

DUNKLEE & MOORE.

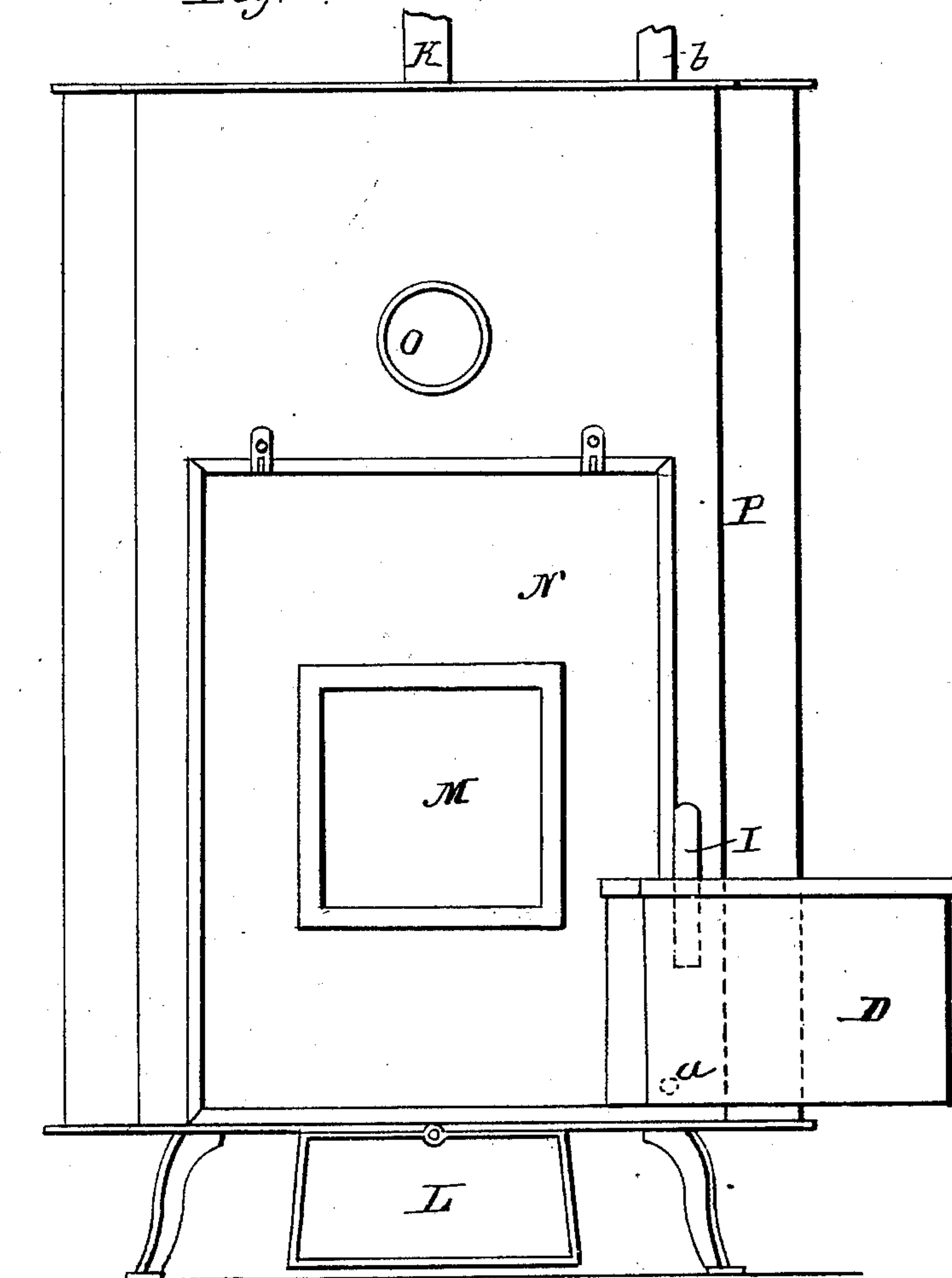
4 Sheets—Sheet 1.

Furnace.

No. 24,858.

Patented July 26, 1859.

Fig. I.



Witnesses:

William E. Smith.
Chas. F. Harriman.
Thos. A. Smith.

