

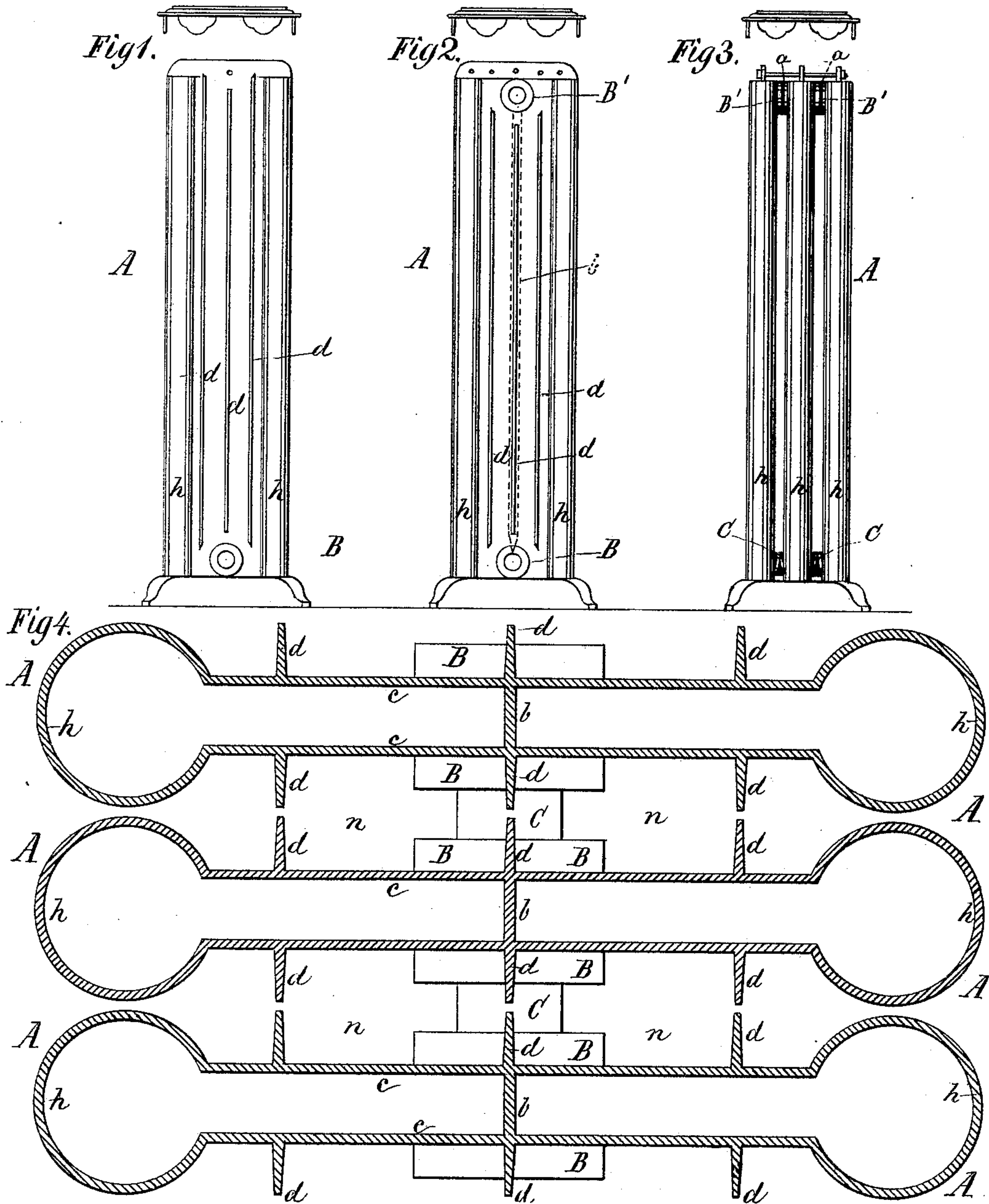
(No Model.)

2 Sheets—Sheet 1.

T. C. JOY.  
STEAM AND HOT WATER RADIATOR.

No. 410,691.

Patented Sept. 10, 1889.



Witnesses:  
Robt L Fenwick  
J. P. Theo. Lang.

Inventor:  
Thaddeus C. Joy  
by his atty  
Masin Fenwick & Lawrence

(No Model.)

