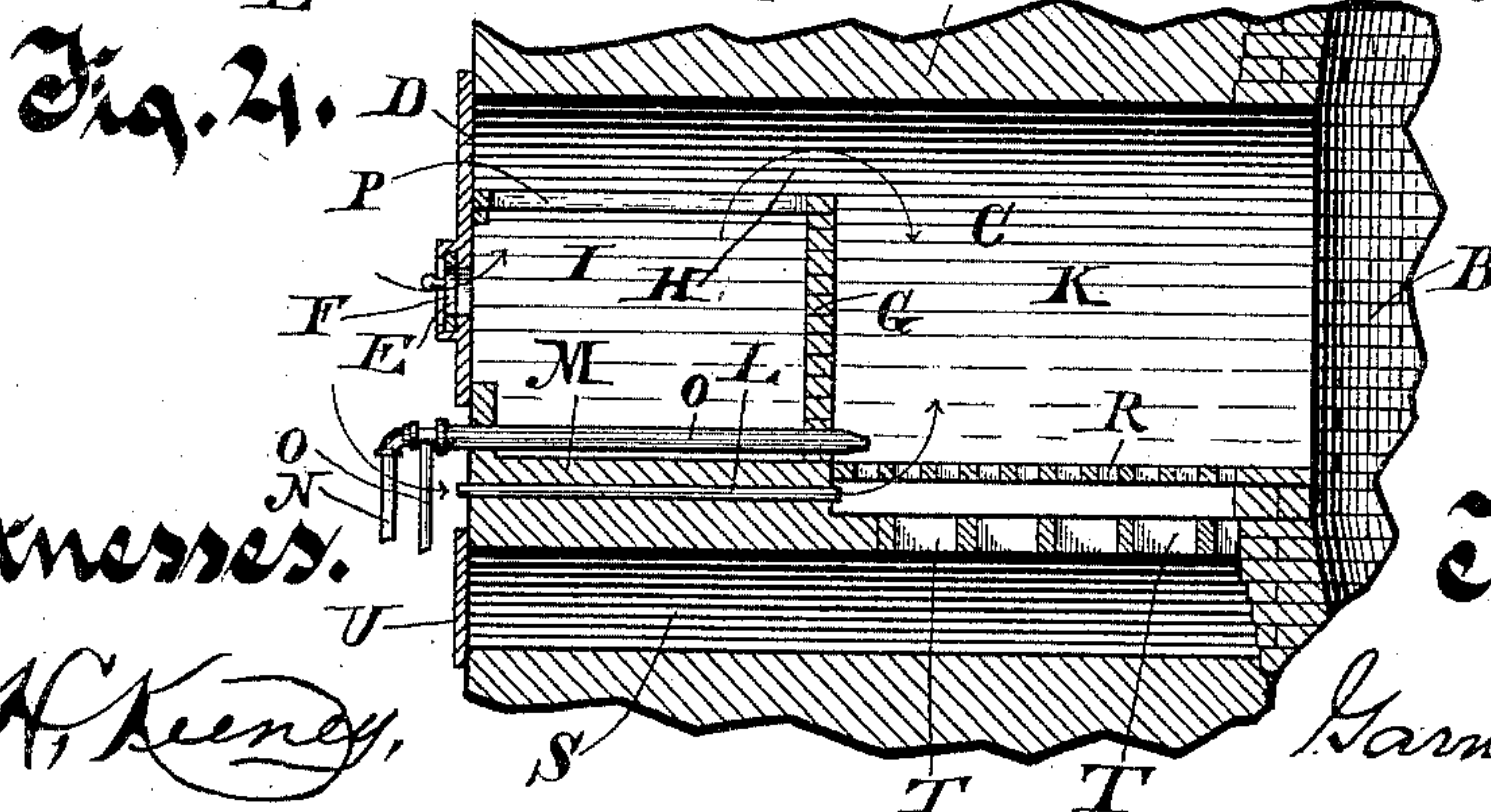
