

(No Model.)

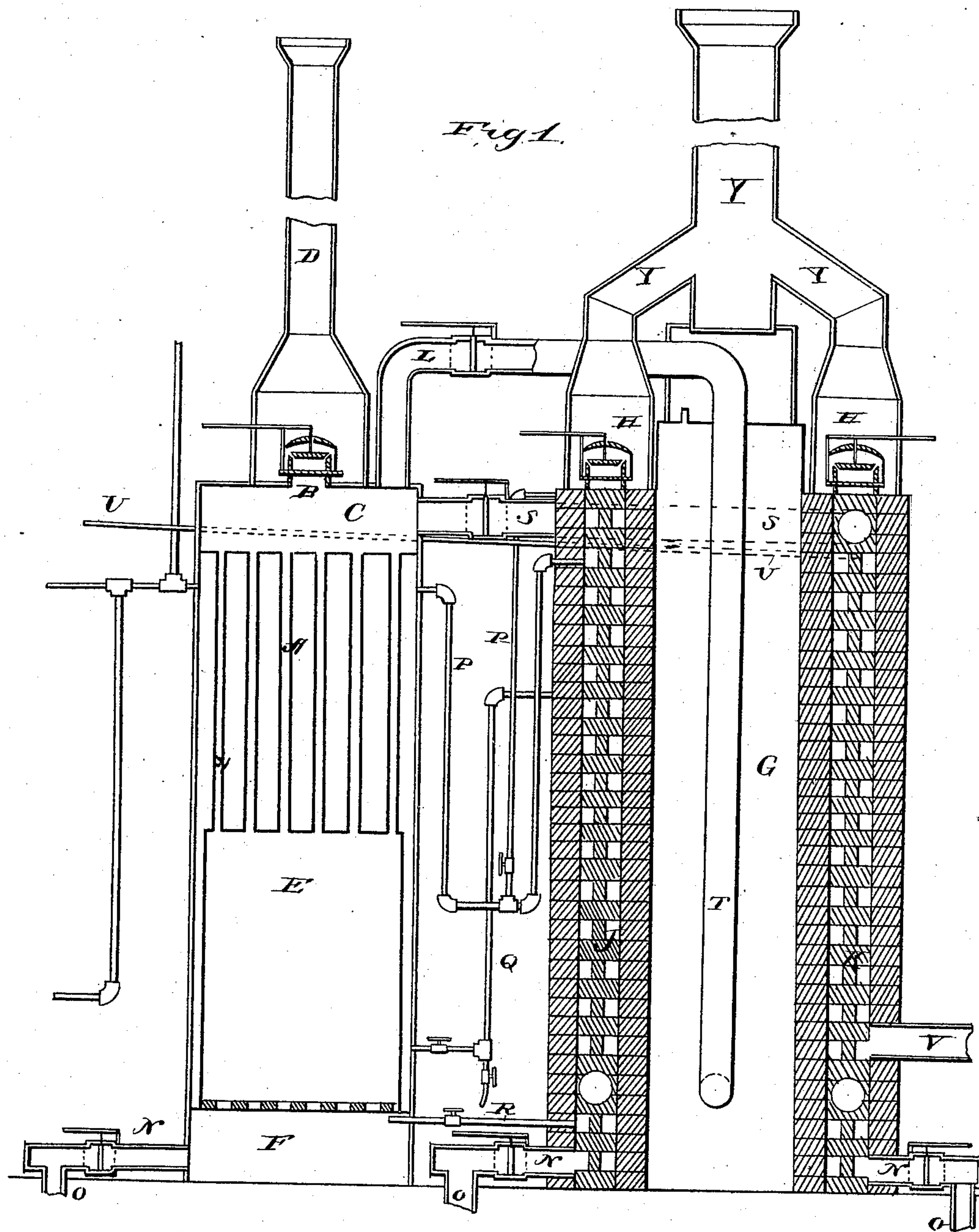
2 Sheets—Sheet 1.

J. BUJAC.

APPARATUS FOR THE MANUFACTURE OF FUEL AND ILLUMINATING GAS.

No. 365,906.

Patented July 5, 1887.



Witnesses:

Wm. A. Rosenthal
Dan. A. Reiff

Inventor:
James Bujac

by Warren C. Stone
Att'y

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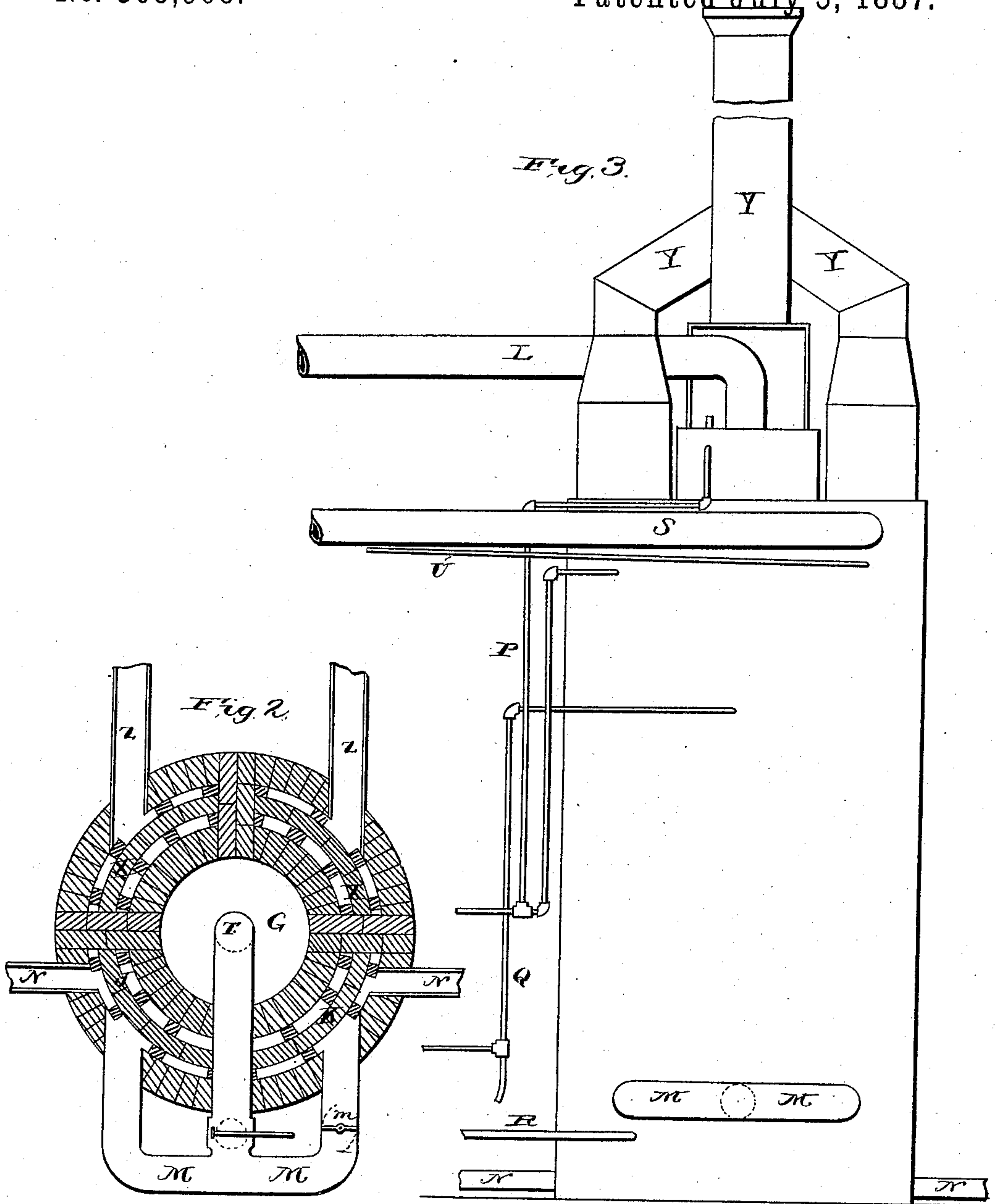
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Atty.

UNITED STATES PATENT OFFICE.

JAMES BUJAC, OF CATONSVILLE, MARYLAND.

APPARATUS FOR THE MANUFACTURE OF FUEL AND ILLUMINATING GAS.

SPECIFICATION forming part of Letters Patent No. 365,906, dated July 5, 1887.

Application filed February 28, 1885. Renewed October 19, 1885. Again renewed April 29, 1886. Again renewed May 23, 1887.
Serial No. 239,167. (No model.)

To all whom it may concern:

Be it known that I, JAMES BUJAC, a citizen of the United States, residing at Catonsville, in the county of Baltimore and State of Maryland, have invented certain new and useful Improvements in Apparatus for the Manufacture of Fuel and Illuminating 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.

The object of my invention is to produce, by means herein shown, and particularly pointed out in the claims, a fuel and highly-illuminating gas at a comparatively low cost, for completely utilizing certain products of combustion which are not unfrequently wasted.

This apparatus consists in the combination of a tubular boiler of proper construction, which provides for the control of the products arising from the fire of the furnace, with a supplemental flue boiler surrounded by a jacket of brick-work, so as to form several independent flues, the whole being inclosed in an iron casing, the two boilers being connected by properly-valved pipes.

In the drawings, Figure 1 is a vertical section of the entire apparatus, showing the relative position to each other of the said tubular and supplemental boilers and their interior arrangement. Fig. 2 is a horizontal sectional view of the supplemental boiler, and Fig. 3 is a front view of said supplemental boiler.

Similar letters refer to similar parts throughout the several views.

A is the tubular boiler; B, a valve controlling the exit of the products arising from the fuel consumed in the furnace.