2 Sheets—Sheet 2.

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Fig 5.

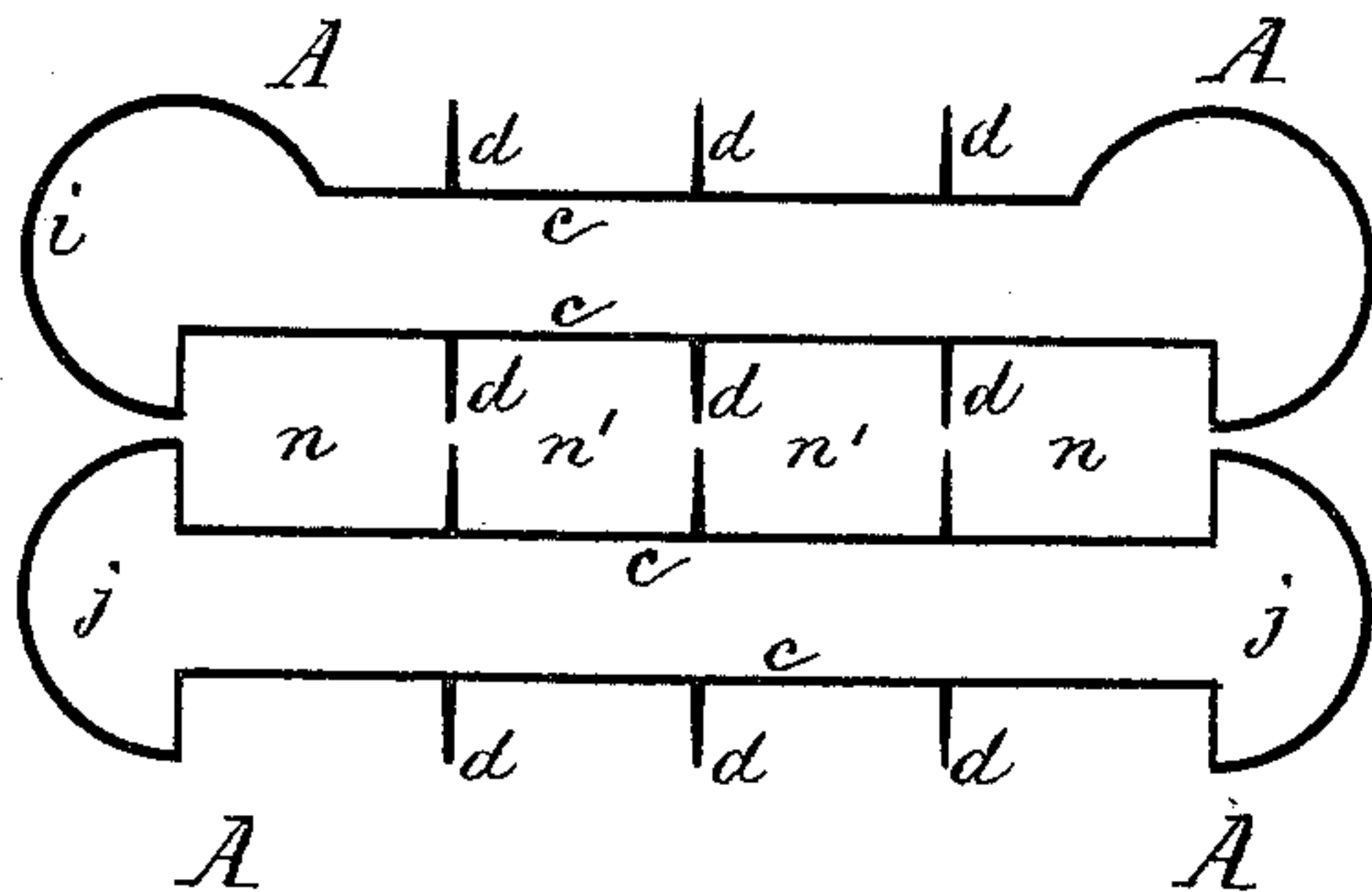


Fig 6.

