

T. S. La France,

Fire Tube Boiler.

No. 104,167.

Patented June 14, 1870.

Fig. 1.

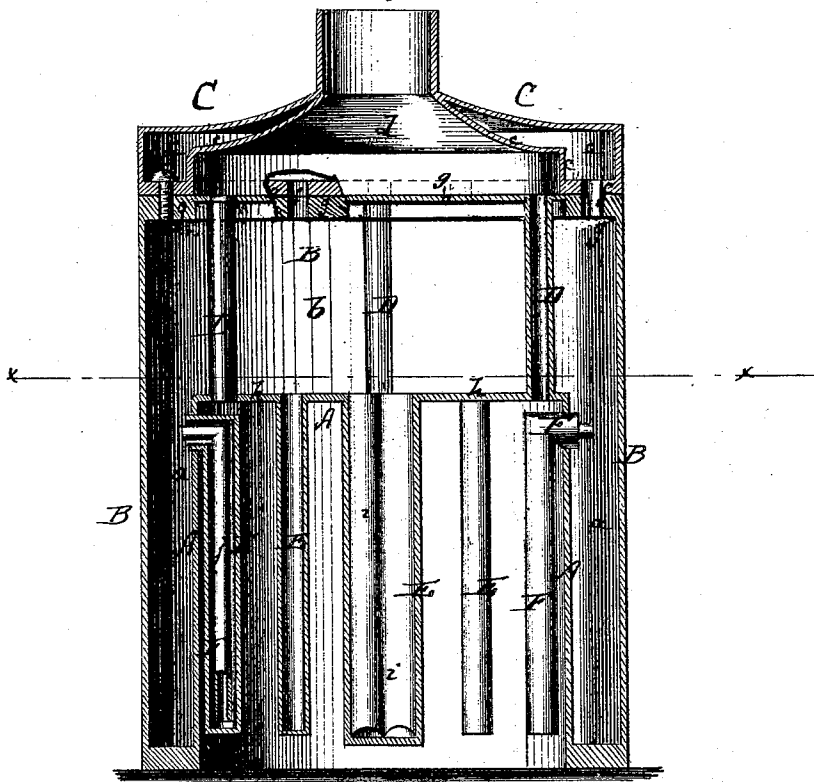
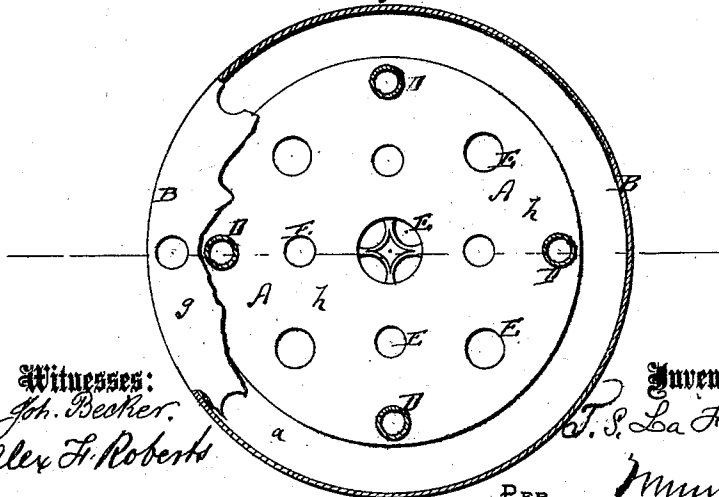


Fig. 2.



Witnesses:
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United States Patent Office.

T. S. LA FRANCE, OF ELMIRA, NEW YORK.

Letters Patent No. 104,167, dated June 14, 1870.

IMPROVEMENT IN STEAM-GENERATORS.

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, T. S. LA FRANCE, of Elmira, in the county of Chemung and State of New York, have invented a new and improved Steam-Generator; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1 represents a vertical central section of my improved steam-generator.

Figure 2 is a horizontal section of the same, taken on the plane of the line *x x*, fig. 1.

Similar letters of reference indicate corresponding parts.

This invention relates to steam-generators, and consists in certain improvements thereon, which will be specified hereinafter.

The invention consists, first, in a new arrangement of double pipes which lead from the main water-chamber into the fire-box, and in which a complete circulation of the water will be obtained to create steam rapidly.

The invention also consists in the use of a novel super-heater, as hereinafter more fully described.

A, in the drawing, represents the cylindrical vertical fire-box, set concentrically into the vertical cylindrical boiler B, which is set up on a suitable foundation. The diameter, as well as the height of the fire-box, are smaller than that of the boiler, so that around the former an annular water-space, *a*, and above it a cylindrical steam and water-space, *b*, are formed, as shown.

Upon the boiler is set a cap, C, which is of nearly conical form, and which is open in the center, connecting with the chimney to allow the escape of smoke through it.

By a vertical or oblique partition, *c*, the central smoke-passage *d* of the cap is separated from an outer annular space, *e*, which is, by apertures *f*, in the bottom of the cap, and top plate *g* of the boiler, in communication with the interior of the boiler, to receive steam from the same.

D D are the smoke-flues, extending through the top plate *h* of the fire-box and top-plate *g* of the boiler, to conduct the products of combustion from the fire-box to the smoke-passage of the cap.

These flues pass through the water and steam in the space *b*, and give off their heat to the same, while the heat remaining to the smoke is given off to the partition *c*, to superheat the steam in the annular space *e*.

From the top plate of the fire-box project downward pipes, E E, which are open at the upper, and closed at the lower ends, so that they receive water from the boiler.

In order to facilitate the circulation of water in these pipes, I arrange a series of concave partitions, *i*, within the same, such partitions extending not quite to the lower ends of the outer pipes E. The water will then flow down in the inner pipes or spaces formed by the partition and arise in the heated outer parts.

By means of elbow-pipes, F, having inner elbow-pipes, *j*, the water may also be carried into the fire-box from the side of the boiler. The circulating water is, by these pipes E F, carried to the hottest parts of the fire-box, and steam readily produced.

The pipes nearest the center may be made smaller than those further off, to facilitate a rapid production of steam at the starting of the fire.

Having thus described my invention,

I claim as new and desire to secure by Letters Patent—

1. The superheater-cap C, combined with a vertical boiler having a partition, *c*, to separate the smoke-passage from the steam chamber.

2. The elbow-pipes F, having inner ones, *j*, and being arranged to project from side of boiler into the fire-box.

3. The combination of cylindrical fire-box with boiler, having cap C and pipes D E F.

T. S. LA FRANCE.

Witnesses:

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