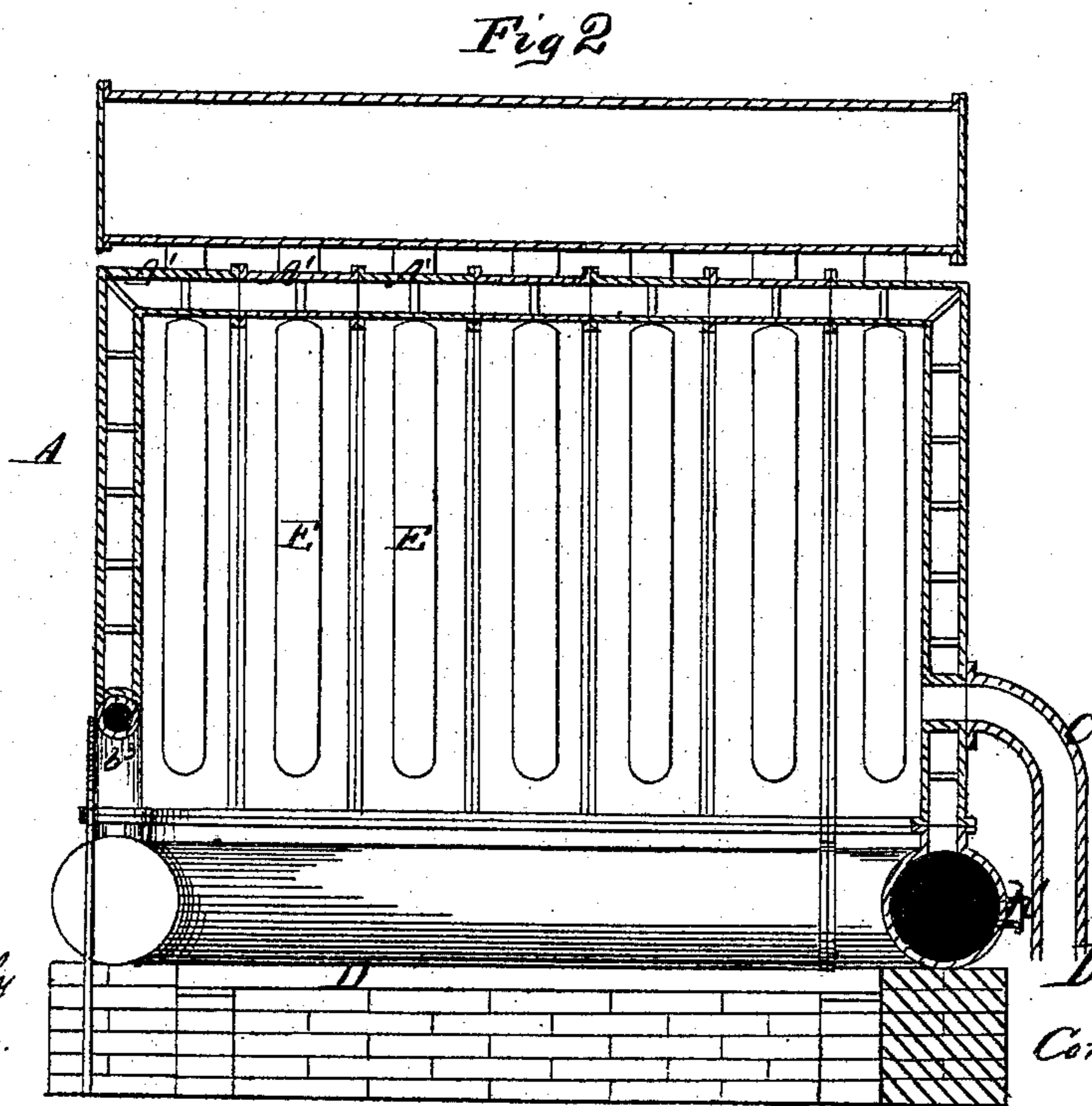
