

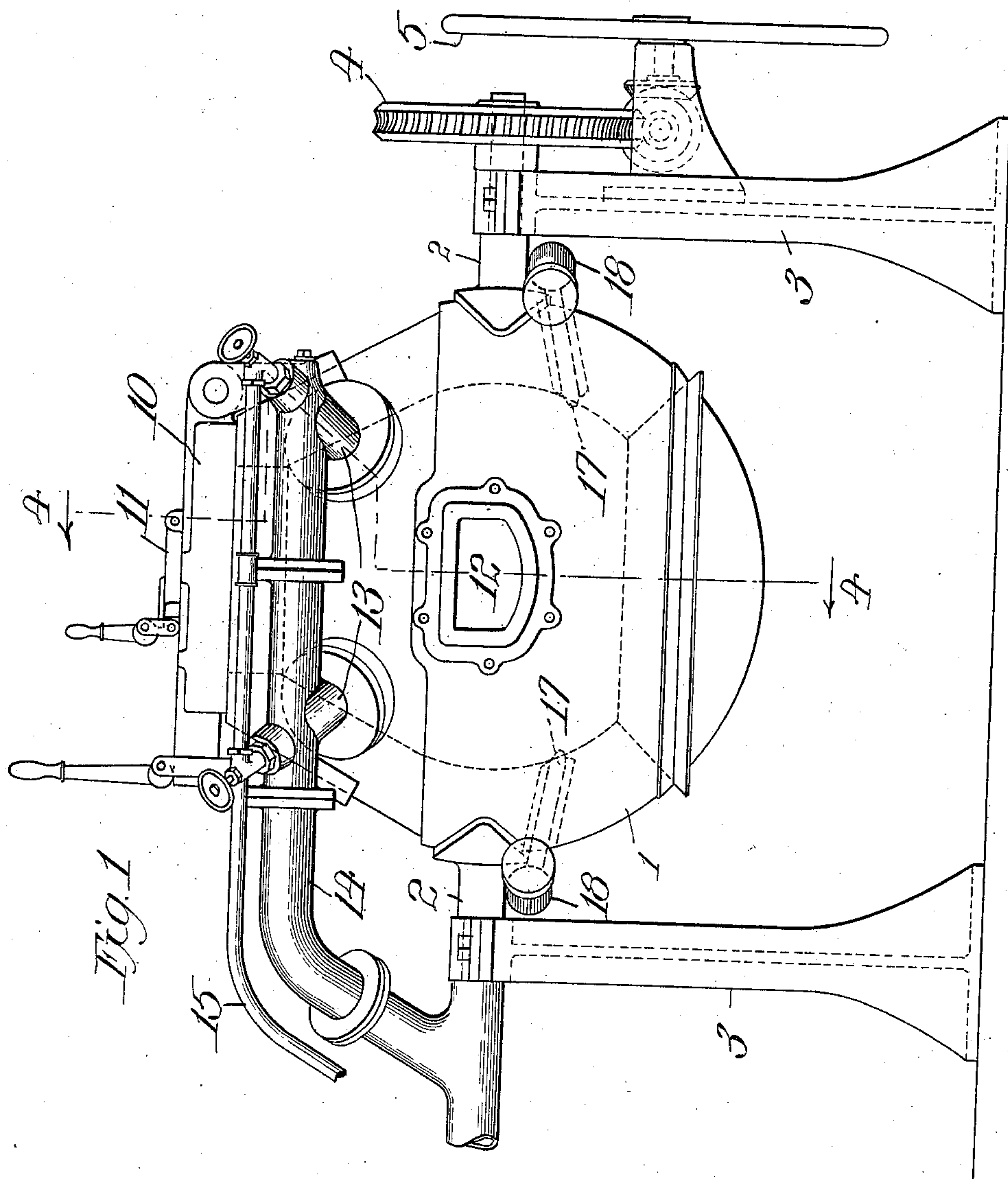
S. T. BLEYER.
FURNACE.

APPLICATION FILED AUG. 24, 1904.

903,163.

Patented Nov. 10, 1908.

3 SHEETS—SHEET 1.



Witnesses:

Edw. R. Barrett

Amelia Williams

Inventor

Samuel T. Bleyer

By Rector & Hibben

His Atty's.

