(No Model.) 2 Sheets—Sheet 1.

A. SPENCE.

WATER HEATER.

No. 418,538. Patented Dec. 31, 1889.

Fig. 1.

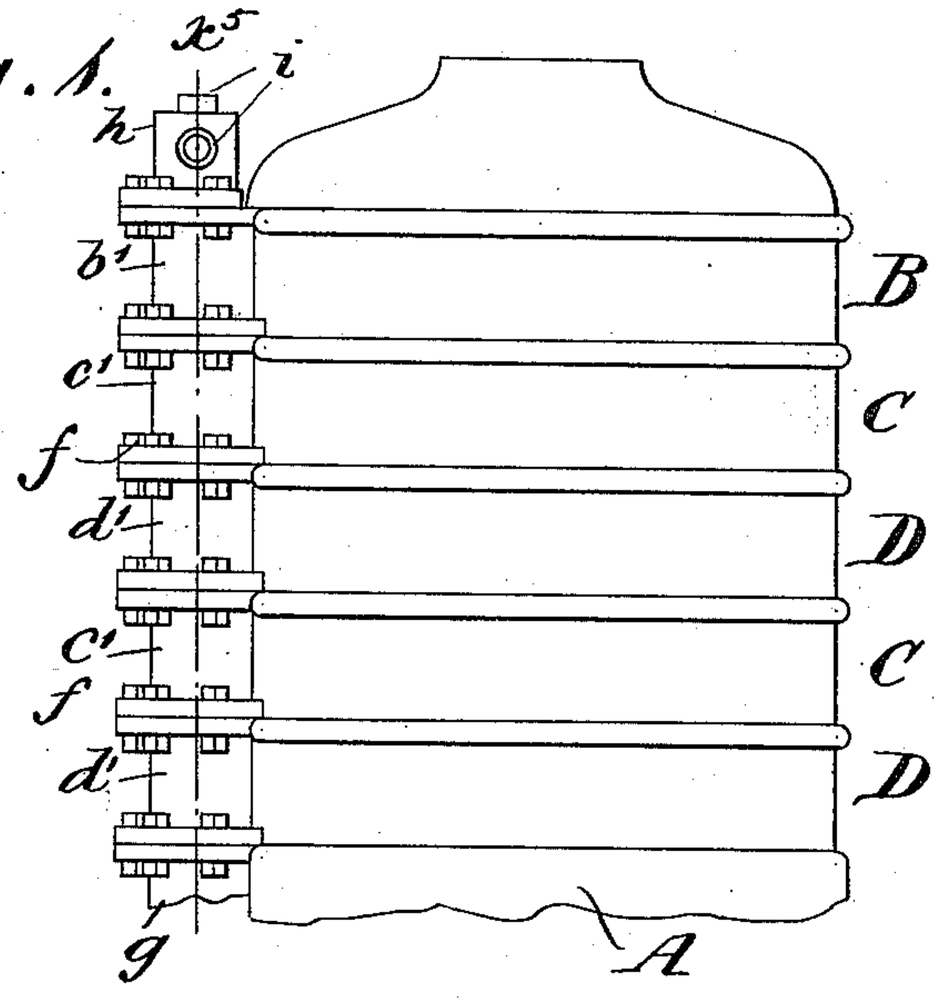


Fig. 3.

