

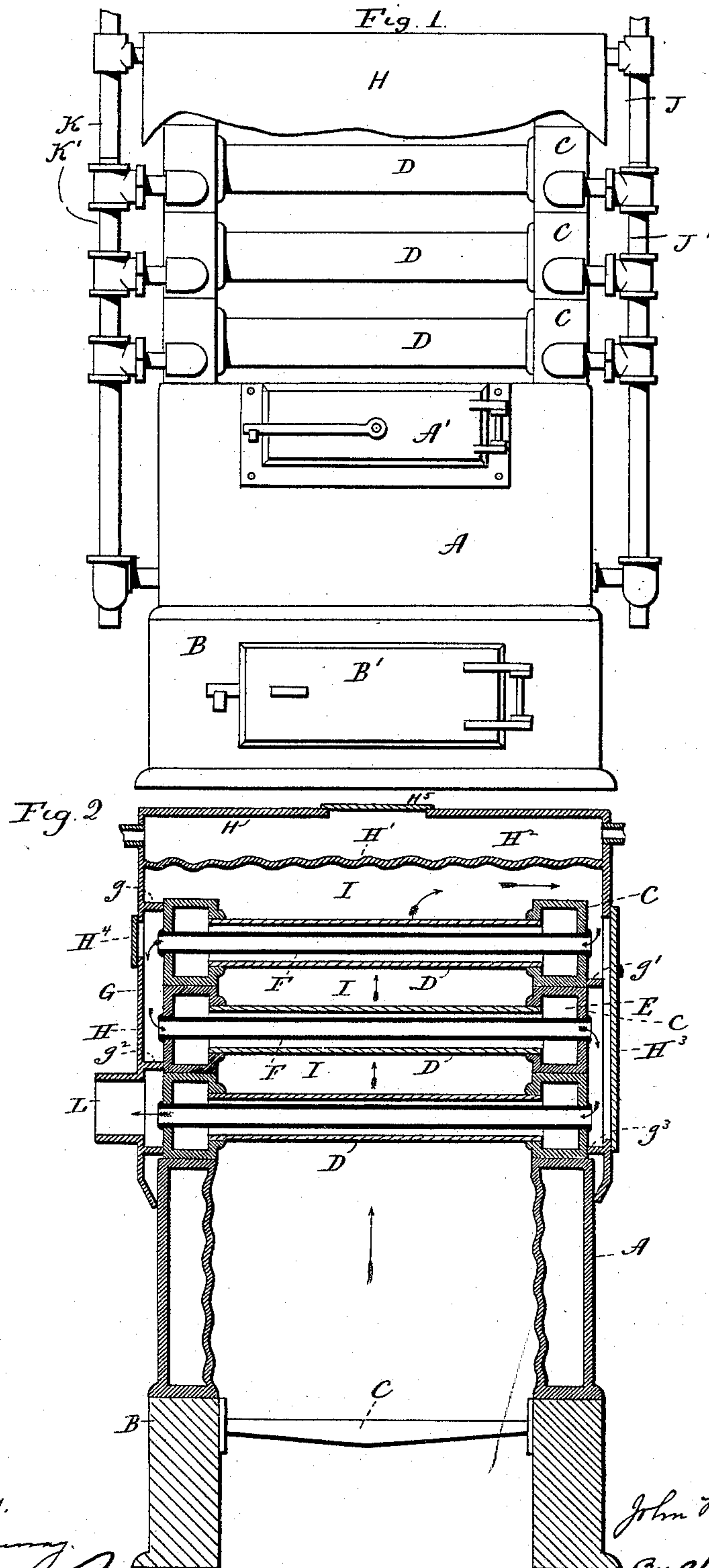
(No Model.)

2 Sheets—Sheet 1.

J. H. McCORMACK.
HOT WATER HEATER.

No. 509,669.

Patented Nov. 28, 1893.



Witnesses,
J. H. Shumway
Asst. C. Secto.

