

(No Model.)

3 Sheets—Sheet 1.

G. C. & L. R. BLACKMORE.

RADIATOR.

No. 448,630.

Patented Mar. 24, 1891.

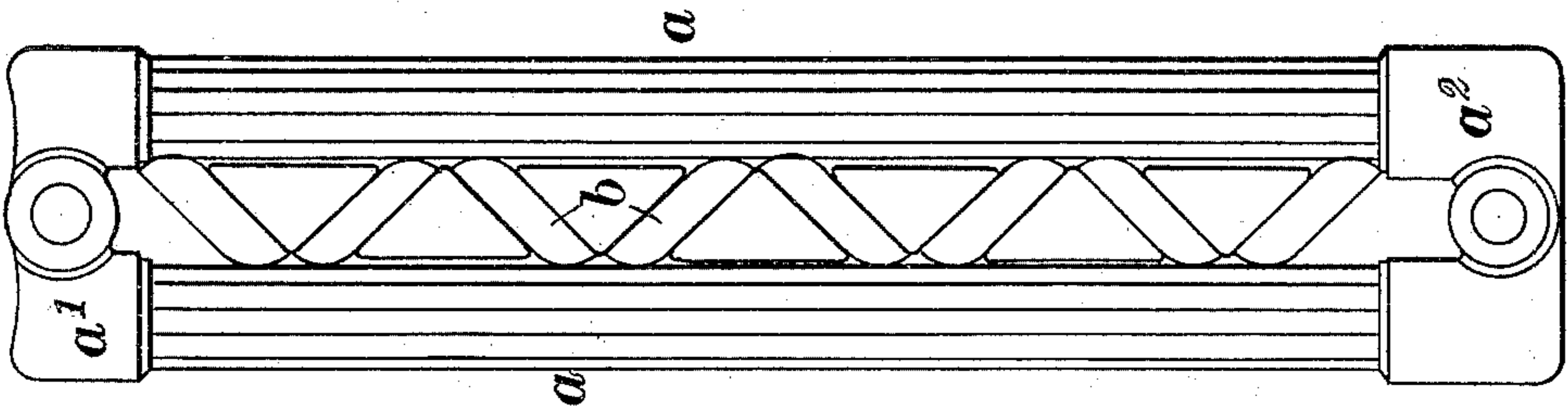
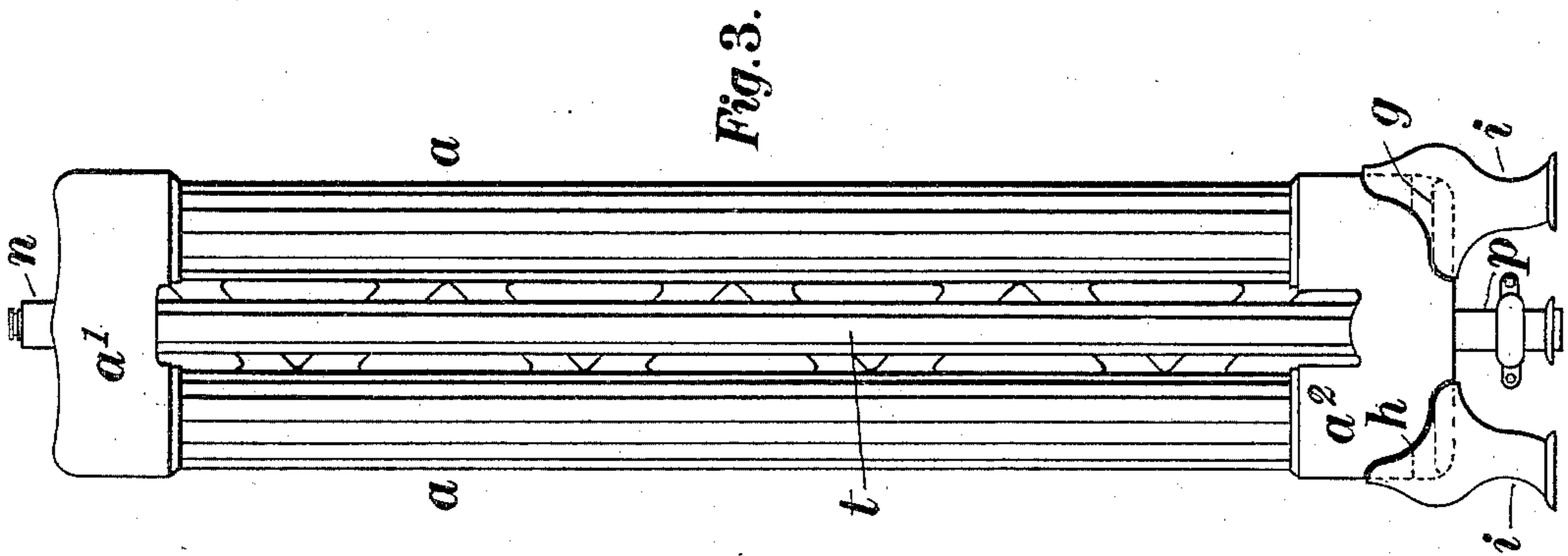