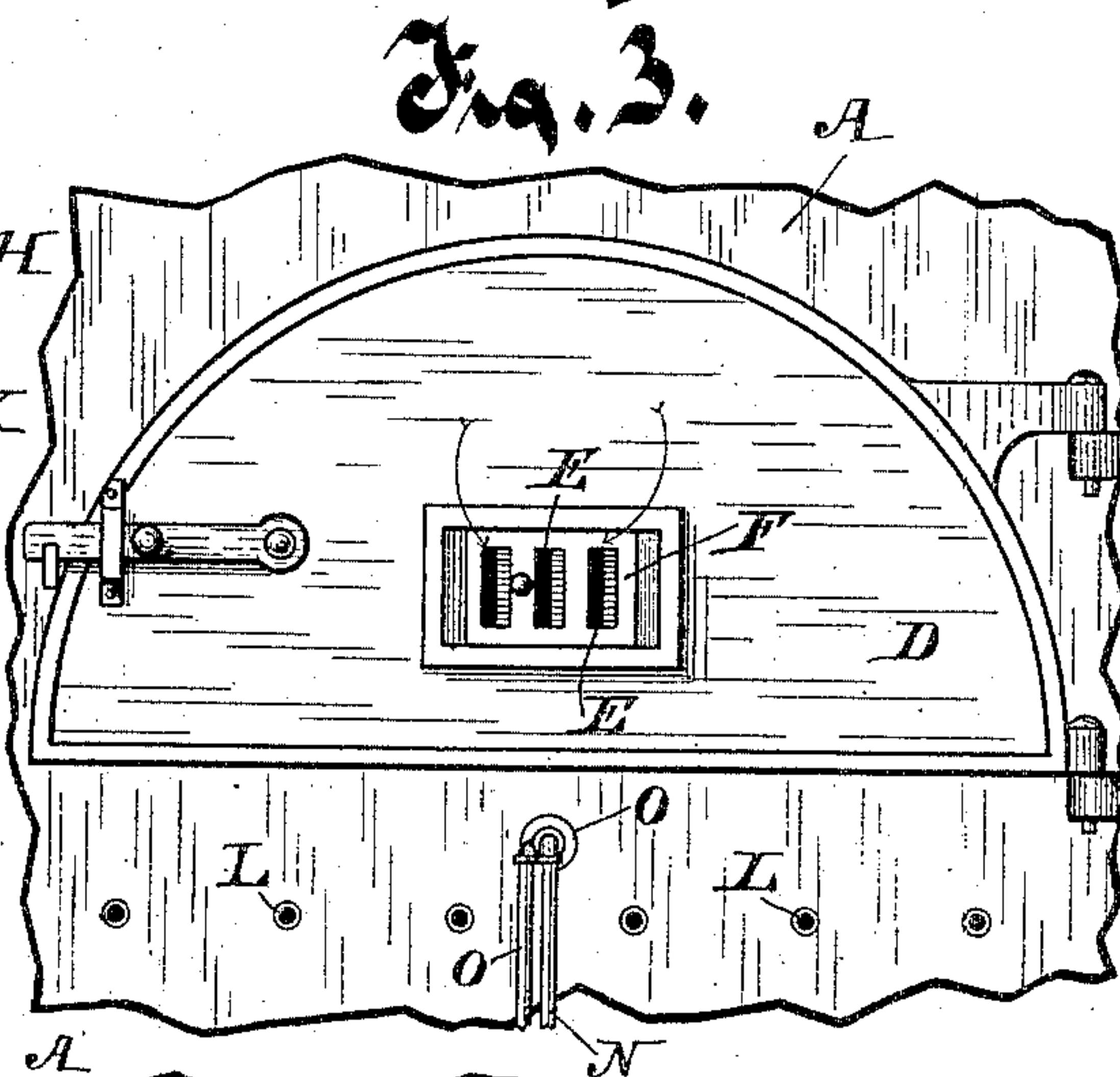
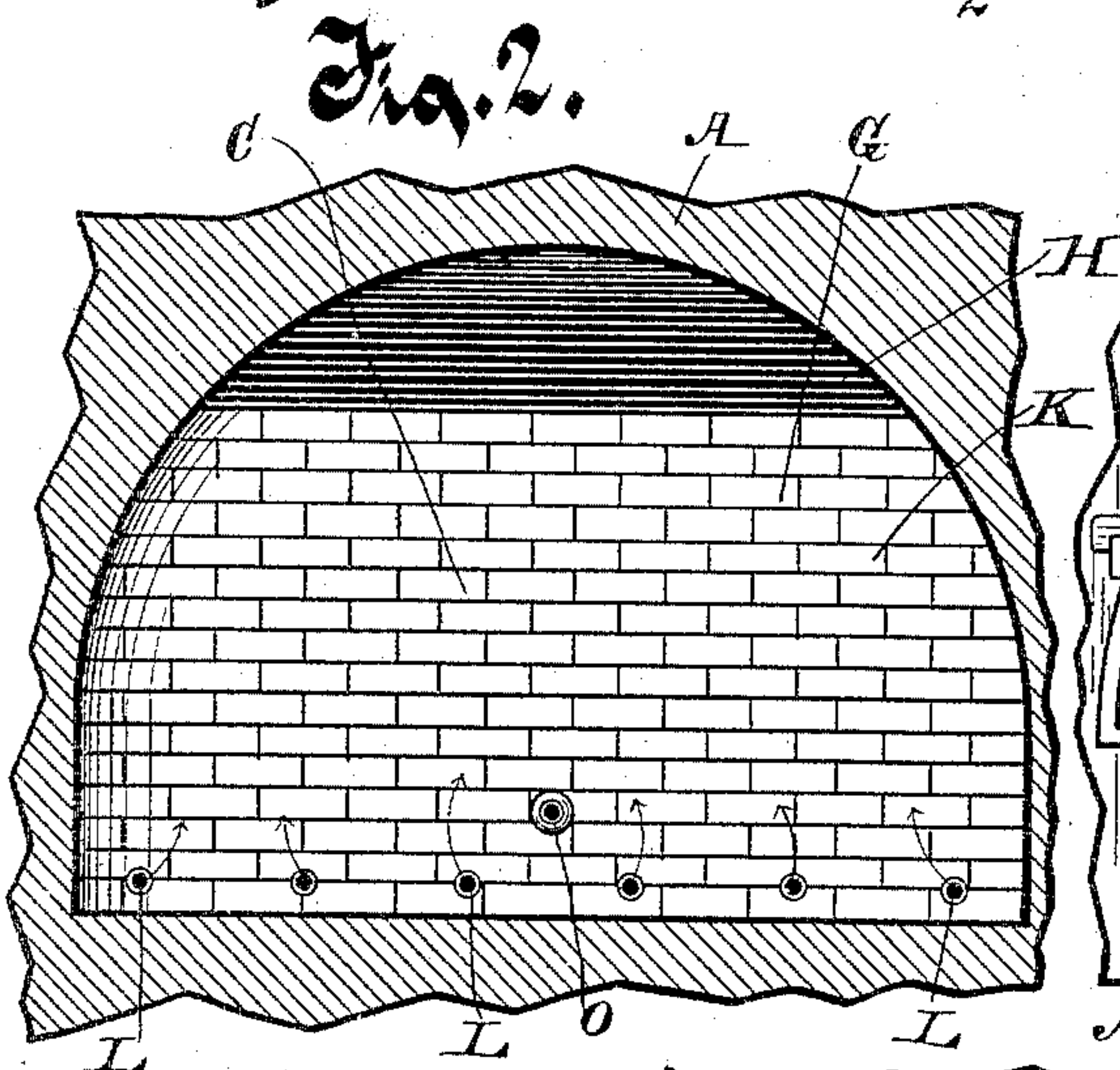
