(No Model.) 2 Sheets—Sheet 1.

E. BOILEAU.

BOILER FURNACE.

No. 526,363. Patented Sept. 18, 1894.

Fig. I.

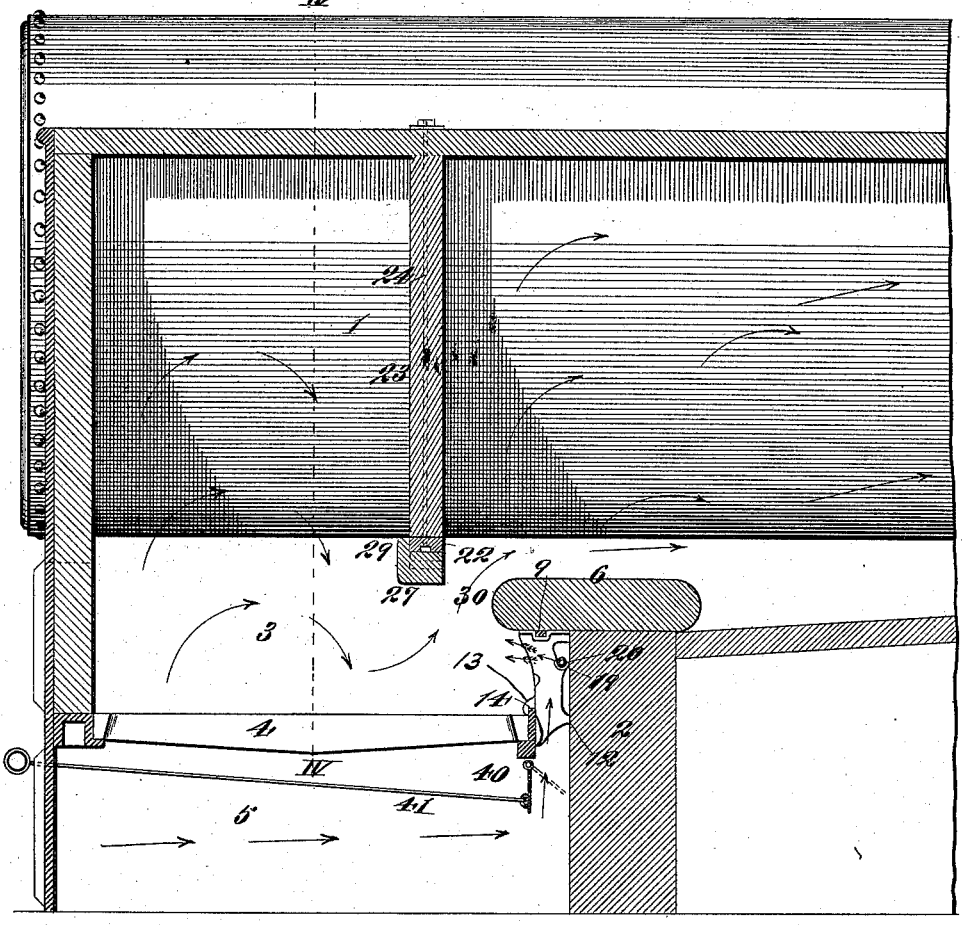


Fig. III.

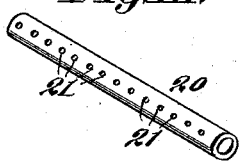
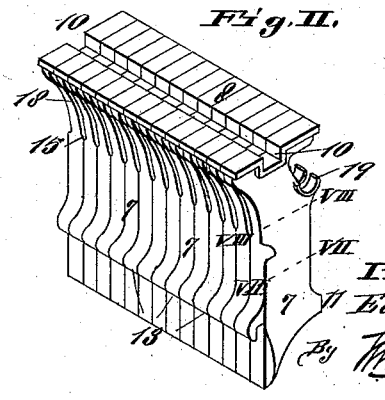


Fig. II.



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Chas. F. Edwards

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By Wright Brothers
Atty's

(No Model.) 2 Sheets—Sheet 2.

E. BOILEAU.

BOILER FURNACE.

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Fig. IV.

