

No. 750,759.

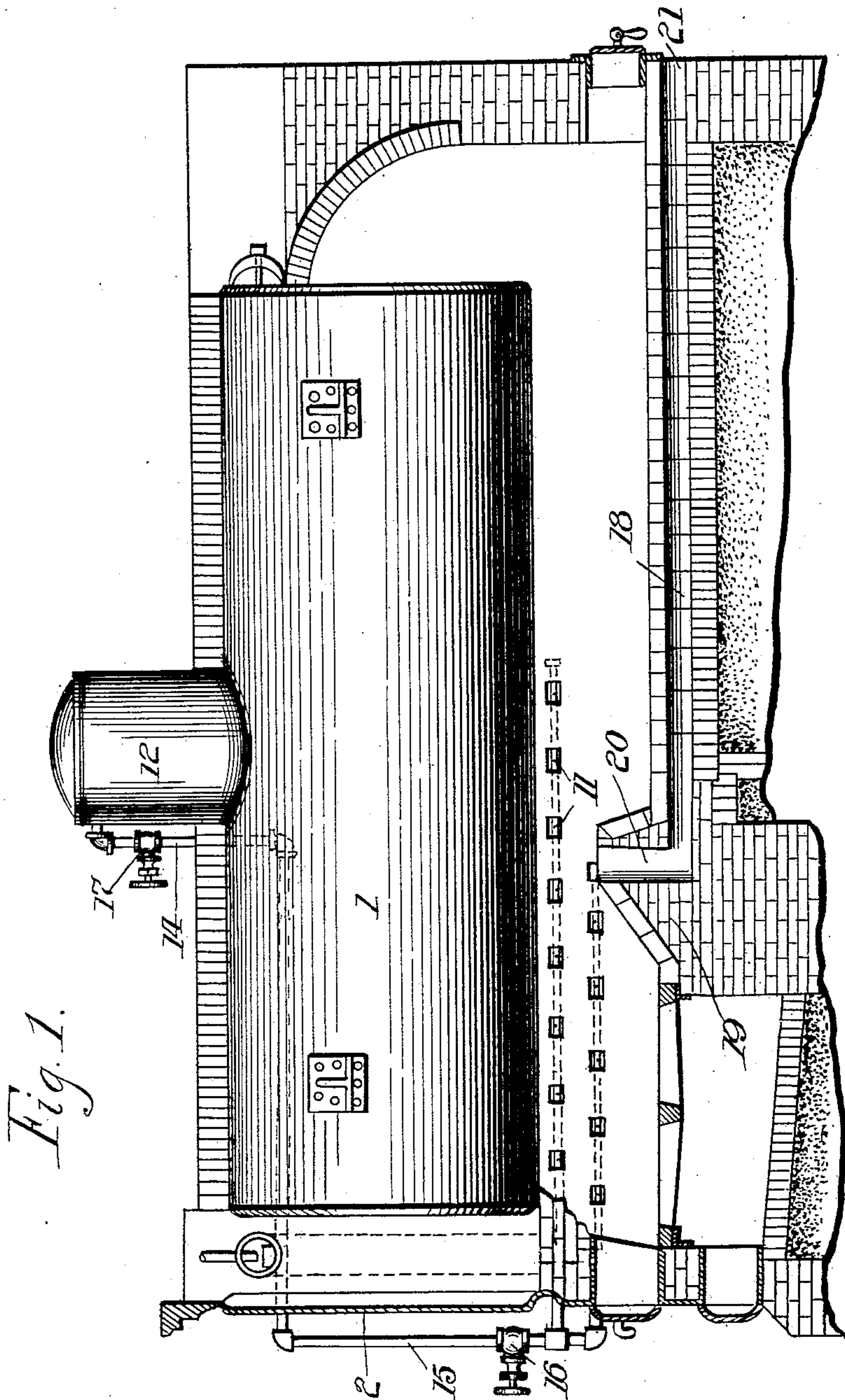
PATENTED JAN. 26, 1904.

R. S. FRANZ.
FURNACE.

APPLICATION FILED JUNE 24, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:
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E. E. Potter,

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Attorneys.

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2 SHEETS—SHEET 2.