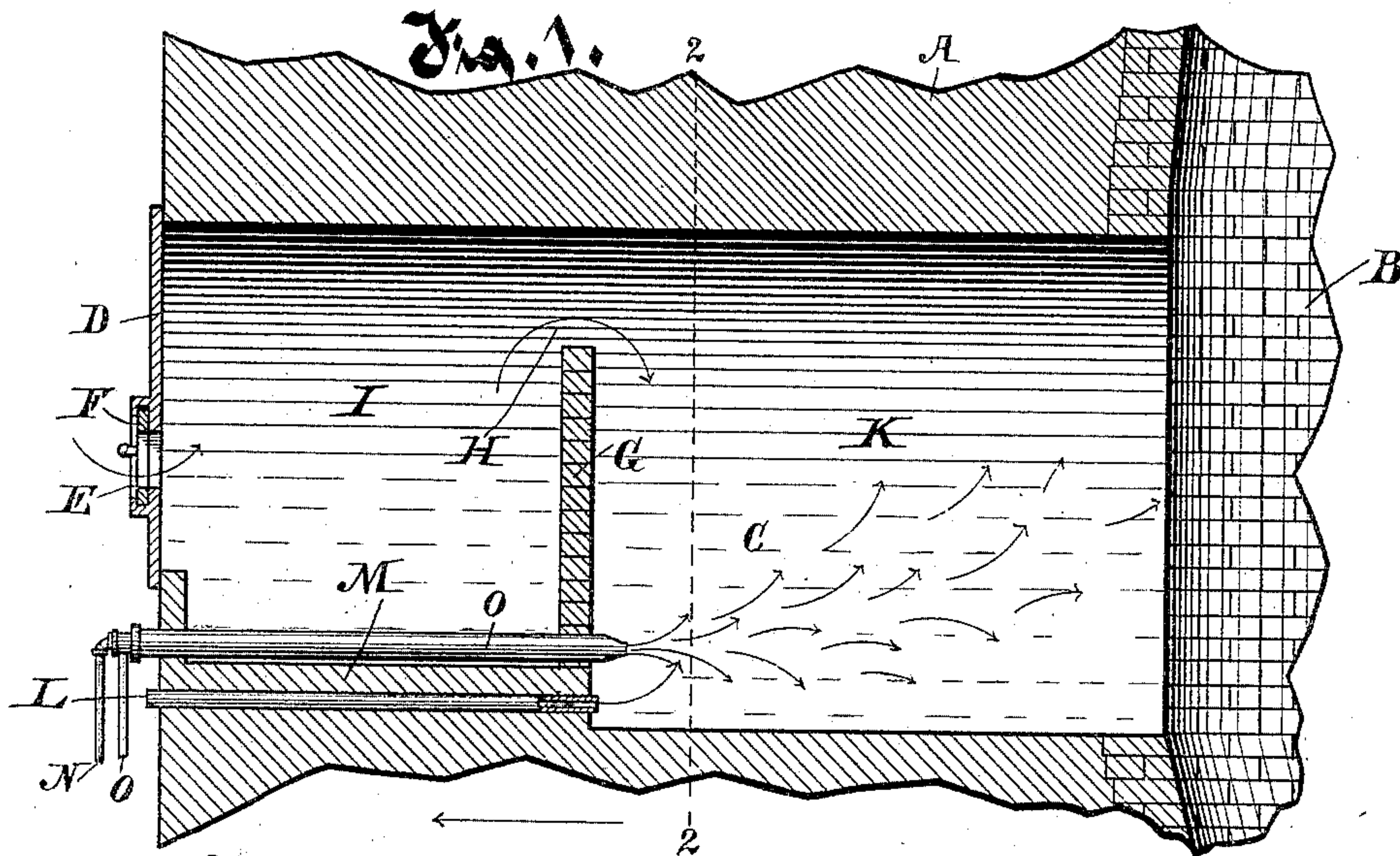


