

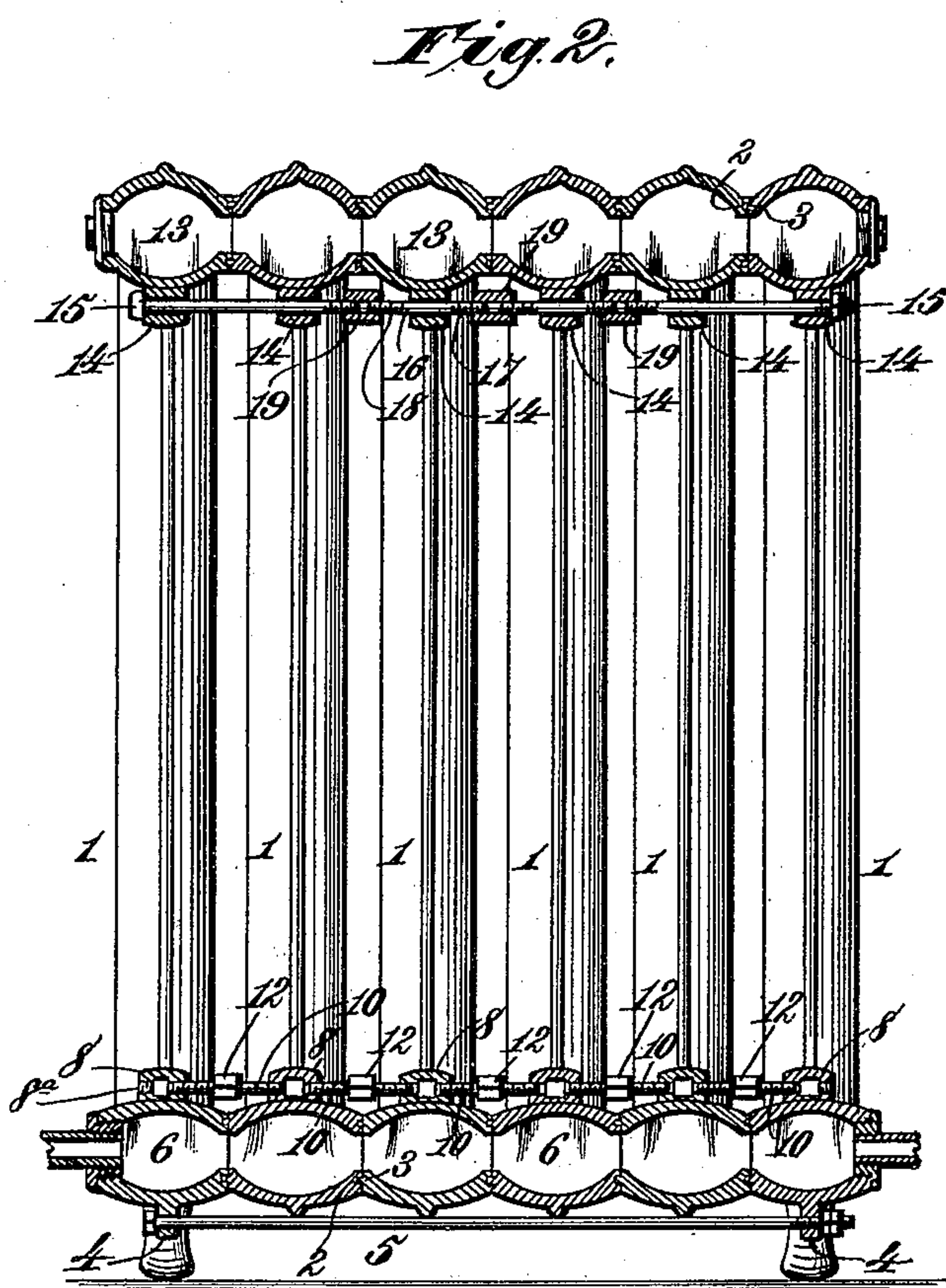
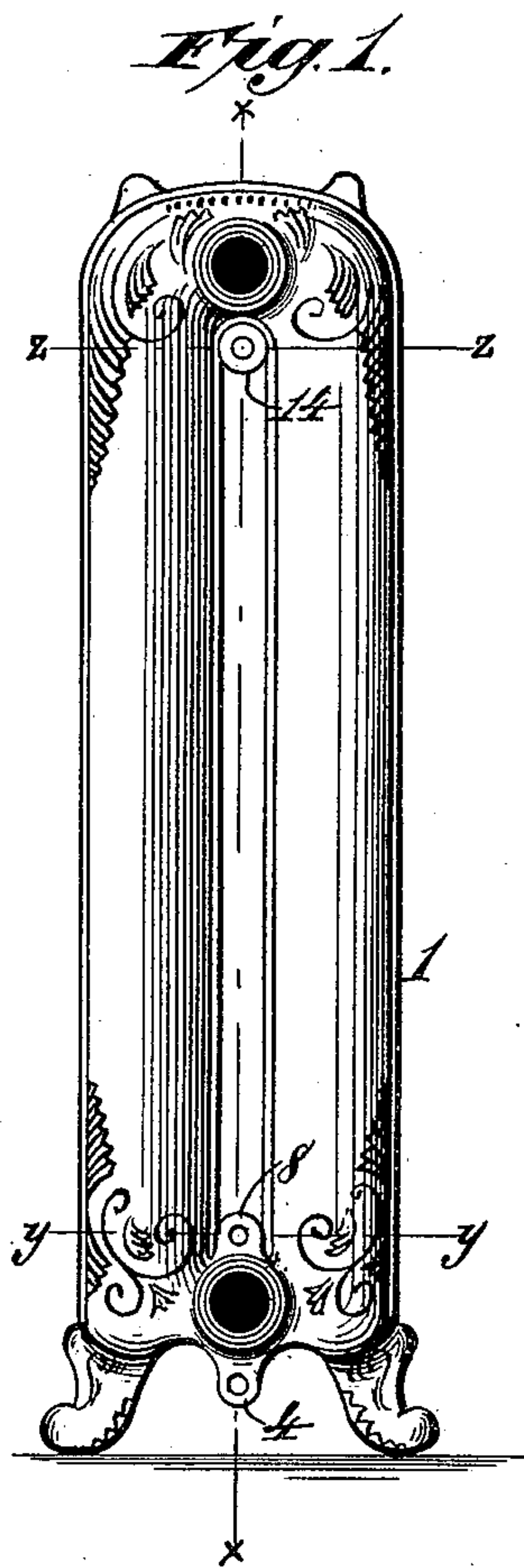
(No Model.)

