

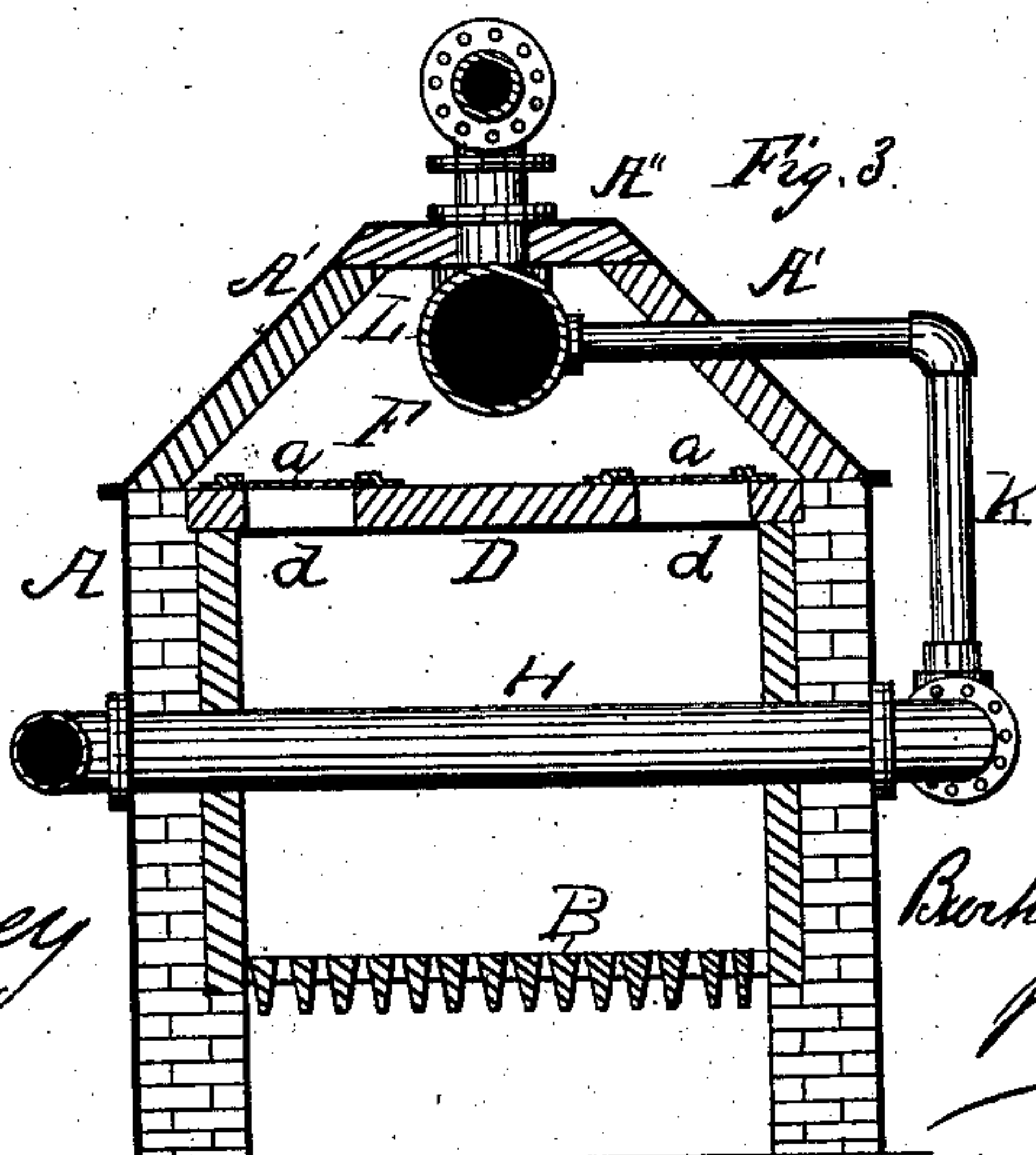
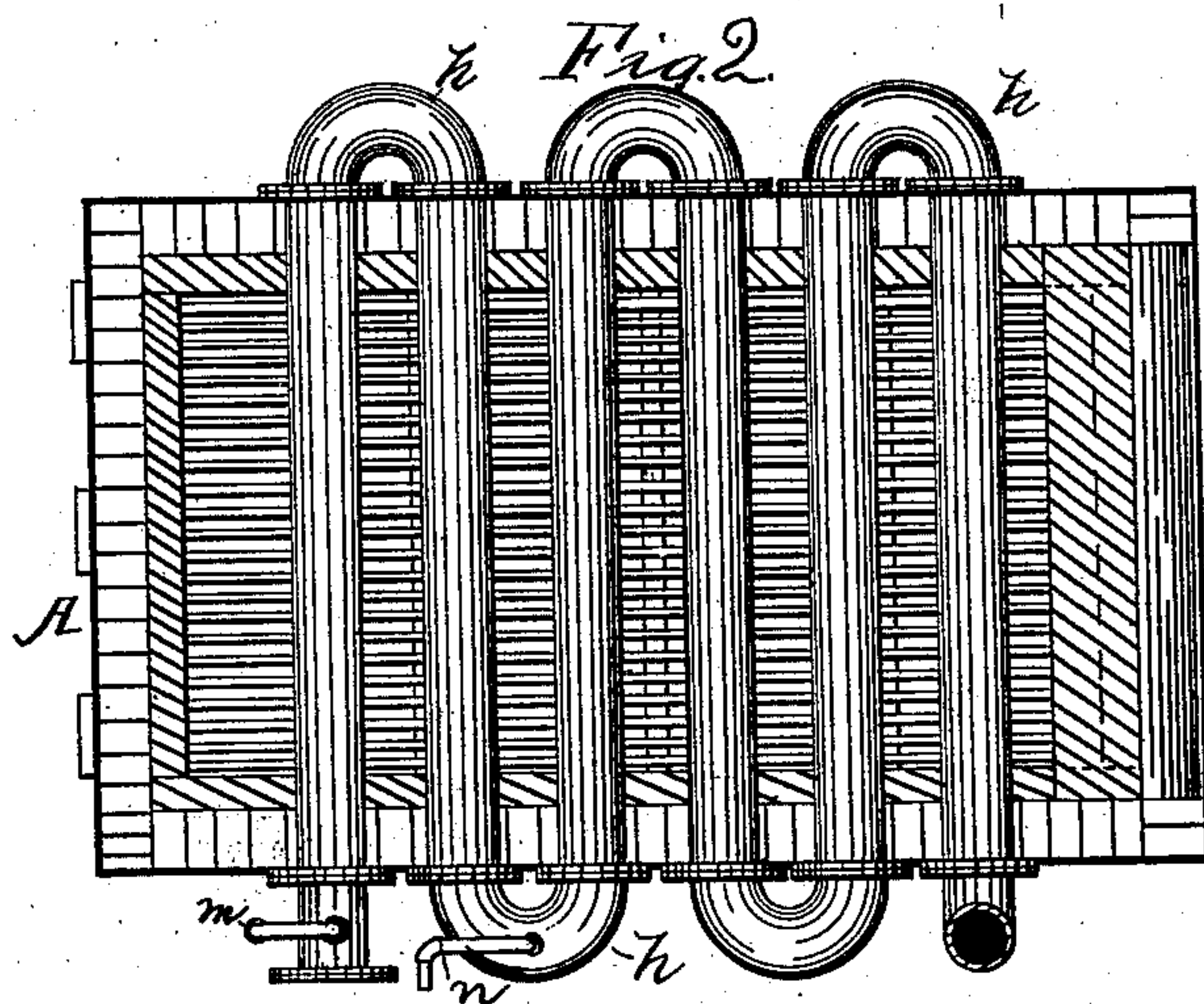
