

(No Model.)

3 Sheets—Sheet 1.

F. C. ROBERTS.
POTTERY KILN.

No. 434,954.

Patented Aug. 26, 1890.

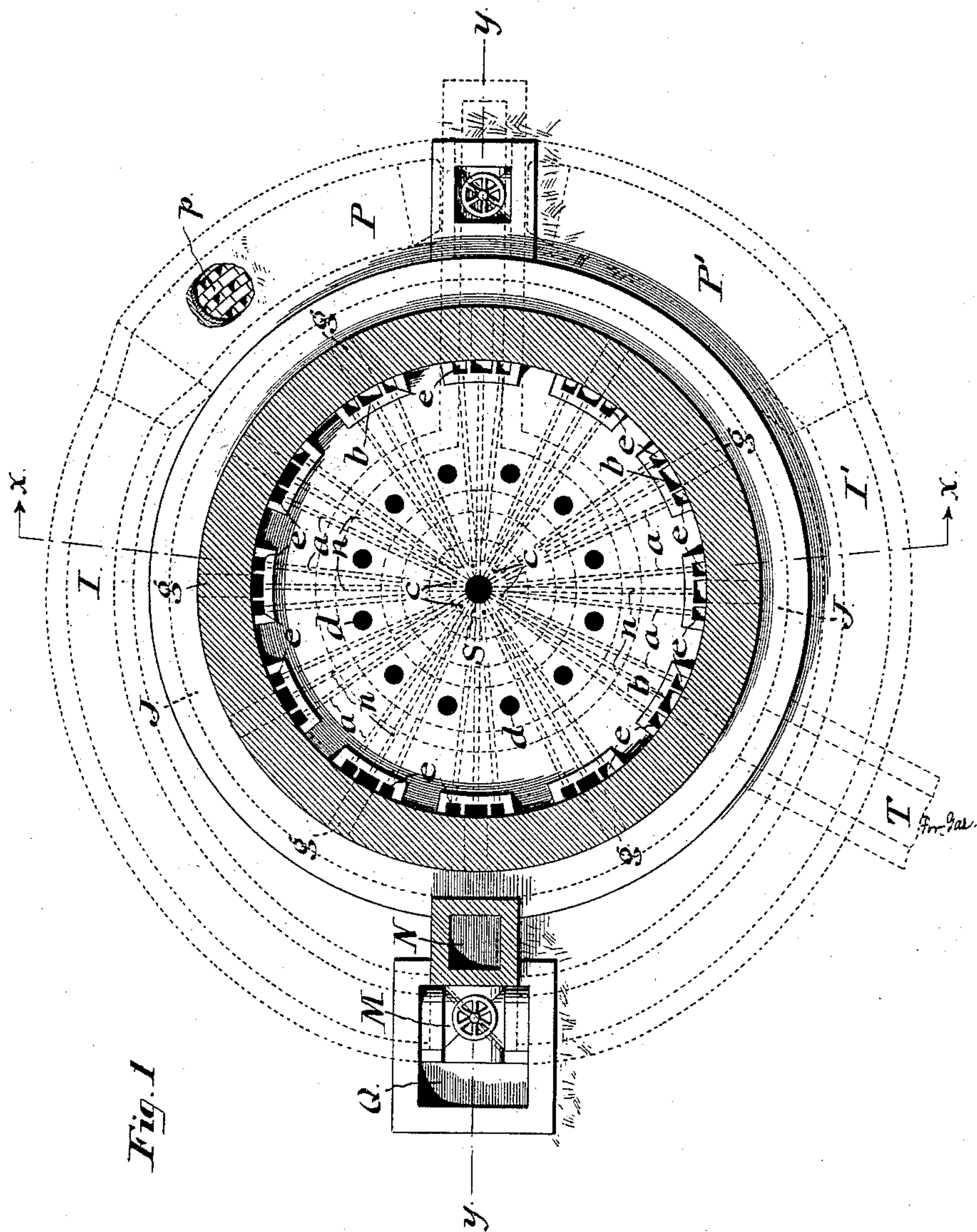


Fig. 1

Witnesses:

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E. Reese

Inventor

Frank C. Roberts,
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Attorneys.