2 Sheets—Sheet 1.

T. HOLLAND.
RADIATOR.

No. 464,797.

Patented Dec. 8, 1891.



Witnesses.
Robert Everett.

J. A. Rutherford.

Inventor.
Timothy Holland.

By *James L. Norris.*
Atty.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 4.

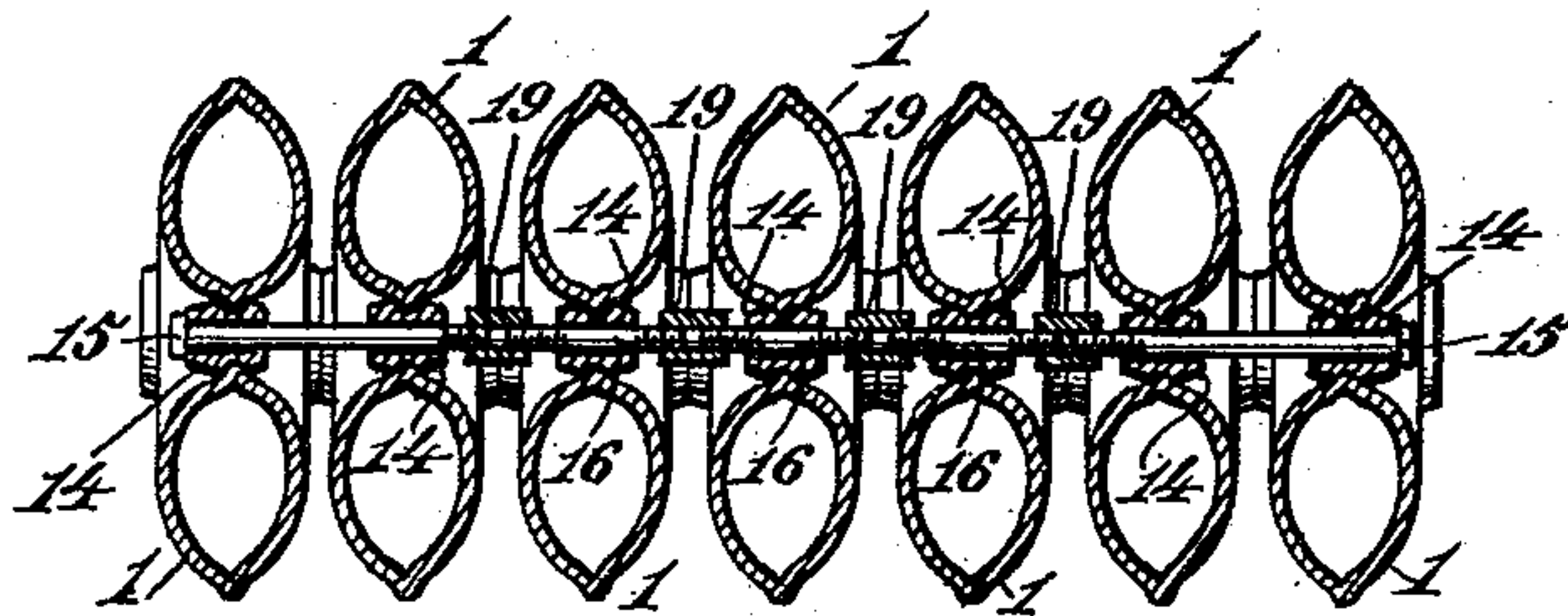


Fig. 5.