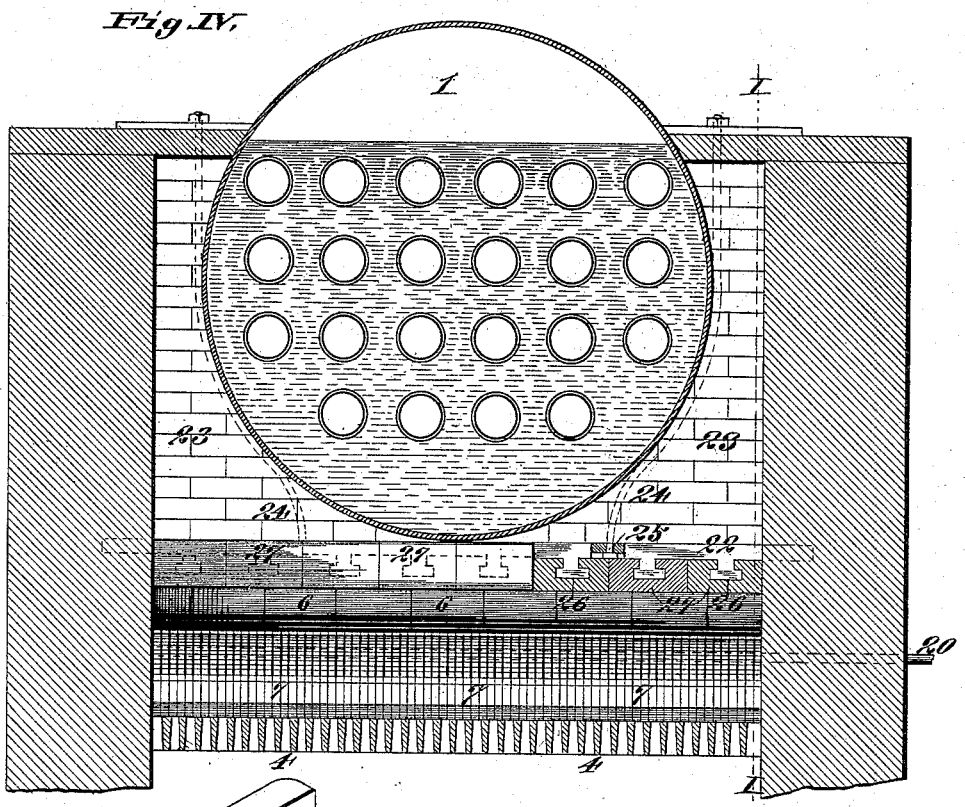

Fig. V.

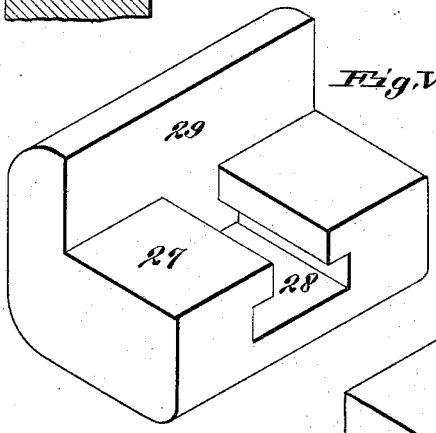

Fig. VI.

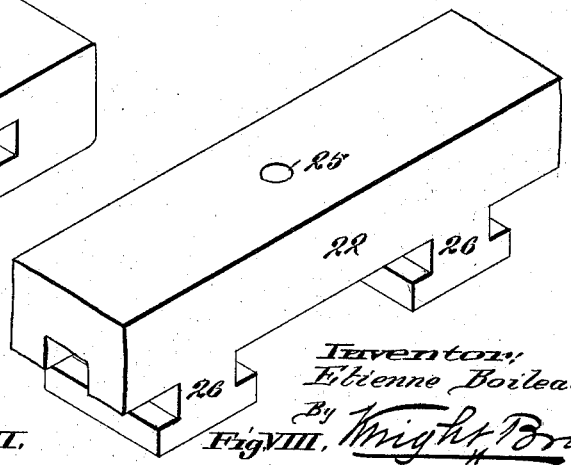

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Fig. VII.

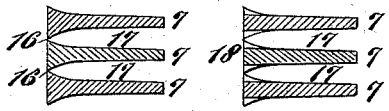
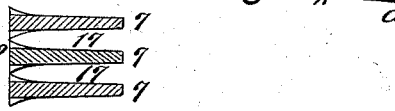


Fig. VIII.



UNITED STATES PATENT OFFICE.

ETIENNE BOILEAU, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE IMPROVED ZIGZAG GRATE BAR COMPANY, OF SAME PLACE.

BOILER-FURNACE.

SPECIFICATION forming part of Letters Patent No. 526,363, dated September 18, 1894.

Application filed November 11, 1893. Serial No. 490,651. (No model.)

To all whom it may concern:

Be it known that I, ETIENNE BOILEAU, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Boiler-Furnaces, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to certain improvements in boiler furnaces, the object being to facilitate thorough combustion and consume the smoke, and the object further being to provide a sectional deflector, the sections or parts of which can be readily renewed as they become burned or destroyed by heat.

