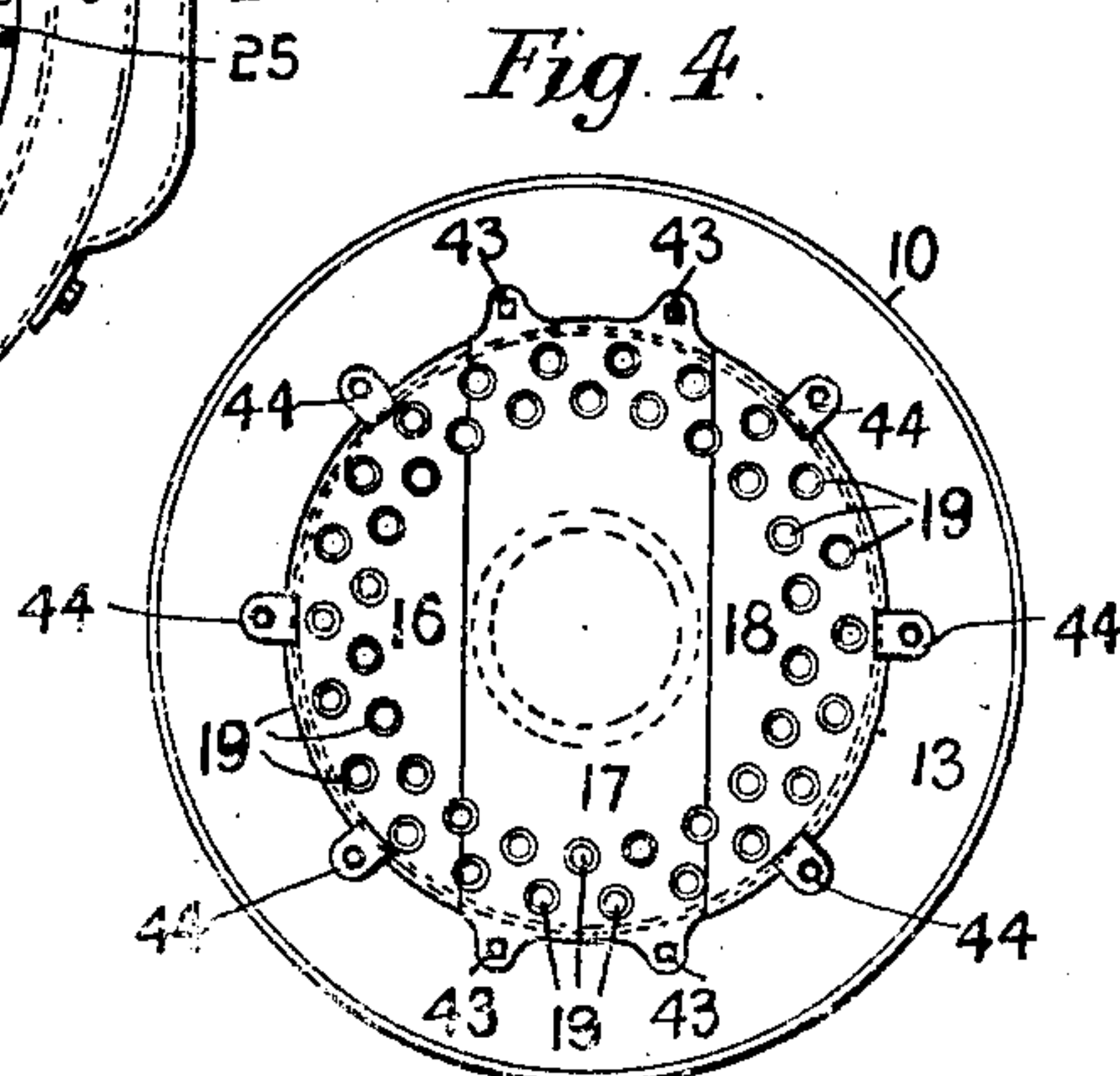
