

No. 771,623.

PATENTED OCT. 4, 1904.

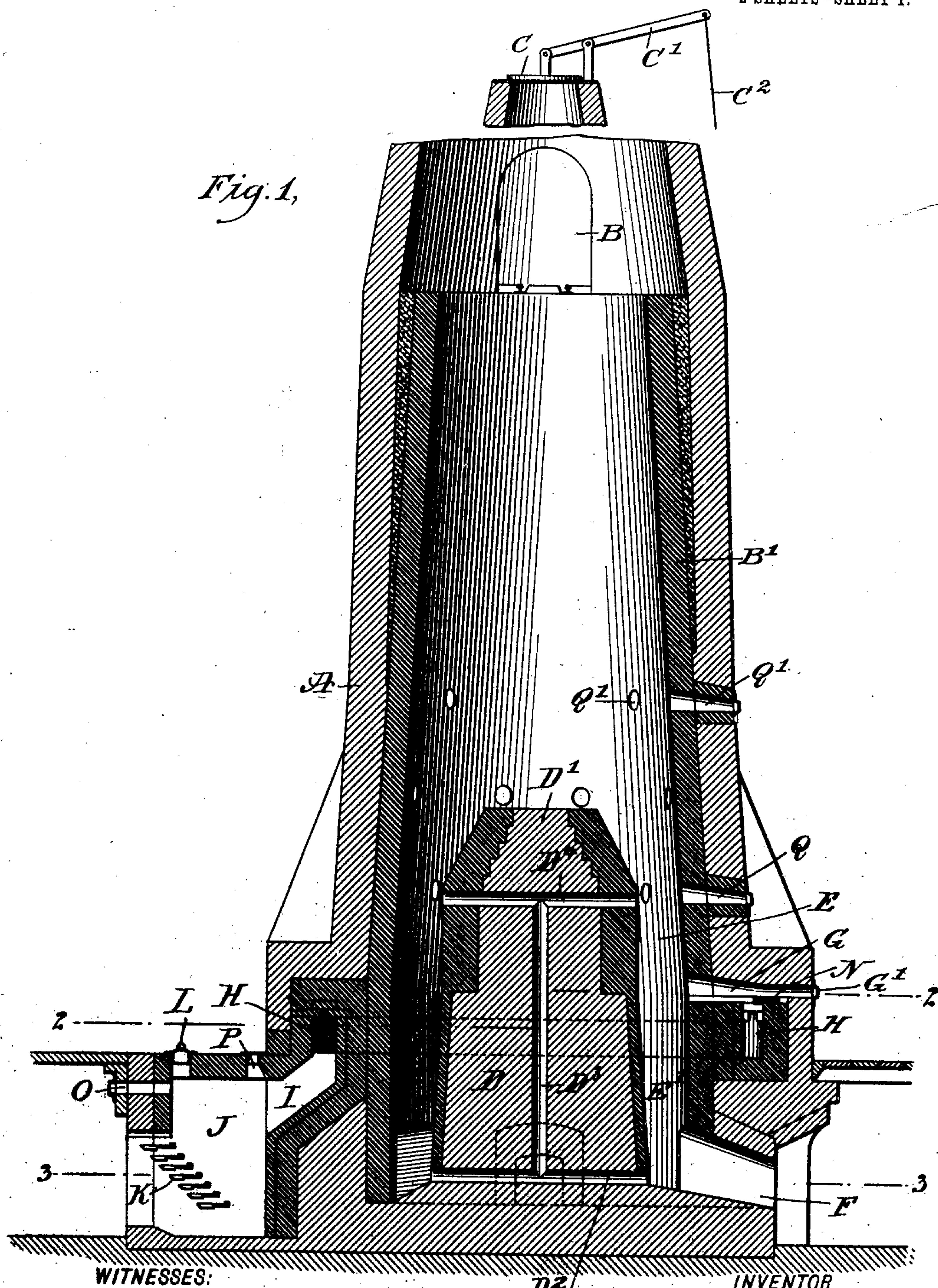
D. H. GIBSON.

KILN.

APPLICATION FILED APR. 20, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

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2 SHEETS—SHEET 2.

Fig. 2.

