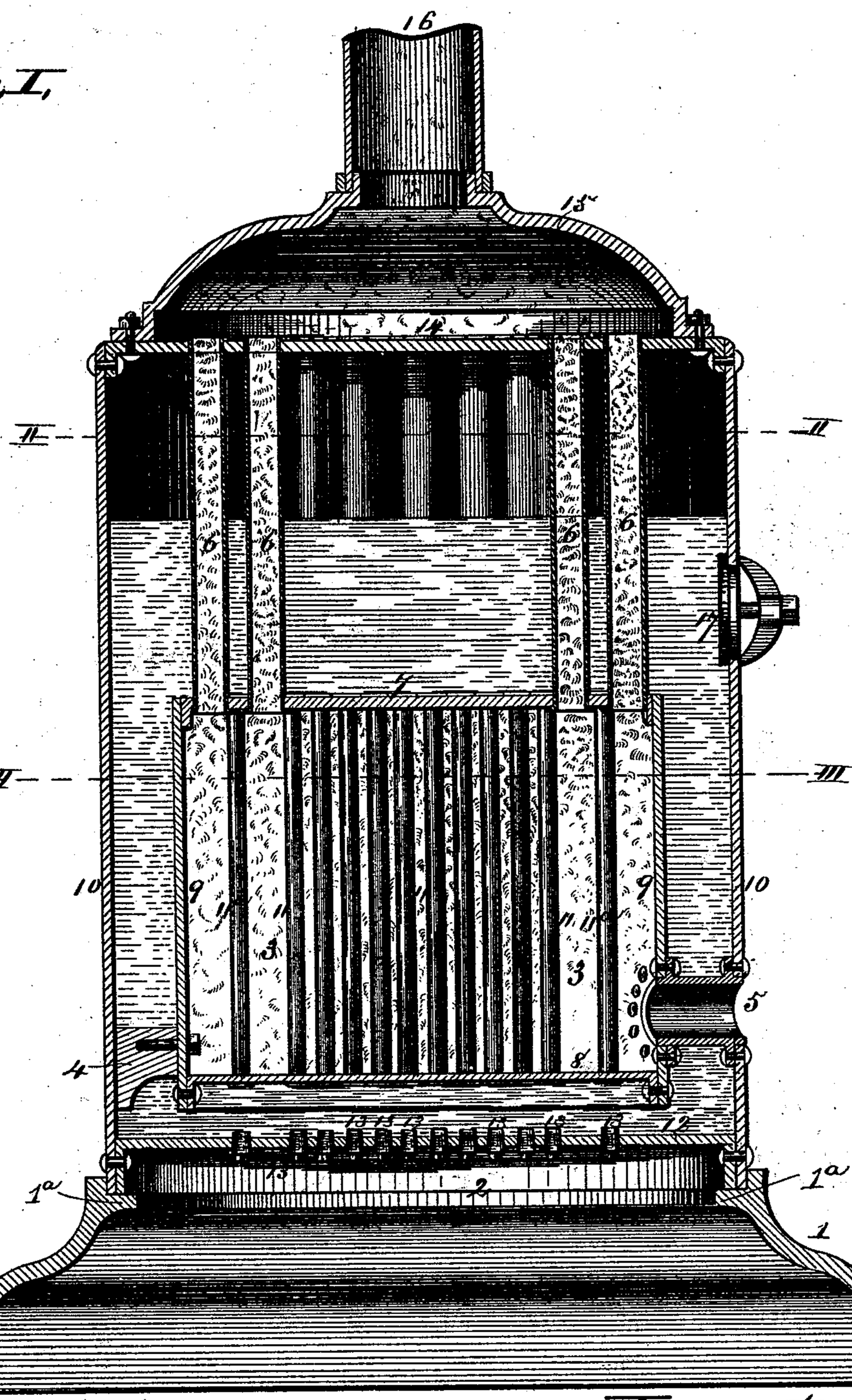
(No Model.) 2 Sheets—Sheet 1.

