

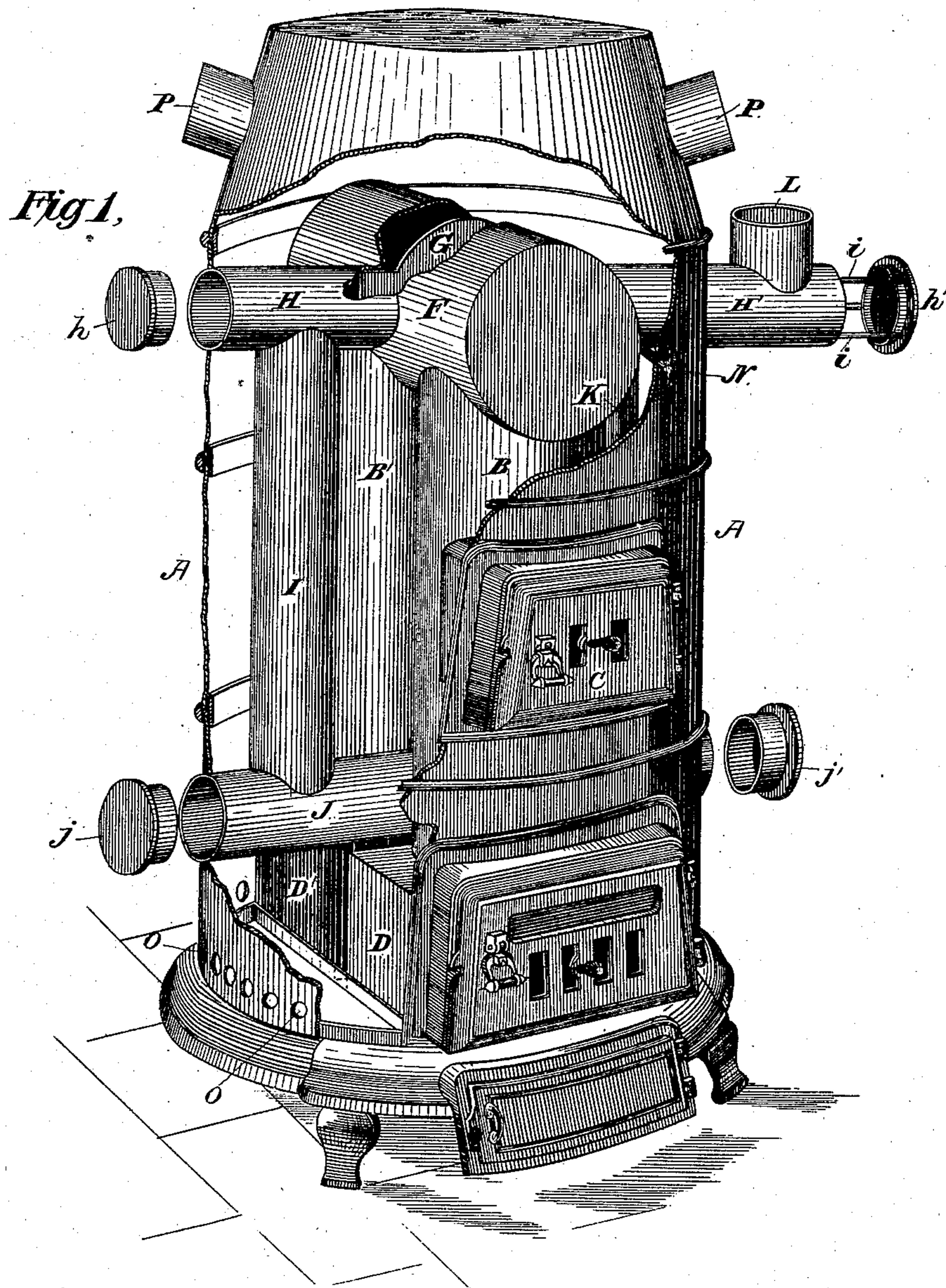
(No Model.)

2 Sheets—Sheet 1.

J. J. RICHARDSON.  
Heating Furnace.

No. 228,119.

Patented May 25, 1880.



Attest:  
Geo. T. Smallwood Jr.  
Walter Allen

Inventor:  
Jeremiah J. Richardson.  
By *Knight Bros*  
Attys.