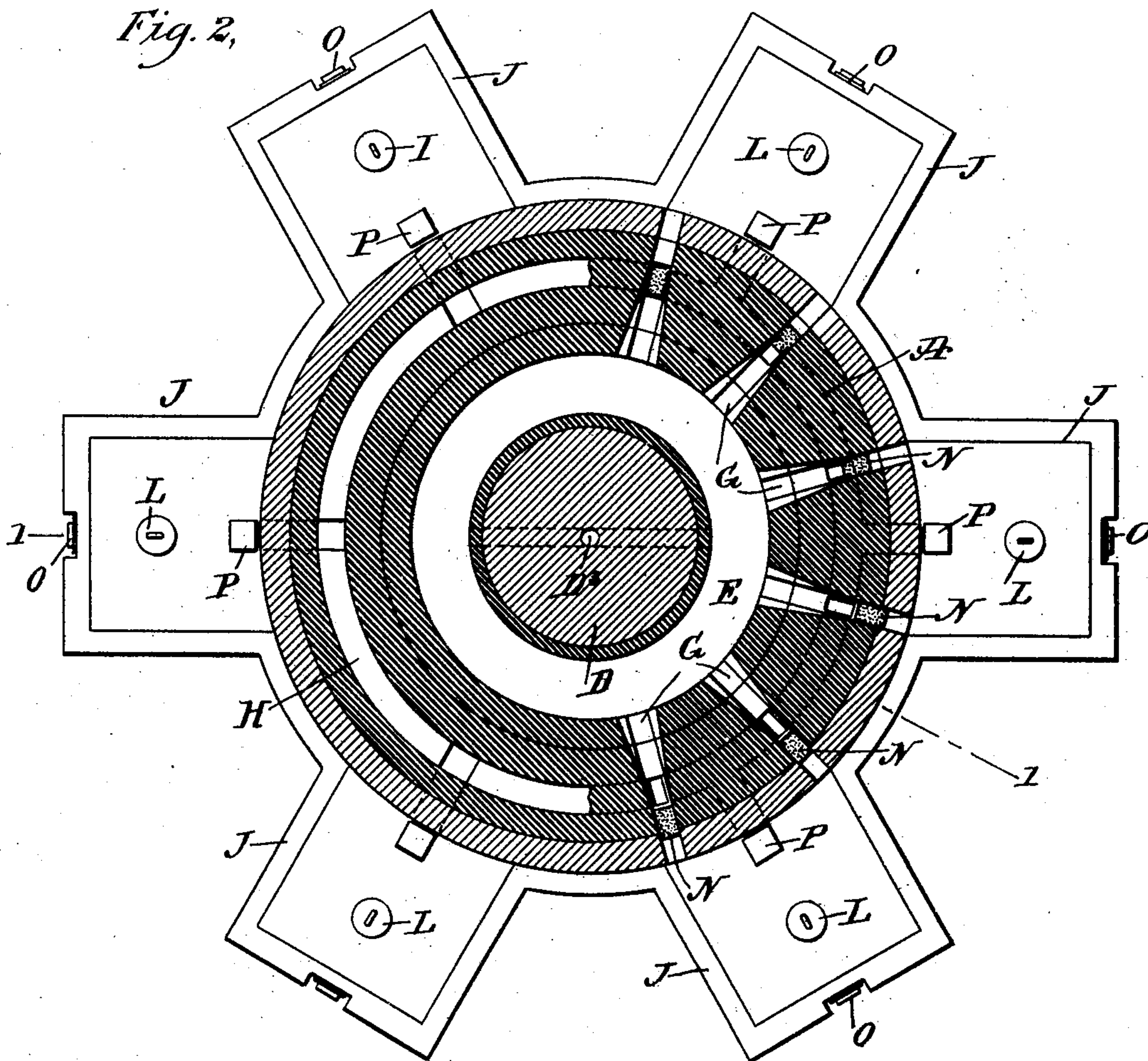
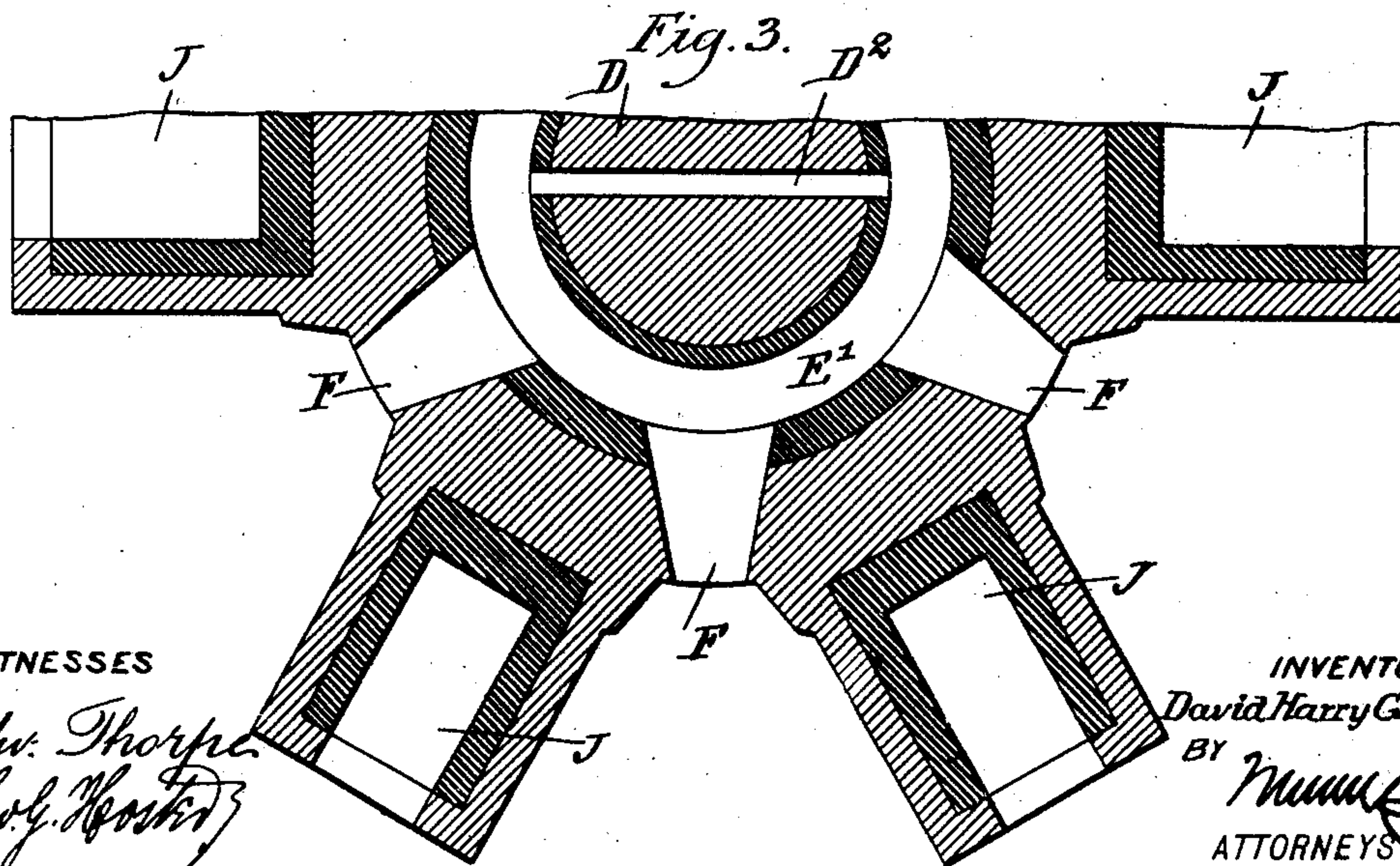


