

No. 842,678.

PATENTED JAN. 29, 1907.

J. V. MARTIN.
FURNACE.

APPLICATION FILED APR. 30, 1906.

2 SHEETS—SHEET 1.

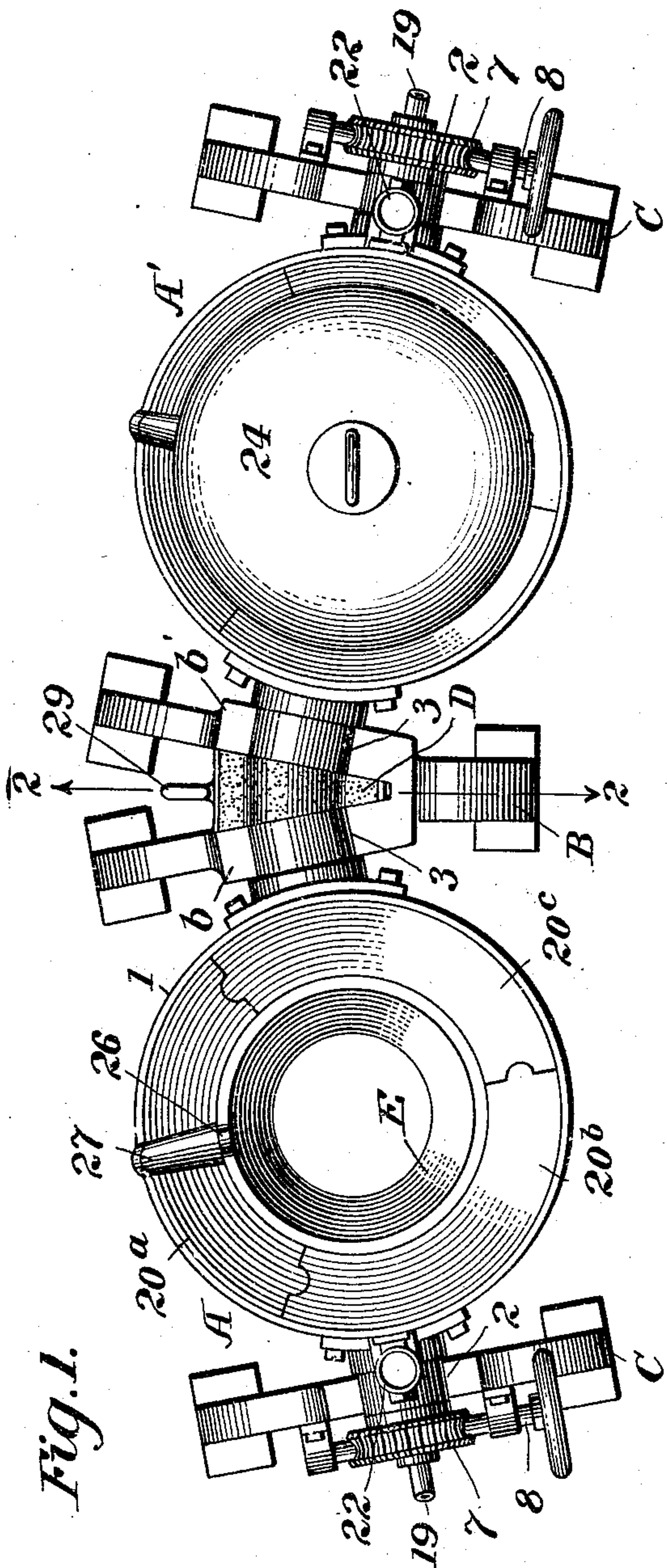


Fig. 1.

