

(No Model.)

G. WHYSALL & J. A. LAMBING.

GAS FURNACE FOR STEAM BOILERS.

No. 398,482.

Patented Feb. 26, 1889.

FIG. 1.

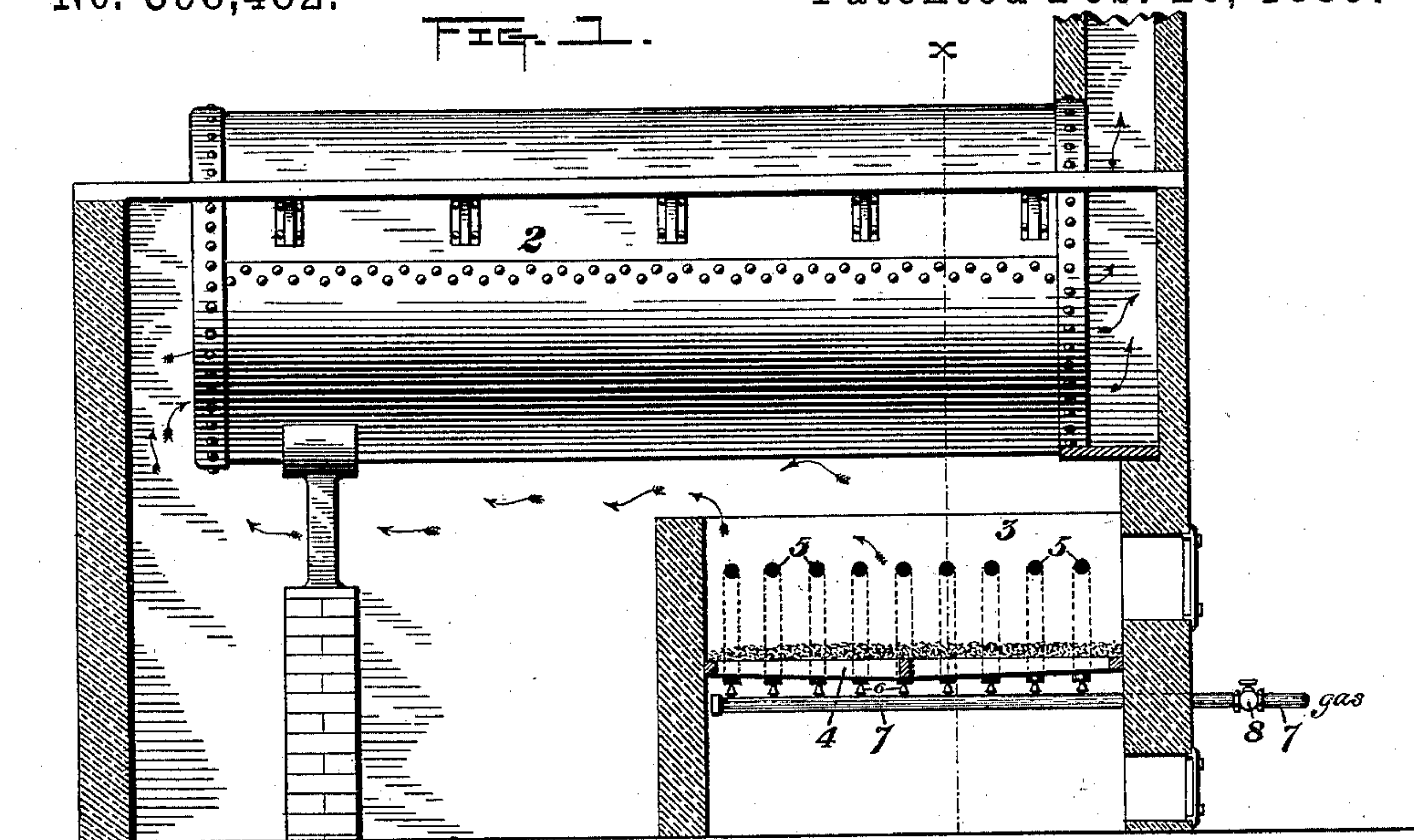


FIG. 2.