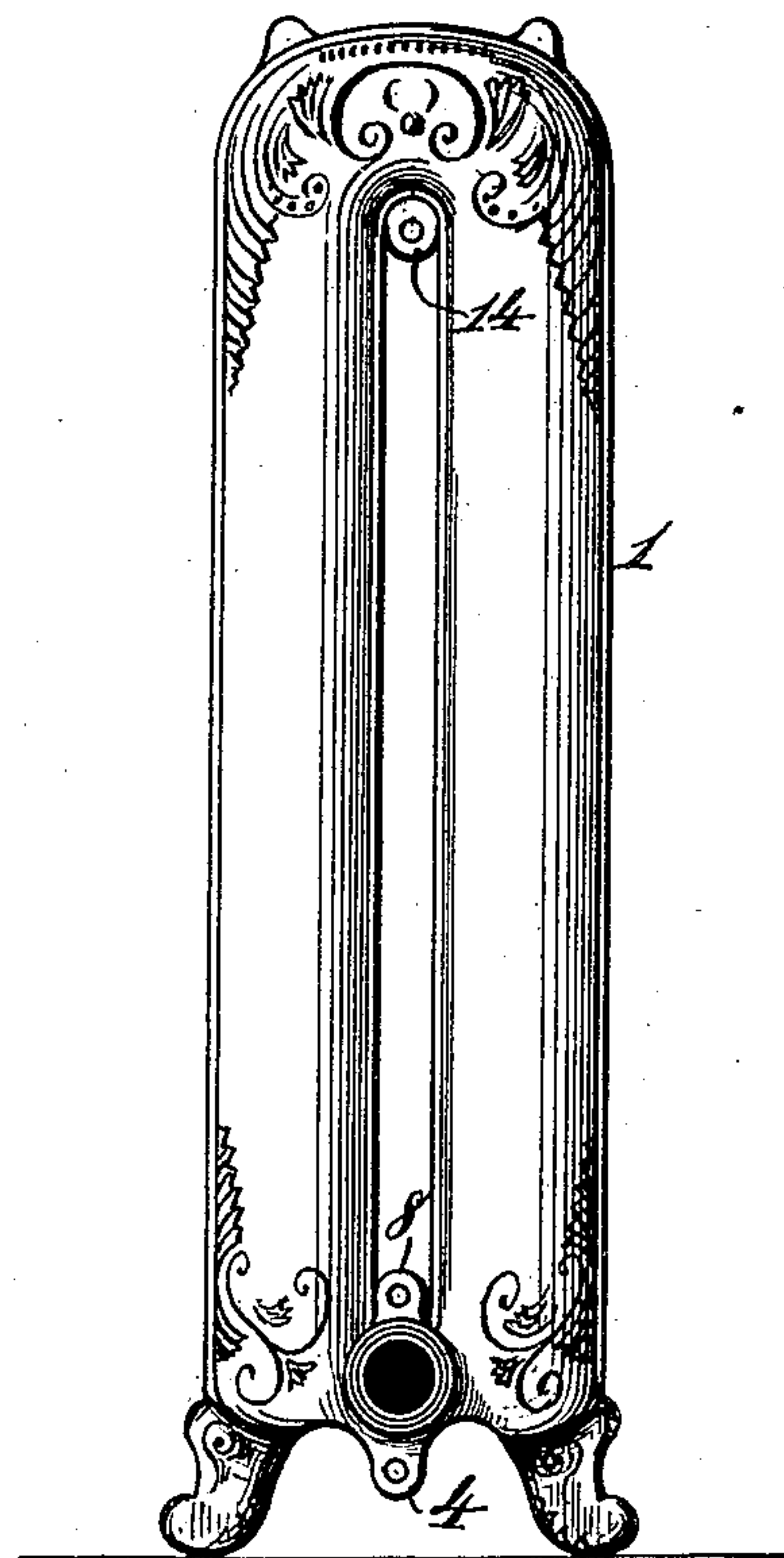
