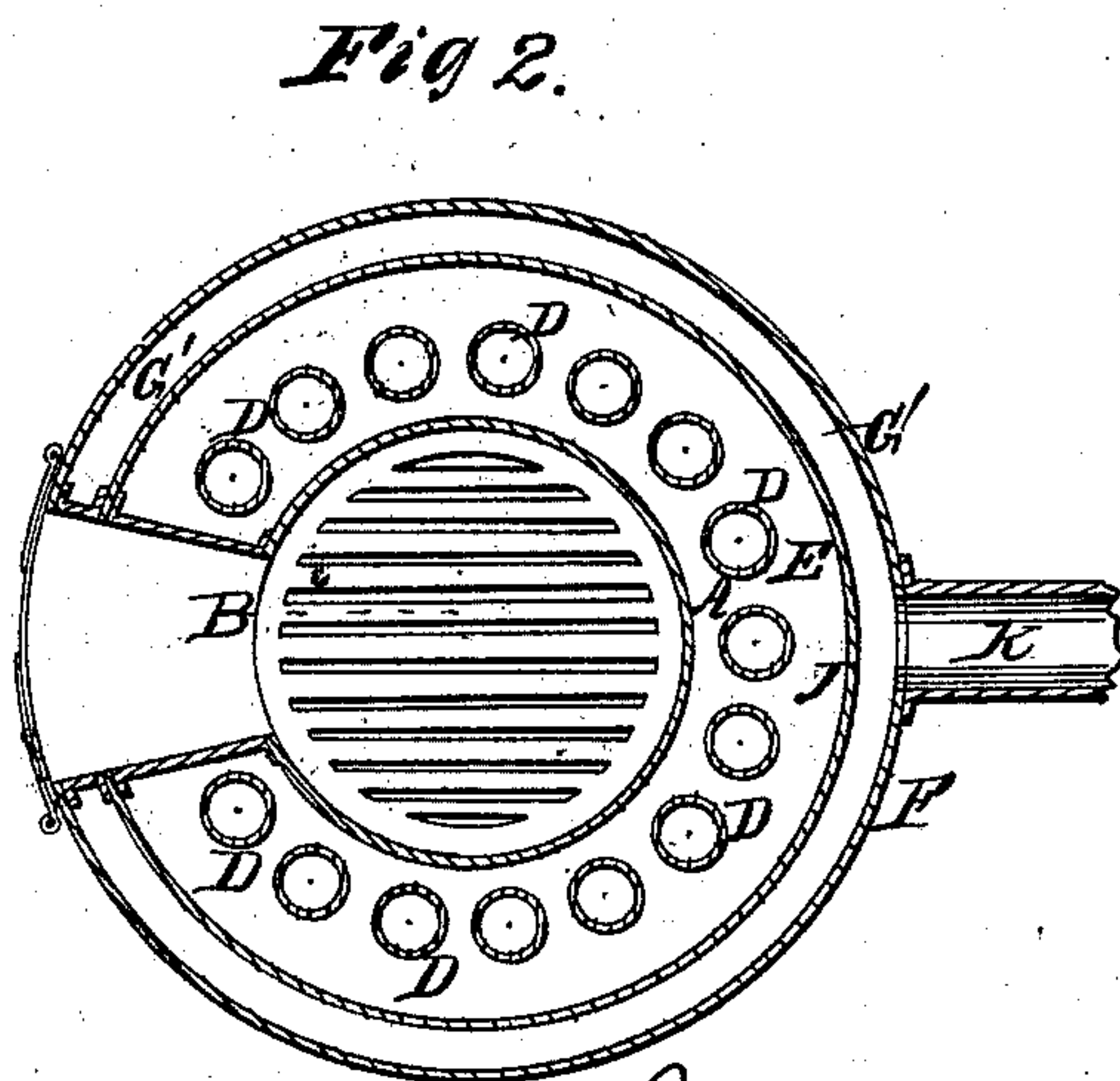
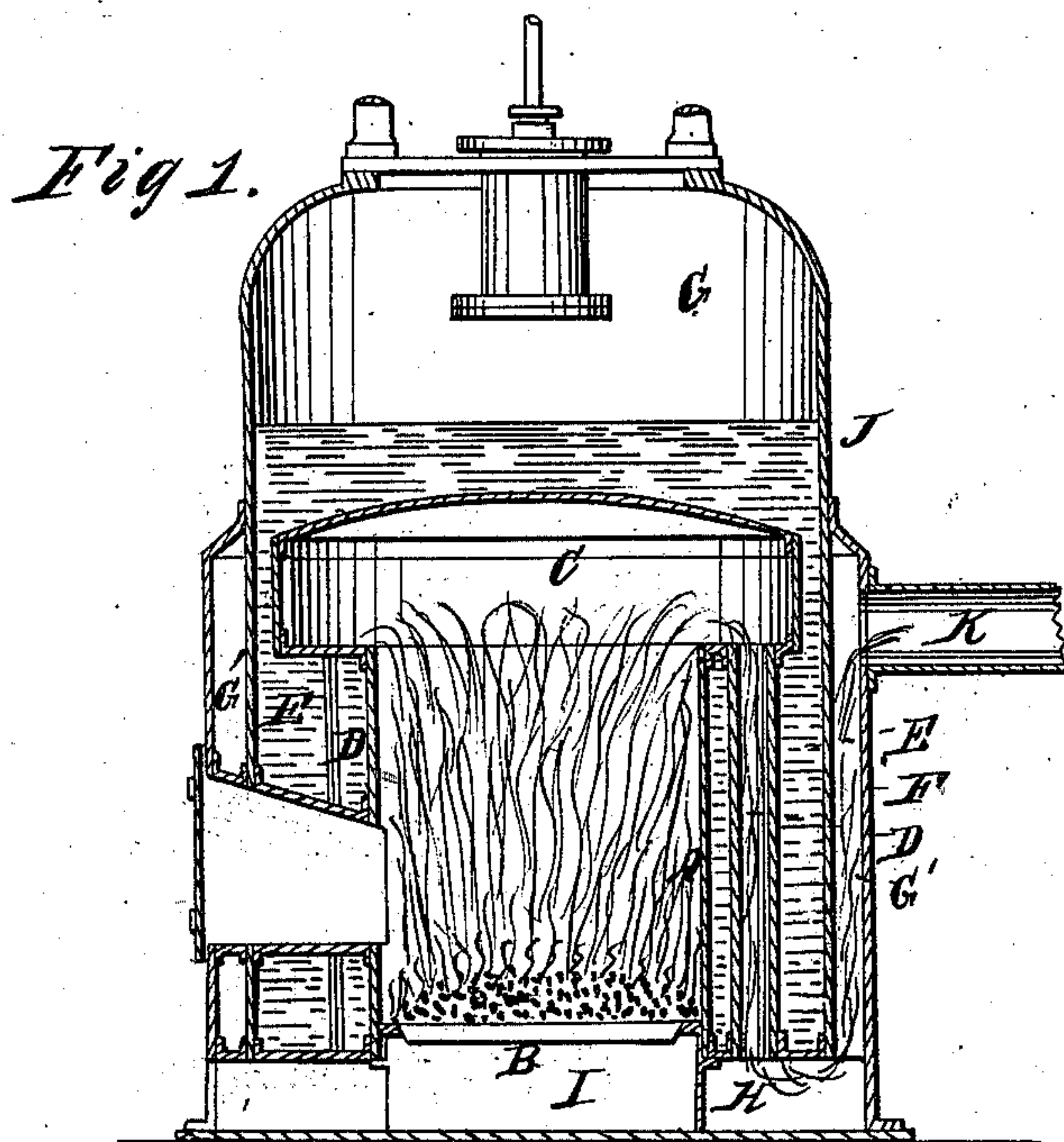


