

(No Model.)

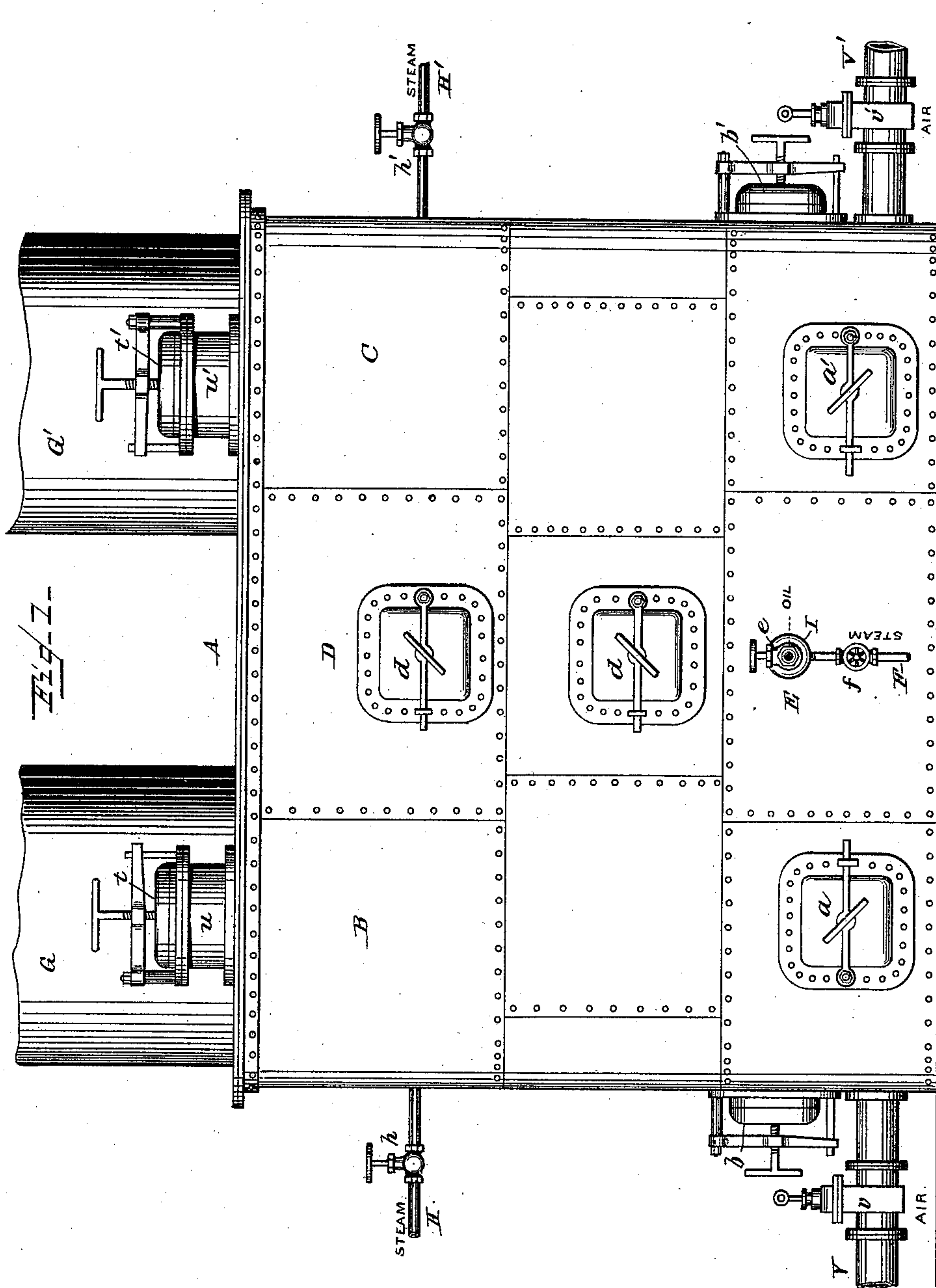
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J. HANLON.

