

No. 629,654.

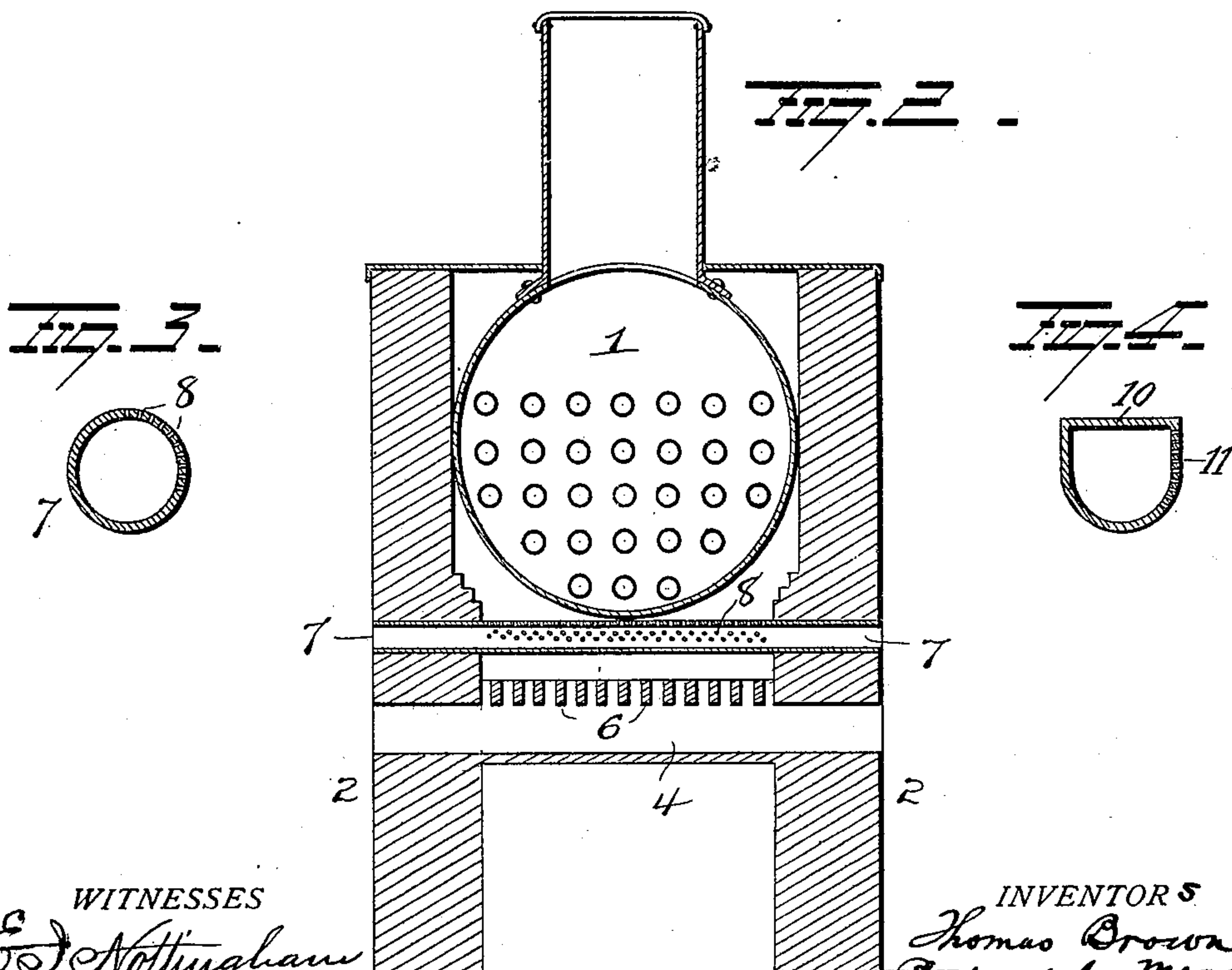