Fig. 2.

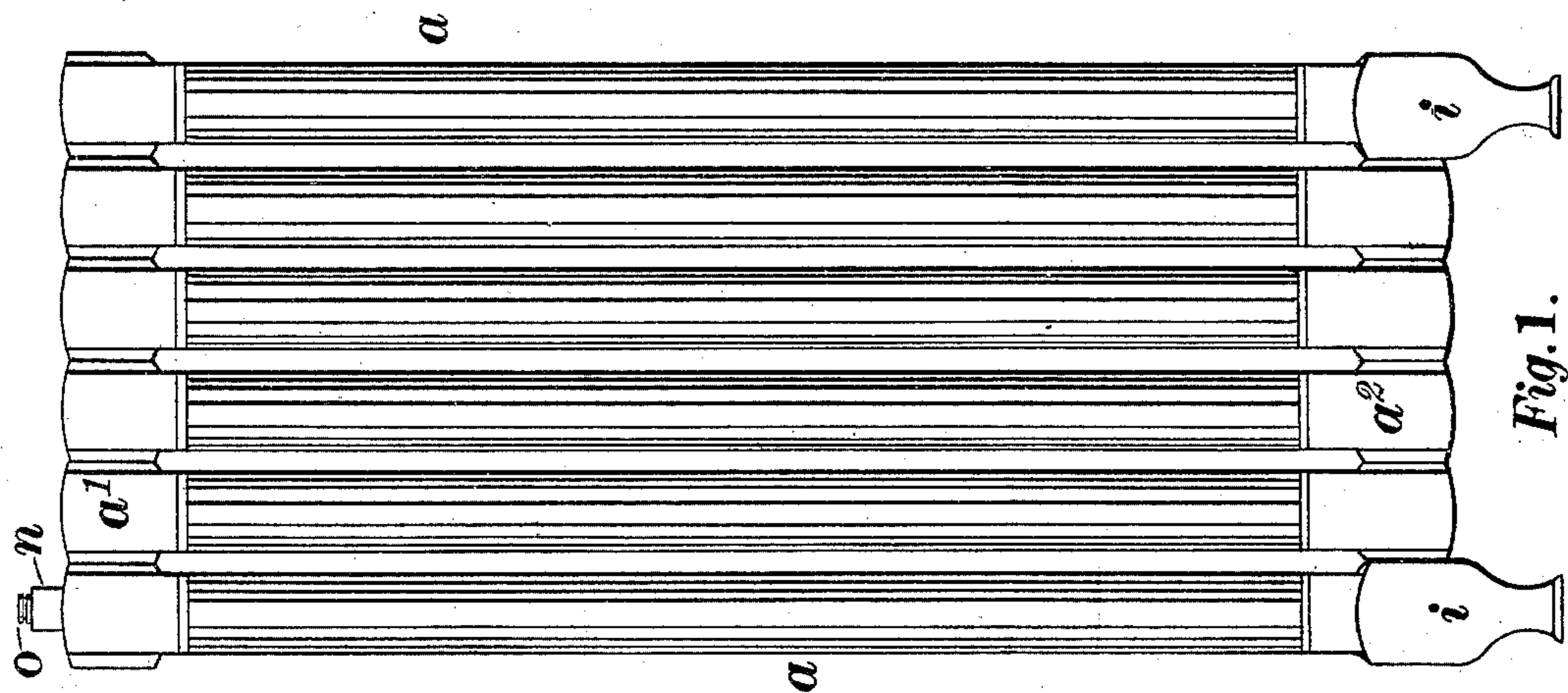


Fig. 1.

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per Crane & Miller, attys.

