No. 750,114. PATENTED JAN. 19, 1904.

T. F. MEINHARDT.

HOT AIR FURNACE.

APPLICATION FILED MAY 23, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

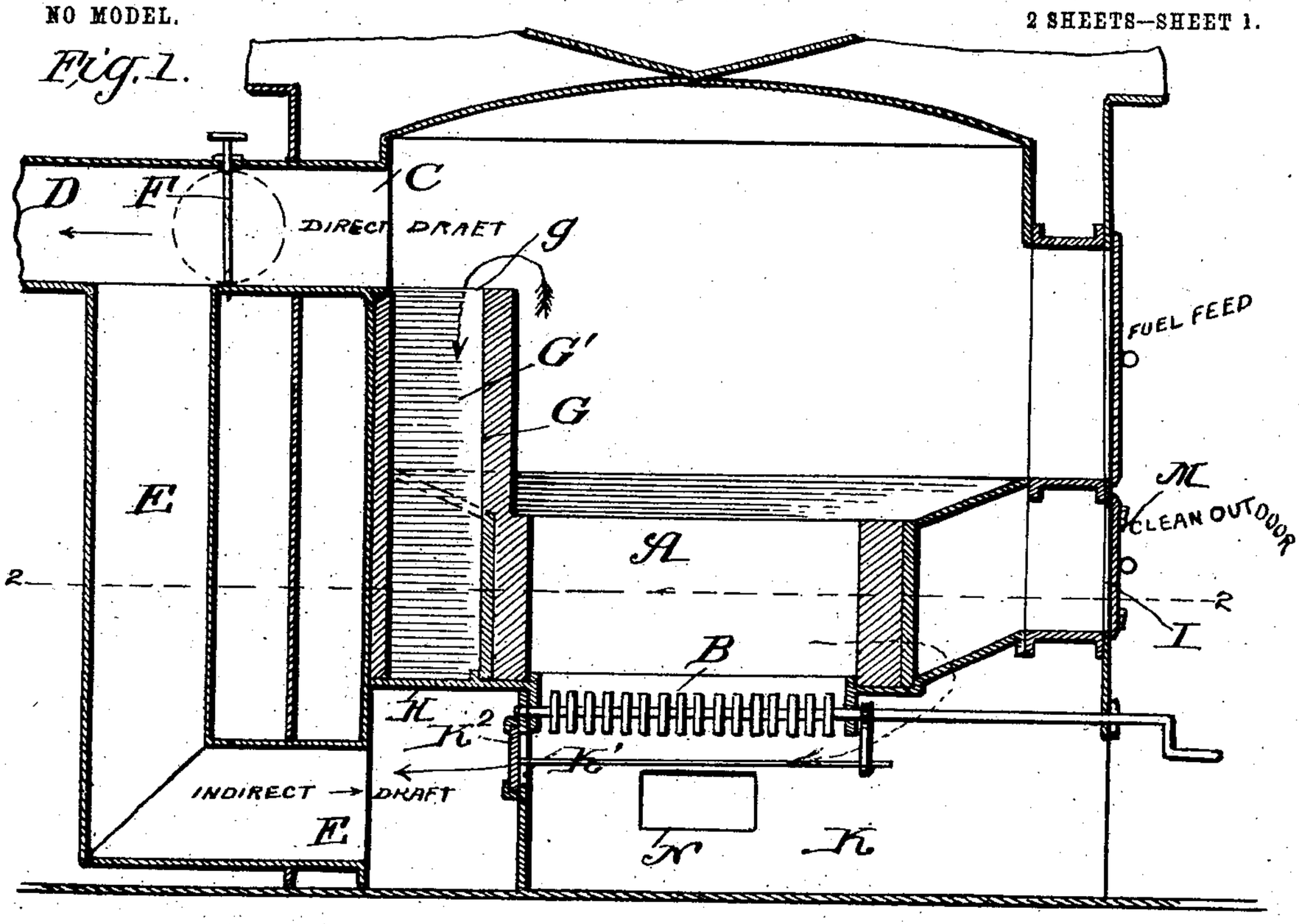
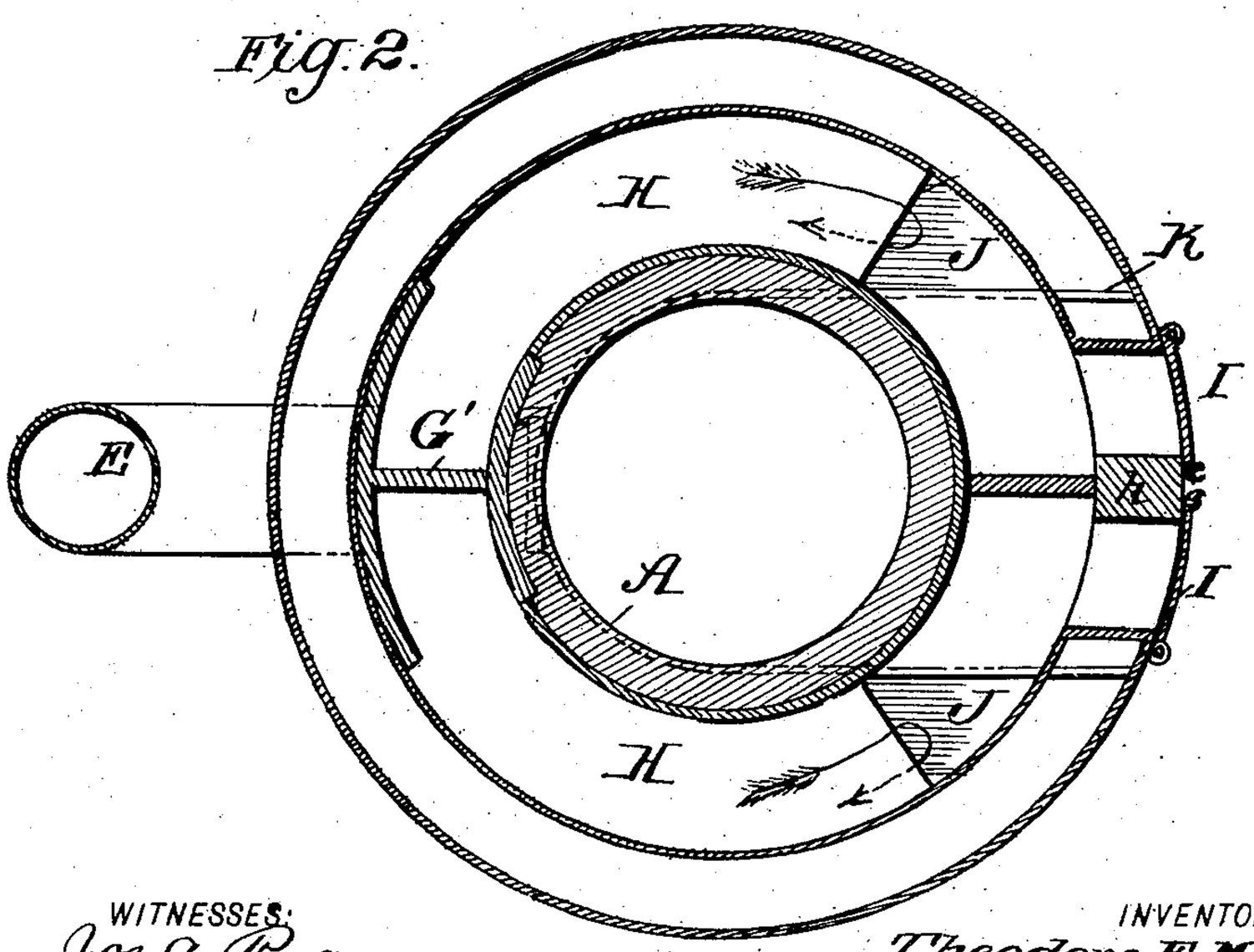


