

No. 610,273.

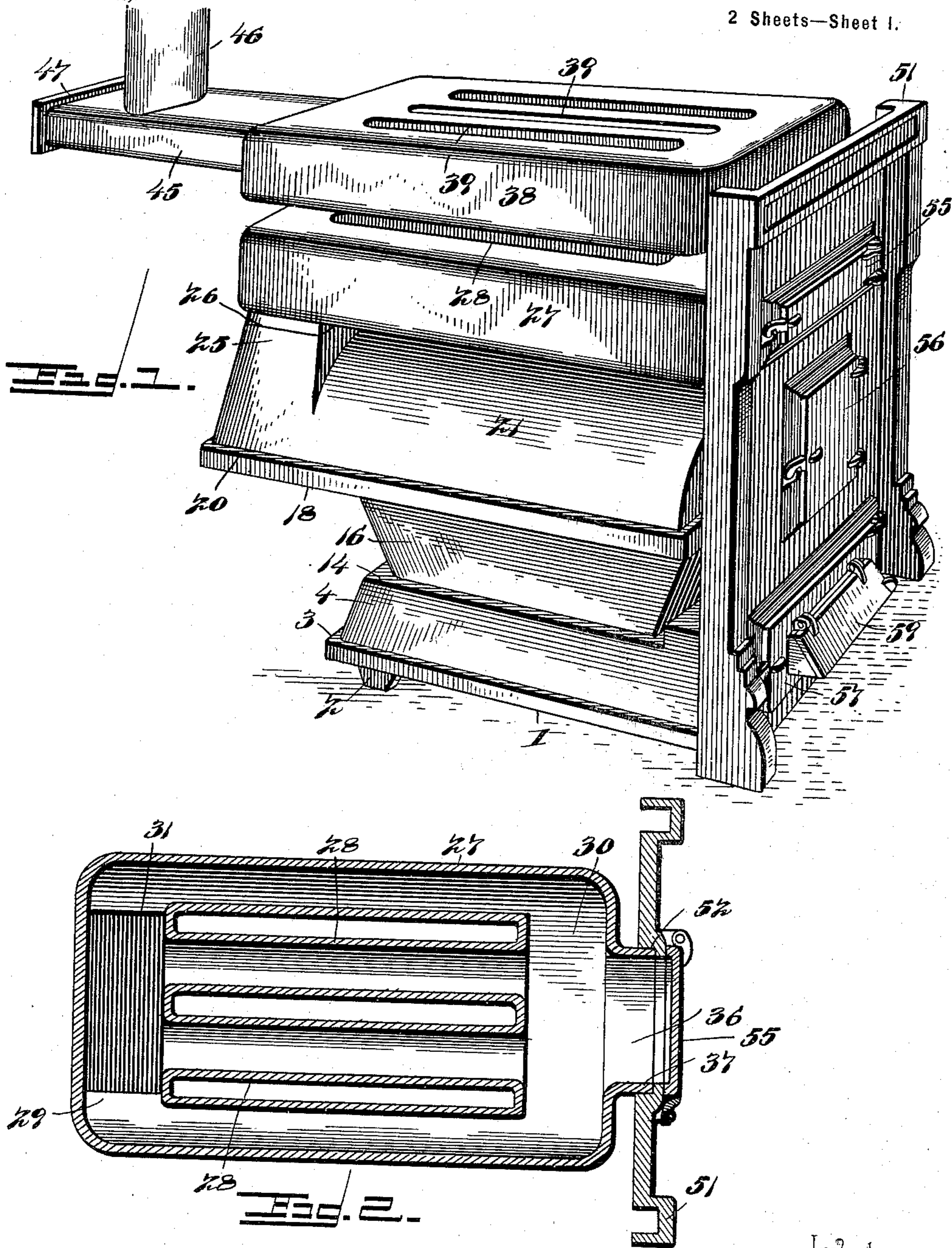
Patented Sept. 6, 1898.

J. P. MOLBY.
HEATING FURNACE.

(Application filed Mar. 5, 1897.)

(No Model.)

