

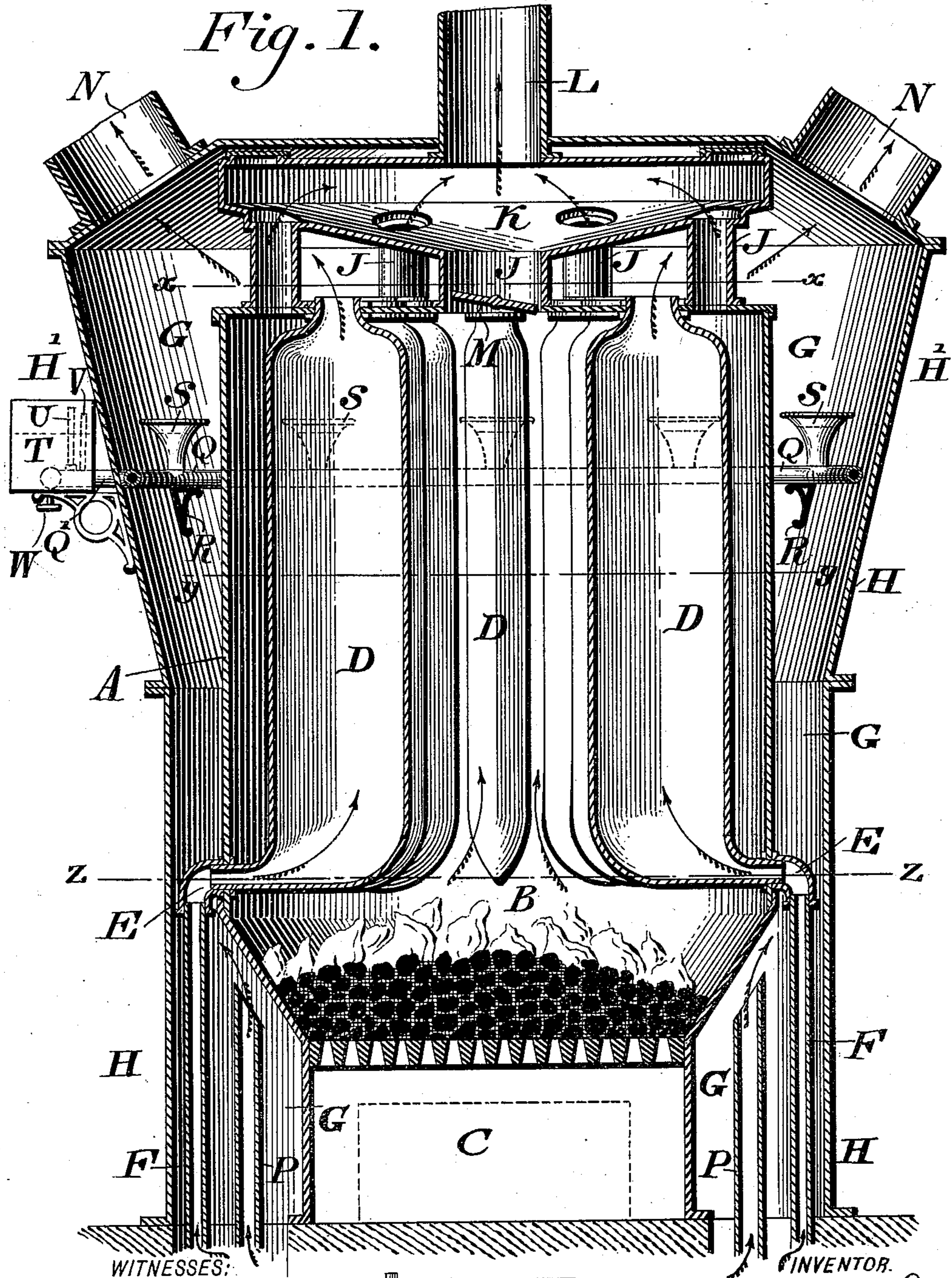
(No Model.)

2 Sheets—Sheet 1.

D. D. READ.
FURNACE.

No. 545,723.

Patented Sept. 3, 1895.



WITNESSES:
P. H. Nagle.
L. Douville.