John H. McCormack
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Carey & Seymour

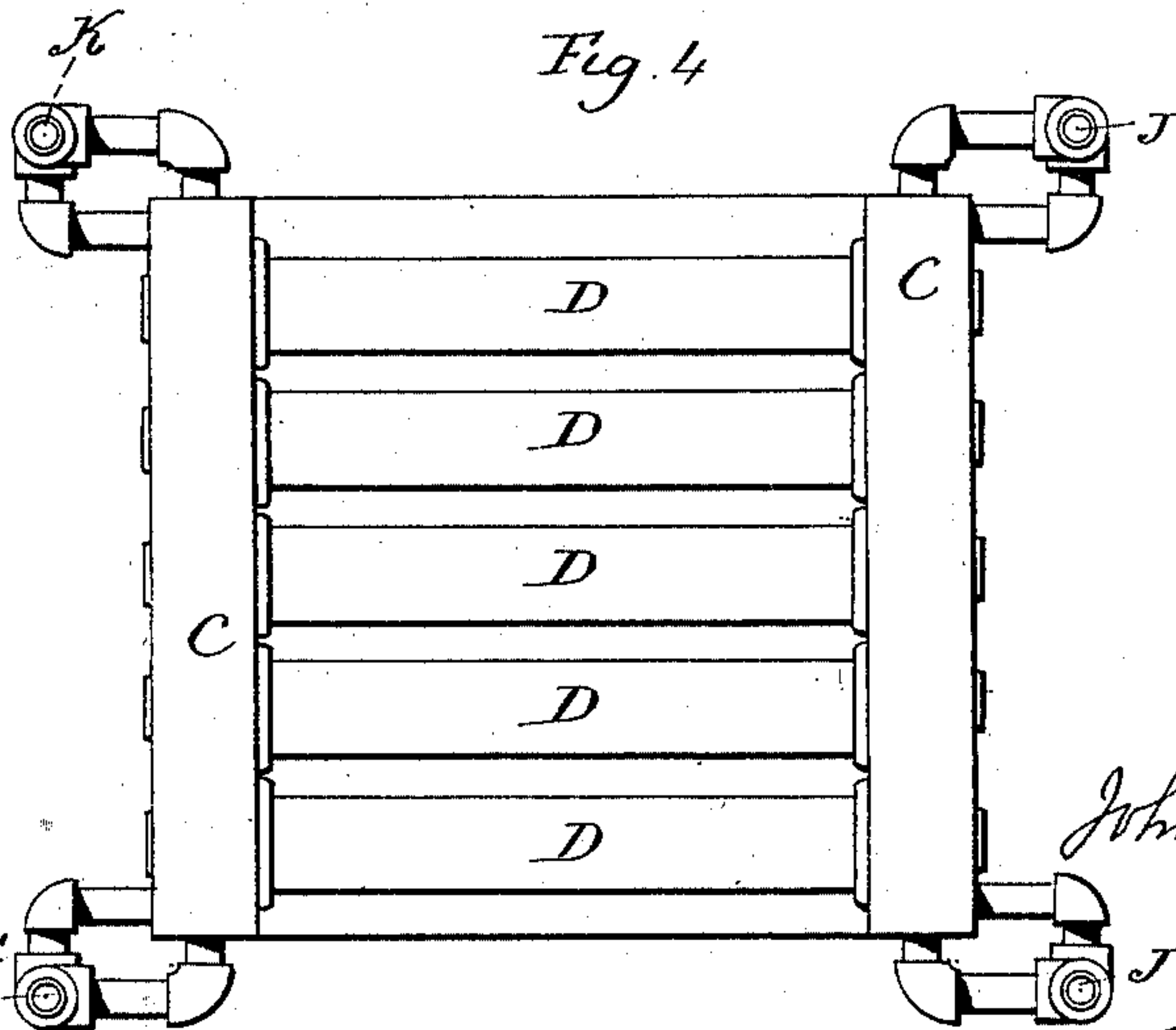