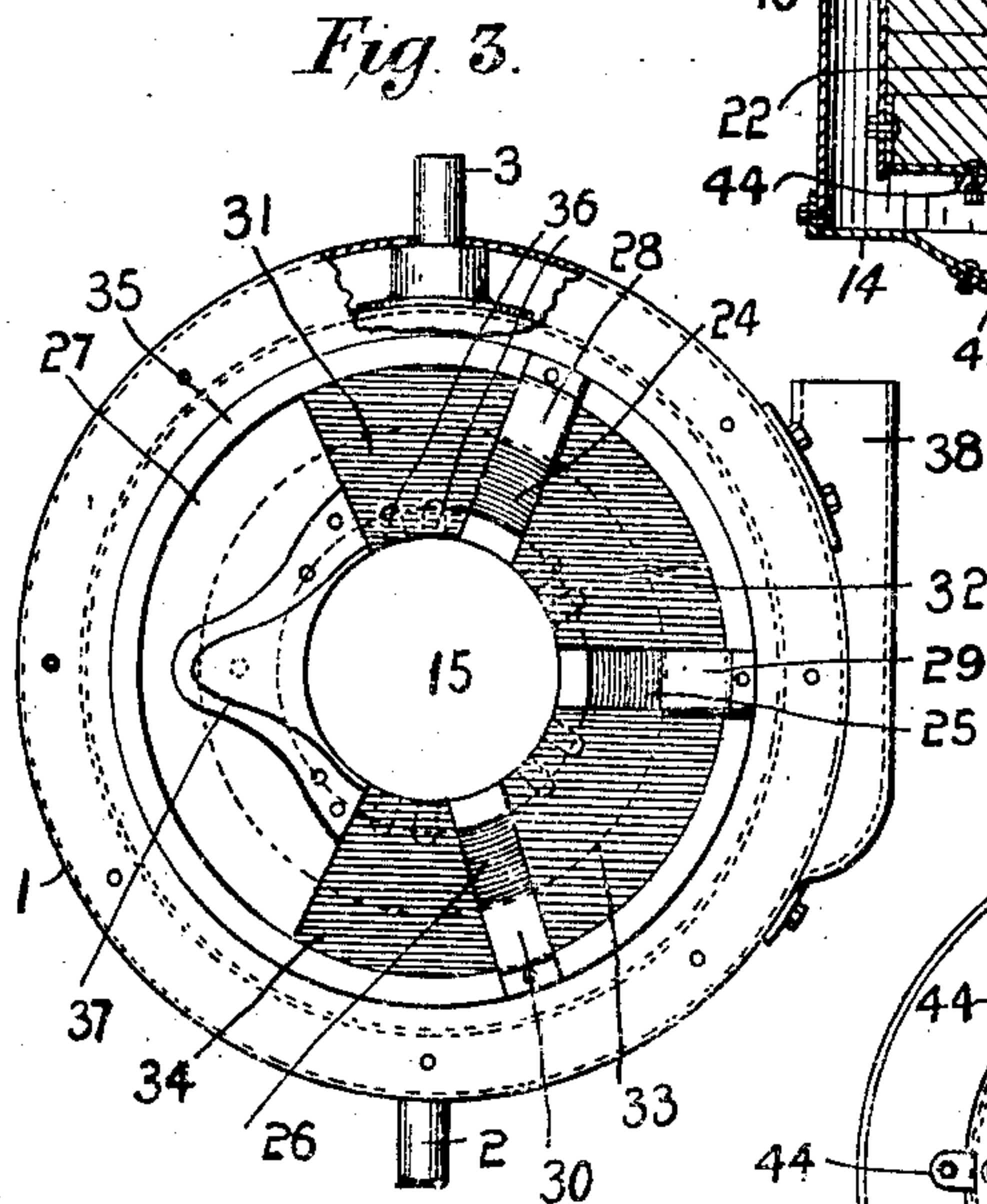