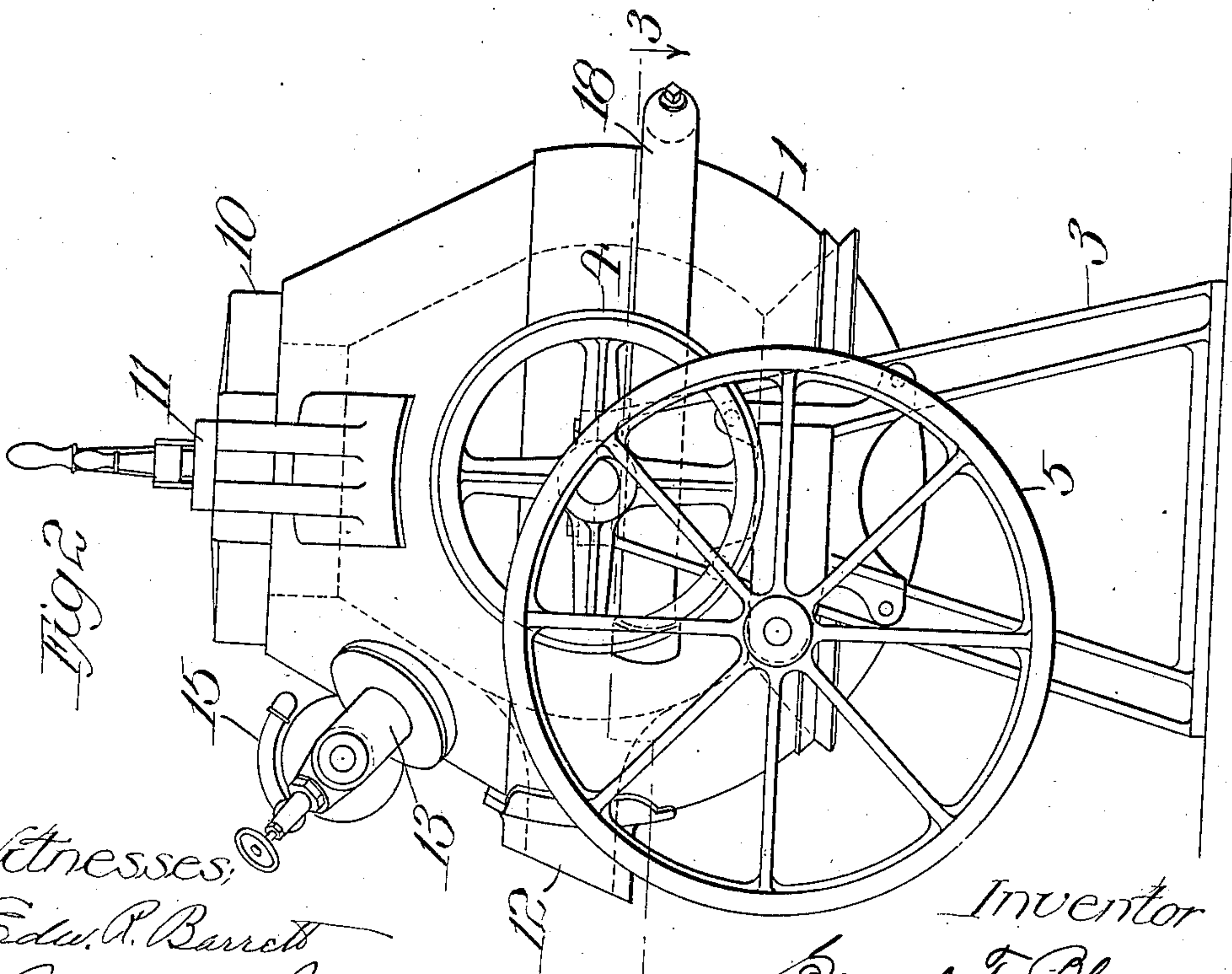
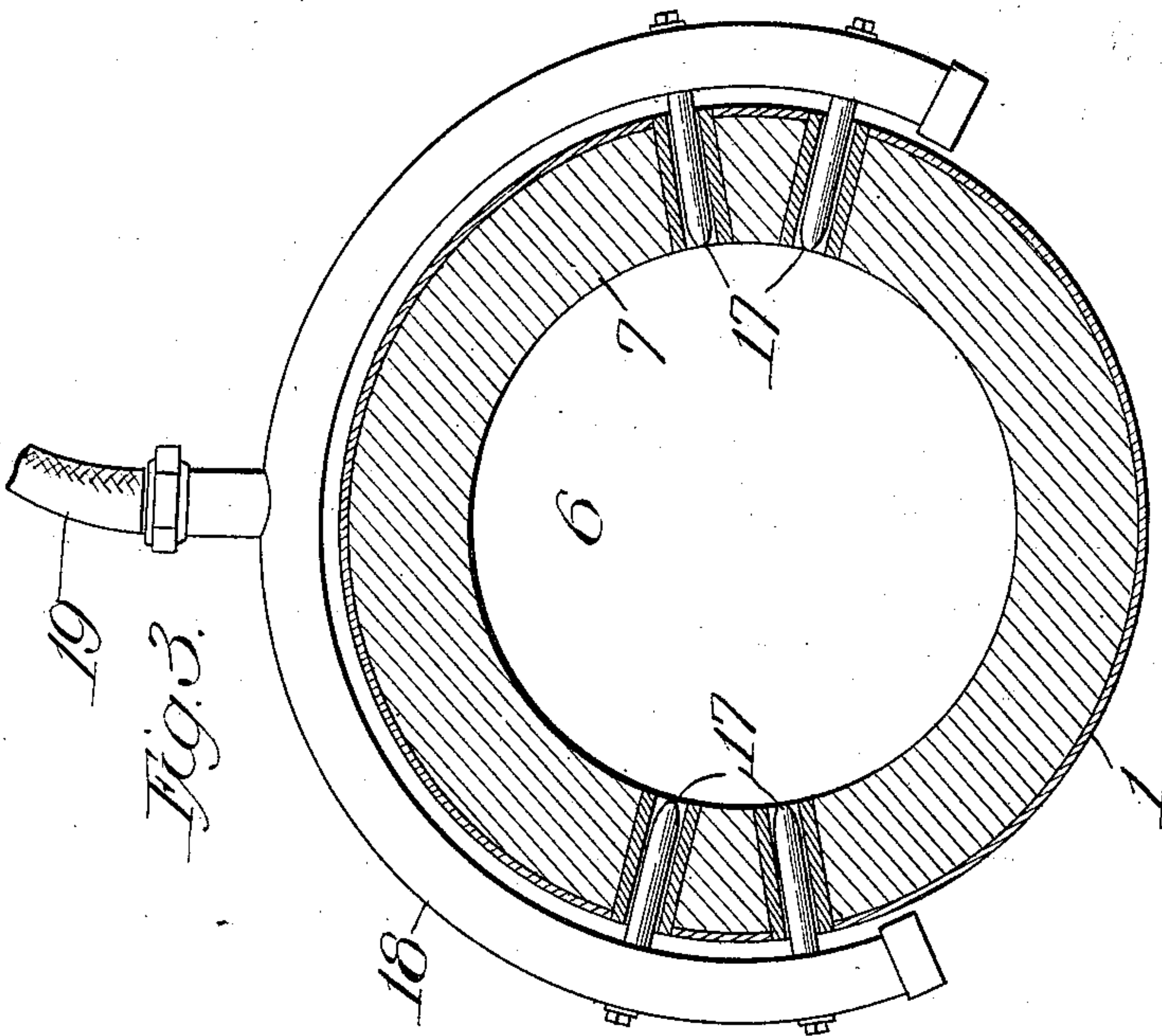
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