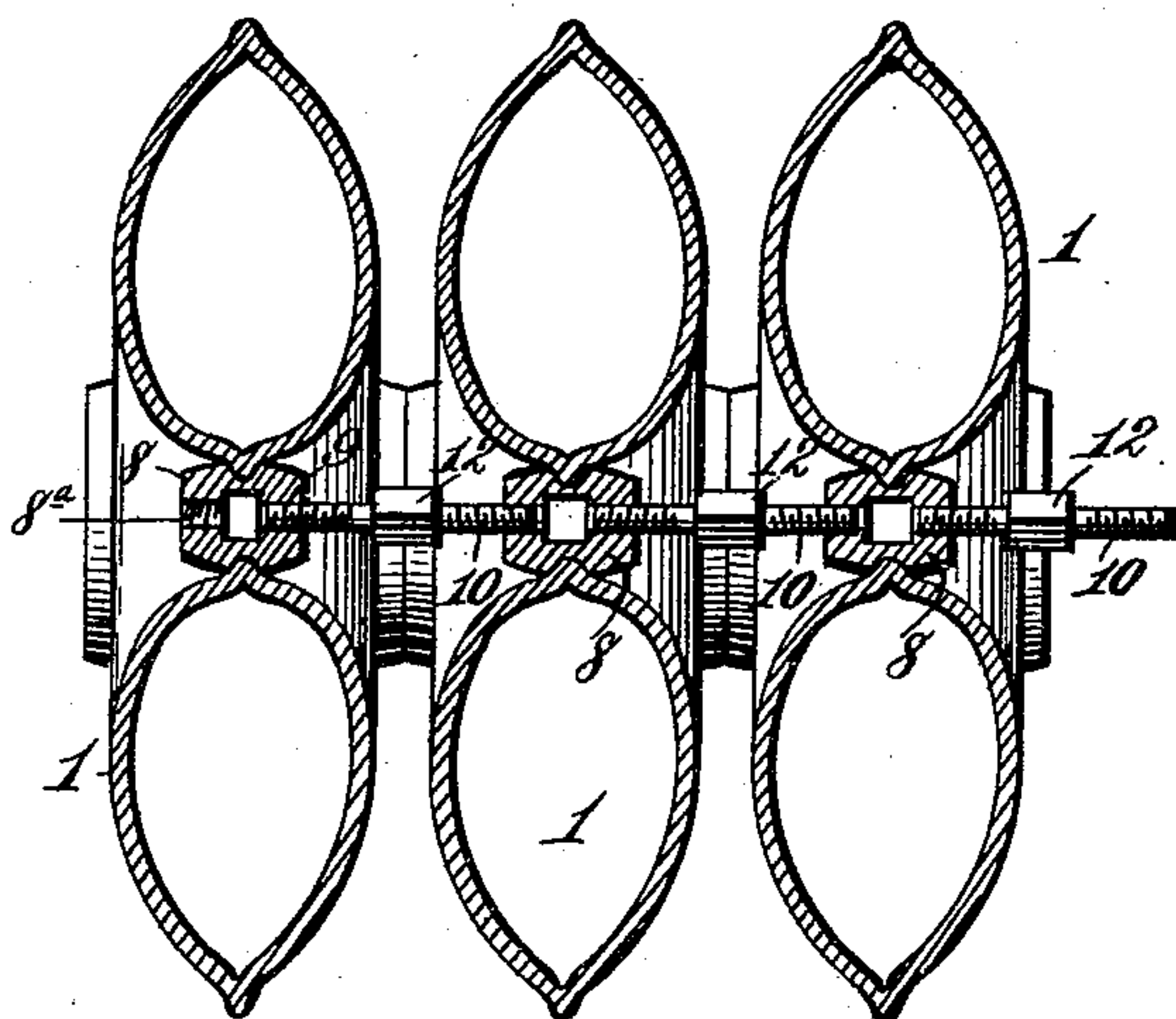