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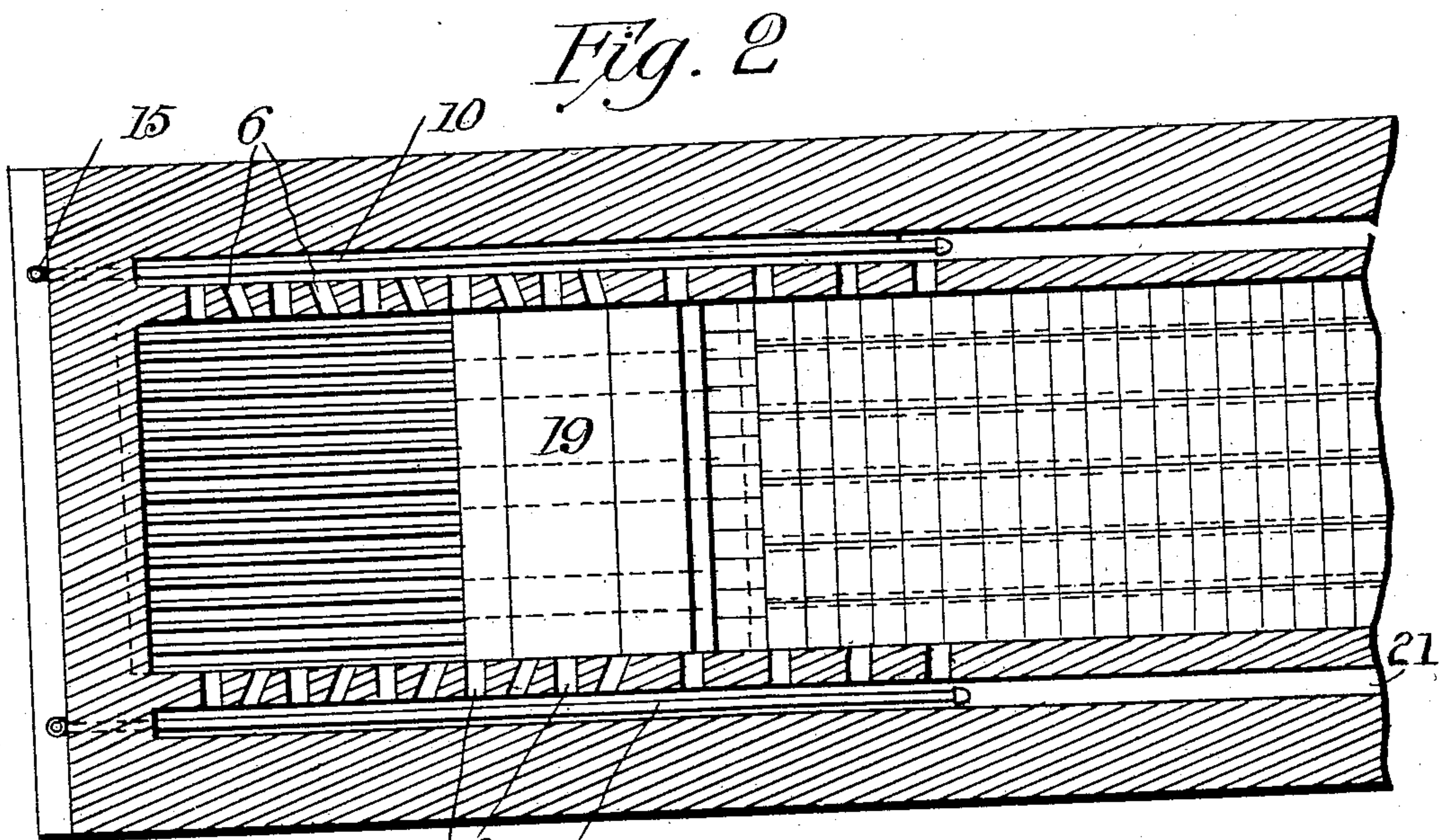
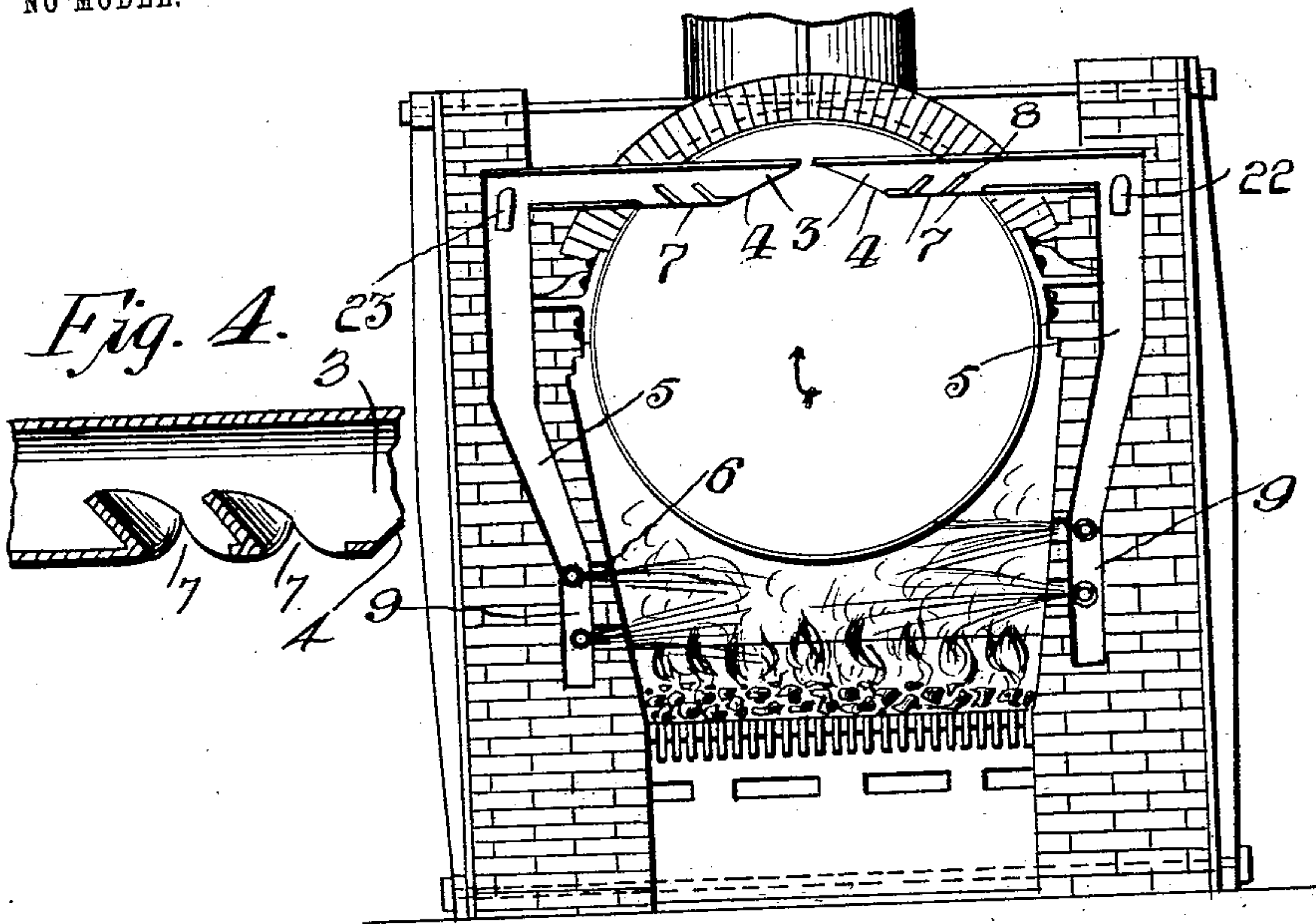


