J. F. BELLEVILLE.

Furnaces.

No. 148,167. Patented March 3, 1874.

Fig. 1.

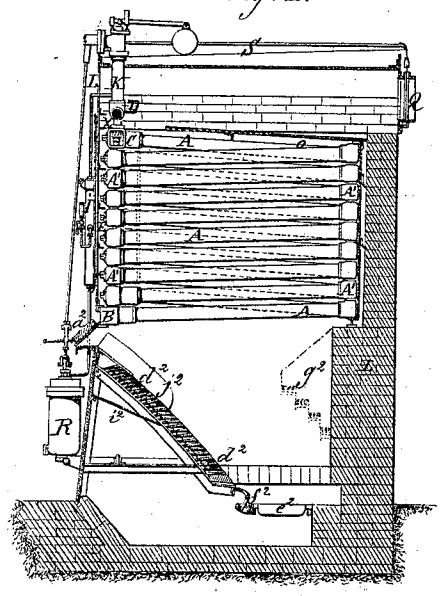
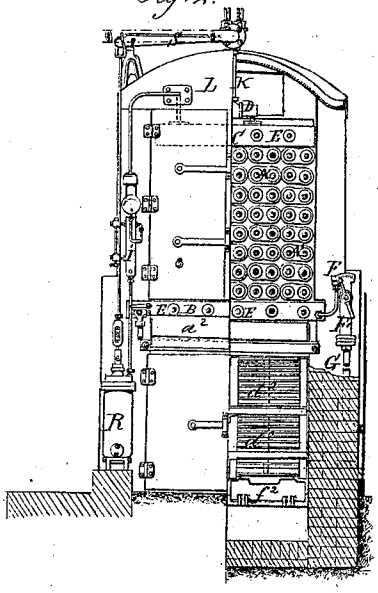


Fig. 2.



Witnesses.

J. C. Shumway

A. J. Tibbits

Julian F. Belleville
Inventor
By Atty.
John P. Earle

UNITED STATES PATENT OFFICE.

JULIEN FRANÇOIS BELLEVILLE, OF SAINT DENIS, FRANCE.

IMPROVEMENT IN FURNACES.

Specification forming part of Letters Patent No. **148,167**, dated March 3, 1874; application filed September 5, 1873.

To all whom it may concern:

Be it known that I, JULIEN FRANÇOIS BELLEVILLE, civil engineer, of Saint Denis, France, have invented an Improvement in Furnaces, of which the following is a specification:

The invention relates to steam-generators known by the name of the Belleville boiler; and the improvements refer to a smoke-consuming furnace.

The smoke-consuming furnace is shown in Figs. 1 and 2, with a continuous feed.

My improvements will be well understood from the following description and the accompanying drawing, in which—

Figure 1 is a longitudinal section of the improved generator complete, and Fig. 2 a front elevation of the same with the doors removed.

The envelope L of the generator is constructed partly of bricks and partly of sheet and angle iron. The doors serve for the visiting and cleansing of the generator.

My arrangement is characterized, first, by the employment of two grates, respectively called the large grate d^2, and the little grate e^2. The large grate d^2 is formed with a surface the inclination of which from the horizontal increases progressively from the summit to the base in the form of a curve, Fig. 1, the tangents of which at the summit and base form angles, which differ about from nineteen to twenty degrees from the horizontal. The angle of the direction of the curve formed by the grate can also vary from thirty to forty degrees, according to the nature of the combustible and the greater or lesser condition of immovability of the grate, due, for example, to the shaking of marine or locomotive engines. Secondly, by the employment of a reverberatory panel, g^2, arranged behind the furnace, opposite the grate d^2. This panel, formed from refractory bricks, accumulates the heat, and provides the grate, through radiation, with the heat indispensable for the distillation and ignition of the raw combustible in proportion as it descends upon the grate. It may be vertically inclined, or arranged in the form of a vault. Thirdly, by the employment of a movable obturator, i^2, serving to close the upper portion of the grate for about one-half of the length, which prevents the access of air across the bars of the upper portion of the grate, or confined to the desired amount, at pleasure. Fourthly, by the employment of movable partitions j^2, of metal or refractory earth, in order to divide the combustible into horizontal slices in the direction of the inclined plane of the grate, in order to facilitate its lighting, and to render its descent as regular as possible throughout the breadth of the grate. Fifthly, by the employment, as a large grate, of a grate, d^2, composed of transverse bars, arranged so as to support one another in the form of a Venetian blind, with a curved or straight surface.

A platform or flame-breaker, O, is intended to force the hot gases to divide themselves as equally as possible upon all the parts of the heating-surface. Movable lateral obturators are intended to interrupt the too direct passage of the flame between the tubes and the envelope. Q is the register of the chimney. An automatic regulator, R, for the register of the chimney, is composed of a stiff spring with permanent action. The cap of the regulator, and, in consequence, the exterior of the spring, communicate with the base of the water-level column i, and receive the pressure of the generator. The interior of the spring communicates with the atmosphere. At S is the transmission of the movement of the regulator R to the register Q.

In order to light the furnace, the necessary quantity of dry wood is placed upon the little grate e^2. Then, through the hopper a^2, coal or other mineral combustible is introduced until the grate is filled from the bottom to the top. The door of the hopper is then closed, and, by means of the obturator i^2, the passage of the air across the upper half of the large grate d^2 is cut, and the wood is lighted in the empty space f^2, which exists between the two grates. This space is closed by one or several movable trays. When the upper part of the grate is lighted, the obturator i^2 is opened just enough to feed this part of the grate sufficiently with

air. When the reverberatory panel g^2 has attained a red heat, the coal distils in proportion as it reaches the head of the grate, and passes into the state of coke. It then descends by its own weight and by the aid of a pusher, and then fresh fuel is added. The coke is gradually pushed until it reaches the little grate, where the burning is completed.

For generating-furnace of steamboats, a tubular grate, with water circulation, may be applied.

I claim—

1. The combination of the two grates a^2 e^2 with the reverberatory panel g^2, as described.

2. The combination of the two grates d^2 e^2 with the movable obturator i^2, so as to close the upper part of the grate d^2, as and for the purpose substantially as described.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

J. F. BELLEVILLE.

Witnesses:
JULES ARMENGAUD,
ALBERT CAHEN.