(No Model.)

G. A. MACE.
LIMEKILN.

No. 436,426.

Patented Sept. 16, 1890.



Witnesses.

A. H. Keeney,
Anna Faust.

Inventor.

Garnett A. Mace
Ernest Ruedich
Attorneys.

UNITED STATES PATENT OFFICE.

GARWIN A. MACE, OF MAYVILLE, WISCONSIN.

LIMEKILN.

SPECIFICATION forming part of Letters Patent No. 436,426, dated September 16, 1890.

Application filed March 31, 1890. Serial No. 345,970. (No model.)

To all whom it may concern:

Be it known that I, GARWIN A. MACE, of Mayville, in the county of Dodge and State of Wisconsin, have invented new and useful Improvements in Limekilns; and I do hereby declare the following to be a full, clear, and exact description of said invention, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates particularly to the construction of the fire-places in a limekiln; and the object of my invention is to provide a device that in the process of combustion either of vaporized carbon oil or of coal or wood will accomplish such a perfect combustion of the fuel and of the gases and smoke within the combustion-chamber as will deliver into the chamber of the kiln the most perfect result in intense heat, free from smoke and unconsumed gases, that it is possible to have from the fuel used.

In the drawings, Figure 1 is a section of a portion of a limekiln wall and chamber, showing my improved fire-place in central vertical longitudinal section. Fig. 2 is a vertical section of my improved fire-place on line 2 2 of Fig. 1, looking toward the left. Fig. 3 is an outside elevation of a portion of the wall of the kiln, showing the door to the fire-place and the ends of the ventilating-ducts and oil-tube. Fig. 4 is a central vertical longitudinal section of my improved fire-place with certain features in addition to those shown in Fig. 1, whereby the fire-place is adapted for burning coal or wood.

