

R. E. MOSHER.
SHEET METAL RADIATOR.
APPLICATION FILED AUG. 14, 1909.

976,203.

Patented Nov. 22, 1910.

2 SHEETS—SHEET 1.

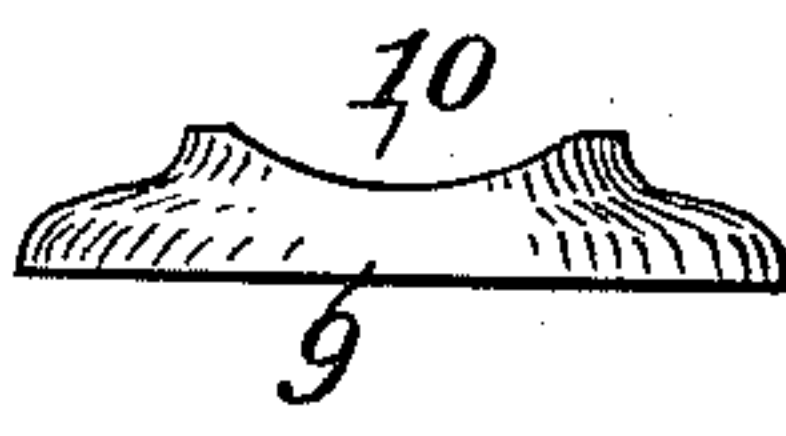
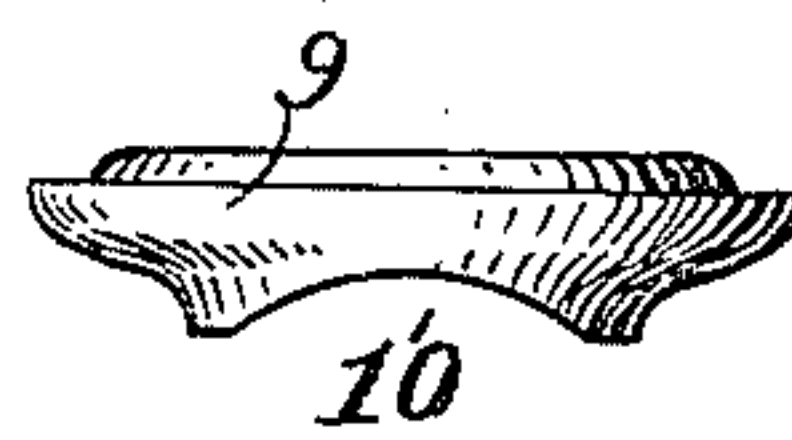
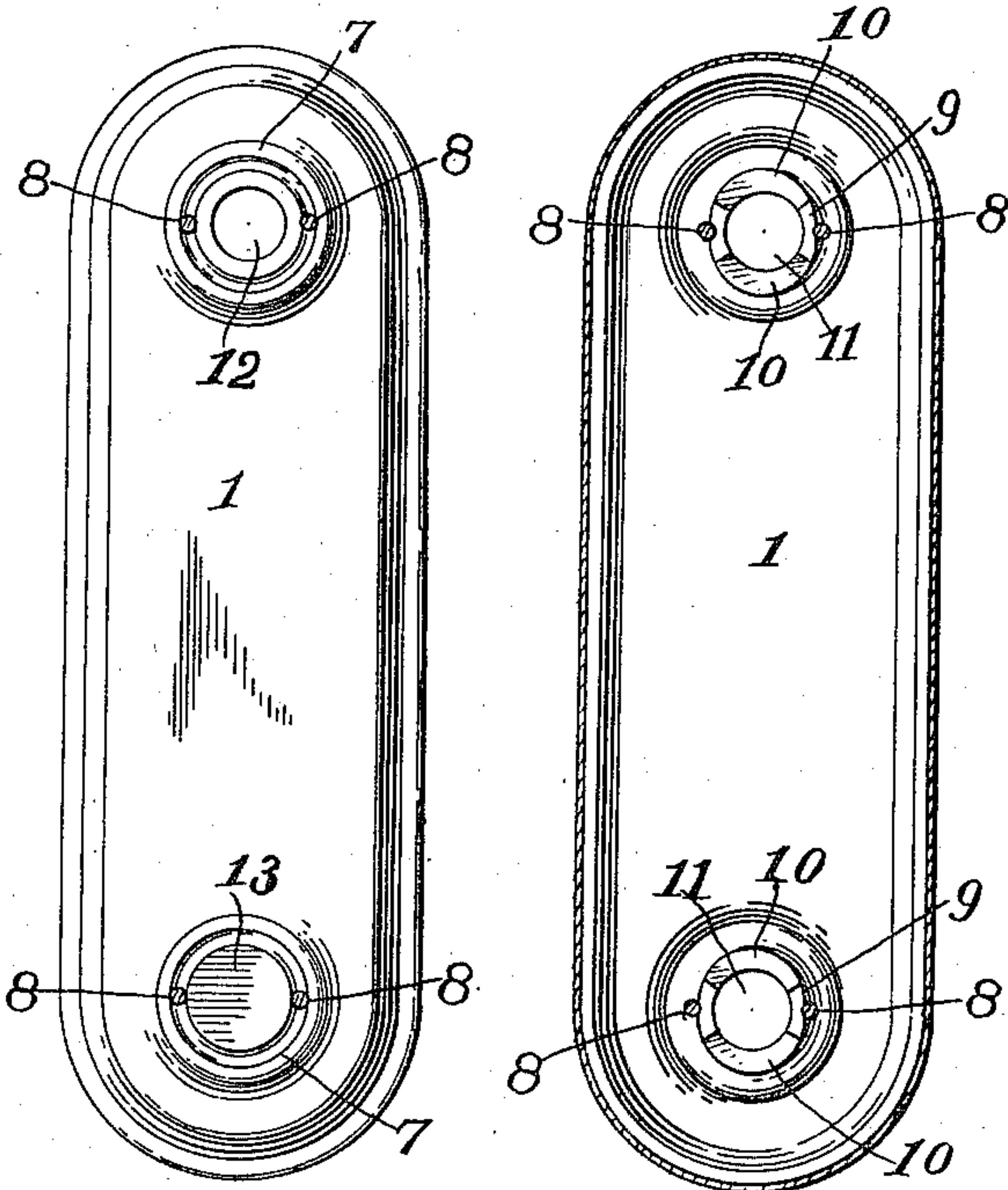
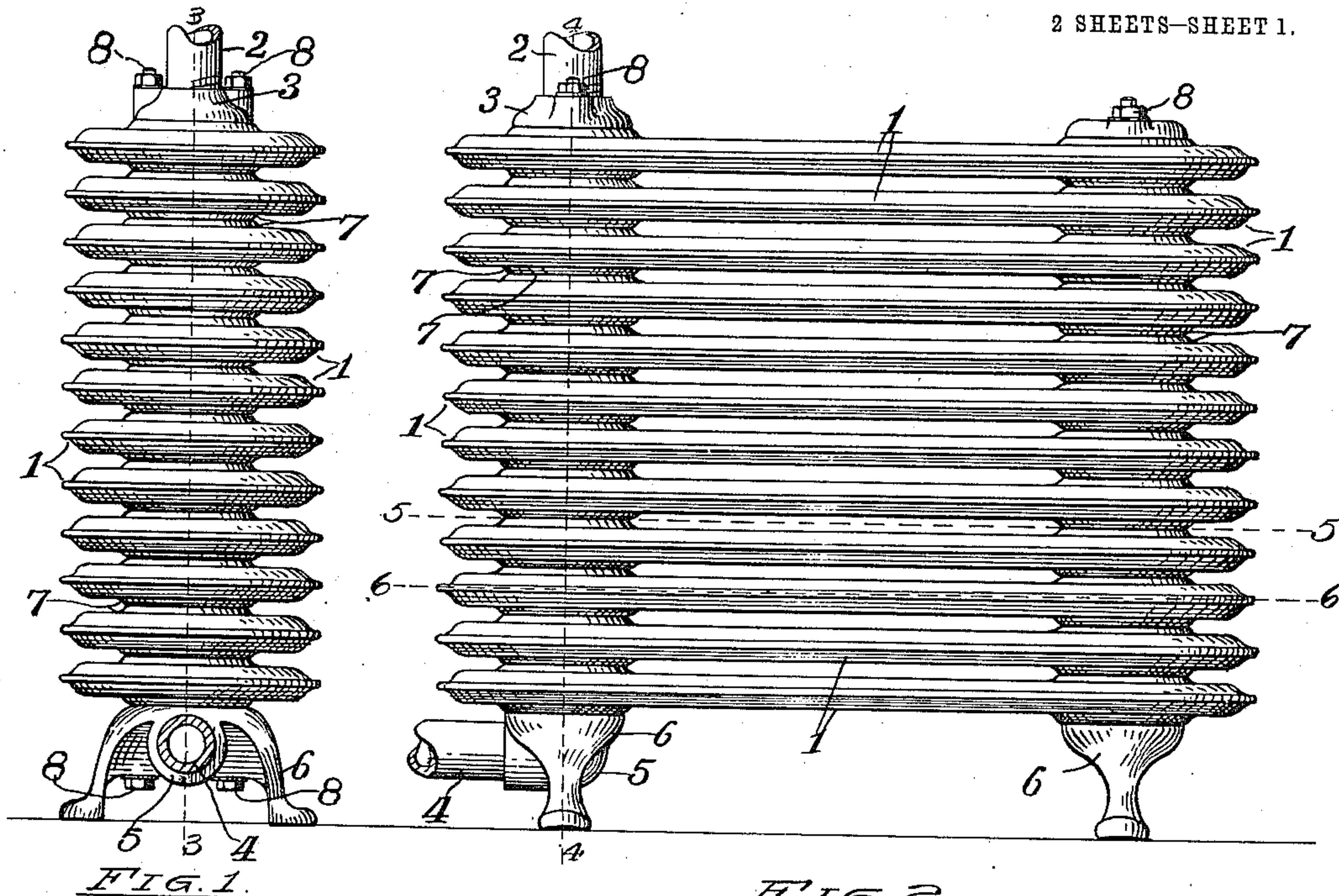


