J. P. OTT.

FURNACE CASING.

APPLICATION FILED JUNE 11, 1912.

1,167,104. Patented Jan. 4, 1916.

Fig. 1.

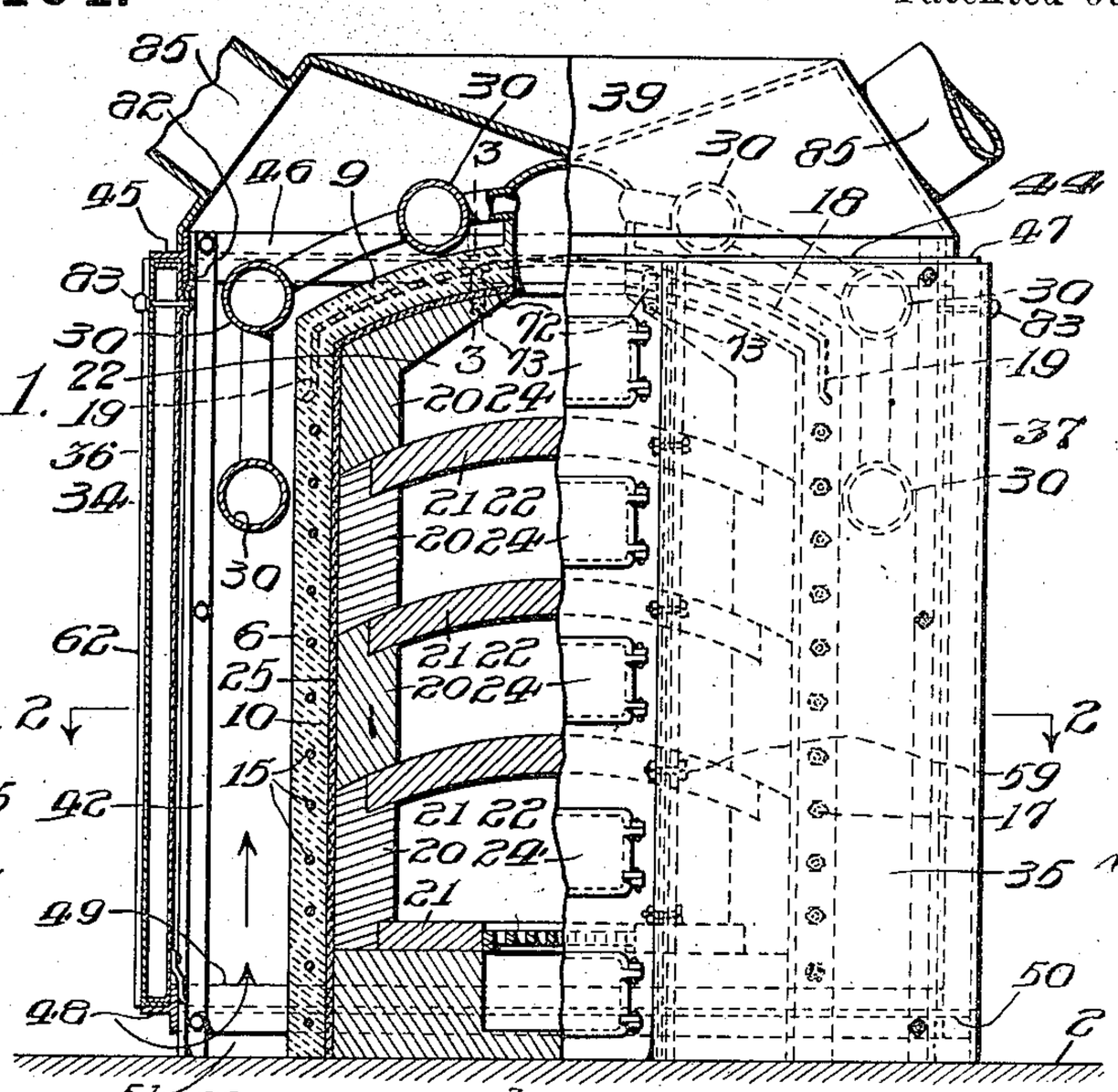


Fig. 4.