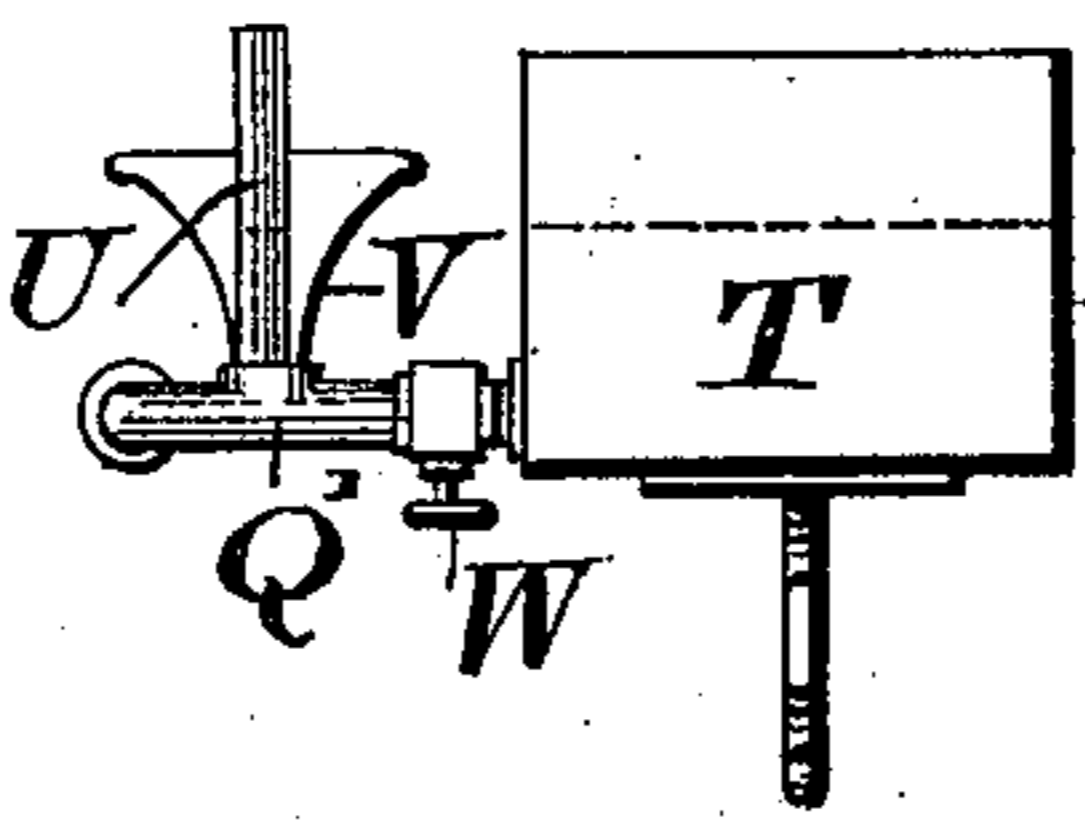


Fig. 5.
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 BY
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(No Model.)