2 Sheets—Sheet 1.



Inventor

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Witnesses

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By *W. S.* Attorneys,

C. A. Snow & Co.

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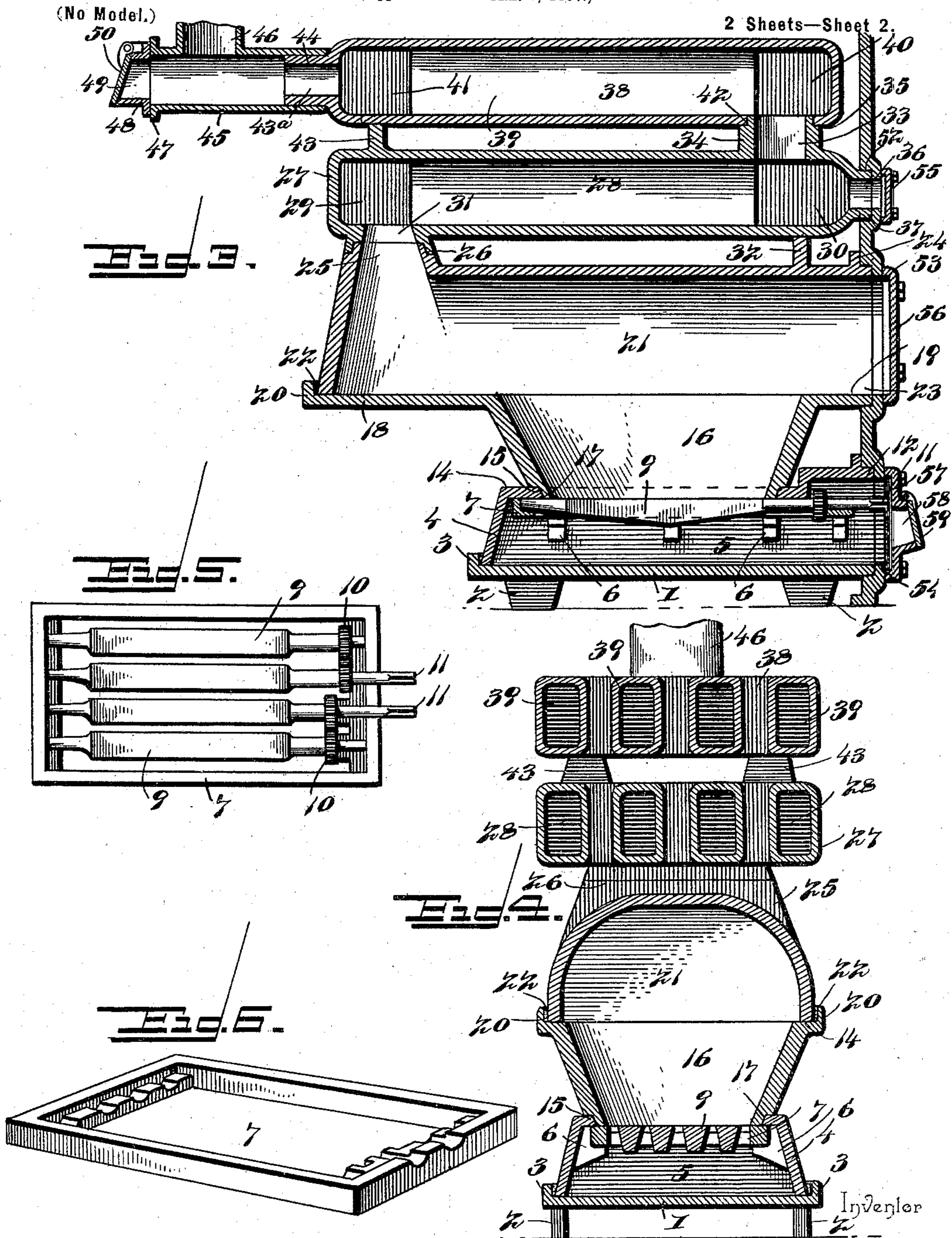
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UNITED STATES PATENT OFFICE.

JOSEPH P. MOLBY, OF CAMBRIA, MICHIGAN.

HEATING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 610,273, dated September 6, 1898.

Application filed March 5, 1897. Serial No. 626,134. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH P. MOLBY, a citizen of the United States, residing at Cambria, in the county of Hillsdale and State of Michigan, have invented a new and useful Heating-Furnace, of which the following is a specification.

This invention relates to hot-air furnaces, the object being to improve the construction of furnaces of this character whereby the parts of which the furnace is composed may be readily disassociated for the purposes of repair, and, further, to increase the radiating-surface whereby the greatest benefit will be derived from the fuel consumed.

With these and other objects in view the invention consists in the novel features of construction and combination of parts hereinafter fully described, and particularly pointed out in the claims.

In the drawings, Figure 1 is a perspective view of a furnace made in accordance with my invention. Fig. 2 is a horizontal section. Fig. 3 is a vertical longitudinal section. Fig. 4 is a vertical transverse section. Fig. 5 is a plan view of the grate removed from the furnace. Fig. 6 is a detail perspective view of the grate-frame detached.