Witnesses
J. S. Linkel
L. A. Armstrong

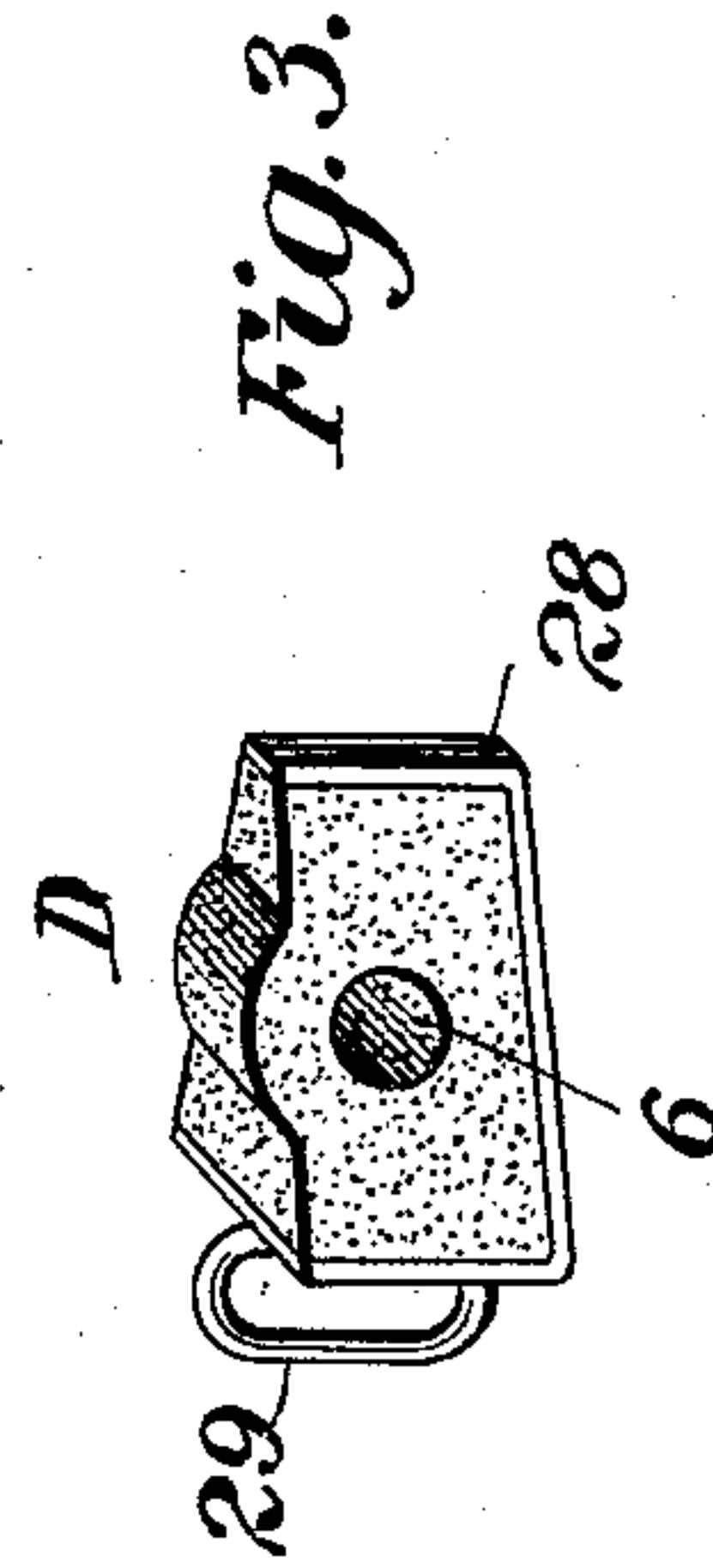


Fig. 3.

