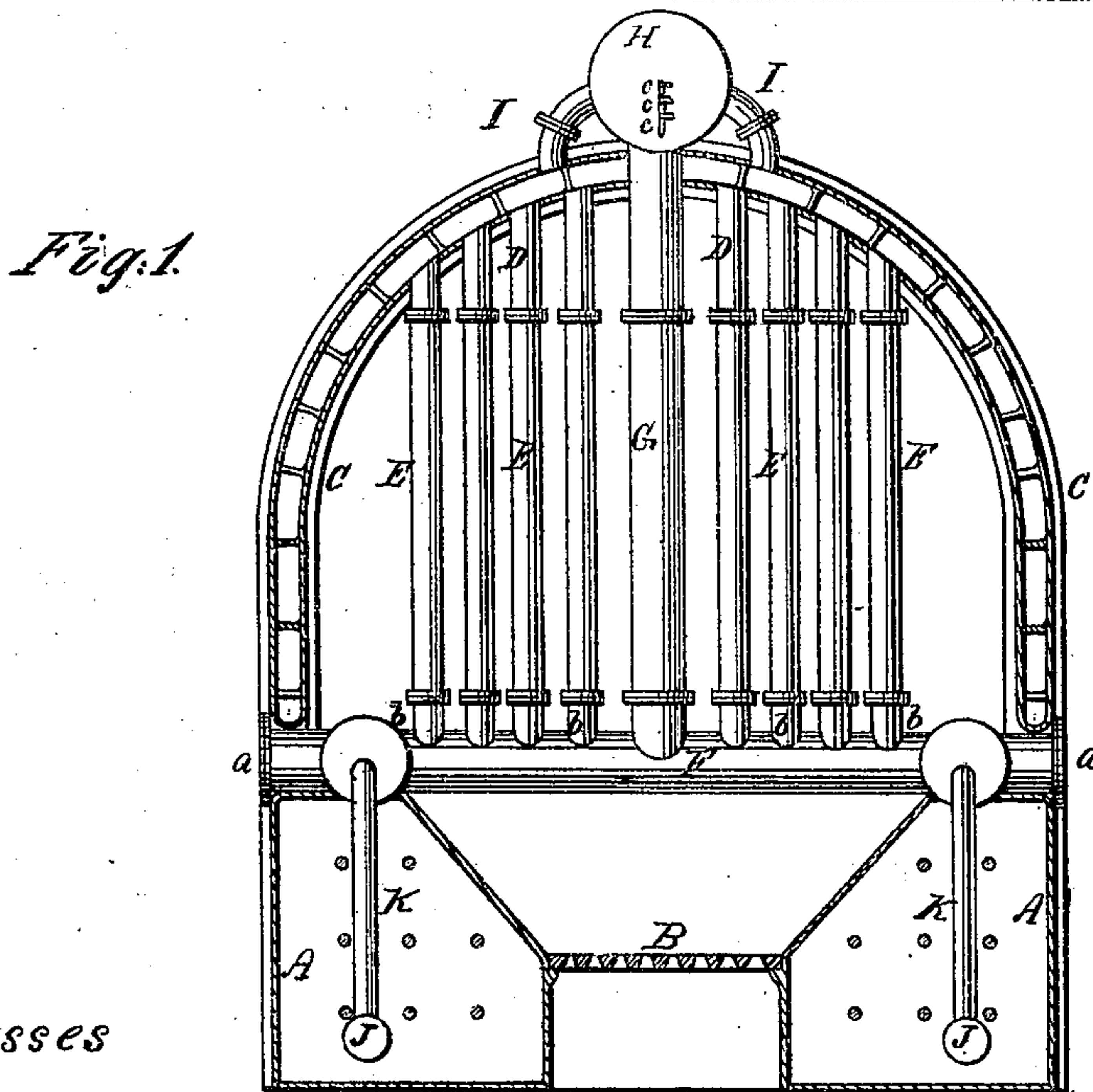