J. E. GREEN.

STEAM BOILER.

No. 517,745. Patented Apr. 3, 1894.

Fig. I.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. II.

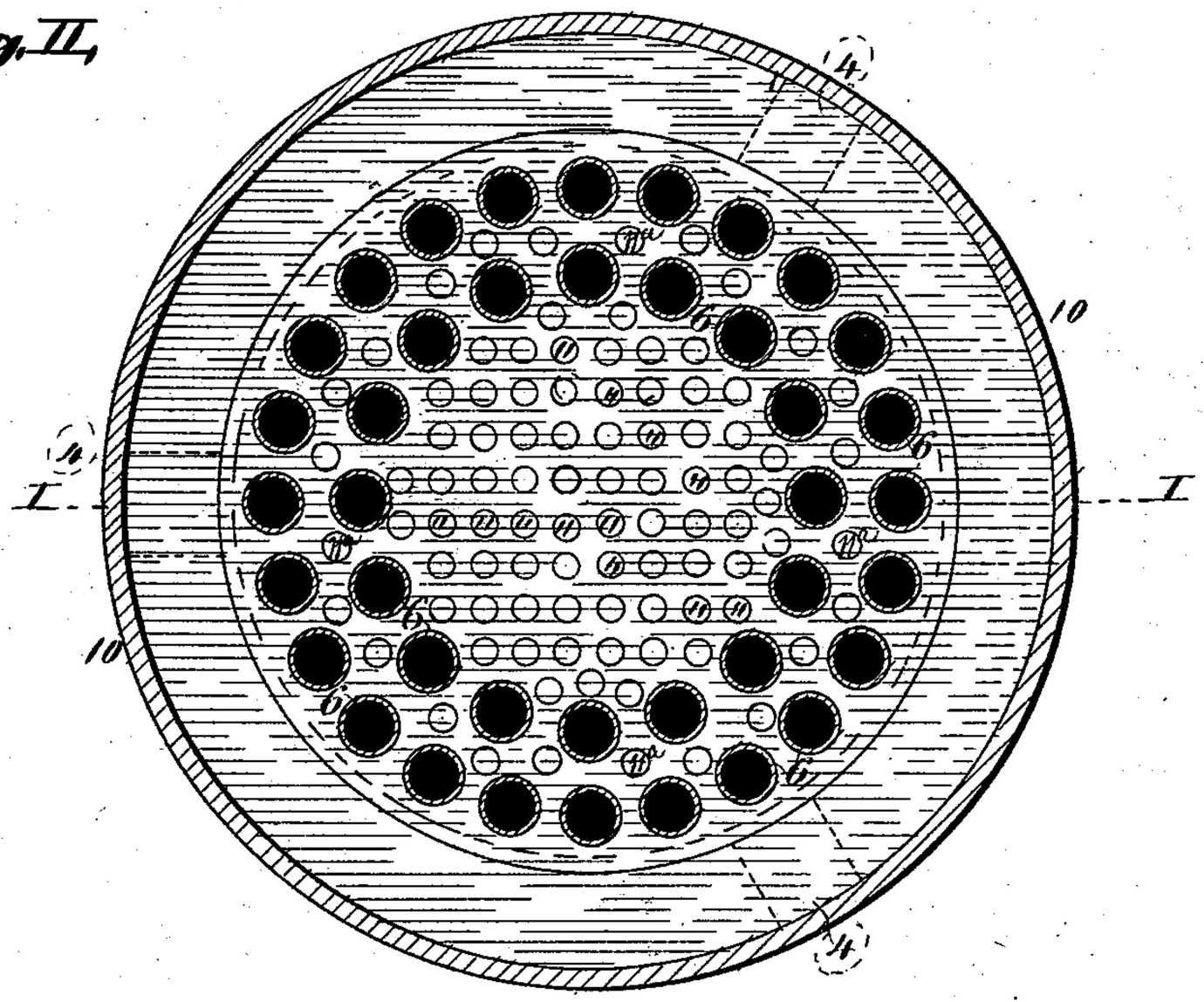
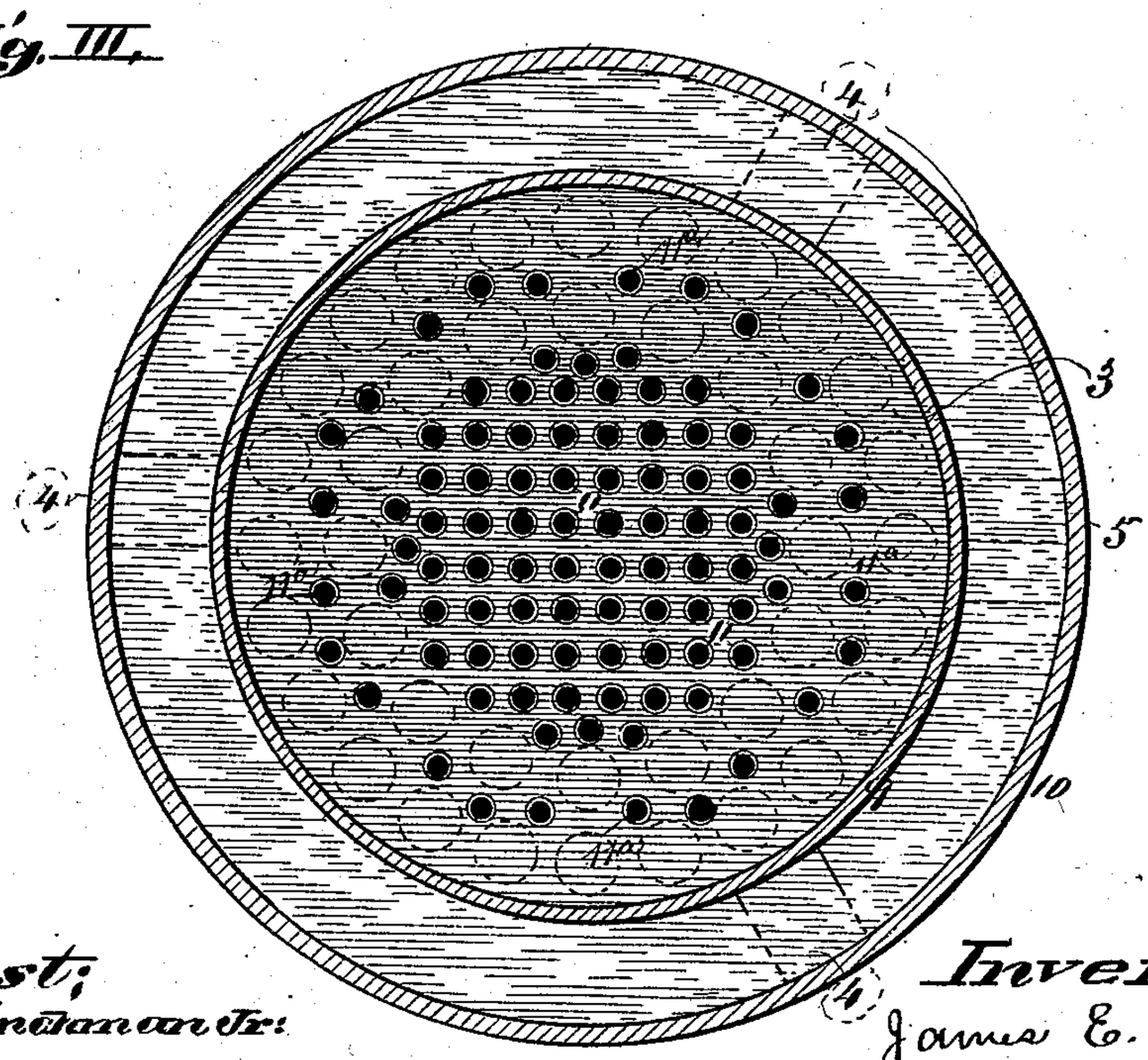


Fig. III.