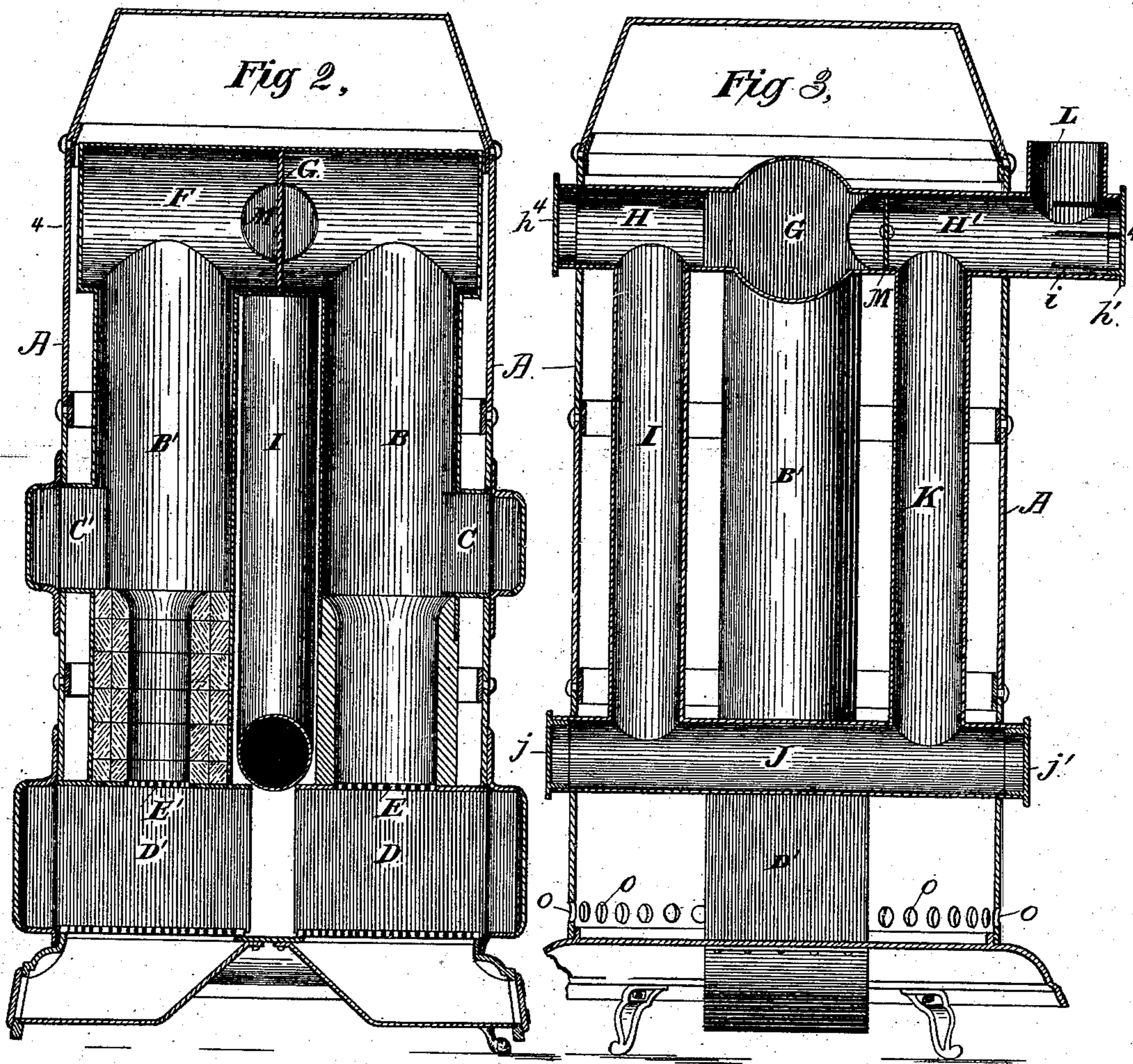
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2 Sheets—Sheet 2.

