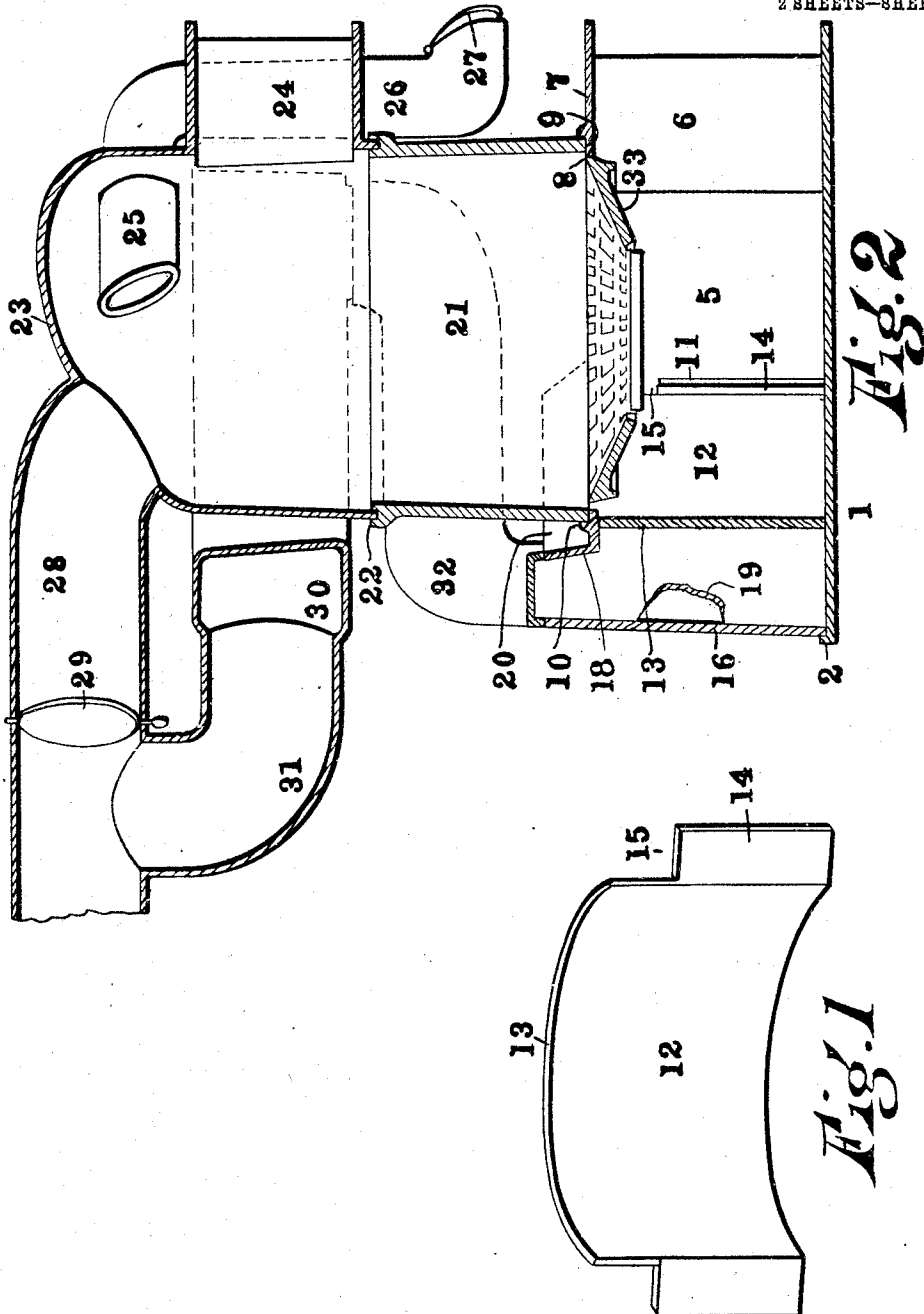


H. J. HOUGH & J. B. CROWL.
FURNACE.
APPLICATION FILED APR. 14, 1909.

959,141.

Patented May 24, 1910.