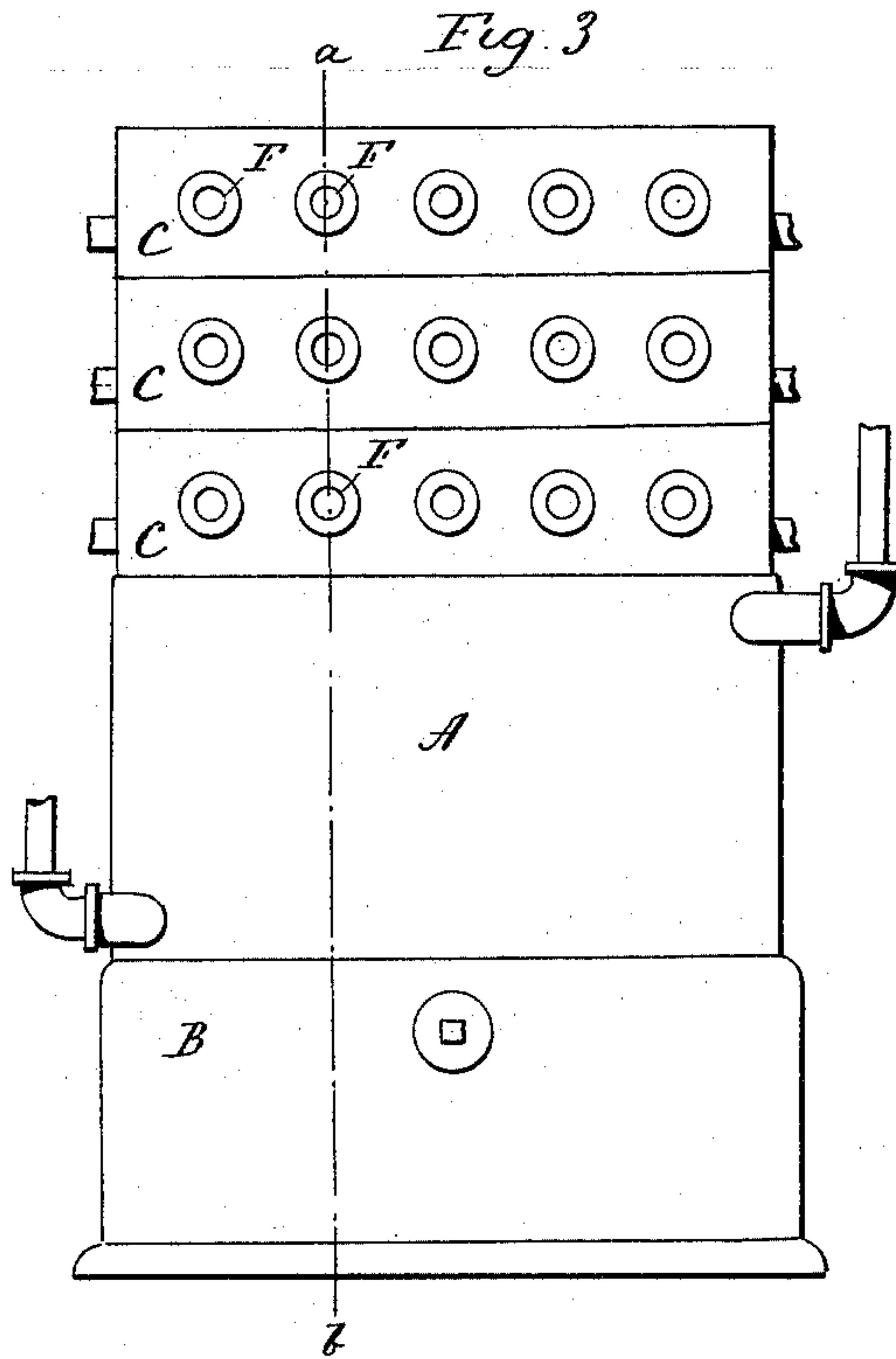
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HOT WATER HEATER.