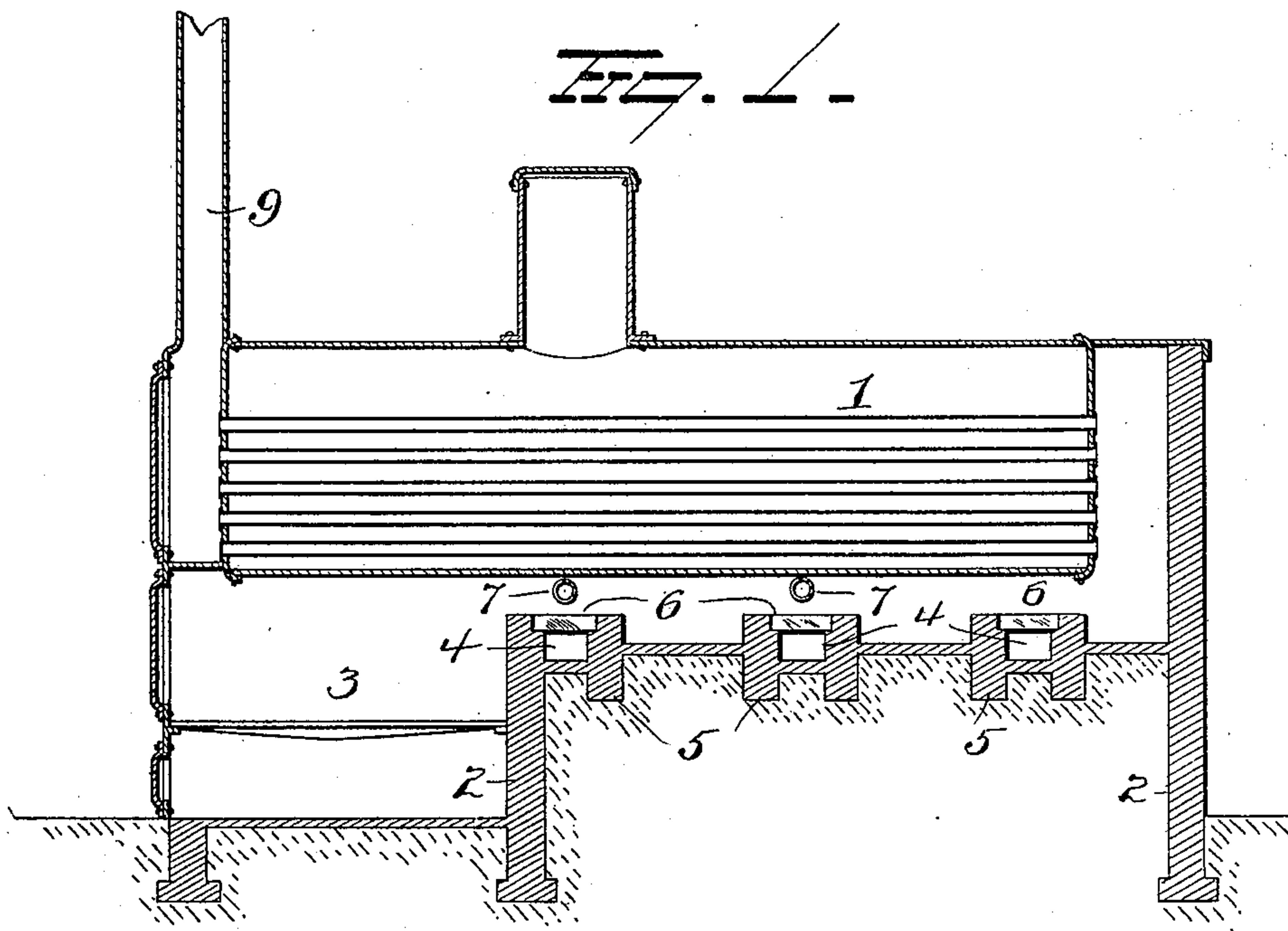
Patented July 25, 1899.

