

M. HIKEC.

SMELTING FURNACE.

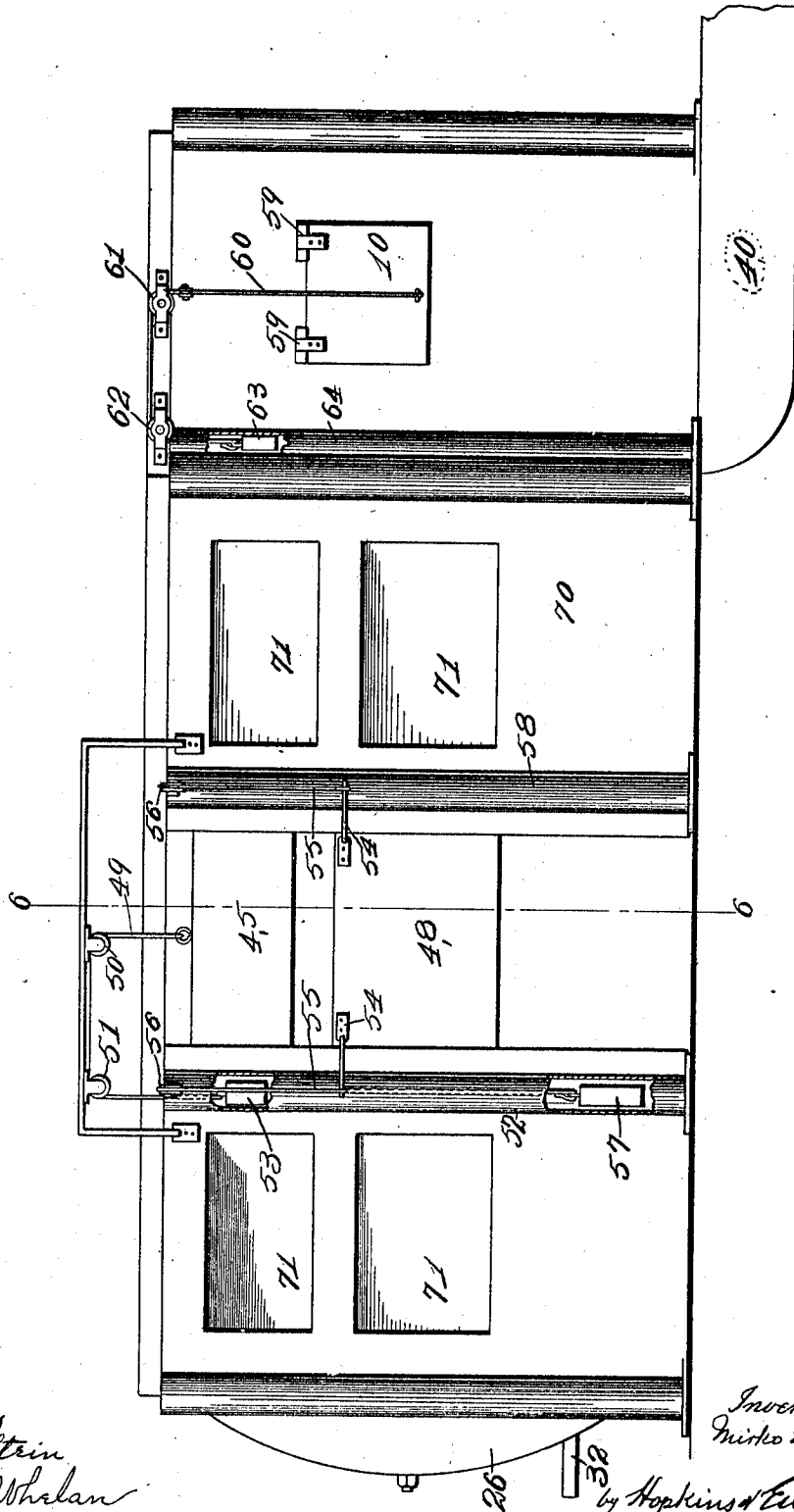
APPLICATION FILED AUG. 17, 1908. RENEWED AUG. 27, 1909.

