

Dec. 21, 1937.

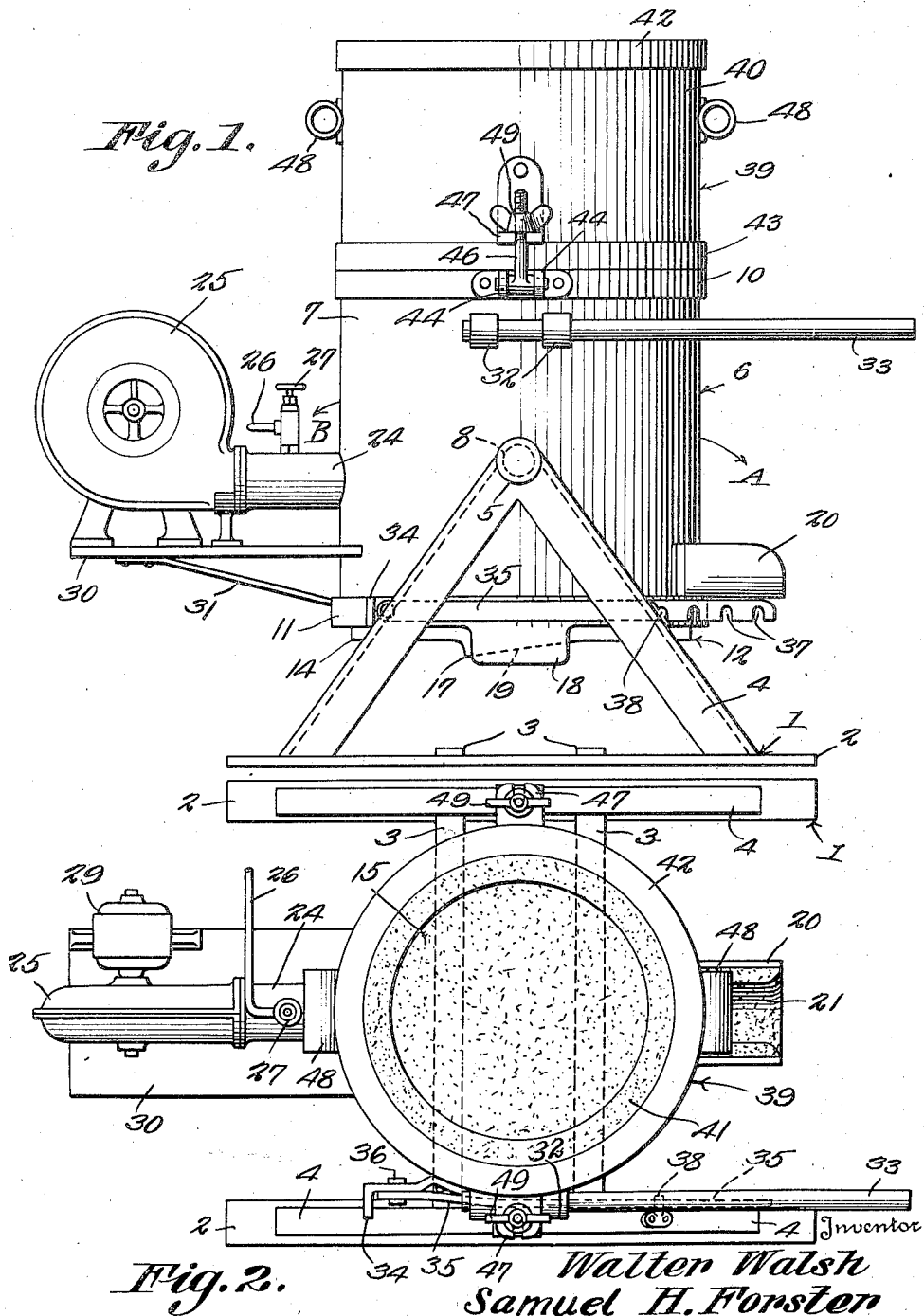
W. WALSH ET AL

2,102,823