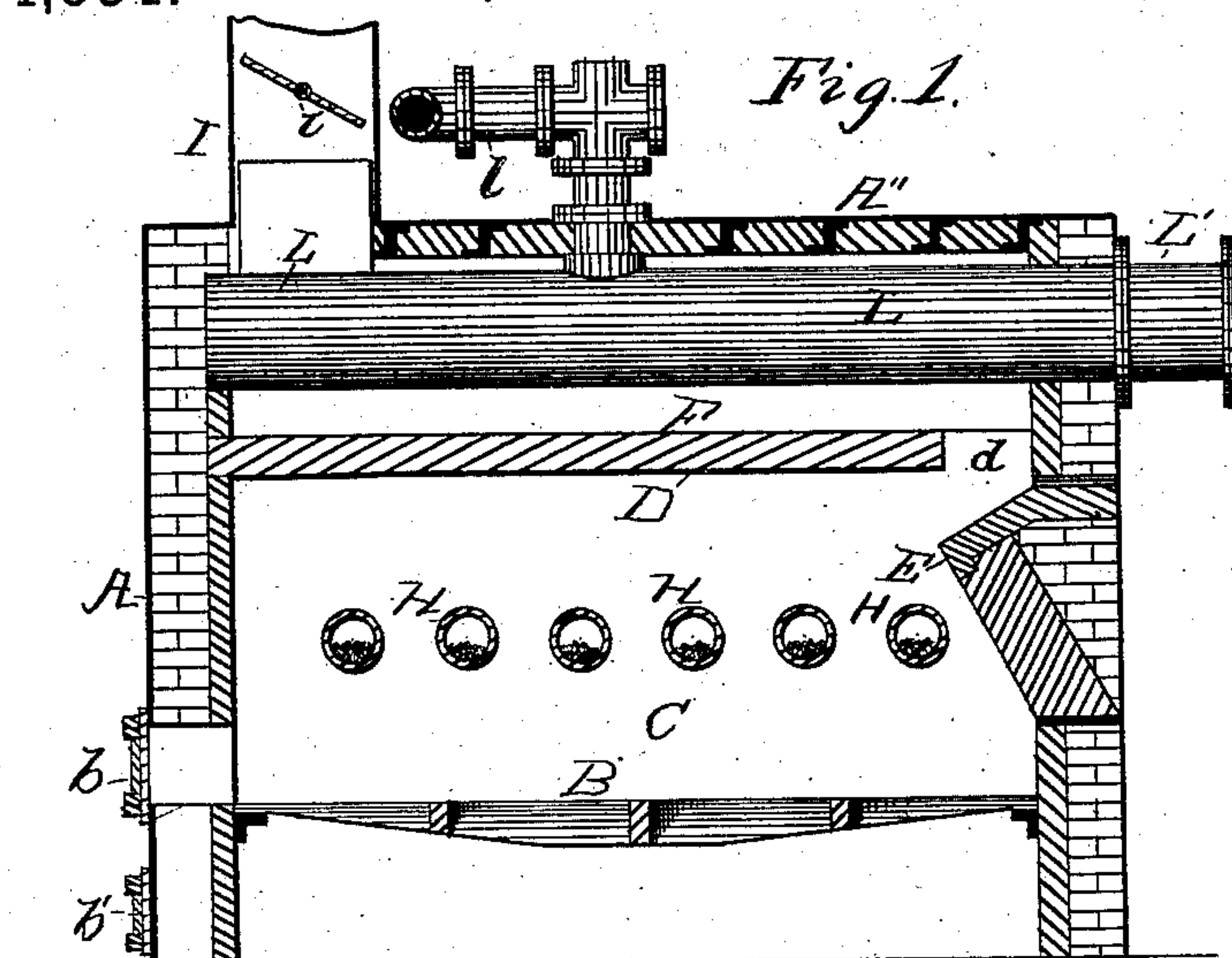
(No Model.)