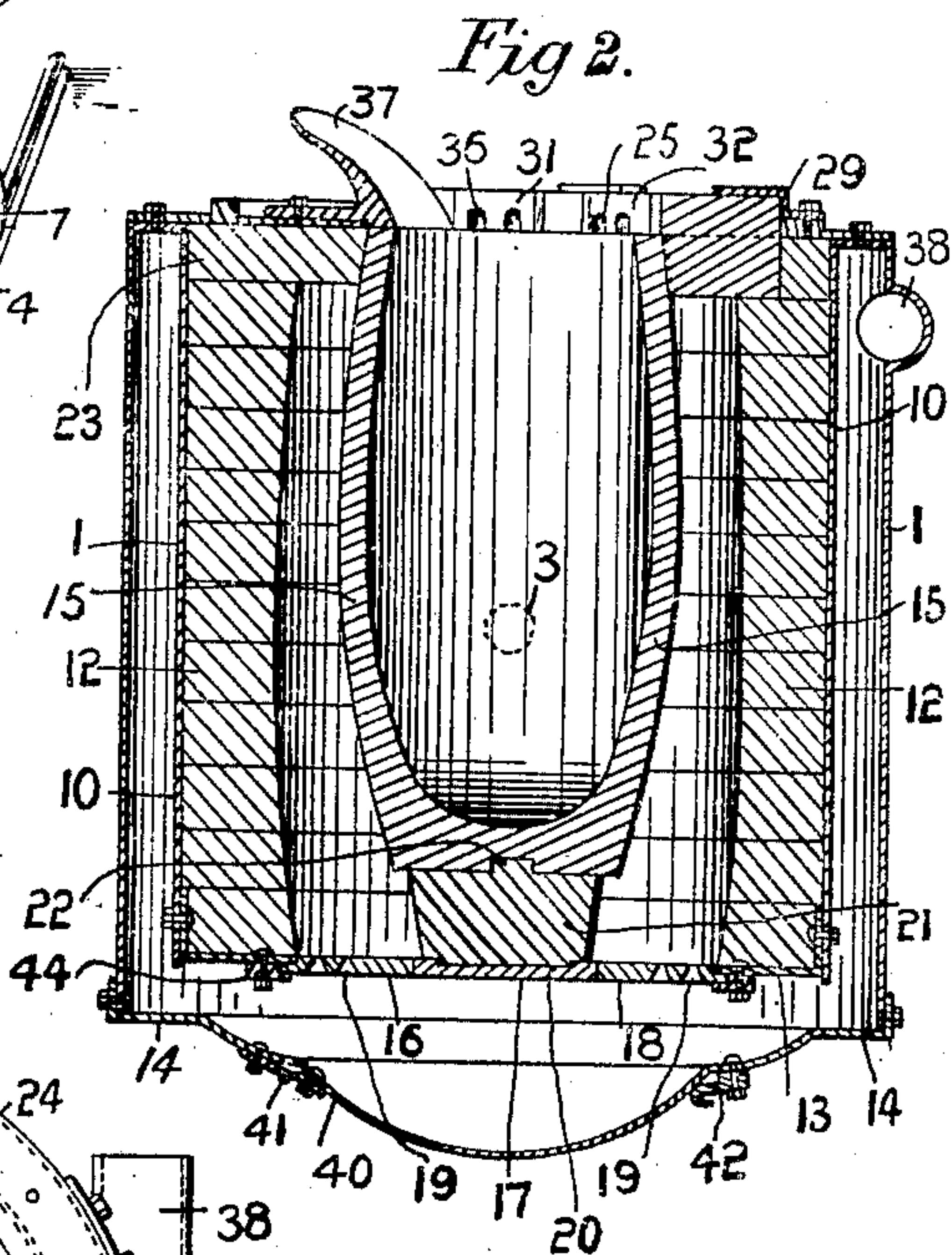