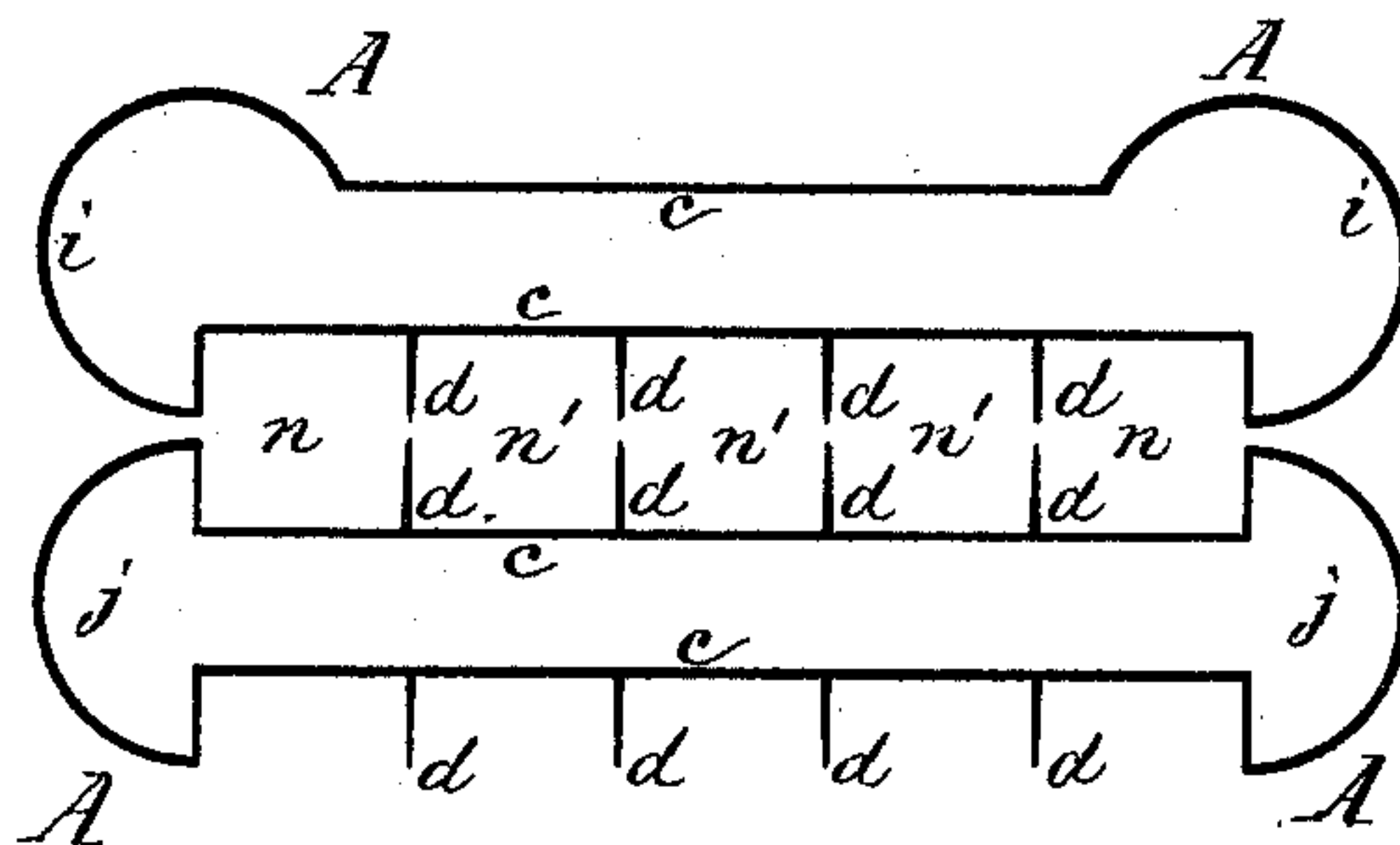


Fig 7.

