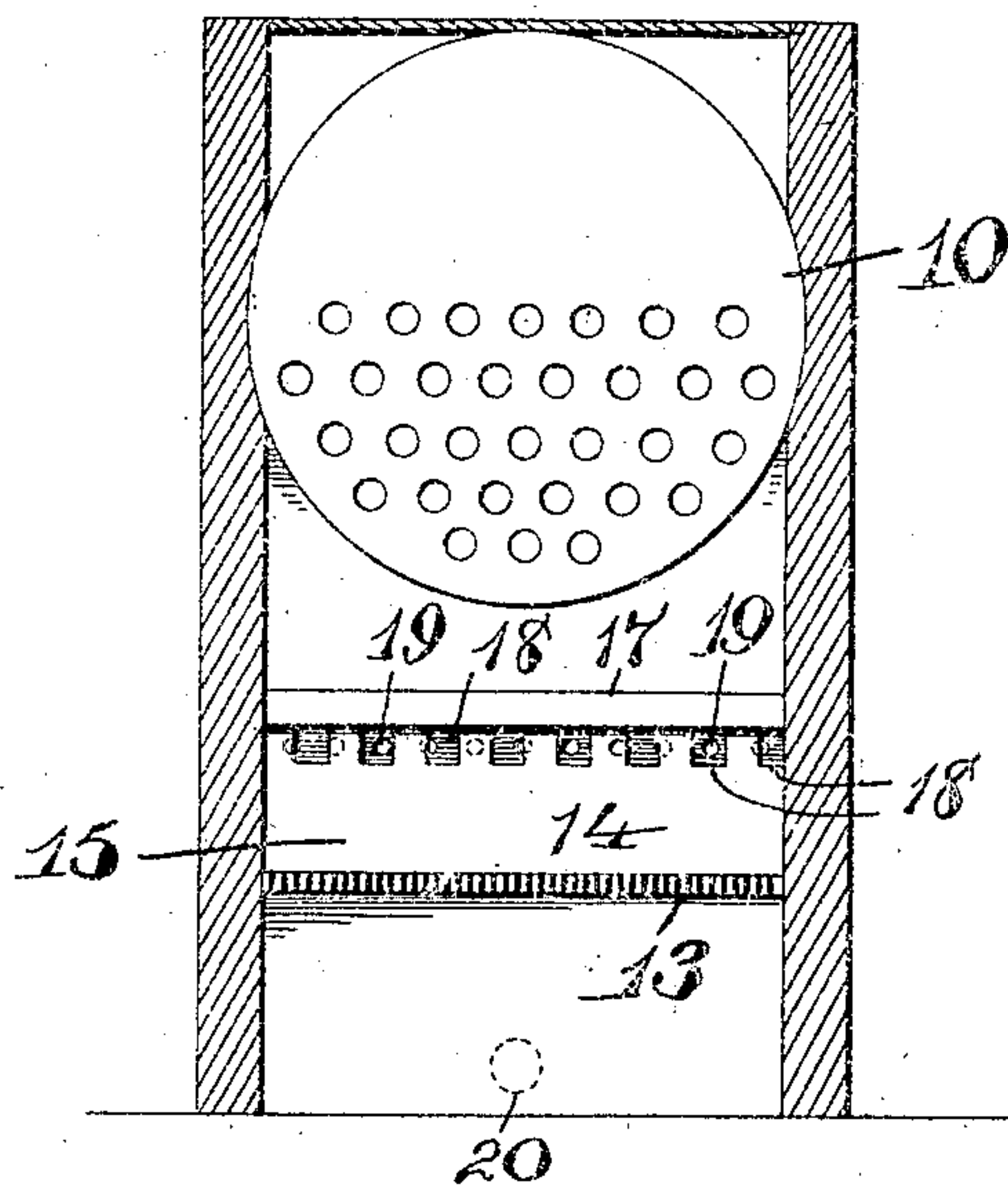