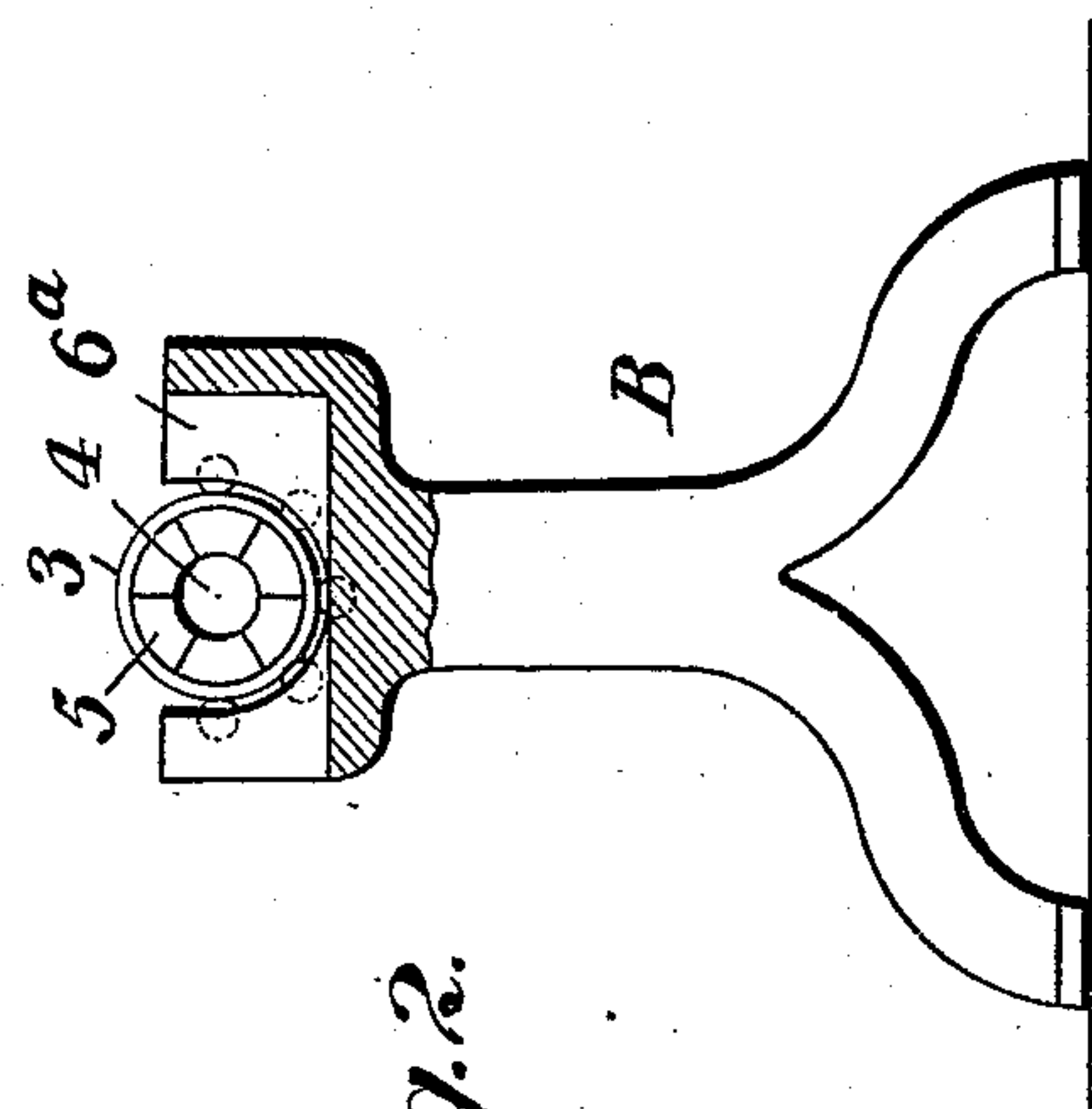


Fig. 2.

by

James V. Martin Inventor

Robert Watson
Attorneys

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2 SHEETS—SHEET 2.

Fig. 4.