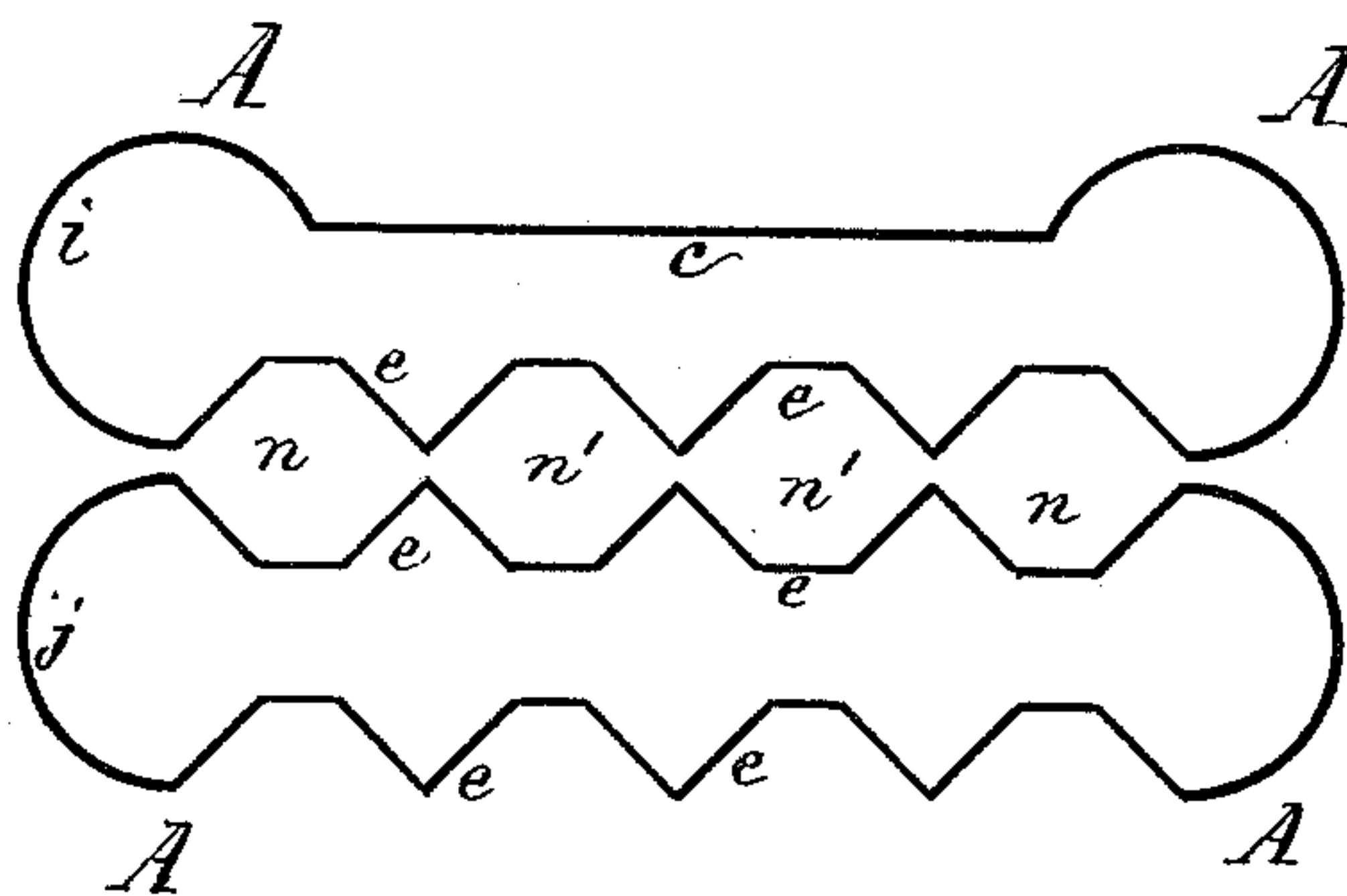


Fig 8.