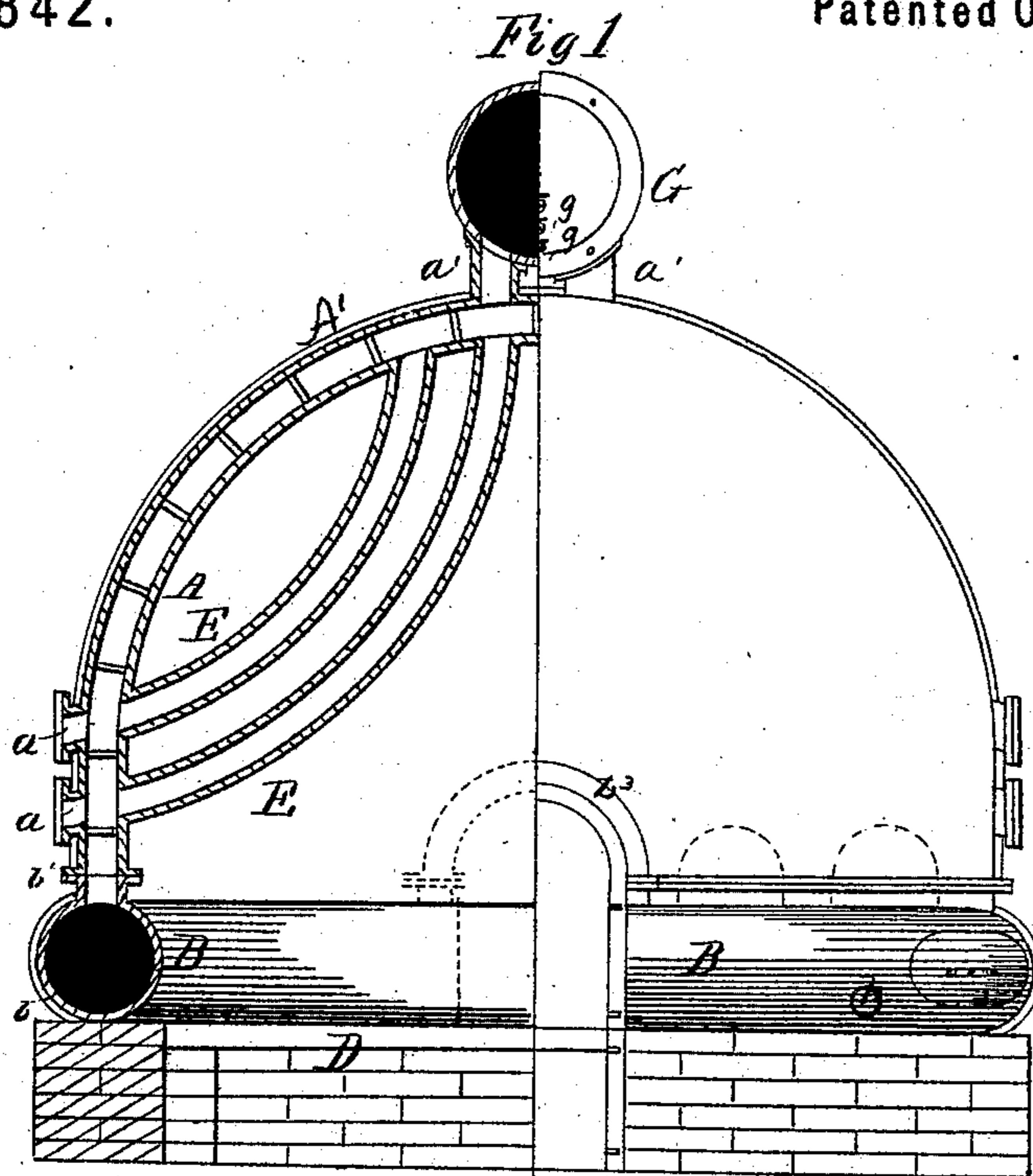