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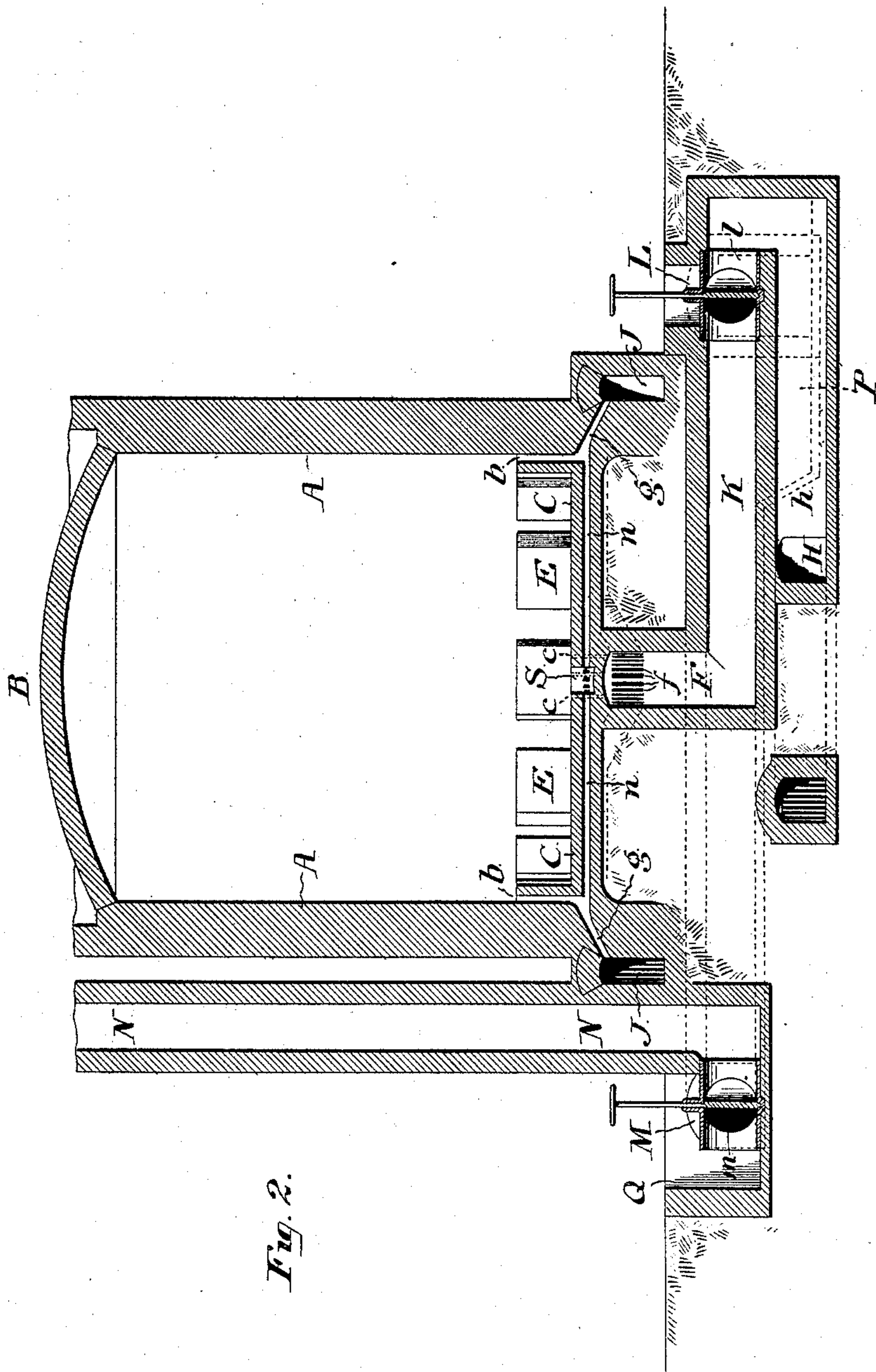


Fig. 2.