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UNITED STATES PATENT OFFICE.

JAMES E. GREEN, OF ST. LOUIS, MISSOURI.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 517,745, dated April 3, 1894.

Application filed February 20, 1893. Serial No. 463,024. (No model.)

To all whom it may concern:

Be it known that I, JAMES E. GREEN, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Steam-Boilers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

This is an improvement in the class of steam boilers in which coal oil is used for fuel.

Figure I is a vertical section of the boiler at I—I, Fig. II. Fig. II is a horizontal section at II—II, Fig. I. Fig. III is a horizontal section at III—III, Fig. I.

1 is the stand, which may be of any form of construction, and which is made with a central opening 2 to allow access to the bottom sheet of the boiler proper and is provided with a horizontal flange 1^a.

3 is a combustion chamber surrounded by water at the top, bottom and sides, the same being supported by brackets 4, the neck 5 through which the gas jet enters and the tubes 6 in its top sheet through which the products of combustion escape from the chamber. The combustion chamber has a top 7, bottom 8, and sides 9, which latter are shown parallel with the outer walls 10 of the boiler.

11 are numerous vertical pipes located in the middle of and passing through the combustion chamber 3 and through the top and bottom sheets 7 and 8 of said chamber. These pipes thus communicate between the water space beneath the fire chamber and the water space above said chamber, and it will be seen that there will be a very rapid upward passage of water through these pipes; and also that the water will be abundantly supplied to their lower ends from the water space beneath, the water passing down between the outer walls of the boiler and the combustion chamber. An outer series of pipes 11^a discharge upwardly between the two series of tubes 6.

Any suitable ignited jet of coal oil, or other combustible fluid may be projected through the neck 5, so as to fill the combustion chamber with flame. No novelty is claimed in this jet. A very efficient jet or flame is made by means of a steam-injector in connection with a supply of the combustible fluid. In this case, the steam and combustible fluid mingle in the injector and mingle with the air outside the injector. I do not, however, claim any novelty in the injector nor confine myself to any special device for throwing a jet of combustible matter into the fire-chamber. The pipes 11 are secured in the top and bottom sheets of the fire-chamber by expanding their ends (in the usual way). The bottom sheet 12 of the boiler has a hole in line with each of the pipes 11 by which access can be had to the interior of the pipes. These holes are stopped with screw-plugs 13. The tubes 6 pass through the top plate 7 of the fire-chamber and the top sheet 14 of the boiler and are secured in the plates by expanding their ends. These tubes discharge into a smoke-chamber or dome 15 and the gases escape through a chimney 16.

17 is a man-hole or hand-hole through which access is had to the interior of the boiler.

I have shown no steam or water pipes, as they do not form any part of the invention.

I claim as my invention—

The combination of the stand 1 having a horizontal flange 1^a, the outer wall 10 supported on the flange, having a bottom sheet 12, and a top sheet 14, the dome 15 having a chimney 16, the combustion chamber 3 having a top 7, a bottom 8 and sides 9, the brackets 4 by which the combustion chamber is supported on the outer wall, out of contact with the latter and the bottom thereof, the neck 5, extending through the side of the outer wall and the combustion-chamber, for the insertion of the gas-jet, the vertical pipes 11 located in and passing through the middle of the combustion chamber, the double series of tubes 6 surrounding the tops of the middle pipes and passing through the top plate of the combustion-chamber and through the top-plate of the outer wall, and the outer series of pipes 11^a, located in and passing through the combustion-chamber, and discharging upwardly between the series of tubes; substantially as described.

JAMES E. GREEN.

In presence of—
ALBERT M. EBERSOLE,
E. S. KNIGHT.