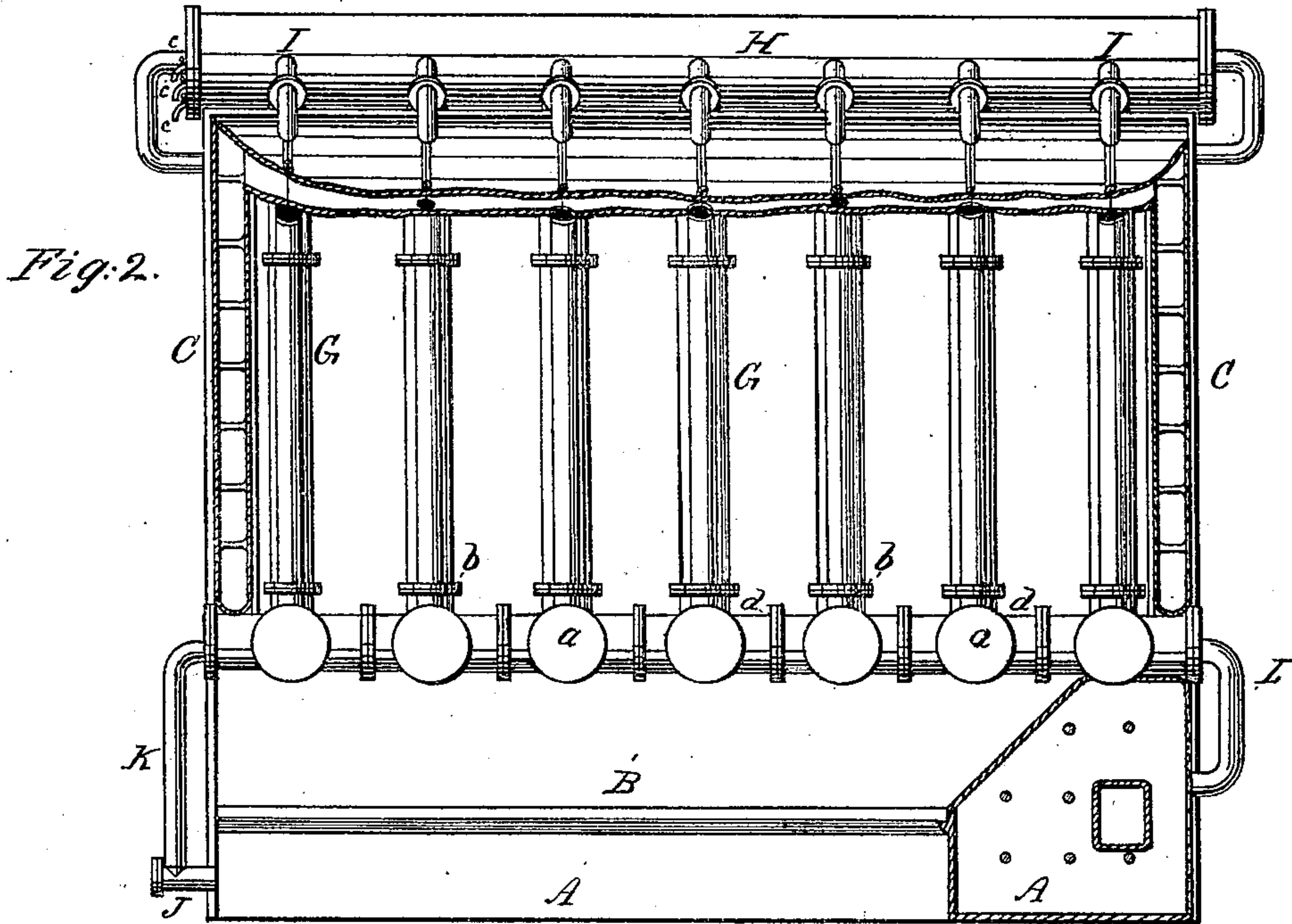