C is the smoke-box; *a*, the flues of the boiler; E, the furnace or fire-box, and F the ash-pit.

G is the supplemental boiler having the central flue, T.

H H are valves controlling the products of combustion from the flues J K; L, the pipe connecting with the flue T, and terminating in the branch pipes M, by which the products from the furnace E are conveyed through the flue T of the supplemental boiler G into the branch pipes M, which discharge into the flues J K.

A valve or damper, *m*, is arranged in one of the branches M, to regulate the passage of the products of combustion to the flue K, so that the heat therein may not be sufficient to produce a deposit of the carbon of the carbonizer.

Q is the water-pipe by which boiling water is supplied to boiler A from the supplemental boiler G.

P P are pipes by which steam is taken from the boilers A and G and conveyed to the brick flue J, from which the steam passes into the pipe R, by which it is conveyed and discharged into the ash-pit F.

S is a pipe through which is conveyed gas from the smoke-box C to the flue K of the supplemental boiler G.

U is a pipe by which the hydrocarbon is conveyed to the flue K.

O O are blast-pipes, and N valved branches, which supply and which completely control the quantity of air admitted into the furnace E of boiler A and the flues J K in the brick jacket of the boiler G.

V is a valved pipe by which the permanent gas passes from the flue into a hydraulic main and into the gasometer.

D is a smoke-stack.

X are flues in the brick jacket of the supplemental boiler G, and Z are pipes connecting the flues X with a brick oven traversed by the pipe which supplies air to the blast.

The operation of my invention is as follows: The fire having been properly lighted in the fire-box E of the boiler A, the draft in the ash-pit F, the valves B of boiler A and H of boiler G are closed, and the valve in pipe L is opened. Air is then supplied to the furnace by the blast, and the quantity admitted is regulated by the valve in pipe N. The products arising from the fuel consumed in the furnace E pass up through the flues of boiler A into the smoke-box C, then into the pipe L, from thence into the flue T of the supplementary boiler G and branch pipes M, which discharge into the flues J and K, where the gaseous fuel is supplied with atmospheric air (by means of the valved pipes N) in such quantity as is needed to effect its complete combustion. The now incombustible residual of this final and complete combustion passes from the flues J

and K into the flues X, and from thence (into a brick oven) in contact with a stack of convoluted pipe, through which the air supplied to the blast is made to pass. The apparatus having attained the proper temperature, steam is taken from either or both of the boilers A and G by means of the pipes P, by which it is conveyed into the highly-heated flue J, from which it passes into the pipe R, through which it is conveyed into the ash-pit F, from whence it passes into the fire-box E, in contact with the incandescent fuel, where the well-known reactions take place by which the vapor of water is resolved into its elementary constituents of hydrogen and oxygen. The oxygen thus liberated combines with the carbon of the fuel to form carbonic oxide, and a portion of the hydrogen forms carbureted hydrogen, while the remainder remains free. These now permanent combustible gases pass from the fire-box E, through the flues of the boiler A, into the smoke-box C, through the pipe S into the flue K of the brick jacket of the supplemental boiler G, where, meeting and mingling with the gaseous carbureting-fluid, (naphtha or other liquid hydrocarbon,) produces a permanent gas of high candle-power and free from all admixtures of either condensable vapors and incombustible non-luminous gases.

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

1. In a gas-making apparatus, the combination of a tubular boiler, a flue boiler surrounded by a jacket provided with a plurality of flues, and means for conveying the products of combustion through both boilers and into the flues of the jacket, substantially as described.

2. In a gas-making apparatus, the combination of a tubular boiler, a flue boiler having

a jacket provided with a plurality of flues, passages for the products of combustion through both boilers to the flues in the jacket, and air-blast pipes for supplying air to support combustion in the jacket-flues, substantially as set forth.

3. In a gas-making apparatus, the combination of a tubular boiler, a flue boiler, a jacket for the latter having a plurality of flues, air-blast pipes for supplying air to support combustion, and valves or dampers to regulate the passage of the products of combustion, as specified.

4. In a gas apparatus, the combination of a tubular boiler, a flue boiler, a jacket having flues, and pipes for taking steam from both boilers and conducting it into one of the jacket-flues, and thence through such flue to the incandescent fuel in the fire-box of the tubular boiler, as specified.

5. In a gas apparatus, the combination of tubular boiler, flue boiler, jacket having a plurality of flues, and means for regulating the passage of the products of combustion to the flues in the jacket, whereby the heat in the flues may be regulated in one of them, as set forth.

6. In a gas apparatus, the combination of tubular and flue boilers, a jacket for the latter having a plurality of flues, and a liquid-hydrocarbon conduit to one of the jacket-flues, where the hydrocarbon is gasified and mixed with the other gas, whence it passes through a proper conduit to the hydraulic main, as set forth.

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

JAMES BUJAC.

Witnesses:

DAN. A. REIFF,

JOSEPH I. McCLOSKEY.