

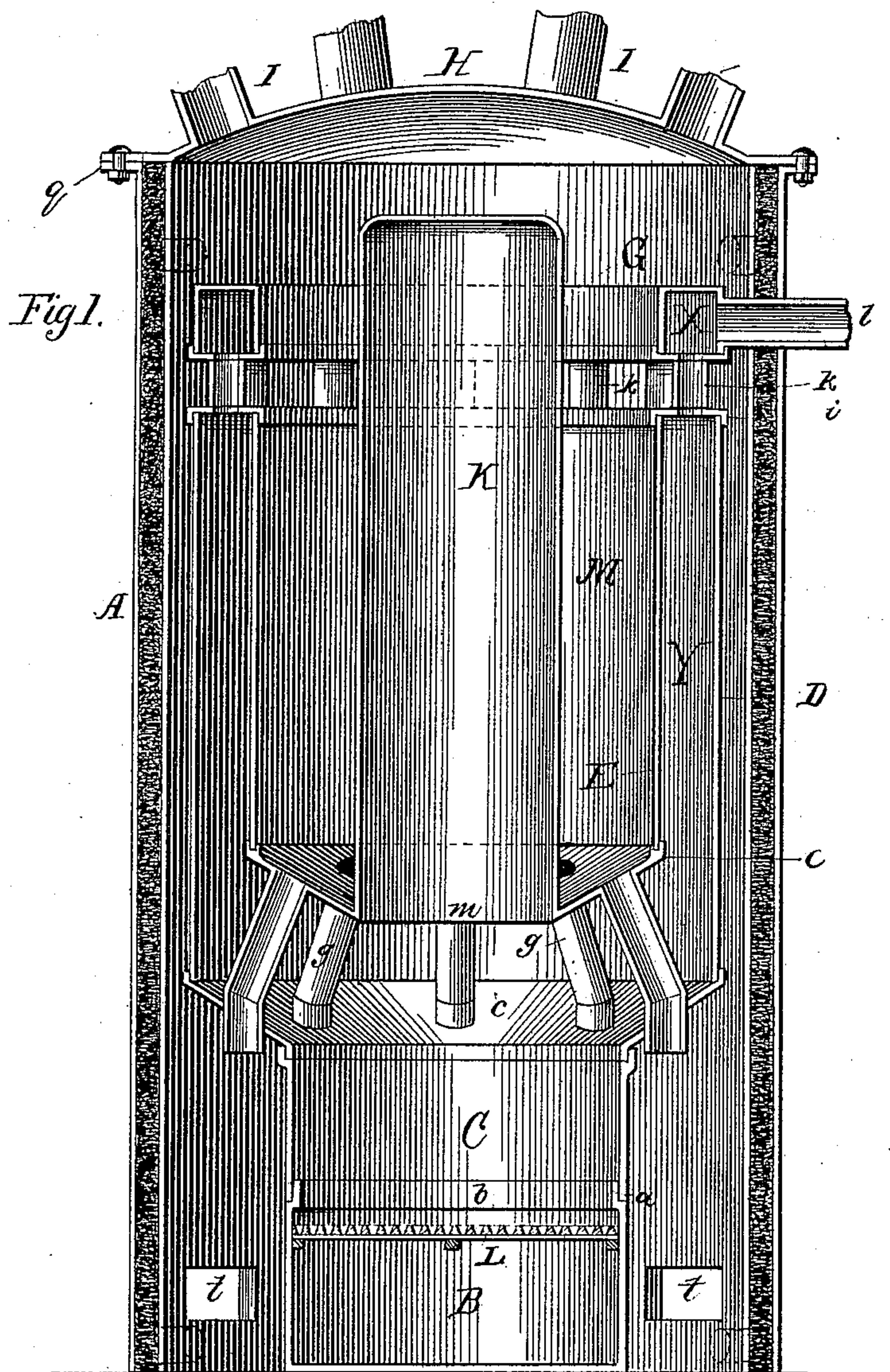
(No Model.)

3 Sheets—Sheet 1.

J. EPPLEY.  
FURNACE.

No. 348,116.

Patented Aug. 24, 1886.



Witnesses:  
*John H. Hinkle*  
*H. C. Farnsworth*

*John Eppley,*  
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Attorneys.