Fig. 3.



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UNITED STATES PATENT OFFICE.

TIMOTHY HOLLAND, OF LOUISVILLE, KENTUCKY, ASSIGNOR TO THE HOLLAND RADIATOR MANUFACTURING COMPANY, OF SAME PLACE.

RADIATOR.

SPECIFICATION forming part of Letters Patent No. 464,797, dated December 8, 1891.

Application filed February 11, 1891. Serial No. 381,017. (No model.)

To all whom it may concern:

Be it known that I, TIMOTHY HOLLAND, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented new and useful Improvements in Radiators, of which the following is a specification.

This invention has for its object to economically manufacture and improve that type of hot-water or steam radiators wherein several upright cast-metal sections are provided with interposed packings and are clamped together by ties or bolts outside of the tubular connections between the radiator-sections.

The invention also has for its object to provide novel means whereby it is possible to conveniently and rapidly add supplemental sections to a radiator in fitting up buildings.

The invention also has for its object to provide novel means which render a radiator susceptible of being shipped in detached sections and erected and secured together in the room where the radiator is to be located.

The invention also has for its object to provide novel and simple means for connecting radiator-sections and dispensing with the usual right and left hand threaded unions or hollow bolts for connecting the sections and placing them in communication with each other.

To accomplish all these objects my invention involves the features of construction, the combination or arrangement of devices, and the principles of operation hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is an end elevation showing the manner of constructing the sections of a hot-water or steam radiator for their connection together according to my invention. Fig. 2 is a vertical sectional view taken on the line $x x$, Fig. 1. Fig. 3 is a horizontal sectional view taken on the line $y y$, Fig. 1, showing an additional radiator-section connected in the series. Fig. 4 is a sectional view taken on the line $z z$, Fig. 1. Fig. 5 is a view similar to Fig. 1, showing a steam-radiator section without a top tubular connection.