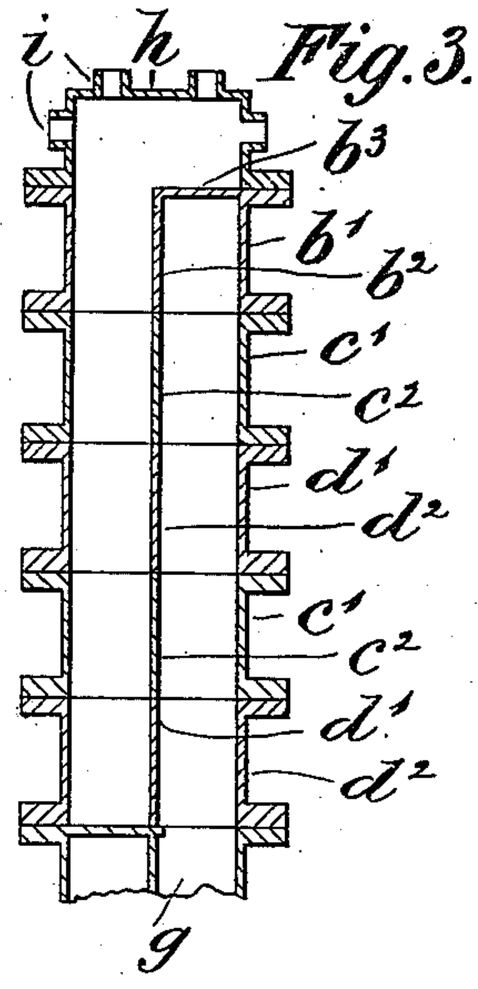
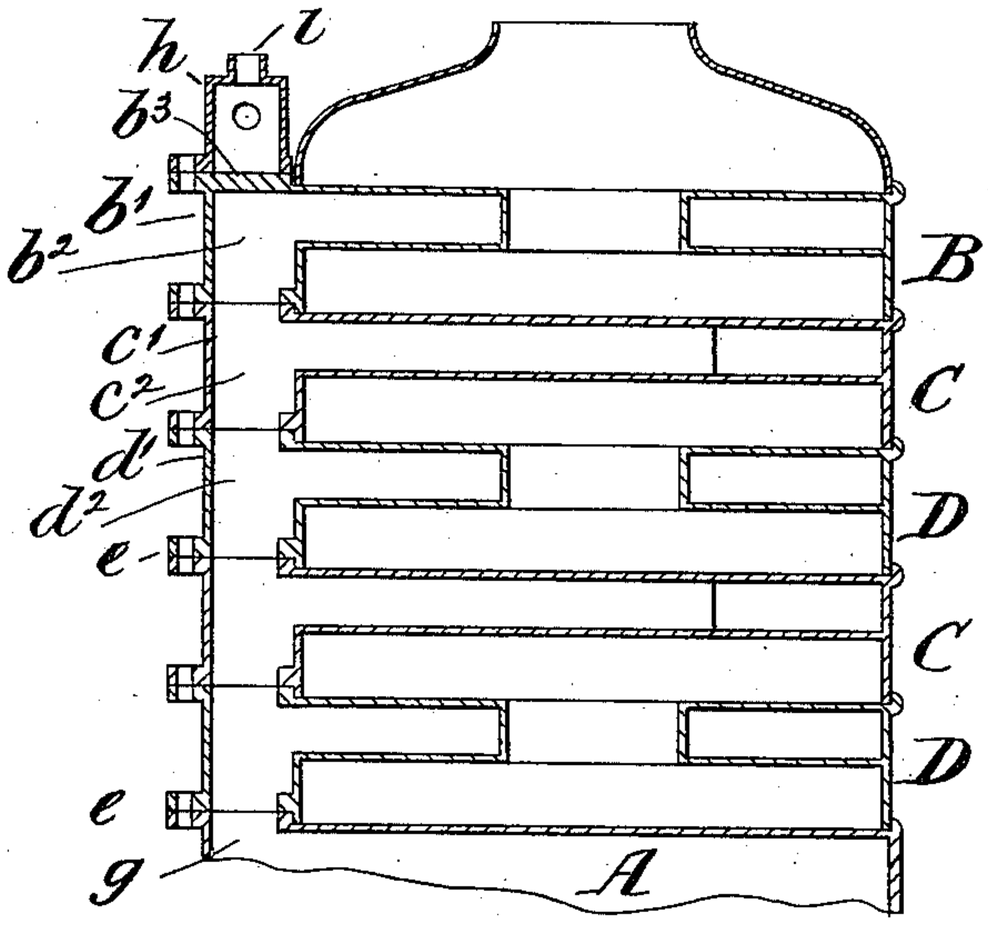


Fig. 2.



Witnesses.
W. Décarie
James Adam.

Inventor.
Archibald Spence
By his Attorney
Charles G. C. Simpson

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

A. SPENCE.

WATER HEATER.

No. 418,538. Patented Dec. 31, 1889.

Fig. 4.

