E. P. DOYEN.

Improvement in Steam Generators.

No. 116,167. Patented June 20, 1871.

Fig 1

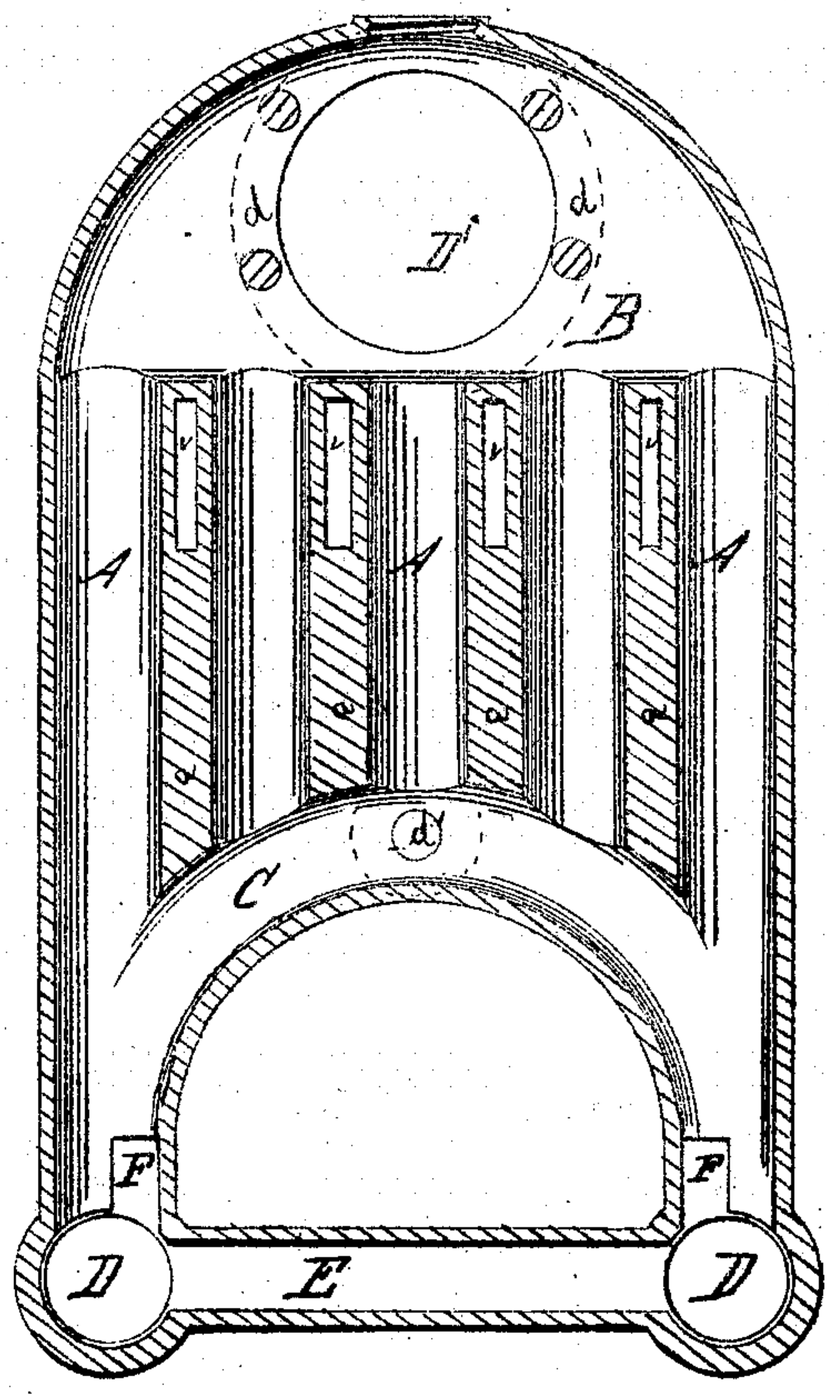
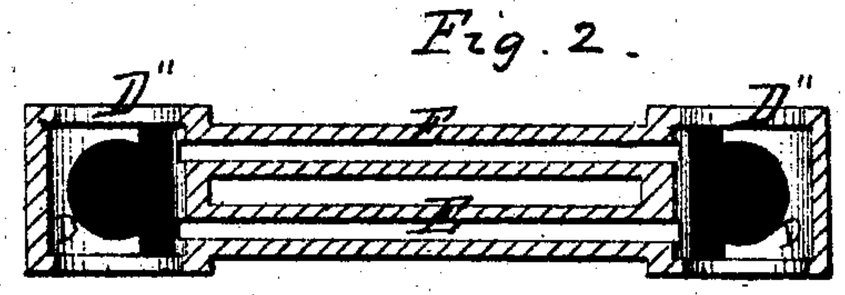


Fig. 2.