APPARATUS FOR THE MANUFACTURE OF GAS.

No. 418,615.

Patented Dec. 31, 1889.



WITNESSES:

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(No Model.)

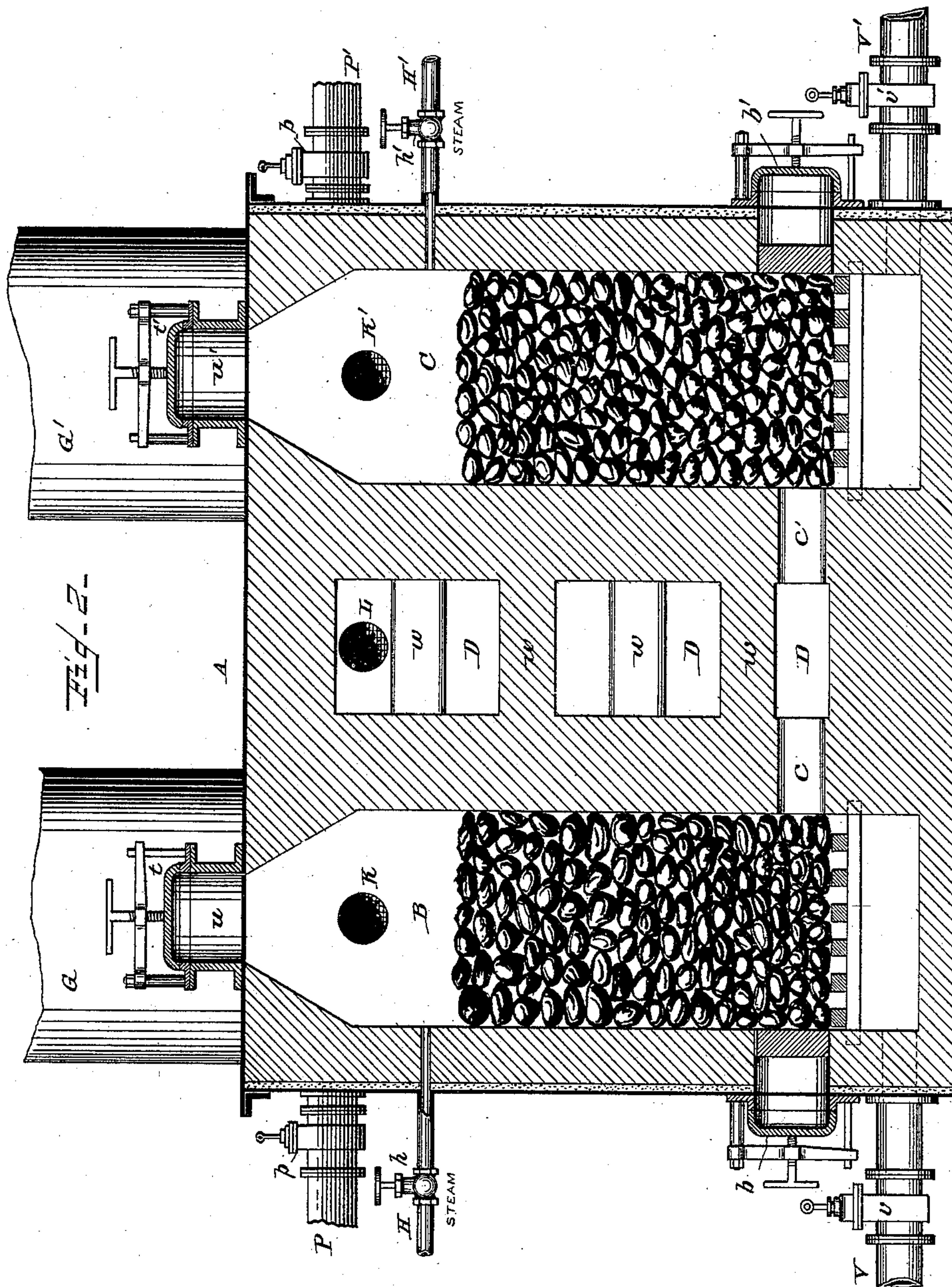
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WITNESSES:

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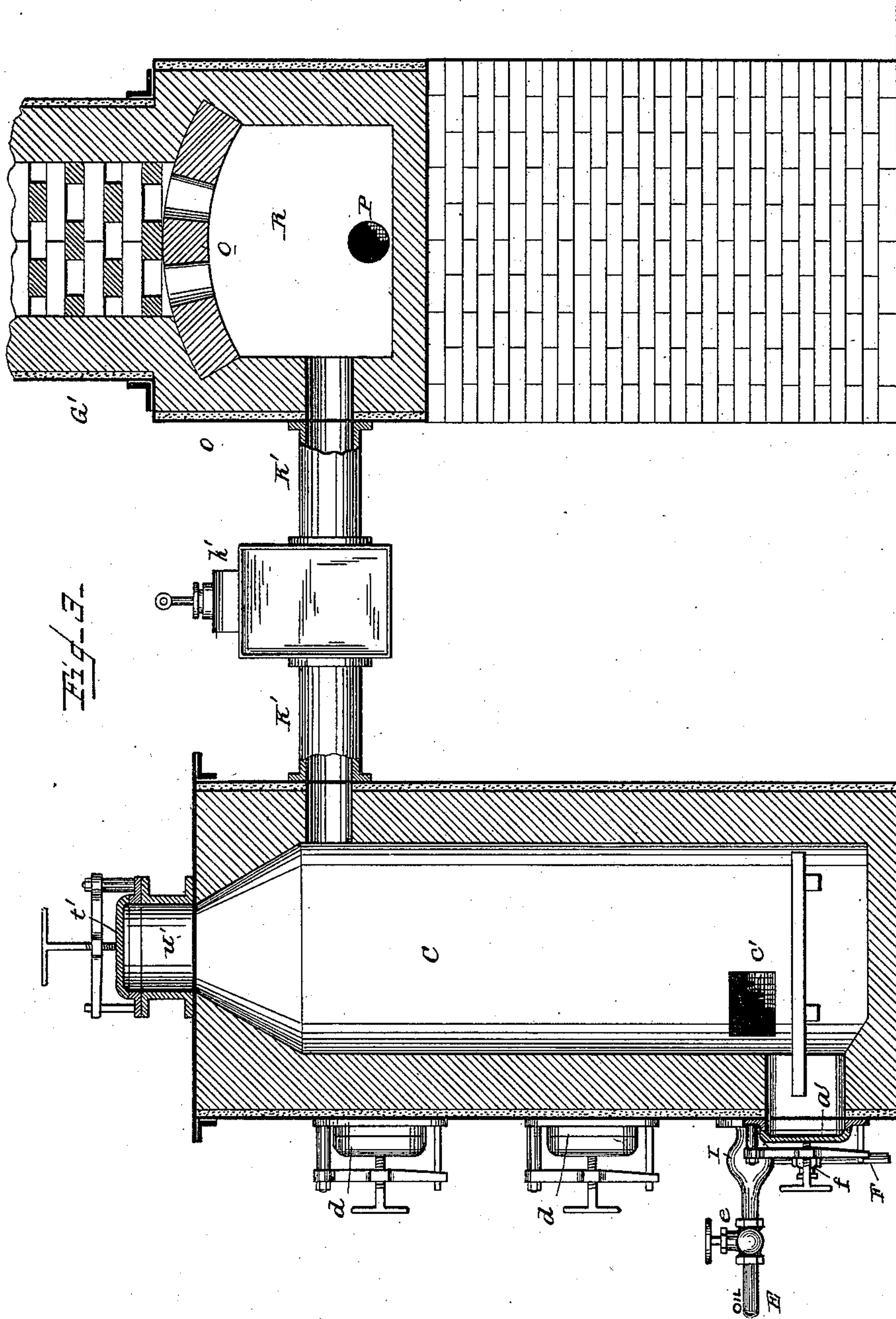
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