

(No Model.)

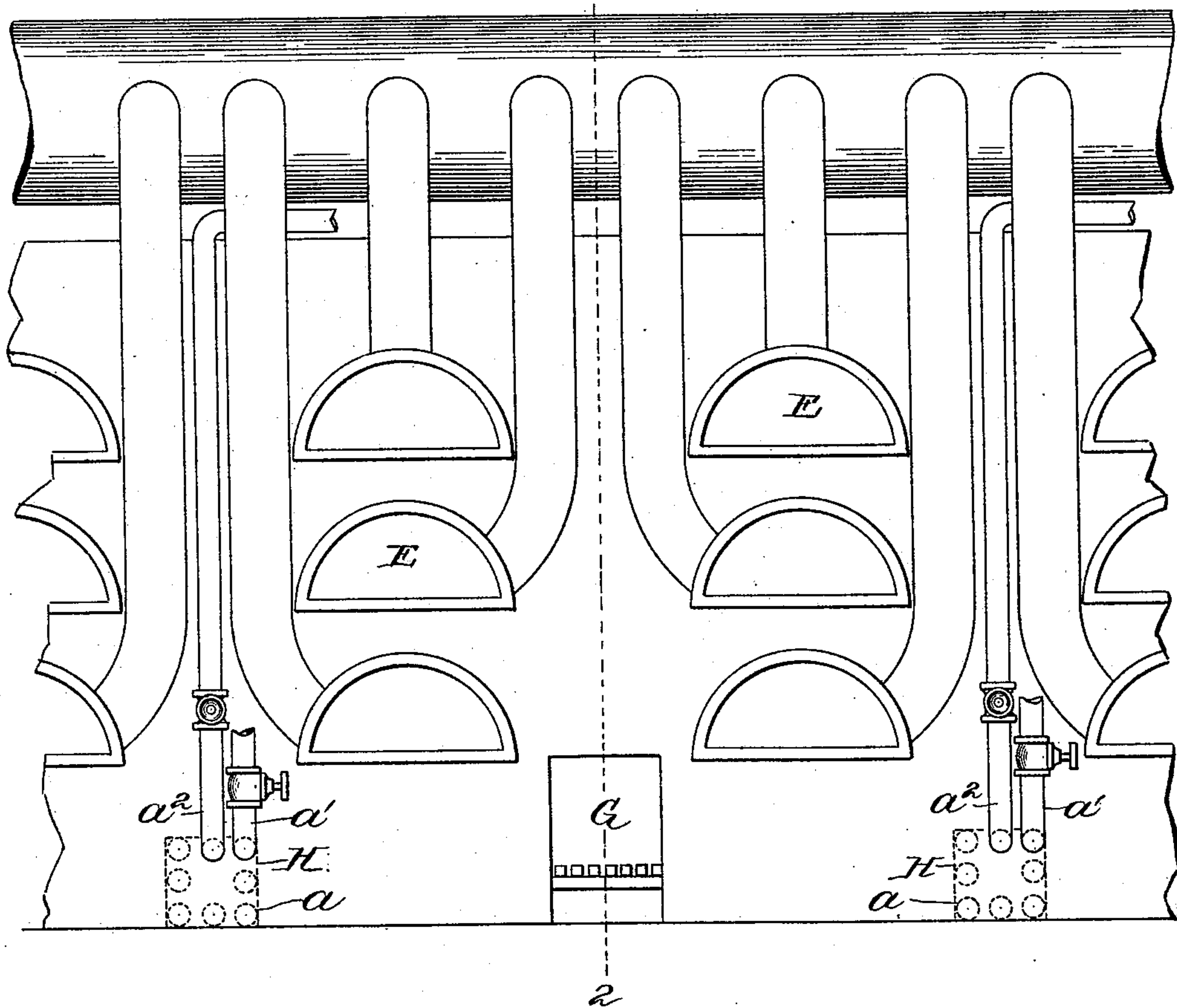
4 Sheets—Sheet 1.

G. F. DINSMORE.
STEAM GENERATOR.

No. 591,460.

Patented Oct. 12, 1897.

Fig. 1.