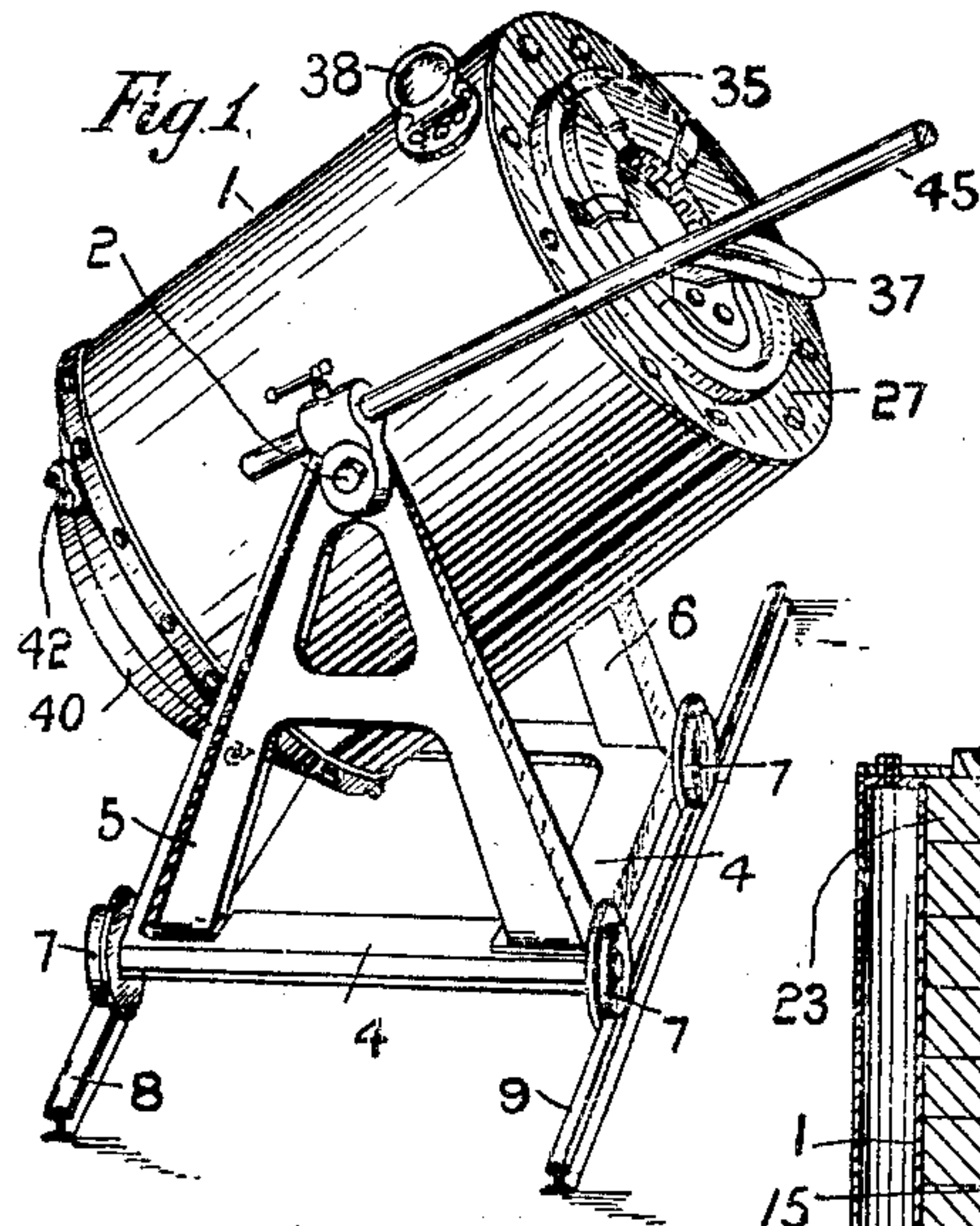