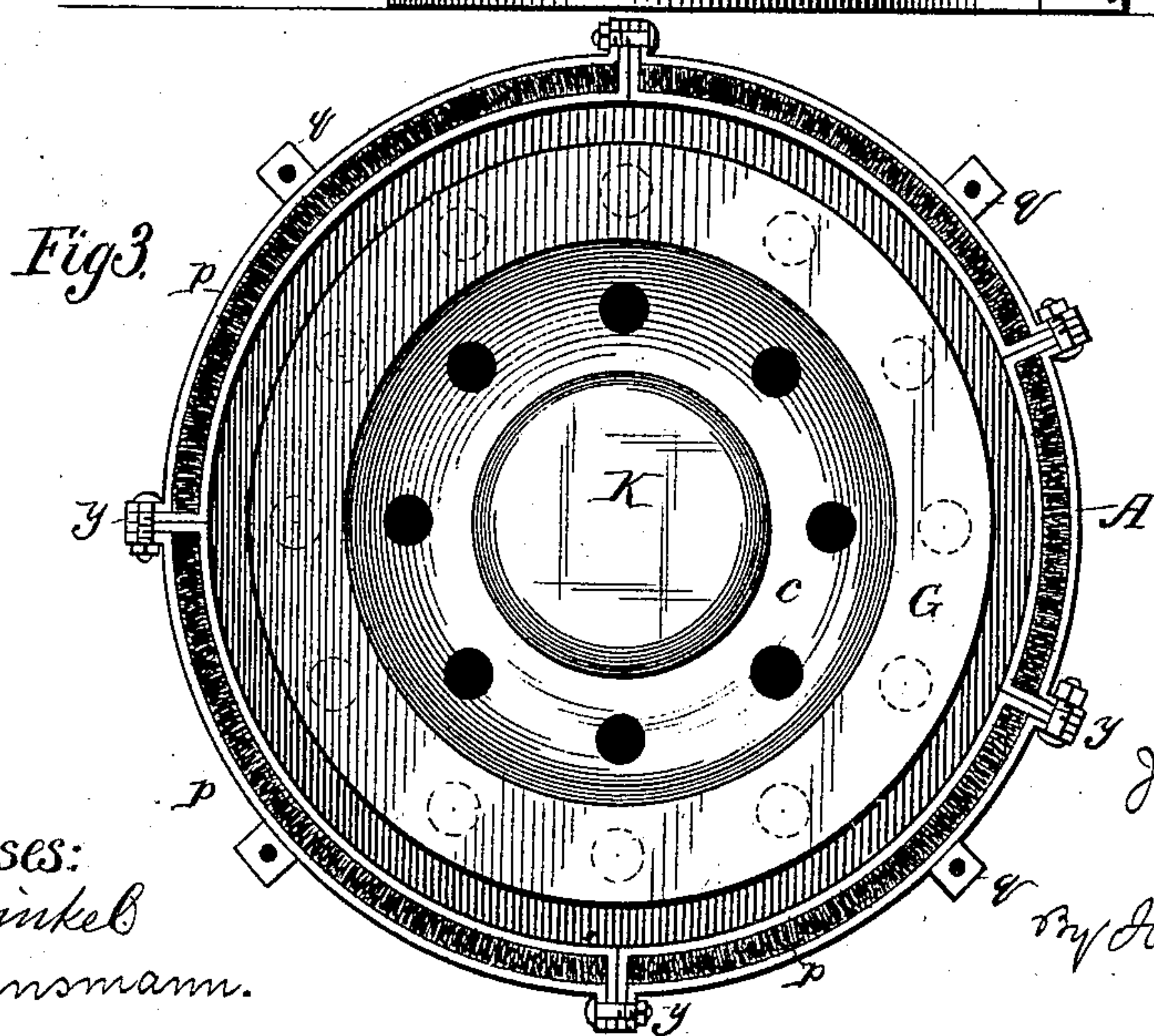
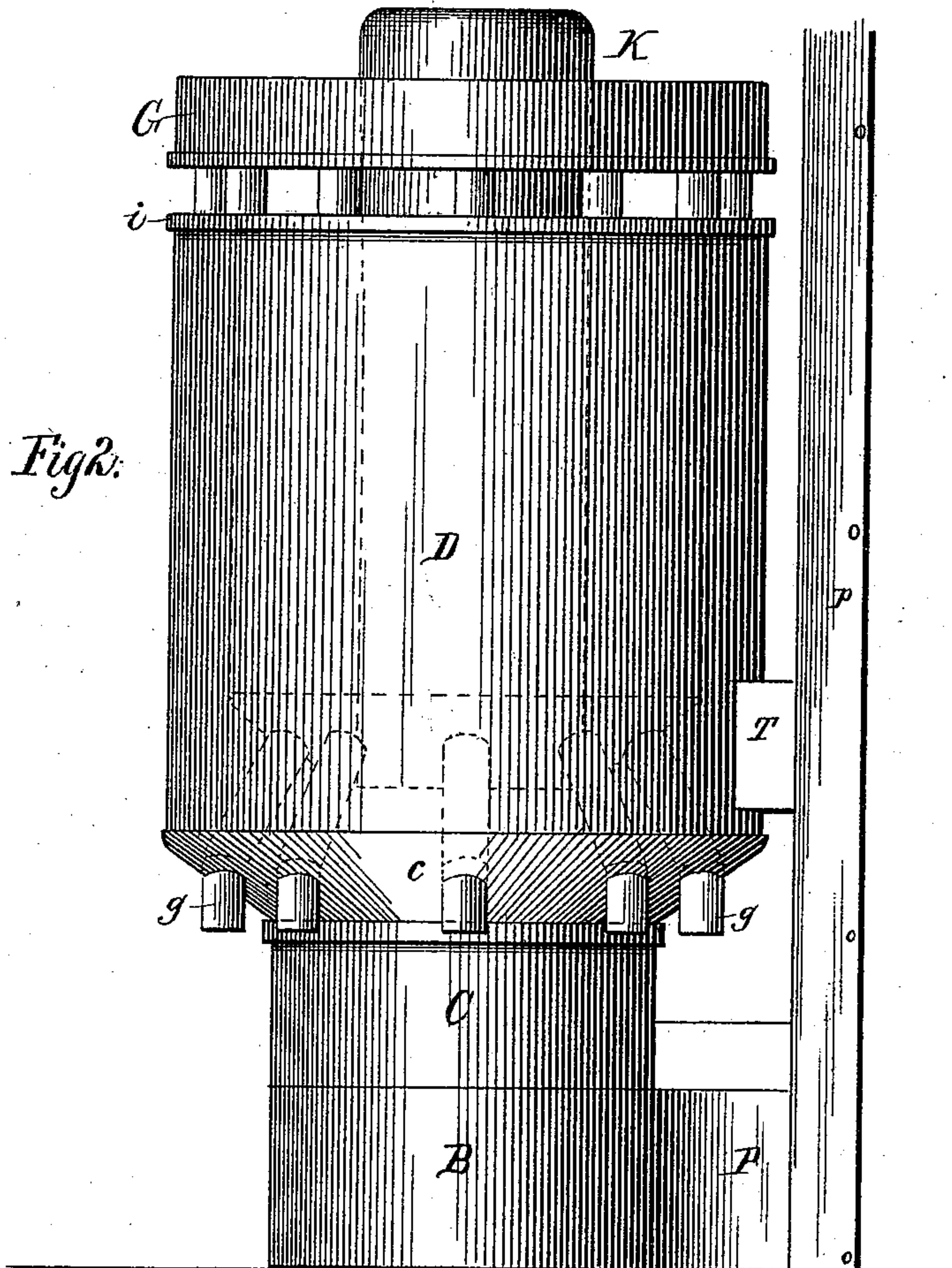
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3 Sheets—Sheet 2.