COMBINATION FURNACE

Filed Aug. 11, 1936

3 Sheets-Sheet 1



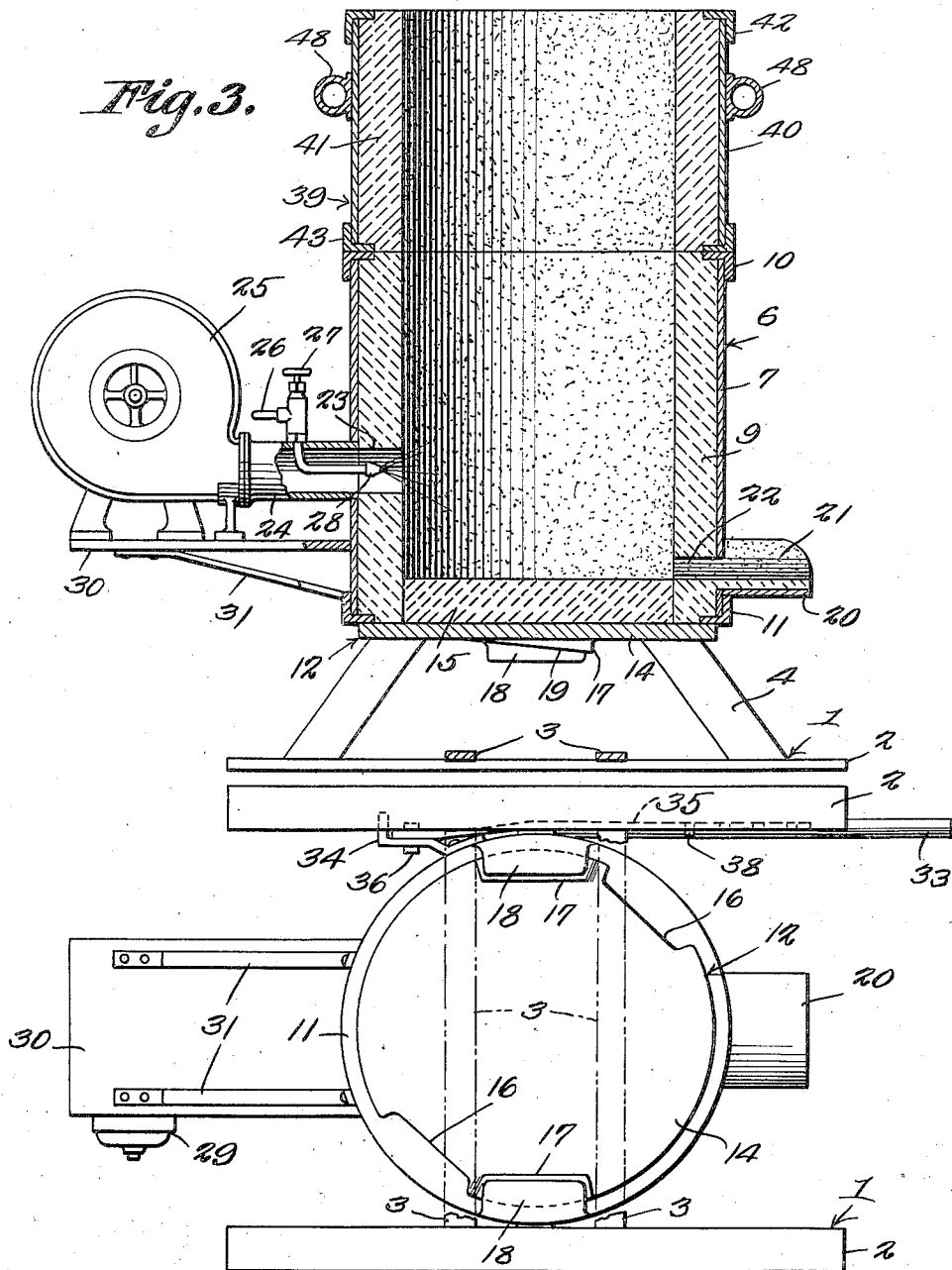