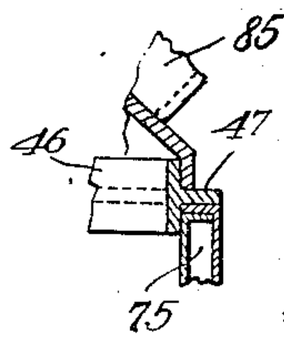


Fig. 5.

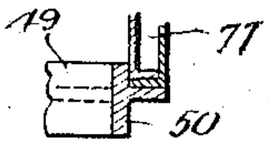


Fig. 2.

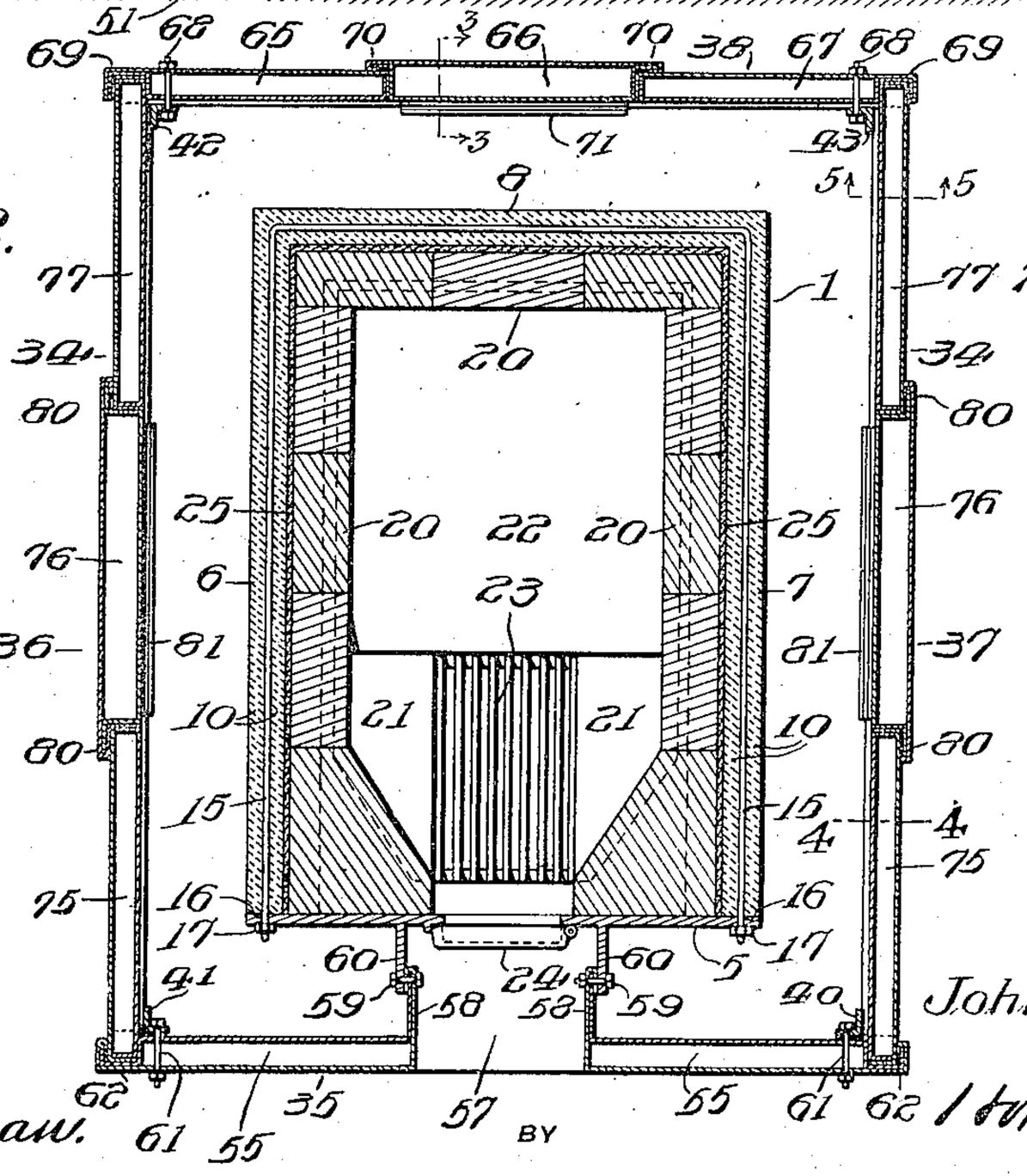
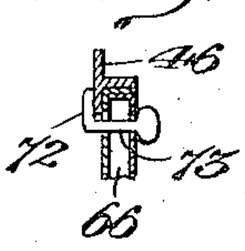


Fig. 3.