In order to enable those skilled in the art to make and use my invention, I will now de-

scribe the same in detail, referring to the drawings wherein—

The numeral 1 indicates the hot-water or steam radiator sections, each made, as here shown, of a single loop-shaped casting comprising upright tubular limbs communicating with each other at their lower ends by elbows and provided on one side of its lower elbow with annular packing-grooves 2 and at the opposite side of such elbow with an annular rib or projection 3 in such manner that compressible packing-rings may be inserted into the annular grooves and the ribs or projections made to rest thereupon, after which the several sections are clamped together, as hereinafter explained, to produce fluid-tight joints.

The under sides of the end sections are each provided with a pendent ear 4 for the passage of a continuous tie-rod 5, having a head at one end and a screw-nut at the opposite end for the purpose of securing it in place and aiding in the perfect connection of the radiator-sections by drawing all of them tightly together. This tie-rod extends the full length of the radiator and fulfills the conditions required to give additional holding force, and inasmuch as this tie-rod is situated beneath the radiator-sections its expansion is in a large measure avoided. The elbow connection 6 at the lower end of each section is cast on its upper side with a lug 8, located centrally between the two limbs of the section and having its bore or internal caliber running parallel and coincident with the longitudinal axis of the radiator. The cast lugs 8 are each formed at one end with an internal right-hand screw-thread 8^a and at the opposite end with a left-hand screw-thread 9, and intermediate the right and left hand screw-threads the lug is cored out to provide a separation between such threads and facilitate the tapping of the latter. The lugs are connected by right and left hand screw-bolts 10, which are solid and provided centrally between their ends with angular enlarged heads 12 to receive a wrench by which to turn them, and thereby cause the radiator-sections to simultaneously move toward each other and be rigidly clamped to-

gether. By this external arrangement of the right and left hand threaded lugs and right and left hand screw-threaded bolts the radiator-sections can be tightened at any time if leakage occurs without the necessity of gaining access to internal devices, as is essential where radiator-sections are united and placed in communication by means of right and left hand screw-threaded nipples. In my improved construction if a joint should leak it can be conveniently tightened through the medium of an ordinary wrench applied to the head of the right and left hand screw-threaded bolt belonging to such joint.

The elbow connections 13 at the upper ends of the radiator-sections in the type of radiator shown by Figs. 1, 2, 3, and 4 are placed in communication with each other, and each elbow is cast on its under side with a pendent lug 14, having a smooth bore or internal caliber arranged coincident with the longitudinal axis of the radiator for the passage of short-bolt sections 15 at the end portions of the radiator. The smooth-bored lugs of the intermediate radiator-sections are adapted to receive short rods 16, having right and left hand screw-threaded ends 17 and 18, to be connected by right and left hand screw-threaded unions or nuts 19 with the short-bolt sections 15 in such manner that by simply turning the unions or nuts 19 the short-bolt sections 15 and the right and left hand screw-threaded rods 16 are drawn lengthwise, and thereby caused to clamp the radiator-sections rigidly together at the top portion thereof to secure fluid-tight joints between the several elbows 13.

It will be obvious from the foregoing that supplemental radiator-sections can be quickly and conveniently added to a radiator-section in fitting up a building, and likewise a radiator-section can be disconnected if occasion demands. The right and left hand screw-threaded rod-sections 16 are of such length as to merely pass through one of the cast lugs 14 of an intermediate radiator-section and project at each end from such lug to engage with the right and left hand threaded unions or nuts 19, by which construction it will be seen that each intermediate section carries its own independent short-rod section 16, and therefore a section can be practically removed and replaced with rapidity and comparatively little labor.

In a radiator having the several sections communicating laterally with each other at the top portion the short bolts and rods 15 and 16 and the right and left hand threaded unions or nuts 19 are important features in conjunction with the external right and left hand threaded lugs 8 and bolts 10 at the lower portions of the sections, for by this combination or arrangement the radiators are not only susceptible of being shipped in sections and erected in the room or place they are to occupy, but the base portions of the sections can be first connected by the right and left

hand threaded bolts to clamp them together, which will be sufficient to retain their upper ends in proper position, but insufficient to secure perfect fluid-tight joints where the upper ends of the sections communicate laterally with each other.