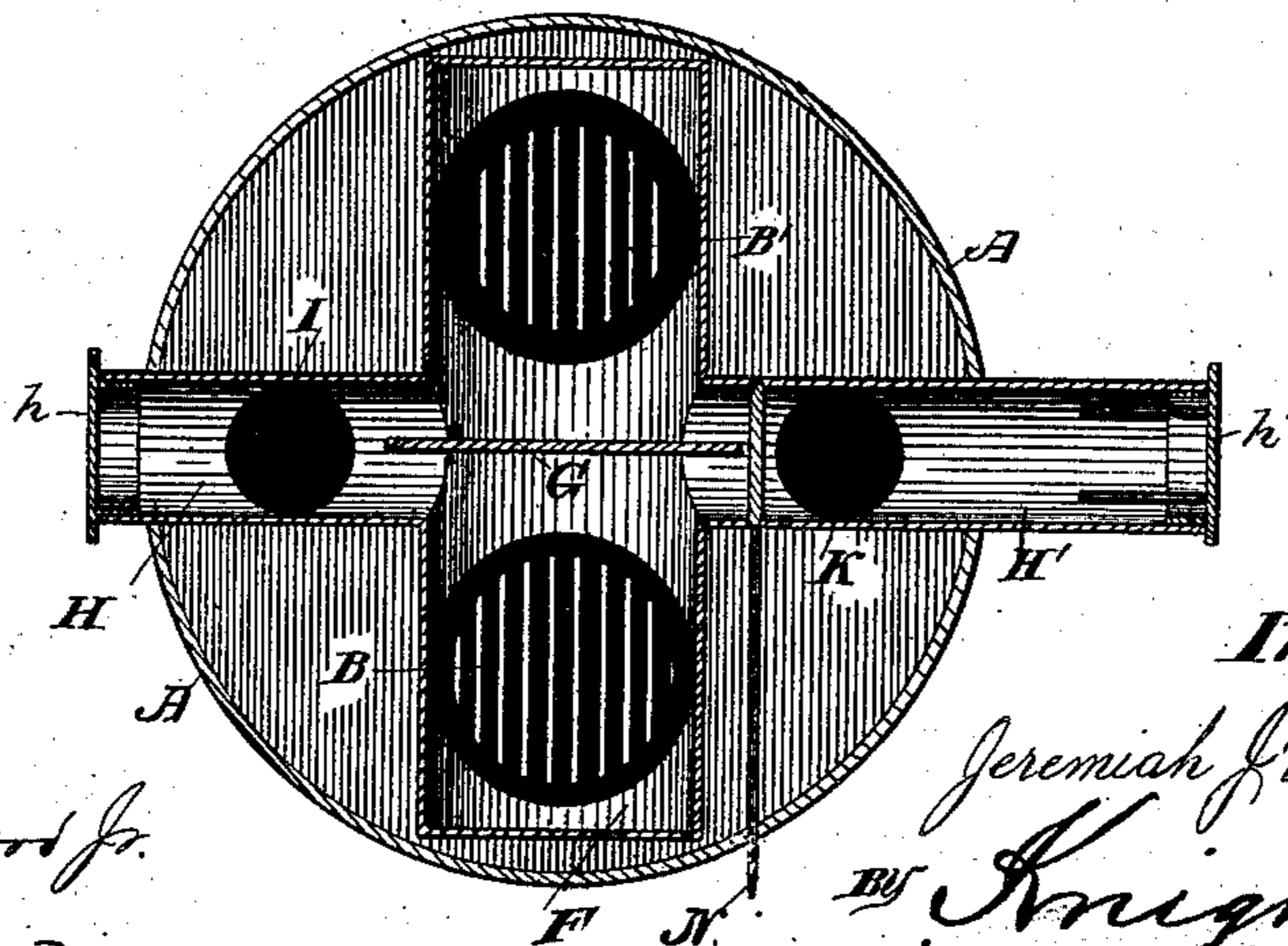
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*Fig 4,*



*Attest:*

Geo. T. Smallwood Jr.  
Walter Allen

*Inventor:*

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Knights Bros  
 Attys

# UNITED STATES PATENT OFFICE.

JEREMIAH J. RICHARDSON, OF BROOKLYN, NEW YORK.

## HEATING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 228,119, dated May 25, 1880.

Application filed March 30, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, JEREMIAH J. RICHARDSON, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented Improvements in Heating-Furnaces, of which the following is a specification.

My improvements have for their object the more economical use of fuel and greater convenience in cleaning the flues and regulating the heat in furnaces.

My improvements relate to a furnace having an exterior casing inclosing two fire-chambers, separated from each other and from the casing by air-spaces, and surmounted by a radiating-drum leading to a common system of flues or to the chimney; and the invention consists, first, in a furnace having two fire-chambers communicating above with a drum on each side of a separating-diaphragm, both compartments of said drum having a common education-flue leading to the chimney; second, in a peculiar system of flues for facilitating the cleaning of the same, as hereinafter more fully described.