Witnesses
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J. M. Hyne

Inventor:
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116,167

UNITED STATES PATENT OFFICE.

ERASMUS P. DOYEN, OF PORTLAND, MAINE.

IMPROVEMENT IN STEAM-GENERATORS.

Specification forming part of Letters Patent No. 116,167, dated June 20, 1871.

To all whom it may concern:

Be it known that I, ERASMUS P. DOYEN, of Portland, in the county of Cumberland and State of Maine, have invented a new and valuable Improvement in Steam-Generators; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing making a part of this specification and to the letters and figures of reference marked thereon.

Figure 1 of the drawing is a representation of a vertical section of my invention. Fig. 2 is a horizontal section of the same.

My invention has relation to an improvement in the construction of sectional steam-generators; and it consists in the construction and novel arrangement of the hollow grate-bars communicating with the water-tubes, whereby a rapid generation of steam is effected. In the accompanying drawing illustrating this invention a single section of the generator is represented. Each section consists of a number of upright tubes connecting a semicircular steam-chamber with an arched tube, forming a portion of the top of the fire-box, and communicating at each end with the horizontal hollow grate-bars.

The letter A of the drawing designates the upright tubes. B represents the semicular cup or steam-chamber. C designates the arched tube forming a portion of the top of the fire-box. The ends of this tube terminate in the short cylinders or corner chambers D, which are connected by the hollow bars E of the water-grate. The cylinders D are larger in vertical diameter than the bars E, and the latter are so arranged that the base line or floor of each hollow bar shall be higher than the bottom of the cylinders D, the object being to provide for the accumulation of sediment at a point whence it can be readily removed.

Usually it is found convenient, in practice, to provide each section with two hollow grate-bars. More may be employed, if it is thought necessary; or, if the generator be of small size, one only may be convenient. In casting, care should be taken to leave sufficient space between the ends of the cylinders D and the outer sides of the bars, to prevent the said bars from coming in contact when the sections are fitted together. This space should be half the width desired between the grate-bars.

F F represent hollow shoulders, extending upward from the cylinder D on each side of each end of the arched tube C, thus forming on the inner side of each end of said tube a plane surface, which is a section of the lateral wall of the fire-box, and is designed to fit accurately to the same portions of the adjoining sections. In this manner a complete fire-box is formed by fitting the sections together, the same being provided with continuous lateral walls, hollow water-grate, and arched top, there being spaces between the tubing forming the arched top for the passage upward of the heated products of combustion. D′ represents the openings in the faces of the semicircular steam-chamber through which communication is established with the steam-chambers of the adjoining sections. These openings are bounded by the annular shoulders *d d*, which may be secured together by rivets or in any suitable manner. D″ D″ represent similar openings at each end of each mud-drum, D, through which communication is established with the drums of the adjoining sections.

When a sufficient number of these sections is joined to make a boiler of the size required the sections are all secured together, in a strong and durable manner, by means of a bolt passing from end to end through the middle openings *d′* in the sides of the arched tube C. The upright tubes A A are laterally connected by the partial walls *a a*, which extend upward from the arched tube C to near the steam-chamber, where they end, each leaving a space for the passage of the heated products of combustion.

The object of this construction is to strengthen the lower portions of the tubes, where the water is, and, at the same time, to contract the spaces between the tubes, leaving the openings or passages *v v* near the top of the smoke-chamber for the purpose of obtaining a better draught.

I claim as my invention—

1. The vertical transverse section herein described, comprising in an entire casting the steam-chamber B, water-tubes A C, fire-box

shoulder F, mud-drums D, and water-grate E, substantially as specified.

2. The combination, with a sectional casting, comprising the steam-chamber B, water-tubes A C, fire-box shoulder F, and mud-drums D, of the hollow grate-bars E, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

ERASMUS P. DOYEN.

Witnesses:

JOS. A. LOCKE,

A. M. AMOS.