Similar reference-numerals indicate similar parts in the several figures.

1 represents a base-plate provided with suitable feet 2 to elevate it a short distance above the floor. This plate is provided on three sides with a vertical flange, (indicated by 3.) 4 represents a casing open at its bottom and front end and adapted to be supported on the base-plate 1, with the flange 3 closely engaging the lower edges of its sides and rear end. This casing, in conjunction with the base-plate, forms the ash-pit 5 of the furnace. The sides of the casing are provided on their interior surfaces with a series of lugs 6, adapted to support the grate-frame 7, which may be slid in and out of position through the open end 8 of the casing 4.

Supported in the grate-frame 7 are a series of grate-bars 9, each bar being provided with a gear 10, the gears of the adjacent bars meshing with each other. One or more of these bars has a stem 11, projecting beyond the front end of the frame 7, adapted to receive a key, by means of which the grate-bars may

be rocked in their bearings for the purpose of shaking the ashes into the ash-pit. The front end of the casing 4 is in alinement with the front edge of the base-plate 1, and a short distance to the rear of the end of the casing said casing is provided with an outwardly-projecting flange, (indicated by 12.) The front portion of the casing is somewhat elevated above the main portion of the casing, as indicated at 13, and in the depressed part 14 of the casing an opening 15 is formed, substantially corresponding in area to the area of the grate-frame 7.

16 represents the fire-pot, the sides of which incline outwardly toward their upper edges. The lower edge of the fire-pot is rabbeted, as indicated at 17, to permit it to fit into the opening 15 and also be supported on the upper surface of the casing 4. From the rear wall of the fire-pot a horizontal shelf 18 extends, said shelf being the full width of the fire-pot. From the middle portion of the front wall of the fire-pot a horizontal shelf 19 extends, and this shelf forms the bottom wall of the opening, through which fuel is fed into the fire-pot. An upwardly-projecting flange 20 extends entirely around the fire-pot and the shelves, except the front edge of the shelf 19 and a small portion of each of its sides.

21 represents the combustion-chamber, the main body portion of which is semicylindrical in form, and this chamber is supported upon the upper edges of the fire-pot and upon the rear shelf 18 just within the flange 20, to which flange it may be bolted, if desired. Cement or other suitable sealing material 22 may be employed to fill up and seal any space between the flange 20 and the lower edge of the combustion-chamber to effectually prevent the escape of smoke or gas at the joint. At the front end of the combustion-chamber 21 an extension 23 is formed, which rests upon the front shelf 19 and forms the opening through which the fuel is fed into the fire-pot. Just in the rear of the front of this extension an outwardly-projecting flange 24 is formed integral on the extension, and this flange is in alinement with the ends of the flange 20. The rear end of the combustion-chamber is provided with an upward extension or flange 25 for the escape of the products of combustion. The upper end of the

extension 25 is rectangular in form and is rabbeted, as indicated at 26.

27 represents a radiator consisting of a series of spaced tubes 28, opening at each end into chambers 29 and 30. The rear chamber 29 is provided with an opening 31, into which the upper end of the extension 25 projects, and the rear end of the radiator is supported on this extension. The front end of the radiator is supported on a lug 32, projecting upwardly from the front end of the combustion-chamber 21. The lug 32, which is formed integral with the combustion-chamber and which forms a support for the front end of the lower radiator 27, holds the latter out of contact with the top of the combustion-chamber and provides an intervening space between the two parts. The extension 25 supports the rear end of the lower radiator above the combustion-chamber. The front chamber 30 of the radiator 27 is provided with an opening 33, and around this opening is an upwardly-projecting flange 34, which flange is rabbeted at its upper edge, as indicated by 35. The chamber 30 is also provided with an opening 36 in its front wall, and the outwardly-projecting flange 37 is formed around this opening. The opening 36 is for the purpose of affording access to the radiator for the purpose of removing dust, soot, &c., that may accumulate therein.

38 represents another radiator, consisting of a series of spaced tubes 39, communicating at their front and rear ends, respectively, with chambers 40 and 41. The front chamber 40 is provided with an opening 42, into which the flange 34 extends, and the front end of this radiator is supported by the shoulder formed upon the flange 34 by the rabbet 35. The rear end of this radiator is supported upon lugs 43, which project upwardly from the rear end of the radiator 27. The lugs 43 and the upwardly-projecting flange 34 support the upper radiator above and out of contact with the lower radiator and provide an intervening space similar to that between the lower radiator and the combustion-chamber. The rear end of the chamber 41 is provided with an opening 43, around which an outwardly-projecting flange 44 is formed, and on this flange a tubular extension 45 is fitted, from which extension the smoke-flue 46 leads. A frame 47 is removably fitted in the rear end of the tube 45, and a door 48 is hinged on this frame and thereby closes the rear end of the tube 45. The door 48 is also provided with an opening 49, which is closed by the hinged lid 50. The door 48 affords access to the tube 45 and to the radiator 38 for the purpose of removing soot, dust, &c., that may accumulate therein.