Inventors:

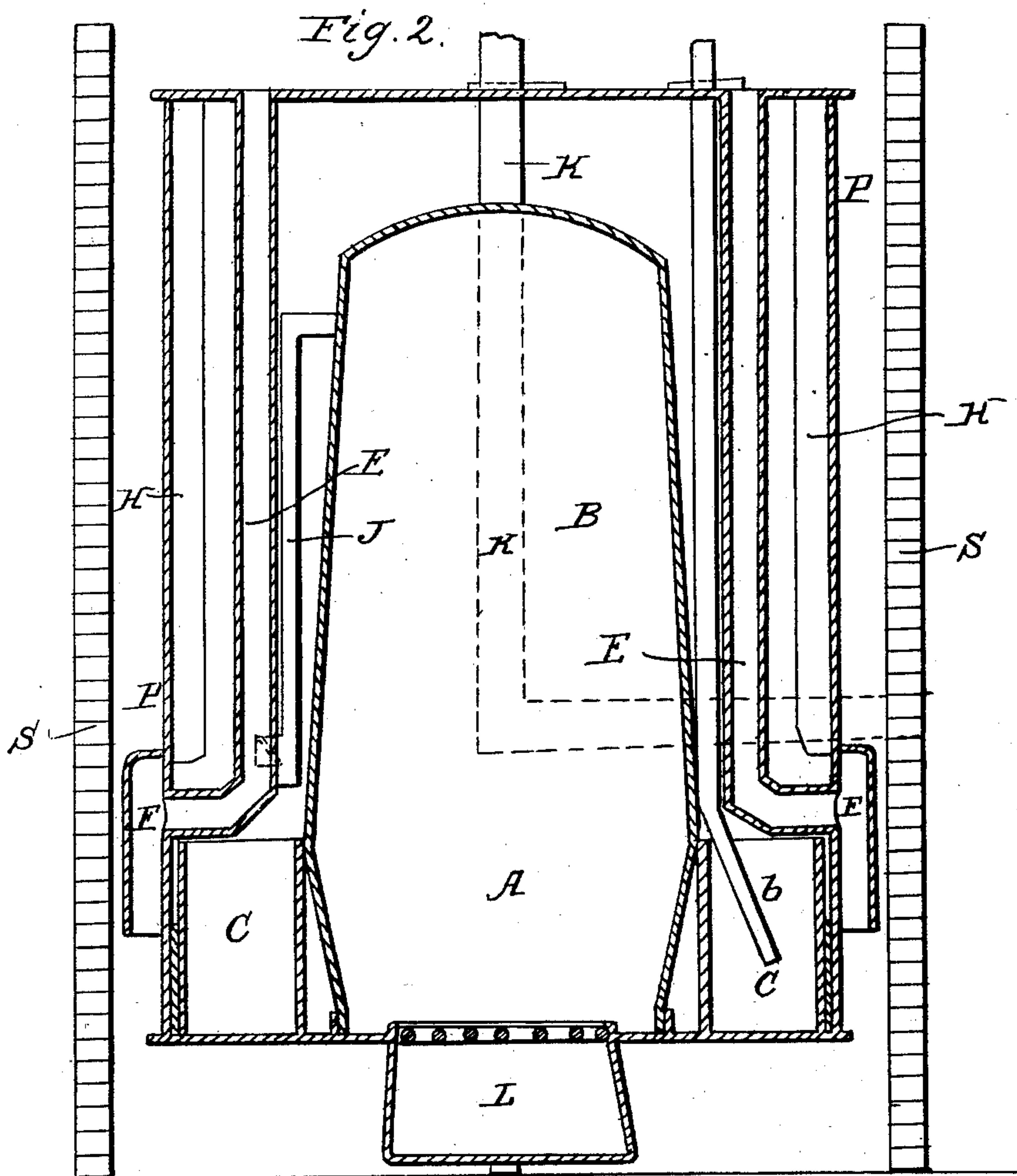
J. Wells Dunklee
William B. Moore

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 George H. Smith

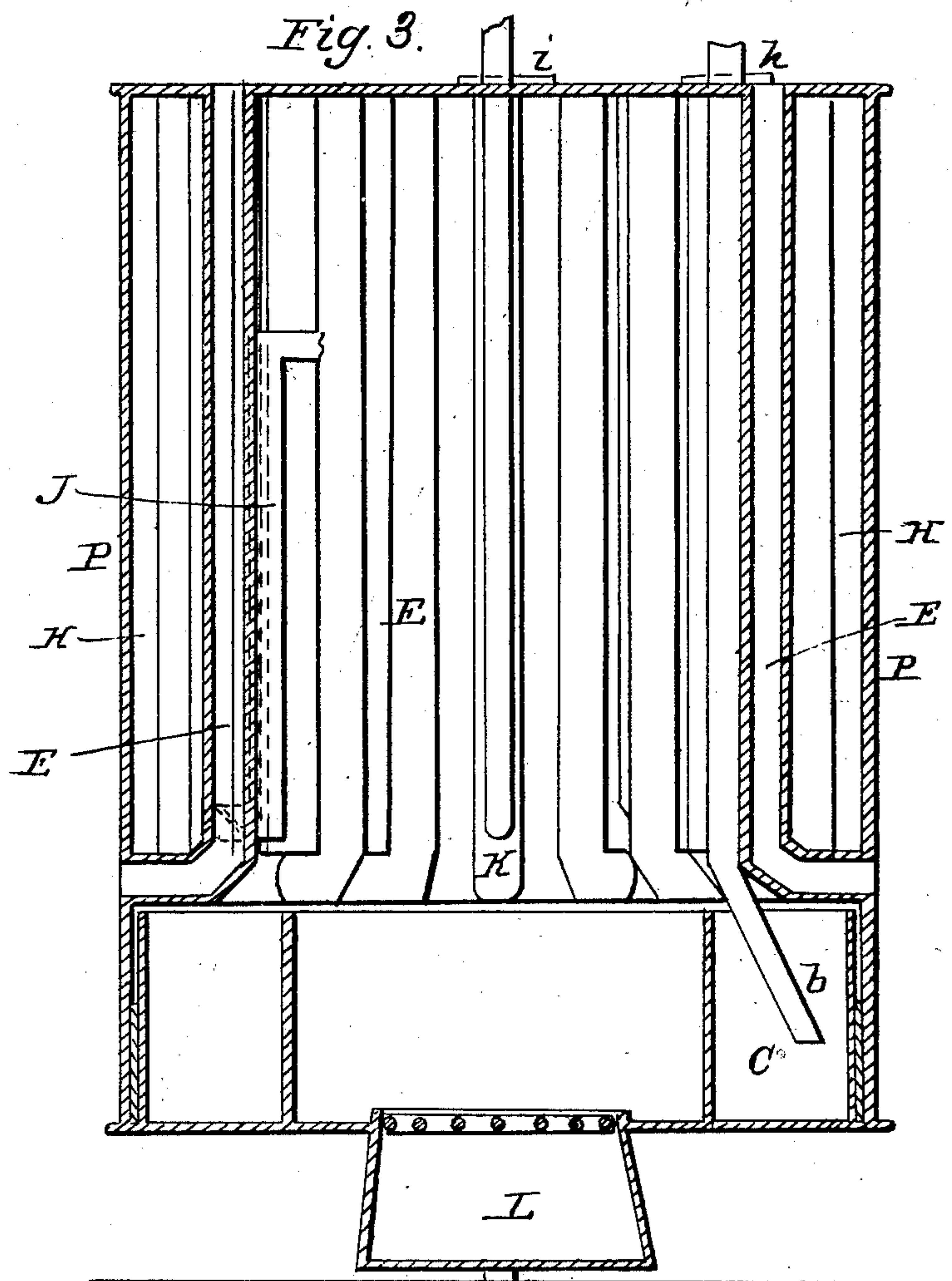
Inventors:
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DUNKLEE & MOORE.

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Furnace.

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Fig. 4.