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FURNACE.

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Patented Aug. 24, 1886.



Witnesses:  
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(No Model.)

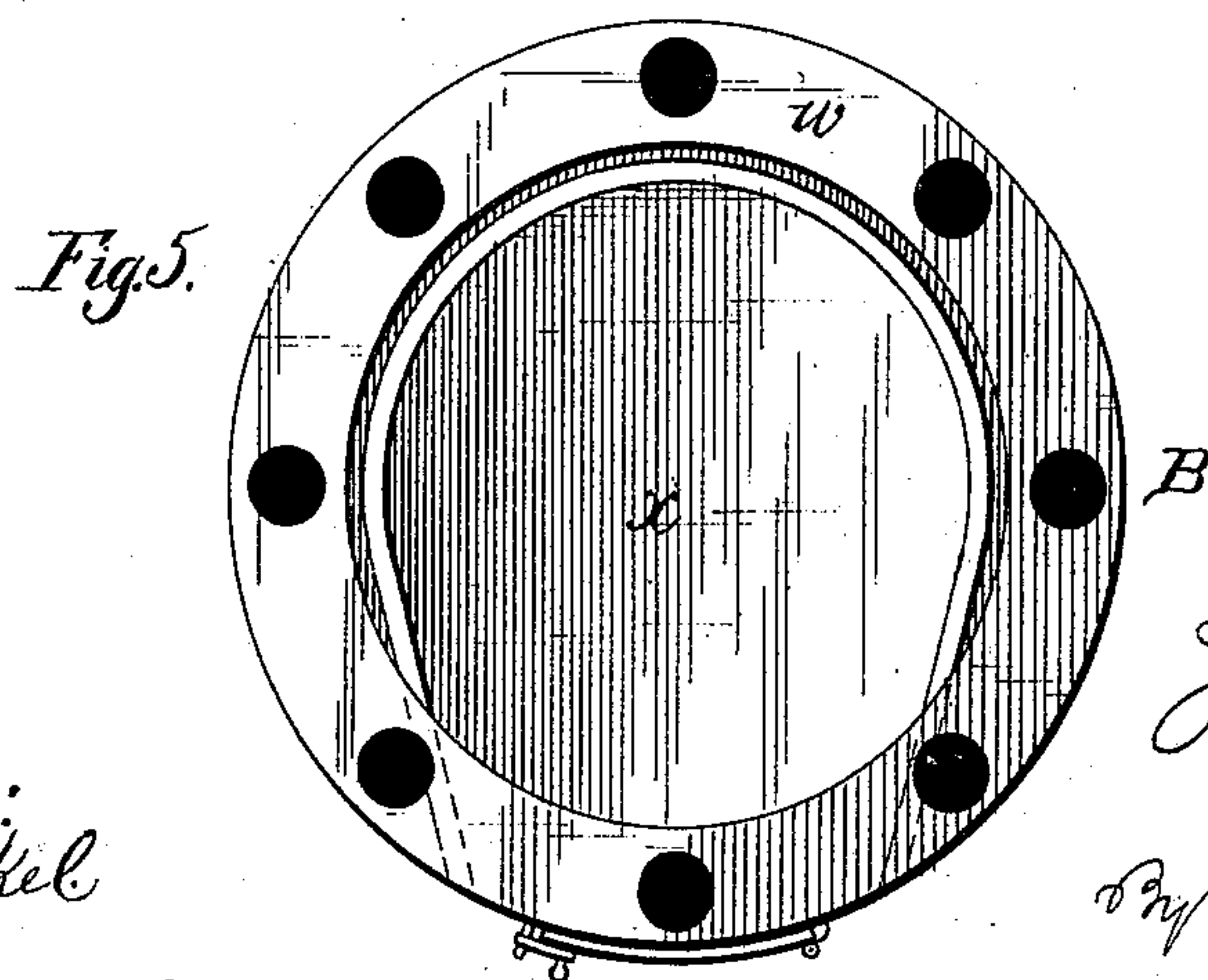
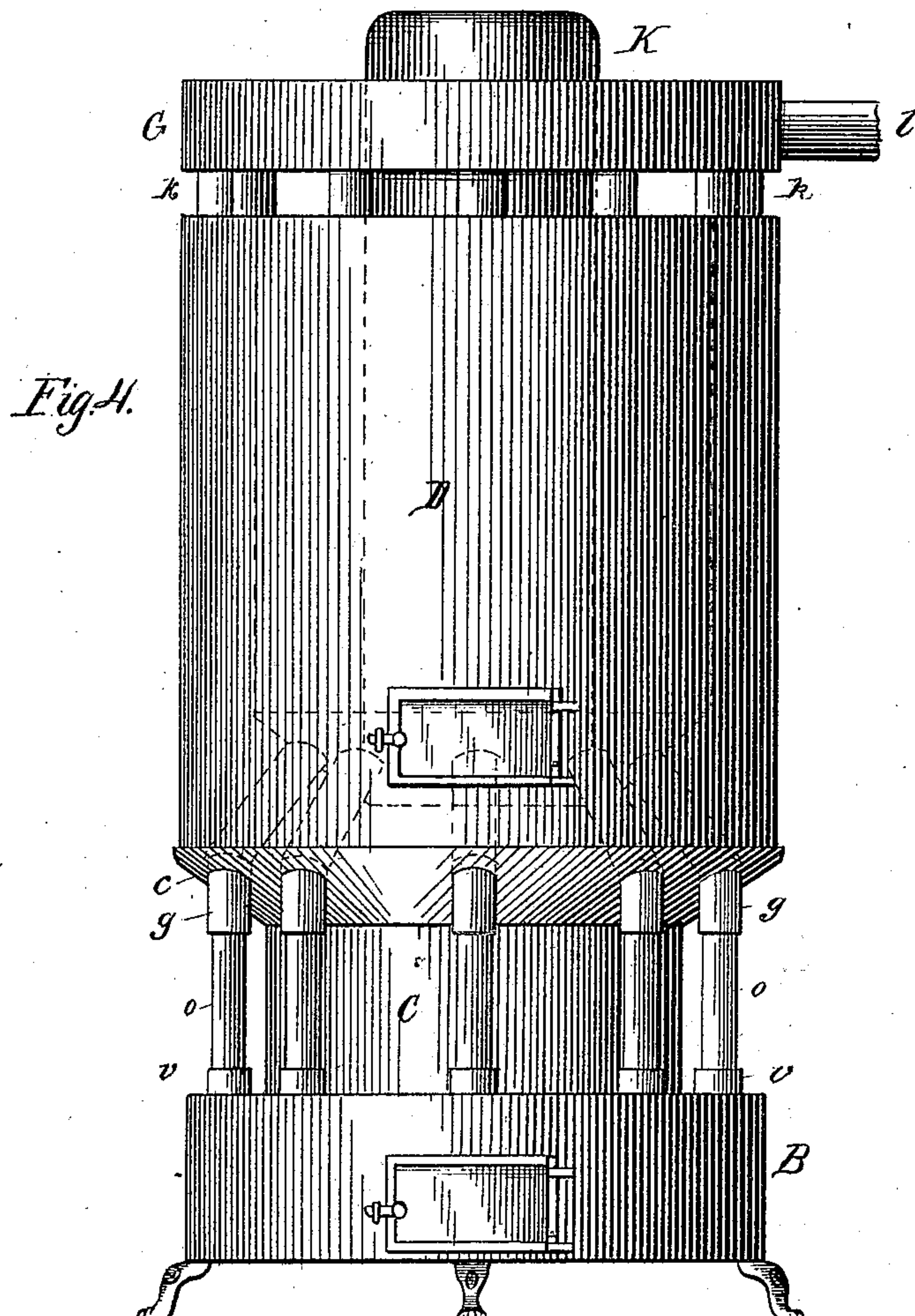
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# UNITED STATES PATENT OFFICE.