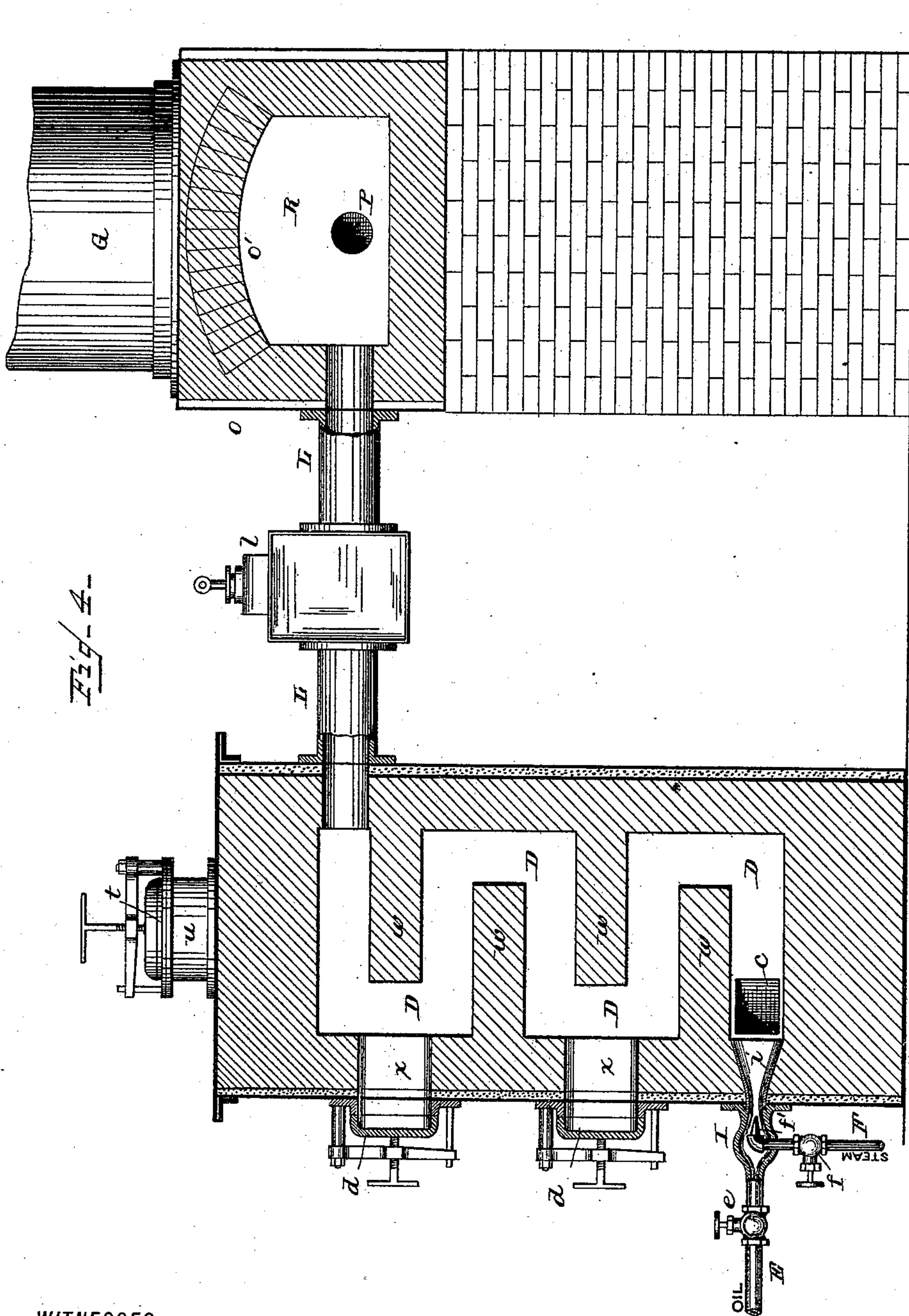
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WITNESSES:

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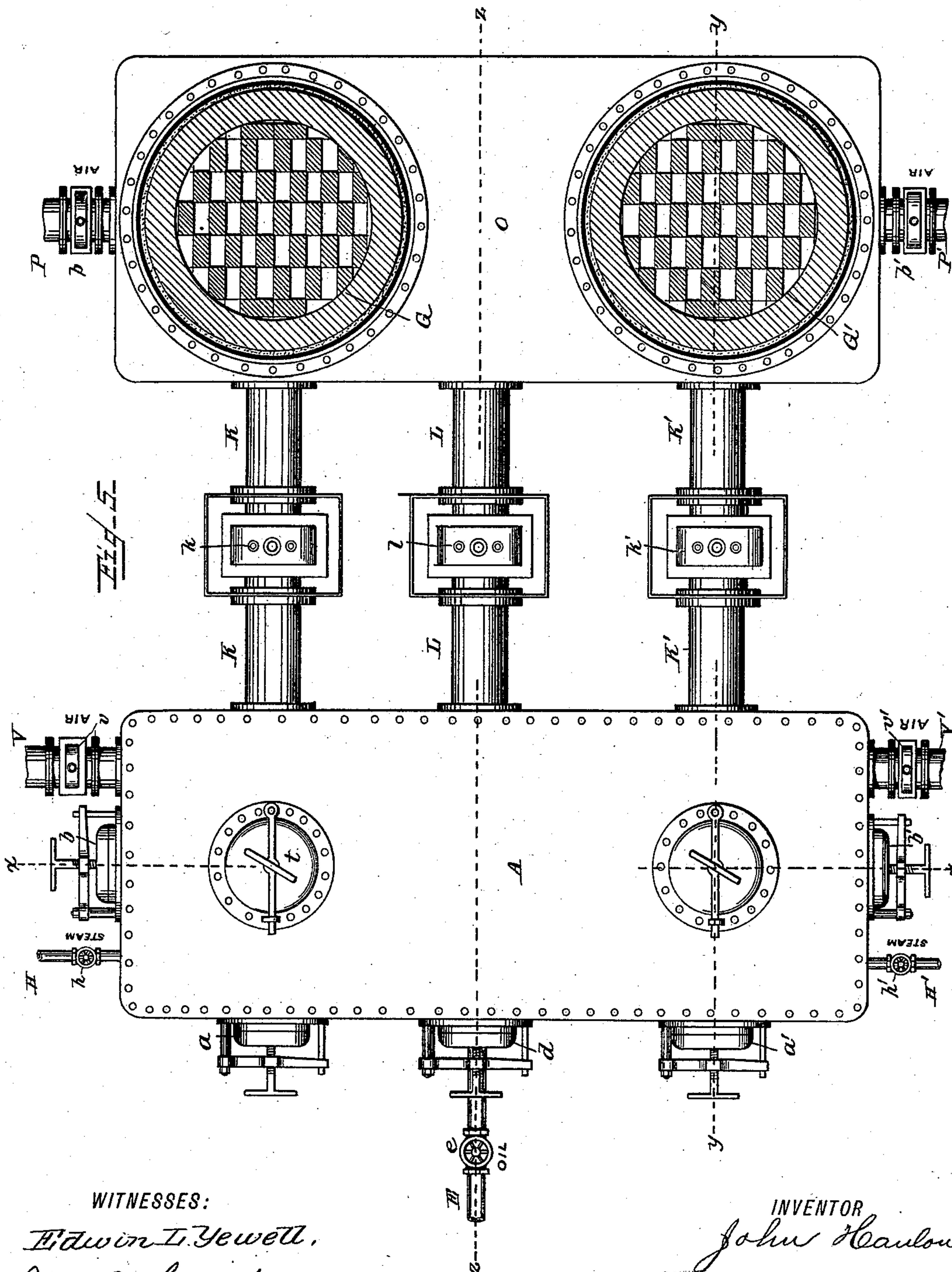
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WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN HANLON, OF NEW YORK, N. Y.