WITNESSES

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FURNACE-CASING.

1,167,104. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed June 11, 1912. Serial No. 702,980.

To all whom it may concern:

Be it known that I, JOHN P. OTT, a citizen of the United States, and a resident of the city of Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Furnace-Casings, of which the following is a specification.

The main objects of this invention are, to provide an improved furnace casing of simple, compact, durable, and relatively inexpensive construction, and which may be readily taken apart for making repairs, for cleaning, or for other purposes; and to provide other improvements as will appear hereinafter.

In the accompanying drawings, Figure 1 is a fragmentary front elevation partly in vertical transverse section of a furnace provided with a furnace casing constructed in accordance with this invention; Fig. 2 a horizontal section on line 2—2 of Fig. 1; Fig. 3 a fragmentary vertical longitudinal section of the rear upper portion of the furnace casing, the section being taken on line 3—3 of Fig. 1 and in a plane extending through one of the rotatable fingers 72 shown in dotted lines in Fig. 1; Fig. 4 is a fragmentary transverse section of the upper right hand portion of the furnace casing, the section being taken in a plane passing vertically through the line 4—4 of Fig. 2; and Fig. 5 is a fragmentary transverse vertical section taken through the right hand lower rear portion of the furnace casing on the line 5—5 of Fig. 2.

For securing the front plate 5 detachably in position, and for reinforcing the side walls 6 and 7 and the back wall 8, a plurality of horizontal rods 15 are embedded in the cement during the course of construction. Each of these rods 15 is preferably in the form of a yoke, which extends longitudinally through the side walls and back wall. The ends of each rod 15 project snugly through apertures 16 provided therefor in the front plate, and each end is provided with a nut 17 threaded therein outside of the front plate 5 for clamping the front plate in position.

For reinforcing the top cement wall 9 of the body 1, a plurality of horizontally spaced rods 18 are embedded transversely in the cement of this top wall, and each of these rods has downwardly bent ends 19 embedded and suitably anchored in the cement side walls 6 and 7.

The body 1 of the furnace has an interior lining 20 of removable sections of fire brick, or other suitable non-combustible material, surrounded and supported by which are a plurality of vertically spaced longitudinally horizontal fuel trays 21, of fire brick, or similar material, forming a plurality of inter-communicating combustion chambers 22. The lowest fuel tray is provided with the usual grate 23, below which is the usual ash pit.

The front plate 5 of the furnace is provided with a plurality of doors 24 hinged thereto and covering corresponding apertures through the plate, permitting access to the fuel trays.

To permit of the expansion and contraction of the fire brick lining with respect to the reinforced cement casing, a layer 25 of any suitable non-combustible yielding material is interposed between the cement casing and the fire brick lining in contact with each, and to insure the retention of a suitable amount of heat in the combustion chambers 22 for the slow combustion of fine or low grade fuel. This interposed layer 25 is preferably made of material that is a non-conductor or poor conductor of heat, asbestos being the material preferred. This layer 25 completely separates the cement casing from the fire brick lining.

Outside of and carried by the body 1 of the furnace are a plurality of heating drums 30, which are connected, as usual, to receive the gases of combustion from the combustion chambers 22, and to discharge the same into any suitable chimney or outlet.