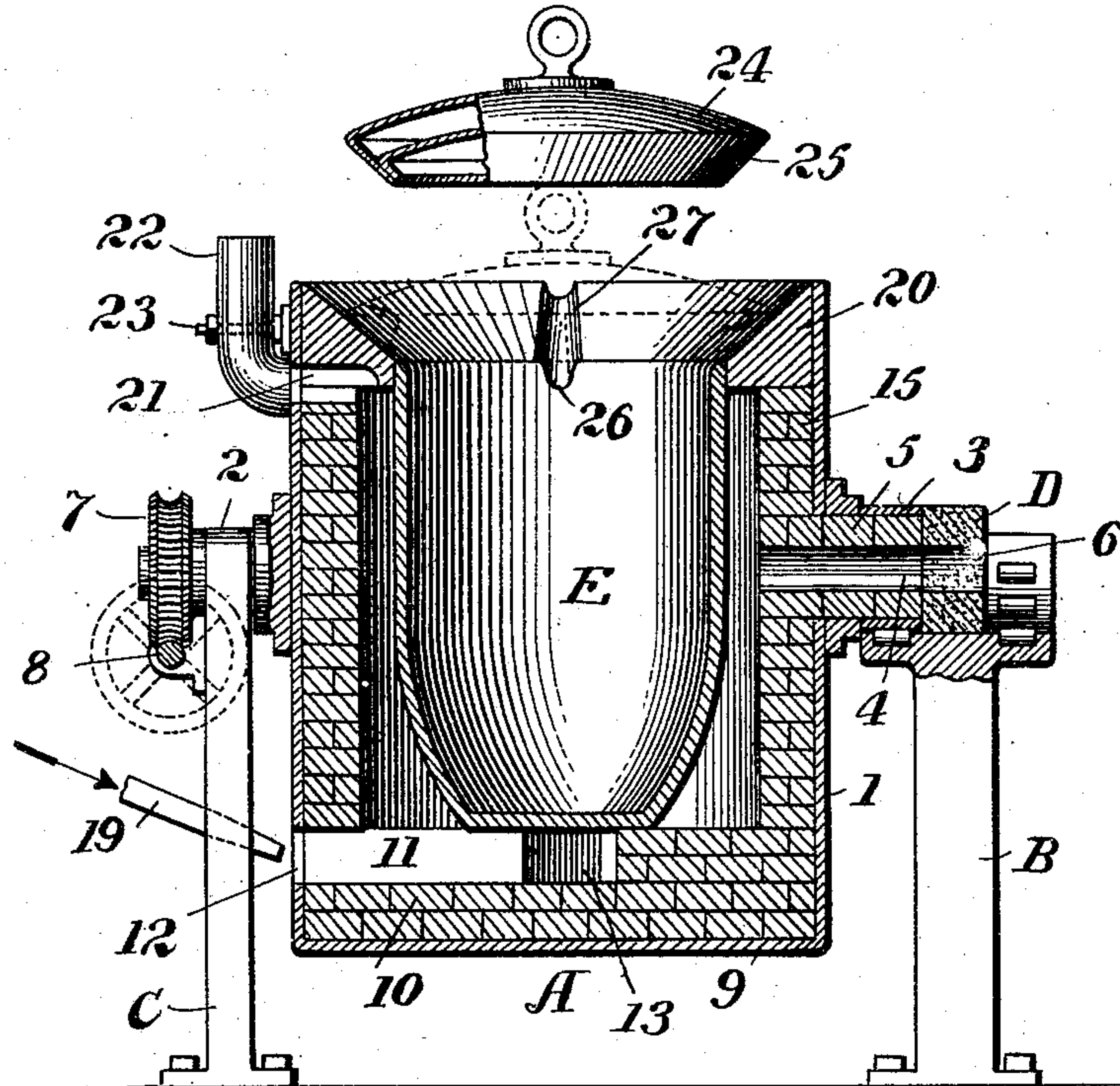