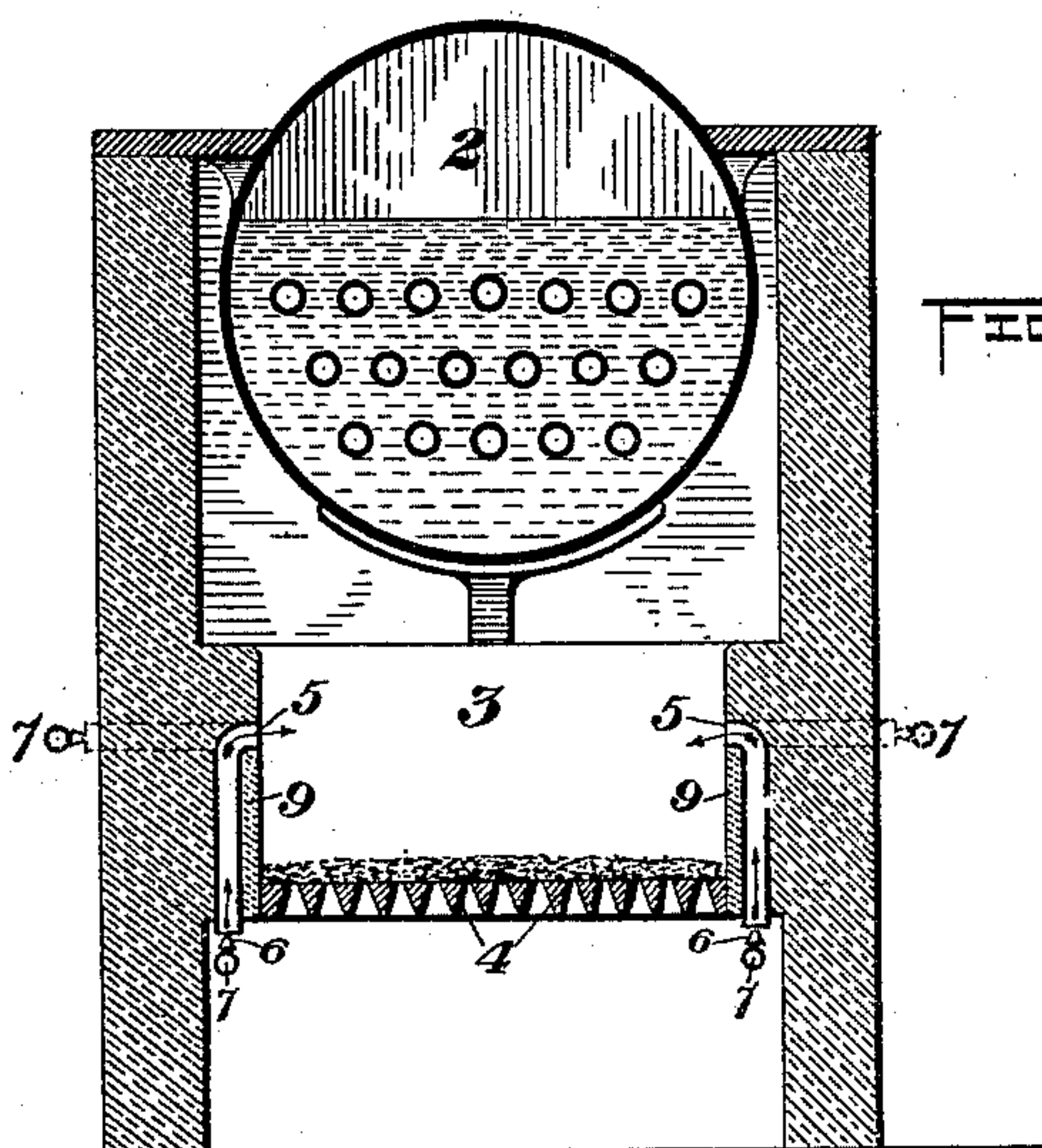


FIG. 3.