D. RENSHAW.

Sectional Steam-Generator.

No. 134,003.

Patented Dec. 17, 1872.



Witnesses

Inventor

Samuel H. Chapman
Amos M. Northrop.

David Renshaw
By Thos. P. Howe
Atty

UNITED STATES PATENT OFFICE.

DAVID RENSHAW, OF SYRACUSE, NEW YORK.

IMPROVEMENT IN SECTIONAL STEAM-GENERATORS.

Specification forming part of Letters Patent No. 134,003, dated December 17, 1872.

To all whom it may concern:

Be it known that I, DAVID RENSHAW, of Syracuse, in the county of Onondaga and State of New York, have invented certain Improvements in Steam-Generators, of which the following is a specification:

Nature and Object of the Invention.

This invention relates to the combination, with a stay-bolted steam-generating reverberatory furnace, of a series of tubes contained within said furnace, and opening into the water-space thereof; and also to the combination therewith and with the said tubes of a cross-pipe or cylinder which connects with the lower ends of the aforesaid tubes; and also in the combination of the aforesaid furnace and the tubes first mentioned with a steam-drum, as hereinafter more fully set forth.

Description of the Accompanying Drawing.

Figure 1 is a vertical section of the furnace and an end view of the remaining portion of the apparatus. Fig. 2 is a side view, partly in section, of the furnace, and a side view of the remaining portions of the apparatus.

General Description.

A is the lower portion of the furnace, which is made in hollow cast-iron sections and stay-bolted, substantially in the manner described in the Letters Patent of the United States granted to me February 20, 1872, and provided with a fire-grate; B. C is the upper portion or reverberatory part of the furnace, which is constructed, in most respects, similar to the construction described in the aforesaid Letters Patent, with the exception that it is provided with downwardly-projecting tubes or connections D D, which connect with the vertical tubes E E. F F are cross-cylinders extending transversely of the furnace from side to side thereof, and having heads *a a*, which may be removed when necessary for the purpose of cleaning the boiler. These tubes F F are provided with upwardly-extending connections *b b*, by means of which connections the tubes or cylinders F F are connected with the vertical tubes E E, which they support. G G are central tubes or cylinders, which extend from the cylinders F F to the steam-drum H, which latter

is provided with gage-cocks *c c c*. I I are pipes, which form connections between the sections of the crown C of the furnace and the said steam-drum H. J is the feed-pipe, and K and L are pipes which form connections between the water-space in the lower part A of the furnace and the cylinders F F. The cylinders F F connect with each other by short sections *d d*. The upper portion C of the furnace is so constructed that its water-space connects with the water-space in the lower portion A, thus providing for a complete circulation of the water between them.

This generator has the advantage that it provides for a complete circulation of the water between the internal steam-generating portions thereof contained within the reverberatory furnace and the upper portion of the water-space in the reverberatory furnace itself; and as the tubes E E and G are vertical it is obvious that however impure the water may be no sediment can form in these tubes, but it will all be deposited in the cylinders F F, from which it can be readily removed, the heads of these cylinders being removable for that purpose. The combination of the steam-drum H, the reverberatory furnace C, and the tubes E E is such that a very rapid and perfect circulation is produced through the upper part or crown of the furnace C, where it is most exposed to intense heat, thereby economizing the effect of the heat and reducing the danger of overheating or any of its consequent ill effects.

Claims.

I claim as my invention—

1. The combination, with the stay-bolted reverberatory furnace C, of the vertical tubes E E, opening into the crown thereof, substantially as hereinbefore set forth.

2. The combination of the said reverberatory furnace C, the vertical tubes E E opening into the crown thereof, and the cross-pipes or cylinders F F, substantially as hereinbefore set forth.

3. The combination of the said reverberatory furnace C, the tubes E E opening into the crown of the said furnace, and the steam-drum H, substantially as hereinbefore set forth.

DAVID RENSHAW.

Witnesses:

THOS. P. HOW,
ANNA M. NORTHROP.