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Witnesses.
J. H. Shumway.
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UNITED STATES PATENT OFFICE.

JOHN H. McCORMACK, OF MERIDEN, CONNECTICUT.

HOT-WATER HEATER.

SPECIFICATION forming part of Letters Patent No. 509,669, dated November 28, 1893.

Application filed April 14, 1893. Serial No. 470,324. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. McCORMACK, of Meriden, in the county of New Haven and State of Connecticut, have invented a new Improvement in Hot-Water Heaters; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a view in front elevation of a hot-water-heater constructed in accordance with my invention; Fig. 2, a view thereof in vertical section; Fig. 3, a view thereof in side elevation with the casing removed; Fig. 4, a similar plan view.

My invention relates to an improvement in hot-water heaters, designed for use in connection with an apparatus for heating buildings, comprising a closed circuit of pipes and radiators through which hot-water is circulated, the object of my present invention being to produce a simple, durable and effective heater adapted to be readily cleaned and kept in repair, and exposing the maximum heating surface to the water to be heated.

With these ends in view, my invention consists in a hot-water heater having certain details of construction and combinations of parts as will be hereinafter described, and pointed out in the claims.

In carrying out my invention, as herein shown, I employ a hollow rectangular, double-walled fire-pot A, provided with a door A', and having its inner walls corrugated, and supported upon a hollow, rectangular, ash-pot B, furnished with a door B', and a grate C, all of suitable construction. Upon the upper edge of the fire-pot, I place, one above the other, three hollow, rectangular, double-walled, independent sections C the inner side walls of which are connected by parallel water-pipes D, located at equal distances apart, the said pipes opening at their ends into the water-space E, of the section in which they are located. Each of the said sections is also provided with draft-pipes F, passing centrally through the respective water-pipes, and smaller than the same, and extending through the outer side walls of the section, their re-

spective ends opening into a draft-chamber G, formed around all of the said sections by means of a casing H, which fits over them, and extends down below the upper edge of the fire-pot A. The upper end of the said casing has a corrugated inner wall H', forming a rectangular, horizontal water-chamber H², as clearly shown in Fig. 2 of the drawings. The space I, inclosed by the said sections and by the upper end of the casing H, forms in effect the combustion chamber of the heater, being located directly over the fire-pot thereof, and conforming thereto in cross-section.

The water-pipes of the several sections, extend transversely across the said space I, at a right angle to the draft of the heater, and are exposed to the greatest heating effect of the flames therein. The casing H, it should be observed, is provided in one of its side walls, with a large door H³, and in the opposite side wall with a smaller door H⁴, whereby the draft-chamber G, is made accessible for cleaning it out, and also cleaning the draft-pipes F. The top of the casing is also provided with a door H⁵, affording access to the chamber H². The draft-chamber G, is provided with horizontal deflectors *g g' g² and g³*, arranged and constructed to deflect the draft from the draft-pipes F of one section to those of the section next below it, and so on, as will be described hereinafter.

It will be understood that the double-walled fire-pot, the double-walled sections, and the water-chamber formed in the casing, are all to be included, in some suitable manner, in the closed water-circuit which extends throughout those parts of the building to be heated. The water-connections of the several parts just mentioned may be varied, and I do not limit myself to the particular connections shown, which include two vertical inlet pipes J and J', and two vertical outlet pipes K and K', as shown in Fig. 4 of the drawings, the chamber H², the respective sections E, and the chamber inclosed by the fire-pot A, being connected with the said pipes, as seen for instance in Fig. 1 of the drawings; but this arrangement might be reversed, and the pipes K K' used as inlet pipes, and the pipes J and J' used as the outlet pipes, for obviously it is immaterial whether the water circulates through

the heater in one direction or the other. Inasmuch as these water connections may be extensively varied, and as they are obvious, it does not seem necessary to describe them in detail.