No. 829,471.

PATENTED AUG. 28, 1906.

M. HARVEY.
CRUCIBLE FURNACE.
APPLICATION FILED OCT. 21, 1904.



Witnesses.
Wm. Kuehn
John A. Percival.

Inventor
Matthew Harvey
By Richard S. [Signature]
ATTORNEYS

UNITED STATES PATENT OFFICE.

MATTHEW HARVEY, OF CANNOCK, ENGLAND.

CRUCIBLE-FURNACE.

No. 829,471.

Specification of Letters Patent.

Patented Aug. 28, 1906.

Application filed October 21, 1904. Serial No. 229,455.

To all whom it may concern:

Be it known that I, MATTHEW HARVEY, a subject of His Majesty the King of Great Britain and Ireland, residing at Hatherton House, Cannock, in the county of Stafford, England, have invented new and useful Improvements in and Connected with Crucible-Furnaces, of which the following is a specification.

10 This invention has reference to crucible-furnaces, and is directed to provide a self-contained crucible-furnace which shall, by preference, be portable and can readily be moved from place to place with the molten metal in the crucible and which can be tilted to pour the metal therefrom. Thus my furnace can when made portable be traveled along to one part of a foundry where the blast is applied, and then when the metal has been melted the crucible-furnace, with the crucible and the molten metal contained therein, can be traveled along as near as possible to the molds into which the metal has to be poured, and the furnace can be tilted so as to pour the metal into the casting-ladles and also can be turned over for cleaning out the blast-grid when required. By the furnace being portable and moved as near as possible to the molds the loss of heat from the metal is reduced to a minimum.

My invention is carried out as I will describe by referring to the accompanying drawings, on which—

Figure 1 is a general view of a portable crucible-furnace constructed in accordance with this invention. Fig. 2 is a sectional elevation of the furnace, on a larger scale, detached from its carriage. Fig. 3 is a plan of the same, partly in section; and Fig. 4 is an inverted plan of the bottom plate or grid of the furnace.

The same reference-numerals indicate the same parts in all the figures.

45 The outer shell 1 is made of sheet-steel or other suitable metal and is, by preference, of cylindrical form, as shown, (although it is to be understood that I do not confine myself to any particular form of the outer shell,) and this is carried, preferably, by side trunnions 2 3 on the carriage 4, made with two standards 5 6 in bearings in which the trunnions 2 3 are mounted. This carriage is provided with flanged wheels 7, constructed to travel along rails 8 9, laid on the shop or yard floor, or the wheels may be made without flanges, so as to travel along any level surface without

the rails. The trunnions 2 3 are situated a little above the center of gravity of the furnace and the charge in the crucible, so that the normal position of the furnace is vertical, with the mouth at the top. The standards 5 6 are made so high as to permit of the furnace being turned upside down on its trunnions for the purpose of cleaning out the bottom of the furnace or for fettling the pot. If desired, the said carriage may be dispensed with and the trunnions 2 3 arranged to turn in stationary bearings. Fixed within the outer shell 1 of the furnace is the cylindrical or other casing 10 of the furnace proper, made of smaller diameter than the shell 1, so as to leave an air-chamber 11 all round between the casing 10 and the outer shell 1. The casing 10 is lined with fire-bricks 12 or other refractory material carried by the annular bottom plate 13, which is fixed to the bottom of the shell 10 at some little distance above the bottom 14 of the outer shell 1. The interior of the fire-brick lining 12 is, by preference, of circular form and is made somewhat larger in diameter than the outside of the crucible 15, which stands therein, the space between the outside of the crucible 15 and the interior of the fire-brick lining 12 being filled with coke or other fuel for heating the crucible. Fixed to the annular bottom plate 13, which carries the fire-brick lining 12, there is a bottom plate or grid, preferably made in three parts, (marked, respectively, 16 17 18,) pierced with air-inlet holes 19, which are, by preference, countersunk on the under side, and this bottom plate or grid carries the coke and the crucible.