2 Sheets—Sheet 2.

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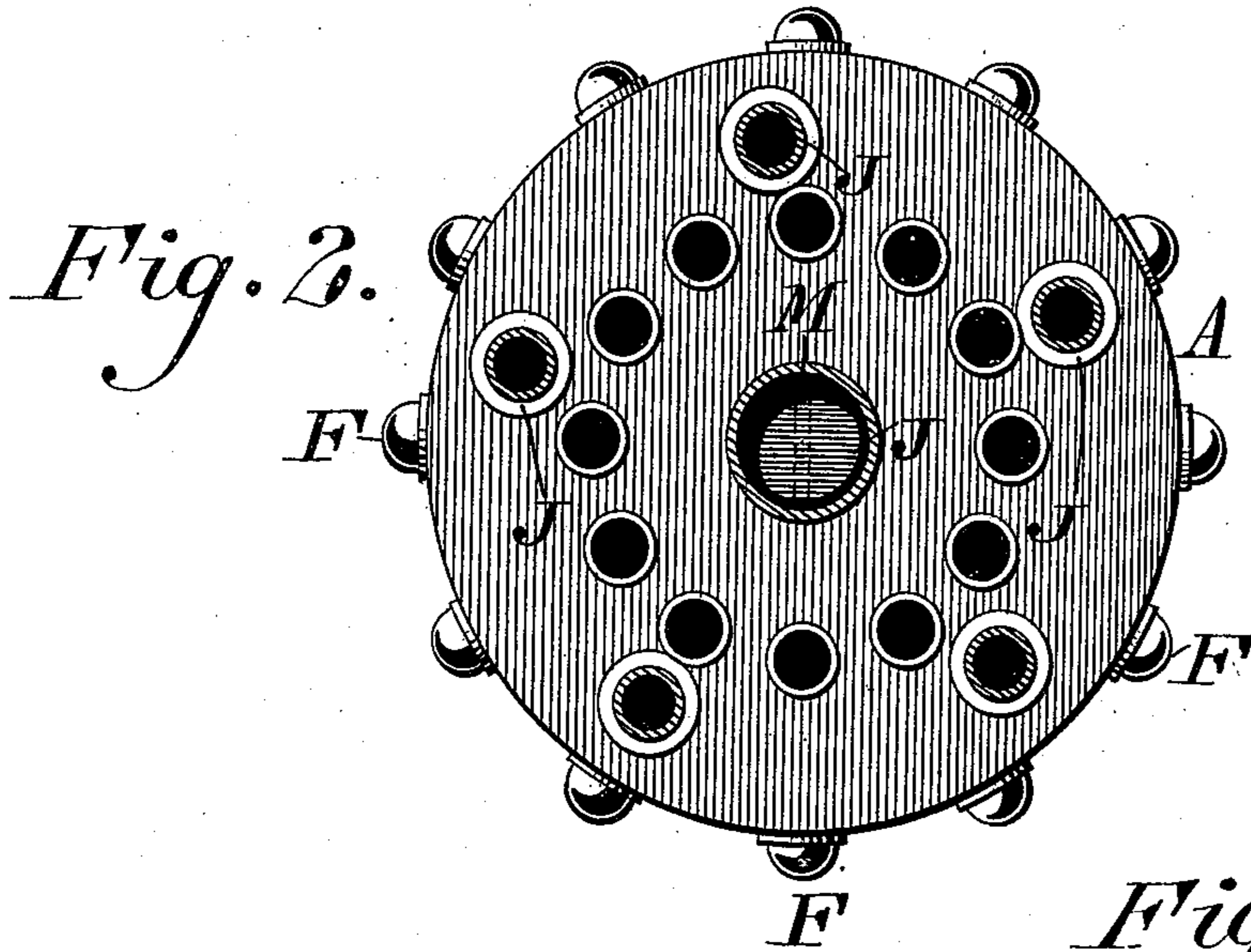


Fig. 3.