945,390.

Patented Jan. 4, 1910.

6 SHEETS—SHEET 1.

FIG. 1



Witnesses
H. C. Stein
B. M. Whelan

Inventor
Misko Hikec
by Hopkins & Eicks Attys

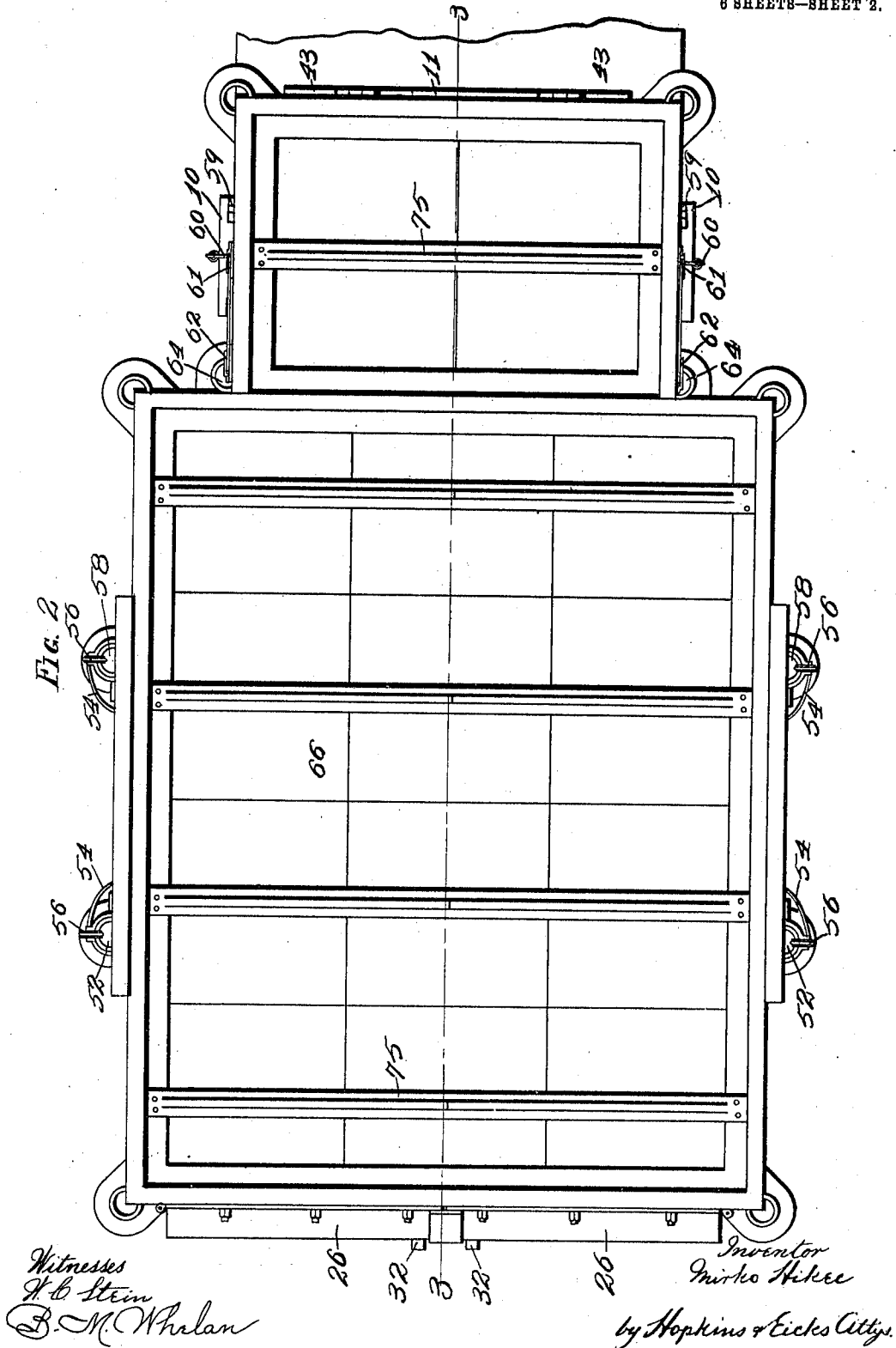
