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Patented Apr. 29, 1902.

J. G. LOEB & J. HAGGE.
SMOKELESS BOILER FURNACE.

(Application filed Dec. 4, 1901.)

(No Model.)

Fig. 1.

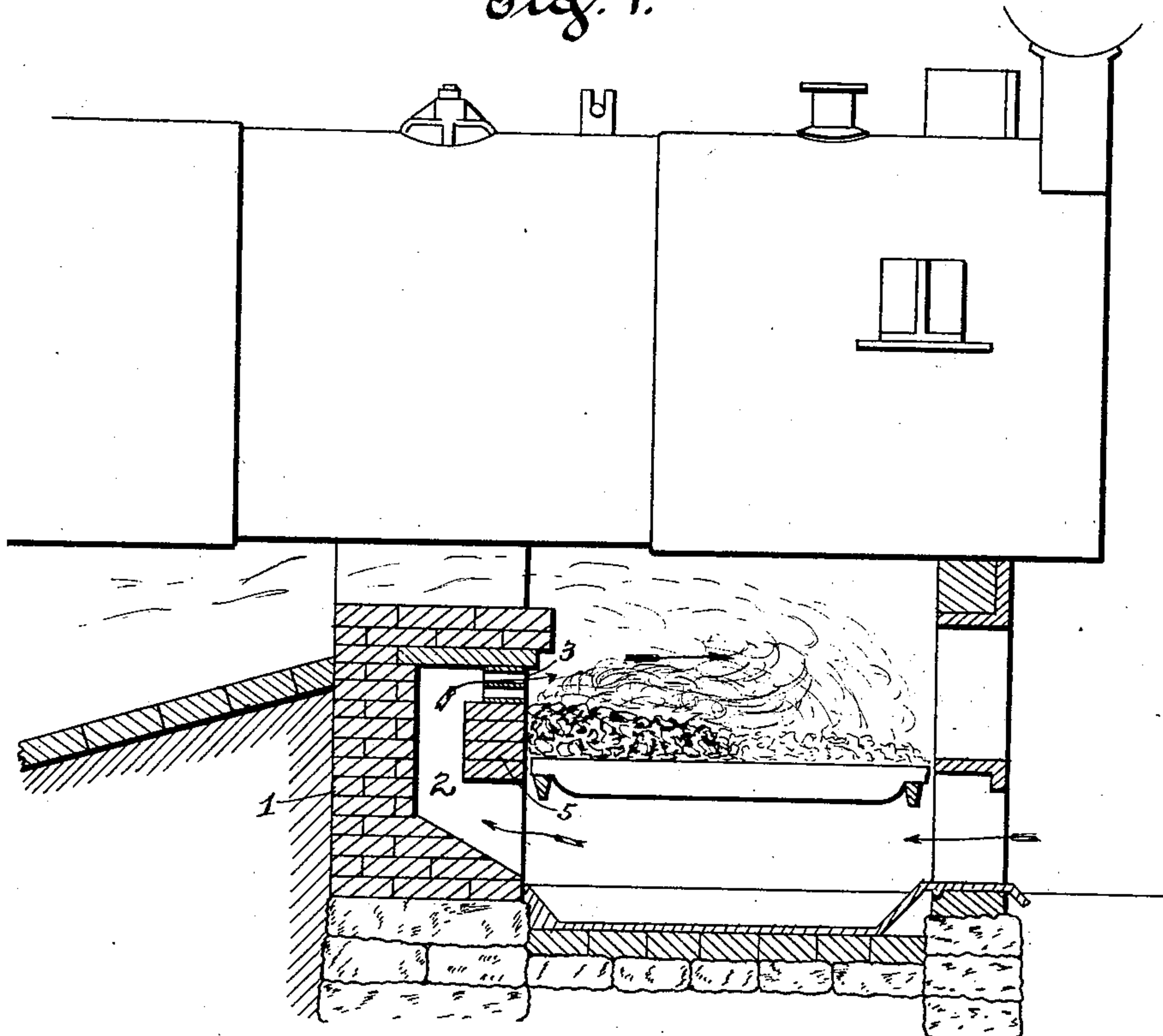
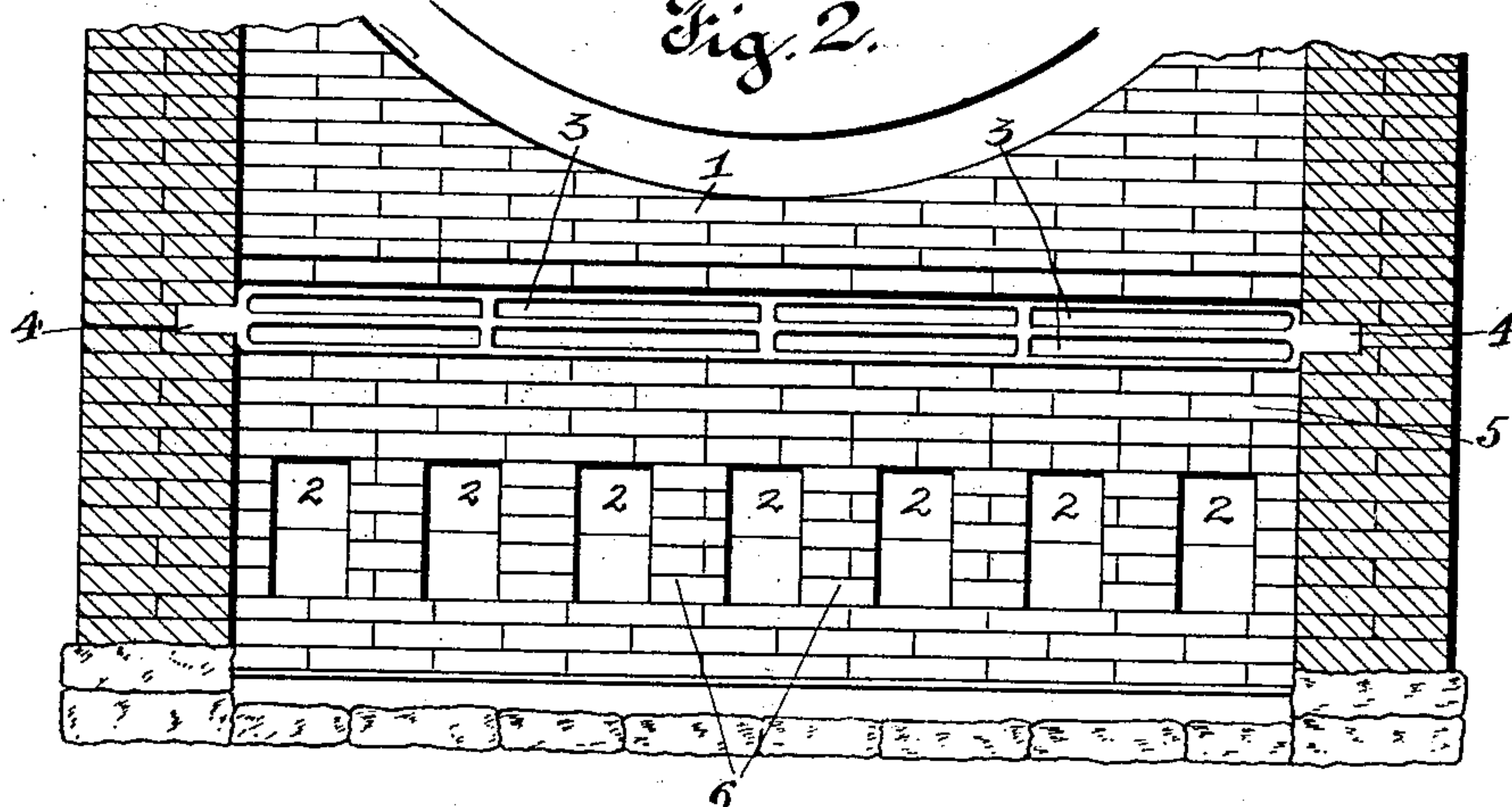


Fig. 2.