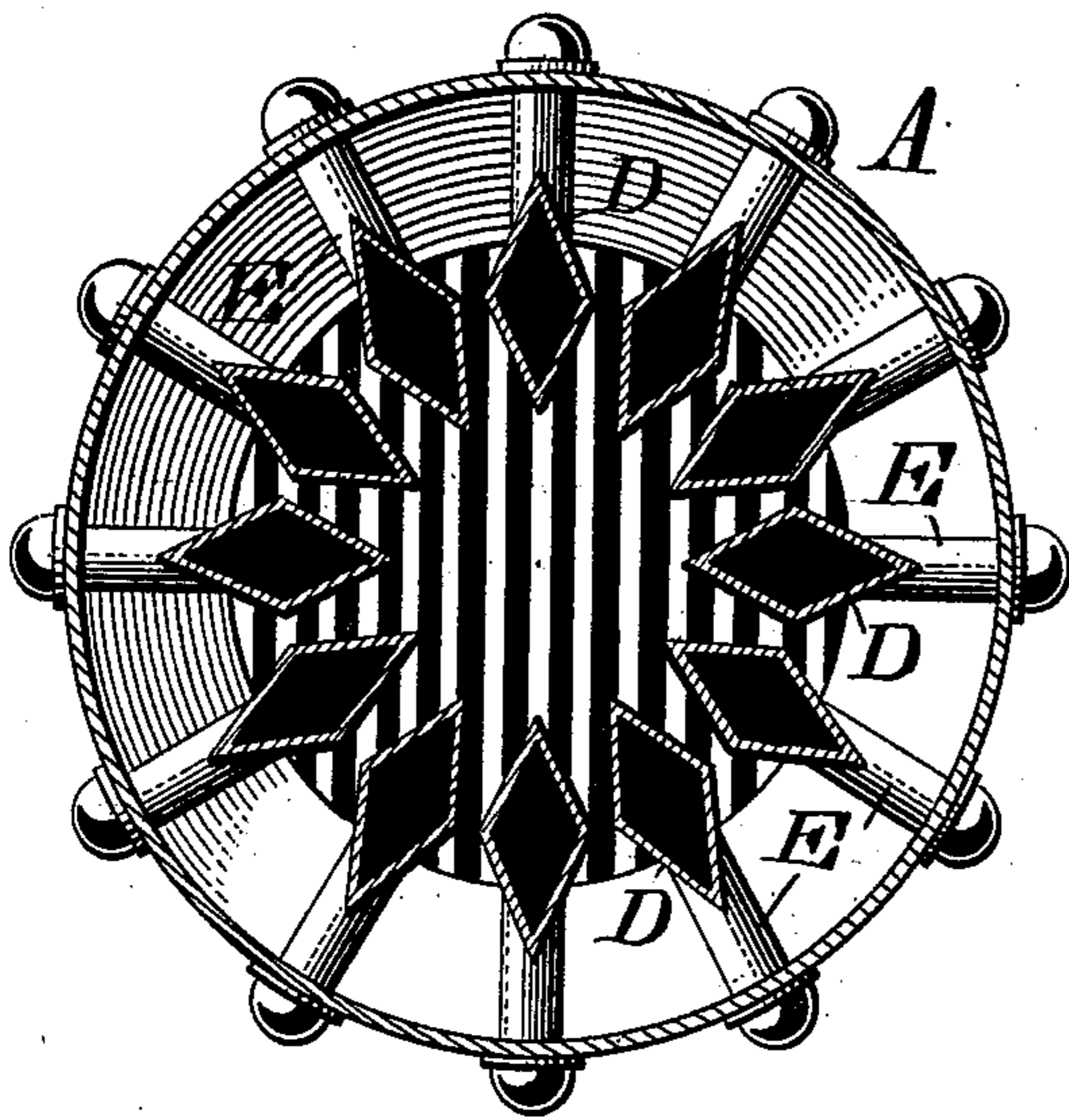
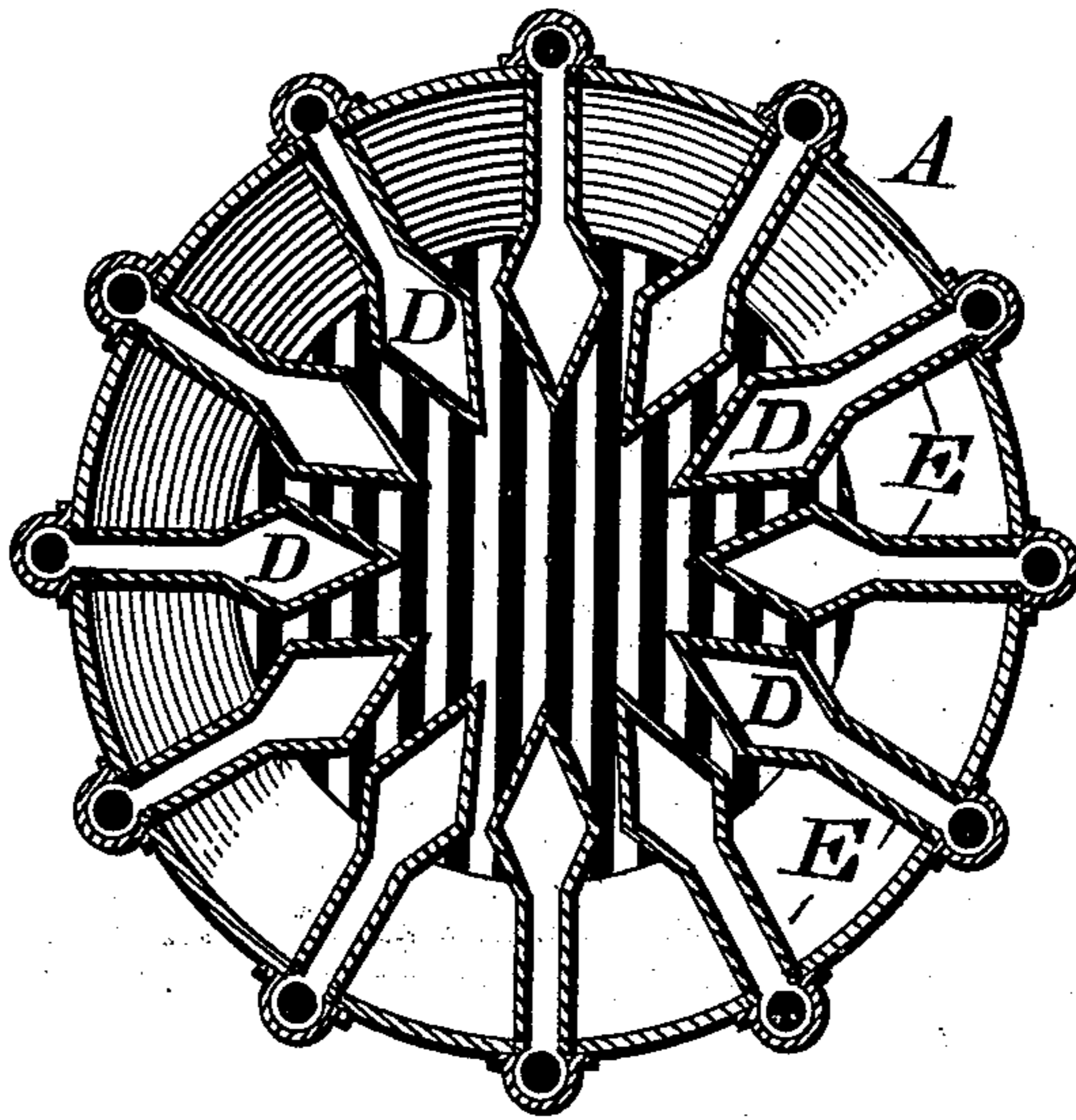