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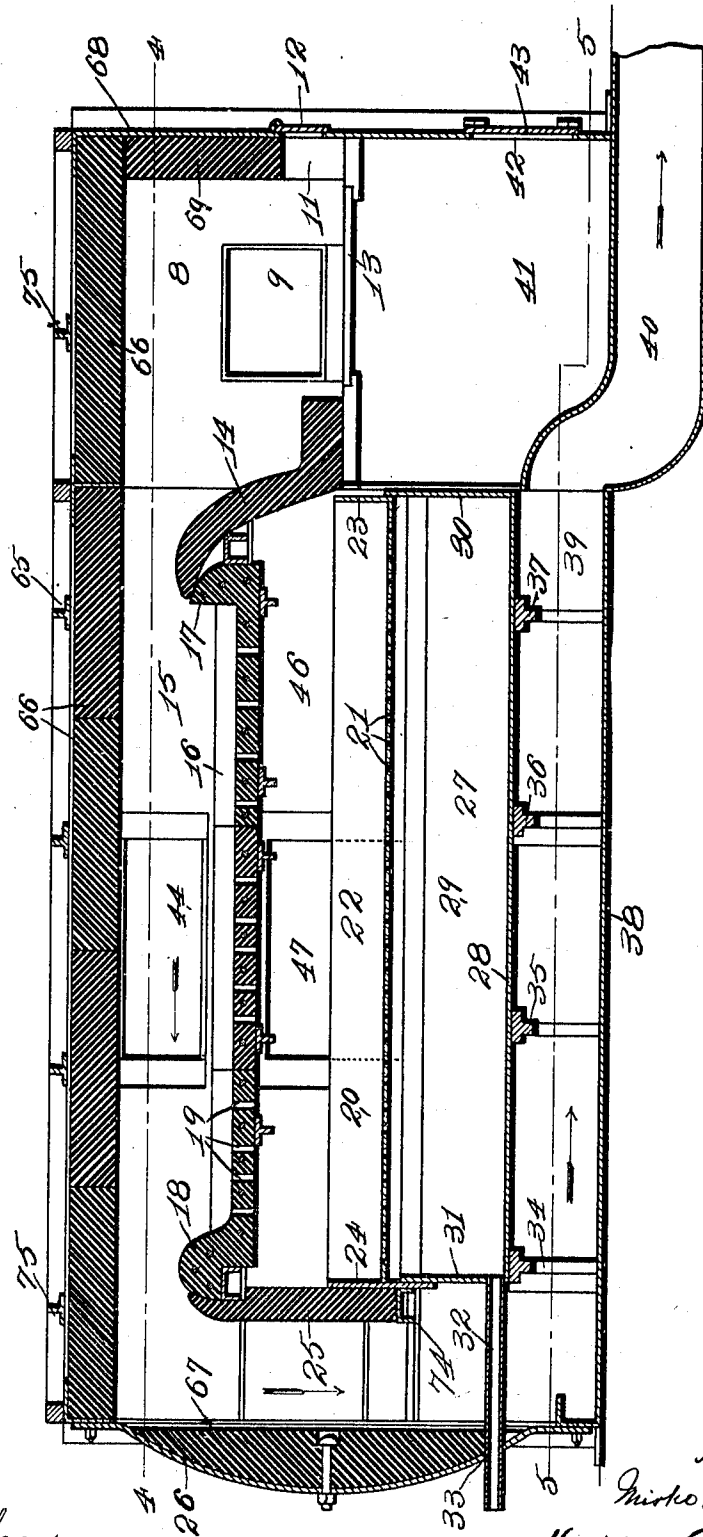
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6 SHEETS—SHEET 3.