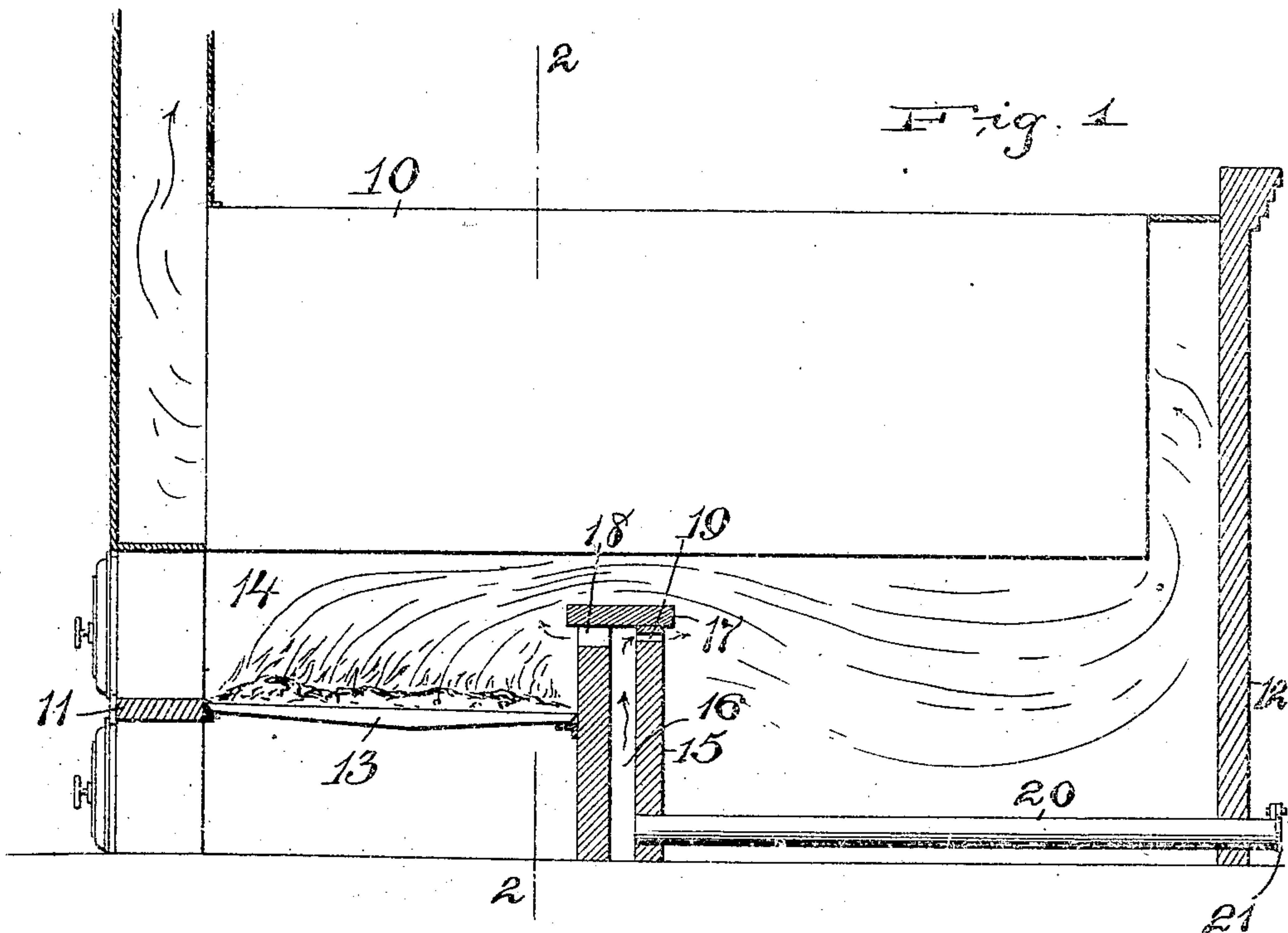


