

No. 723,622.

PATENTED MAR. 24, 1903.

C. P. & G. P. ROBERTS.
FURNACE GRATE.

APPLICATION FILED MAY 8, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

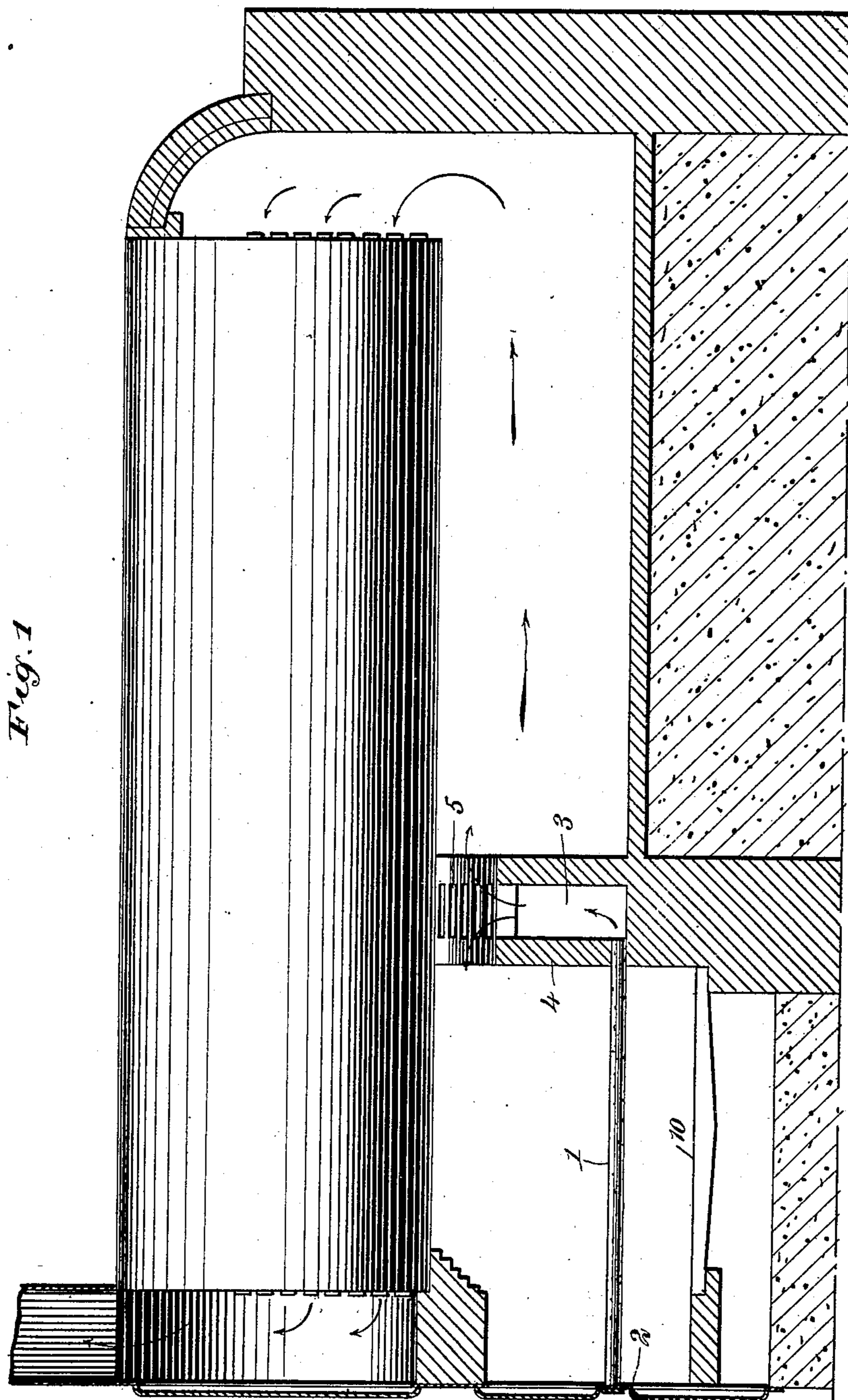


Fig. 1

WITNESSES:

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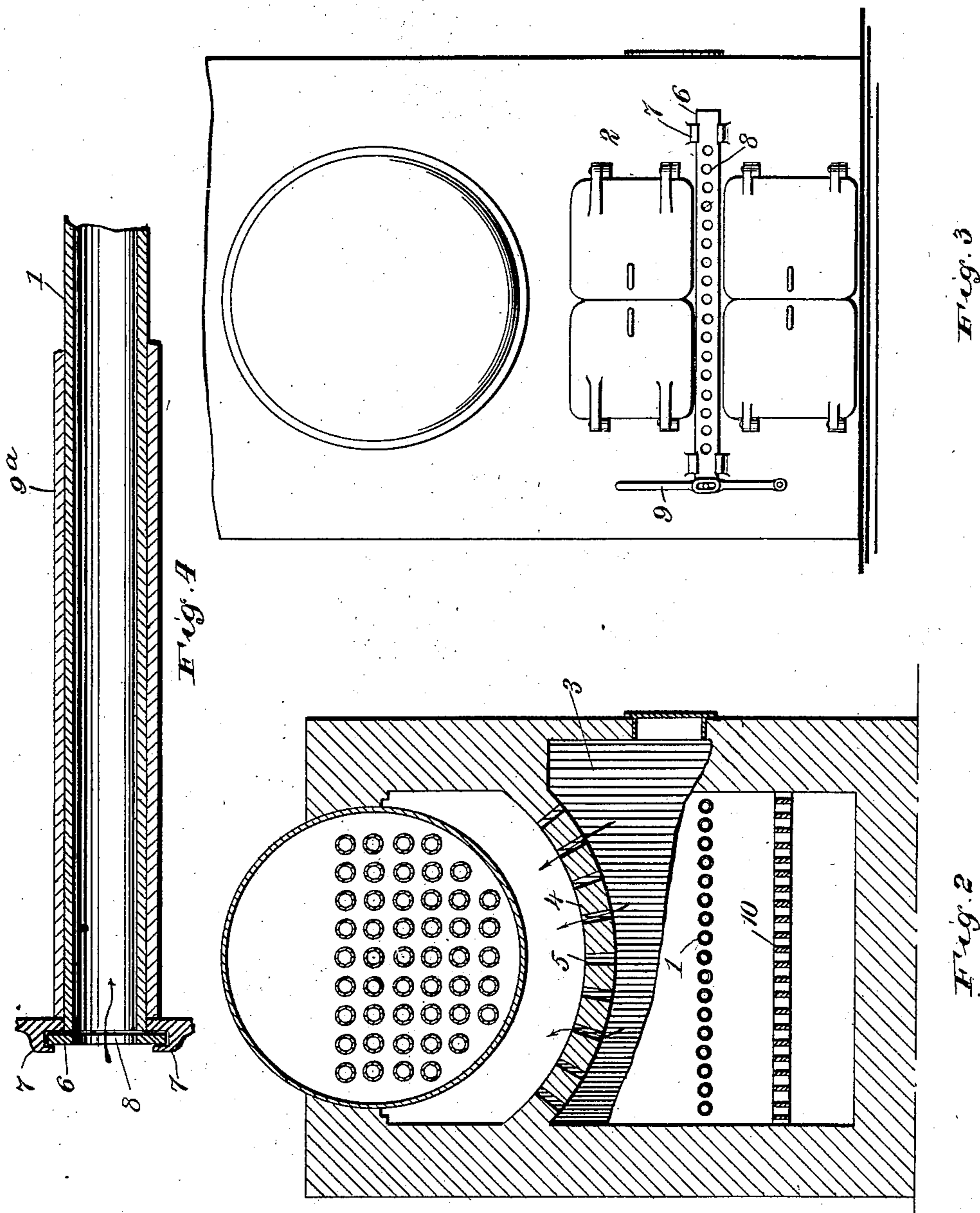
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APPLICATION FILED MAY 8, 1902.