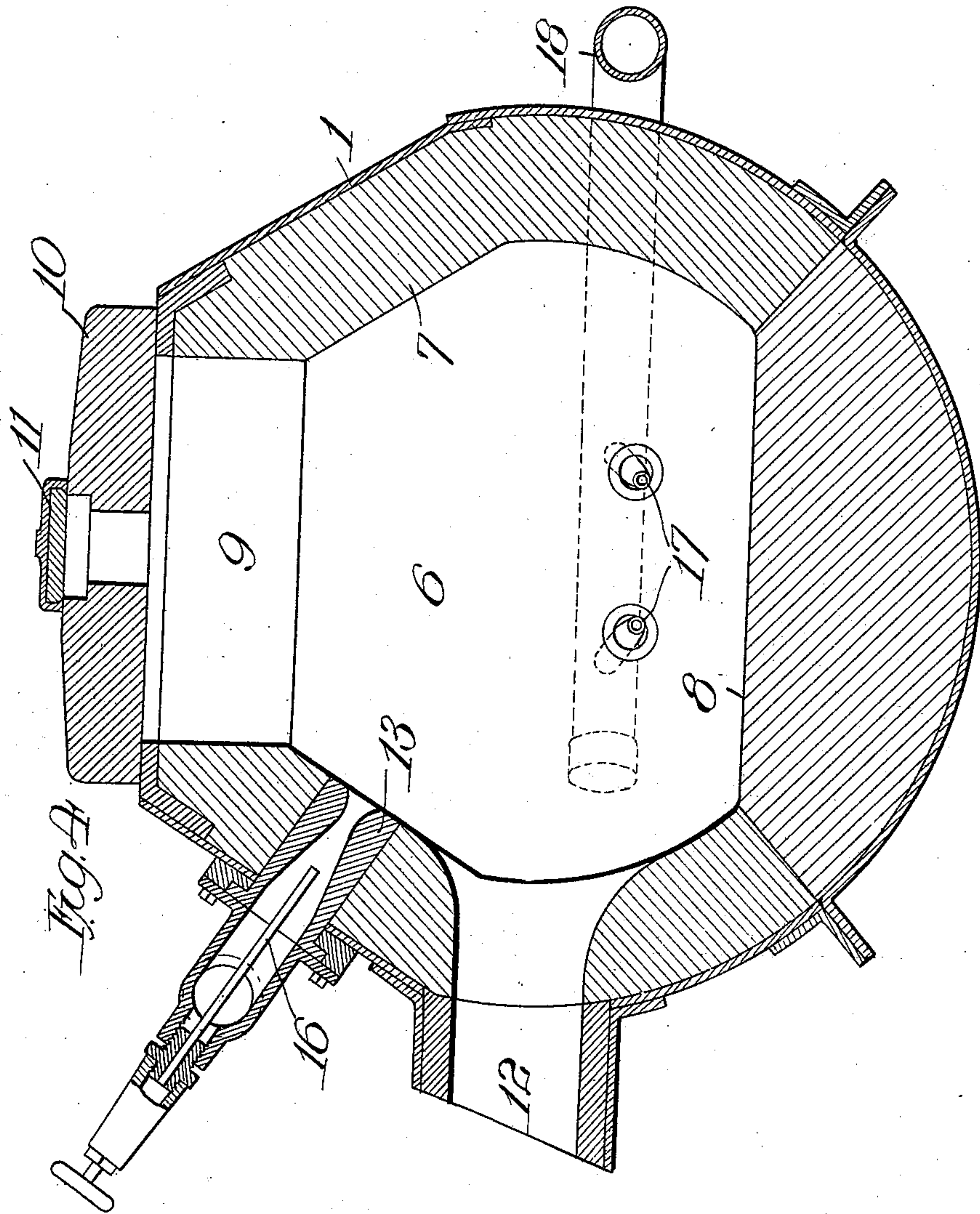
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UNITED STATES PATENT OFFICE.