B. VAN STEENBERGH.

APPARATUS FOR MANUFACTURING GAS.

No. 294,534.

Patented Mar. 4, 1884.



WITNESSES

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APPARATUS FOR MANUFACTURING GAS.

SPECIFICATION forming part of Letters Patent No. 294,534, dated March 4, 1884.

Application filed October 23, 1883. (No model.)

To all whom it may concern:

Be it known that I, BURHANS VAN STEENBERGH, of Goshen, in the county of Orange and State of New York, have invented certain
5 new and useful Improvements in Apparatus for Manufacturing Gas; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it
10 appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to an improved apparatus for manufacturing heating or illuminating gas; and the object of the invention is to provide a readily portable apparatus, which shall be simple in construction and convenient of operation, and which may be transported in
15 sections and quickly set up, for making gas on a comparatively small scale. The apparatus, by its construction, however, is adapted to generate gas quite rapidly and in large volume as compared with its size. Gas is made
20 by the decomposition of steam and a hydrocarbon oil in contact with anthracite coal or coke or other suitable material in heated retorts and fixing the gas in a separate heated retort.

The construction of the apparatus is illustrated in the accompanying drawings, in which
30 Figure 1 represents a vertical longitudinal section of the apparatus. Fig. 2 represents a horizontal section just above the lower tier of retorts. Fig. 3 represents a vertical cross-section.