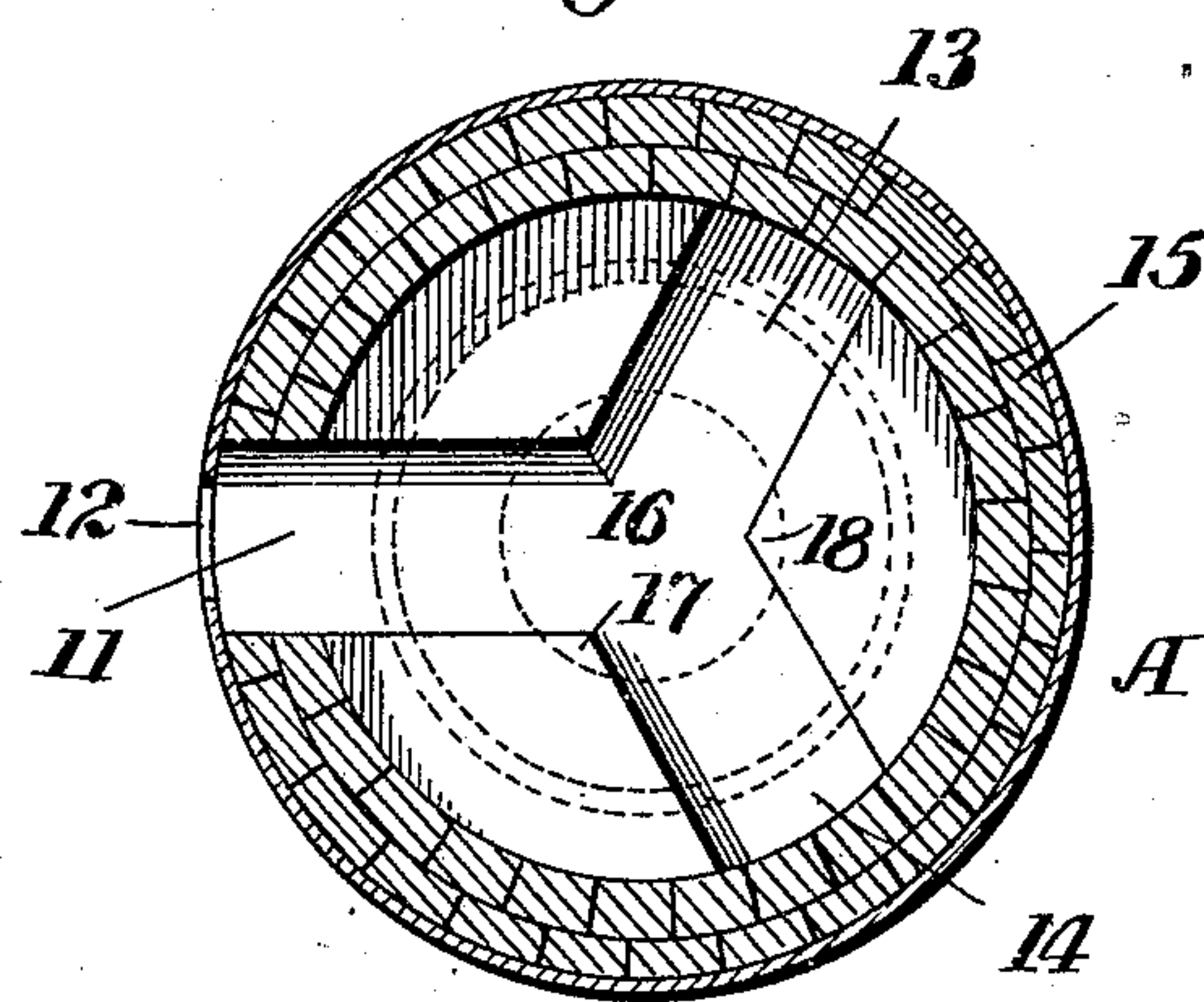