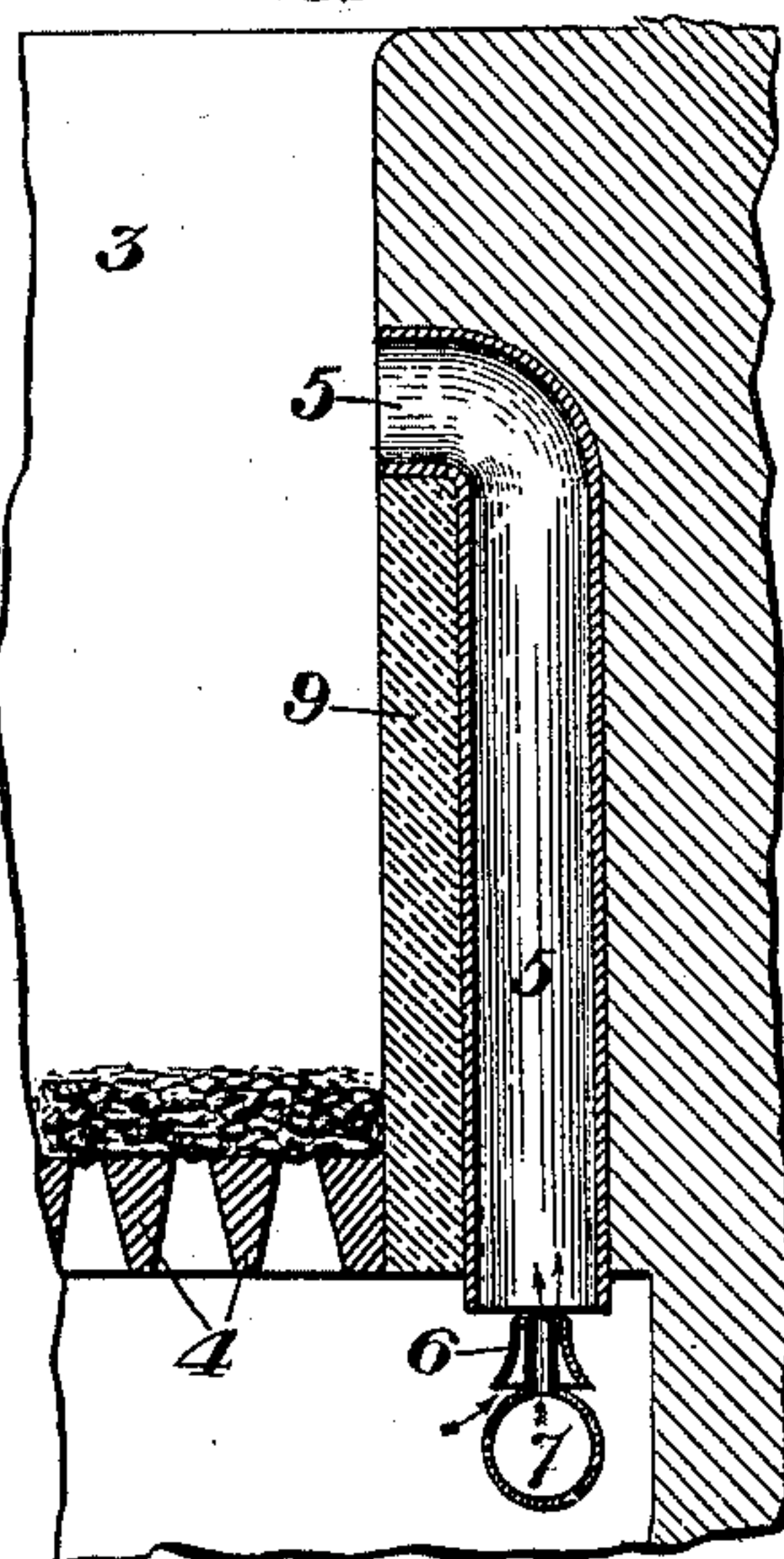