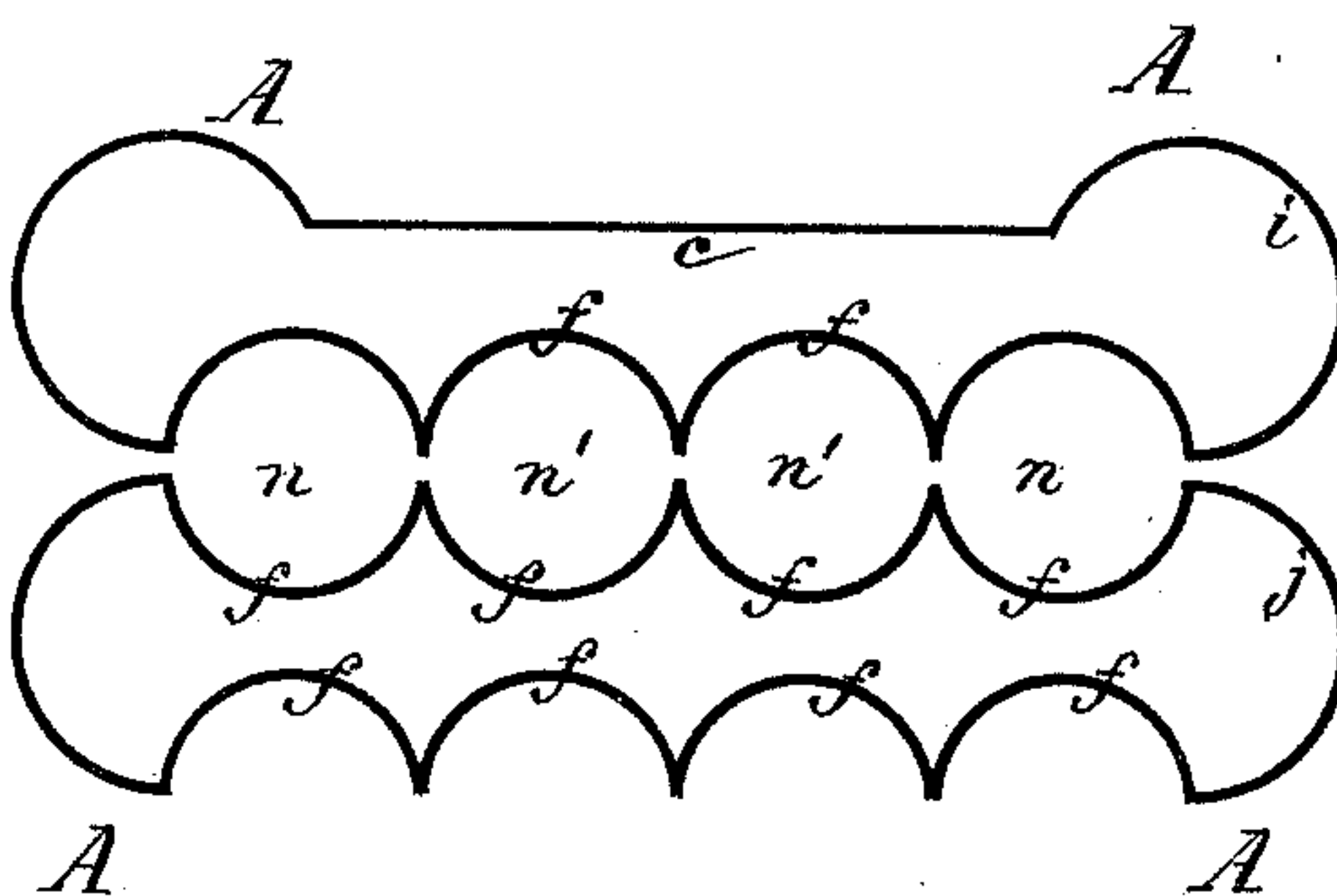
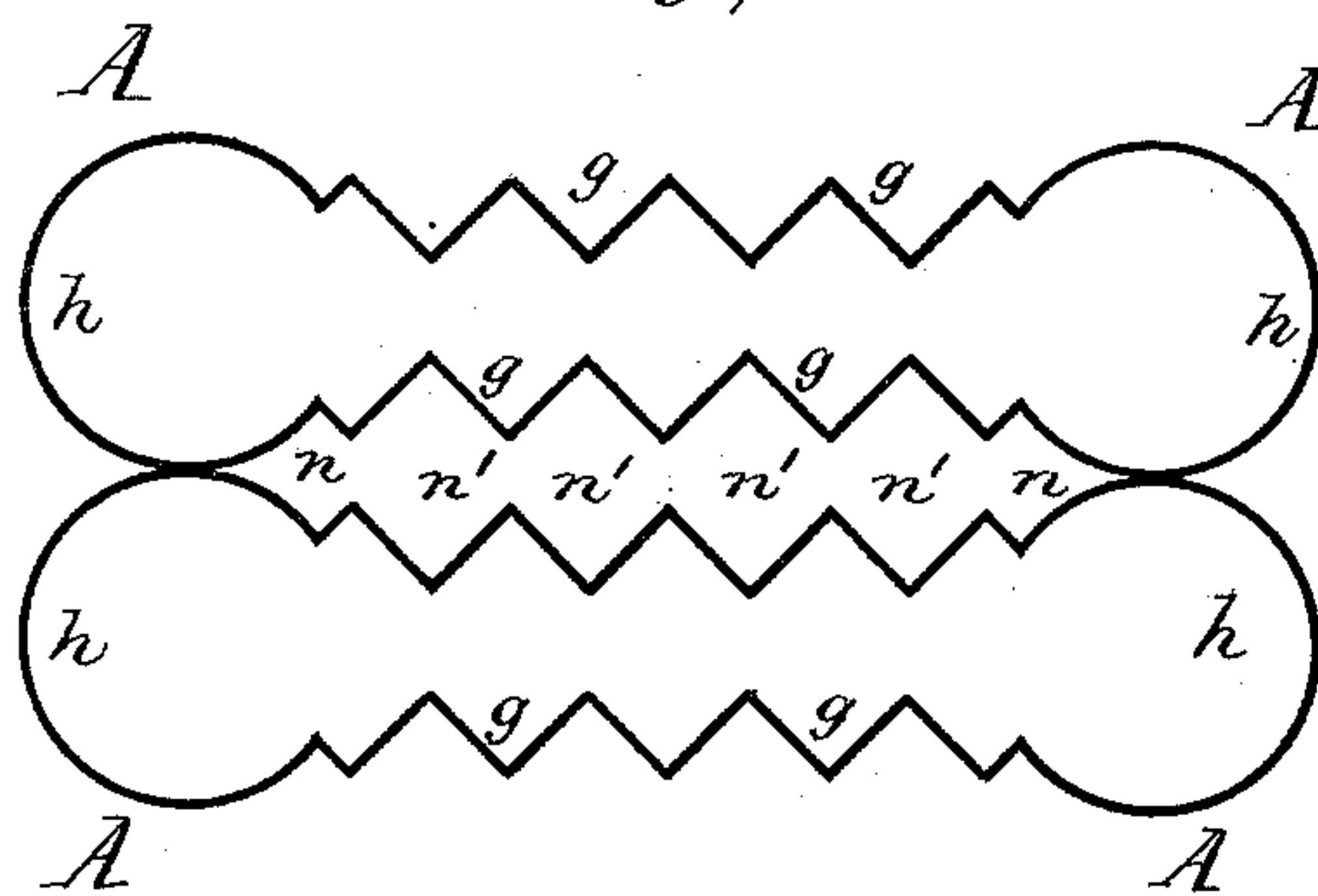