D. RENSCHAW.
Sectional Steam-Generators.

No. 143,842.

Patented Oct. 21, 1873.



Witnesses
J. B. Connolly
E. Connolly.

Inventor
David Renschaw
by
Connolly Bros
Atty's.

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Fig. 3.

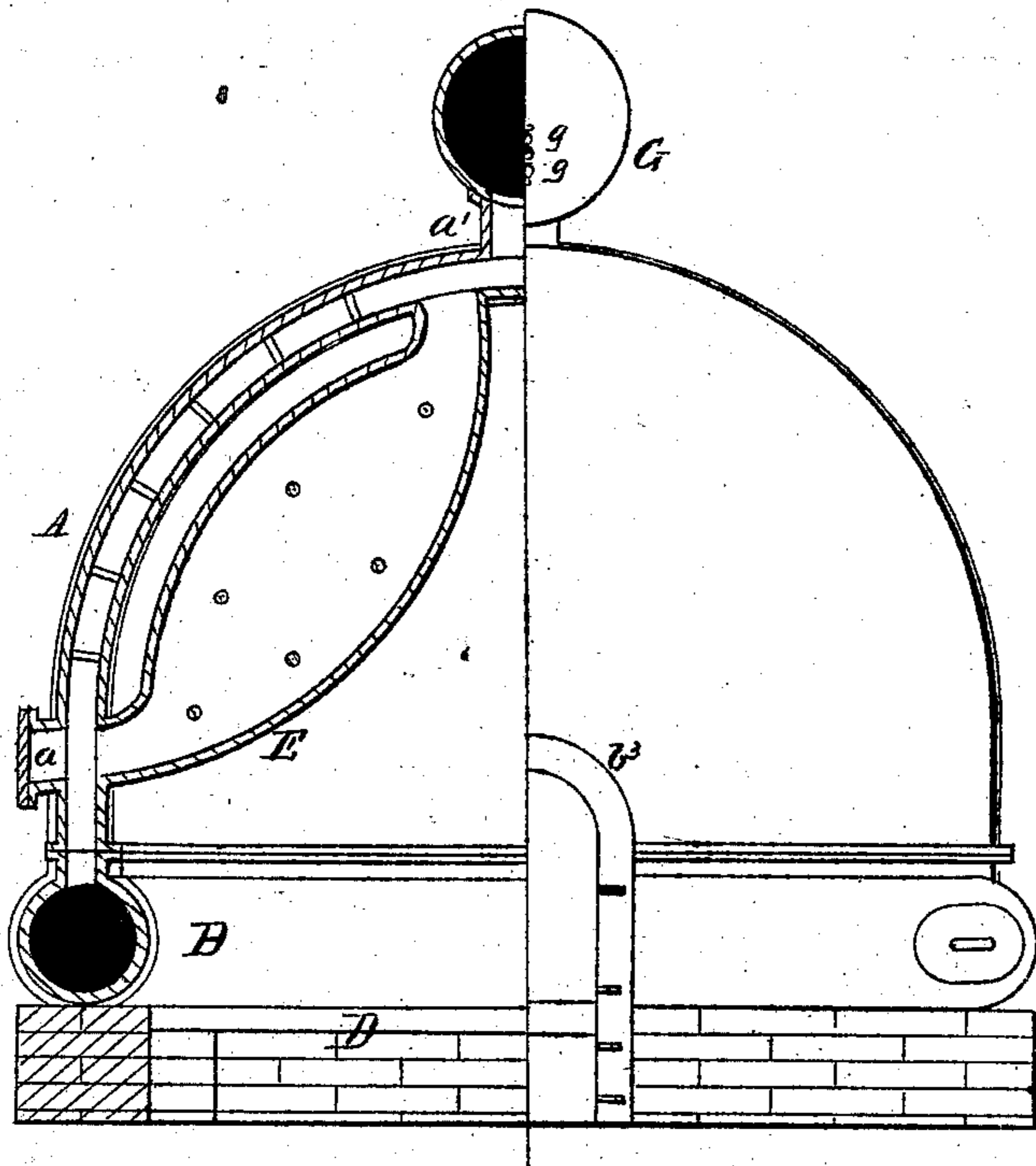
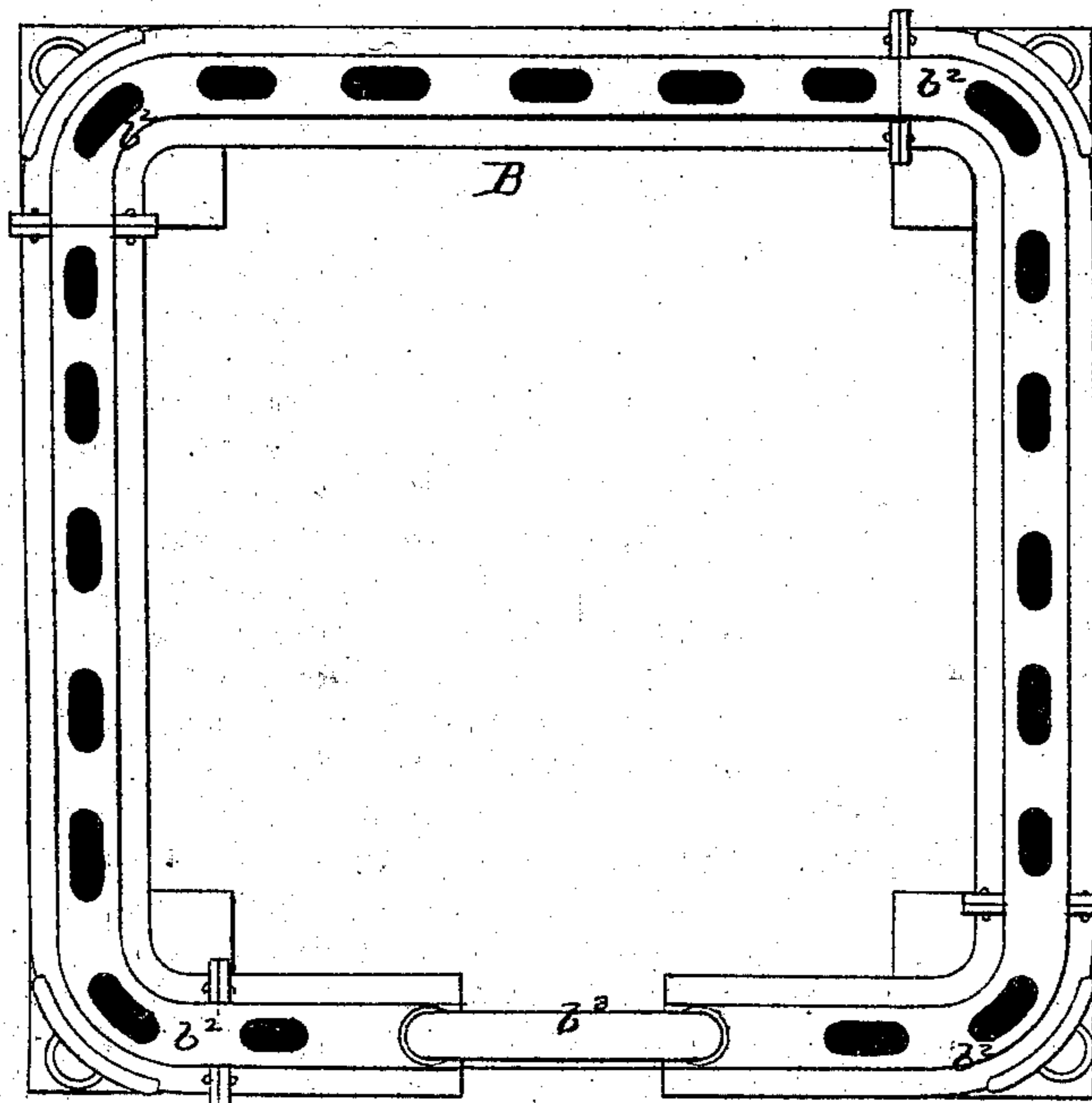