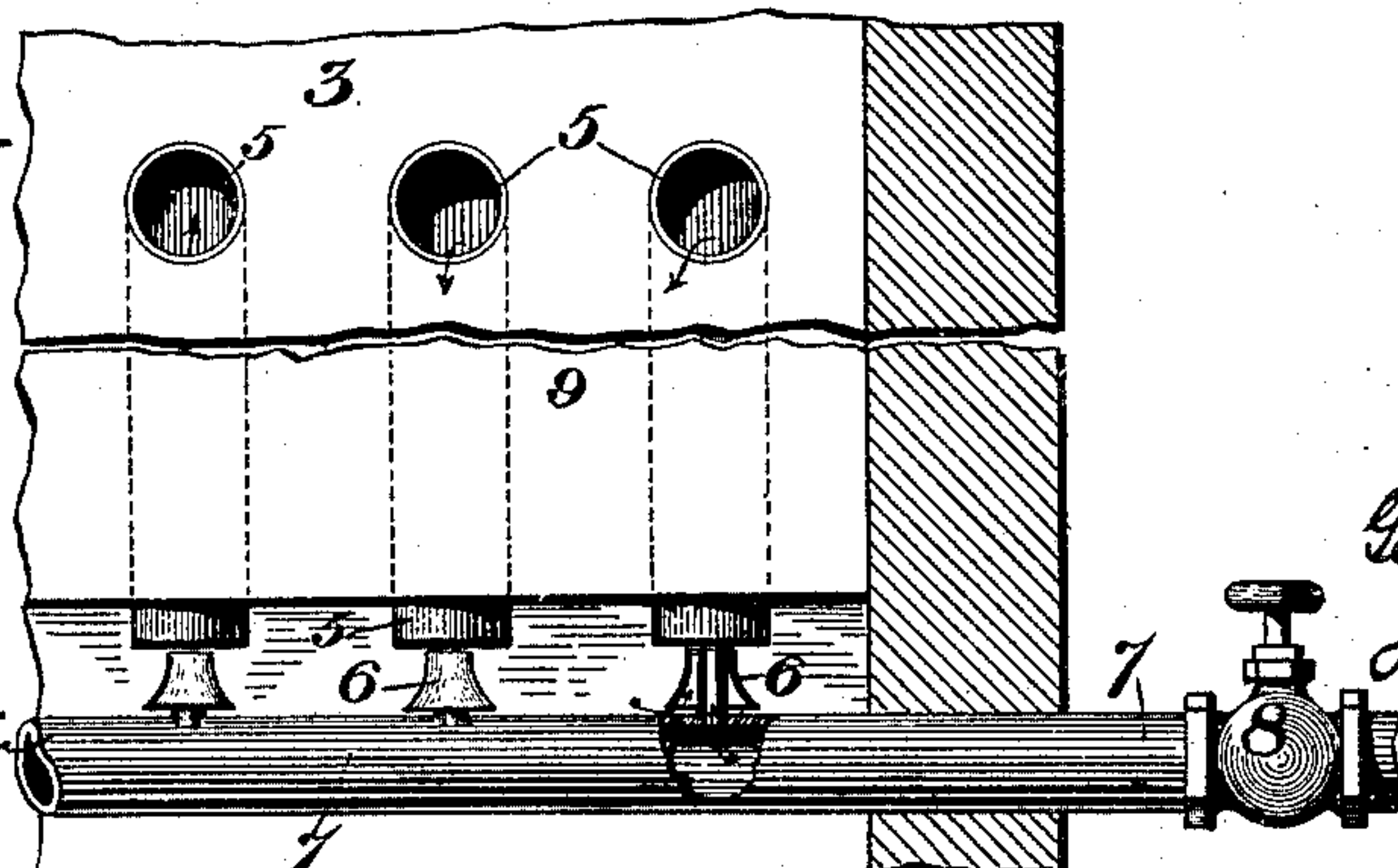


