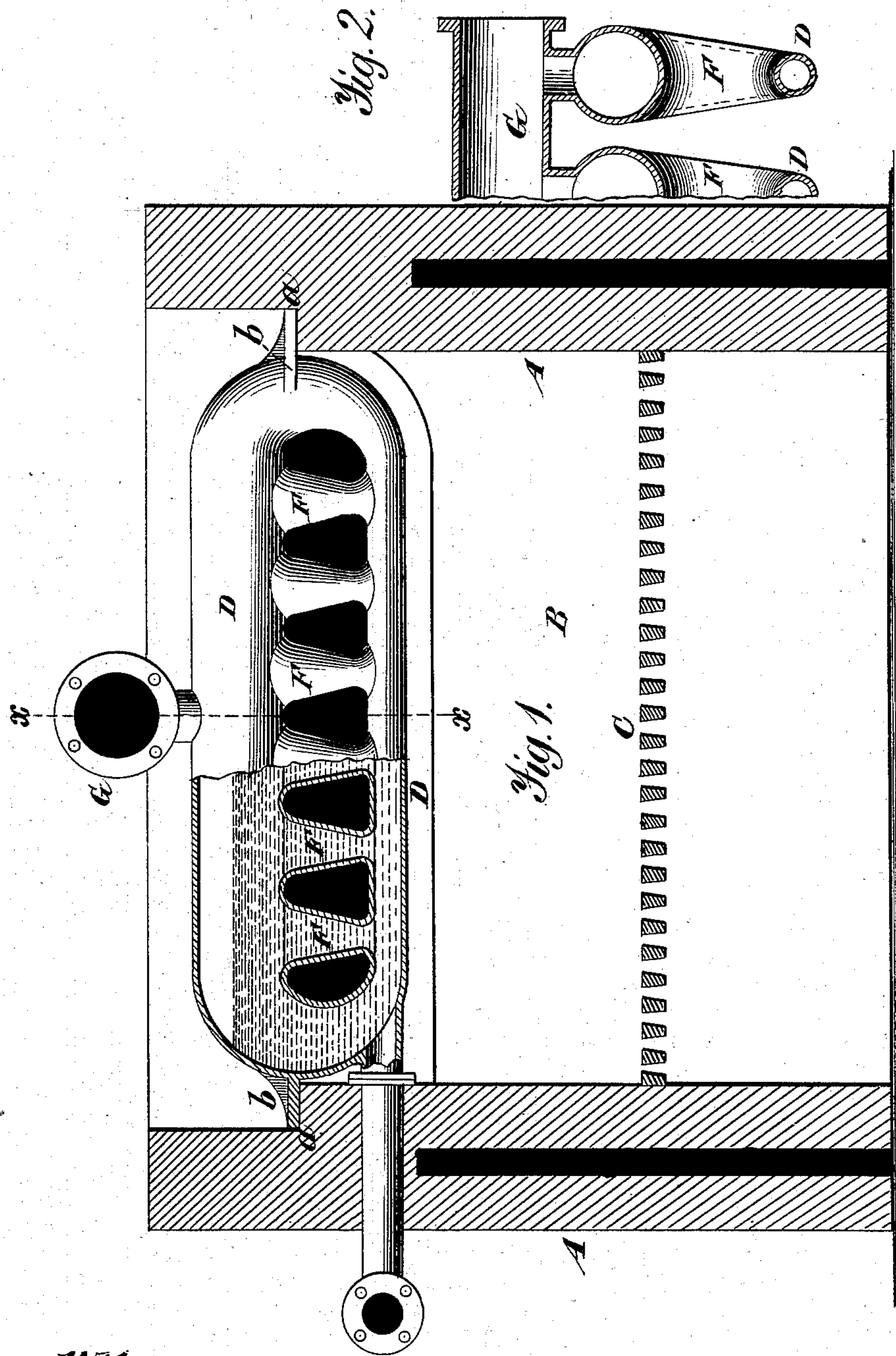


(No Model.)

D. RENSCHAW.
SECTIONAL BOILER.

No. 274,825.

Patented Mar. 27, 1883.