Fig. 3.

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UNITED STATES PATENT OFFICE.

ROBERT S. FRANZ, OF ETNA, PENNSYLVANIA.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 750,759, dated January 26, 1904.

Application filed June 24, 1903. Serial No. 162,833. (No model.)

To all whom it may concern:

Be it known that I, ROBERT S. FRANZ, a citizen of the United States of America, residing at Etna, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Furnaces, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in furnaces, and has for its object to provide a furnace of particular construction, wherein a perfect combustion will be obtained and every unit of heat fully utilized.

Another object of my invention is to provide a furnace which will be economical in construction, simple to operate, and one wherein any class of fuel may be used. Also either air or steam may be employed to facilitate perfect combustion.

Briefly described, my invention comprises a furnace in which the side walls have been so constructed that air or steam may be passed from them to the combustion-chamber, and means also being provided whereby the hot air which generally escapes through the chimney may be conducted to the fire-box and further facilitate the combustion therein.

The invention finally consists in the novel construction, combination, and arrangement of parts to be hereinafter more fully described, and specifically pointed out in the claims.

In describing the invention in detail reference is had to the accompanying drawings, forming a part of this specification, and wherein like numerals of reference indicate like parts throughout the several views, in which—

Figure 1 is a longitudinal sectional view of my improved furnace. Fig. 2 is a cross-sectional view, and Fig. 3 is a horizontal sectional view, through the combustion-chamber. Fig. 4 is a detail view, partly in section, of one of the horizontal flues having formed therein the deflectors.