FIG. 5.
Witnesses
H. C. Van Antwerp
Minnie Johnson.

FIG. 6.
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RALPH E. MOSHER
BY Luther V. Moulton
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2 SHEETS—SHEET 2.

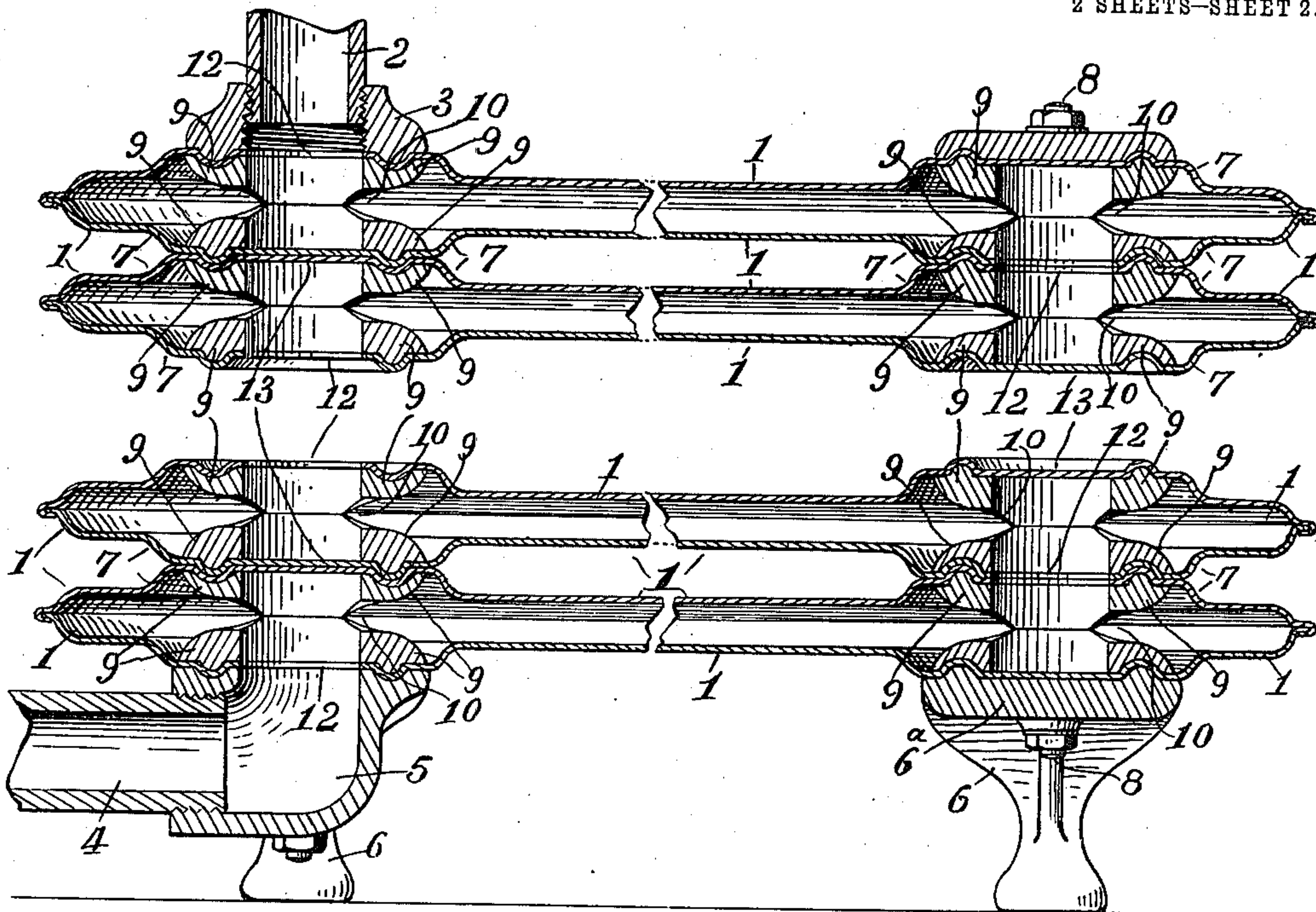


FIG. 3.

