

C. A. SIMONTON.

HOT AIR FURNACE.

APPLICATION FILED OCT. 12, 1908.

927,608.

Patented July 13, 1909.

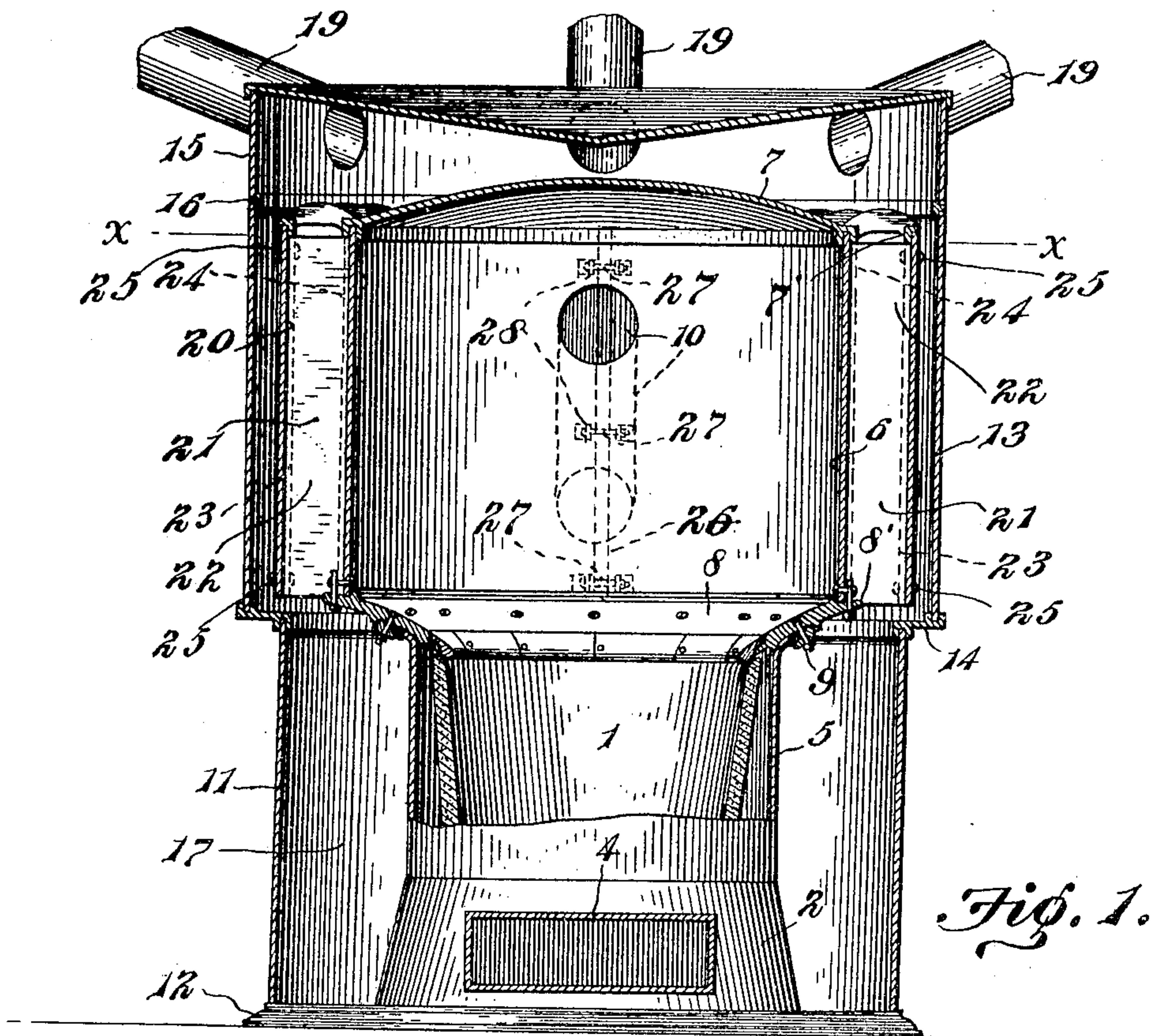
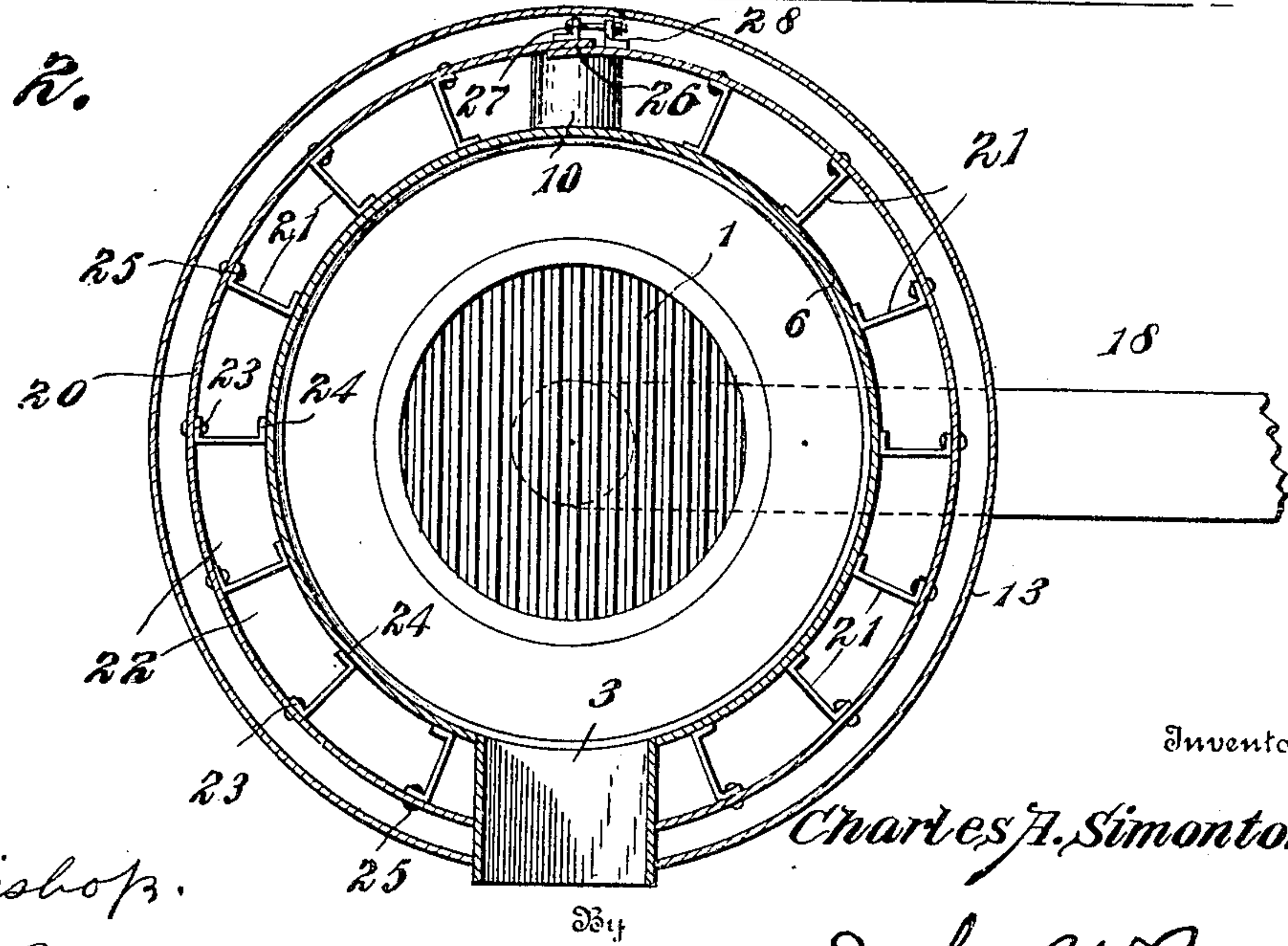


Fig. 1.

