E. C. THOMPSON.

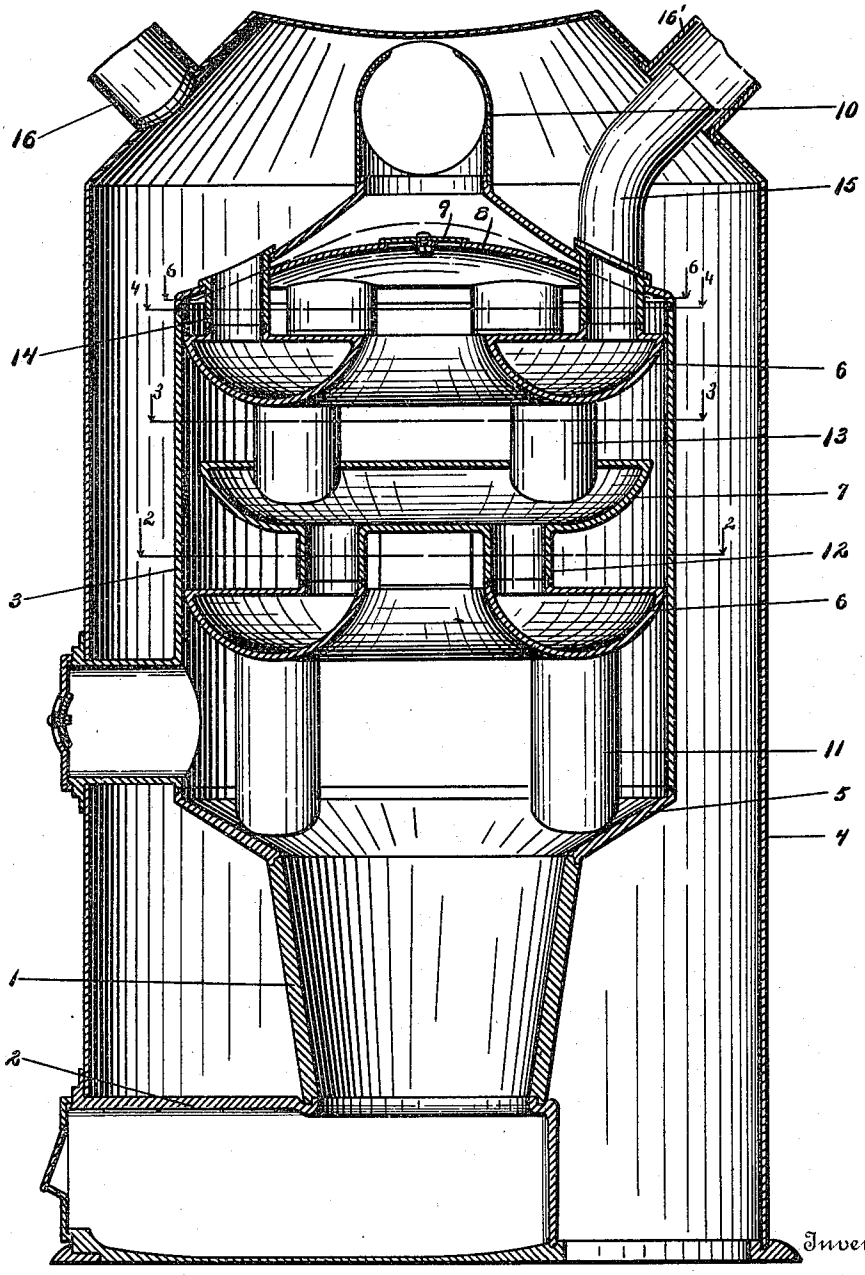
HOT AIR FURNACE.

APPLICATION FILED JUNE 3, 1914.

1,148,726.

Patented Aug. 3, 1915.

2 SHEETS—SHEET 1.



Inventor

Fig. 1.

Witnesses

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2 SHEETS—SHEET 2.