Surrounding the body 1 of the furnace and the heating drums 30, and spaced therefrom, is a double outer casing 34 substantially rectangular and oblong in planular outline and consisting of a vertical front wall 35, two vertical side walls 36, 37, a vertical back wall 38, and a top wall or dome 39. The walls of this outer casing are preferably supported by a rectangular frame, preferably made of iron or steel beams and comprising four vertical angle irons, 40, 41, 42 and 43, arranged within the outer casing at its four corners respectively, and the lower ends of which rest upon the foundation 2 of the furnace. The upper ends of these vertical beams are rigidly

connected by four horizontal T beams, 44, 45, 46, and 47, forming a horizontal rectangular continuous upper frame, and the lower ends of the vertical beams are suitably connected by horizontal T beams 48, 49, and 50, forming a three-sided rectangular lower frame open in front. All of these T beams are preferably arranged with their base portions in vertical planes, and with their central webs extending outwardly with respect to the furnace from their base portions respectively. The lower frame 48, 49, and 50, is preferably spaced a short distance above the base 2 of the furnace to provide openings 51 for the admission of cold air from the space surrounding the furnace into the space between the double outer casing 34, and the cement inner casing 10 of the furnace.

The vertical walls of the double outer casing 34 of the furnace are preferably formed of a plurality of readily removable hollow sections of sheet metal, which are detachably secured to the rigid rectangular frame, 40 to 50. Of these walls, the front wall 35 is preferably formed of two vertical hollow sections 55 arranged in the same vertical plane upon opposite sides respectively of the front of the furnace and spaced apart horizontally to provide an opening 57 for access to the doors 24 of the furnace. Each of these front sections 55 is provided on its inner vertical margin with a flange 58, preferably integral therewith and formed by bending and bringing the opposite sides of the section together. This flange 58 projects rearwardly from its section toward the body of the furnace and is detachably clamped adjacent its inner edge, by means of bolts 59, to a vertical flange 60 provided therefor, and which projects outwardly from and is preferably integral with the front plate 5 of the body of the furnace. The outer vertical margin of each of these front sections 55 is detachably, by means of bolts 61 or otherwise, secured to the corresponding vertical angle iron 40 or 41, and is preferably provided with a flanged extension 62, preferably integral therewith forming a rearwardly opening transversely rectangular channel adapted to receive the vertical front marginal portion of a side section of the outer casing. The extension 62 is preferably formed by bringing the two sides of the section together and bending them to form the channel. The upper ends of these front sections fit snugly in the lower angle formed between the base and the web of the corresponding horizontal T beam 44.

The back vertical wall of the outer casing is preferably formed of three hollow sections 65, 66 and 67, arranged consecutively in horizontal series in the same vertical plane. These sections fit snugly between and are held against displacement vertically or horizontally inwardly by the horizontal central webs and the vertical base portions of the two corresponding horizontal T beams 46 and 49.

The outer vertical marginal portion of each of the outer back sections 65 and 67 is detachably secured by means of bolts 68 to the corresponding vertical angle iron 42 or 43, and the sides of the section are brought together and bent to form a flanged extension 69, preferably integral therewith forming a forwardly opening transversely rectangular channel adapted to receive a vertical edge of a side section. The central section 66 of the back wall is provided upon its outer side with two oppositely disposed vertical marginal flanges 70 which engage against the outer surfaces of the adjoining hollow sections to hold the latter sections in position. The marginal flanges are preferably formed by bringing the two opposite side walls of the section together, and overlapping the edge of one side wall with the marginal portion of the other side wall. The central section 66 is held detachably against withdrawal rearwardly by means of a suitable flange 71 rigidly secured to the inner surface of the central section adjacent the lower margin thereof and overlapping the inner surface of the corresponding lower T beam, and by means of corresponding rotatable fingers 72 engaging the inner surface of the upper T beam and rigidly mounted on bolts 73 extending through the section. The central section preferably has a short amount of movement vertically between its T beams to permit of its ready removal or adjustment.

Each side wall 36 and 37, of the outer casing, is preferably composed of three hollow sections, 75, 76 and 77 arranged consecutively in horizontal series in the same vertical plane. Each of these sections fits between and is held against displacement vertically or horizontally inwardly by the corresponding T beams 45 and 48 or 47 and 50. The central one, 76, of these sections is similar in construction to the central section 66, hereinbefore described, of the back wall, and is provided, as hereinbefore described, with two oppositely disposed vertical marginal flanges 80 integral therewith, which engage against the outer surfaces of the adjoining sections 75 and 77. The central side section 76 is also provided with a flange 81 rigid therewith which overlaps and engages the corresponding lower T beam 48 or 50 and with fingers 82 rigidly mounted upon the inner ends of rotatable bolts 83 extending through the sections, the fingers being arranged to be readily rotated by the bolts into or out of engagement with the inner surfaces of the corresponding upper T beam 45 or 47. The outer sections 75 and 77 fit snugly in the corresponding

channels formed by the flanged extensions 62 and 69, and are held securely in position solely by the corresponding central section 76.