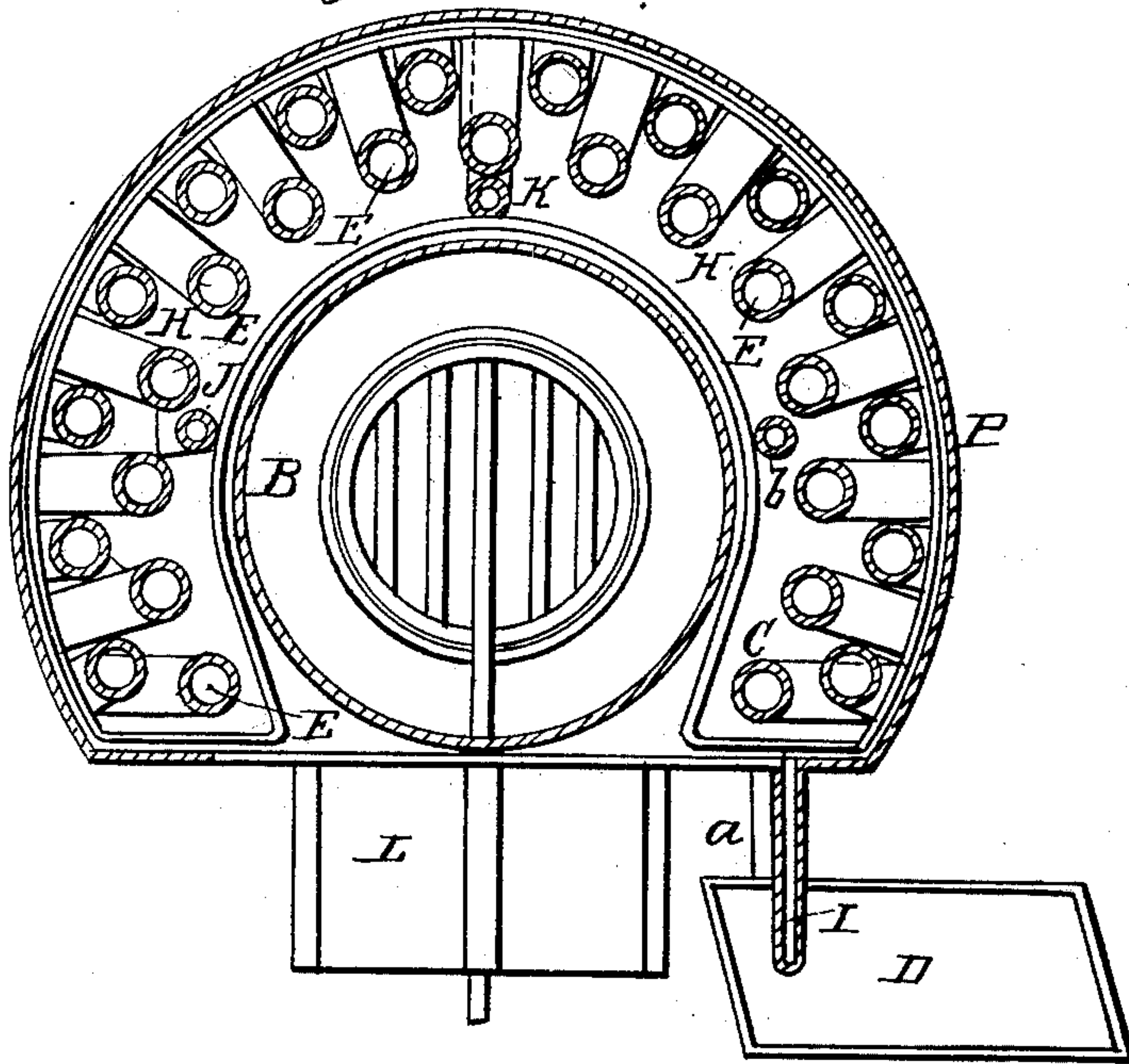
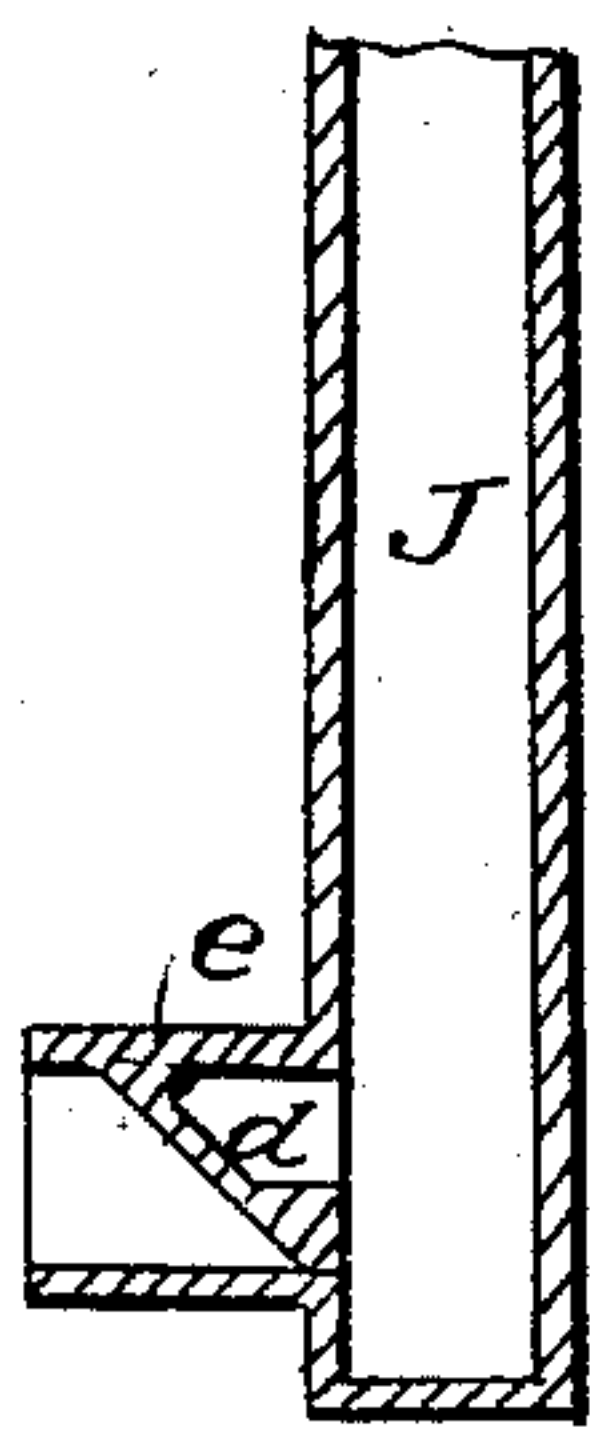


