

No. 608,435.

Patented Aug. 2, 1898.

S. O. BERG.
SMOKE CONSUMING FURNACE.

(Application filed Apr. 7, 1898.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 3.

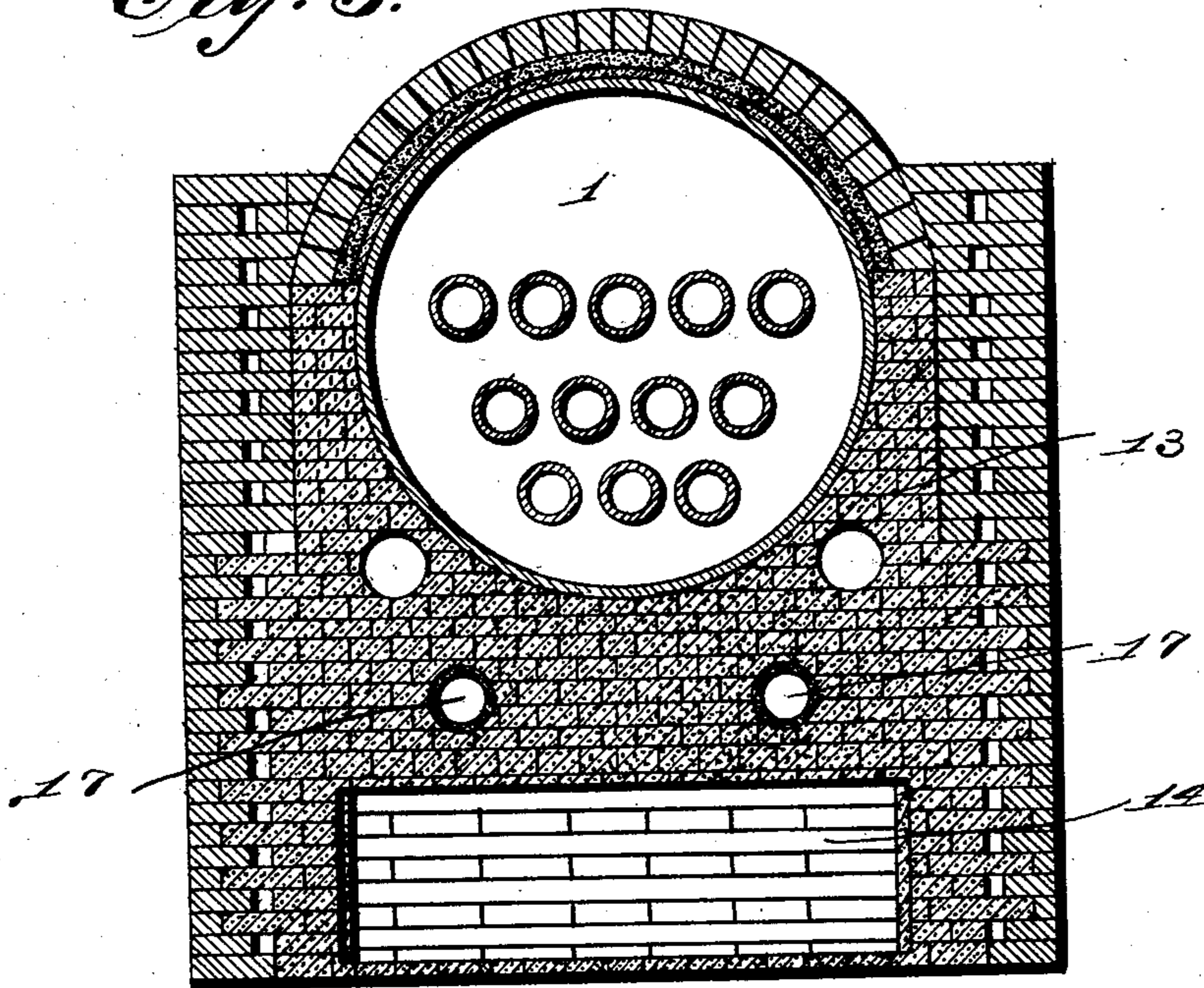
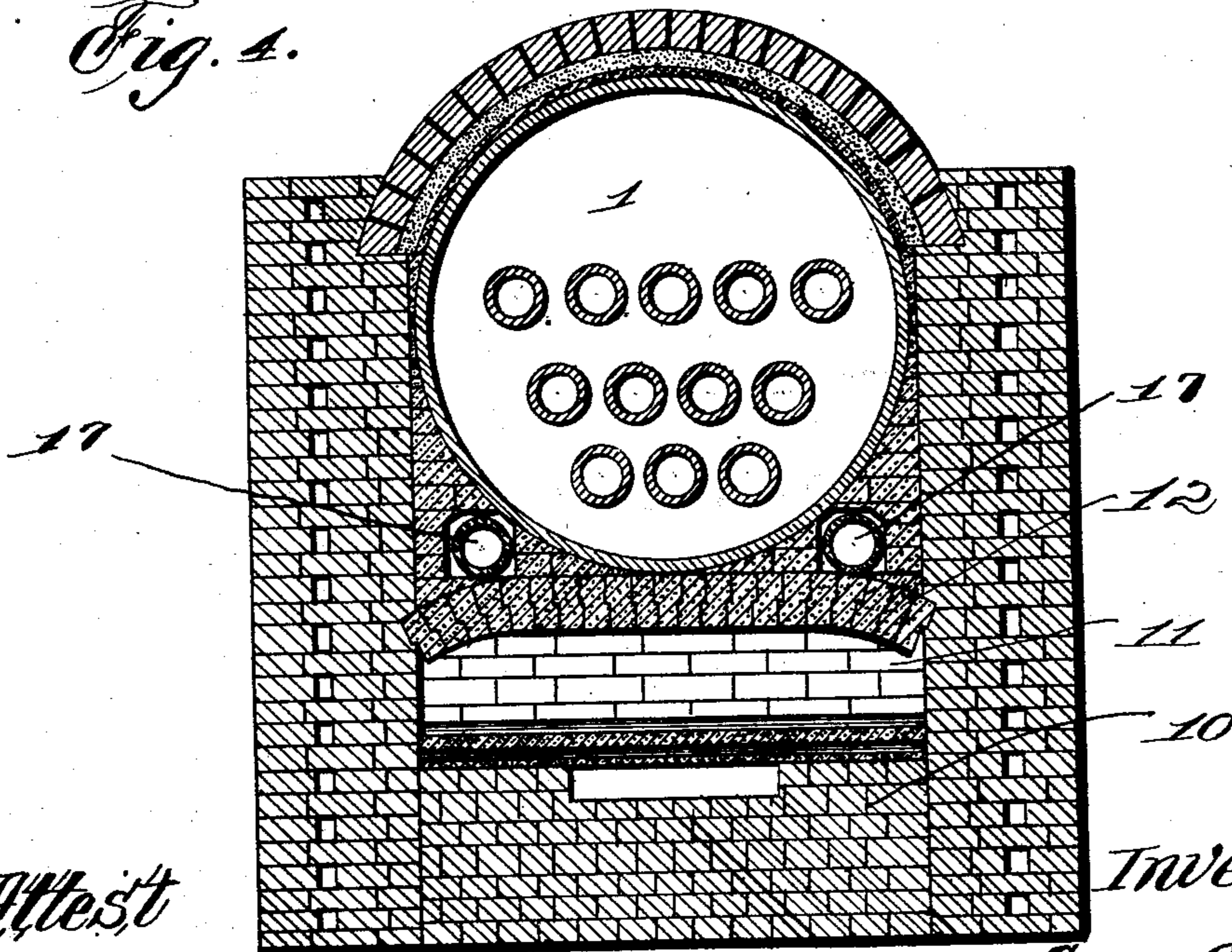