Fig. 5.



Witnesses
J. S. Hinkel
A. L. Armstrong

Inventor
James V. Martin
by *Robert Watson*
Attorneys

UNITED STATES PATENT OFFICE.

JAMES V. MARTIN, OF BALTIMORE, MARYLAND, ASSIGNOR OF ONE-THIRD
TO THOMAS C. BRIAN, OF BALTIMORE, MARYLAND.

FURNACE.

No. 842,678.

Specification of Letters Patent.

Patented Jan. 29, 1907.

Application filed April 30, 1906. Serial No. 314,591.

To all whom it may concern:

Be it known that I, JAMES V. MARTIN, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Furnaces, of which the following is a specification.

This invention comprises improvements in furnaces for melting metals, the details and advantages of which will be pointed out in the following specification, taken in connection with the accompanying drawing, in which—

Figure 1 is a top plan view of a pair of communicating furnaces, the furnace at the left having its cover removed. Fig. 2 is a section through the central standard or support for the furnaces, taken on the line 2 2 of Fig. 1, the block of refractory material being removed. Fig. 3 is a perspective view of the block of refractory material which fits between the adjacent trunnions of the furnaces. Fig. 4 is a central vertical section through one of the furnaces. Fig. 5 is a section on the line 5 5 of Fig. 4.

Referring to the drawings, A and A' indicate a pair of similarly-constructed furnaces each cylindrical in form and each having trunnions 2 3 projecting from its outer cylindrical wall at opposite sides of the furnace. As shown in Fig. 4, the trunnion 3 of each chamber has a passage-way 4 extending through it and into the interior of the furnace, and this hollow trunnion has an interior lining 5 of fire-brick. The hollow trunnions 3 are supported upon a standard B, arranged between the furnaces, and the trunnions 2 are supported upon independent standards C. As will be evident from an inspection of Fig. 1, the furnaces are arranged with their trunnions at an obtuse angle. The central standard B has a wedge-shaped socket 6^a between the bearings *b* and *b'*, and a wedge-shaped block of refractory material D, Figs. 1 and 3, is adapted to fit closely within said socket, the sides of the block fitting against the faces of the bearings. This block of refractory material has an opening 6 therein, which when the block is in position registers with the passage-ways 4 in the trunnions, so that a continuous passage-way is provided from one chamber to the other through the trunnions and through said block.

By removing the wedge-shaped block access may be had to the interiors of the trun-

nions for the purpose of removing the lining from the trunnions and for inserting new material without the necessity of dismantling the furnaces. The arrangement shown permits the furnaces to be rotated independently without interfering with one another and without adding much to the length of the passage-way between the furnace-chambers. Worm-wheels 7 are arranged upon the outer trunnions 2, and worm-shafts 8, supported upon the standards C, are provided for the purpose of rotating the furnaces about their horizontal axes for the purpose of pouring the metal.

A description of one furnace will apply to both. As shown in Fig. 4, the furnace A comprises the outer cylindrical metal shell 1, having a metal head 9 at its lower end and the trunnions 2 and 3 projecting from its sides. The bottom of the furnace has a lining 10 of brick, in which is constructed a channel 11, leading from a fuel-inlet opening 12 in the side of the casing to the central portion of the lining or flooring 10, and from the inner end of this main channel branch channels 13 and 14 diverge and extend to the circular lining 15 of the chamber. Preferably these channels extend radially from the center at equal angles to one another, as shown, and are of such width that a free passage for the flame is afforded beneath the crucible, which latter is supported equally by the angular portions 16, 17, and 18 of the brickwork at the diverging points of the channels. The fuel injected into the furnace through a suitable burner 19 impinges upon the bottom of the channel 11 and flows through the branch channels and is spread equally around the furnace, the bottom of the crucible being also heated by the passage of the flames beneath it. The brick lining 15 of the cylindrical wall of the furnace extends nearly to its upper end and is surmounted by a coping 20 of refractory material of greater width than the brick lining. This coping is removable and, as shown most clearly in Fig. 1, is made in sections 20^a, 20^b, and 20^c to facilitate its removal and insertion. A crucible E is held centrally in position within the furnace-chamber by the annular coping 20, which fits closely around the upper end of the crucible, as shown. Above the fuel-inlet opening 12 and at the top of the brick lining 15