No. 883,828.

PATENTED APR. 7, 1908.

P. RIELLY.
SMOKE CONSUMING FURNACE.
APPLICATION FILED JAN. 25, 1907.



WITNESSES:

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UNITED STATES PATENT OFFICE.

PATRICK RIELLY, OF NEWARK, NEW JERSEY.

SMOKE-CONSUMING FURNACE.

No. 883,828.

Specification of Letters Patent.

Patented April 7, 1908.

Application filed January 25, 1907. Serial No. 353,942.

To all whom it may concern:

Be it known that I, PATRICK RIELLY, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Smoke-Consuming Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of this invention is to provide a device to secure more efficiency from the furnace of a boiler, or similar structure, and is designed to provide a means for making a more perfect combustion of the gases that come from the fire, and the particular construction herein illustrated and described, refers to the bridge wall in a furnace that is supplied, from the outside, by means of a suitable pipe passing through the combustion chamber, this pipe carrying air and feeding the inside of the bridge wall, which is hollow, and tending also to heat the gas.

The invention further consists in designing the top of the bridge wall so as to feed the larger part of the air, fed into the bridge wall, forward into the fire box, and to take a small portion of the air coming in and feed it through a series of much smaller perforations in the bridge wall back into the combustion chamber.

The invention is illustrated in the accompanying drawings, in which

Figure 1 is a section of a furnace showing the boiler in elevation. Fig. 2 is a section on line 2, 2, in Fig. 1.

Any suitable boiler or medium to be heated can be used, but I illustrate a tube boiler 10, and on the front thereof is a suitable wall 11 on which are installed the usual ash-pit and furnace doors, and the back of the furnace is inclosed by a wall 12, customary side walls of course, being also installed. The grate 13 is secured, on one end, to the bridge wall, and on the other end to the front wall 11, in the manner now employed, and between this grate and the boiler is the fire box 14. The bridge wall 15 is of a peculiar construction, and embodies a space 16 running across the width of the furnace and having, on its top edge, a covering 17 which is usually

made of fire brick, and which is of any ordinary type now employed. At the top of the bridge wall directly under the covering, on the front side of the bridge wall toward the fire box, is a series of openings 18 which are comparatively large, and on the back of the bridge wall and leading the other way into the combustion chamber, are the perforations 19 which are smaller than the perforations 18, the purposes of which will be described hereinafter. The space 16, in the bridge wall, and consequently the perforations, in the bridge wall, are supplied by means of a pipe 20 which is arranged to pass back through the combustion chamber, and thus be constantly heated to a considerable degree, and a suitable valve or closure 21 can be placed on the end of the pipe to regulate the admission of air.

The device, when it operates, tends to feed air in through the pipe 20, the space 16, and out of the perforations 18, thus throwing most of the air entering into the fire box 14, directly over the fire, and thus supplying the necessary elements to complete, to a great extent, the combustion of gases. At the same time a small portion of the air passes out through the perforations 19 and completes in the combustion chamber by mingling with the unconsumed gases that have passed over the bridge wall, a still further consumption of gas, and it is thought, in this way, that almost all the gases coming from the coal can be consumed before passing into the flue of the chimney.

This device is designed to be used in lessening the amount of smoke coming from a chimney, thus making it possible to use soft coal and not to injure the public health, and also gives the user of the coal more benefit of his fuel. The particular arrangement of perforations is emphasized, and their sizes are also specified because if the perforations, through the bridge wall, were of about the same size, there would be no mixture in the fire box and very little in the combustion chamber, as the force of the draft from the fire would simply force some of the products of combustion through the perforations in the bridge wall, and the only mixture would be in the combustion chamber, and it would be impossible to get any of the air into the fire box. By making the perforations in the rear of the bridge wall smaller, the flow in that direction is retarded, and the balance of the

air is forced forward into the fire box to be used up therein, after it combines with the gases from the fuel.

5 Having thus described my invention, what I claim is:—

10 A furnace comprising inclosing walls, an element to be heated arranged therein, a bridge wall, a grate forming, with the bridge wall, a fire box on the front of the bridge wall, the bridge wall forming a combustion chamber with the rear walls of the inclosing walls, the bridge wall having a chamber therein and having perforations in its front wall above the grate and arranged to be 15 above the fire, the perforations being of almost the capacity of the chamber in the bridge wall, whereby most of the air therefrom will pass into the fire box, the bridge wall also having a series of perforations much 20 smaller than the perforations in the front thereof, the smaller perforations leading

through the back of the bridge wall into the combustion chamber, the perforations in the front and back of the bridge wall being arranged out of alinement so as to destroy any 25 tendency of the draft from the fire to pass through the bridge wall, the current of air being thus induced from the chamber in the bridge wall through the front perforations by the draft of the fire alone; the chamber in 30 the bridge wall having no other connection through the front of the bridge wall, and a pipe leading into the chamber of the bridge wall and passing through the combustion chamber, whereby it is heated. 35

In testimony that I claim the foregoing I have hereunto set my hand this 24th day of January, 1907.

PATRICK RIELLY.

Witnesses:

WM. H. CAMFIELD,
E. A. PELL.