Fig. 4.



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UNITED STATES PATENT OFFICE.

D. DEAN READ, OF HACKENSACK, NEW JERSEY, ASSIGNOR TO JAMES E. CHURCH, OF SAME PLACE.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 545,723, dated September 3, 1895.

Application filed December 27, 1893. Serial No. 494,925. (No model.)

To all whom it may concern:

Be it known that I, D. DEAN READ, a citizen of the United States, residing at Hackensack, in the county of Bergen, State of New Jersey, have invented a new and useful Improvement in Furnaces, which improvement is fully set forth in the following specification and accompanying drawings.

My invention consists of a furnace formed of parts of novel construction whereby large heating-surfaces are presented and great volumes of hot air are produced and other features are presented, as hereinafter set forth, and pointed out in the claims.

Figure 1 represents a vertical section of a furnace embodying my invention. Figs. 2, 3, and 4 represent horizontal sections on lines $x x$, $y y$, and $z z$, respectively, Fig. 1; and Fig. 5 represents a side elevation of a water-tank and indicating-gage of an evaporating device for moistening the heated air.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings, A designates a furnace, of which B is the combustion-chamber and C the ash-pit. Within said chamber B are air-receiving vertical flues D, whose lower portions are deflected laterally and contracted, forming necks E, whose outer ends pass through the casing of the furnace A and are connected with air-supplying pipes F, the latter occupying the lower portion of the chamber G, formed by the exterior casing H, and opening to the atmosphere.

The top of the casing of the furnace A is connected by the pipes J with the chamber K, which thus receives the products of combustion and directs the same to the chimney-flue L, the central pipe J having a damper M therein and forming a direct draft to said flue L, while the surrounding pipes J form indirect draft with said flue L. The upper ends of the flues D open into the chamber G, which have the outlets N for directing the heat to the place of service.

In the lower portion of the chamber G are air-supplying pipes P, which open from the atmosphere into said chamber. It will be seen that cold or fresh air is thus admitted into the

lower portion of the chamber G by means of said pipes P, and other volumes of cold or fresh air are admitted into the flues D and directed into the upper portion of said chamber, the air being highly heated, as is evident, and a large quantity of hot air formed in the chamber G, it being noticed that the bottom wall of the chamber B is flaring or conical, and the air entering the chamber G at the discharge ends of the pipes P is directed against said wall, which serves to heat the adjacent portion of the chamber G.