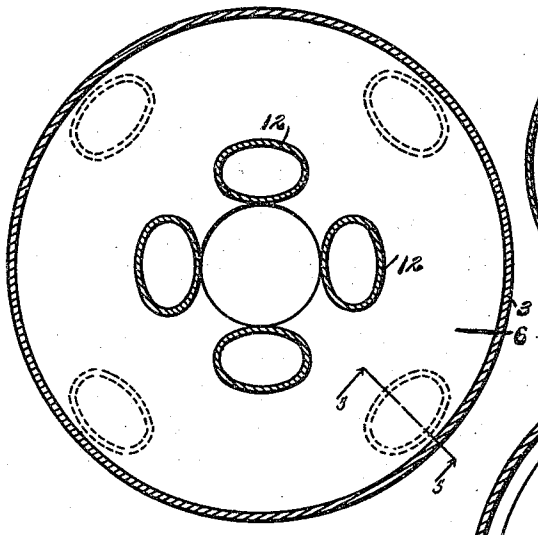


FIG. II.

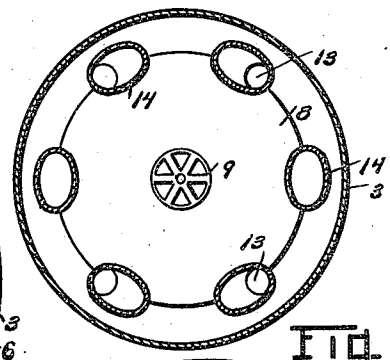


FIG. VI.

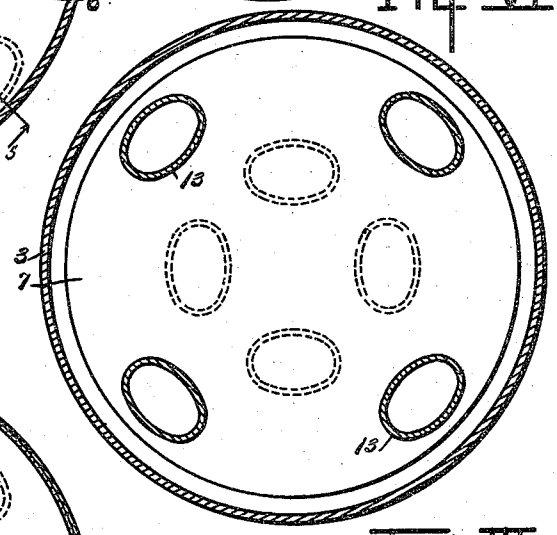


FIG. III.

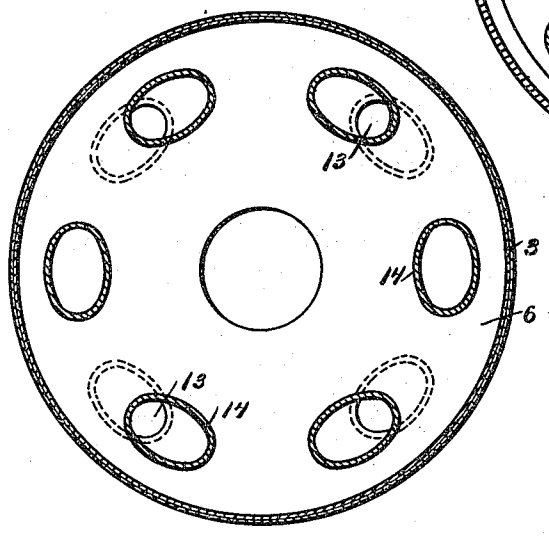


FIG. IV.

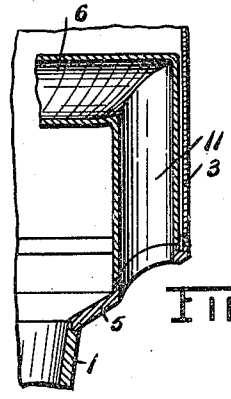


FIG. V.

Inventor

Witnesses

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UNITED STATES PATENT OFFICE.

EDWARD C. THOMPSON, OF MARSHALL, MICHIGAN.

