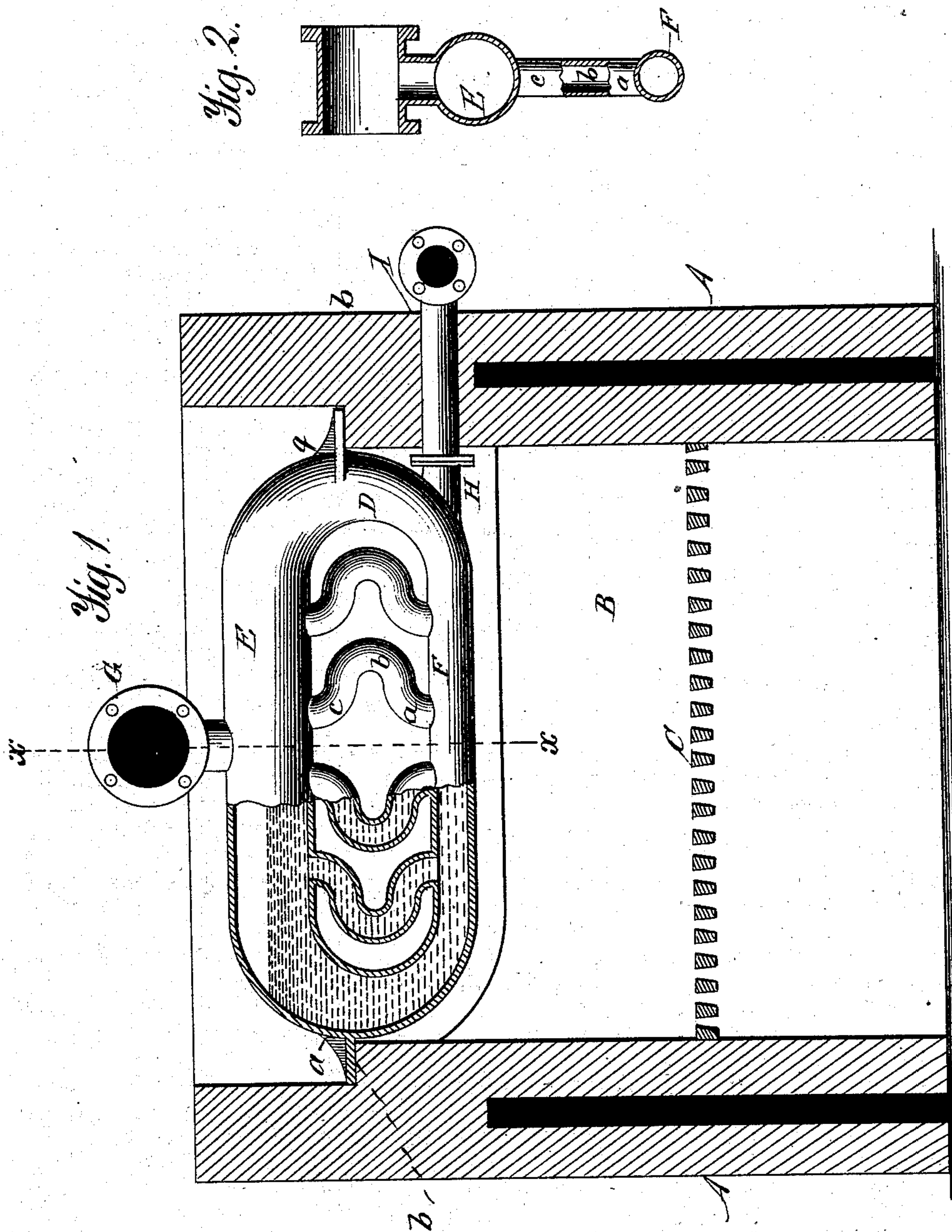


(No Model.)

D. RENSHAW.
SECTIONAL STEAM GENERATOR.

No. 274,824.

Patented Mar. 27, 1883.



Witnesses.
A. Ruppert.
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UNITED STATES PATENT OFFICE.