To secure perfect fluid-tight joints at the top of the communicating sections after the required number of sections for a complete radiator have been clamped together by the solid right and left hand threaded lugs 8 and bolts 10, I have specially devised the short bolt and rod sections 15 and 16 and the right and left hand threaded unions or nuts 19. After the lower ends of the radiator-sections have been drawn together by the bolts 10 the upper short bolts 15 and rod-sections 16 can be adjusted lengthwise a sufficient distance to permit the introduction of the right and left hand threaded unions or nuts 19 into correct position for engaging, connecting, and tightening the bolts 15 and rods 16 for effecting perfect joints at the top communicating ends of the radiator-sections. If a radiator-section is to be added, it can be readily effected, while if a radiator-section is to be disconnected it is only necessary to remove such section with its short-rod section 16. It would be impossible to effect this and enable radiator-sections to be joined fluid-tight at the top and sections added or disconnected at will were the short bolts 15, the independent right and left hand threaded rods 16, and the right and left hand threaded unions or nuts 19 not provided, as described and shown.

By arranging the right and left hand threaded lugs 8 and the right and left hand threaded bolts 10 outside of the tubular connections between the radiator-sections I reduce in a large measure the expansion of the bolts and place the latter in a convenient position to be operated through the medium of an ordinary wrench, and thereby avoid the necessity of operating right and left hand threaded nipples that serve to connect radiator-sections and place them in communication with each other.

The radiator can be shipped in sections and subsequently erected and secured together in the room of a building where the radiator is to be located, and all this can be effected in a simple and convenient manner, thereby avoiding considerable machine-work.

An important feature of my invention, arising from the construction and arrangement of the exterior lugs 8 and bolts 10, resides in the fact that since the adjacent ends of two lugs are rigidly connected with the opposite ends of a screw-bolt it will be impossible for such lugs to move or slide upon the bolt, and consequently the expansion of those portions of the radiator-sections between a pair of adjacent lugs 8 operates to secure a greater compressing force in the packing-joint, thereby reducing in a large measure the possibility of leakage.

If desired, the radiator-sections may have

no communication with each other at their upper ends, and in Fig. 5 I have exhibited a radiator-section of this type. Such radiator-sections are particularly designed for steam, and a forced circulation is effected by forcing the steam to ascend one limb and descend the opposite limb of each radiator-section in the usual manner.

Having thus described my invention, what I claim is—

1. A radiator consisting of loop-shaped sections, each having an elbow connection at its lower end cast on its upper side with an external projecting lug arranged centrally between the upright parts forming the loop and containing at one end an internal right-hand screw-thread and at the opposite end an internal left-hand screw-thread, and solid right and left hand screw-threaded bolts rigidly connecting the lugs outside the tubular connections between the radiator-sections and each provided intermediate its ends with an angular or similar head to receive a wrench, substantially as described.

2. A radiator consisting of independent loop-shaped sections having upper communicating elbow connections, each cast with an external lug, the lengthwise adjustable and independent short-bolt sections extending through the lugs on the outermost sections,

the lengthwise adjustable and independent right and left hand screw-threaded rods extending through lugs on the intermediate radiator-sections, and right and left hand screw-threaded unions or nuts connecting the said rods with each other and with the short-bolt sections, substantially as described.

3. A radiator consisting of independent loop-shaped sections having upper and lower communicating elbows, the upper elbows being each cast with an external lug and the lower elbows packed and clamped by a gang of independent connections, the lengthwise adjustable and independent short-bolt sections extending through the lugs on the outermost sections, the lengthwise adjustable and independent right and left hand screw-threaded rods extending through the lugs on the intermediate radiator-sections, and right and left hand screw-threaded unions or nuts connecting the said rods with each other and with the short-bolt sections, substantially as described.

In testimony whereof I have hereunto set my hand and affixed my seal in presence of two subscribing witnesses.

TIMOTHY HOLLAND. [L. S.]

Witnesses:

FREDERICK LEADBEUTER,
W. S. HOGUE.