Figure I is a detail, vertical, longitudinal section of my improved furnace, the section being taken on line I—I, Fig. IV. Fig. II is a perspective view, showing a number of the sections or plates located in front of the bridge-wall, and between which air enters the fire box. Fig. III is a perspective view, showing part of the perforated steam pipe. Fig. IV is a transverse, vertical section, taken on line IV—IV, Fig. I. Fig. V is an enlarged, perspective view of one of the blocks which form the deflector in front of the bridge-wall. Fig. VI is an enlarged, detail, perspective view, showing part of the bar which supports the deflector blocks. Fig. VII is a detail, horizontal section, taken on line VII—VII, Fig. II; and Fig. VIII is a similar view, taken on line VIII—VIII, Fig. II.

Referring to the drawings, 1 represents the boiler, 2 the bridge wall, 3 the fire-box, 4 the grates, and 5 the ash-pit of a furnace. The bridge-wall 2 has a cap 6, beneath which and in front of the bridge wall is located a series of vertical plates 7, the upper ends 8 of which fit against the bottom of the cap 6, and are held in line by means of a strip 9 fitting in recesses 10 in the tops of the plates. The lower ends of the plates are formed with projections 11, which fit against the bridge-wall, as shown at 12, Fig. I, and the lower ends of the plates are also provided with horns or lugs 13, which fit over the upper edge of a bar 14, that supports the inner ends of the grate bars 4. The front edges of the plates, below a point 15, meet together, as shown at 16, Fig. VII, while from their front edges the plates taper back so as to form spaces 17 between them, through which the air passes from the ash-pit. Above the point 15 the front edges of the plates are cut away, as shown at 18, Figs. II and VIII, to permit the air to pass into the fire box in front of the bridge-wall. The backs of the plates are provided with horns 19, to receive a steam pipe 20, which has perforations 21, see Fig. III, in its side which faces the fire box.

In the operation of the furnace, air passes from the ash-pit up between the plates 7, and escaping through the openings 18, enters the inner part of the fire box, and to provide for a large amount of air or oxygen when required, I employ the pipe 20, through which steam may be passed to create a forced current of air from the ash-pit into the fire box.

The construction is simple and durable, and in case one of the plates 7 should become destroyed by heat, it can be renewed.

A short distance in front of the cap 6 of the bridge-wall is a deflector, consisting of a bar 22, which extends across beneath the boiler, and upon which brick work 23 is placed, closing the space between the boiler and the outer walls of the furnace above the bar 22. The bar is supported, or may be supported in the side walls of the furnace, and is further supported by rods 24, the lower ends of which fit in perforations 25 in the bar 22, (see Figs. IV and VI,) and the upper ends of which pass through the top of the outer wall of the furnace, as shown in Fig. IV. On the under side of the bar 22 are placed a number of tenons 26. 27 represents blocks, each having a mortise 28 to receive one of the tenons 26. Each block has a vertical flange 29, which fits against the front edge of the bar 22, as shown in Fig. I. The blocks fit, one against another, as shown in Fig. IV, and protect the bar 22 from the flames and heat of the fire-box, and when any one or more of the blocks becomes destroyed by heat, it can be readily slipped off the bar and replaced by another one. This deflector, with the wall 23, causes the heat and products of combustion of the front part of the fire box to descend and pass through the narrow space 30 between the deflector and the bridge-wall, where they are

brought into direct contact with the oxygen entering between the plates 7, the result being a thorough combustion and a thorough consumption of the smoke.

40 represents a damper hinged beneath the bar 14, and which may be operated from the front of the furnace by a rod 41, for the purpose of regulating the passage of air from the ash-pit to the plates 7.

I claim as my invention—

1. In a boiler furnace, in combination with a bridge-wall and grate bars, the plates 7 having tapered sides at their lower parts, and openings at their upper parts, and having notches in their upper ends to receive a strip 9; substantially as and for the purpose set forth.

2. In a boiler furnace, in combination with a bridge-wall and grate bars, the plates 7 having openings 18 and provided with lugs 13 on their front faces, and projections 11, and horns 19 on their rear faces, and a perforated steam pipe fitting in said horns; substantially as and for the purpose set forth.

3. In a boiler furnace, the combination of the bridge-wall having an overhanging cap, the plates 7 located beneath said cap for admitting air from the ash pit to the fire-box in front of the bridge-wall, a perforated steam pipe 20, located behind the plates 7, and a deflector wall 23 located slightly in front of the bridge wall substantially as and for the purpose set forth.

4. In a boiler furnace, a deflector, consisting of a bar having tenons, and blocks having mortises to receive the tenons, and having vertical flanges to protect said bar; substantially as set forth.

ETIENNE BOILEAU.

In presence of—
A. M. EBERSOLE,
C. G. EDUARDS.