DAVID RENSHAW, OF BOSTON, MASSACHUSETTS.

SECTIONAL STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 274,824, dated March 27, 1883.

Application filed October 14, 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 Steam-Generators; 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.

This invention relates to the class of boilers known as "sectional," and has for its objects simplicity in construction, cheapness in first cost, durability, safety, and effectiveness in generating steam, presenting a large surface to the heat of the furnace.

The invention consists in constructing a section of a sectional boiler of a smaller lower water portion, an upper enlarged water and steam portion, and intermediate bent connecting water-tubes connecting said upper and lower portions together.

In this invention all the parts are made cylindrical or tubular in cross-section, so that it combines security with strength.

Referring to the drawings hereto annexed, Figure 1 represents a side elevation, partly in section, of one section of my improved boiler; Fig. 2, an end view in vertical section taken on the line *x x* of Fig. 1.

A A are the side walls of the furnace; B, the combustion-chamber, and C the grate-bars. D represents one section of a sectional boiler, having an upper portion, E, and a lower portion, F. These upper and lower portions are united at their ends, which makes of them an entire section, forming what I term an "elongated" or "oval" water-space. Between the portions E and F, I locate short bent pipes, having bends *a b c*, which are cast with the other portions of the boiler. The object of these bent pipes is threefold: first, to break up the flame-space formed between the portions E F; second, to create a circulation of the water and increase the heating-surface; and, third, to provide for the expansion and contraction of the pipes and the horizontal expansion of the entire section. The steam-dome G is su-

perposed on the top of the section, as usual, and provided with connecting-flanges, and cast in one piece with the other portion of the section. The flanges are for connecting with other sections. The smaller or bottom portion, F, is provided with an extension, H, also cast to the section, and from it extends a pipe, I, having a connecting-flange, *a*, for ready attachment to other sections for water-communication, so that two or more of these sections may be connected together to form a boiler. Upon the rounded ends of the sections I cast lugs *a*, extending out from the wall of the section. These lugs are for the purpose of suspending the boiler-sections within the furnace-chamber. Upon the upper portion of the furnace-walls A, I form ledges *b b*, upon which the lugs *a a* rest. All the boiler-sections are cast with these lugs, so that as many sections may be added to the boiler as may be required. Of course the boiler may be diminished by removing any of the sections. The sections are interchangeable, so that when any are worn out or require to be shifted any section will fit its fellow without further fitting or trouble.

The walls of the furnace may be constructed with air-spaces, either to prevent radiation or to heat air to be supplied to the furnace.

The operation will be readily understood from the foregoing description.

It is evident that a boiler made up of sections such as described is peculiarly adapted for transportation. The sections are readily handled and easily put together. It makes a rapid steam-generator, and may be used for house-heating or for motive-power purposes. It must not be overlooked that, the smallest body of water being below in close contact with the heat of the furnace, steam is more rapidly generated than when a large body of water is exposed to the heat. It will be further observed that the smaller body being below allows free access of the heat and flame to pass up around and through the sections, much more so than if the sections were all of a size. Thus I produce a generator simple, strong, durable, and efficient. The feed and blow-off is effected through the pipe I, and the steam is taken off in the usual way from the steam-dome.

Safety-valves and other appliances of steam-

boilers may be employed; but, such forming no part of this invention, they are not shown or described.

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

1. A section of a sectional steam-generator, consisting of an upper and lower portion of varying sizes of cylindrical contour in cross-section, said portions being provided with connecting water-tubes bent as shown, and having a continuous water-connection at their ends, as described, and for the purposes set forth.

2. A sectional steam-generator constructed as described, consisting of an upper and a lower

portion, E and F, of varying diameters, having a continuous water-connection, and having compound bent circulating-tubes arranged to permit a free flow of water through their interior, and a free circulation of heat around their exterior, said sections having cast thereon sustaining-lugs, a steam-dome, and a water-feeding and blow-off pipe, 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,
WM. S. BELLOWS.