2 SHEETS—SHEET 1.



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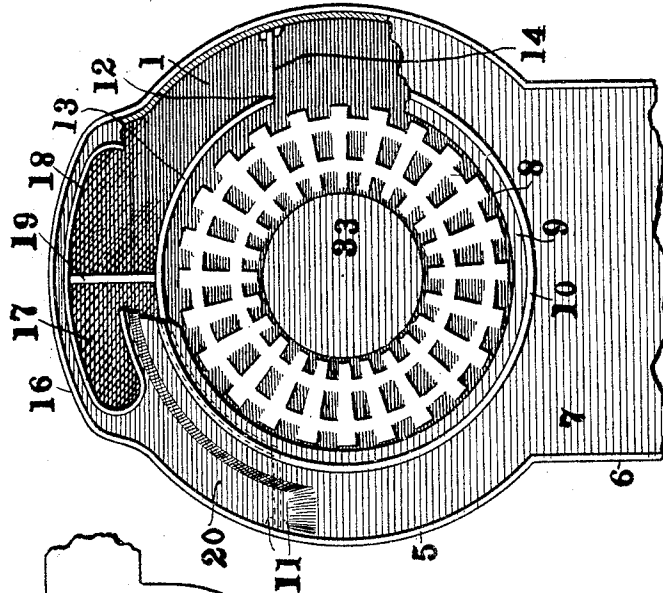


Fig. 4

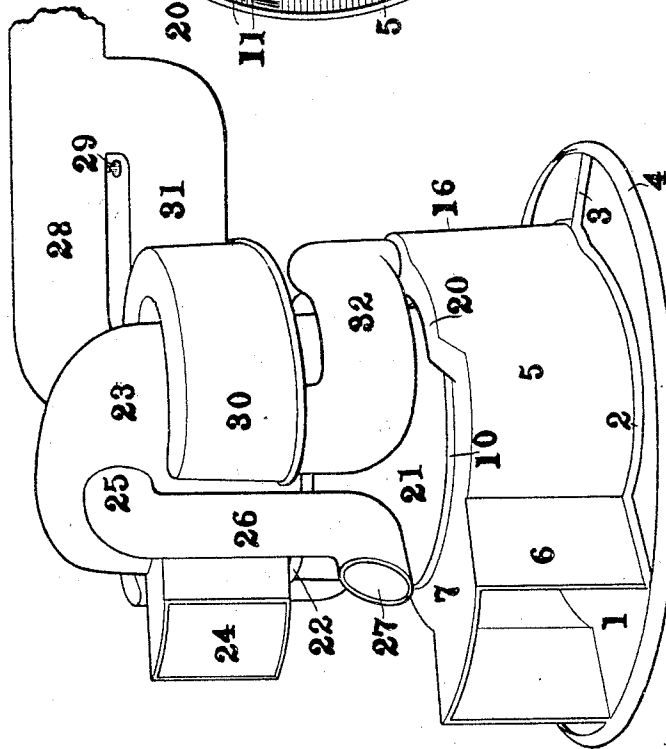


Fig. 3

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FURNACE.

959,141.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, HIRAM J. HOUGH, of Akron, Summit county, Ohio, and JOHN B. CROWL, of Alliance, Stark county, Ohio, citizens of the United States, have invented new and useful Improvements in Furnaces, of which the following is a specification.

This invention relates to warm air furnaces for heating buildings, apartments, etc. and the object thereof is to construct a device provided with flues whereby the products of combustion may be conducted thence by a circuitous path to give greater radiating surface to the furnace with the idea of more intensely heating the air inclosed by the furnace casing.

A further object of the invention is to construct the offtake flues for the furnace in such a manner that the products of combustion from the combustion chamber will pass downwardly into the ash-pit and be there deflected laterally to bring them into contacting engagement with the side walls thereof in order to heat the latter, thereby constituting the ash-pit a portion of the radiating surface of the furnace, the products of combustion from the ash-pit being carried from thence upwardly by a circuitous path to the direct offtake flue of the furnace.

A still further object is to place in the ash-pit of the device a deflecting member so disposed that the products of combustion entering the ash-pit from the combustion chamber will be deflected laterally thereby, into contact with the lateral walls of said ash-pit.