From the foregoing, it is evident that by simply turning the bolt 83, the central section 76, and then the adjoining sections 75 and 77, may all be readily removed, and that all of the sections of the outer casing may be easily and quickly detached and removed to permit access to the interior portions of the furnace, or for any other purpose.

The top wall or dome 39 of the outer casing preferably telescopes snugly over the upper portion of the upper rectangular frame, and rests upon the central webs of the T beams 44, 45, 46 and 47 composing the frame. The usual pipes 85 lead from the dome to deliver the heated air from the furnace.

Having thus fully described this invention, I claim and desire to protect by Letters Patent of the United States:

1. A furnace casing including beams forming a frame, and hollow sections carried by said beams and detachably secured thereto, said sections including a group of three sections, two of which are held in position by the third located between said two, said third section being detachably connected to said frame, and said two sections being freely removable upon the removal of said third section.

2. A furnace casing comprising a frame, and hollow sections carried by said frame and detachably secured thereto, said sections including a group of three sections, two of which are held in position by the third located between said two, said third section being detachably connected to said frame and said two sections being freely removable upon the removal of said third section.

3. A furnace casing consisting of a frame comprising vertically spaced substantially horizontal beams, a plurality of wall sections extending between said beams and supported thereby, said wall sections including a group of three consecutive sections arranged in horizontal series, the central section of said group being detachably connected to said beams and being arranged to hold the other two sections of said group in position, said two sections being freely removable from said beams upon the removal of said central section.

4. A furnace casing comprising a frame, including spaced horizontal parallel beams arranged in vertical alinement, and a hollow sectional wall fitting between said beams in a plane therewith, and supported by the lower one of said beams, said wall including a group of three hollow wall sections, two of which are held against withdrawal from said frame, solely by the third of said sections, said third section being located between said two sections, and being detachably connected to said horizontal beams.

5. A furnace casing comprising two vertically spaced horizontal beams, vertical beams secured to said horizontal beams and holding the latter in spaced relationship, and hollow sheet metal wall sections arranged between and in the plane of said horizontal beams, said sections including a group of three sections, one of which is located between and is provided with flanges overlapping the other two sections, and means detachably connecting said section to said horizontal beams.

6. A furnace casing comprising a frame, including two spaced horizontal parallel beams arranged in vertical alinement, and two horizontally spaced vertical beams connected to said first mentioned beams, and a hollow sectional wall fitting between said horizontal beams in a plane therewith and supported by the lower one of said horizontal beams, said wall including a group of three hollow interlocking wall sections, two of which are held in position with respect to said beam by the third of said sections, said third section being located between said two sections and being provided with means removably holding the same in position with respect to said beams.

In witness whereof, I have hereunto set my hand this 10th day of June, A. D., 1912.

JOHN P. OTT.

Witnesses:
A. IRWIN GARDNER,
ALEXANDER PARK.

Correction In Letters Patent No. 1,167,104.

It is hereby certified that in Letters Patent No. 1,167,104, granted January 4, 1916, upon the application of John P. Ott, of Philadelphia, Pennsylvania, for an improvement in "Furnace-Casings," an error appears in the printed specification requiring correction as follows: Page 1, between lines 36 and 37, insert the following paragraph:

Referring to the drawings, one embodiment of this invention is shown as applied to a furnace including a hollow body or main portion 1, substantially rectangular and oblong in planular outline and resting upon a suitable flat foundation 2. The body 1 comprises a vertical front plate 5, vertical side walls 6 and 7, a vertical back wall 8 and a longitudinal horizontal and transversely arched top wall 9. The front plate 5 is preferably made of cast iron, or other similar material, and the side, back and top walls are preferably made of a continuous layer or casing 10 of cement or concrete, which will be referred to hereinafter as the inner casing of the furnace.;

and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 7th day of March, A. D., 1916.

[SEAL.]

J. T. NEWTON,

Acting Commissioner of Patents.

Cl. 126–114.