formed at its end with a shoulder, having a filling or cap piece resting upon said shoulder within the end and having the metal of the radiator unit formed in over the cap-piece and united in a seam above the same.

5. A circulating connection for radiator units, consisting of flared openings in the opposed walls of the units, having outwardly-projecting flanges, and a tubular member formed with shoulders against which the outwardly-projecting flanges abut, and projecting within the flanges, and having its ends flared into close contact with the flared openings of the units, and securely holding the flanges between the shoulders and the flared ends of the tube within the units.

The foregoing specification signed this 17th day of March, 1903.

WILLIAM R. KINNEAR.

In presence of—

J. GREEN,

HARRY E. KNIGHT.