FIG. 4.



WITNESSES,

H. L. Gill.

M. J. Corwin.

INVENTORS,

George Whysall

John A. Lambing

by W. BAKER & SONS

Their Attorneys.

UNITED STATES PATENT OFFICE.

GEORGE WHYSALL, OF TOLEDO, OHIO, AND JOHN A. LAMBING, OF WILKINSBURG, PENNSYLVANIA.

GAS-FURNACE FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 398,482, dated February 26, 1889.

Application filed February 27, 1888. Serial No. 265,421. (No model.)

To all whom it may concern:

Be it known that we, GEORGE WHYSALL, of Toledo, in the county of Lucas and State of Ohio, and JOHN A. LAMBING, of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Gas-Furnaces for Steam-Boilers; and we do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical longitudinal section of a boiler-furnace provided with our improved burner apparatus. Fig. 2 is a vertical cross-section on the line xx of Fig. 1. Fig. 3 is a detached vertical section of one of the burner-pipes and its gas-supply. Fig. 4 is a similar section of a series of these burners.

Like symbols of reference indicate like parts in each.

Our invention is designed to provide improved means for burning gas—either natural gas or artificially-produced gas—in the combustion-chambers of steam-boiler furnaces, the object being to enable a maximum of heat to be produced from a small amount of gas. Such burners are especially desirable in places where the natural-gas supply is small, or where water-gas or other artificial gas is employed, and generally wherever it is desirable to economize the fuel.

In the drawings, 2 represents a steam-boiler, which is set in the usual way, having beneath it a combustion-chamber, 3, wherein are the usual grate-bars, 4. At the opposite sides of the combustion-chamber are the mouths of the gas pipes or flues 5. These are preferably arranged in parallel vertical series of pipes, opening at their bases and having projecting thereinto the gas-jet nozzles 6 of gas-supply pipes 7. The upper ends of the pipes are bent so as to be directed horizontally toward the opposite side of the combustion-chamber. As shown in Fig. 2, there are two series of these burner-pipes, one series on each side of the combustion-chamber. Their orifices are therefore directed toward each other, so that the burning gas-jets shall meet at the middle of the combustion-chamber under the boiler. The grate-bars 4 may be covered with

any suitable refractory covering—such as fire-brick, loam, &c.—but preferably with coal-ashes. This prevents the access of air to the combustion-chamber through the grate-bars, and affords a bed, which serves to radiate and equalize the heat on the boiler. The peculiar advantage in the use of coal-ashes is that they are easily obtainable, and when it is desired to use the furnace for the combustion of solid fuel the ashes may easily be raked out, so as to leave the grate-bars free for the coal.

The operation of the furnace is as follows: The gas, having been turned on in the supply-pipes by opening the cocks 8, is ignited as it issues from the orifices in the combustion-chamber, and the issuing jets from both sides of the combustion-chamber, converging at the middle beneath the boiler, burn with an intense heat. The air for combustion is induced by the gas-jets into the gas-supply pipes or flues, and the mingled air and gas is fed to the combustion-chamber in the manner usual with burners of the Bunsen pattern. The combustion is very thorough, and the burning gas, following the bottom and sides of the boiler, serves to heat it more quickly and more evenly and with less danger of burning the boiler in spots than in any other furnace known to us. The furnace is therefore very economical and serviceable.

In order to protect the gas pipes or flues from being burned out, we provide them with brick walls or facings 9 on the inner sides, and where our invention is applied to a battery of boilers we prefer to divide the combustion-chambers from each other by vertical partition-walls of sufficient height to protect the gas pipes or flues.

Instead of arranging the gas-supply pipes or flues vertically, as shown in the drawings, they may be introduced into the combustion-chamber horizontally, as shown in dotted lines in Fig. 2. In either case the mouths of the gas pipes or flues should be sufficiently above the level of the grate-bars that when coal is used it shall not interfere with or clog the pipes.

We claim—

1. A combustion-chamber of a furnace having grate-bars and adapted to the combustion of solid fuel, and having a gas-supply pipe or

port entering the combustion - chamber
through the wall thereof, and having its open-
ing at said wall above the normal level of the
fuel on the grate-bars, substantially as and
5 for the purposes described.

2. In a steam-boiler furnace, the combina-
tion, with the boiler and the combustion-cham-
ber below the boiler, of gas-supply ports or
pipes opening into the combustion-chamber
10 on opposite sides thereof, and a flue extend-
ing from the combustion-chamber beneath the

boiler, substantially as and for the purposes
described.

In testimony whereof we have hereunto set
our hands this 15th day of February, A. D. 15
1888.

GEORGE WHYSALL.
JOHN A. LAMBING.

Witnesses:

E. A. GRAYSON,
GEO. W. FUNK.