SAMUEL T. BLEYER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE HAWLEY DOWN DRAFT FURNACE COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

FURNACE.

No. 903,163.

Specification of Letters Patent.

Patented Nov. 10, 1908.

Application filed August 24, 1904. Serial No. 221,954.

To all whom it may concern:

Be it known that I, SAMUEL T. BLEYER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Furnaces, of which the following is a specification.

This invention relates to a furnace either for melting purposes alone or for both melting and refining or converting in a continuous and uninterrupted manner.

In the melting operation gas or vaporized oil is introduced as jets of flame into the furnace and directed upon the body of metal or ore on the hearth of a tiltable furnace body or chamber. In the refining and converting operation a series of twyers direct blasts of air upon and into the body of molten metal, with the result that the metal is refined or converted.

The furnace is reliable and efficient in operation, and moreover the same performs its functions in a comparatively inexpensive manner.

The present furnace is designed as an improvement upon the furnace shown and described in United States Letters Patent No. 725,490, issued April 14, 1903, to the Hawley Down Draft Furnace Company, as assignee of Edward H. Schwartz.

In the drawings, Figure 1 is a front elevation of the furnace, which is here shown as a combined melting furnace and converter; Fig. 2 a side elevation thereof; Fig. 3 a horizontal section on the line 3—3 of Fig. 2, and Fig. 4 a vertical section on the line 4—4 of Fig. 1.