JOHN EPPLEY, OF YORK, PENNSYLVANIA.

## FURNACE.

SPECIFICATION forming part of Letters Patent No. 348,116, dated August 24, 1886.

Application filed May 19, 1884. Serial No. 131,986. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN EPPLEY, a citizen of the United States, residing at York, in the county of York and State of Pennsylvania, have invented certain new and useful Improvements in Furnaces, of which the following is a specification.

My invention relates to improvements in hot-air furnaces, and has for its object to construct a furnace with great heating capacity in proportion to the amount of fuel consumed, and which may be used as an ordinary furnace, or easily converted into a portable heating-stove.

The invention consists in the general construction of the furnace to produce the greatest possible amount of heat with the least consumption of fuel, as described hereinafter, and illustrated in the accompanying drawings, in which—

Figure 1 is a central vertical section of a furnace embodying my improvements. Fig. 2 is a side view, the outer casing removed. Fig. 3 is a plan view thereof with the top removed. Fig. 4 is a front elevation of the furnace converted into a portable heater; and Fig. 5 is a plan view of the base used in the form of heater shown in Fig. 4.

A represents the outer wall of the furnace, it consisting of two concentrically-arranged casings, between which is asbestos, mineral wool, or other non-conducting material. The casing has a top, H, from which extend the hot-air pipes I.

Inclosed in the casing A is the heater proper, which consists, essentially, of a base, B, cylinders C, D, and E, reverberatory dome K, and circular casing G, these parts being generally arranged as clearly shown in Fig. 1, and hereinafter particularly described. The front portion of the base B is elongated, as shown in Fig. 2, to form a neck, P, which extends through the outer wall of the furnace, and through which the interior of the ash-pit in the base may be reached.

Supported on suitable bearings in the base B above the ash-pit is a grate, L, of usual construction, and at the upper edge of the base is a flange or ring, b, above a shoulder, a, on which rests the cylinder C, constituting the fire-pot of the furnace.

Resting on the upper edge of the cylinder

C, and secured thereto in any suitable manner or forming part thereof, is an outwardly projecting and inclined plate c, the outer edge of which is turned up to form a flange, within which rests the cylinder D, constituting the outer wall of the combustion-chamber.

Inside of the cylinder D is arranged the cylinder E, which is much smaller in diameter than the former, to form an intervening chamber, Y, and is supported therein on a plate, e, which extends to the edge of the dome and is similar in form to the plate c.