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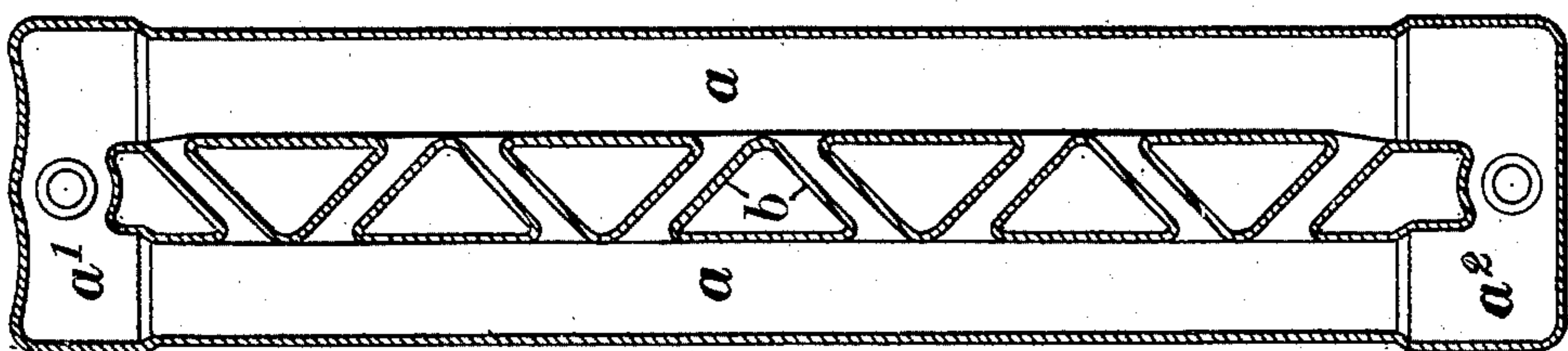
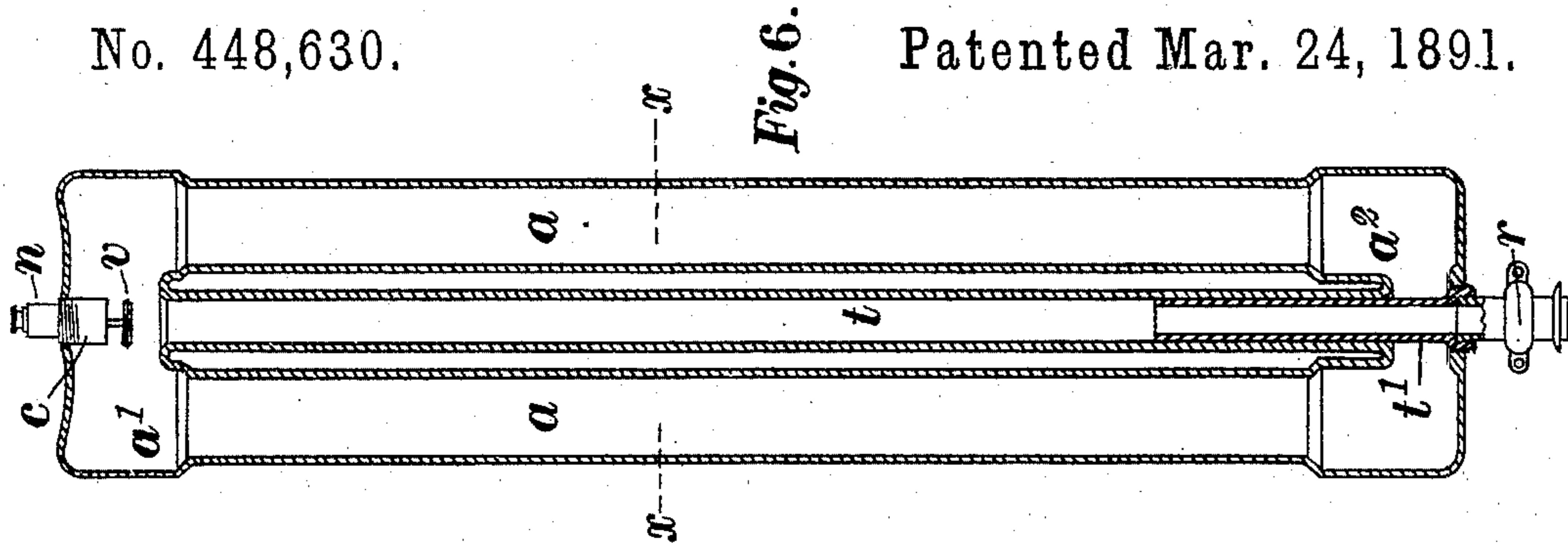