Fig. 2.



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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3

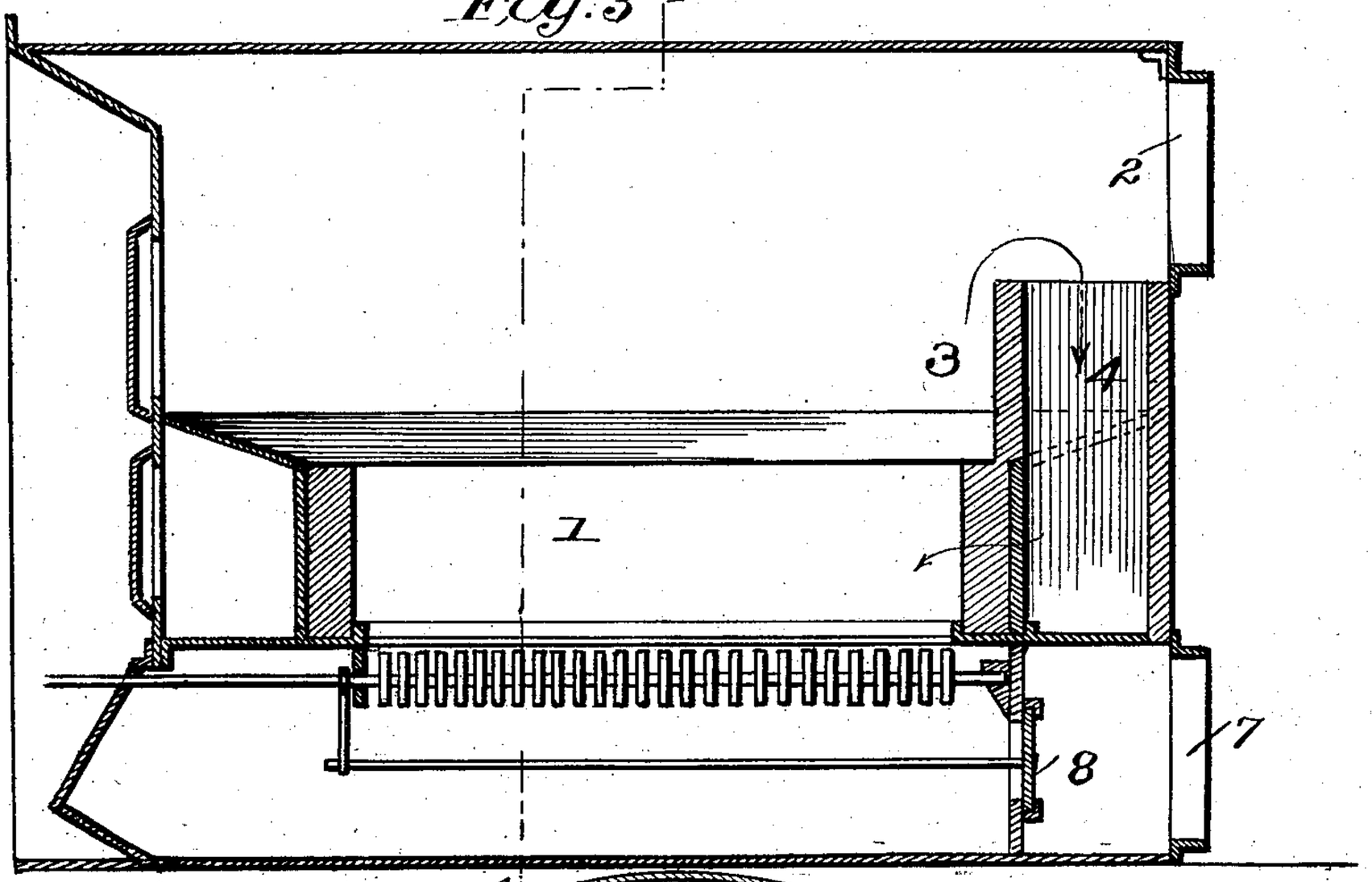
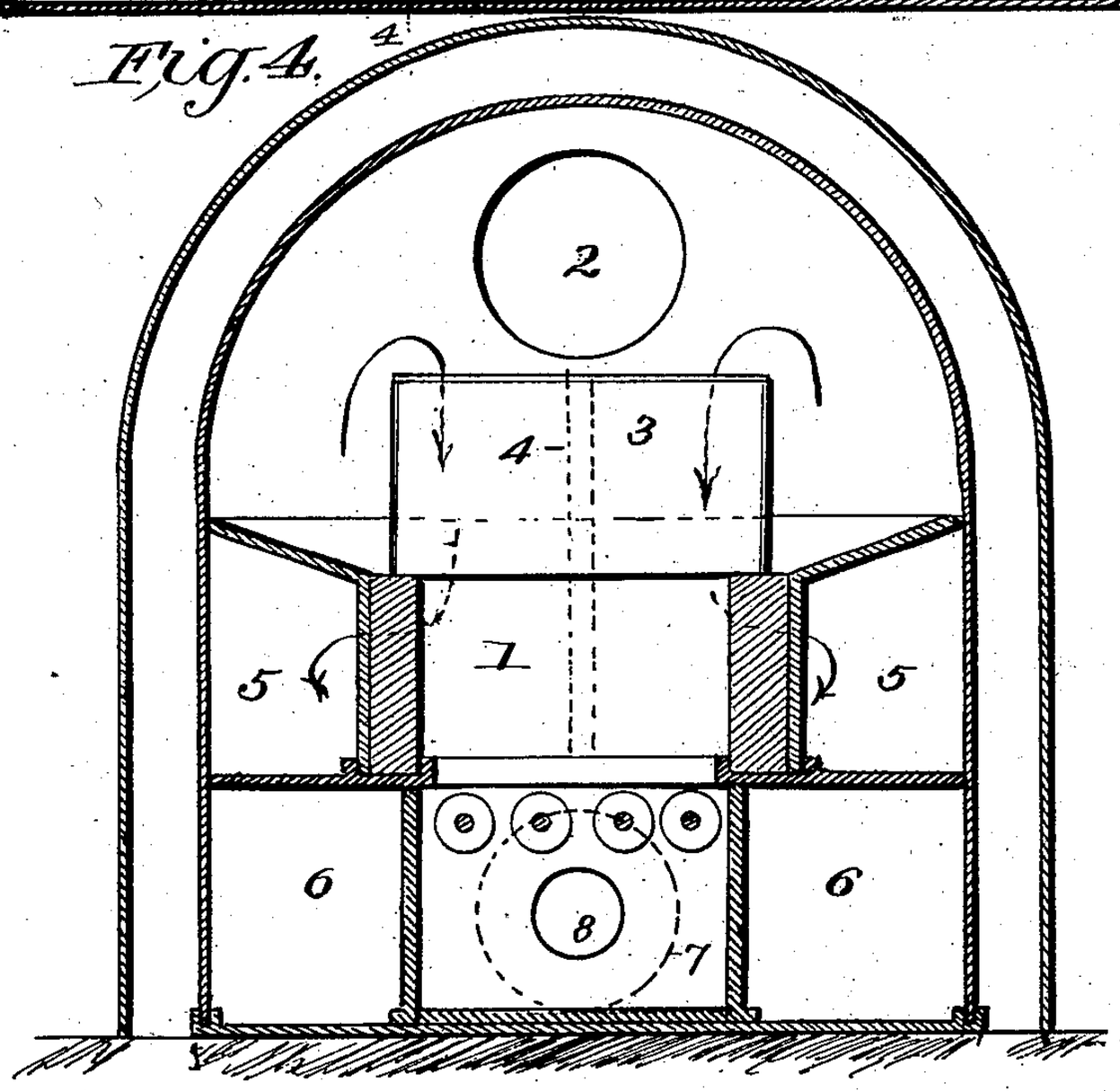