Witnesses
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JOHN G. LOEB AND JOHN HAGGE, OF ST. LOUIS, MISSOURI.

SMOKELESS BOILER-FURNACE.

SPECIFICATION forming part of Letters Patent No. 698,977, dated April 29, 1902.

Application filed December 4, 1901. Serial No. 84,626. (No model.)

To all whom it may concern:

Be it known that we, JOHN G. LOEB and JOHN HAGGE, of the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Smokeless Boiler-Furnaces, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

10 This invention relates to smokeless boiler-furnaces; and it consists of the novel construction, combination, and arrangement of parts, as will be more fully hereinafter described and claimed.

15 The object of this invention is to construct a boiler-furnace bringing a current of fresh air from below the grate-bars and passing the same through the bridge-wall over the fresh fuel, there being a solid wall back of and above the grate to support the fuel.

20 Figure 1 is a vertical sectional view of a boiler-furnace, showing our invention. Fig. 2 is a cross-sectional view of the same, showing the front side of the bridge-wall.

25 Referring to the drawings in detail, the bridge-wall 1 is built with a plurality of air-passages 2, leading from the ash-pit backwardly below the grate, then upwardly to a point some distance above the grate, and then forwardly to the fire-box, thus leaving the solid wall 5 back of and above the grate to support the fuel and to discharge the air, which passes through the bridge-wall above the fuel and not through the fuel. The lower
30 ends of the air-passages 2 are formed rectangular in laying the brick, as shown in Fig. 2, the pillars 6 between the openings serving to support the solid wall 5. The casting 4 is placed upon the solid wall 5 and supports the upper portion of the bridge-wall, said upper
35 portion projecting forwardly a slight distance over the fuel, so as to force the air coming through the bridge-wall to pass over the fuel. The air-passages 2 connect with the air-passages 3, formed through the casting 4, said
40 passages 3 being long and flat, as required, to spread the air into thin horizontal sheets.

45 In building the fire the fuel should be piled upon the back part of the grate against the solid wall 5, and the fire should be started upon the front part of the grate. The gases

of combustion arising from the fire will mix with the air passing through the bridge-wall and over the fuel, thus insuring a perfect combustion. The fuel piled upon the back part of the grate against the solid wall 5 will become heated and give off gas, which will mix with the air coming through the bridge-wall, and this gas will be perfectly consumed when it comes in contact with the flame from the front part of the grate. Then this hot fuel is pulled forwardly and fresh fuel takes its place. This feature of passing fresh air through the bridge-wall over the fresh fuel and not through it is of great importance and is made possible by the solid wall 5, care being taken to place the fresh fuel directly against this wall 5.

It has been found by experience that in arranging a furnace of this construction the smoke arising from the fresh fuel is consumed.

We claim—

In a boiler-furnace, the bridge-wall 1 built with a plurality of air-passages 2 leading from the ash-pit backwardly below the grate, then upwardly to a point some distance above the grate and then forwardly to the fire-box, thus leaving the solid wall 5 back of and above the grate to support the fuel and to discharge the air which passes through the bridge-wall above the fuel and not through the fuel, the lower ends of the air-passages 2 being formed rectangular in laying the brick and the pillars 6 between said air-passages serving to support the solid wall 5; the casting 4 placed upon the solid wall 5 and supporting the upper portion of the bridge-wall, said casting having longitudinally-extending slots forming air-passages 3 and said upper portion of the bridge-wall projecting forwardly a slight distance over the casting and over the fuel so as to force the air coming through the bridge-wall to pass forwardly over the fuel; substantially as specified.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN G. LOEB.
JOHN HAGGE.

Witnesses:

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