Fig. 3.



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# UNITED STATES PATENT OFFICE.

DAVID HARRY GIBSON, OF SEATTLE, WASHINGTON.

## KILN.

SPECIFICATION forming part of Letters Patent No. 771,623, dated October 4, 1904.

Application filed April 20, 1904. Serial No. 204,017. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID HARRY GIBSON, a citizen of the United States, and a resident of Seattle, in the county of King and State of Washington, have invented a new and Improved Kiln, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved limekiln arranged to allow continuous working of the kiln and to permit shutting off the burning of the limestone for a time without requiring drawing the fires in the furnaces.

The invention consists of novel features and parts and combinations of the same, as will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a sectional side elevation of the improvement on the line 1 1 of Fig. 2. Fig. 2 is a sectional plan view of the same on the line 2 2 of Fig. 1, and Fig. 3 is a sectional plan view of the same on the line 3 3 of Fig. 1.

The stack A of the limekiln is provided with a suitable lining B' of fire-brick, concrete, or the like, and in the upper portion of the stack A are arranged charging-doors B for the introduction of the limestone to be burned, and the top of the stack is normally closed by a cover C, hung on a lever C', provided with a cord or rod C<sup>2</sup>, extending to the ground, to enable the operator to lift the cover C whenever it is desired to discharge the gases from the top of the stack.

In the lower portion of the stack A and rising from the bottom thereof is arranged a central distributor D in the form of a column having its top D' in the shape of the prism of a cone, the said column forming with the wall of the stack A an annular passage, of which the upper portion forms an annular burning-chamber E and the lower portion an annular cooling-chamber E', as plainly indicated in Fig. 1. From the lower end of the cooling-chamber E' lead a number of outlets F through

the wall of the stack to the outside thereof for discharging the burnt lime from the lower end of the cooling-chamber. Into the burning-chamber E opens a series of gas entrances or passages G, preferably disposed radially in the wall of the stack and closed at their outer ends by suitable doors G'. Each of the gas-entrances G connects at its bottom with an annular gas-conduit H, formed in the wall of the stack A and connected at its bottom by a number of flues I with corresponding gas-generating chambers J, each having grates K for burning a gas-generating coal or like fuel introduced into the gas-generating chamber from the top through suitable covers or doors L, as illustrated to the left in Fig. 1. (See also Fig. 2.)

