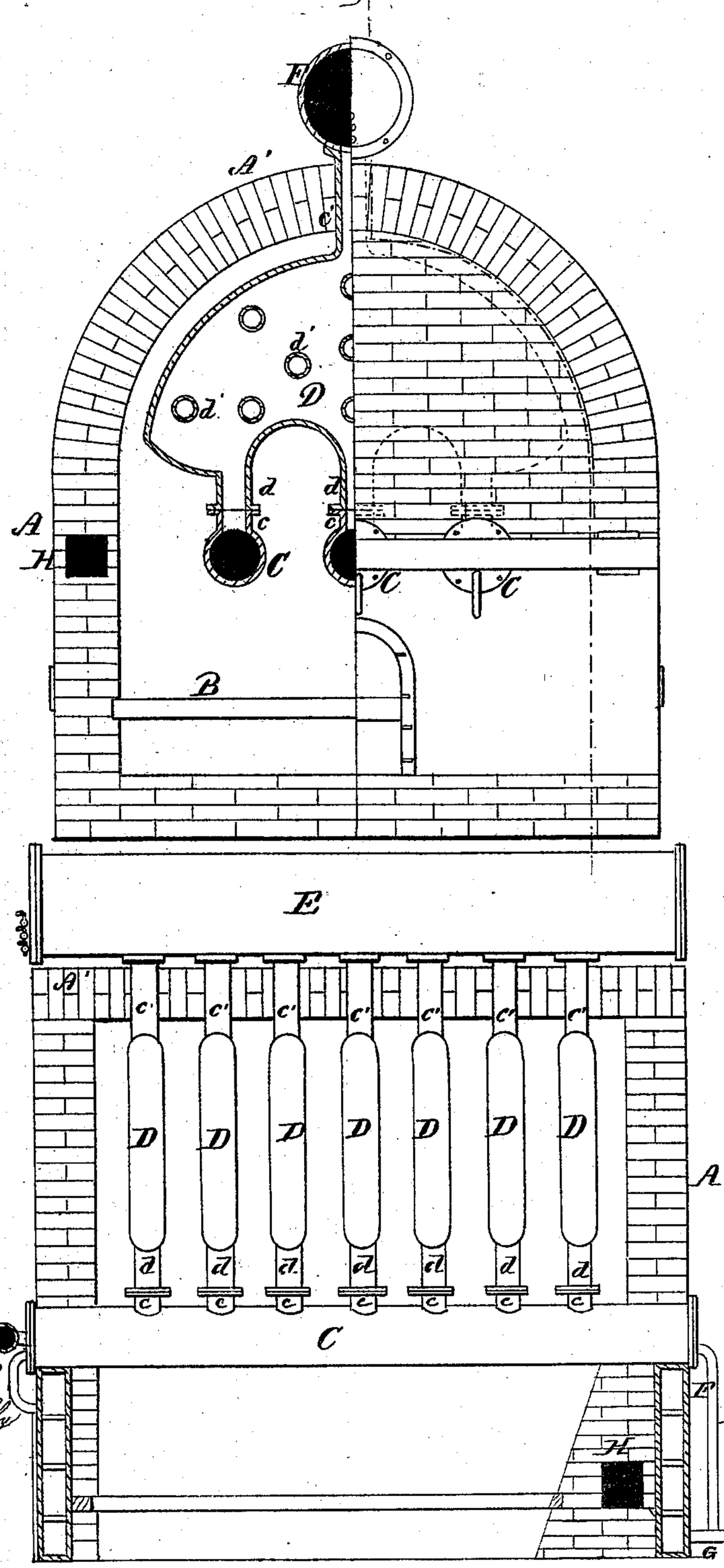
D. RENSHAW.

Sectional Steam-Generators.

No. 143,844. Patented Oct. 21, 1873.

Fig 1



Witnesses
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UNITED STATES PATENT OFFICE.

DAVID RENSHAW, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN SECTIONAL STEAM-GENERATORS.

Specification forming part of Letters Patent No. **143,844**, 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 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.

My invention relates to sectional steam-generators used in connection with a reverberatory furnace, formed either with solid walls of brick, or other material possessing great capacity for storing and returning heat, or with hollow sectional walls, as in my patent of February 20, 1872, which sectional walls are adapted to hold water and generate steam. The present invention relates particularly to the construction of the internal sections; and as these are designed to almost wholly fill the fire-chamber, (a due regard being had for free circulation of drafts,) I prefer to make the walls of the furnace of brick, so as to obtain as much reverberatory power as possible. The sections are of cast metal, and are formed with stay-bolts, which I prefer to make hollow, though they may be made solid, if desired, and with legs or pedestals by which they form connections with tubular water-chambers beneath them, these latter running longitudinally through the furnace, while the former are arranged laterally. Each section is also formed with an open projection, which rises from its top, and by which communication is had with a steam-drum located above the crown of the furnace. When a water-furnace is used the sections forming the walls thereof communicate also with this drum, as illustrated in my patent above mentioned. The sections are fed by means of elbow-pipes communicating with the front base and tubular water-reservoirs by suitable openings in the heads of the latter, said base being formed of a cast-metal section, having a fire-door, the rear base being a similar section communicating with the tubular water-chambers by elbow-pipes, and having a blow-off at the bottom of said base.

Referring to the drawings, A is a reverberatory furnace, constructed with an arched top or crown, A′. B is the grate. C C C are tubular water-chambers, made of cast metal, and formed with flanged projections *c*, by which communication is had with the sections D by means of the flanged projections *d* thereon. The sections D are of the construction and form plainly shown in the drawing, having an arched crown or top, and cast with hollow stay-bolts *d′*. They are supported by the tubular water-chambers C, and communicate with the steam-drum E by means of the projections *c′* cast upon said sections, and flanged in the manner shown. F F are feed-pipes, communicating with the base and tubular chambers, and conveying water from the former to the latter. A blow-off pipe is shown at G, and flues H H are arranged as in my patent of December 10, 1872, No. 133,723, to carry off the gases and products of combustion.

A generator thus constructed presents many points of advantage. The sections D, having their upper lines arched, receive the full reverberatory power of the furnace, and the arch imparts security against danger by the contraction and expansion of the metal. Additional strength is imparted by the stay-bolts; and as I prefer to make these hollow, they thus afford superior means for circulation of the flame and drafts. The various curvatures also, as plainly shown in the drawing, are designed with a view to bringing the flames in contact with every accessible part of the sections; and as the sections themselves occupy a very considerable portion of the fire-chamber, it is obvious that a relatively large fire-surface is obtained in a very small space. Besides, as there are no angles whatever in the sections, there is no chance afforded for the accumulation of sediment, which must, consequently, fall into the tubular chambers C, whence it can be readily removed.

What I claim is—

1. The flat stay-bolted sections D, arranged laterally within the furnace, and crossing the

longitudinal center thereof, and having communication with the longitudinal water-chambers beneath, said sections being arched above and below, substantially as shown and described.

2. The combination of the reverberatory furnace and steam-drum E with the flat stay-bolted sections D, arranged laterally within the furnace, and crossing the longitudinal center thereof, and having communication with the longitudinal water-chambers beneath, said sections being arched above and below, substantially as shown and specified.

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.