Fig. 5.

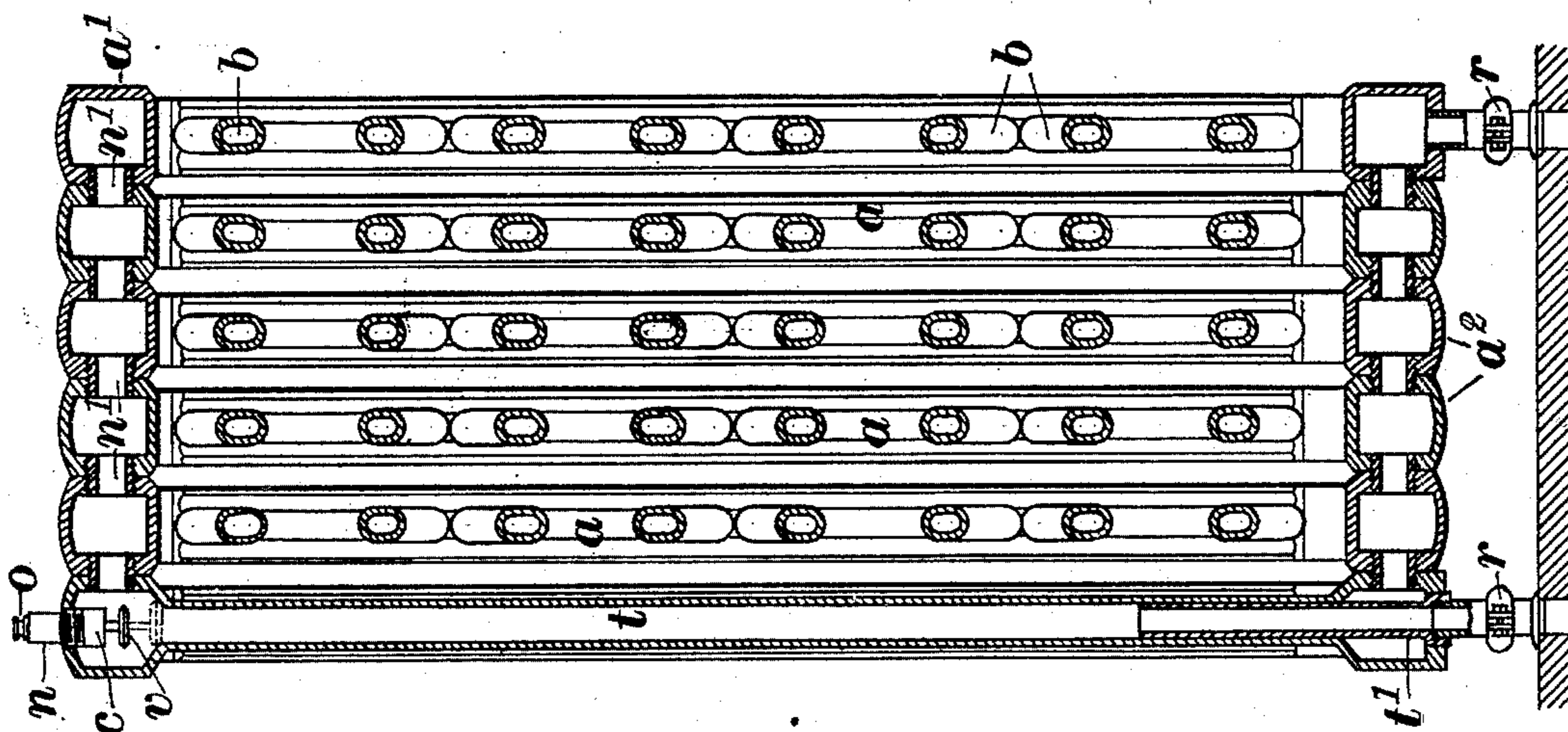


Fig. 4.

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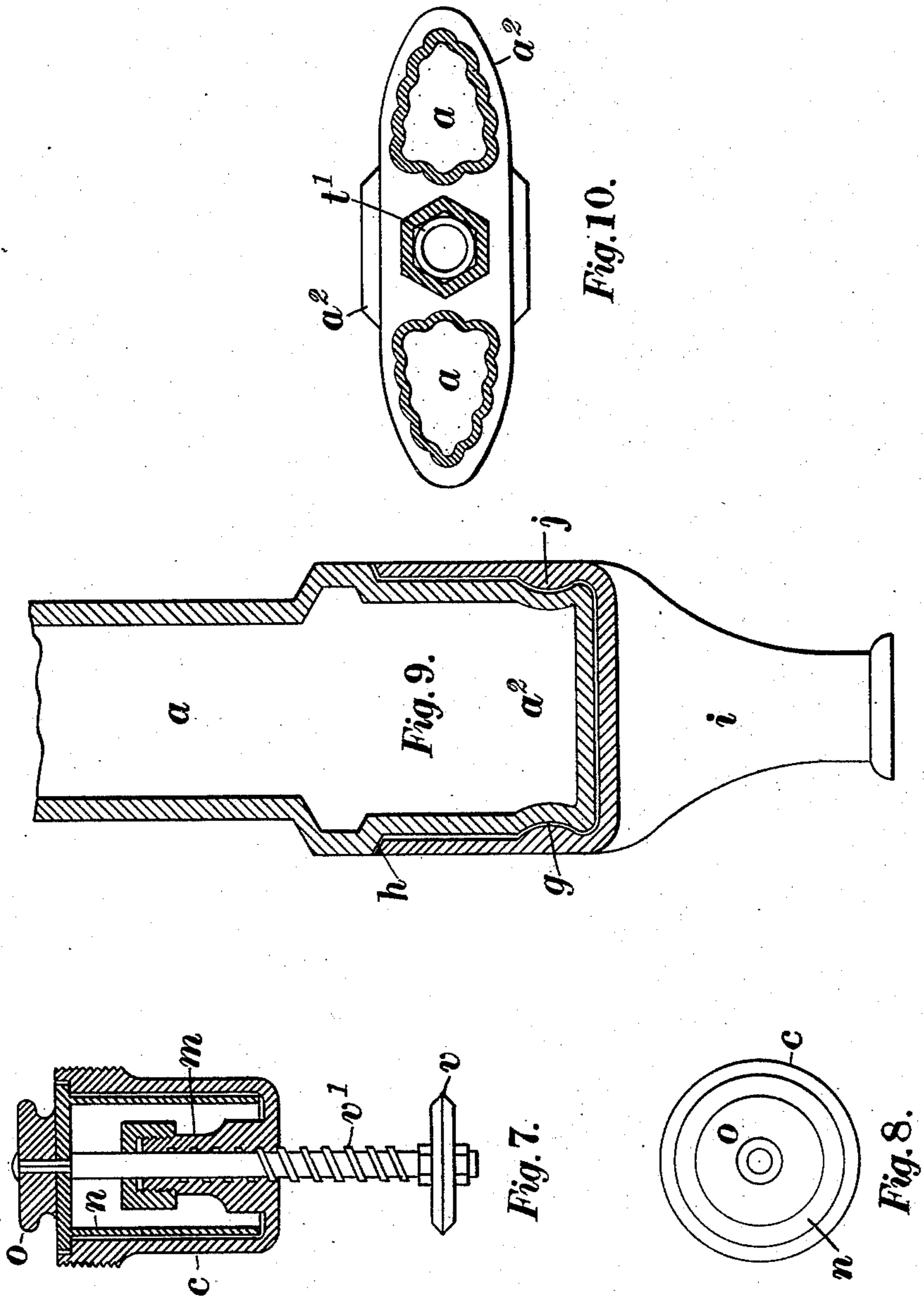
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Inventor.
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UNITED STATES PATENT OFFICE.