Witnesses.
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UNITED STATES PATENT OFFICE.

DAVID RENSHAW, OF BOSTON, MASSACHUSETTS.

SECTIONAL BOILER.

SPECIFICATION forming part of Letters Patent No. 274,825, dated March 27, 1883.

Application filed October 12, 1882. (No model.)

To all whom it may concern:

Be it known that I, DAVID RENSHAW, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Sectional Boilers; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

My invention has relation to that class known as "sectional boilers," and has for its object cheapness in first cost, durability and security from explosions, easily manipulated, and simple in construction.

The invention consists in providing individual sections of a sectional boiler with an upper large water and steam portion and a lower smaller water portion continuous at their ends, and connected centrally by frusto-conical tubes of the Galloway boiler type, and with connecting-flanges all cast in one piece. The boiler may be enlarged or diminished in size by increasing or diminishing the number of sections, each section being interchangeable.

Referring to the accompanying sheet of drawings, Figure 1 is a side elevation, partly in section. Fig. 2 represents an end sectional view taken on the line *xx* of Fig. 1.

A is the brick structure or boiler-setting, having hollow walls. B is the furnace, and C the grate-bars. On the side walls of the furnace, near their top, I form offsets or ledges *a*, for the purpose of suspending the boiler over the furnace. Upon the ends of each boiler-section I cast or otherwise provide lugs *b*, adapted to rest upon the ledges *a* of the wall A of the furnace, by means of which each section is suspended and held in place. As many of these sections as are required to make up the boiler may be suspended by the lugs *b* on the ledge *a*. The sections may be interchanged with each other as occasion may require, when from any cause they may become worn, overheated, or other cause requiring a change, and it would be advantageous to do it, and, with other boilers of its class, it has the advantage of being shipped in sections.

Referring more particularly to the construction of the boiler, D is the lower or smaller portion, and E the upper and larger steam and water portion. Connecting these portions D and E are frusto-conical tubes F, largely tapering for their length.

The principle of my boiler is this, that the small quantity of water exposed to the direct heat of the furnace is very readily converted into steam. For the boiler to be effective this steam must be quickly liberated, and as it is still expanding on its ascent the upwardly-enlarging tubes fully provide for this expansion, and thus the ascending saturated steam and heated water have ready access to the enlarged space above. Upon the top of each section is cast the steam-dome G, which is provided with connecting-flanges to form a union with its fellow, and at the end of each section I also provide a water-connection, H, provided with flanges in like manner, so that the water in all of the sections is at the same level and the steam at the same pressure. The boiler or all the sections may be supplied from the same source. It is always preferable to set the boiler with its joints out of contact with the direct heat of the furnace.

It will be observed that the water and steam bodies are cylindrical or tubular in cross-section; in fact, all the parts are cylindrical, and therefore embody the strength that round bodies are known to have as compared with rectangular bodies. The circulation of the water is much easier and more rapid in conduits having circular turns at the angles than in those having square ones, for the reason that in square corners there is sure to be an eddy which retards the circulation.

It will be further observed that my boilers enlarge in transverse section from the bottom upward. Thus the flame has free access to impinge on all parts of the boiler before it escapes to the uptake, and the entire surface is exposed to the heat, and thus a rapid generation of steam is the result. The boiler may be used for house-heating as well as for steam-engine purposes.

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

1. A steam-boiler section constructed with
a lower small water-space and upper enlarged
water and steam space, said spaces having
continuous connection at their ends, and a
5 transverse connection through straight taper-
ing tubes, all cast in one piece, said tubes en-
larging in diameter from bottom to top, as de-
scribed.

2. A steam-boiler section made in one piece,
10 consisting of an upper and lower section va-
rying in diameter, having a continuous water-
connection at their ends, and connected cen-

trally with straight tapering tubes enlarging
upwardly from their base, a steam-dome con-
nection, and a water-connection, substantially 15
as described.

In testimony that I claim the foregoing as
my own I affix my signature in presence of two
witnesses.

DAVID RENSHAW.

Witnesses:

EDWIN W. BROWN,

WILLIAM S. BELLOWS.