Fig. 5.



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Inventors:
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UNITED STATES PATENT OFFICE.

B. W. DUNKLEE AND W. B. MOORE, OF BOSTON, MASSACHUSETTS.

STEAM-HEATING APPARATUS.

Specification of Letters Patent No. 24,858, dated July 26, 1859.

To all whom it may concern:

Be it known that we, B. WELLS DUNKLEE and WILLIAM B. MOORE, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Air and Steam Heating Combination-Furnaces; and we do hereby declare that the same is fully described and represented in the following specifications and the accompanying drawings, of which—

Figure 1, is a front view of a furnace constructed in accordance with our plan. Figs. 2 and 3, are vertical sections of the same, the latter taken without the fire pot and cone. Fig. 4, is a horizontal section of said furnace, and Fig. 5, a vertical section of the lower end of the escape pipe and its valve, to be hereinafter described.

The object we accomplish by this invention is, first, to secure a soft, humid, and healthful atmosphere by the agency of steam; second, the method or device used to accomplish this result is so arranged as to prevent any possibility of danger from explosion under any circumstances; thirdly, by this device we prevent the possibility of any injurious gases or smoke from entering the room under any circumstances; fourthly, we accomplish these results in an economical manner by dispensing with a steam boiler, and applying it to any ordinary furnace; fifthly, by the use of water and steam as an agency to extract the heat from the surface of the furnace and carry it to the radiating pipes and flues, we are enabled to retain and diffuse a much greater amount of heat than by the agency of air.

By the use of water and steam as extracting and transmitting agents, we are enabled to take away the heat from the radiating surface of the furnace, much faster than by the use of air alone, without increasing the combustion of the fuel.