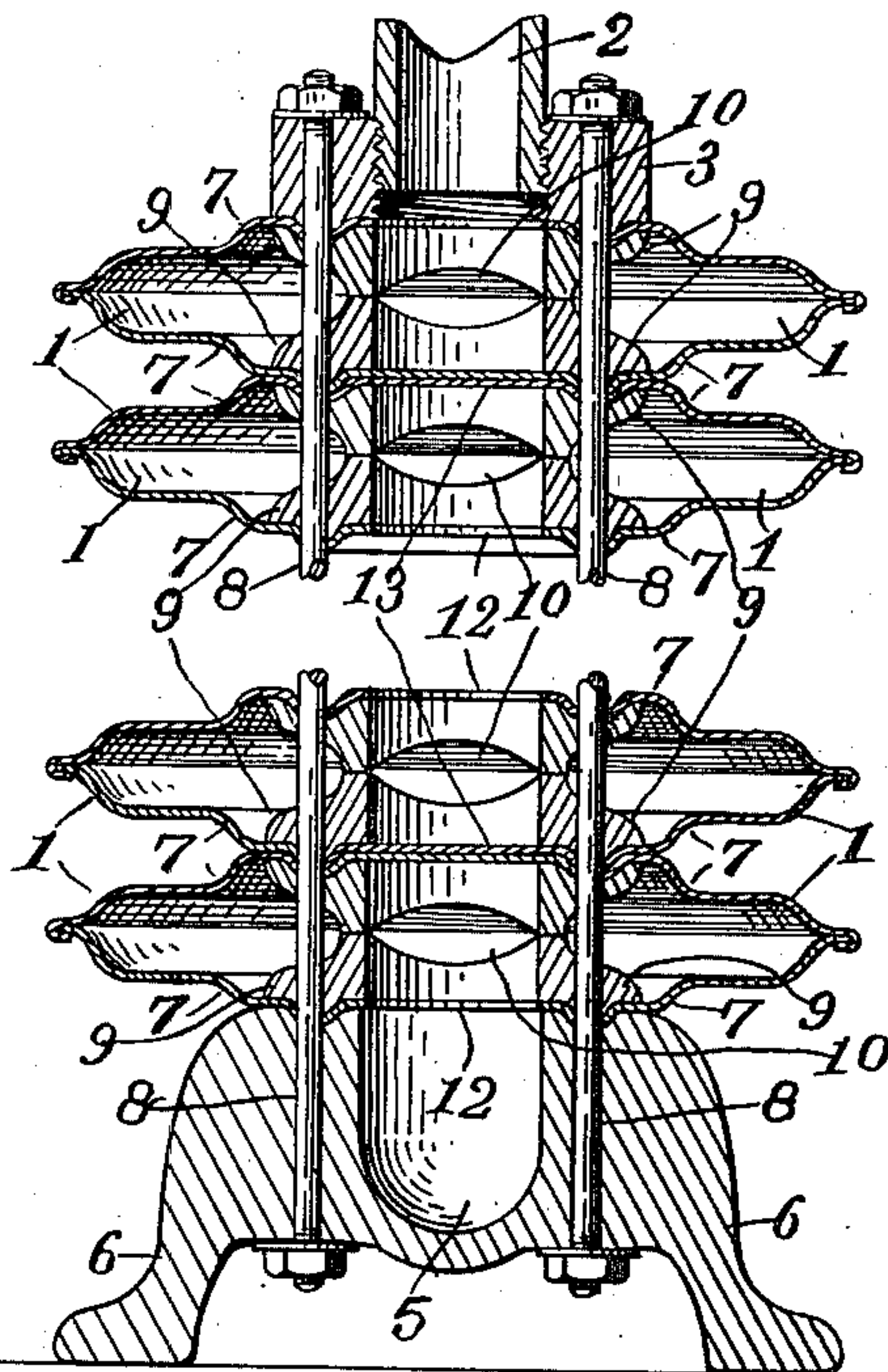


FIG. 4.

Witnesses
H. C. Van Antwerp.
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UNITED STATES PATENT OFFICE.

RALPH E. MOSHER, OF GRAND RAPIDS, MICHIGAN, ASSIGNOR OF ONE-HALF TO ALFRED D. RATHBONE, OF GRAND RAPIDS, MICHIGAN.

SHEET-METAL RADIATOR.

976,203.

Specification of Letters Patent.

Patented Nov. 22, 1910.

Application filed August 14, 1909. Serial No. 512,817.

To all whom it may concern:

Be it known that I, RALPH E. MOSHER, a citizen of the United States of America, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Sheet-Metal Radiators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in sheet metal radiators, and its object is to provide a radiator made of sheet metal that may be easily manufactured; that can be readily assembled or taken apart; that will be effective in operation, and to provide the same with various new and useful features, hereinafter more fully described.

The device consists essentially of a series of horizontally disposed stamped sheet metal sections arranged to circulate the heating fluid longitudinally and in succession therethrough, supporting rings within said sections, between which rings the sheet metal is securely clamped to form tight joints between the sections, binding bolts extending through the series, means for connecting pipes for circulating the heating fluid, and in various features of construction and arrangement, as will more fully appear by reference to the accompanying drawings in which:

Figure 1 is an end elevation of a radiator embodying my invention; Fig. 2 a side elevation of the same; Fig. 3 an enlarged vertical section of a portion of the same on the line 3—3 of Fig. 1; Fig. 4 the same of a transverse section on the line 4—4 of Fig. 2; Fig. 5 a plan view of one of the sections of the radiator showing a horizontal section on the line 5—5 of Fig. 2; Fig. 6 a horizontal sectional view of the same on the line 6—6 of Fig. 2; Fig. 7 a detail of one of the supporting rings, and, Fig. 8 the same of the opposing supporting ring.

Like numbers refer to like parts in all of the figures.