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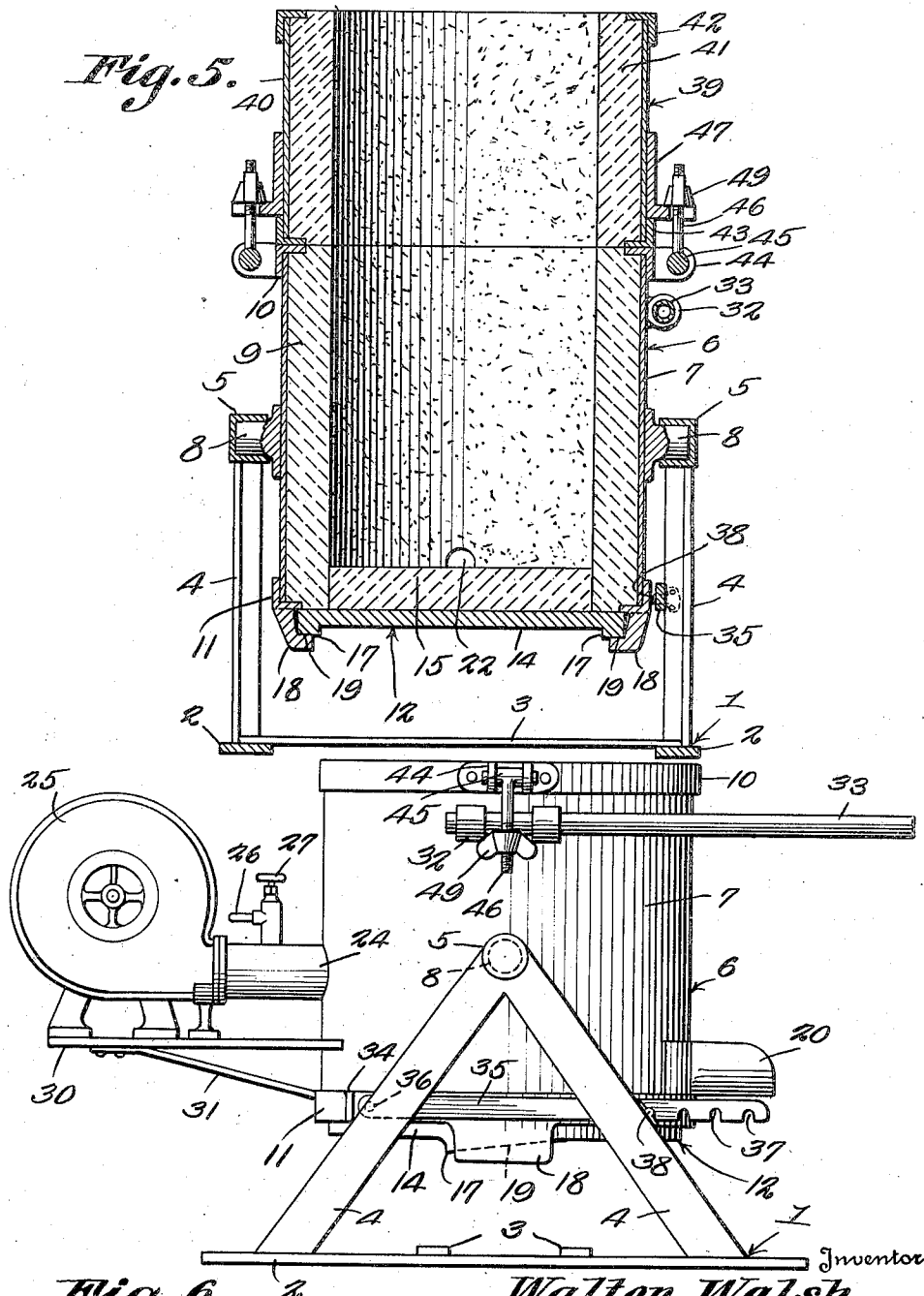