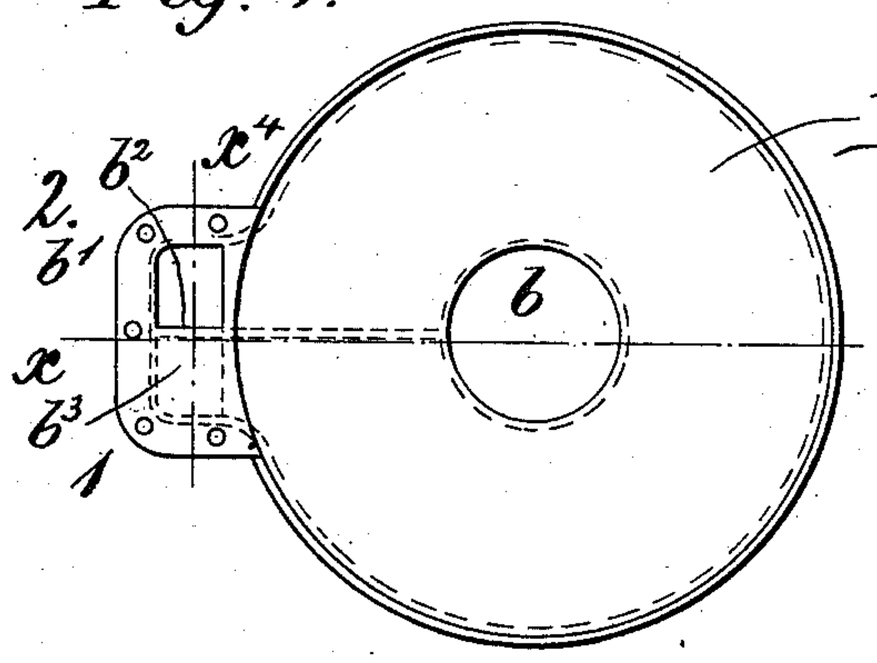


Fig. 5.

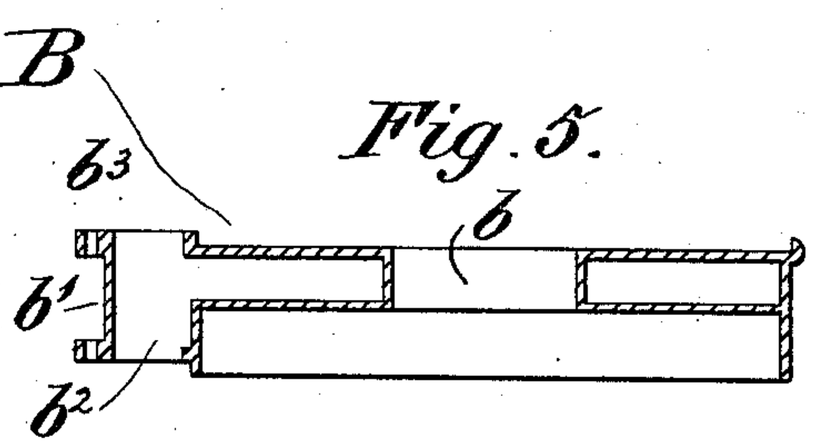


Fig. 8.

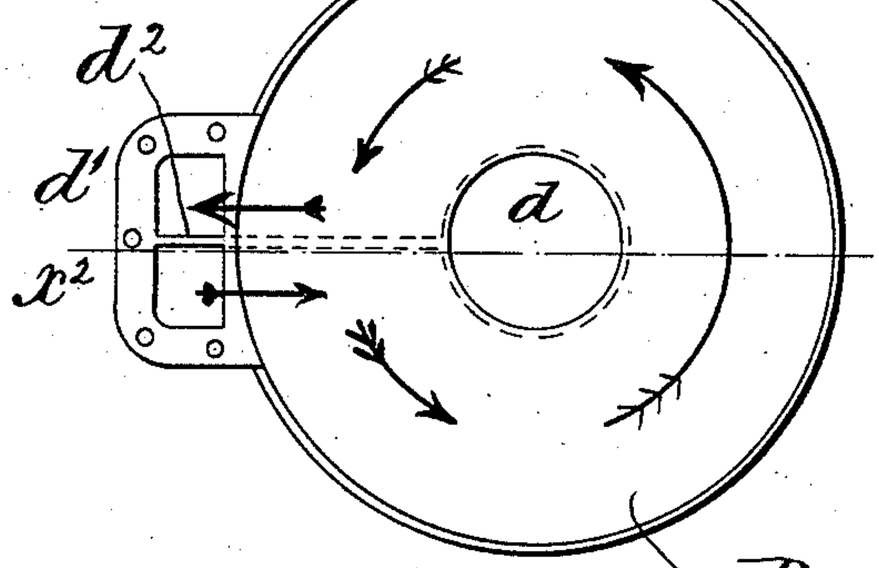


Fig. 9.

Fig. 6.

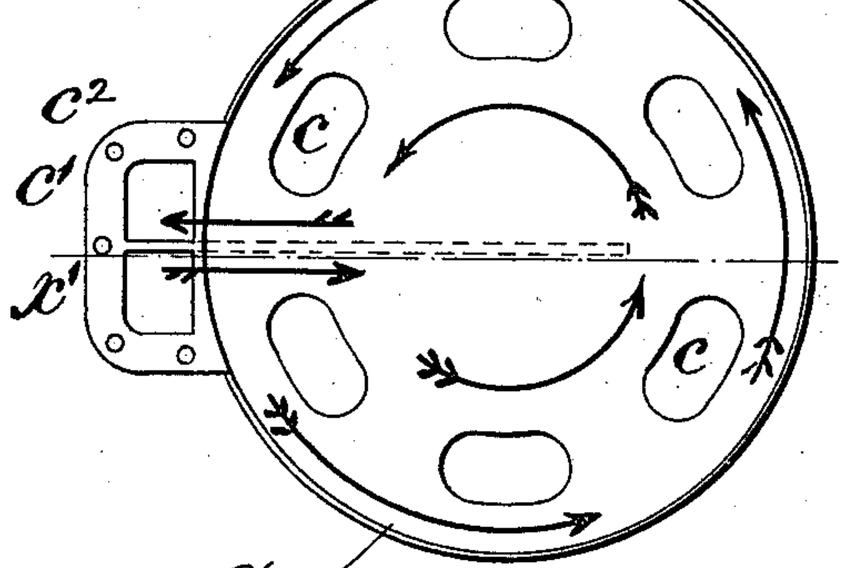


Fig. 7.