FIG. 3



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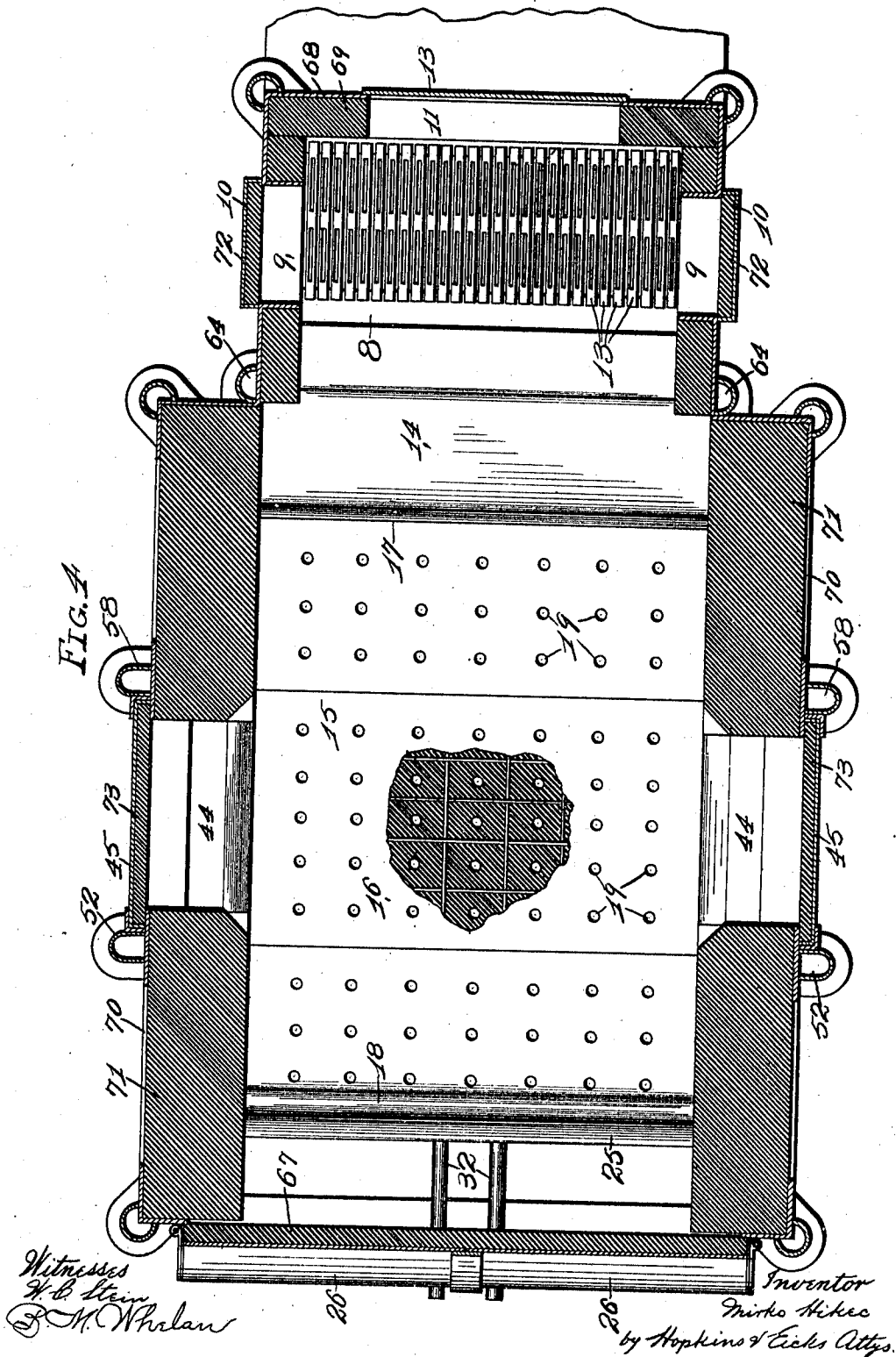
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6 SHEETS—SHEET 4.