APPARATUS FOR THE MANUFACTURE OF GAS.

SPECIFICATION forming part of Letters Patent No. 418,615, dated December 31, 1889.

Application filed July 16, 1887. Serial No. 244,518. (No model.)

To all whom it may concern:

Be it known that I, JOHN HANLON, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Apparatus for Manufacturing Gas; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to the manufacture of illuminating-gas in a double-cupola generator by decomposing steam in contact with incandescent fuel, carbureting the gases resulting from the decomposed steam with hydrocarbon liquid or vapor in a separate carbureting-chamber, and combining and fixing the carbureted gas in a heated fixing-chamber; and more particularly the invention relates to improvements in the apparatus covered by patents granted to me, No. 300,466, dated June 17, 1884, and No. 311,124, dated January 20, 1885.

The object of my invention is to simplify the construction of the apparatus, make it more compact and less expensive to erect, and to provide for the more economical manufacture of gas; and more especially the object is to provide a separate carbureting-chamber, conveniently arranged between the two fuel-chambers and maintained at the desired temperature by heat radiated from such chambers. By means of such carbureting-chamber the hydrocarbon liquid can be supplied to the water-gas without danger of burning or decomposition into lamp-black, and thereby economy in the use of oil is effected and the quality of the gas is improved.

My invention is clearly illustrated in the accompanying drawings, in which—

Figure 1 represents a front elevation of the apparatus. Fig. 2 represents a vertical section on line *x x*, Fig. 5, through the two fuel-chambers and the carbureting-chamber. Fig. 3 represents a vertical section on line *y y*, Fig. 5, from front to rear, through one fuel-chamber and the base of the fixing-chamber. Fig. 4 represents a vertical section on line *z z*, Fig. 5, from front to rear, through the carbureting-chamber and base of the fixing-cham-

ber. Fig. 5 represents a top plan view of the apparatus with the fixing-chambers in horizontal section.

The generating part of the apparatus A is built of brick and covered with a riveted iron jacket. It is divided by vertical brick partition-walls into the side fuel-chambers B C and the middle carbureting-chamber D, which chambers are lined with fire-brick. The fuel-chambers are provided at the base with the usual grates and ash-pits, ash-doors *a a'*, and side doors *b b'*, just above the grates for removing clinker, and at the top with the fuel-passages *u u'*, having lids *t t'*. Air-blast pipes V V', having valves *v v'*, connect with the ash-pits, and steam-supply pipes H H', having valves *h h'*, connect with upper portions of the fuel-chambers, preferably just above the coal-level.

My carbureting-chamber D is, for convenience and for economy of construction and operation, arranged centrally in the generating part of the apparatus between the two fuel-chambers and communicates with such chambers at the base just above the grates by means of passages *c c'*. It is constructed with horizontal partitions or shelves *w w* extending alternately from opposite sides or front and back of the chamber nearly across it, but terminating a short distance from the opposite wall, so as to form a continuous zig-zag passage from top to bottom of the chamber, as shown in Figs. 2 and 4. The hydrocarbon-oil-supply pipe E, having valve *e*, connects with injector I, which opens by the flaring mouth *i* into the base of chamber D just between the inlet-passages *c c'* for water-gas from chamber B C. Steam-supply pipe F, having valve *f*, connects with the injector and terminates therein with a jet-nozzle *f'*. Openings *x x*, having lids *d d*, are provided in the wall of the carbureting-chamber to give access for cleaning or repairing the shelves, if required.