Witnesses.

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UNITED STATES PATENT OFFICE.

ARCHIBALD SPENCE, OF MONTREAL, QUEBEC, CANADA, ASSIGNOR TO WARDEN KING, OF SAME PLACE.

WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 418,538, dated December 31, 1889.

Application filed October 21, 1889. Serial No. 327,746. (No model.)

To all whom it may concern:

Be it known that I, ARCHIBALD SPENCE, a subject of the Queen of Great Britain, residing at the city of Montreal, in the District of Montreal and Province of Quebec, Canada, have invented new and useful Improvements in Water-Heaters; and I do hereby declare that the following is a full, clear, and exact description of the same.

My present invention has reference to further improvements in the water-heater for which Letters Patent of the United States were granted to me on the 8th day of March, A. D. 1887, under No. 359,105; and it consists in further improvements in the construction and arrangement of the connection which unites the water-spaces in the furnace with the sections; and the object of my invention is to form both the said connections and sections with less labor of molding and consequent cost or expense. I attain this object by the water-heater illustrated in the accompanying drawings, in which similar letters of reference indicate like parts.

Figure 1 is an elevation of the water-heater. Fig. 2 is a vertical section of the water-heater, taken about the position of the line x in Fig. 4. Fig. 3 is a vertical section of the water-connection as formed in part on each section. The section is taken at line x^5, Fig. 1, which is the same position as line x^4, Fig. 4. Fig. 4 is a plan of the top or first section. Fig. 5 is a vertical section of the top or first section taken on line x, Fig. 4. Fig. 6 is a plan of the second section. Fig. 7 is a vertical section of the second section taken on line x', Fig. 6. Fig. 8 is a plan of the third section. Fig. 9 is a vertical section of the third section taken on line x^2, Fig. 8.

I would first generally remark that in the heater about to be described the sections, *per se*, are the same as heretofore shown in my said previous patent, only that in this case the corresponding portions of the water-connection are made integral with the various sections.

The invention is illustrated by a heater composed of five sections, there being three different species of sections of the same genus combined in one water-heater. After the first or top section the second and third sections alternate, and thus a heater may be arranged with any greater or less number of sections than five, as shown.

Letter A is the furnace, which is substantially similar to that shown in my aforesaid patent.

B is the top or first section. This is preferably made with a central opening b, as heretofore.

b' is a projecting portion forming the water-connection integral with the section B, and is divided into two parts by a vertical diaphragm b^2. One of the divisions thus formed is closed at the top by a horizontal diaphragm b^3.

The second section C is preferably provided with the openings c, as before. It is also provided with a projection c', divided by a vertical diaphragm c^2 into two parts, and this diaphragm is arranged to agree and form a joint with the diaphragm b^2.

The third section D is exactly the same as the section B, only that the diaphragm b^3 is omitted. It has a central opening d, a projection d', divided by a diaphragm d^2, which agrees and forms a joint with the diaphragm c^2.

If the heater is to have a greater number of sections than three, the sections C and D are repeated alternately for the number of sections required.

It will be seen by Fig. 3 that when the sections are built together, being provided with flanges e, secured together with bolts and nuts f, that the diaphragms b^2, c^2, and d^2 form practically one continuous diaphragm, and that the water rising from the water-casing g of the furnace A is arranged to connect with the side 1, or that which at the top has the diaphragm b^3, so that the said water is caused to pass or circulate through all the sections in the same direction, as shown by the arrows in Figs. 4 and 6. It passes into the side 2 (see Fig. 3) and rises up into a casing h, provided with suitable necks i, for connecting the circulating-pipes with.

The heater above described is in operation substantially similar to that described in my

hereinbefore-mentioned patents; but the expense and labor of molding the sections of this heater are considerably diminished.

What I claim is as follows:

The combination, in a heater, of the sections B, C, and D, having the projecting integral portions b', c', and d', forming the water-connection to the said sections, also having diaphragms b^2, c^2, and d^2, the whole substantially as described.

ARCHIBALD SPENCE.

Witnesses:
L. O. HÉTU,
CHARLES G. C. SIMPSON.