The furnace is of the tiltable type, having a somewhat spherical body 1, made of sheet metal and lined with fire brick, as hereinafter described. The furnace body is provided with trunnions 2, mounted in standards 3, whereby the same may be tilted. One of the trunnions has a worm gear 4 connected through suitable gearing with the hand wheel 5, whereby the furnace may be rocked or tilted by the operator during the melting or refining or converting operation, if desired, or when it is desired to pour the molten metal. The furnace body has an interior chamber 6, lined with fire brick 7, and the bottom of such chamber is made flat, forming a hearth 8, on which the metal is melted. The charging opening 9 is at the top, and the same is closed by a suitable

door 10, which is itself provided with a small door or peep-hole 11. The furnace chamber has on one side a pouring outlet 12, which is comparatively short, the same being formed by a short casting bolted to the furnace body and communicating with an opening through the fire brick. This outlet is however of such size and of the described shortness that a bar or rod may be inserted therein by the operator to remove any accumulated slag.

The burner comprises two nozzles 13, inserted through the upper part of the furnace body above the outlet 12 and connecting with an air supply pipe 14 leading from a suitable source of air, which may be furnished by a blower. An oil supply pipe 15 communicates with two injectors 16 inserted in the nozzles or burners proper and adapted to supply the fuel which is vaporized and mixed with air and burned in the furnace chamber to make intense heat flames or flame jets for melting any metal on the hearth.

The burners are convergingly arranged and downwardly directed, with the result that their flames focus substantially at the central vertical axis of the furnace chamber and slightly above the hearth. The flames strike the metal and quickly melt the metal on the hearth. This hearth is flat in order that all the molten metal thereon shall be of uniform depth and not of considerable depth in the central portion and shallow at the edges, as in the case of a curved hearth. This construction results in a uniform quality of metal, inasmuch as all the metal receives the same action of the flame and of the air blast, as hereinafter explained.

The air blast mechanism comprises a series of twyers 17, arranged at opposite sides of the furnace and having an angular disposition with respect to the burners of somewhat less than ninety degrees. These twyers are located below the trunnions and above the line of metal when molten and are directed slightly downwardly, so that the air blasts discharged therefrom will strike the metal. Moreover, these twyers are arranged in two pairs at opposite sides of the furnace, the members of each pair by preference converging, with the result that the air blasts focus substantially at the central axis of the furnace.

The air is supplied to the twyers through

an air supply pipe 18 curved around a little more than half of the furnace and connected to the twyers. The air is supplied to the pipe through a hose 19, which is flexible, so as not to interfere with the tilting movement of the furnace. In practice the metal to be melted or ore to be treated is placed upon the hearth, the same being introduced through the charging door. The burners are then started and the vapor therefrom ignited. The jets of flame are thereby introduced directly against the metal or ore, and the same is quickly melted until it forms a body of molten metal of uniform thickness on the hearth of the furnace. If it is simply desired to melt the metal, the furnace body is now tilted and the metal poured out through the pouring outlet. In case any slag should accumulate on the molten metal the same may be drawn out by the operator through the pouring outlet. Again, if desired, the furnace body may be rocked or tilted occasionally or continuously during the melting operation. If, however, it is desired to refine or convert the molten metal in addition to melting the same, the burners are shut off and the twyers are opened by the opening of a valve (not shown) upon the air hose, whereupon the air blasts are directed against the body of molten metal until such metal is properly refined or converted. In this operation also the furnace may be rocked occasionally or continuously, as may be desired or required according to

the judgment of the operator. In this furnace different kinds of metal may be melted or smelted, and the same may also be refined or converted, the latter operation being performed in a continuous manner and immediately after the melting operation. This furnace will be found useful particularly in the melting of brass, in which case the twyers may be dispensed with, and the same may also be used in making steel, the pig iron being first melted and then the molten metal converted into the proper character of steel desired by the operator. Moreover, the furnace may be used to melt and treat other things than metals, and I therefore contemplate using my invention wherever applicable.

I claim:

A furnace comprising a tiltable body having an interior furnace chamber, a series of twyers arranged at opposite sides of the furnace and downwardly inclined to deliver air blasts upon the molten metal in the bottom or hearth of the furnace, and separate burners arranged in the furnace body and entering the same above the line or plane of the hearth, said burners being arranged to deliver or direct flame jets upon the metal on the hearth of the furnace.

SAMUEL T. BLEYER.

Witnesses:

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