GEORGE C. BLACKMORE AND LAWRENCE R. BLACKMORE, OF NEWARK,
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RADIATOR.

SPECIFICATION forming part of Letters Patent No. 448,630, dated March 24, 1891.

Application filed June 11, 1890. Serial No. 355,106. (No model.)

To all whom it may concern:

Be it known that we, GEORGE C. BLACKMORE and LAWRENCE R. BLACKMORE, citizens of the United States, residing at Newark, Essex county, New Jersey, have invented certain new and useful Improvements in Radiators, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The object of this invention is to furnish an efficient hot-water radiator of neat appearance and adapted to be easily set up in its operative position.

The invention consists partly in a particular construction for the radiator-sections and partly in certain details of construction.

In the annexed drawings, Figure 1 is a side elevation of a radiator embodying our invention; Fig. 2, an elevation of one of the intermediate sections taken at right angles to the position shown in Fig. 1, and Fig. 3 is an end elevation of the entire radiator. Fig. 4 is a central vertical section of the radiator; and Figs. 5 and 6 are central vertical sections, taken at right angles to the position shown in the preceding figure, of one of the end and intermediate sections, respectively. Fig. 7 is a sectional elevation of the inlet-valve, and Fig. 8 a plan of the same. Fig. 9 is a transverse section of the lower portion of one end section with one of the feet applied thereto. Fig. 10 is a transverse section on line xx in Fig. 6.

The radiator is shown herein comprising two end sections and four intermediate sections having their heads connected together by means of nipples in the usual manner; and it is evident that the number of intermediate sections may be increased or diminished to alter the area of heating-surface of the radiator without changing its operation. Each radiator-section comprises two vertical columns a , connected at the top and bottom by the horizontal heads a' and a^2 , respectively. The end section, to which the hot-water supply pipe is connected, is provided with an inlet-tube t , intermediate to such vertical columns a and extending between the heads a' and a^2 .

In order to insure the introduction of the hot water into the top of the radiator, a tube

t' , fitted to the interior of the inlet-tube t , is provided at one end with a bush t^2 , which is screwed into a suitable aperture in the bottom of the head a^2 , with the tube t' projecting a little above the top of such head. By this means the lower end of the inlet-tube t is closed from the lower head, and the hot water on entering passes directly to the upper end of the inlet-tube t past the valve v , whence it is distributed in the other sections of the radiator through the nipples n' . The supply-pipe p is screwed into the bush t^2 in order to connect the same with the radiator. In each of the other sections the water columns are connected between the heads a' and a^2 by a series of inclined tubes b , through which the water has a free circulation from one column to the other without interrupting its downward flow in its passage to the outlet-pipe p , which is applied to the section at the opposite end of the radiator.

