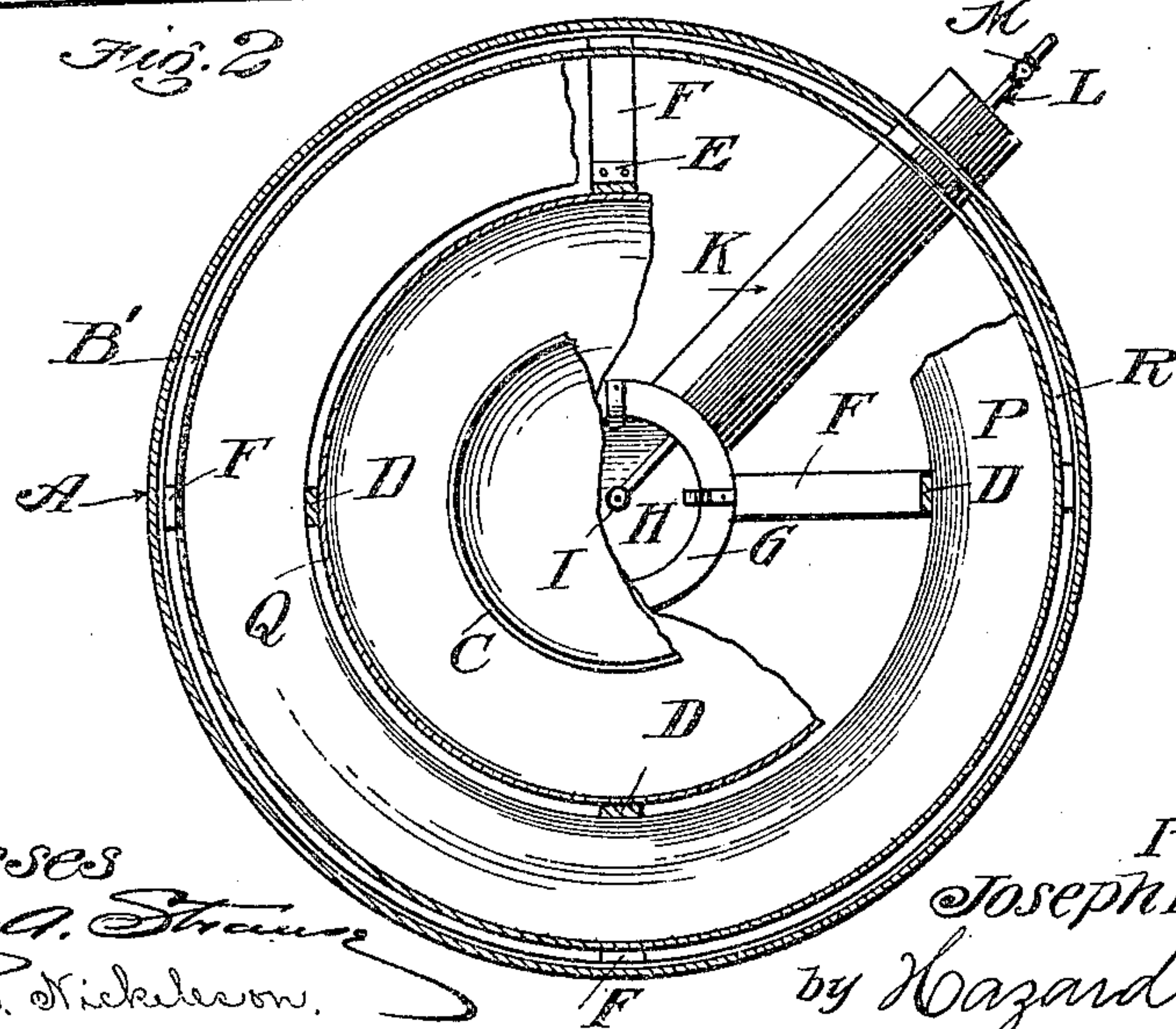