Fig. 6.

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UNITED STATES PATENT OFFICE

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COMBINATION FURNACE

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2 Claims. (Cl. 263—33)

One object of this invention is to provide a novel furnace in which ferrous metals or non-ferrous metals may be melted. Another object of the invention is to provide novel means for supporting the body of the furnace for tilting movement to enable the molten metal to be poured out, novel means being provided for holding the body of the furnace vertical when a pouring operation is not desired. Another object of the invention is to supply novel means for applying heat to the substance to be melted. A further object of the invention is to provide the body of the furnace with a removable tubular extension which is employed when ferrous metals are being smelted, it being possible to remove the extension when its presence is not required.

It is within the province of the disclosure to improve generally and to enhance the utility of devices of that type to which the present invention appertains.

With the above and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction herein-after described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, may be made within the scope of what is claimed, without departing from the spirit of the invention.

In the drawings:

Fig. 1 shows in side elevation, a device constructed in accordance with the invention;

Fig. 2 is a top plan;

Fig. 3 is a vertical transverse section wherein parts remain in elevation;

Fig. 4 is a bottom plan;

Fig. 5 is a section at right angles to Fig. 3;

Fig. 6 is a view similar to Fig. 1 but showing the extension removed from the body of the furnace.

The numeral 1 marks a support, which may be of any desired kind. The support 1 may comprise parallel sills 2 connected by cross ties 3, the sills carrying inverted V-shaped standards 4 provided at their upper ends with bearings 5.

A tubular furnace body 6 is disposed between the standards 4. The body 6 comprises a metal shell 7 having oppositely-disposed trunnions 8 received in the bearings 5 of the standards 4, the furnace body, thus, being mounted on the standards for swinging movement. The shell 7 of the body 6 has a refractory lining 9.

An upper ring 10 is provided. In cross section, the upper ring 10 is an angle member. The depending flange of the upper ring 10 extends around and is secured to the shell 7 of the body 6.

The horizontal inwardly extended flange of the upper ring 10 partially overlaps the upper end of the refractory lining 9. A lower ring 11 is provided. In cross section, the lower ring 11 is an angle member. The upstanding flange of the lower ring 11 extends around and is secured to the shell 7 of the body 6. The inwardly extended lower flange of the lower ring 11 partially overlaps the lower end of the refractory lining 9.

The body 6 has a removable bottom 12. The bottom 12 comprises a metallic disk 14 and a refractory facing 15 secured to the upper surface of the disk. In the edges of the disk 14 there are oppositely-disposed notches 16. The disk 14 is provided with oppositely-disposed, depending cam lugs 17. Oppositely-disposed, depending and inwardly extended brackets 18 are secured to the lower ring 11.

The facing 15 of the bottom 12 is received in the lower portion of the lining 9 of the body 6, the inwardly extended parts of the brackets 18 on the ring 11 of the body 6 passing through the notches 16 of the disk 14, the disk 14 overlapping the lower end of the lining 9, as shown in Fig. 5. The bottom 12 is rotated, and, then, mutually inclined edges 19 of the cam lugs 17 and the brackets 18 cooperate to force the disk 14 of the bottom 12 up tightly against the lower end of the lining 9 and against the inwardly projecting flange of the ring 11, as shown in Fig. 3.

The body 6 has an outwardly projecting spout 20 provided with a refractory lining 21, the spout communicating with a hole 22 in the side wall of the body 6, the hole being located immediately adjacent to the upper surface of the lining 15 of the bottom 12. The body 6 has a hole 23 disposed oppositely to the hole 22 and at a little greater elevation than the hole 22. The hole 22 communicates with the neck 24 of a blower 25. The neck 24 of the blower 25 is secured to the shell 7 of the body 6. A fuel conduit 26 enters the neck 24 of the blower 25. A valve 27, under the control of an operator, is interposed in the fuel conduit 26, externally of the neck 24 of the blower 25. The fuel conduit 26 carries a nozzle 28 of any desired kind, located in the hole 23 of the body 6 and discharging into the body. The blower 25 is driven by a motor 29, which may have the usual rheostat control (not shown). The blower 25 and the motor 29 are mounted on a platform 30 connected at its inner end to the shell 7 of the body 6. The platform 30 is sustained by braces 31 joined at their inner ends to the lower ring 11 of the body 6.

The shell 7 of the body 6 is supplied with

sockets 32. The sockets 32 are adapted to receive the inner end of a handle bar 33 which may be used to tilt the body 6 in the direction of the arrow A in Fig. 1, so that the molten material may run out of the spout 20.