Witnesses:

Arthur S. Randall
Edmund A. Bates

Inventor:

George F. Dinsmore

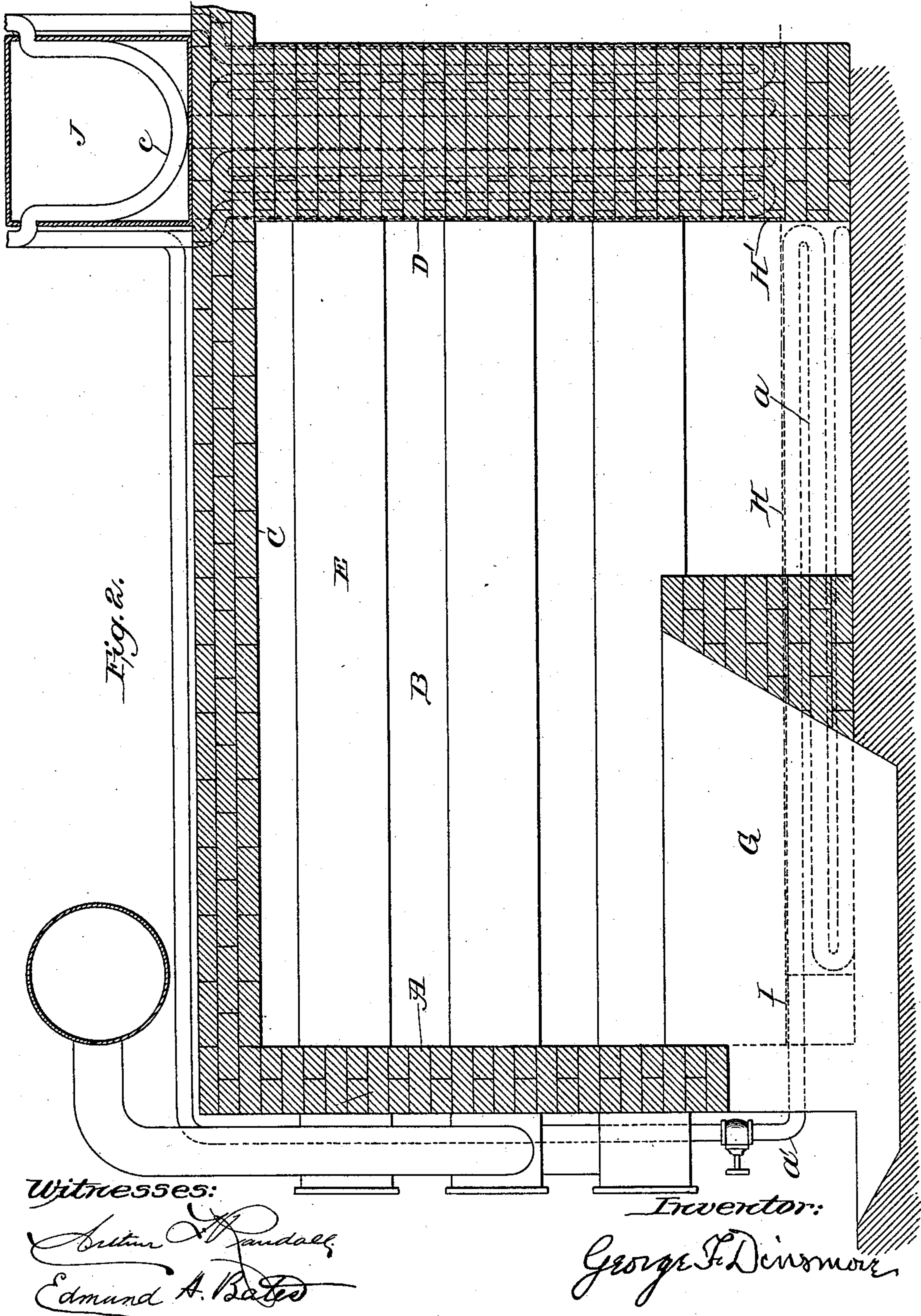