51 represents the front of the furnace. This front is provided with openings 52, 53, and 54, into which project the flange 37, the front end of the extension 23, and the front end of the casing 4, respectively. The rear face of the front 51 engages the flanges 12 and 24,

and the parts are thereby held in position relatively to each other. On the front face of the casing-doors 55, 56, and 57 are hinged to close the openings 52, 53, and 54, respectively. The door 55 gives access to the end of the radiator 27 for the purpose of cleaning it. The door 56 gives access to the fire-pot, and the door 57 affords access to the ash-pit. The door 57 is provided with an opening 58 for the admission of draft to the fire, and this opening is closed by a hinged lid 59, which may be opened as occasion demands.

The radiators 27 and 38 will each be cast in one piece, thereby avoiding any seams or joints in their make-up and so preventing the escape of gas or smoke from them. The combustion-chamber will also be cast in one piece, as will the fire-box and its shelf extensions and flange. The casing 4, with its flange and lugs, will also be cast in one piece, as will also the base-plate, with its flange and feet. When the parts are fitted together, cement or other sealing material may be filled in the joints to effectually prevent the escape of gas or smoke, which is a very important thing in a hot-air furnace.

The front of the furnace is provided with ears to which the several doors are hinged and with catches with which the latches of the doors engage. These ears and catches will preferably be cast integral with the furnace-front, and it is evident the doors may be readily attached in place.

From the foregoing description it will be seen that a furnace made in accordance with my invention will present a very extended radiating-surface and that by causing the products of combustion to circulate through the radiators the heat generated by the fire will be more fully utilized, and thereby effect a great saving in fuel. It is also obvious that the several parts constituting the furnace may be easily disassociated for the purpose of repair and that they may be so assembled as to practically exclude the escape of any gas or smoke from the furnace.

It will be understood that changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having thus described the invention, what I claim is—

1. In a heating-furnace, the combination with a casing forming the ash-pit, of a grate supported therein below the top wall thereof, said casing having an opening in its top wall over the grate, a fire-pot supported in said opening and having a shelf extending from the rear thereof, a flange around said shelf and fire-pot, and a combustion-chamber removably supported upon said shelf and fire-pot within the flange, substantially as described.

2. In a heating-furnace, the combination of a fire-pot consisting of a single casting and

provided at its back with a horizontal shelf, a combustion-chamber supported upon the fire-pot and the shelf thereof and consisting of a single casting provided at its rear end with an upper opening located above said shelf, a lower radiator 27 composed of a horizontal series of tubes and consisting of a single casting provided at its front end with an upper opening and having a lower opening at its rear end registering with that of the combustion-chamber and connected with the latter by a joint, an upper radiator 38 composed of a horizontal series of tubes and consisting of a single casting provided at its front end with an opening communicating with the upper opening of the lower radiator and connected with the same by a joint, and supports holding the upper and lower radiators out of contact with each other and maintaining the lower radiator out of contact with the combustion-chamber and providing intervening spaces between such parts, substantially as described.

3. In a heating-furnace, the combination of a fire-pot having a shelf extending from the rear thereof, a combustion-chamber supported upon the fire-pot and the shelf thereof and provided at its rear end with an opening offset from the fire-pot and located above the shelf, said combustion-chamber being provided with an upwardly-extending flange 25 surrounding the opening, the lower radiator

27 composed of a horizontal series of tubes and consisting of a single casting provided at the bottom of its rear end with an opening receiving the upwardly-extending flange 25, a support interposed between the front end of the lower radiator 27 and the combustion-chamber and cooperating with the flange 25, to hold the said lower radiator out of contact with the combustion-chamber and to provide an intervening space between them, the upwardly-extending flange 34 formed integral with the top of the lower radiator 27 and surrounding an opening at the front end of the same, an upper radiator 38 composed of a horizontal series of tubes and consisting of a single casting provided at its front end with a bottom opening receiving the flange 34 of the lower radiator, and a support interposed between the rear ends of the upper and lower radiators and cooperating with the flange 34 to hold the upper radiator out of contact with the lower one and to provide an intervening space between the radiators, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOSEPH P. MOLBY.

Witnesses:

RUSSELL E. CONVERSE,
GEO. D. HARDING.