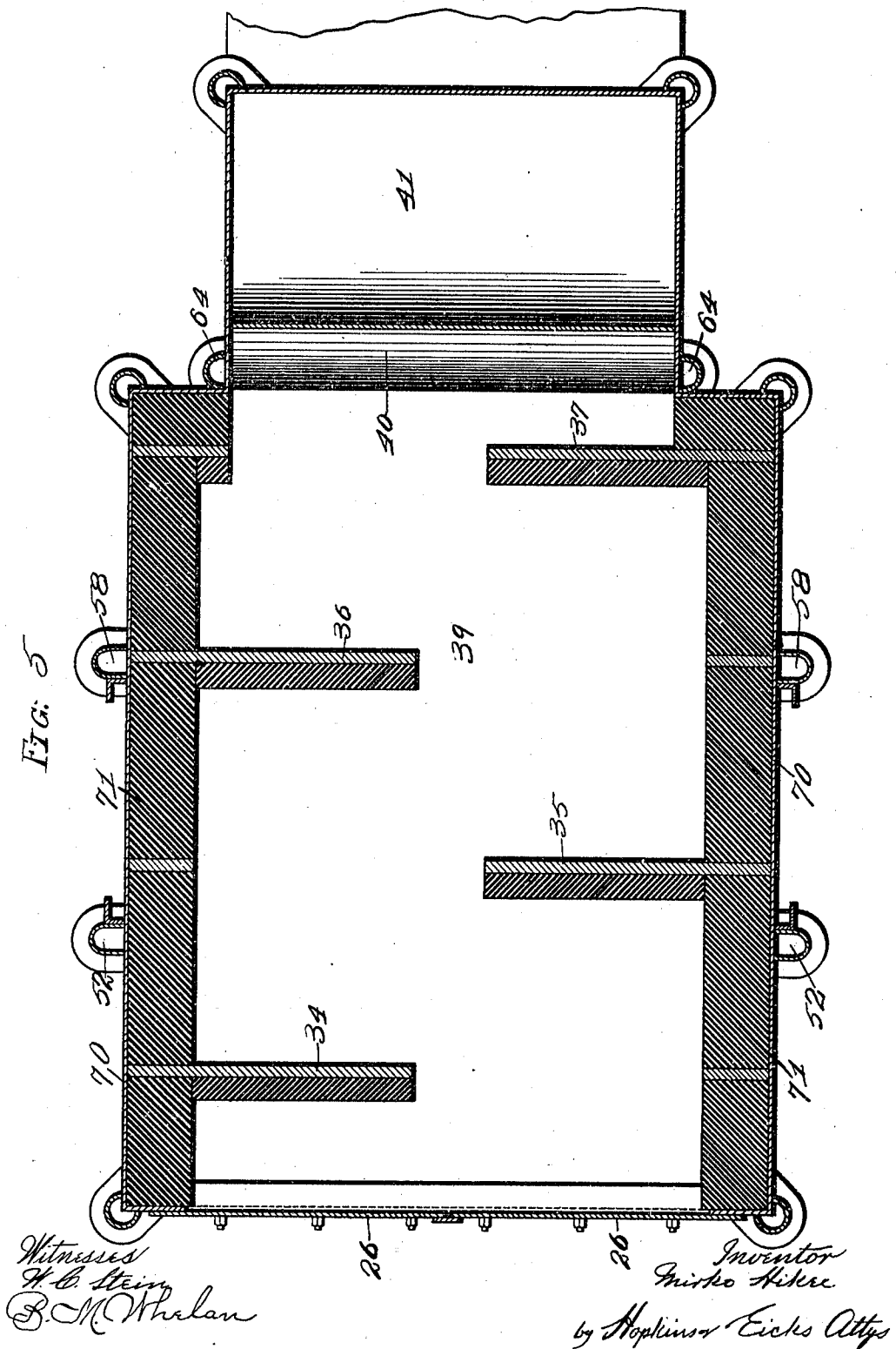
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6 SHEETS—SHEET 5.