The retort-furnace A has its walls built up of ordinary brick, lined internally with fire-clay tiles or slabs, and covered externally with
40 a jacket of plate-iron, cast or rolled. The sides of the furnace are preferably made in sections, which are bolted together when the furnace is set up, and they are of such dimensions that they may be conveniently packed
45 and transported, and so that any one may be readily detached from the wall, in order to admit workmen to repair the inside of the furnace or to remove and replace any defective or worn part or section of the generating-retorts.
50

The usual grate, B, supported at its ends

upon ledges or lugs, is provided, separating the ash-pit from the fuel and retort chamber C, and in the front wall are doors *b b'*, opening, respectively, into the fuel-chamber and
55 the ash-pit. A partition of fire-clay tiles, D, separates chamber C from the upper chamber, F, and such partition is provided at the rear end of the furnace with two openings, *d d'*, which may be partially or entirely closed by
60 dampers *a a'*, the rods or handles of which should pass out through the wall of the furnace. In the rear wall is built a deflecting-bridge, E, projecting into chamber C, above the retorts, for causing reverberation of the
65 flame and heated products over the tops of the retorts, and thereby better heating them. The top or crown of the furnace is constructed of inclined fire-clay slabs or tiles *A' A'* and the horizontal central tile, *A''*. The inclined tile
70 *A'* throws the hot products of combustion against the sides of the retort, and thus uniformly heat it and economize the heat in the most advantageous manner. A chimney, I, for the escape of products of combustion, and
75 having a regulating-damper, *i*, rises from the top of the furnace, near the front end thereof, so that the hot products are compelled to pass the whole length of chamber F and impart their heat to the fixing-retort.
80

The decomposing retorts or conduits H are composed of numerous straight sections extending transversely across the chamber C through walls, and are connected together outside of the walls by return-bends *h*. The
85 straight sections and bends are provided with flanges, which are tightly secured together by bolts or screws, so that the return-bends may be readily removed for charging the retorts with coal or other material and cleaning them
90 out when necessary. At the farther end of the series of retorts, near the rear of the furnace, a pipe, K, connects them with a fixing-retort, L, in chamber F. This retort is provided with the usual mouth-piece, *L'*, having a
95 tight-fitting lid, and a pipe, *i*, is provided for conducting gas to the hydraulic seal or wash-box, or to any place of storage or use. A steam-supply pipe, *n*, connects with the return-bend uniting the second and third retort,
100 and an oil-supply pipe connects with the first retort. In making illuminating-gas, naphtha

or crude petroleum may be supplied near the latter end of the series of retorts, or at some point beyond the steam-supply, in order to better carburet the gases resulting from the decomposed steam. The retorts are charged with anthracite coal or other material affording a large heating-surface, so as to partially fill them and leave a passage-way for the gas. The retorts are preferably made small, and many of them provided, so that they may be quickly and thoroughly heated.

In conducting the operation of making gas, a fire is kindled on the grate and maintained as long as the production of gas is continued, and the retorts and contained coal or coke are first raised to or about an incandescent heat. Then steam, preferably in a superheated state, is admitted into the retorts and decomposed by contact with incandescent or highly-heated carbon, forming hydrogen and carbonic oxide. Hydrocarbon oil is also admitted, and converted by the heat into rich carbureted-hydrogen gas, which serves to carburet or enrich the hydrogen and carbonic oxide resulting from the decomposed steam, and thus form an illuminating-gas. The gases from the decomposed steam and that from the oil are conducted into the fixing-retort L, where they are combined and converted into a fixed illuminating-gas of high candle-power. Should it be found that the heat is too high for safely and economically admitting hydrocarbon oil into the retorts H, it may be admitted into ascending pipe K, and there be vaporized by the hot gas, passing to retort L; or the oil may be admitted into retort L near the inlet for the gas from retorts H. The gas, on leaving the fixing-retort, may be washed with water and purified by lime in the usual manner, though for many purposes little or no purification will be re-

quired. Broken brick or pumice-stone may be charged into the retorts, for affording a large heating-surface, instead of coal or coke, and gas be made from steam and oil only.

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

1. The retort-furnace having a deflecting-bridge projecting from its rear wall, in combination with the connected series of retorts arranged as and for the purpose described.

2. The retort-furnace having the deflecting-bridge projecting from an end wall, and also having a horizontal partition provided with openings at one end, dividing the furnace into two chambers, in combination with the retorts, arranged as described.

3. The horizontal series of retorts extending transversely across the furnace, and connected outside the walls by return-bends, and having supply-pipes for steam and oil connected with one or more of the retorts, in combination with the fixing-retort, a connecting-pipe, and the horizontal partition, having passages and separating the first series of retorts from the fixing-retort, for the purpose described.

4. The furnace A, constructed with deflecting-bridge E, partition D, having openings at one end, the chimney I at the opposite end of the furnace, and with slanting crown-plates A', in combination with the connected generating-retorts H and the fixing-retort L, as and for the purpose described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

BURHANS VAN STEENBERGH.

Witnesses:

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M. P. CALLAN.