Fig. 2.



Witnesses  
J. A. Bishop.  
H. B. Austin

Inventor  
Charles A. Simonton.  
By  
Joshua R. Porter.  
Attorney



# UNITED STATES PATENT OFFICE.

CHARLES A. SIMONTON, OF CRESTLINE, OHIO.

## HOT-AIR FURNACE.

No. 927,608.

Specification of Letters Patent.

Patented July 13, 1909.

Application filed October 12, 1908. Serial No. 457,274.

*To all whom it may concern:*

Be it known that I, CHARLES A. SIMONTON, a citizen of the United States, residing at Crestline, county of Crawford, and State of Ohio, have invented certain new and useful Improvements in Hot-Air Furnaces, of which the following is a specification.

My invention relates to hot air furnaces and the object of my invention is to provide a hot air furnace of improved construction wherein the heated air will be distributed substantially uniformly to the hot air pipes leading to the several rooms to be heated.

In hot air furnaces of the usual construction some of the hot air pipes are found to deliver quantities of hot air while other pipes are practically useless for heating the rooms to which they lead, carrying hither only cold air or no air at all. This is due to a stronger draft in some of the pipes than in the others, which draws the heated air to the side of the furnace from which they extend leaving the cold air upon the other side.

The primary object of my invention is to provide a hot air furnace in which the cold fresh air entering the furnace will be distributed uniformly about the radiator drum, evenly heated and distributed substantially uniformly to the several distributing pipes.

A further and particular object of my invention is to provide a hot air furnace which shall be of simple construction, and easily assembled and of low cost to manufacture, and one which shall prevent the gases and smoke from the fire mingling with the heated air, other objects will appear hereinafter.

With these objects in view my invention consists generally in a hot air furnace comprising a casing and an inner radiator shell forming an air space between them, an outer radiator drum arranged within said casing and about the upper portion of the inner radiator shell for maintaining the fresh air in intimate contact with the latter, and a plurality of radially disposed partitions arranged between the inner and outer radiator drums and dividing the air space between them into a plurality of vertical channels or flues. The partitions and the flues defined by them extend upwardly to a point just below the mouths of the hot air pipes, so that the heated air will be delivered directly to said pipes and not drawn by the drafts to one side of the furnace and carried off by only a few of the pipes.

My invention further consists in a furnace

as above mentioned in which the partitions dividing the air space between the drums are formed of sheet metal having their edges turned to form flanges which abut the respective drums, and preferably secured to the outer one.

My invention further consists in a furnace characterized as mentioned in which the outer radiator drum is formed with overlapping edges and clamped into position about the inner radiator drum, the partitions above mentioned serving as spacing members.

My invention further consists in various details of construction and arrangements of parts all as will be fully described hereafter and particularly pointed out in the claims.

My invention will be more readily understood by reference to the accompanying drawings forming a part of this specification and in which,

Figure 1, is a vertical central section of a hot air furnace embodying my invention in its preferred form and Fig. 2, is a horizontal section of the same taken on the line  $x-x$  of Fig. 1.

Referring to the drawings, 1 indicates a fire-pot, 2 the ash pit, 3 the fuel opening and 4 the doorway to the ash pit. The fire-pot 1, is preferably surrounded by a steel jacket 5 upon the upper edge of which is supported the inner radiator drum consisting of a vertically disposed substantially cylindrical shell 6 and the upper and lower heads 7 and 8 respectively. The latter comprises an annular casting securely fixed to the upper edge of the jacket 5 with a gas and smoke tight joint 9. The jacket 5 and the radiator drum constitute the inner shell of the furnace from which extends the smoke pipe 10.