A means is provided for preventing the body 6 from tilting in the direction of the arrow B in Fig. 1. That means is an angle bracket 34, secured to the lower ring 11, and adapted to engage the outer edge of one of the standards 4, as shown in Fig. 1.

A means is provided for preventing the body 6 from tilting in the direction of the arrow A in Fig. 1, saving when the operator desire to tilt the body in that direction. This means is a latch bar 35 having its inner end pivoted at 36 to the angle bracket 34. At its outer end, the latch bar 35 has seats 37 adapted to be engaged, one at a time, with a keeper 38 on one of the standards 4.

In practical operation, the parts are arranged as shown in Figs. 3 and 1, and the body 6 is held upright by the engagement of the angle bracket 34 with the corresponding standard 4, and because one of the seats 37 of the latch bar 35 is engaged with the keeper 38 on the standard 4. The blower 25, actuated by the motor 29, forces air through the neck 24 of the blower, into the body 6, the burning fuel being discharged through the nozzle 28 and the conduit 26, under the governance of the valve 27.

When it is desired to pour out the molten metal, the latch bar 35 is freed from the keeper 38, and, then, the body 6 of the furnace can be tilted by means of the handle 33, to enable the molten metal to run out of the spout 20.

When ferrous metals are to be smelted, recourse is had to a tubular extension 39, which is placed on the upper end of the body 6. The tubular extension 39 comprises a cylindrical metal shell 40, provided with a refractory lining 41. The shell 40 is supplied with sockets 48, which are oppositely disposed. Carrying bars (not shown) may be inserted through the sockets 48 to permit the extension 39 to be placed readily on the upper end of the body 6 and to enable the extension to be removed readily from the body. The numeral 42 designates an upper ring, which is, in cross section, an angle member. The depending flange of the upper ring 42 surrounds and is secured to the shell 40 of the extension 39. The horizontal inwardly extended flange of the ring 42 partially overlaps the upper end of the lining 41 of the extension 39. The numeral 43 marks a lower ring, which, preferably, is an angle member. The vertical flange of the ring 42 surrounds and is secured to the shell 40 of the ex-

tension 39. The horizontal, inwardly extended flange of the ring 43 extends part way across the lower end of the lining 41 of the extension 39. The ring 43 of the extension rests on the ring 10 of the body, as shown in Fig. 5.

A means is provided for holding the extension 39 in place on the upper end of the body 6. With this end in view, the ring 10 of the body has oppositely disposed pairs of ears 44 and in each pair of ears is journaled the shaft 45 of a retainer 46 adapted to be received in a notched angle bracket 47 secured to the shell 40 of the extension 39, as shown in Fig. 5. A wing nut 49 is threaded on each retainer 46 and is adapted to bind on the outstanding portion of the angle bracket 47.

The structure is such that the extension 39 may be mounted on the upper end of the furnace body 6 when ferrous metals are to be smelted, the parts being shown in that relation in Figs. 3 and 5. If desired, and when non-ferrous metals are to be smelted, the extension 39 may be removed from the body 6 of the furnace, as shown in Fig. 6.

Having thus described the invention, what is claimed is:

1. In a device for smelting ferrous or non-ferrous metals at the will of an operator, a tubular furnace body, a tubular extension, means for securing the extension detachably on the upper end of the body, the body having an outlet spaced from the extension and constituting an egress means for molten metal when the extension is mounted on the body and when the extension is detached from the body, means associated solely with the body for melting metal, a support, and mechanism carried directly by the body and independently of the means for securing the extension to the body, for mounting the body alone, or the body and the extension together, at the will of an operator, for tilting movement on the support.

2. In a device for smelting ferrous or non-ferrous metals at the will of an operator, a tubular furnace body, a tubular extension detachably mounted on the upper end of the body, the body having an outlet spaced from the extension and constituting egress means for molten metal when the extension is mounted on the body and when the extension is detached from the body, means associated solely with the body for melting metal, a support, and mechanism carried directly by the body, and independently of the extension, for mounting the body alone, or the body and the extension, on the support, for tilting movement.

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