Fig 9.



Witnesses:

Robt. L. Fenwick  
J. P. Theo. Lang.

Inventor:

Thaddeus C. Joy  
by his atty  
Mason, Fenwick & Lawrence



# UNITED STATES PATENT OFFICE.

THADDEUS C. JOY, OF TITUSVILLE, PENNSYLVANIA.

## STEAM AND HOT-WATER RADIATOR.

SPECIFICATION forming part of Letters Patent No. 410,691, dated September 10, 1889.

Application filed February 6, 1889. Serial No. 298,875. (No model.)

*To all whom it may concern:*

Be it known that I, THADDEUS C. JOY, a citizen of the United States, residing at Titusville, in the county of Crawford and State of Pennsylvania, have invented certain new and useful Improvements in Steam and Hot-Water 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 present invention relates to steam and hot-water radiators formed of a series of hollow connected circulating-sections, which have vertical projections on those sides which stand opposite each other, which projections form unobstructed vertical air-column ways from the bottom to the top of the sections, as in Letters Patent No. 390,128, granted to me September 25, 1888; and it consists in a steam or hot-water radiator comprising a series of connected hollow radiator-sections having hollow columnar enlargement projections at their ends, which projections are in horizontal section a part of a circle, and also having on their intermediate narrower portions projections which, with the enlargement projections at the ends of the sections, form a series of vertical air-column ways from the bottom to the top of the sections, except where interrupted by connecting collars, thimbles, and tie-bolts, as will be hereinafter described.