Resting in a recess 20 in the center part 17 of the bottom plate or grid there is an ordinary graphite or other suitable stand 21, and this stand has a central projection 22 to take into a corresponding recess in the bottom of the crucible 15, so as to prevent the lower part of the crucible from shifting when the furnace is tilted. The block 21 carries the crucible at some little distance above the bottom plate, and thus allows for plenty of fuel or fire on the bottom plate round the bottom of the crucible and insures the blast which enters the holes in the bottom plate playing properly on the lower part of the crucible. The upper part of the crucible 15 is kept in place and prevented from moving sidewise by fitting between the top blocks 23 24 25 26, which rest on the top of the fire-brick lining 12 and make up the space be-

tween the sides of the crucible and the inside of the casing 10. The block 23 is held in place by the cast-iron or other cover-plate 27, which is secured to the top of the casing 1, and the blocks 24 25 26 are held in place by angle-brackets 28 29 30, which fit on the top of these blocks 24 25 26 and are bolted onto the cover-plate 27. Between the blocks 23 24 25 26 sector-like fire-brick blocks 31 32 33 34 are placed, and these rest on the cover-plate 27 and on the top of the crucible 15 and they are held in place by fitting between blocks 23 24 25 26, as aforesaid, and within the annular projecting ring 35, which is formed on the top of the cover-plate 27. One or more of these cover-blocks 31 32 33 34 can be removed when required for charging the coke into the furnace. The cover-blocks 31 32 33 34 are made with channels 36 on their under side on the top of the pot, through which the blast escapes. Fixed on the cover-plate 27 there is a cast-iron or other spout 37, conforming with and fitting on the top of the crucible 15 for the purpose of facilitating the pouring of the metal therefrom. The center line of this spout 37 is at right angles to the axis of the trunnions 2 3. Near the top of the outer casing 1 is the blast-inlet 38, to which the blast-pipe is connected. The blast fills the air-chamber 11 and passes down to the bottom of the furnace proper and then up through the holes 19 in the grid or bottom plate of the furnace proper and then up through the coke and on through the holes 36 in the upper part of the furnace, and so escapes.

In the bottom 14 of the outer shell there is a large hole closed by a removable cover 40, preferably made of a dished shape, as shown in Fig. 2, and secured by suitable means, as by the hinges 41 and catch 42, and so arranged that in case the crucible 15 should break and the metal run out therefrom the metal will run through the blast-holes 19 in the bottom plate and be caught by the dish-like cover 40, which can readily be opened and the metal removed. The bottom plate

or grid, which is shown in inverted plan by Fig. 4, is, by preference, made in three parts 16 17 18, of which the center part 17 is secured to the annular bottom plate 13, as by the bolts 43; but the side parts 16 18 are secured by suitable catches, such as the turn-buttons 44, so that these side parts 16 18 can readily be removed when it is required to fettle the pot without disturbing the central portion 17, on which the block which supports the pot stands. Fixed on the trunnion 2 of the furnace or otherwise suitably fixed to the furnace there is a lever 45, by which the furnace can be turned about its trunnions for the purpose of pouring the metal which will flow through the spout 37 at the open top of the same.

If desired, the outer shell 1 may be dispensed with, and the trunnions 2 3 will then be fixed on the sides of the casing 10 of the furnace proper and the bottom plate or grid will be boxed in and connected with the blast; but I prefer to employ the casing 1, as aforesaid, with the blast arranged as shown on my drawings, as by so doing the blast takes up some of the heat which radiates from the furnace proper and is thus heated before entering the furnace, thereby effecting a certain economy in fuel.

What I claim as my invention, and desire to secure by Letters Patent, is—

A crucible-furnace comprising a casing, a bottom perforated plate therefor, a block resting on said plate, a crucible within the casing and supported on said block, top blocks held on the top of the casing and having their inner ends bearing against the top of the crucible and removable sector-shaped blocks held between the top blocks.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MATTHEW HARVEY.

Witnesses:

CHARLES BOSWORTH KELLEY,
THOMAS JOHN ROWE.