1 represents a series of hollow sheet metal radiator sections of two corresponding portions having their edges securely connected to each other all around the margins; 2 a pipe for admitting the heating fluid; 3 a collar for the same having a corresponding face to that of one of the supporting rings 9, and

adapted to co-act therewith; 4 an outlet pipe for the heating fluid; 5 an elbow for said pipe having a face adapted to co-act with one of the supporting rings 9; 6 legs for the radiator; 6^a a connecting member for one pair of the legs having a face adapted to co-act with one of the supporting rings 9. Each section is provided with an outlet opening 12 at its respective ends, one opening upward and the other downward, and surrounding each opening and also directly opposite thereto is a raised circular portion 7, whereby the sections are spaced apart when placed one above the other. In each raised portion 7 is an annular concavo-convex portion at each end of the section, one of these portions is depressed, and the opposite one raised to fit within the same. These annular intermeshing portions thus serve to align the sections and insure a tight joint therebetween. To support these raised portions 7 and firmly press the same in contact with each other to form a tight joint, supporting rings 9 each having a central opening therethrough corresponding to the openings 12 are provided and arranged in pairs, one of each pair having a raised annular portion as in Fig. 7 to co-act with the opposing ring in the next section, which has a corresponding annular depression. These rings fit within the sheet metal of the radiator member and securely support the same in close contact. Thus when the radiator sections are superposed, the filling rings form a continuous series of supporting means with the various sheets forming the radiator sections rigidly clamped therebetween. Clamping bolts 8 are provided which extend through concave and convex portions of the rings and through the entire series of sections and also through the collar and elbow at the respective upper and under sides of the series, whereby the whole are securely held in place, and the joints therebetween made tight.