In the drawings, A, denotes the fire-pot, and B, the cone or drum of an ordinary furnace. Surrounding the fire-pot and extending upward to a level with its top is a water reservoir C, connected by means of a pipe, A, (as shown in dotted lines on Fig. 1,) to an outside receiving reservoir or tank, D, the said tank receiving its supply of water from any proper source, by means of an additional pipe, provided with a water cock and ball regulator. Surrounding the cone or drum, B, and within the outer casing, P, of the furnace and immediately over the

water reservoir, C, is a series of cold air conducting and steam condensing pipes, E, opening at their lower ends with an elbow through the outer casing P, into the petticoat chamber, F, and opening at their upper ends into the hot air chamber of the furnace.

The letter, L, in accompanying drawings denotes the ash pit of the furnace; the letter, M, denotes the feed door or mouth of the furnace through which the fuel is thrown to the furnace pot, A.

The letter, N, denotes that part of the casing that is designed to be moved in case the inner parts should at any time need repairs.

The letter, O, denotes the aperture for the exit of smoke from the combustion chamber through the smoke pipe.

h, denotes the damper to the vaporizing pipe, b, and, i, denotes the damper for the ventilating pipe, K, as shown in Fig. 3, in the drawings.

S, S, is a brick wall surrounding the whole furnace.

The object of the pipes, E, is to receive the air which shall be admitted into the base of the furnace through the cold air duct and petticoat chamber, F, and by means of said air passing through said pipes, and steam circulating over the outside of the said tubes, E, they are rendered the steam condensing power and the heat transmitting medium to the cold air.

The outer casing, P, by receiving the steam on its inner surface, and also by receiving the cold air on its outer surface, aids in condensing the steam and thus transmitting its latent heat to the air to be warmed.

By means of steam being brought in contact with so large amount of surface on the one side, and atmospheric air on the other, as are exposed by the pipes, E, and casings, P, as above described, we render a much greater amount of heat available than by any other contrivance known.

By means of the large surface exposed by the many pipes, E, and the large outer casing, P, we are able to admit air to a surface sufficiently large to enable us to take up all the heat that is brought to the surface of the condensing pipes, E, and casing, P, by the transmitting agency of steam which could not have been done if we had applied it to the smaller surface of the fire pot and dome of the furnace where the steam is applied.

Extending upward from about three (3)

inches below the surface of the water in the reservoir, C, is what we term a vaporizing pipe, *b*, provided with a damper or valve at its entrance into the hot air chamber of the furnace the said pipe being for the purpose of rendering the heated air more humid, and moist when such a result is desirable.

Leading from the space, H, between the fire pot and outer casing, P, and through the said outer casing a short distance above the inner water reservoir is a pipe, I, extended downward by means of an elbow into the water contained in the cold water tank, D, to a varying depth, by this means enabling us to prevent the pressure of the steam from rising above a certain point, and at the same time allowing it to rise to a desirable altitude, and also condensing the escape steam as it escapes through the pipe, I, thus preventing the possibility under any circumstances of an explosion, and also economizing the use of the water.

The gases are led from the bottom of the space, H, by a pipe, J, into the smoke chamber, B, and is provided with a self regulating valve, *d*, turning on a fulcrum, *e*, at its upper extremity as seen in Fig. 5. The lower part of such damper is made of sufficient weight to keep it closed until the steam forces the gases against it with sufficient force to open it and permit them to escape

into the said pipe, J, which leads into the smoke drum or cone of the furnace, or may be carried into the smoke, and with it into the chimney.

For the purpose of ventilation a pipe, K, is led from the floor to be ventilated through the hot air and steam chamber of the furnace from thence leading into the chimney flue.

Having thus described our invention and its mode of operation, what we claim as our invention and desire to secure by Letters Patent is—

The combination of the tubes, E, casing, P, inner and outer reservoirs, C, and, D, and condensation pipes, I, and escape pipe, J, with its valve, *d*, with petticoat chamber, F, and vaporizing pipe, *b*, and the use of the iron known as the Poleux patent metal alloy coating, substantially and for the purposes set forth in the foregoing specifications and accompanying drawings.

In testimony whereof we have hereunto set our signatures this twenty ninth day of June, A. D. 1859.

B. WELLS DUNKLEE.
WM. B. MOORE.

Witnesses:

WILLIAM E. SMITH,
CHAS. A. DEARBORN, Jr.