In the accompanying drawings, Figure 1 is a side view of an inner side of one of my steam-radiator sections, the top of the radiator being raised above the section. Fig. 2 is a similar illustration, but showing the radiator-section provided with a lower and upper collar for hot-water-connecting thimbles. Fig. 3 is an end view of three sections, similar to the one shown in Fig. 2, as connected together for circulation of water through them for heating air in the column-ways formed between the sections by the projections on their surfaces and at their ends. Fig. 4 is a horizontal section of three sections as connected by either steam or hot-water thimbles and collars. Figs. 5, 6, 7, 8, and 9 are diagrams in horizontal section illustrating my invention in some of the different forms in which it may be embodied

in either a steam-radiator or hot-water-circulating radiator.

A A A in the drawings are sections of either a steam-radiator or hot-water-circulating radiator; B B', hollow collars formed on each of the respective sections, and having screw-threaded openings through them for the passage of steam or hot water, and the reception of screw-threaded thimble C, for connecting the sections near their bottoms. The thimbles, as C, may be used in connection with the hot-water collars B' by forming screw-threads in these collars, like the collars B; but it is contemplated to pack the abutting collars B' with a suitable annular gasket *a*, placed between their ends, as indicated in Fig. 3.

The radiator-sections may be of the internal construction shown, having a transverse diaphragm, as *b*, between the collars; or they may be of any known construction, so far as their circulation-chamber is concerned. If the diaphragm *b* is provided, it will be of such length as will permit the steam or water to circulate beneath and above it, as indicated by dotted lines in Fig. 2.

The castings of my radiator-sections are made with heating side surfaces extending from top to bottom, and these surfaces can be either flat on the inside, as indicated at *c*, and ribbed on the outside, as at *d*, Figs. 1, 2, 3, 4, 5, and 6; or they may be shaped internally and externally in either of the forms shown at *e*, *f*, and *g* in Figs. 7, 8, and 9. The intermediate projections on the outside surfaces of the sections A form in all of the illustrations vertical air-column ways *n n'* from top to bottom of the sections, and these column-ways are preferably of unvarying horizontal area from bottom to top; but my present invention is not confined to having the column-ways of unvarying horizontal area or diameter throughout their length. The end projections are of greater diameter than the intermediate portions of the sections, and they are hollow and of columnar form, as shown, and they should be circular on about one-half their outer and inner surfaces, so as to present to the eye, when the radiator is set up for use, a columnar finish at both ends. In Figs. 1, 2, 3, 4, and 9 the end enlargement projections are repre-



sented at *h* as being nearly complete circles, while in Figs. 5, 7, and 8 at *i* they have a nearly three-quarter circular form, and at *j* a semicircular form, and they form, with either  
5 the right-angular rib projections *d*, or with the spaced triangular projections *e*, or with the immediately-united triangular projections *g*, or with the projections formed by the scallops *f*, vertical air-column ways from bottom  
10 to top of the sections.

In the use of hot water as the heating medium the supply is introduced at the top or bottom of the radiator at a collar, and in the use of steam at the bottom through a collar.  
15 By the herein-described invention an increased surface for heating air at the ends of the radiator is secured, and at the same time, by the columnar finish of said ends, a much more imposing effect is produced, and such  
20 finish is very desirable in this class of structure, inasmuch as it is usually placed in hallways or against walls of rooms, and is liable, if not constructed with round smooth surfaces, to offer dangerous obstructions to persons  
25 passing by the radiators; and while all

the advantages just stated are secured the usual increased amount of heating-surface can be obtained from the intermediate portions of the sections.

What I claim is—

The steam or hot-water radiator formed of a series of connected hollow circulating-sections, the intermediate portions of said sections having hollow columnar enlargement projections at their ends, which are in horizontal section a part of a circle and form a vertical air-column way *n* from bottom to top and end to end of the sections, and said intermediate portions of the sections being  
35 formed with projections which, with the enlargement projections, form a series of vertical air-column ways, as *n n'*, from bottom to top of the sections, substantially as and for the purpose described. 40

In testimony whereof I hereunto affix my signature in presence of two witnesses. 45

THADDEUS C. JOY.

Witnesses:

GEO. A. CHASE,  
JOS. T. CHASE.