To insure tight joints, it is not necessary to machine the rings where they engage the sheet metal, but the latter is formed when stamped with less elevation and depression of the concavo-convex annular parts at the joints than the rings and when clamped between the rings these parts are formed thereby to closely fit by being further formed up between the rings. To permit circulation of heating fluid, the adjacent sides of these supporting rings are cut away as at 10 form-

ing openings therebetween. It will thus be seen that when assembled each alternate connection between the various sections is intercepted by the closures 13 and in alternate relation at opposite ends of the sections, whereby the fluid circulation is longitudinally alternate and in opposite directions in alternate series through the various radiating members, thus securing complete and satisfactory circulation of fluid whether steam, hot water, or other fluid is used. It will also be noted that very little machining is required to make the joints of this device tight, or to assemble the same, the sheets being punched and stamped complete and ready for assembling in pairs, the supporting rings cast complete with the openings therethrough, the supporting rings being placed in the sections when the sheets are connected to form the respective members and are securely held in place by the intermeshing tongue and groove formation. When the device is assembled, the sheet metal is securely clamped and held between these supporting rings and easily packed if occasion requires, but the tongue groove formation around the openings is considered sufficient to make tight joints without packing.

What I claim is:—

1. A radiator comprising sheet metal sections having raised portions near each end to space the sections apart, said portions also having concavo-convex circular portions adapted to intermesh with like portions in the adjacent sections, supporting rings in the sections having like concavo-convex portions engaging the like portions of the sections, and clamping bolts extending through the sections and rings.

2. A radiator comprising sheet metal sections having raised circular portions near each end and oppositely arranged openings at its respective ends, said raised portions also having concavo-convex annular portions adapted to intermesh with like portions of the adjacent sections, supporting rings within the section and having lateral openings, and corresponding concavo-convex portions engaging the concave and convex portions of the sections, and clamping bolts extending through the concavo-convex portions of the sections and rings.

3. A radiator comprising a sheet metal section having a circular raised portion provided with a central opening, circular concavo-convex portions surrounding the said opening, a collar having an opening opposite the opening to the radiator and a circular portion adapted to intermesh with the said

concavo-convex portion of the radiator, supporting rings provided with concave and convex annular portions to fit within the interior of the radiator and having lateral openings, and means for clamping a series of said sections in contact with each other and with the collar.

4. A radiator comprising a series of stamped sheet metal sections, each having an opening near each end and at opposite sides thereof, said sections also having raised circular portions to space the sections apart, said circular portions also having intermeshing concavo-convex portions, supporting rings having concave and convex annular portions adapted to fit within said section and support the raised portions thereof, said rings also having lateral openings for circulation of fluid, a collar having a face adapted to intermesh with the concavo-convex portion of one of said members, an elbow having a face adapted to intermesh with the concavo-convex portion of the opposite member, and bolts extending through the concave and convex portions of said members, supporting rings, collar, and elbow to clamp the whole together.

5. A radiator comprising horizontally disposed superposed sheet metal members having raised annular portions to space the sections apart and also having openings in each member at opposite ends and opposite sides of the same, means for connecting pipes to the first and last section of the series, consisting of a collar above the said members and an elbow below said members, legs on said elbow to support the radiator, supporting rings within the raised portions of said members and having lateral openings for the circulation of fluid there- through, and bolts extending through the series of sections, the supporting rings and the pipe connecting means.

6. A radiator, comprising a series of superposed sheet metal sections having raised annular portions to space the same apart, supporting rings in said sections within said portions, a collar above the series of rings and raised portions, an elbow below the same, legs integral with the elbow, and bolts extending through the rings, the collar, and the elbow at each side of the vertical central openings therein.

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

RALPH E. MOSHER.

Witnesses:

GEORGIANA CHACE,
LUTHER V. MOULTON.