J. F. ALLEN.

STEAM GENERATOR.

No. 76,580. Patented Apr. 14, 1868.

Fig. 2.

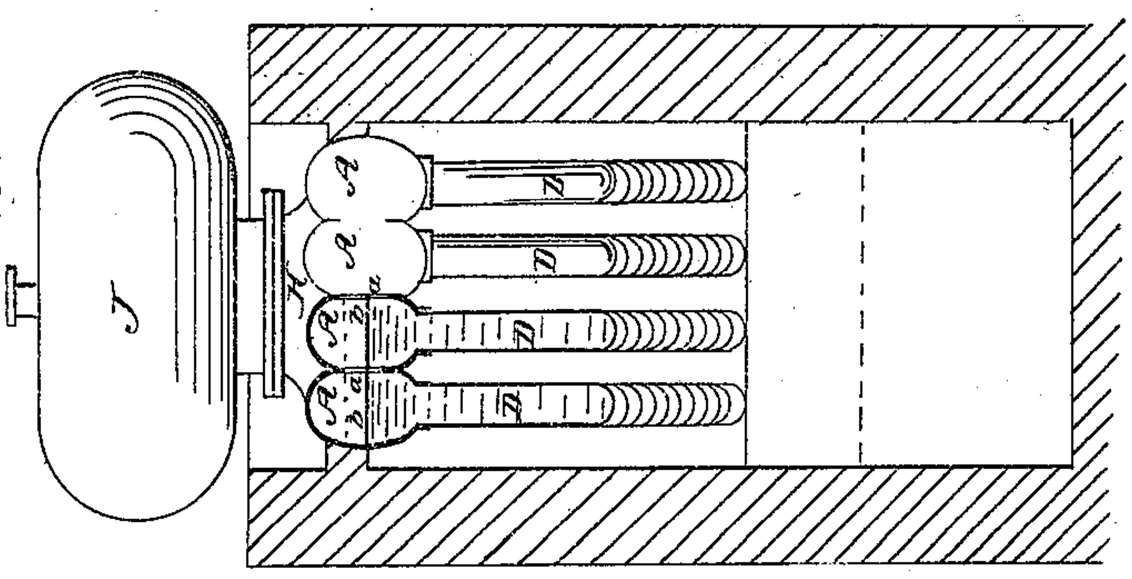
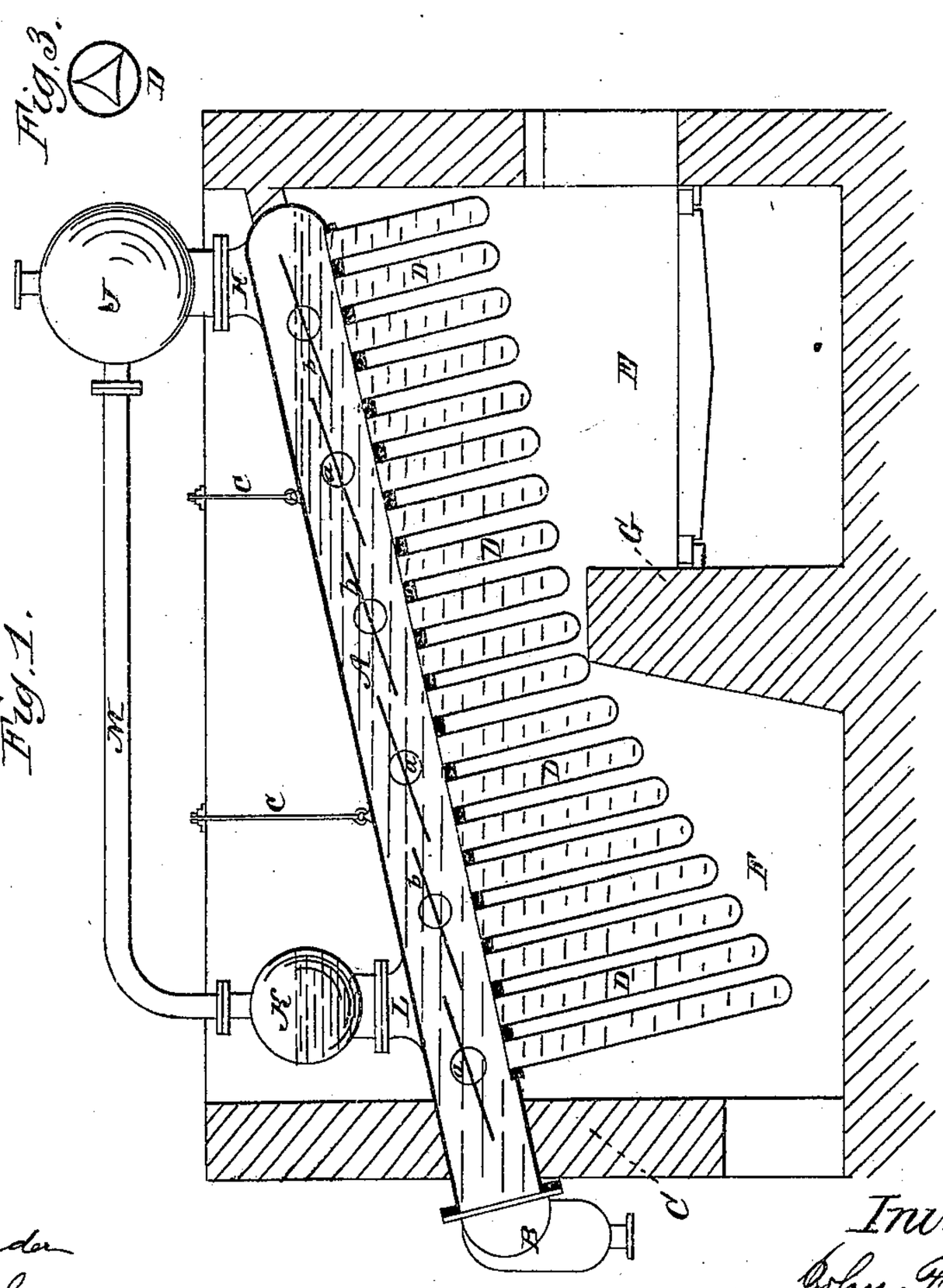