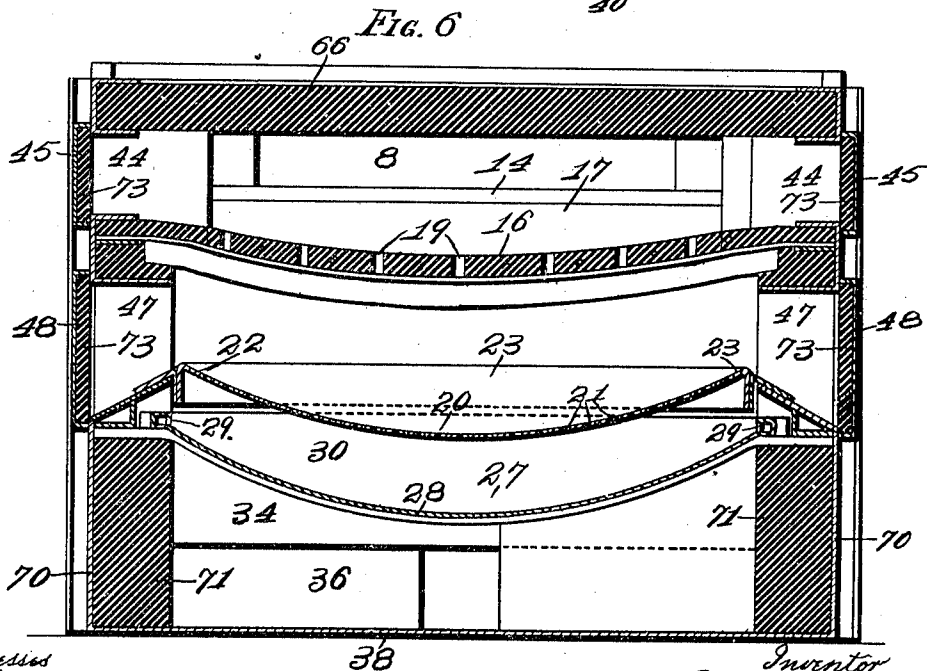
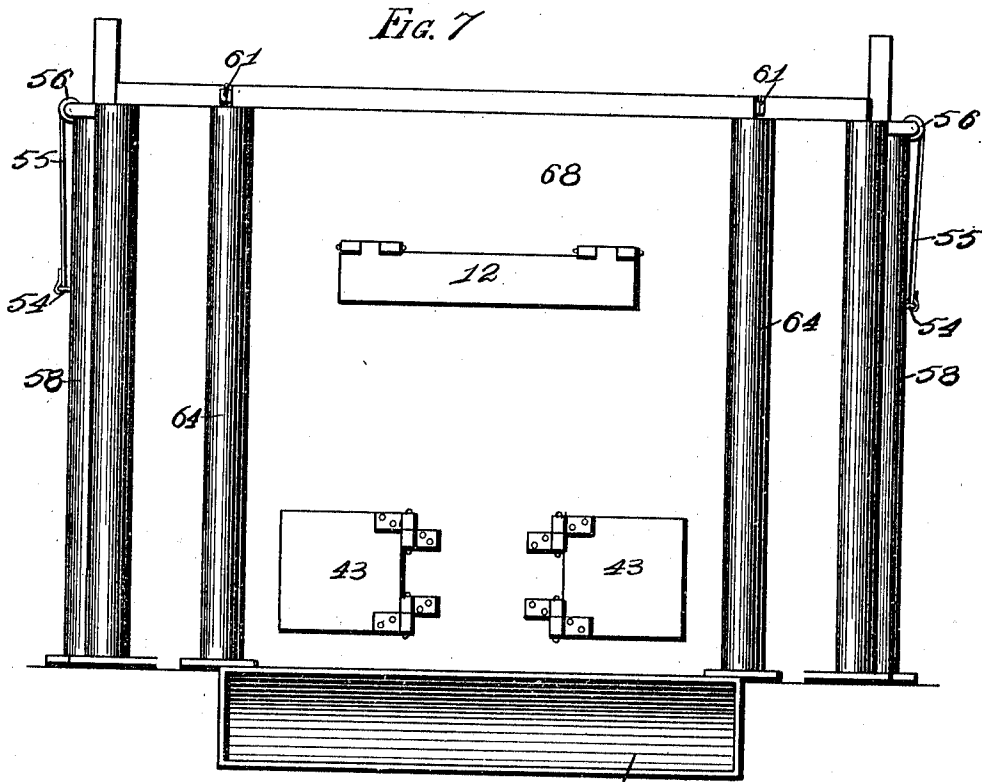
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6 SHEETS—SHEET 6.