The casing comprises the lower casing 11 which rests upon the base 12, the upper casing 13 supported thereon by the offset lower casing ring 14 and the hood 15 which is secured to the upper edge of the upper casing by the upper casing ring 16. The inner radiator drum shell 6 is of greater diameter than the fire-pot jacket 5, and the lower and upper casings are of correspondingly different diameters for obvious reasons, the lower casing ring 14 being in the same plane or slightly below the lower drum head 8. The inner shell of the furnace and the casing form an air space 17 between them which is supplied with fresh air through the air duct 18, said duct discharging centrally beneath



the ash pit as indicated in dotted lines in Fig. 2. From the upper part or hood of the casing extend the hot air pipes 19 which conduct the heated air to the several rooms to be heated. It is obvious that those pipes which are of such length and disposition as to constitute the best flues will normally create such a draft or current within the air space 17 as to draw the heated air, which is also the lightest, to their side of the furnace, thereby forcing the heavy cold air to the opposite side of the furnace. This will either prevent any circulation of air from the furnace through the pipes of less draft or else permit only cold or partially heated air to be driven therethrough. To obviate this, I form a portion of the air space which is directly about the inner radiator drum 6 into a plurality of vertically disposed flues which discharge into the hood substantially at the mouths of the several pipes 19.

20 indicates the outer radiator drum which is arranged within the upper casing and about the inner radiator drum 6, forming an air heating space between them which is divided by a plurality of radially disposed partitions 21 into a like number of vertically disposed flues 22. The drum 20 and partitions 21 are substantially co-extensive in height with the portion 6 and terminate close beneath the mouths of the pipes 19. The partitions 21 are formed of sheet metal and have their vertical edges turned to form flanges 23, 24 which abut the drums 20 and 6 respectively, spacing them apart, and the partitions are preferably secured to the outer drum as by bolts or rivets 25 passing through the flanges 23. The outer radiator drum 20 is formed with a lap joint 26 which is secured by bolts 27 extending through lugs or ears 28 secured to the drum near the lapping edges. By tightening the bolts the partitions 21 are securely clamped against the inner drum 6 and the whole is supported between the annular extensions 7' and 8' of the heads 7 and 8 respectively. It should be noted that the partitions are arranged only in the narrow portion of the air space between the drums where the air receives the most heat and where it is more readily affected by the drafts or currents created by the pipes 19, leaving the larger space which surrounds the jacket unobstructed for the proper circulation and equalization of the cold air entering through the duct 18.

Frequently when the wind forces the cold air through the duct, the air is forced to one side of the furnace and through some of the pipes before it has a chance to be heated, which necessitates closing the duct to such an extent that the air supply is inadequate. With the improved furnace above described the several flues 22 defined by the partitions 21 are equally heated and hence are of equal draft. The cold air entering the lower portion of the air space 17 is permitted to freely circulate and become equally distributed before entering the flues 22, therefore it is obvious that hot air will be delivered equally to the several pipes 19.

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

1. In a hot air furnace a fire-pot jacket and a superimposed inner radiator drum, in combination with an outer radiator drum surrounding said inner drum and substantially co-extensive in height therewith, said outer drum being formed with overlapping edges, and a plurality of radially disposed sheet metal partitions between said drums each comprising a single sheet of metal having its vertical edges turned to form flanges abutting the respective drums and secured to the outer drum only and means adjacent to said overlapping edges of said outer drum for clamping the same and said partitions upon the inner drum, substantially as described.

2. In a hot air furnace a fire-pot jacket and a superimposed radiator drum, said drum having upper and lower heads provided with peripheral extensions, in combination with an outer radiator drum surrounding said inner drum and formed with overlapping edges, a plurality of radially disposed sheet metal partitions each having its outer edge secured to the outer drum and its inner edge abutting said inner drum, and means for contracting said outer drum to clamp the same and said partitions in position, and said drum and partitions being supported between said peripheral extensions, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES A. SIMONTON.

Witnesses:

CHANCE E. DEWALD,  
JOHN STORGH.