With the foregoing and other objects in view, the invention consists in the novel construction, combination and arrangement of parts constituting the invention to be hereinafter specifically described and illustrated in the accompanying drawings which form a part hereof wherein is shown the preferred embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

In the drawings, in which similar reference numerals indicate like parts in the different figures: Figure 1 is a perspective view of a deflecting member used in the ash-pit of a furnace embodying this invention. Fig. 2 is a vertical, central, sectional view of a

furnace embodying this invention. Fig. 3 is a perspective view of the furnace shown in section in Fig. 2; and, Fig. 4 is a plan of so much of an ash-pit with a portion broken away to illustrate the use of the same in connection with the furnace shown in Fig. 3 embodying this invention.

The furnace is mounted as is usual in substantially all furnaces of this general type upon a base ring comprising a central plate 1 surrounded by an upwardly-extending beading 2 from which extend arms 3 to support a shouldered ring 4 on which the casing of the furnace is seated and held in place. Mounted on the plate 1 of the base ring is an ash-pit consisting of an approximately cylindrical portion 5 provided with an inlet 6 of the usual type. The upper wall or roof 7 of the ash-pit is provided with an opening 8 surrounded by a seat 9 for a fire-pot inclosed by a cylindrical beading 10. On the inner face of the wall of the ash-pit 5 are two pairs of upwardly-extending ridges 11 the members of each pair being spaced apart to form between them an upwardly-extending groove constituting a seat, and the pairs themselves are oppositely-disposed with respect to each other on the two sides of the ash-pit. These ridges 11 are designed to constitute guiding and holding means for a deflecting member 12 shown best in Fig. 1 and it comprises a semi-cylindrical portion 13 provided with laterally-extending wings 14 cut away at 15 for a purpose to be stated. This deflecting member is inserted in position when the furnace is erected by inverting the ash-pit and inserting the wings 14 in the seats formed between the pairs of ridges 11 and when so positioned the upper edge of the semi-circular portion of the deflecting member 12 will rest against the under face of the upper wall or roof 7 of the ash-pit and engage the same sufficiently firm to make an approximately tight joint. The semi-circular portion is so shaped as to be approximately concentric with the opening 8 in the roof 7 of the ash-pit and surround the same as clearly shown in Fig. 4. When the ash-pit is seated on the plate 1 the member 12 will be fixedly held in position with its under surface resting on the plate 1. The rear portion of the ash-pit is preferably extended at 16 and the roof thereof is provided with an opening 17 inclosed by a flange 18 and this opening con-

stitutes the offtake flue for the products of combustion which pass into the ash-pit. Extending from the member 12 to the rear wall of the ash-pit is a septum 19 arranged approximately centrally of the opening 17 and extending from the base plate 1 upwardly into the opening 17. Commencing at a point approximately above the position occupied by the wings 14 of the member 12 the roof 7 of the ash-pit is provided with a pair of enlarged upwardly-extending portions 20 approximately concentric with the center of the opening 8 and extending to the rear portion 16 thereof. It is contemplated that these enlarged portions will commence at a point approximately over or just in front of the positions occupied by the wings 14.

Mounted on the seat 9 of the ash-pit is a fire-pot 21 preferably having its lower end of greater diameter than the upper, as clearly shown in the drawings, but the exact configuration or shape of this fire-pot is immaterial and any form of fire-pot may be employed which suits the fancy or desire of the manufacturer of the furnace. The upper portion of the fire-pot is provided with a seat 22 preferably constructed by enlarging the upper edge of the fire-pot and forming therein an annular groove constituting a seat. Adapted to be mounted on the seat 22 of the fire-pot is a feed section 23 having its upper end preferably dome-shaped and provided with a fuel pouch 24 of the ordinary kind employed in furnaces of this type. Extending into the upper end of the fuel section 23 is an air inlet pipe 25 the upper portion 26 of which extends downwardly and from thence outwardly through the furnace casing and its lower end is closed through the medium of a door 27. Extending from the upper portion of the fuel section 23 is the direct offtake flue 28 of the furnace having a damper 29.

