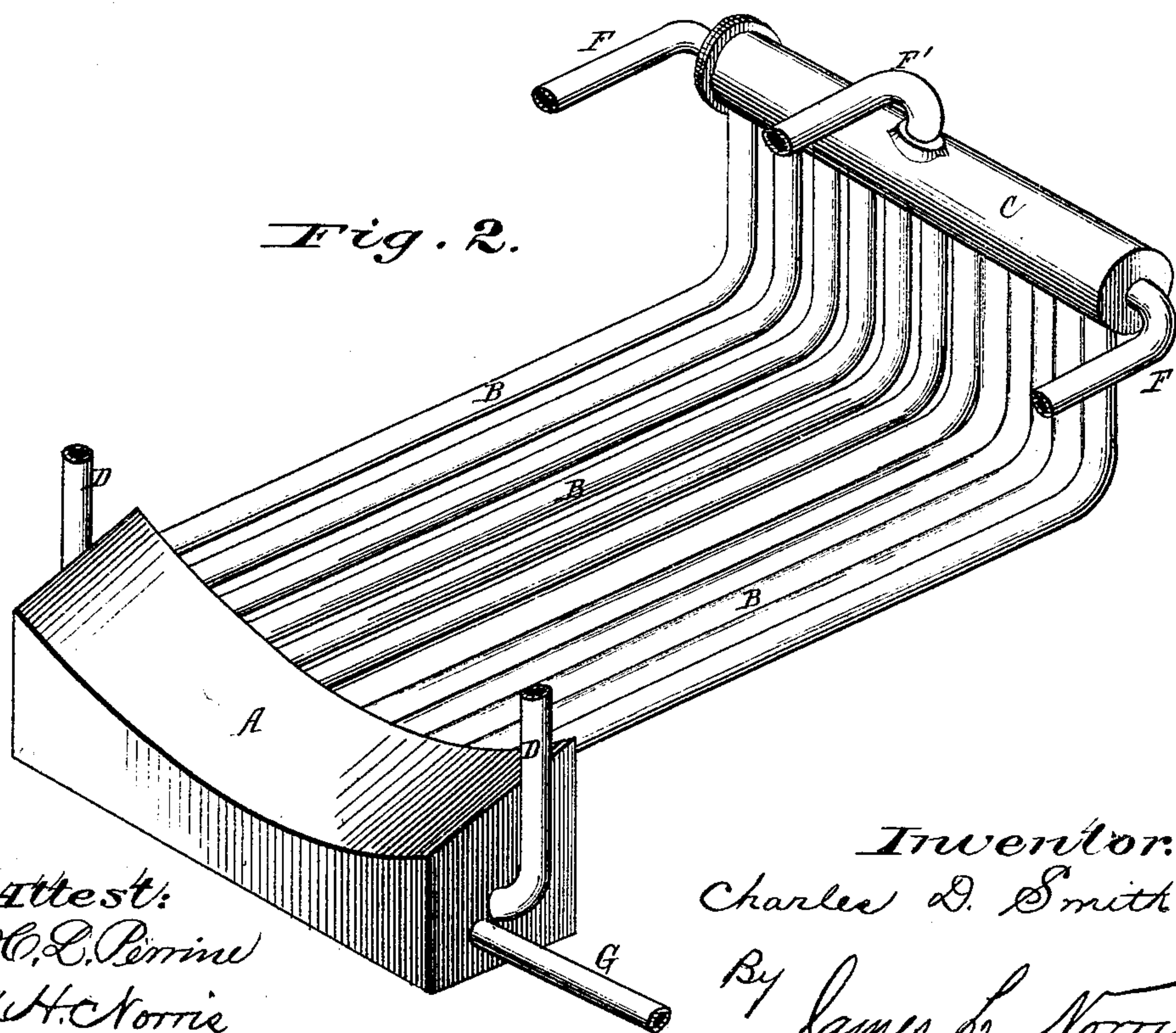
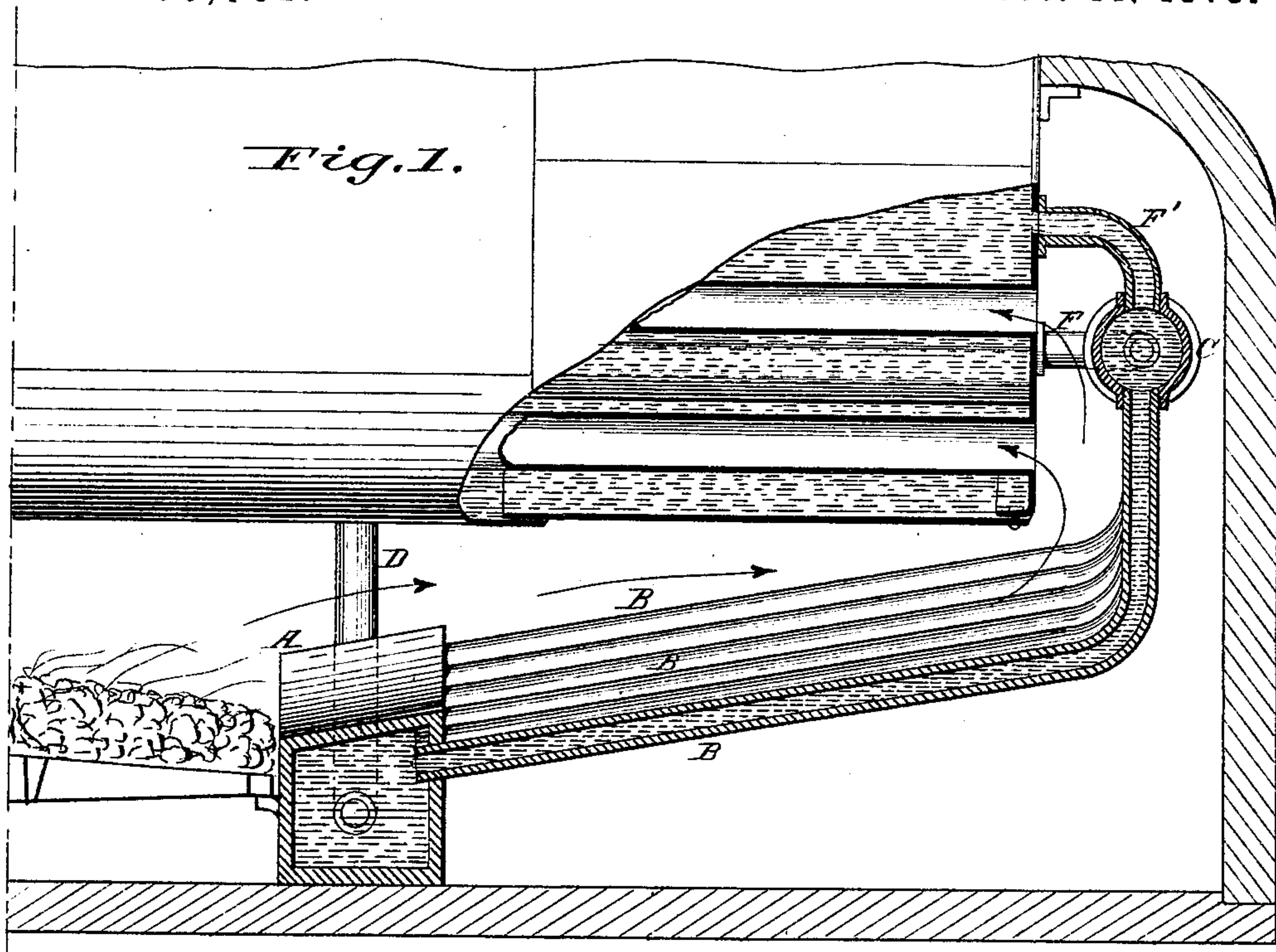