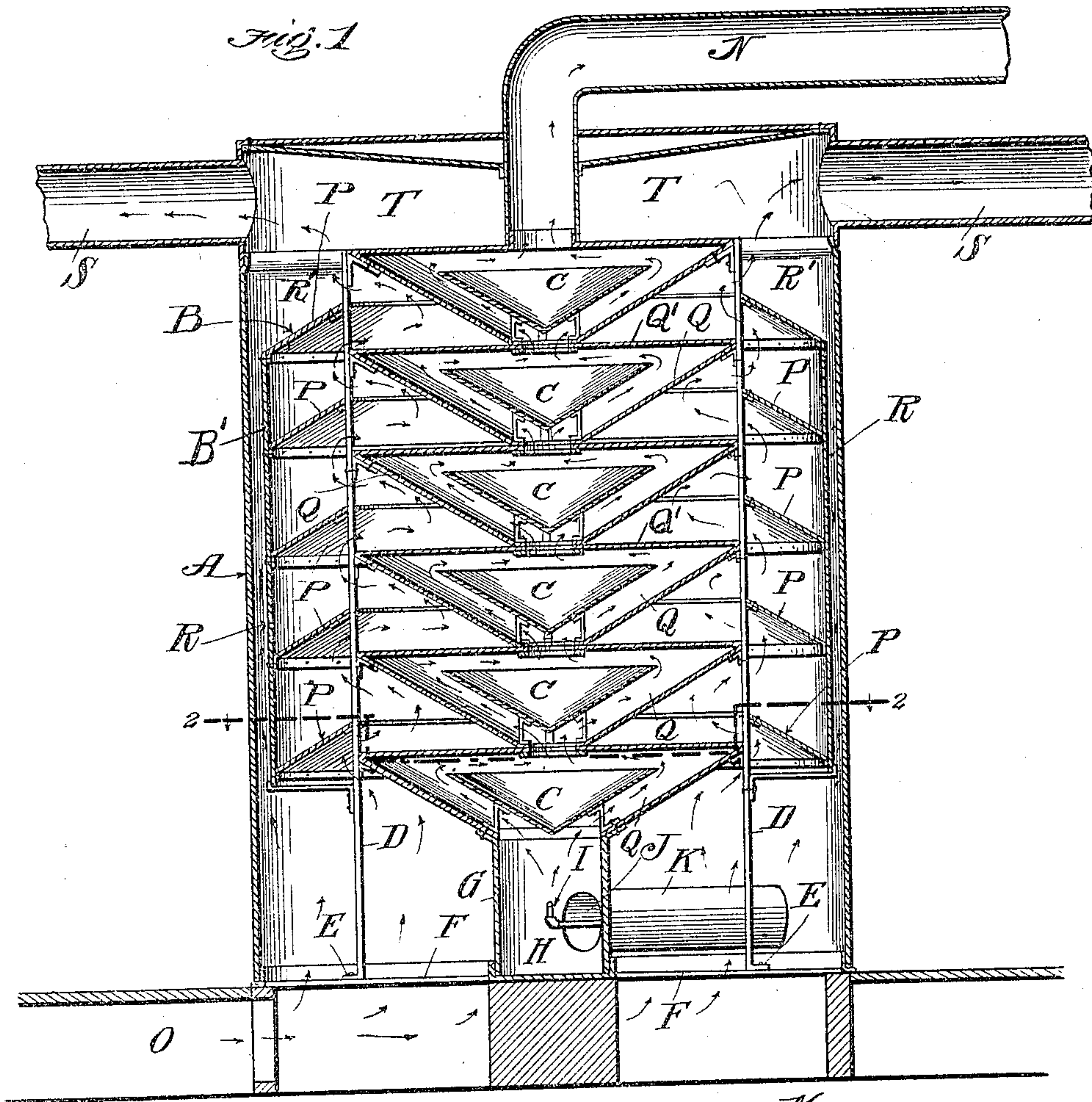