an opening 21 extends partly through the brickwork and partly through the coping from the interior of the furnace-chamber to an outlet-pipe 22, which is connected by a pivot-bolt 23 to the metal casing of the furnace. The outlet-pipe may be swung to one side, so as to uncover the opening 21, and a plug or stopper may be inserted in said opening to prevent the exit of heat or products of combustion when desired. The upper surface of the coping 20 slopes inwardly, as shown, and a cover 24, having a conical flange 25 on its lower side, is adapted to fit onto the coping to cover the crucible. The cover is shown in full lines removed from the furnace in Fig. 4 and in dotted lines in position upon the furnace. Recesses 26 and 27 in the crucible and coping, respectively, are provided for the purpose of pouring the metal.

In using the furnaces together when fuel is admitted through the burner 19 of one furnace the outlet passage-way 21 of that furnace is closed and the products of combustion after passing through the first chamber flow through the hollow trunnions into the adjoining furnace-chamber and thence to the atmosphere through the outlet 21 of the latter chamber. In this way while metal is being melted by the intense heat in the chamber in which the fuel is injected the ingots or scrap metal in the adjoining chamber may be heated by the heated gases which flow through the hollow trunnions into the latter chamber. After the metal has been melted and poured from one crucible the latter may be filled with fresh material and the fuel then injected into the chamber in which the castings have been heating. Of course the fuel-inlet opening of one of the chambers is always closed when the furnaces are used together. If it is desired to use only one furnace, a solid wedge-shaped block may be inserted between the hollow trunnions instead of the block shown in Fig. 3, thus cutting off communication between the two furnaces, or by closing the fuel inlet and outlet openings of the furnace which is not in use and leaving the inlet and outlet openings of the furnace which is in use open, of course, the heated gases will not be carried through the trunnions from one chamber to the other even if the perforated block D is in position.

The block D has a metal shoe 28 extending around its ends and base, the edges of the shoe being flush with the inclined faces of the block. The purpose of this shoe is to prevent injury to the block in removing and inserting it. A suitable handle 29 is connected to the shoe.

The cover 24 is preferably somewhat dome-

shaped, as shown, so as to provide additional space above the crucible for containing scrap material, &c. By providing a suitable enclosed space above the crucible to hold such scrap material the cover need not be removed as often to insert new material as if the cover were flush with the top of the crucible. As the scrap material melts of course it occupies much less space, and with the arrangement shown the material can be piled into the crucible above its upper edge and as the metal melts the material above the crucible will pass down into the crucible. The flaring surface of the coping serves as a funnel to direct the material into the crucible.

When it is desired to repair the brick lining in the furnace, the coping is taken out and the crucible removed, thus permitting access to the brickwork.

It will be noted that the upper end of the crucible fits closely within the coping. This prevents the contents of the crucible from being exposed to the flame and avoids oxidation and loss of metal.

What I claim is—

1. The combination with a pair of furnace-chambers arranged adjacent to one another and independently supported upon horizontal trunnions, the trunnions of one chamber being at an obtuse angle to the trunnions of the other chamber and the adjacent trunnions having axial openings communicating with the interiors of their respective furnace-chambers, of a block of refractory material fitting between said adjacent trunnions, said block having an opening therethrough registering with the openings in the trunnions.

2. The combination with a pair of furnace-chambers arranged adjacent to one another and independently supported upon horizontal trunnions, the trunnions of one chamber being at an obtuse angle to the trunnions of the other chamber and the adjacent trunnions having axial openings communicating with the interiors of their respective furnace-chambers, and a standard having two bearings for supporting the adjacent trunnions and having a wedge-shaped socket between said bearings, of a wedge-shaped block of refractory material adapted to fit within said socket and against the ends of said adjacent trunnions, said block having an opening therethrough adapted to register with the openings in the trunnions.

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

JAMES V. MARTIN.

Witnesses:

JNO. WATSON, Jr.,
MARY M. MAGRAW.