Fig. 3.

Fig. 1.



Witnesses

Henry E. Roeder

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Inventor.

John F. Allen

United States Patent Office.

JOHN F. ALLEN, OF TREMONT, NEW YORK

Letters Patent No. 76,580, *dated April* 14, 1868.

IMPROVEMENT IN STEAM-GENERATOR.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, JOHN F. ALLEN, of Tremont, Westchester county, in the State of New York, have invented a new and useful "Steam-Generator;" and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Figure I represents a longitudinal section of my steam-generator, and

Figure II shows a front view and partial section of the same.

In the accompanying drawings, A A A represent chambers, made oval or circular in section, running the whole length of the boiler, and projecting through the after brick wall. These chambers are cast together, three, four, or more, side by side, and provided with suitable openings, *a*, to form communications from one to the other. The forward end of these chambers is closed, and made circular, while their after ends are open, and provided with a flanch, to which a reservoir or chamber, B, is attached, situated on the outside of the after brick wall C, for the collection of any sediment, and to which the supply and blow-off pipes are attached.

The chambers A are strengthened near the central part by braces or division-plates *b*, running lengthways, and are slightly inclined upwards, for the purpose of allowing the particles of steam and water to pass easily into the upper part of these chambers.

On the bottom of each chamber A, tubes or pipes, D, are securely fastened, closed at the bottom, and projecting downwards into the fire and flame. Those tubes or pipes directly over the fireplace E are made all of the same length, while those tubes situated in the combustion-chamber F, behind the bridge-wall G, are gradually increasing in length as they depart from the fire.

Near the forward end of the chambers A, a branch, H, is provided, communicating with all the chambers, and to which a steam-chamber, J, is attached.

Near the after end of the chambers A, but in such a position as to come within the after brick wall C, a similar branch, L, is arranged, communicating with a water-chamber, K, the top of which is connected with the steam-chamber J by a pipe, M, for the purpose of equalizing the pressure in the same, and at the same time to allow the escape of any steam from that part of the generator.

The chambers A are placed in the brick-work, at a slight inclination, and form the top of the flue or fire-chamber, and are supported in that position by suitable auger-bolts, *c c*, fastened to bars resting on the top of the brick-work.

The steam generated in the pipes D, as well as in the chambers A, rises upwards, and passes into the steam-chamber J, the several particles of steam being conducted in the desired direction by the inclined braces or partition-plates *b*, assisted by the inclined upward position of the chambers A, the steam passing into the chamber J, while the particles of water carried with the same will readily follow the circular ends of these chambers A, and pass back again below the partition-plates *b*, and as the water below said partition-plates *b*, exposed to the direct action of the fire, becomes of less specific gravity, it rises, and is replaced by the cooler current above said partition-plates, and a regular and rapid circulation in these chambers is maintained. For the same purpose, a triangular tube is inserted into each of the suspended tubes D, (see Figure III,) the object of which is to direct two currents of water in the same, and to maintain a rapid circulation in each of them.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The arrangement of a number of chambers, A, of an oval or circular section, with circular forward end, and strengthened by braces or division-plates *b*, inclined upwards, for the purpose described, in combination with hanging tubes or pipes D, the whole being constructed in the manner and for the purpose substantially as set forth.

2. I claim the combination of the above-described chambers A, with hanging pipes D, water-chamber K, steam-chamber J, and connecting-pipe M, when constructed and arranged substantially as described and specified.

JOHN F. ALLEN.

Witnesses:

HENRY E. ROEDER,

WM. DERFER.