W. Baxter,
 Steam-Boiler Fire-Tube.
 N^o 83,445. Patented Oct. 27, 1868.



Witnesses.
 E. F. Kastenhuber
 Chas. Wahlers

Inventor
 Wm. Baxter
 By Van Dantona & Hannell
 his atty

UNITED STATES PATENT OFFICE.

WILLIAM BAXTER, OF NEWARK, NEW JERSEY.

IMPROVEMENT IN STEAM-GENERATORS.

Specification forming part of Letters Patent No. **83,445**, dated October 27, 1868.

To all whom it may concern:

Be it known that I, WILLIAM BAXTER, of Newark, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in Steam-Boilers; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification, in which drawing—

Figure 1 is a vertical central section of this invention. Fig. 2 is a horizontal section thereof.

Similar letters indicate corresponding parts.

This invention relates to a steam-boiler the fire-box of which is provided with descending flues or fire-tubes passing through the water-space, which is surrounded by a smoke-chamber and surmounted by a steam-dome in such a manner that a boiler is obtained with a very large heating-surface contracted in the smallest possible space, the fire being compelled to pass in an up-and-down zigzag course through and around the water-space without being permitted to pass up through or come in contact with the steam-space of the boiler.

A represents the fire-box of my boiler, which is provided with a grate, B, in its bottom and with a combustion-chamber, C, in its top. Said fire-box and its combustion-chamber are surrounded and covered by the water-space E, and from the combustion-chamber C extend the tubes D through the water-space in a downward direction into the gas-chamber H, which surrounds the ash-box I and forms the bottom of the main part J of the boiler. This

part is surrounded by a jacket, F, forming a smoke-chamber, G', through which the heated gases rise, and which connects by a flue, K, with the smoke-stack. This smoke-chamber terminates below the water-line of the boiler, the jacket F being so formed that it closes up against the main part of the boiler about at a level with the top of the fire-box, as shown in Fig. 1 of the drawing. The upper portion of the main part J forms the steam-dome G, which is clear above the fire, as shown.

The fire or the heated products of combustion on rising from the grate spread in the combustion-chamber C; then they descend through the tubes D and rise again through the smoke-chamber G', as indicated in Fig. 1 of the drawing, and by these means a very large heating-surface is obtained, and, furthermore, a complete combustion is effected, the heating-surface being composed of the entire area of the fire-box, the combined area of the tubes D, and the area of the main part J as far as the same is inclosed by the jacket F, and the complete combustion of the gases being effected in the successive passage of said gases through the chambers C, H, and G'.

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

The arrangement of the fire-box A, flues D, jacket F, pipe K, and steam-dome G, substantially as set forth.

WILLIAM BAXTER.

Witnesses:

LEICESTER ALLEN,
W. HAUFF.