Fig. 4.



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UNITED STATES PATENT OFFICE.

THEODORE F. MEINHARDT, OF CHARLOTTESVILLE, VIRGINIA.

HOT-AIR FURNACE.

SPECIFICATION forming part of Letters Patent No. 750,114, dated January 19, 1904.

Application filed May 23, 1903. Serial No. 158,482. (No model.)

To all whom it may concern:

Be it known that I, THEODORE F. MEINHARDT, a citizen of the United States, residing at Charlottesville, in the county of Albemarle and State of Virginia, have made certain new and useful Improvements in Hot-Air Furnaces, of which the following is a specification.

My invention is an improvement in hot-air furnaces, and particularly in that class of such furnaces wherein the products of combustion are caused to traverse a somewhat circuitous passage in order to extract as far as possible all the heat units; and the invention consists in certain novel constructions and combinations of parts, as will be hereinafter described and claimed.

In the drawings, Figure 1 is a vertical longitudinal section, and Fig. 2 a cross-section on about the line 2 2 of Fig. 1, of a cylindrical furnace embodying my invention. Fig. 3 is a vertical longitudinal section, and Fig. 4 a vertical cross-section on about the line 4 4 of Fig. 3, of a horizontal or an oblong furnace embodying my invention.

Furnace may be made of steel, wrought or cast iron, or other material, in one piece or in several sections, as may be desired.

By my invention I cause the products of combustion to travel in a circuit around the hot fire-pot, where they come in direct contact with the outer side of the hot cast-iron linings, after which the products of combustion are directed down at the front to flues alongside the ash-pan and return thence to the rear of the furnace, means being provided whereby the combustion is equally divided, so that one half of the products will travel around one side of the fire-pot and ash-pan and the other half around the other side, separating-divisions being provided at the front and rear of the upper and lower drums in order to secure the desired division of the products, and clean-out doors being provided, as presently described.

By my invention I provide in a hot-air furnace an upper drum or covered passage extending from the rear to the front of the furnace on opposite sides of the fire-pot, and a lower drum or covered passage on opposite sides of the ash-pan extending from front to rear of the furnace, such drums including flues on opposite sides of the fire-pot and ash-pan chamber, and the lower flues communicating at their front ends with the front ends of the flues extending alongside the fire-pot, as will be more fully described.