The inlet-valve consists of the usual disk v , beveled on its rim to fit a conical seat s , formed at the top of the inlet-tube t , and having its stem v' threaded to engage a threaded sleeve m , through which such stem passes.

To avoid the exposure of the stuffing-box beyond the surface of the section it is formed within a cup c , having an external thread at the top fitted to an aperture in the top of the head a' , and having the sleeve m projected upwardly from its bottom. A guard n is attached to the upper end of the valve-stem and provided with a knob o to turn the latter in actuating the valve, and such guard is formed with a cylindrical shell fitted to the interior of the cup c to prevent the accumulation of dust and dirt within the cup c and to prevent its being ground into the joints between the valve-stem and the sleeve m in the operation of the device.

As shown in Figs. 1, 3, and 9, the extremities of the heads a^2 of the end sections are provided with rabbets h , having grooves g therein parallel to the lower corners of the heads. The feet i are provided with sockets fitted to the rabbeted portions of the heads a^2 , and with ribs j within such sockets to engage the grooves g . By such construction the feet are readily detachable, and may be removed from the radiator to render the fittings

below the same accessible in connecting and disconnecting the supply and return pipes.

For convenience in setting up the radiator in place we apply thimbles to the lower ends 5 of the supply and discharge pipes, which are provided with flanges or floor-plates at their lower ends, and are also provided with internal screw-threads for the pipe-connections to the boiler. Such thimbles are connected to 10 the supply and discharge pipes by means of couplings *r*, of special construction for easy application and removal.

The object of the inlet-tube *t* is to avoid the marring of the appearance of the radiator 15 by an external tube extending from the floor to the top of the radiator, at which point it is desirable to feed the hot water in order to secure a good circulation throughout the several sections.

20 Having thus set forth our invention, what we claim herein, and desire to secure by Letters Patent, is—

1. In a radiator-section, the combination, with the columns *a a*, united at the ends by 25 the heads *a'* and *a²*, of the series of inclined tubes *b*, as and for the purpose set forth.

2. The combination, with a series of radiator-sections, each consisting of the columns *a a*, heads *a'* and *a²*, and inclined tubes *b*, of an 30 end section consisting in the vertical columns *a a*, united at the ends by the heads *a'* and *a²*, and the intermediate tube *t*, connecting the heads and having an inlet-connection at its lower end, as and for the purpose set forth.

35 3. The combination, with a series of radiator-

sections, each consisting of the columns *a a*, heads *a'* and *a²*, and inclined tubes *b*, of an end section consisting in the vertical columns *a a*, united at the ends by the heads *a'* 40 and *a²*, the intermediate inlet-tube *t*, and the tube *t'*, connecting the heads and formed integral therewith, fitted to the interior of the same and extended through the lower head *a²* to connect with the supply-pipe, substantially 45 as shown and described.

4. The combination, with a radiator-section having an upright inlet-tube *t*, provided with the valve-seat *s* at its upper end, of the valve 50 *v*, with threaded stem *v'*, the cup *c*, applied to the upper end of the section and provided with the upwardly-projecting sleeve *m*, threaded internally and inclosed therein, and the guard *n* and knob *o*, applied to the upper 55 end of the valve-stem, as and for the purpose set forth.

5. The combination, with a vertical radiator-section having rabbets formed in its lower end with grooves *g* therein, of feet *i*, having 60 sockets fitted to the rabbets in the head *a²* and provided with ribs *j* to engage the grooves *g*, substantially as shown and described.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

GEORGE C. BLACKMORE.
LAWRENCE R. BLACKMORE.

Witnesses:

H. J. MILLER,
F. C. FISCHER.