Surrounding the fuel section 23 and spaced apart therefrom is a horseshoe-shaped radiator 30 the rear portion of which is connected by means of a pipe 31 with the offtake flue 28. The front separated ends of this radiator 30 are connected with the opening 17 and the roof 7 of the ash-pit by a Y-shaped member from which extend two divergent laterally-extending pipes 32 which are preferably formed upon curvilinear lines with one end of said member adapted to be seated on the roof 7 of the ash-pit 5 and inclose the flange 18. The upper outer ends of these pipes 32 are suitably connected with the outer separated ends of the horseshoe-shaped radiator 30. The furnace is preferably provided with a grate 33 of any preferred type.

The operation of the device is as follows: In starting a fire in a furnace embodying this invention, the damper 29 is preferably turned so as to permit the products of com-

bustion from the fire-pot to pass directly outwardly through the pipe 28 to a chimney and this position of the damper insuring this passage of the products of combustion is maintained until the fire is effectually started. As soon as the fire has attained sufficient headway and it is desired to increase the radiation of heat from the furnace, the damper 29 is closed which causes the products of combustion to pass downwardly through the grate into the ash-pit and from thence they are deflected laterally and pass over the tops of the wings 14 through the spaces 15 rearwardly to the opening 17; from thence they pass upwardly through the curvilinearly-shaped pipes 32 to the front ends of the horseshoe-shaped radiator 30, from thence escaping by the pipes 31 to the main offtake flue 28.

It will be noted that the wings 14 when the deflecting member 12 is placed in the ash-pit serve to prevent ashes becoming lodged in the flues formed between the semi-circularly-shaped portion 13 of the member 12 and the side walls of the ash-pit and at the same time as these wings are cut away at 15 the products of combustion may pass from around to the rear of the ash-pit and from thence outwardly through the flue system already described.

The upwardly-enlarged portions 20 of the roof of the ash-pit enlarges the passage for these products of combustion which otherwise might prove too small by reason of the interposing of the wings 14. The septum 19 serves to divide the products of combustion which pass into the ash-pit and prevents too large a quantity thereof passing around either side of the ash-pit and generally serves as an equalizing medium to prevent too great a proportion of gases passing to either side of the ash-pit.

What we claim and desire to secure by Letters Patent, is:—

1. In a furnace an ash-pit provided with an opening in the roof thereof surrounded by a seat for a fire-pot, the inner face of each of the side walls of said ash-pit provided with grooves constituting seats, a deflecting member mounted in said seats extending across said ash-pit with the medial portion of said member formed upon curvilinear lines approximately concentric with the opening in the roof thereof and approximately in alinement therewith, said member further provided with openings in the lateral portions thereof to permit the products of combustion to escape therethrough, the roof of said ash-pit provided with a second opening rearwardly of said first mentioned opening for establishing communication with the flue system of the furnace whereby the products of combustion passing from said fire-pot through said opening into said ash-pit are permitted to pass through the

openings in said deflecting member rearwardly and laterally of said second opening in said roof and from thence outwardly through the flue system of said furnace.

5 2. In a furnace an ash-pit provided with an opening in the roof thereof surrounded by a seat for a fire-pot, the inner faces of the side walls of said ash-pit provided with means for supporting a deflecting member, a
10 deflecting member sustained by said means and extending across said ash-pit the medial portion of which is curvilinearly-formed to approximately register with the marginal portions of the walls surrounding the open-
15 ing in the roof of said fire-pot, said deflecting member provided with laterally-arranged openings to permit the products of combustion to pass therethrough and encounter the lateral walls of said ash-pit dur-

ing their passage therethrough, the roof of 20 said ash-pit provided with a second opening rearwardly of said first opening for establishing communication with the flue system of the furnace, a portion of the roof of said ash-pit between said deflecting member and 25 said second opening upwardly-enlarged to permit the passage of the products of combustion from said ash-pit to said second opening.

In testimony whereof we have hereunto 30 set our hands in presence of two subscribing witnesses.

HIRAM J. HOUGH.
JOHN B. CROWL.

Witnesses:

GLENARA FOX,
C. E. HUMPHREY.