In carrying out my invention I employ a construction similar to that illustrated in my Letters Patent No. 715,569, granted me December 9, 1902, and in addition to this construction I employ novel means whereby the

hot air which passes between the flues of the boiler and generally escapes through the chimney may be conducted to the fire-box through suitable channels provided therefor in the side walls of the furnace. Between the crown-plate of the boiler 1 and the boiler-casing 2 I provide the pipes 3, which are located, preferably, near the top of the boiler, these pipes having their ends cut at an angle, as indicated at 4, whereby as the hot air passes upwardly in the direction of the air, as indicated in Fig. 2 of the drawings, the same will be buffeted and carried to the combustion-chamber by means of the flues 5 and the channel 6, which lead to the combustion-chamber. The lower sides of the pipes 3 are sheared, as indicated at 7, and the sheared portion bent upwardly, as indicated at 8, whereby a deflector is formed, so that when the heat passes through the sheared opening 7 the same will be deflected into the flues or channels 5. The flues or channels 5 are formed in the side walls of the furnace and pass downwardly to the oblong channels 9, also formed in the side walls of the furnace, and connecting with these channels 9 and the combustion-chamber are the ports or channels 6. It will thus be seen that all the waste heat from the flues which generally pass up the chimney is conveyed to the fire-box, whereby a greater combustion is produced than heretofore realized. To assist this combustion and further facilitate the combustion of the fuel, I provide the pipes 10, which pass through channels 9, and in said pipes I provide perforations 11. These pipes 10 may be connected to any suitable air-supply or steam-supply, and in Fig. 1 of the drawings I have illustrated the same as connected to the steam-dome 12 of the furnace by means of the pipes 14 and 15, suitable valves 16 and 17 being provided whereby the amount of steam admitted to the combustion-chamber may be controlled. The channels 9 are located upon each side of the fire-box and above the grates, whereby when the steam is admitted through ports or channels 6 the combustion of the fuel will be aided, and to further facilitate the combustion thereof I provide the cold-air flues 18, which pass longi-

tudinally of the furnace and enter the bridge-wall 19, as indicated at 20, the inlet to this flue being provided at the rear end of the furnace, as indicated at 21.

5 To assist the hot air and waste heat in passing through the pipes 3 and the channels 5, a suitable air or steam supply may be passed into the channels 5, as indicated at 22, the pipe 23 entering the channel 5 at its upper
10 end, whereby the moment the hot air enters the flues 3 and reaches the channels 5 it will be forced down the channels 5 and pass out into the combustion-chamber through the channels 6, the steam or air which passes
15 out of the apertures or ports 11 of the pipe 10 further assisting the hot air to the combustion-chamber.

It has been found by experiment that by my improved construction a perfect form of
20 combustion will be realized in furnaces constructed along this line, and that the saving of fuel is accomplished and any degree of heat desired can be readily secured.

While I have herein shown and described a
25 practical embodiment of my invention, it will be obvious that various slight changes may be made in the details of construction without departing from the general spirit of my invention.

30 Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a furnace of the type set forth, a plurality of channels formed in the side walls
35 thereof provided with ports leading therefrom to the combustion-chamber, steam-pipes mounted in said channels in communication with said ports, vertical channels formed in the side walls of the furnace, horizontal flues
40 located in the smoke-exit and communicating with said channels, the lower edges thereof being sheared to form apertures and deflectors, whereby the unconsumed products

are deflected into the said flues, substantially as described. 45

2. In a furnace, a plurality of channels formed in the side walls of the furnace, a plurality of ports leading from said channels to the combustion-chamber, steam-pipes having
50 ports formed therein supported in said channels, and adapted to be connected to a suitable steam-supply, means for controlling said steam-supply, vertical channels formed in the side walls of the furnace, horizontal flues connecting with said channels, the ends of said
55 flues adapted to be located adjacent to the crown-plate of the boiler, the lower edge of said flues being sheared to form apertures and deflectors, cold-air flues extending longitudinally of the furnace and having outlets in
60 the bridge-wall of the furnace, substantially as described.

3. In a furnace, a plurality of channels formed in the side walls of the furnace, a plurality of ports leading from said channels to
65 the combustion-chamber, air-pipes having ports formed therein and supported in said channels, a suitable air-supply connected to said pipes, vertical channels formed in the side walls of the furnace, horizontal flues connecting with said channels, the ends of said
70 flues adapted to be located adjacent to the crown-plate of a boiler, the lower edges of said flues being sheared to form apertures and deflectors, and an air or steam supply connected to said vertical channels, cold-air flues passing longitudinally of the furnace and outlets
75 in the bridge-wall of the furnace, substantially as described.

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

ROBERT S. FRANZ.

Witnesses:

R. J. FRICKER,
H. C. EVERT.