Through the plates c and e, and directly through the fire-pot, extend pipes g, the lower ends of which may project through the lower plate, c. These pipes constitute conduits for the admission of cold air from the outside of the fire-pot to the interior of the cylinder E.

On the upper edges of the cylinders D E rests a circular perforated plate, i, constituting the top of the chamber Y, which communicates with a supplemental chamber, X, in the casing G, through pipes k. From one side of the casing G extends the escape-pipe l, which connects with the flue.

Supported on the plate e, and above the central opening, m, therein, is the reverberatory dome K, into which the heated gases and products of combustion rise, and then descend and circulate around the pipes g, thoroughly heating the latter, and then pass up through the combustion-chamber between the cylinders D E, through the pipes k, and into the supplemental chamber X, where they are collected and directed through the outlet-pipe l to the flue.

The cold air is admitted to the furnace through openings t in the outer wall, A, near the bottom thereof, and passes upward into the pipes g, which conduct it directly through the fire-pot and into the heating-chamber M, where it is exposed to the heated sides of the dome K and cylinder E and ascends to the top of the furnace, from where it is distributed through the pipes I to the apartments to be heated. It will be seen that by this construction the parts of the furnace are all thoroughly exposed to the direct action of the fire and become thoroughly heated, and that the cold air from the openings t is caused to pass into intimate contact with the highly-heated surfaces and takes up the heat rapidly and es-



capas freely. The outer wall or casing, A, is made of metallic plates, as shown, and is divided vertically into a number of sections, *p*, all of which are provided at the edges with flanges *y*, by which the several sections may be bolted together. By thus dividing the outer casing, A, into vertical sections any particular section may be removed without disturbing the rest, and thus all parts of the furnace proper may be easily reached for any purpose without disturbing the air-pipes I. At the upper ends of the sections *p* are provided ears *q*, to which the cover H may be bolted and held in place above the furnace.

In one of the sections *p* of the casing A are two openings, one of which is adapted to receive the neck P of the base B, and the other opening is arranged to receive a neck, T, extending from the side of the cylinder D, and through which the fuel is fed into the fire-pot. These openings are closed by suitable doors.

It is sometimes desirable to use the furnace as a portable heater, and to make it available for this purpose the outer casing, A, is removed and the form of base shown in Figs. 4 and 5 may be used. In this instance the base B is of circular form and provided on its under side with suitable openings outside of the ash-pit *x*, through which the cold air is admitted to the heater. The upper plate, *w*, of the base is provided with a series of openings having collars *v*, into which fit the lower ends of an additional set of pipes, *o*. The upper ends of the pipes *o* fit into the downwardly-projecting ends of the flues *g* in the plate *c*. By this arrangement a direct connection between the base and furnace is effected, and the furnace thus adapted for use as an ordinary stove without otherwise altering the construction of its parts, so that it may be easily employed for either purpose.

Instead of filling the space between the walls of the outer casing with asbestos, the said casing may have upper and lower openings whereby to permit a current of cold air to act as the non-conductor.

I claim—

1. The combination of the outer sectional non-conducting casing, A, the inner cylindrical casings, D E, and central dome, K, extending above said casings D E, the latter casings and dome being connected to form an air-chamber, M, and gas-chamber Y, as described, the fire-pot C, having at its upper extremity a flange, and air-pipes *g*, extending through said flange and communicating with the chamber M, substantially as described.

2. The combination of the outer sectional non-conducting casing, A, the inner cylindrical casings, D E, and central dome, K, extending above said casings D E, the latter casings and dome being connected to form an air-chamber, M, and gas-chamber Y, as described, the fire-pot C, having at its upper extremity a flange, air-pipes *g*, extending through said flange and communicating with the chamber M, and an independent annular casing surrounding the dome above the chamber Y, and communicating with the latter and with the chimney, substantially as described.

3. The combination, in a furnace, of the base composed of flanged sections B C, outwardly-extending flange *c*, supported at and within the flange at the upper end of the section C, casings D E, dome K, extending above said casings, the dome and casing E being connected and supported by a plate, *e*, to constitute an intervening chamber, M, air-pipes extending through said flange *c* and plate *e*, an annular casing communicating with the flue and with the chamber between the casings D and E, and an outer sectional non-conducting casing, A, all substantially as and for the purpose set forth.

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

JOHN EPPLEY.

Witnesses:

G. WASHINGTON LOUCKS,  
GEORGE B. KRABER.