HOT-AIR FURNACE.

1,148,726. Specification of Letters Patent. Patented Aug. 3, 1915.

Application filed June 3, 1914. Serial No. 842,561.

To all whom it may concern:

Be it known that I, EDWARD C. THOMPSON, a citizen of the United States, residing at Marshall, Michigan, have invented certain new and useful Improvements in Hot-Air Furnaces, of which the following is a specification.

This invention relates to improvements in hot air furnaces.

The main objects of this invention are: First, to provide an improved hot air furnace of high efficiency. Second, to provide an improved hot air furnace of large air heating capacity which is at the same time compact in structure.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow:

I accomplish the objects of my invention by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

A structure which is a preferred embodiment of my invention is clearly illustrated in the accompanying drawing forming a part of this specification, in which:

Figure I is a vertical central section from front to rear of a hot air furnace embodying the features of my invention. Fig. II is a detail horizontal section through the combustion chamber on a line corresponding to line 2—2 of Fig. I. Fig. III is a horizontal section through the combustion chamber on a line corresponding to line 3—3 of Fig. I. Fig. IV is a horizontal section through the combustion chamber on a line corresponding to line 4—4 of Fig. I. Fig. V is a detail vertical section on a line corresponding to line 5—5 of Fig. II. Fig. VI is a detail horizontal section on a line corresponding to the broken line 6—6 of Fig. I.

In the drawing similar reference characters refer to similar parts throughout the several views, and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

Referring to the drawing, 1 represents the fire pot, 2 the ash pit and 3 the combustion chamber of a hot air furnace, the ash pit and fire pot being shown in conventional form. The hot air chamber or casing 4 surrounds the ash pit, fire pot and combustion chamber as is common practice. The combustion chamber 3 is seated upon an upwardly flaring flange 5 on the upper end of the fire pot. Within the combustion chamber I arrange a plurality of air heating drums, the drums being disposed in a spaced relation one above another. The structure illustrated has three drums. The top and bottom drums 6 are annular and are disposed with their outer edges close to the wall of the combustion chamber, and the central or intermediate drum 7 is centrally disposed with its edges in a spaced relation with the walls of the fire pot so that the drums constitute baffle members. The hot gases and products of combustion strike the bottom of the lower annular drum and pass through the center thereof striking against the bottom of the intermediate drum 7 and pass between it and the top of the lower drum and thence over the intermediate drum and against the under side of the top drum, through the center of which they pass.

I preferably provide a baffle plate 8 which is disposed above the top drum with its outer edges in a spaced relation to the walls of the combustion chamber so that the products of combustion may pass around the same. The hot gases are directed by this baffle plate across the top of the top drum. The baffle plate is provided with a central damper 9. The means for opening and closing this damper are not shown as they form no part of my present invention.

The combustion chamber is provided with a central discharge flue 10. The drums are connected to each other and to the hot air chamber by suitable flues. The flues 11 which connect the lower drum to the air chamber open through the flange 5 so that the air is caused to circulate against the wall of the fire pot.

The bottom drum 6 is connected to the intermediate drum by flues 12, while the intermediate drum is connected to the top drum by flues 13 and the top drum is provided with discharge flues 14 opening into the hot air chamber, or provided with register pipes as 15, as may be desired. In the embodiment illustrated the top walls of the drums are flat. The bottom walls of the annular drums are curved in cross section, while the bottom wall of the intermediate drum is convex. I thus secure curved surfaces for the products of combustion to travel across so that they travel in contact with the walls and their passage through the furnace is not seriously impeded.

In hot air furnace installations there is

frequently some particular room, or rooms, which, on account of its location, is difficult to heat. For such cases I provide a delivery flue 15 for one of the discharge flues 14, the delivery flue being arranged to deliver into the flue 16′ somewhat like an injector. This insures a circulation in the conduit 16′ and the conduit 16′ is not robbed by the other conduits, as 16, leading from the hot air chamber to other rooms. The flues connecting the drums with the hot air chamber and with each other are preferably staggered or arranged out of alinement, as shown, which causes the air to pass over or come in contact with a greater heating area than would otherwise be the case.