The flues D are many-sided in cross-section, or may be oval, thus presenting on their exterior large heating-surfaces to the products of combustion and on their interior similar surfaces to the air admitted therinto. It will also be seen that the necks E extend in horizontal or somewhat horizontal positions and are subjected directly to the products of combustion, so as to be highly heated, whereby the air entering said necks is similarly affected, in which condition it is directed into the flues, where it is still further heated and permitted to expand prior to discharge into the hot-air chamber G. When the damper M of the central pipe J is closed and an indirect draft is secured, the products of combustion are diverted to and around the air-flues D, so as to secure the heating of the entire flues from top to bottom. The exterior casing H flares upwardly, as at H', thus expanding the upper portion of the chamber G and increasing the area of said chamber, and thereby providing a large hot-air-storage room. Within said chamber G is a pipe Q, which is supported on brackets R and provided with communicating cups or vessels S, which may be vase-shaped. One end of said pipe passes through the wall of said chamber H and is connected with the tank T, which is supplied with water, the latter being distributed by the pipe Q into the cups S, thereby exposing a large surface of water to evaporation for effectively moistening the heated air.

Rising from and communicating with the portion Q' of the pipe Q, outside of the chamber G and adjacent to the tank T, is a glass pipe U, forming a water column, which indi-

cates the height of water in the cups S, there being supported back of or adjacent to said pipe a flat piece V of sheet metal or other suitable material, which acts as a dial, so that
5 the height of the water may be perceived.

Interposed between the tank T and pipe Q is a cock or valve W, whereby the supply of water to the said pipe Q may be adjusted and controlled and may be shut off at night or
10 other times, as desired.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A furnace having a combustion chamber
15 with flaring bottom walls, an ash pit, air flues in said chamber having horizontal necks passing through the wall of said chamber, an exterior casing forming a hot air chamber between it and the combustion chamber and
20 ash pit, air inlet pipes connected with the necks of said flues, and air inlet pipes leading into said chamber and having their outlet adjacent to the flaring bottom wall of the combustion chamber, said parts being combined
25 substantially as described.

2. A furnace having a combustion chamber and an ash pit, an exterior casing forming a hot air chamber surrounding said combustion chamber and ash pit, air flues with contracted
30 ends in said combustion chamber, having at their lower ends air inlet pipes communicating with the atmosphere, below said combustion chamber, air inlet pipes leading into said hot air chamber adjacent to the bottom walls
35 of said combustion chamber, said air flues communicating at their upper ends with the hot air chamber, an upper chamber connected by pipes with the combustion chamber, a discharge flue for said upper chamber, and a
40 damper in the central one of said pipes, said

parts being combined substantially as described.

3. A furnace having a hot air chamber, a water pipe leading into said chamber, a cup
45 in said chamber communicating with said pipe, a vertical glass pipe on said water pipe, outside of said chamber, and a vertical plate forming a dial adjacent to said glass pipe, said parts being combined substantially as described.
50

4. A furnace having a combustion chamber with flaring bottom walls, an ash pit, air flues in said chamber, having horizontal and also
55 vertical necks passing through the walls of said chamber, an exterior casing forming a hot air chamber between it and the combustion chamber and ash pit, air inlet pipes connected with the necks of said flues and air inlet pipes leading into said chamber and having
60 their outlets adjacent to a flaring bottom wall of the combustion chamber, all of said parts being combined together with the pipes for the escape of the products of combustion, substantially as described.

5. A furnace having a combustion chamber
65 with flaring bottom walls, an ash pit, air flues in said chamber having horizontal and also vertical necks passing through the walls of said chamber, an exterior casing forming a hot air chamber, between it and the combustion
70 chamber and ash pit, air inlet pipes leading into said chamber, and having their outlet adjacent to the flaring bottom wall of the combustion chamber, and outlet pipes for the articles of combustion, all of the parts being
75 combined substantially as described.

D. DEAN READ.

Witnesses:

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J. C. VAN HORN.