A is the wall of the kiln.

B is the chamber of the kiln in which the stone or other form of carbonate of lime is placed, for calcining it. The chamber B is ordinarily of considerable size, so as to receive a large supply of the material to calcine, which is usually introduced at the top of the kiln and passes by gravity to the bottom of the chamber of the kiln as the quicklime is removed therefrom, permitting it to come down from above.

C is the fire-place, of which there may be one, two, or more in each kiln, which fire-places are each in general form a chamber or arched passage extending from the outside of the wall of the kiln through the wall to the

chamber B. At the outer end the fire-place is provided with a door D, for closing that end of the fire-place, which door has a series of openings E E, which may be closed partially or entirely by the grated slide F. Within the fire-place and extending entirely across it from side to side and projecting upwardly from the floor of the fire-place is a wall or screen G. This screen does not extend quite to the top of the fire-place; but a passage H for air over the top of the screen is provided. The screen G divides the fire-place into two chambers, an outer or air chamber I and an inner or combustion chamber K, the air-chamber being adapted to receive fresh air through the openings E E, which, being therein somewhat warmed by its proximity to the combustion-chamber, is thereafter in its warmed condition discharged over the screen G into the top of the combustion-chamber, where it mingles with the heated and unconsumed gases and smoke and completes the combustion, as hereinafter further described. The combustion-chamber K opens directly into the kiln-chamber B. This chamber K has its floor somewhat lower than the plane of the floor of the chamber I, and a series of air-ducts L lead from the outside of the wall through the raised portion M of the floor of the chamber I into the chamber K near its floor. A pipe N, for supplying the combustion-chamber with carbon oil, is surrounded by a steam-pipe O, which pipes both lead into the chamber K and are adapted to supply the mingled oil and steam or vaporized oil for combustion in the chamber K. These pipes M and O pass through the chamber I near its bottom and enter the chamber K a little above the plane of the ducts L L. The result of this form of construction is that in use a supply of vaporized carbon oil is discharged into the chamber K from the pipes N and O, and a supply of air through the ducts L L is admitted to the chamber below the point at which the vaporized oil is discharged into the chamber, whereby the combustion of the oil is secured, and an additional supply of air, being admitted to the chamber I through the openings E E, passes over the screen G into the combustion-chamber K near its top and there comes in direct contact and mingles with the unconsumed gases and smoke in the chamber which rise to that part

of the chamber, resulting in a complete and perfect combustion of the theretofore unconsumed gases and smoke, so that the completed product of the combustion passes into the chamber B in the most intense and purest form of heat that is possible from the fuel used. The chamber B is provided with proper ventilation to secure the necessary draft there-through.

10 In the modified form of device shown in Fig. 4 a removable perforated floor or grate P is located at the top of the screen G and extends therefrom across the chamber I to the door D, and a removable grate R is located
15 in the chamber K just above the air-ducts LL; also a passage-way or pit S is provided in the wall A beneath the fire-place, into which openings T T are made through the floor of the chamber K. This form of fire-place is adapted
20 for the use of coal or wood, which is introduced into the combustion-chamber K, over the floor P, and rests and is burned on the grate R, the ashes falling through the grate and through the openings T T into the pit S, from which they
25 may be removed at the front of the wall. The passage-way S is provided with a door U to prevent the admission of air to the chamber K.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a limekiln, a fire-place extending 30 through the wall of the kiln, divided into an outer air-chamber and an inner combustion-chamber by a screen-wall, the outer chamber being provided with a door having openings for the passage of air therethrough, and air-ducts leading from the outside of the wall di- 35 rectly to the combustion-chamber near its floor, and devices for supplying the combustion-chamber with fuel above the air-supplying ducts, substantially as described. 40

2. In a limekiln, a fire-place having an inner combustion-chamber, an outer air-chamber provided with air-openings into the air-chamber, a screen between the two chambers, and a passage over the screen from the air- 45 chamber into the combustion-chamber, air-ducts leading from the outside of the wall directly into the combustion-chamber near its floor, a grate in the combustion-chamber located above the plane of the air-ducts, and 50 provision for removing ashes from the combustion-chamber, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GARWIN A. MACE.

Witnesses:

R. SAUERHERING,
ED SAUERHERING.