Fig. 4.



Attest

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UNITED STATES PATENT OFFICE.

SVEN O. BERG, OF ST. LOUIS, MISSOURI.

SMOKE-CONSUMING FURNACE.

SPECIFICATION forming part of Letters Patent No. 608,435, dated August 2, 1898.

Application filed April 7, 1898. Serial No. 676,838. (No model.)

To all whom it may concern:

Be it known that I, SVEN O. BERG, of the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Smoke-Consuming Furnaces, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to smoke-consuming furnaces; and it consists of the novel construction, combination, and arrangement of parts hereinafter shown, described, and claimed.

Figure 1 is a longitudinal sectional view of a smoke-consuming furnace constructed in accordance with the principles of my invention. Fig. 2 is a horizontal sectional view taken approximately on the line 2 2 of Fig. 1. Fig. 3 is a vertical transverse sectional view taken approximately on the line 3 3 of Fig. 1. Fig. 4 is a vertical transverse sectional view taken approximately on the line 4 4 of Fig. 1.

Referring by numerals to the accompanying drawings, 1 indicates the horizontal boiler; 2, the usual boiler-setting; 3, the support for the rear end of the boiler, and 4 the mud-drum.

5 indicates the front wall of the boiler-setting, the same being provided with a fire-opening 6 and the openings 7, beneath said fire-opening, through which the ashes are removed. This front wall 5 is provided with an ordinary boiler-front 8, which is provided with suitable doors through which the fuel is passed onto the grate-bars and through which the ashes are removed.

9 indicates the horizontally-arranged grate-bars, the forward ends of which rest in the front wall 5, the rear ends resting upon the wall 10, that extends from the ground up to the boiler 1, there being an opening 11 formed in the wall 10 immediately above the rear ends of the grate-bars 9 and there being a fire-brick arch 12 above said opening. Located a short distance to the rear of this transverse wall 10 is a wall 13, in the lower portion of which is formed an opening 14, and a short distance to the rear of this wall 13 is a transversely-arranged wall 15, which does not extend all the way to the under side of the boiler, the top of this last-mentioned wall 15 being connected to the bottom of the wall 13 by a

curved wall or base of fire-brick 16. A pair of pipes 17, preferably constructed of fire-clay, are located in the upper portion of the wall 10, adjacent each side wall of the furnace, the flaring open mouth of each of said pipes curving downwardly and being located approximately above the center of the grate-bars 9. Said pipes 17 pass through the wall 10 and extend from thence downwardly and rearwardly through the wall 13 to a point in the chamber immediately in front of the upper end of the curved wall 16.

Located at suitable points in the front wall 5 of the furnace, above the fire-openings therein and discharging downwardly onto the grate-bars 9, are the air-inlet tubes 18, which may be, if desired, provided with suitable dampers.

The operation of my improved furnace is as follows: After a fire has been started upon the grate-bars 9, air is allowed to discharge through the pipes 18 onto the forward portion of the fire upon said grate-bars. This tends to cause the smoke arising from the fire to pass out of said fire at the rear portion thereof. A portion of the flames arising from the fire will pass upwardly through the pipes 17 and after passing through said pipes will commingle with the smoke and other products of combustion at the rear ends of said pipes, and at this point a perfect combustion of all the smoke, gases, and like products is obtained. By the use of the air-inlet pipes 18 the black smoke is all driven out of the fire at the rear portion thereof, and only a portion of the flames of said fire containing no smoke will pass through the pipes 17.

By my improved construction the intense heat resulting from the complete combustion of the smoke and gases is obtained at a central point in the length of the boiler. Therefore the water within said boiler will be heated and circulate much more quickly than where the intense heat is applied directly to one end of the boiler.

A furnace of my improved construction can be very cheaply built, is very economical in the use of fuel, is very effective in the burning of black smoke usually arising from furnace-fires, and steam can be generated much

more quickly than in a furnace of the ordinary construction.

I claim—

5 1. In a smoke-consuming furnace constructed with a fire-box and having the combustion-chamber constructed at a point beneath the center of the boiler, a plurality of tubes leading from the fire-box into said combustion-chamber, and a plurality of trans-
10 verse walls supporting said tubes, in which walls are formed openings beneath said tubes, substantially as specified.

15 2. In a smoke-consuming furnace, a fire-box formed beneath one end of the boiler and there being a combustion-chamber formed beneath the center of said boiler, a plurality of flame-conveying tubes leading from the

fire-box into the combustion-chamber and air-inlet tubes located in the front furnace-wall, substantially as specified. 20

3. In a smoke-consuming furnace, constructed with a fire-box and a combustion-chamber, the combination with flame-conveying tubes leading from the fire-box into the combustion-chamber, of air-inlet tubes 25 located in the front furnace-wall and discharging downwardly into the fire-box, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

SVEN O. BERG.

Witnesses:

ALBERT J. MCCAULEY,
JOHN C. HIGDON.