T. BROWN & B. C. MOORE.

SMOKELESS FURNACE.

(Application filed May 15, 1899.)

(No Model.)



WITNESSES
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UNITED STATES PATENT OFFICE.

THOMAS BROWN AND BERTRAND C. MOORE, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNORS TO THEMSELVES AND SAMUEL ROSS, OF SAME PLACE.

SMOKELESS FURNACE.

SPECIFICATION forming part of Letters Patent No. 629,654, dated July 25, 1899.

Application filed May 15, 1899. Serial No. 716,865. (No model.)

To all whom it may concern:

Be it known that we, THOMAS BROWN and BERTRAND C. MOORE, of Washington, in the District of Columbia, have invented certain
5 new and useful Improvements in Smokeless Furnaces; and we 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
10 make and use the same.

Our invention relates to an improvement in smokeless furnaces, the object of the invention being to provide a furnace with improved means for consuming the products of combustion.
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A further object is to provide a smokeless furnace which will be extremely simple in construction and most effectual when in operation.

20 With these objects in view the invention consists in certain novel features of construction and combinations and arrangements of parts, as will be more fully hereinafter described, and pointed out in the claims.

25 In the accompanying drawings, Figure 1 is a view in longitudinal section illustrating our improvements. Fig. 2 is a view in transverse section of the same. Fig. 3 is a detail view, and Fig. 4 is a view of a modified form of our
30 improved cold-air flue.

Our improved furnace is preferably of the tubular-boiler variety, in which the boiler 1 is mounted horizontally and supported on any approved walls of masonry 2, and the furnace
35 is provided with the combustion-chamber 3, as shown. Below the bottom of the boiler 1 and between the transverse walls of masonry are provided several parallel transversely-disposed flues 4, formed by hollow bridge-walls 5, extending from one side to the other
40 of the furnace-walls and recessed, as shown, to support a series of longitudinally-disposed fire-bricks 6, spaced apart to permit the air to pass freely therebetween. The flues 4 communicate with holes or openings in the sides
45 of the furnace to permit the entrance of outside air. In the accompanying drawings we have shown three of these flues 4; but we would have it understood that we might employ less than
50 three or more than three, as may be found desirable, according to the size of the furnace

and character of fuel to be consumed. Above one or more of said flues 4 (preferably the first two, as shown in the drawings) transversely-disposed tubular flues 7 are located. The
55 flues 7 pass through the sides of the furnace and are provided with perforations 8, preferably partially around the rear side of the flue, so as to permit the cold air to escape into the products of combustion and at the same time
60 prevent the products of combustion entering the flue. In the accompanying drawings we have shown two of these flues 7; but we do not wish to be limited to any particular number of them, but consider ourselves at liberty to use
65 as many of them as each particular furnace may require, according to the size of the furnace and character of fuel to be consumed.

The operation of our improved furnace is as follows: The products of combustion from
70 the combustion-chamber 3 pass between the cold-air flues 4 and 7, where they will be supplied with additional oxygen to insure their complete consumption, while the heated air passes through the tubular boiler 1 and out
75 the smoke-stack 9.

Instead of making the tubes 7 cylindrical we might construct them as shown in Fig. 4. In this form of our invention the tubes 7 are made with a flat side 10 to bear against the
80 boiler 1 and with a semicircular perforated section 11 to discharge cold air into the products of combustion. Various other slight changes might be resorted to in the general form and arrangement of the several parts
85 described without departing from the spirit and scope of our invention, and hence we would have it understood that we do not wish to be limited to the precise details set forth, but consider ourselves at liberty to make such
90 slight changes and alterations as fairly fall within the spirit and scope of our invention.

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

95 1. The combination in a furnace, of a combustion-chamber, a transverse bridge-wall having an air-duct therein provided with orifices adapted to discharge upwardly and an air-pipe disposed immediately over and above
100 said bridge-wall, the wall of said pipe farthest removed from the combustion-chamber

having perforations and the portion of said pipe toward the combustion-chamber being closed throughout the length of said pipe.

2. In a furnace, the combination with a
5 combustion-chamber and a boiler above the same, of a series of hollow bridge-walls located under the boiler, each having air-inlets and each having a series of openings for the discharge of air toward the boiler, and air-
10 pipes disposed under the boiler and immediately over, above and parallel with said bridge-walls, each pipe being closed on the

side nearest the combustion-chamber and having perforations in its wall farthest removed from the combustion-chamber.

15

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

THOMAS ^{his} × BROWN.
BERTRAND ^{mark} C. MOORE.

Witnesses:

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S. W. FOSTER.