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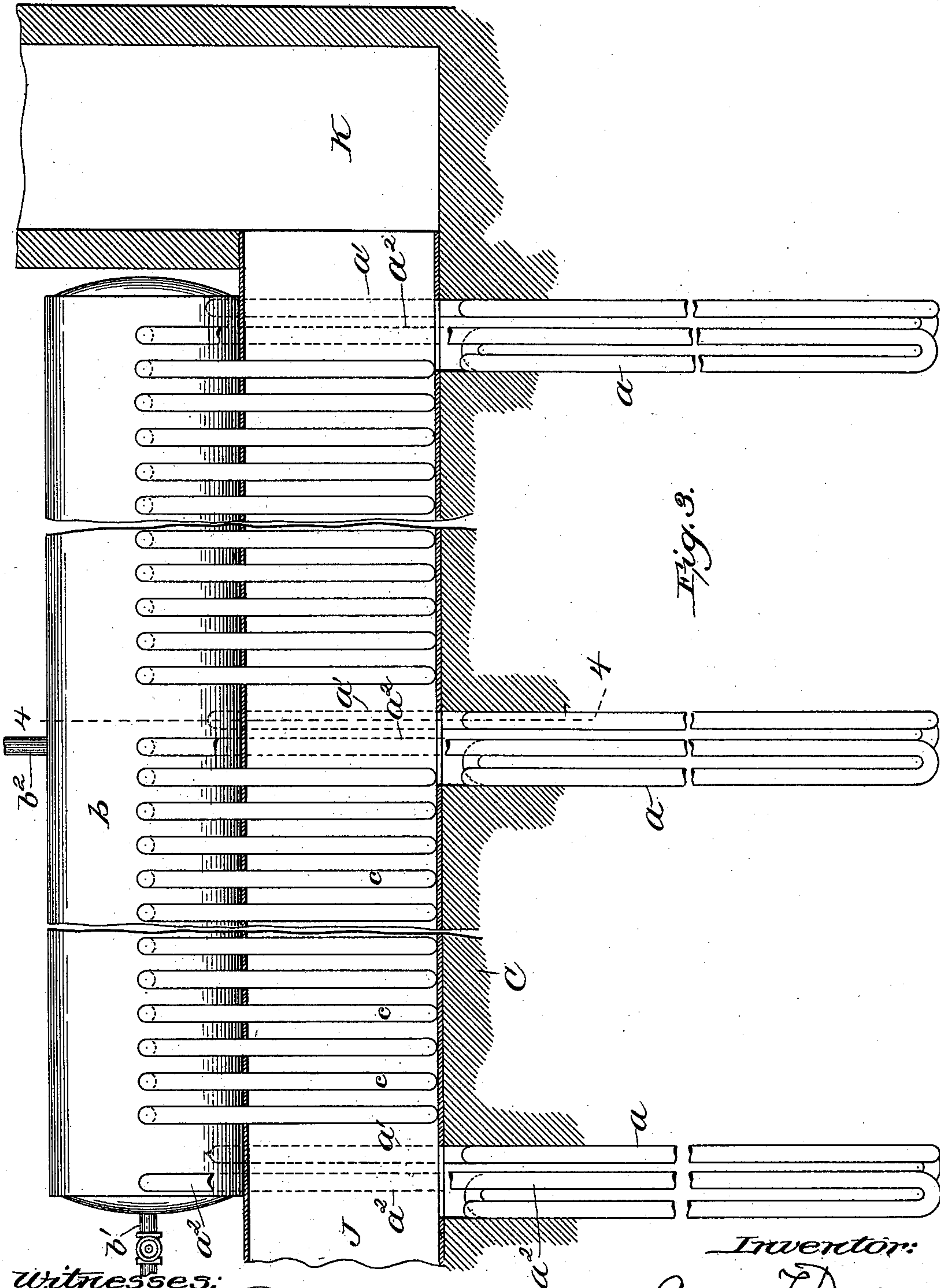
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Witnesses:

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Inventor:

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4 Sheets—Sheet 4.

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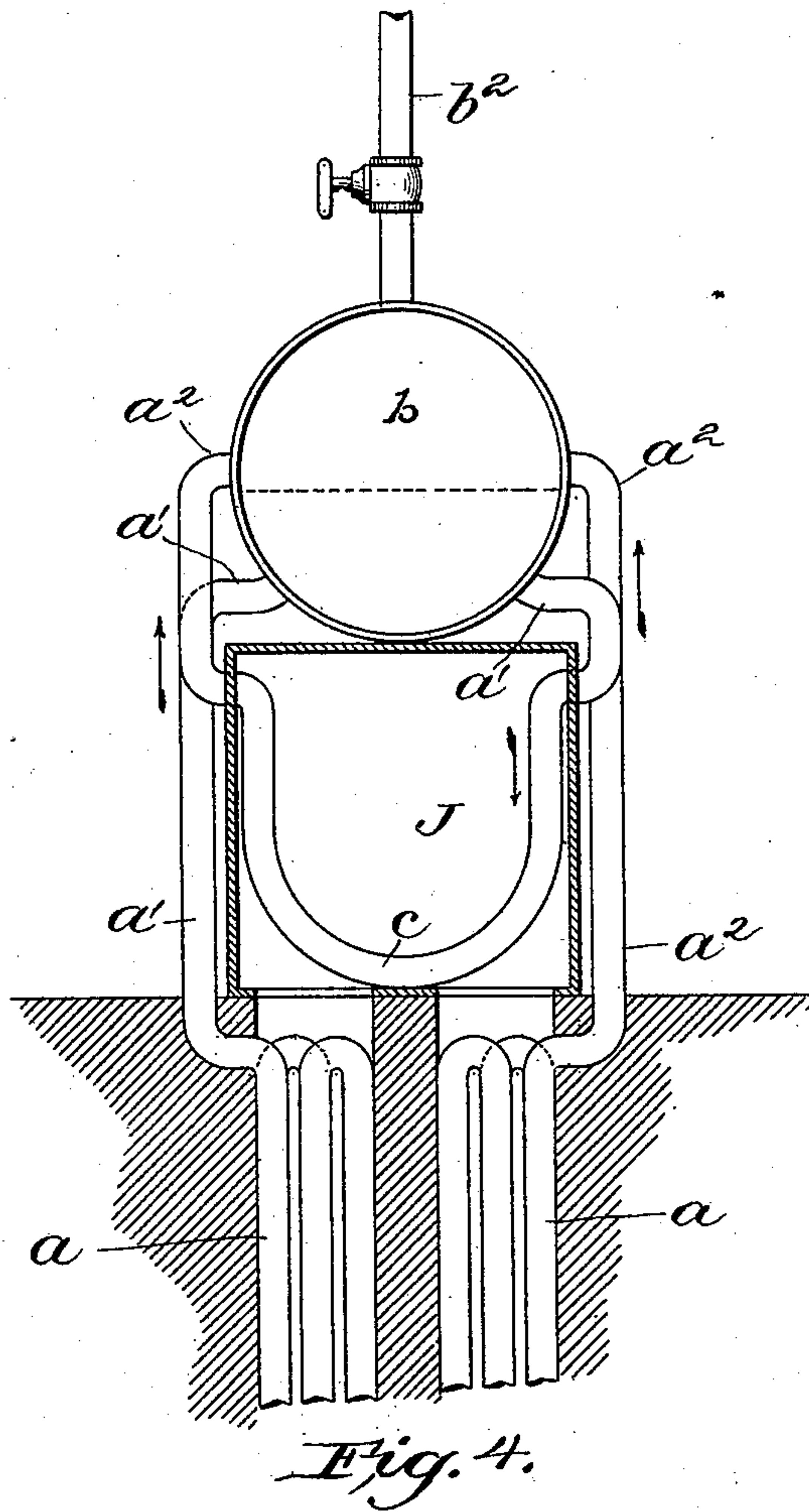


Fig. 4.

Witnesses:

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Inventor:

George F. Dinsmore

UNITED STATES PATENT OFFICE.

GEORGE F. DINSMORE, OF BOSTON, MASSACHUSETTS.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 591,460, dated October 12, 1897.

Application filed January 11, 1897. Serial No. 618,855. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. DINSMORE, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Steam Generating and Superheating Apparatus, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention contemplates a steam generating or superheating apparatus, such as is hereinafter particularly set forth, whereby the waste units of heat accruing in the manufacture of soft-coal gas may be utilized to generate or superheat steam either for power or for use in manufacture of what is commonly known as "water-gas."

The object of the invention is to provide a new and improved method or system and apparatus for generating or superheating steam which shall utilize to a maximum degree what has heretofore been the waste units of heat accruing in the manufacture of soft-coal gas and of such a character and arrangement of parts as to be easily applied to contrivances now commonly employed in the manufacture of soft-coal gas, and which will in no way detract from the efficacy of such apparatus, and which shall also be comparatively simple in and inexpensive of construction, all as is hereinafter more fully set forth and described in the following specification, after which the invention or novel features of the device are particularly pointed out and clearly defined in the claim at the close hereof.

Of the drawings, Figure 1 is a front view of what is known in the art as a "bench of coking-retorts." Fig. 2 is a sectional view of the same, taken on the line 2 2 of Fig. 1. Fig. 3 is a sectional view of the upper rear portion of a bench of retorts, showing parts of my invention not shown in Figs. 1 and 2. Fig. 4 is a sectional view of Fig. 2, taken on line 4 4 of Fig. 3.