Witnesses
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UNITED STATES PATENT OFFICE.

MIRKO HIKEC, OF COLLINSVILLE, ILLINOIS.

SMELTING-FURNACE.

945,390.

Specification of Letters Patent.

Patented Jan. 4, 1910.

Application filed August 17, 1908, Serial No. 448,854. Renewed August 27, 1909. Serial No. 514,878.

To all whom it may concern:

Be it known that I, MIRKO HIKEC, a subject of the Emperor of Austria-Hungary, and resident of Collinsville, Illinois, have invented certain new and useful Improvements in Smelting-Furnaces, of which the following is a specification.

My invention relates to improvements in smelting furnaces and has for its object to provide a furnace in which the ore to be smelted is subjected at all of the stages of its reduction, to the heat generated by down-draft furnaces, and in which the metal freed from the ore by the action of the heat is twice strained through perforated surfaces; the further objects of the invention and its results being hereinafter more fully described.

In the drawings—Figure 1 is a side elevation of a device embodying my invention. Fig. 2 is a top plan view of the same. Fig. 3 is a vertical, longitudinal view in section of the same, taken along the line 3—3 of Fig. 2. Fig. 4 is a transverse sectional view of the same taken along the line 4—4 of Fig. 3. Fig. 5 is a similar view in section, taken along the line 5—5 of Fig. 3. Fig. 6 is a transverse, vertical view in section of the same, taken along the line 6—6 of Fig. 1. Fig. 7 is a front elevation of the same.

The heat desired to be used in the device of my invention is generated in the fire-box 8 which is provided with the side openings 9—9 provided with the doors 10—10; the fire-box 8 also having the front opening 11 provided with the door 12, and being provided at its bottom with the grate bars 13. The fire-box 8 is provided with the rear wall, of fire-brick or the like, 14, shown in section in Fig. 3, over which the products of combustion from the fire-box 8 pass, and then pass through the oven 15.

The oven 15 is provided with the bottom 16 having at its front end the retaining wall 17 and at its rear the retaining wall 18; the bottom 16 being provided with the perforations 19 and being constructed of fire-clay as are also the walls 17 and 18. The bottom 16 is preferably concave as illustrated in Fig. 6. Beneath the bottom 16 the perforated pan or strainer 20 is slidably mounted; the perforations being indicated in Fig. 3 by the numeral 21; the straining member 21 having the side flanges 22, front flanges 23 and rear flanges 24. When the straining member 20 is in place, the rear wall 25 is

built in place as shown in Fig. 3, to assist in forming a flue for the downward passage of the products of combustion from the fire-box 8, the outer wall of said flue being formed by the doors 26—26.