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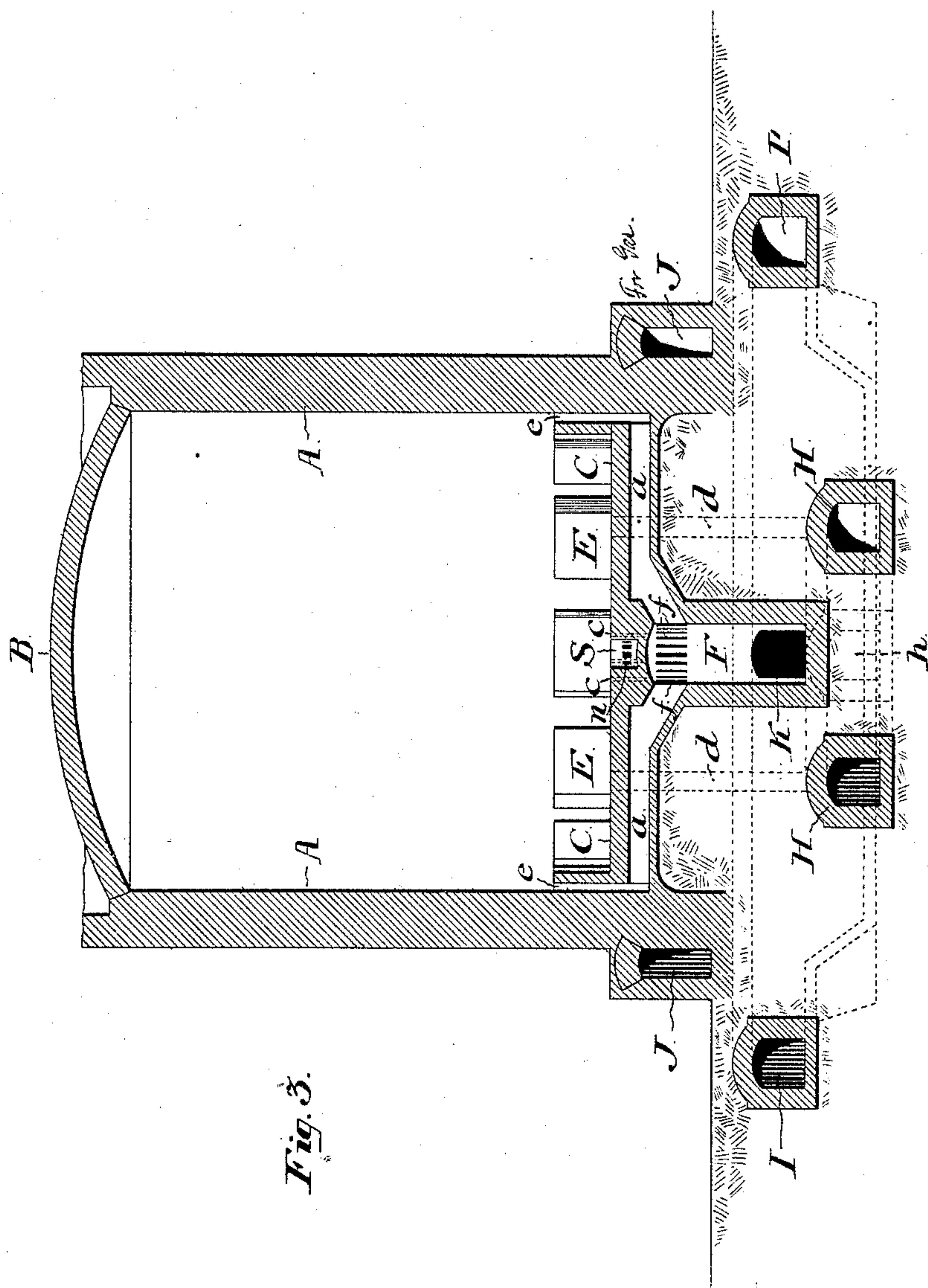


Fig. 3.

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UNITED STATES PATENT OFFICE.

FRANK C. ROBERTS, OF PHILADELPHIA, PENNSYLVANIA.

POTTERY-KILN.

SPECIFICATION forming part of Letters Patent No. 434,954, dated August 26, 1890.

Application filed April 2, 1890. Serial No. 346,271. (No model.)

To all whom it may concern:

Be it known that I, FRANK C. ROBERTS, of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Pottery-Kilns, whereof the following is a specification, reference being had to the accompanying drawings.

My invention relates to an improved system of applying the regenerative principle to use in connection with pottery-kilns; and its chief object is to afford a more thorough distribution of heat throughout the kiln; while preserving all the desirable features which result from maintaining the flow of the currents through the kiln permanently in the same direction, the reversal of said currents (for the regenerative action) being effected outside of the kiln proper.

In the drawings, Figure 1 represents a horizontal section through the kiln and chimney, showing in plan the kiln-floor and in dotted lines the relation of the various passages thereto. Fig. 2 is a vertical central section through the kiln on a plane passing through the kiln on the line *y y*, and Fig. 3 is a vertical section on the two radial planes indicated by the lines *x x* and looking in the direction of the arrows.