Referring particularly to Figs. 1 and 2 of the drawings, I have shown therein a common form of a bench of retorts, such as are in general use in the manufacture of bituminous or soft coal gas, the said bench comprising in its construction the front wall A, side walls B B, top C, and rear wall D. These

walls form an oven in which are arranged retorts E, in which the coal-gas is generated in the well-known manner, they being heated to a high degree of heat on their sides within the oven by means of a fire built in the fire-box G. The heat and products of combustion pass from the fire-box up around the retorts and then down at each side of the oven to flues H, arranged in the side walls of the oven, one at each side thereof, and the said side flues have a mouth I, which at the forward face or side of the wall communicates with the interior of the oven. The flues H extend rearwardly of the bench and communicate with vertical flues H', formed in the rear wall, which flues H' in turn communicate with a main flue J, which in turn communicates with the chimney, a portion of which is shown at K. (See Fig. 3.)

The foregoing construction and arrangement are of a design in which I do not claim that any invention is involved.

A great quantity of heat is carried off through the flues with the products of combustion and otherwise, which heat heretofore, so far as known to me, has been wholly wasted. My invention contemplates the utilization of these waste units of heat for useful purposes, and in carrying out my invention I will now proceed to describe one form of apparatus for accomplishing the purposes of the invention.

Within the flues H, I place a coil of pipe *a*, the extremities of which project forward outside the front wall of the bench or oven, and the ends of the coil communicate with a boiler or steam-drum *b*, which latter is preferably arranged above the main flue J and is provided with a suitable water-feed pipe *b'* and steam-offtake pipe *b''*. The end *a'* communicates with the said steam chest or boiler at a point below the water-line, while the end *a''* of the coil communicates with the boiler or steam-chest *b* at a point above the water-line. By this arrangement of the coil and its extremities a circulation is obtained down through the extremity *a'* into the coil *a*, where it is heated to a very high degree and converted into steam through the action of the waste units of heat passing through the flue H. From the coil *a* the steam or superheated

steam passes through the pipe a^2 to the steam-space of the boiler, from which it may be taken or drawn off for various purposes.

Where the coil a is used to superheat steam
 5 for use in the manufacture of water-gas, the
 extremity a^2 of the coil may be arranged to
 communicate with a gazogene or cupola, where
 it may be brought into contact with the in-
 10 candescent carbon or coke contained therein
 after a well-known manner, and the pipe a'
 may be arranged to communicate with a suit-
 able steam-supply source. The upright flues
 15 II' are or may be fitted or provided with coils
 a , communicating with the steam chest or
 boiler b in the same manner as do the coils a
 in the flues II . The waste units of heat pass-
 ing through the main flue J are utilized by
 providing pipes c , formed in loops and placed
 20 within said flue and arranged as shown, so as
 that one extremity of said pipes will commu-
 nicate with the steam chest or boiler b above
 the water-line and so as that the other ex-
 tremity thereof will communicate with the
 steam chest or boiler below the water-line,
 25 thus insuring a circulation through the said
 pipes. In some instances I contemplate em-
 ploying within the flue J a length of coiled
 pipe, one end thereof communicating with
 the steam chest or boiler above the water-
 30 line and the other end thereof communicat-
 ing with the steam chest or boiler below the
 water-line.

Ordinarily in gas-making plants, for econ-
 35 omy of space and convenience, a number of
 benches are arranged in a row or series, the
 rear walls of which also constitute the rear

walls of a similar series or row of benches,
 and all the flues of each bench are arranged
 to communicate with one common main flue,
 so that I contemplate in some instances con- 40
 structing the boiler or steam-chest of such a
 length and capacity as that a number of coils
 a from a multiplicity of benches may com-
 municate therewith, as shown in Fig. 3.

Having thus explained the nature of the 45
 invention and described a way of construct-
 ing and using the same, though without at-
 tempting to set forth all of the forms in which
 it may be made or all of the modes of its use,
 it is declared that what is claimed is— 50

The combination, with an apparatus for
 manufacturing coal-gas, comprising a fur-
 nace, and retorts therein, the furnace having
 a plurality of horizontal and vertical flues
 and a main flue into which said flues lead, of 55
 an apparatus for generating steam compris-
 ing a steam and water drum arranged outside
 of and adjacent to the main flue and a series
 of pipes each leading from the water-space
 of the steam and water drum into one of said 60
 flues and thence to the steam-space of the
 steam and water drum, substantially as de-
 scribed.

In testimony whereof I have signed my
 name to this specification, in the presence of 65
 two subscribing witnesses, on this 8th day of
 January, A. D. 1897.

GEORGE F. DINSMORE.

Witnesses:

ARTHUR F. RANDALL,
 EDMUND A. BATES.