Fig. 4.



Witnesses.
J. B. Connolly
Edw. Connolly.

Inventor
David Renshaw
by
Connolly Bros
Attys

UNITED STATES PATENT OFFICE.

DAVID RENSHAW, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN SECTIONAL STEAM-GENERATORS.

Specification forming part of Letters Patent No. **143,842**, dated October 21, 1873; application filed February 4, 1873.

To all whom it may concern:

Be it known that I, DAVID RENSHAW, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Sectional Steam-Generators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

Referring to the drawings, Figures 1 and 3 are front elevations and partial sections of my invention. Fig. 2 is a vertical longitudinal section of the same, and Fig. 4 is a detail view.

This invention relates to the construction of sectional steam-generators, the sections being cast in a single piece, and forming a part of the fire-chamber or reverberatory furnace. The invention consists in the construction and combination of the upper parts of said generator, and of a pipe-base for the equal delivery of water to said upper section, and to furnish ready and efficient cleaning facilities.

The upper part of the furnace is constructed generally in accordance with my patent of December 24, 1872—that is to say, of hollow flat pipe-sections, (which may, however, be round,) stay-bolted, and communicating, by suitable openings, with the base, and with a steam-drum placed above the furnace. The base of the furnace in the patent referred to consists of wide cast-metal sections, stay-bolted, and so constructed as to form a flaring top to the fire-chamber. In the present case I substitute for these broad sections a round metal pipe of suitable dimensions, said pipe being located directly beneath the upper sections, with which it communicates, as hereinafter described, and having flanges of the same width as the said upper sections. The base-pipe extends around the four sides of the furnace, the corners being turned by means of suitable elbows, and provision being made for the furnace-door by means of an arch-pipe flanged to the pipe-base, so as to form a continuous water-body around the entire generator. The internal generators are composed of a series of curved

pipes or flat sections, cast with, and forming a part of, the flat pipes which make the side walls of the reverberatory furnace; thus differing essentially from boilers constructed with sections located above the grate and inside the furnace, but not cast or communicating directly with the outer sections or hollow walls of the reverberatory furnace.

Referring to the drawing, A shows a reverberatory furnace, the crown, front and rear walls of which are formed of cast-metal sectional pipes A', flat or round, stay-bolted when made flat, and secured together by flanges and bolts, substantially as in my patent above referred to. The base is shown at B, extending from the lower line *b* of the furnace to the flange-joint *b*¹. This base-pipe extends, as suggested, around the four sides of the furnace, the corners being turned by means of elbows *b*², flanged and bolted, as seen. An arched section is shown at *b*³, forming a doorway to the fire-chamber. A flue is shown at C, in the rear of the furnace. D is the grate, which extends from side to side, and from the front to the rear of the furnace, giving thereby the entire base of the structure as grate-area, this being necessary from the large amount of fire-surface exposed in so small a space. The internal sections are shown at E, consisting either of a series of arched pipes, as shown in Fig. 1, or of flat stay-bolted sections, as in Fig. 3.

I have called these internal sections because they are located inside the furnace, and are suspended, as it were, between the grate and roof thereof; but they are not separate from the walls, being cast in one piece therewith, each section, accordingly, of the upper part of the furnace consisting of a portion of the wall or side and an internal section. The outer portions of these sections are formed with projections *a*, which enable the molder to get out his cores, and, at the same time, give cleaning facilities unequalled in any other construction. The projections *a* are closed by caps. The projections *a'* connect with the steam-drum in the manner shown. G is the steam-drum, provided with gage-cocks *g g*. The feed and blow-off pipes are shown, respectively, at *h* and *h'*.

Among other advantages of a steam-generator thus constructed will be observed the

following: The base being formed of a round pipe, it brings the connecting joint or joints between it and the side sections to a low point, and hence permits the internal sections to be lengthened correspondingly. The sections E communicating directly, as indicated, with the hollow walls of the furnace, there is an upward circulation in said internal sections, and a downward circulation in the walls, carrying down the sediment to the water-legs or base B, whence it can be readily removed through the hand-holes shown. The sections forming the wall and the internal sections being cast in one piece, instead of separately, effect a saving in manufacture, as it makes a large deduction in the amount of machine-work or fitting

necessary in construction. A still further advantage is, that direct access can be had, for cleaning purposes, to the interior sections E by removing the caps *a*.

What I claim is—

The combination of the base B, the sections A' E, made with the projections and caps *a*, and the steam-drum G, placed outside, substantially as shown.

In testimony that I claim the foregoing I have hereunto set my hand this 22d day of January, 1873.

DAVID RENSHAW.

Witnesses:

M. DANL. CONNOLLY,
THOS. A. CONNOLLY.