Having now described the construction of my improved heater, I will proceed to set forth the mode of its operation. Fire having been kindled in the fire-pot, the water in the compartment formed by the double walls thereof is heated, and put in circulation. The main combustion of fuel takes place, as before stated in the space I, the flames lapping around the water-pipes D, which expose a large surface to their action, and the flames also heating the sections E, which inclose the said space I. The flames also impinge against the corrugated inner wall H' of the casing, and heat the water in the chamber H², which is set in circulation. The further course of the draft will best be understood by Fig. 2 of the drawings. It is prevented from going to the left by the fender g, and therefore passes to the right in the direction of the arrows, and passes down into the draft-chamber until it meets the fender g', whereby it is deflected through the several draft-pipes F of the upper section C. Thence emerging from the left hand ends of the draft-pipes thereof into the draft-chamber again, it is deflected by the fender or deflector g² therein, into the left hand ends of the draft-pipes F of the middle section C, passing thence into the draft-chamber again through the right hand ends of the said pipes. The fender or deflector g³ then deflects it into the right hand ends of the draft-pipes F of the lower section C, and it finally emerges from the left-hand ends of the said pipes, and enters the flue L. In its discharge through the said draft-pipes, the draft heats the water in the water-pipes D, through which the said draft-pipes centrally pass. It will thus be seen that the heat of combustion is utilized to great effect in heating the water passed through the heater, whereby I get a great effect from a given amount of fuel. My improved device is also of simple and durable construction, and its parts are easily accessible for attention and repair.

I may employ three sections, more or less, and change their form and the form of other parts of the heater, as may be found expedient.

I would have it understood that I do not limit myself to the exact construction herein shown and described, but hold myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of my invention.

I am aware that a water-heater having draft-pipes arranged to pass through its water-pipes is old, and that it is old to employ deflectors to give direction to the draft in water-heaters. I do not therefore claim either of these constructions broadly.

Having fully described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

1. A hot-water heater having a fire-pot, a series of water pipes located above the same in horizontal planes and constructed and arranged for the upward passage of the draft through them, water connections for the said pipes, a series of draft-pipes passing through the said water-pipes, a casing inclosing the said water and draft-pipes, and forming a draft-chamber around the same, a draft-flue located at the lower end of the said casing, and means located upon opposite sides of the heater within the said draft-chamber, for deflecting the draft downwardly successively through the draft-pipes in opposite directions alternately, substantially as set forth, and whereby the draft is caused to pass upward over and around the exterior surfaces of the water pipes and then back and forth and downwardly through the draft-pipes, and finally emerge from the lower end of the draft-chamber.

2. A hot-water heater having a fire-pot, a series of independent hollow chambered horizontal sections located one on the other above the said fire-pot, and each provided with water-pipes and with draft-pipes passing through the same, water connections for the said sections, a casing fitting over the said sections, and forming a draft chamber, and means located upon opposite sides of the heater for downwardly deflecting the draft of the heater successively through the said draft-pipes of the said sections, in opposite directions alternately, the said pipes having communication through the said chamber, substantially as described.

3. A hot-water heater having a fire-pot, a series of independent, chambered horizontal sections located one above the other on the upper edge of the said pot, and each section having horizontal water-pipes and draft pipes passing through the same, and together inclosing a combustion chamber through which the draft rises upwardly, passing over and around the said water-pipes, a casing inclosing the said sections and forming a draft-chamber around the same, and provided with a water chamber which is located above them, and with a draft-flue which is located at its lower end, and deflectors located within the said chamber on opposite sides thereof and at different elevations, and arranged to deflect the draft downwardly from the draft-pipes of one section to those of the other in succession in opposite directions alternately, substantially as described, and whereby the draft first passes upwardly over and around the water-pipes and then downwardly in a zigzag course through the draft-pipes, and finally leaves the heater at the lower end of the draft-chamber.

4. A hot-water heater having a rectangular fire-pot, and a series of hollow, rectangular, chambered sections supported one above the other on the upper edge of the same, each section being furnished with water-pipes which

5 extend between opposite sides of it, and with draft-pipes which pass through the said water-pipes, and through the outer walls of the said sides of the sections, water-connections for the said pipes, and a casing surrounding the said sections, and forming a draft-chamber into which the ends of the draft-pipes open, and having fenders or deflectors for deflecting the draft from the pipes of one sec-

tion to the pipes of another and so on, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JOHN H. McCORMACK.

Witnesses:

ROB. E. ALLEN,
E. L. DENING.