C. D. SMITH.

FEED-WATER HEATERS FOR STEAM-BOILERS.

No. 183,781.

Patented Oct. 31, 1876.



Attest:  
H. L. Perrine  
A. H. Norris

Inventor:  
Charles D. Smith

By James L. Norris  
att'y.



# UNITED STATES PATENT OFFICE.

CHARLES D. SMITH, OF BOSTON, MASSACHUSETTS.

## IMPROVEMENT IN FEED-WATER HEATERS FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **183,781**, dated October 31, 1876; application filed February 2, 1876.

*To all whom it may concern:*

Be it known that I, CHARLES D. SMITH, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Steam-Generators, of which the following is a specification:

This invention relates to certain improvements in auxiliary generators for steam-boilers; and the invention consists in a steam-generator placed beneath a horizontal boiler, extending from the rear ends of the grate-bars to the rear end of the boiler, occupying the entire space in the combustion-chamber or ash-pit beneath the boiler, said generator consisting of a series of inclined water-tubes communicating with a steam or water-chamber at their upper ends, which is provided with pipes which enter the rear end of the boiler, the lower ends of the pipes communicating with a water-supply reservoir provided with a pipe at each end for connection with a pump to supply feed-water or with the boiler, as will more fully hereinafter appear.

In the drawing, Figure 1 is a longitudinal section of my auxiliary steam-generator as applied to a boiler; and Fig. 2 is a perspective view of the auxiliary generator.

Referring to the drawing, the letter A represents a reservoir for supplying feed-water to the boiler, the said reservoir having at each end a pipe, D, which is for connecting with a pump to supply the boiler, or with the boiler itself, in case other means are employed to supply the feed-water to the reservoir. From

the water-reservoir extend a series of water-tubes, B B, in an inclined position, to the rear end of the boiler, where they communicate with a horizontal steam or water chamber, C, located directly in rear of the boiler. From the middle and ends of this steam or water chamber project pipes F F' F, which communicate with the boiler at its end, for conducting the steam from the steam or water chamber C to the boiler.

It will be seen that the auxiliary generator occupies the entire space of the combustion-chamber beneath the boiler, extending from the rear end of the fire-grate to the rear end of the boiler, and by this means more heating-surface is presented for the water to evaporate steam.

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

The combination of the series of inclined water-tubes B, the steam and water chamber C, arranged at the upper ends of the tubes and provided with the pipes F F' F, communicating with the boiler, and the water-supply reservoir A, arranged at the lower ends of the water-pipes and provided with the pipes D D, for communicating with a feed-pump or the boiler, all substantially as described.

CHAS. D. SMITH.

Witnesses:

L. H. RICHARDSON,  
C. L. SANBORN.