A represents the exterior wall of the kiln proper, which is preferably circular and provided with a dome-shaped roof B and horizontal floor C. In said floor, and preferably midway between the center of the kiln and the inner surface of its wall, is a series of symmetrically-arranged permanent outlet-passages *d*, which lead downward into an annular flue H beneath the floor. A horizontal passage *h* leads from said flue to the valve-chamber *l* of an ordinary reversing-valve L, which chamber communicates on each side with a pair of regenerator-passages P P', which may be filled with fire-brick *p* or any other material adapted to regenerative purposes, said passages being preferably arranged circumferentially, as shown, with reduced portions I I', respectively leading to the chamber *m* of a second reversing-valve M, which communicates on the one hand with an air-inlet Q and on the other with a chimney N. These reversing-valves may be of any ordinary construction, and of course are adapted

to alternate the outflow of the products of combustion and inflow of air through the regenerators. The valve L also controls communication between the regenerators and the horizontal air-passage K, which leads inward to a central point beneath the kiln, and there rises vertically, as indicated at F, nearly to the level of the floor C.

From the upper portion of the passage F a series of radial passages *f* lead through the kiln-floor to discharge-jets *e*, circumferentially arranged around the inner surface of the kiln and wall. I prefer to form said jets *e* in each side of the upwardly-projecting pieces of brick-work E, rising a short distance above the floor, so as to give a better distribution of the heat, the central portion of said brick-work being occupied by the gas-inlet jets *b*, whose arrangement will now be described.

The main inlet for gas is indicated by the dotted lines at T, (see Fig. 1,) and communicates with an annular flue J, arranged around the outer periphery of the kiln-wall, from which flue J inwardly-projecting passages *g* lead to the jets *b*, above referred to as being formed in the central part of the brick-work E. Branch passages *n*, of considerably smaller transverse area than the passages *b*, lead from the ends of the passages *g* through the floor of the kiln to a central discharge-orifice S in said floor, immediately above the vertical air-passage F. A series of small vertical air-ducts *c* rise from the top of the passage *f* through the floor of the kiln, and are symmetrically disposed around the central gas-orifice S, so as to distribute the air necessary for proper combustion throughout the gas which issues from said opening.

The operation of the apparatus is as follows: Gas admitted at the inlet T flows into the annular passage J, and thence into the circumferential jets *b* and central orifice S. The products of combustion pass out through the openings *d*, and thence to one of the regenerators P or P'. Assuming the other regenerator to have been previously heated by the outgoing products of combustion, the air admitted at Q passes through said regenerator, and thence, after becoming heated to the proper degree, flows through the passages K,

F, and *f* into the jets *e*, arranged on each side of the circumferential gas-jets *b*. A small portion of said air also rises through the passages *c*, around the central gas-orifice *S*.

5 The operation of the device is continuous, the proper reversal of the currents being of course effected by the reversing-valves *L M*, and the direction of the currents within the kiln proper being constant. The arrange-
10 ment of the outlets for products of combustion at points intermediate between the central and circumferential air and gas inlets gives the best possible distribution of heat in a uni-
15 sired, the gas can also be heated by the re-generativesystem, it being only necessary to divide the regenerator-passages longitudinally so as to permit the separate heating of air and gas, and to provide controlling-valves
20 at the points of communication between the gas-inlets and regenerators. I do not deem it necessary, however, to describe such modification in detail, as it will be readily understood.

25 I claim—

The combination, in a kiln, of an annular

gas-passage around the same provided with a main gas-inlet, a series of gas-inlet jets communicating with the said passage and arranged circumferentially within the kiln, a 30 central orifice in the kiln-floor, a series of converging branch passages leading through the kiln-floor from said jets to said orifice, a series of air-inlet jets circumferentially arranged within the kiln, a central air-passage, 35 a series of radial passages leading through the kiln-floor from the central passage to the air-inlet jets, air-ducts leading from said central passage to the central orifice, a series of permanent outlet-passages for products of 40 combustion arranged in the kiln-floor intermediate between the center and circumference thereof, a chimney, a pair of regenerators communicating with said central air-passage, said outlet-passages, and said chimney, and 45 a pair of reversing-valves controlling such communication, substantially as set forth.

FRANK C. ROBERTS.

Witnesses:

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