In the bottom of the column forming the distributor D is arranged a diametrical passage D<sup>2</sup>, leading to the bottom of the annular cooling-chamber E', so that air from the outside in passing through the openings F into the cooling-chamber can also pass into the said passage D<sup>2</sup>, which connects at its middle with a vertical passage D<sup>3</sup>, extending in the column and connecting at its upper end with a diametrical passage D<sup>4</sup>, discharging cooled air into the upper portion of the burning-chamber for regulating the heat in the stack.

When the fuel is burning on the grates K, gas is generated, which passes by the flues I into the annular gas-conduit H, from which the gas passes to the several gas-entrances G to finally pass into the burning-chamber E, the amount of gas being regulated by a gas-regulator, preferably in the form of a fire-brick or valve N, held slidably in the bottom of the corresponding gas-entrance G over the connection between the gas-entrance and the conduit H. (See the right-hand side of Fig. 1.)

Suitable normally closed ducts O and P connect with each gas-generating chamber J, the duct O serving for cleaning and sweeping the flues I and the duct P serving for stirring the burning fuel on the grates K. Peep-holes Q and Q' are arranged in the wall of the stack above the burning-chamber E to permit of inspecting the progress of the burning and to



allow of introducing stirring-rods to agitate the material in case the same becomes choked or clogs the stack.

The operation is as follows: When the stack is filled with limestone and the fuel is burning on the grates K of the several gas-generating chambers J, then this gas passes into the burning-chamber E to burn therein, and thus reduce the limestone to produce lime, which gradually settles and passes downward into the cooling-chamber E', from which the burnt lime is removed through the openings F. From the foregoing it will be seen that lime can be continually fed into the upper end of the stack A and the burnt lime removed from the bottom of the cooling-chamber, so that the operation can be continually carried on to insure the burning of a large amount of lime in a given time.

In case it is desired to stop the burning of the lime in any portion of the kiln it is only necessary for the operator to move the corresponding gas-regulators into a closed position to disconnect the conduit H from the corresponding gas-entrance G, and if it is desired to stop the burning completely for a day or a few days without requiring drawing the fire on the grates it is only necessary to move the several gas-regulators into a completely closed position to shut off the gas from the burning-chamber E to prevent draft through the grates K and the fuel thereon to keep the latter burning slowly without generating much gas.

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

1. A kiln having a distributor disposed therein forming an annular space about the same and means for admitting air to said annular space through said distributor.

2. A kiln having a centrally-disposed distributor forming an annular space thereabout, inlet air-passages at the base of said distributor, a vertical passage within said distributor and communicating therewith and other passages leading from said vertical passage thereabove and passing to the surface of said distributor.

3. A kiln comprising an annular wall, a dis-

tributer within said kiln and forming an annular space within the same, said annular wall having openings therethrough for withdrawing the treated material, said distributor having inlet air-passages at the base thereof opposite to said first openings, and passages in the upper part of said distributor communicating with said inlet-passages and delivering into said annular space.

4. A kiln having an annular gas-passage in the wall thereof, radially-disposed gas-inlet passages having openings in the lower wall thereof communicating with said annular passage above and opening upon the inner surface of the wall of said kiln, and bricks slidably mounted in said last passages and adapted to regulate the flow of gas thereto.

5. A kiln having an annular gas-passage in the wall thereof, inlet-passages disposed above the same communicating therewith and leading to the inner face of said wall, bricks slidably mounted in said last passages and regulating the admission thereto, a centrally-disposed distributor mounted in said kiln and forming an annular space within the same, said distributor having air-passages for delivering air into said annular space.

6. A limekiln comprising a stack having charging-doors at the upper end and outlets for the burnt lime at the bottom, gas-generating chambers connected with an annular gas-conduit having gas-entrances leading into the stack, above the outlets, and a central distributor rising in the stack a distance above the said gas-entrances and forming with the interior face of the stack an annular passage, the upper portion of which forms a burning-chamber and the lower portion a cooling-chamber, the said central distributor being provided with air-passages having their entrances at the bottom of the cooling-chamber and the outlets above the burning-chamber, as set forth.

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

DAVID HARRY GIBSON.

Witnesses:

J. M. WINSLOW,  
E. H. JAMES.