The combining and fixing chambers G G' are mounted on the common connecting-base O, which is mounted upon a masonry foundation on a level with the upper parts of the fuel and carbureting chambers. A large chamber R on base O forms a free communication between chambers G G', so that gas

or products of combustion admitted into any portion of chamber R can be passed into either chamber G or G'. Perforated arches support the brick-work in chambers G G'.
 5 In practice, each chamber G G' is provided with one or more valved gas-take-off pipes (not here shown,) so that during a gas-making run first one may be used for combining and fixing gas till its temperature is too much
 10 reduced, then the other used for such purpose to the end of the run, so as to insure the better fixing of the gas throughout the run, as explained in the above-mentioned patents. Pipes K K', having water-cooled valves *k k'*,
 15 connect the tops of fuel-chambers B C with chamber R, and pipe L, having water-cooled valve *l*, connects the top of carbureting-chamber D with chamber R. Air-blast pipes P P', having valves *p p'*, connect one with
 20 each end of chamber R, for supplying air for causing combustion of gaseous products from the fuel-chambers when heating up the apparatus.

In operating the apparatus the ignited
 25 bodies of fuel in chambers B C are blasted with air till they are heated to incandescence, and during this operation the gaseous products given off from the fuel are passed through pipes K K' (the valves of which are
 30 open) into chamber R, and there burned for heating the combining and fixing chambers G G'. Air for burning the products is admitted to chamber R by pipes P P'. The air-blasts are continued till the bodies of fuel and
 35 the combining and fixing chambers are suitably heated. Then they are shut off and all lids and doors of the fuel-chambers closed. Valves *k k'* are closed and valve *l* of pipe L, leading from carbureting-chamber D to the combin-
 40 ing and fixing chambers, is opened. Steam is now admitted by pipes H H' into the tops of fuel-chambers B C, and decomposed by passage down through the bodies of incandescent fuel, and the resulting water-gas passes
 45 through flues *c c'* into the base of carbureting-chamber D. As gas enters chamber D, hydrocarbon oil is blown into it in the form of spray or vapor by injector I, and the two are intimately mingled together by passing
 50 back and forth through the zigzag passage between the heated shelves of the chamber. The gas thus becomes uniformly carbureted to the desired candle-power, and on leaving chamber D passes into one of the heated
 55 chambers G or G', where it is combined and converted into a fixed gas. The manufacture of gas is thus continued till the heat of

the fuel and fixing chamber becomes too much reduced to produce proper decomposition of steam and fixing of the gas when the
 60 steam and oil are shut off and the apparatus is again heated up, as above described, preparatory to again making gas.

The carbureting-chamber, provided with brick or fire-clay tile partition-plates, ar-
 65 ranged as described, can be maintained at the desired temperature for properly vaporizing the oil, and it supplies the necessary means for suitably mixing the water-gas and oil-vapor before they are subjected to the
 70 high heat of the combining and fixing chamber, whereby burning and waste of oil are prevented and gas of a high candle-power and improved quality is produced.

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

1. In a gas apparatus, the two fuel-chambers and the connected carbureting-chamber built in one structure and separated by par-
 80 tition-walls, and the fixing-chambers having valved connections both with the fuel-chambers and the carbureting-chamber, as and for the purpose described.

2. The two fuel-chambers having steam-
 85 supply pipes connected near their tops, in combination with a carbureting-chamber arranged between them and connecting therewith at the base and having a gas-escape
 90 pipe leading from its top, for the purpose described.

3. In combination with the two fuel-chambers, the carbureting-chamber arranged between them and having a series of partition-
 95 plates forming a zigzag passage, flues connecting the fuel-chambers with the carbureting-chamber at the base, and a gas-discharge pipe leading from the top of the carbureting-chamber, for the purpose described.

4. In combination with the two fuel-cham-
 100 bers, the carbureting-chamber arranged between them in the same shell and connecting with such chambers at the base, and having partition-plates forming a zigzag passage, and the hydrocarbon-oil-supply pipe connect-
 105 ing with the base of the carbureting-chamber, for the purpose described.

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

JOHN HANLON.

Witnesses:

HENRY C. SOMMERS,
 F. W. SEMKEN.