Beneath the straining member 20, which is preferably concave as shown in Fig. 6, I provide a container 27 which has an imperforate bottom 28, side walls 29—29, a front wall 30, and a rear wall 31. Projecting downwardly through and from the rear wall 31 I provide the pipes 32, which pass through the doors 26—26, said doors 26—26 being perforated to admit the passage of said pipes 32—32, as indicated by the numeral 33.

Beneath the container 27, the furnace of my invention is provided with the staggered partition walls 34, 35, 36 and 37, arranged as shown in Fig. 5, which are designed to form a flue for the outward passage of the products of combustion, in the direction indicated by the arrow in Fig. 3; the top of said flue being formed by the imperforate bottom 28 of the container 27 and the bottom of said flue being formed by the base-plate 38 with which the furnace is provided; the flue so formed being indicated by the numeral 39. The flue 39 in turn communicates with the flue 40 formed as shown in section in Fig. 3 and extending outwardly to a point beyond the ash-box 41. The ash-box 41 is provided with the front opening 42 and door 43.

The oven 15 is provided with the side openings 44—44 which in turn are provided with vertical sliding doors 45. The space between the oven bottom 16 and the straining pan 20 (indicated in Fig. 3 by the numeral 46) is also provided with side openings 47—47, which in turn are provided with sliding doors 48. The doors 45—45 are suspended by cords 49 passing over pulleys 50—50 and 51—51, the depending end of the cords 49—49 passing into the tubular guides 52—52, and the lower ends of said cords 49—49 being provided with weights 53—53. A like means of support is provided for the doors 48—48; these doors being provided with brackets 54—54, to the outer ends of which are attached the cords 55—55 passing over the pulleys 56—56 and provided at their outer ends with the weights 57, which weights are also contained in the guides 52 at one side of the doors 48, and 58 at the opposite side of said

doors 48. The doors 10 are hinged as indicated by the numeral 59 and provided with cords 60 passing over pulleys 61 and 62 and having weights 63 operating in the vertical guides 64.

5 The mode of operation of the device of my invention is as follows. The ore being placed in the oven 15, the metal freed from the ore by the action of heat from the fire-box 8 passes downwardly through the perforations 19 into the straining member 20—20. It is then further freed from impurities by passing through the perforations 21 into the container 27. The outer ends of
10 pipes 32 are plugged with clay in the manner usual to the art during the accumulation of the molten metal in the container 27. When the desired amount of metal has accumulated in said container 27, the pipes 32
15 are tapped by the removal of the fire-clay from their mouths and the free metal is drawn away to be cast in such forms as may be desired.

20 The top wall of the furnace 65 is provided with fire-proof material 66 and the doors 26—26 are similarly provided as indicated by the numeral 67. Similarly the front wall 68 is provided with fire-proof material as indicated by the numeral 69 and the side
25 walls 70—70 are similarly fire-proofed as indicated by the numeral 71. The doors

10—10 are provided with a lining of like fire-proof material as indicated by the numeral 72 and the doors 45 and 48 are similarly lined with fire-proof material as indicated by the numeral 73. The removable fire-proof wall 25 is supported by the removable transverse bar 74, and the side walls are connected by tie-bars 75.

Having thus fully described my invention, 40 what I claim as new and desire to have secured to me by the grant of Letters Patent, is:

In a smelting furnace, a fire-box; an oven having a perforate bottom; a straining 45 member mounted beneath said oven; a container mounted beneath said straining member; a flue extending downwardly from the oven; a second flue communicating therewith and extending beneath the container; 50 and another flue communicating with the last named flue and passing beneath the fire-box to the exterior of the furnace, substantially as described.

In testimony whereof, I have signed my 55 name to this specification, in presence of two subscribing witnesses.

MIRKO HIKEC.

Witnesses:

ALFRED A. EICKS,
WALTER C. STEIN.