In the construction shown in Figs. 1 and 2 the furnace has a fire-pot A, a grate B, an upper or direct-draft flue C, leading to the offtake D, and a lower or indirect-draft flue E leading to the offtake D, a damper F being provided to open or close the direct-draft flue C in the different operations of the furnace. At the rear of the furnace and at the rear of the fire-pot A, I provide a down-flue G, extending above the fire-pot A and opening at its upper end g' a considerable distance above the said fire-pot and discharging at its rear end to the side flues H of the upper drum, such flues H extending forwardly on opposite sides of the fire-pot A to a point on opposite sides of the clean-out door I and communicating at their front ends with the front ends of the flues J of the lower drum. These flues J of the lower drum extend rearwardly on opposite sides of the ash-pan chamber K and discharge at their rear ends to the indirect-draft flue E, as will be understood from Figs. 1 and 2 of the drawings. The down-flue G has a central vertical partition G′, which is continued downwardly at the rear side of the upper drum and operates to divide the products of combustion discharged from the fire-pot and to deliver them in separated portions to the opposite flues H of the upper drum, as will be understood from Figs. 1 and 2, the products being thus discharged in equal portions to the opposite flues H and directed thence toward the front of the furnace, where they discharge to the flues of the lower drum, which flues extend around the ash-pan chamber K and discharge at their rear ends to the indirect-draft flue, as before described. It will be noticed that I thus provide a particular course for the products of combustion, causing them to travel to the front along the opposite sides of the fire-pot and over the hot cast-iron linings thereof, and then to dive down and pass rearwardly around the ash-pan to their con-

nection with the indirect flue, the hot-air space L of the furnace encircling the upper and lower drums and operating to withdraw the heat units therefrom as far as possible. At the rear side K′ of the ash-pan chamber K and in line with the indirect-draft flue E, I provide a dust-flue door K^2, controlling an opening K′ at the rear of the ash-pan chamber, which can be opened to take off the dust of the ashes in shaking the furnace. I also provide clean-out doors I for the upper drum and N for the lower drum, as will be understood from Fig. 1 of the drawings.

In Figs. 3 and 4 I illustrate the invention embodied in a horizontal or oblong type of furnace in which the fire-pot 1 communicates at its lower end with the direct-draft flue 2. The upright flue 3 at the rear side of the fire-pot conveys the products of combustion down, dividing them by means of a partition 4 and delivering them to the flues 5 of the upper drum, said flues extending on opposite sides of the fire-pot from the rear to the front of the furnace and discharging the products at their front ends down to the front ends of the flues 6 of the lower drum, such flues 6 conveying the products rearwardly on opposite sides of the ash-pan chamber and discharging them to the lower or indirect-draft flue 7, the dust-door 8 being arranged at the rear of the ash-pan chamber in communication with the indirect flue 7, as will be understood from Figs. 3 and 4 of the drawings.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The improvement in furnaces herein described, consisting in the combination with the fire-pot, the ash-pan chamber below the same, and the direct and indirect draft connections, of the down-flue at the rear side of the fire-pot and extending at its upper end within the fire-pot and having an intermediate upright partition dividing it into two upright flue-sections, the upper drum having flues communicating at their rear ends with the flue-sections of the upright flue and extending thence forwardly around the opposite sides of the fire-pot and discharging at their front ends to the flues of the lower drum, the lower drum having flues communicating at their front ends with the front ends of the flues of the upper drum and extending thence rearwardly on opposite sides of the ash-pan chamber, and discharging at their rear ends to the indirect-draft connection, and the dust-door at the rear side of the ash-pan chamber in communication with the indirect-draft connection, and the hot-air chamber outside the said upper and lower drums, substantially as set forth.

2. In a hot-air furnace, the combination of an upper drum or covered passage, extending from the rear to the front of the furnace, on opposite sides of the fire-pot, and a lower drum or covered passage on the opposite sides of the ash-pan extending from front to rear of the furnace for the course of the products of combustion and the down-flue at the rear side of the fire-pot having an intermediate partition dividing it into upright flue-sections discharging independently at their lower ends to the opposite sides of the upper drum.

3. The combination of the fire-pot, and the down-flue at the rear side thereof, and divided into independent upright flue-sections, the upper drum having the opposite flues communicating at their rear ends with their respective upright flue-sections and extending thence forwardly on oppposite sides of the fire-pot, the lower drum having side flues communicating at their front ends with the front ends of the upper drum-flues and extending thence rearwardly on opposite sides of the ash-pan chamber, and indirect-draft connections with the rear ends of said flues, substantially as set forth.

4. The combination of the fire-pot, an upper drum or covered passage extending from the rear to the front of the furnace on opposite sides of the fire-pot, and a down-flue at the rear side of the fire-pot and extending at its upper end above the fire-pot and provided with an intermediate upright partition dividing it into upright flue-sections discharging at their lower ends to their respective side portions of the upper drum or covered passage, substantially as set forth.

THEODORE F. MEINHARDT.

Witnesses:
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