J. E. HAYDEN.  
FURNACE.

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Witnesses  
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# UNITED STATES PATENT OFFICE.

JOSEPH E. HAYDEN, OF PASADENA, CALIFORNIA.

## FURNACE.

No. 804,315.

Specification of Letters Patent.

Patented Nov. 14, 1905.

Application filed December 27, 1904. Serial No. 238,543.

*To all whom it may concern:*

Be it known that I, JOSEPH E. HAYDEN, a citizen of the United States, residing at Pasadena, in the county of Los Angeles and State of California, have invented new and useful Improvements in Furnaces, of which the following is a specification.

My invention relates more particularly to furnaces used to heat buildings or a number of apartments therein; and it consists of two series of inverted-cone-shaped baffle-plates, the members of each being superimposed one above the other in a cylindrical casing adapted for placement in the cylindrical casing of a conventional form of furnace.

The invention resides in the peculiar configuration and arrangement of the baffle-plates.

My furnace has two channels for the passage of air and one central channel for the passage of the products of combustion. The central channel through which the products of combustion pass communicates with the outer air at the top, the bottom of which is the combustion-chamber in which the burner is placed, the said inner channel at the top forming the flue or smoke-stack of the furnace. The inner heating-channel communicates at the bottom with the outer air. The air entering at the bottom passes between the outer baffle-plates and the middle series of baffle-plates and is discharged into the rooms of the buildings to be heated.

It is the object of my invention to provide a furnace simple of construction and reliable in operation and adapted to provide a large heating-surface in a compact device and to adapt the device for placement in any conventional form of cylindrical furnace-casing. I accomplish these objects by means of the device described herein, and shown in the accompanying drawings, in which—

Figure 1 is a central vertical section of a furnace embodying my invention. Fig. 2 is a transverse horizontal section taken on line 2 2 of Fig. 1 looking down, as indicated by the arrow-head thereon.

In the drawings, A represents the outer cylindrical casing of a conventional form of furnace adapted to receive my improved heat-distributing device B, located therein. The device consists of two series of inverted-cone-shaped baffle-plates C and a series of surrounding baffle-plates P in the shape of the frustum of a cone. These plates are supported by a plurality of upright supports D,

bolted or otherwise secured, as at E, to the spider-arms F, which extend radially from the casing G of the central-draft or combustion chamber H. In the combustion-chamber H is disposed the burner I, which may be of any description suited to heat this chamber. In this case I have shown an ordinary gas-burner I projecting into the central combustion-chamber H through a draft-opening J, the said draft-opening being formed by the cylindrical draft-casing K, the burner being supplied with fuel through the pipe L, having regulating-cock M thereon. (See Fig. 2.)

The air which passes into the various apartments being heated passes first into the furnace at the intake O at the bottom of the furnace and passes thence up between the spider-arms and is divided, part of the air passing through the annular opening R between the casings A and B' and the balance of the air passing under the annular baffle-plates P and through the central openings in these baffle-plates and between them and the inverted-cone-shaped baffle-plates Q and thence in a zigzag course until it commingles with the air passing through the opening R at the point R' and thence up into the distributing-chamber T and thence through the channels S, leading to the various apartments being heated. The baffle-plates Q have a central opening for the passage there-through of the products of combustion and are otherwise closed at the top and the bottom. Centrally disposed in each of these baffle-plates are the inverted-cone-shaped baffle-plates C, closed at the bottom and open at the top and so arranged that the hot air coming from the furnace passes around the same in an outwardly and upwardly direction until it contacts with that portion Q' of the baffle-plate Q where the hot air will be thrown in a horizontal direction toward the center of the furnace, whence it will pass up into the chamber formed by the plates, and so on out through the distributing-chamber. The direction in which the hot air in its zigzag course is compelled to travel in passing from the combustion-chamber upwardly through the distributing-chamber will result in radiating large quantities of heat units into the surrounding and ascending air-column and materially increase the efficiency of the furnace.

By an inspection of the central vertical section (shown in Fig. 1) it will be seen that the clearance between the baffle-plates Q and



the annular baffle-plates P is smaller at the bottom and is gradually enlarged as it approaches the top, the purpose being to afford enlarged clearance for the air as it approaches  
5 the top, the same becoming hotter as it approaches the top of the furnace and passes thence into the distribution-chamber.

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

A hot-air furnace comprising an outer cylindrical casing having in the bottom thereof a combustion-chamber and in the top thereof a distributing-chamber; a smoke-stack  
15 thereon; a central hot-air flue leading from the combustion-chamber to the smoke-stack, the said hot-air flue formed of a series of in-

verted-cone-shaped deflectors superimposed one above the other and having a central opening therethrough, the top of each of said  
20 cone-shaped deflectors being arranged horizontally; and an inverted-cone-shaped deflector closed at the bottom and open at the top in each of the above-mentioned deflectors, the said last-mentioned cone-shaped de-  
25 flectors being disposed centrally in each of the first-mentioned cone-shaped deflectors.

In witness that I claim the foregoing I have hereunto subscribed my name.

JOSEPH E. HAYDEN.

Witnesses:

HENRY T. HAZARD,  
G. E. HARPHAM.