In order that my invention may be more fully understood, I will proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 is a perspective view of a hot-air furnace embodying my improvements, part of the exterior casing being broken away. Fig. 2 is a vertical central section through the combustion-chambers. Fig. 3 is a central section in a plane at right angles to that of Fig. 2. Fig. 4 is a horizontal section through the line 4 4, Figs. 2 and 3.

A may represent any suitable shell or casing, constructed of wrought or cast metal or of brick. If of metal it will preferably be made in horizontal sections, as shown, for convenience in construction and transportation. Inclosed within this shell are two combustion-chambers, B B', of wrought or cast metal, having suitable fire-doors C C', and being supported upon ash-boxes D D'. A suitable grating, E E', is provided in the bottom of the chambers B B'.

Surmounting the two vertical combustion-chambers B B' is a horizontal drum, F, partitioned off into two equal compartments by

a vertical plate, G. Said plate may project into transverse flues H H', which lead horizontally from the middle of the sides of the drum F.

The flues H H' project through the shell or casing A, and have their ends closed by caps h h', so that they are easily accessible for the purpose of cleaning. The cap h' is provided with fingers i, by means of which it may be held at any desired position for the purpose of forming a check-draft. Projecting downward from the flue H is a down-draft flue, I, communicating with a horizontal pipe, J, from which an uptake-flue, K, communicates with the flue H', that leads directly to the smoke-pipe L. The horizontal pipe or flue J extends at each end outside the shell or casing A, and has each end closed by caps or lids j j', which may be removed when it is desired to clean out the pipe.

In the flue H', between the openings therefrom into the drum F and uptake K, I place a damper, M, which may be operated from the outside by handle N, so as to allow the smoke to pass directly to the chimney from the drum F through pipe H', or else to cause it to go through the flues H I J K before entering the pipe H', as may be desired. The cold air enters at O and the warm air exits through pipes P.

It will be seen that there are no flues that can become choked with ashes or soot, and every part can be readily cleaned out in a few moments. In large buildings particularly the ordinary furnace must be urged to its utmost capacity in order to warm the building in cold weather, and the furnace that has a fire-pot of sufficient capacity to warm a large building in cold weather gives too much heat in spring or early fall, when but little is required.

By having two fire-chambers in this manner the option of either a single or double fire is obtained; and for further convenience and economy I prefer to make one of the chambers smaller than the other, or one may be lined with brick, so that an extremely moderate heat may be obtained, which may, if desired, be increased to a pitch far beyond what is ordinarily obtained.

When fire is started in one of the chambers it will so heat the division-plate G as to form

a partial vacuum on the opposite side of the plate, and thus assist the draft of the opposite fire; or by opening the doors on the opposite side to the fire a check-draft may be obtained.

5 Although the foregoing description describes definitely only one mode of applying my invention, I do not restrict myself to any particular form or material of any of the elements—  
10 as, for instance, the chambers may be one of cast and the other of wrought metal, or one may be cylindrical, as shown, and the other some more contracted shape, as may be desired.

I am aware that heating apparatus have  
15 been constructed in which the fire-chamber has been divided by a separating-wall into two compartments, and such a construction I do not claim.

Having thus described my invention, the  
20 following is what I claim as new and desire to secure by Letters Patent:

1. A hot-air furnace having two fire-pots and combustion-chambers, B B', communicating, respectively, with the two compartments

of a radiating-drum, F, as and for the purpose 25 set forth.

2. In a hot-air furnace, the fire-chambers B B', surmounted by radiating-drum F, said drum communicating with horizontal flues H H', extending outside the casing of the furnace, and provided with caps h h', substantially as shown. 30

3. The combination of the combustion-chambers B B', drum F, flues H H', downtake I, pipe J, and uptake-flue K, all substantially as 35 described and shown.

4. The combination of chambers B B', drum F, flues H H' and I J K, the flues H H' having caps h h', and the flues J having caps j j', substantially as described, and for the purpose 40 set forth.

5. The combination of the chambers B B', drum F, and flues H H' I J K and damper M, all situated and operating as described.

JEREMIAH J. RICHARDSON.

Witnesses:

WORTHINGTON GREGORY,  
WILLIAM H. BEACH.