NO MODEL.

2 SHEETS—SHEET 2.



WITNESSES:

John A. Thompson
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UNITED STATES PATENT OFFICE.

CLARENCE PERCIVAL ROBERTS AND GEORGE PERCIVAL ROBERTS, OF
TOLEDO, OHIO, ASSIGNORS OF ONE-HALF TO SINCLAIR BERDAN, OF
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FURNACE-GRATE.

SPECIFICATION forming part of Letters Patent No. 723,622, dated March 24, 1903.

Application filed May 8, 1902. Serial No. 106,399. (No model.)

To all whom it may concern:

Be it known that we, CLARENCE PERCIVAL ROBERTS and GEORGE PERCIVAL ROBERTS, citizens of the United States, and residents of Toledo, in the county of Lucas and State of Ohio, have invented a new and Improved Furnace-Grate, of which the following is a full, clear, and exact description.

This invention relates to improvements in grates for steam-boiler furnaces, the object being to provide a grate of hollow bars through which atmospheric air may pass and become heated before it meets with the products of combustion.

We will describe a furnace-grate embodying our invention and then point out the novel features in the appended claim.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal section of a furnace, showing a grate embodying our invention. Fig. 2 is a transverse section thereof. Fig. 3 is a front elevation of the furnace, and Fig. 4 is a longitudinal section of one of the grate-bars.

The grate-bars consist of tubes 1, which pass through openings in the front wall 2 of the furnace, and at their inner ends they communicate with a chamber 3, formed in the bridge-wall 4, and the top of the bridge-wall is provided with openings 5, through which the heated air received from the tubular grate-bars may pass and mingle with the products of combustion. The openings 5 are the full width of the chamber, so that by such free outlet the air will not be retarded in the chamber, but will mix in large quantities with the products of combustion. The amount of air entering the tubes may be regulated by means of a damper 6, mounted to slide in guides 7, arranged on the front of the furnace, and this damper is provided with openings 8 to be moved into alinement with the open ends of the tubular grate-bars 1 to close the same more or less, as may be desired. On one end of the damper 6 is arranged an operating-lever 9.

To prevent the burning out of the tubular grate-bars, we cover them with a material

not affected by heat to any considerable extent. This material may consist of asbestos, cement, or other refractory material 9^a.

A secondary grate consisting of bars 10 of ordinary construction is arranged below the grate-bars 1, the distance between the two grates being sufficient to give access through the ash-pit door both to the surface of the secondary grate and to the ash-pit. The purpose of this secondary grate is to maintain a slow incandescent fire, which is supplied almost entirely by drippings from the upper grate. The heat arising from the material on the secondary grate will keep the tubular grate-bars heated, and consequently heat the air passing through the same, and the heated air passing between the upper grate-bars will pass through the main bed of fuel thereon and consume the smoke, the draft being maintained through the space between the bridge-wall and boiler, because the bridge-wall is entirely closed at the inner end of the grate-bars or between the upper and lower bars.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

The combination in a furnace of a bridge-wall, the said bridge-wall having a chamber provided with outlets opening through the top of the bridge-wall which is spaced from the boiler in the furnace, said outlets being the full width of the chamber, tubular grate-bars leading from said chamber through the front wall of the furnace, covering of refractory material for the bars and grate-bars arranged below the tubular bars, the said bridge-wall being closed at the inner ends of the two sets of grate-bars, whereby air heated by fire on the lower grate-bars will pass through the bed of fuel on the upper tubular bars, substantially as specified.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

CLARENCE PERCIVAL ROBERTS.
GEORGE PERCIVAL ROBERTS.

Witnesses:

JOHN Q. ADAMS,
ROSE M. MARKS.