The hot gases and products of combustion, owing to the arrangement of the heating drums, come in contact with the tops and bottoms thereof and also are deflected against the connecting flues, so that a very large heat absorbing and radiating surface is secured in the furnace. The products of combustion are also directed against the walls of the combustion chamber in their passage around the drums so that a large portion of the area of these walls is effectively utilized as radiating surfaces.

I have illustrated and described my improvements in a simple and practical embodiment, without however, attempting to maintain proper proportions of parts and certain parts being shown conventionally, as it is believed the proper proportions and embodiment will be readily understood by those skilled in the art to which my invention relates. I have not attempted to illustrate or describe various embodiments which I contemplate, as I believe the disclosure made will enable those skilled in the art to which my invention relates to embody or adapt the same as conditions may require. I desire, however, to be understood as claiming my improvements specifically in the form illustrated as well as broadly within the scope of the appended claims.

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

1. In a hot air furnace, the combination of a fire pot provided with an outwardly projecting flange at its upper end, a combustion chamber mounted at the edge of said flange, a hot air chamber surrounding said fire pot and combustion chamber, a plurality of air drums disposed in a spaced relation one above another within said combustion chamber, the bottom and top drums being annular and disposed with their outer edges in close proximity to the walls of the combustion chamber, the bottom drum being disposed in a spaced relation to said fire pot flange, the intermediate drum being disposed centrally with its outer edges in a spaced relation to the walls of the combustion chamber whereby said drums constitute baffle members, the top walls of said drums being flat, the bottom wall of said intermediate drum being convex, the bottom walls of said annular drums being curved in cross section, air inlet flues connecting the lower drum with said hot air chamber through flue openings in said fire pot flange, discharge flues connecting the upper drum with said hot air chamber through the top of said combustion chamber, and connecting flues for said drums, said inlet, discharge and connecting flues being disposed out of alinement so that the air is caused to circulate within the drums, the capacity of each drum being substantially greater than that of the combined flues delivering thereto.

2. In a hot air furnace, the combination of a fire pot provided with an outwardly projecting flange at its upper end, a combustion chamber mounted at the edge of said flange, a hot air chamber surrounding said fire pot and combustion chamber, a plurality of air drums disposed in a spaced relation one above another within said combustion chamber, the bottom and top drums being annular and disposed with their outer edges in close proximity to the walls of the combustion chamber, the bottom drum being disposed in a spaced relation to said fire pot flange, the intermediate drum being disposed centrally with its outer edges in a spaced relation to the walls of the combustion chamber whereby said drums constitute baffle members, air inlet flues connecting the lower drum with said hot air chamber through flue openings in said fire pot flange, discharge flues connecting the upper drum with said hot air chamber through the top of said combustion chamber, and connecting flues for said drums, said inlet, discharge and connecting flues being disposed out of alinement so that the air is caused to circulate within the drums, the capacity of each drum being substantially greater than that of the combined flues delivering thereto.

3. In a hot air furnace, the combination of a fire pot, a combustion chamber, a hot air chamber surrounding said fire pot and combustion chamber, air drums disposed in a spaced relation one above another within said combustion chamber, one of said drums being annular and disposed with its outer edges in close proximity to the walls of the combustion chamber and an adjacent drum being disposed centrally with its outer edges in a spaced relation to the walls of the combustion chamber whereby said drums constitute baffle members, said annular drum being curved in cross section, air inlet flues connecting the lower drum with said hot air chamber, discharge flues connecting the upper drum with said hot air chamber, and connecting flues for said drums, said inlet, discharge and connecting flues being dis-

posed out of alinement so that the air is caused to circulate within the drums, the capacity of each drum being substantially greater than that of the combined flues delivering thereto.

In witness whereof, I have hereunto set my hand and seal in the presence of two witnesses.

EDWARD C. THOMPSON. [L. S.]

Witnesses:

JAS. W. GRACE,

WM. SLATER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."