

No. 708,215.

Patented Sept. 2, 1902.

C. H. FOSTER.  
HOT AIR FURNACE.

(Application filed Mar. 13, 1902.)

(No Model.)

Fig.1.

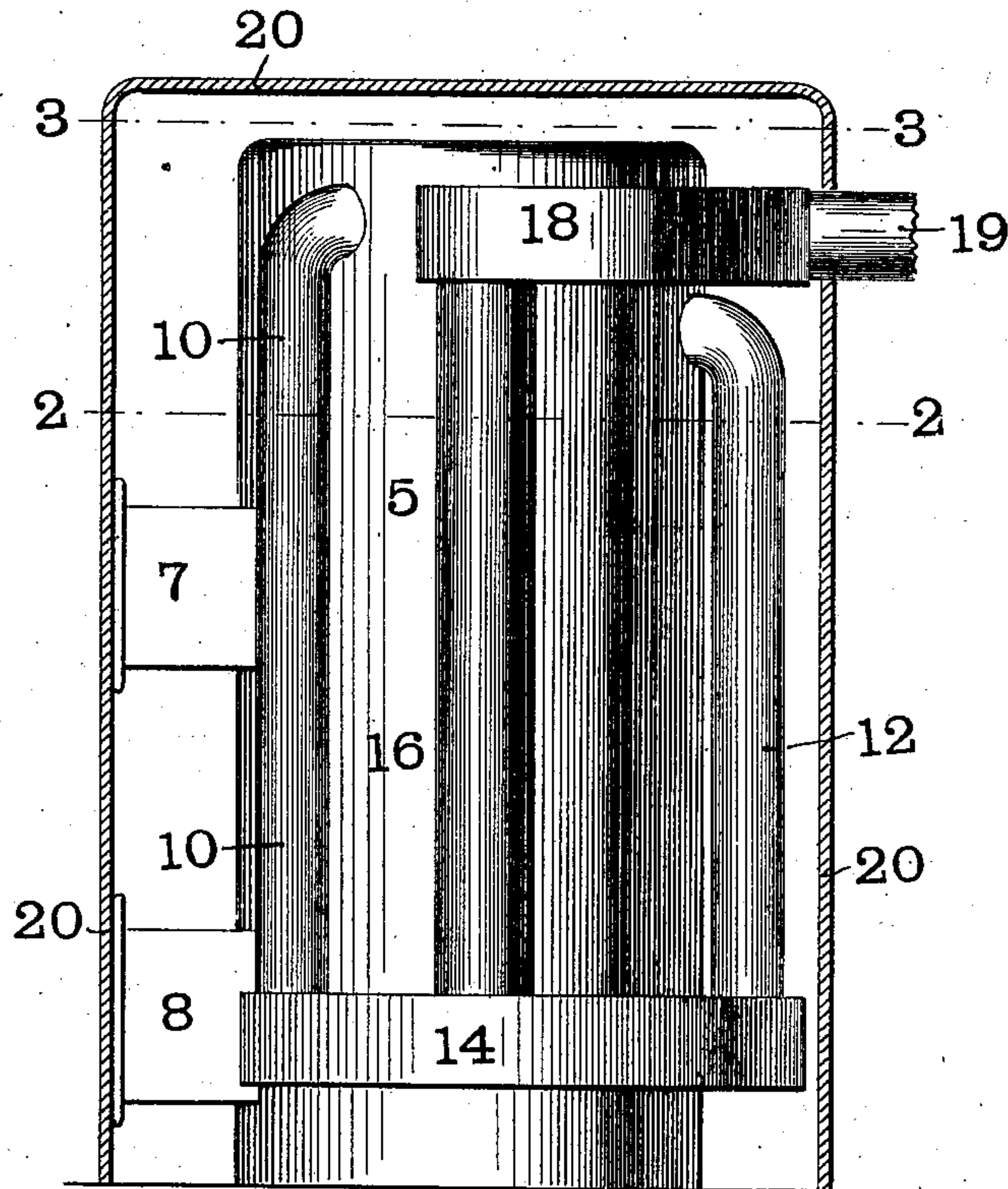


Fig.2.

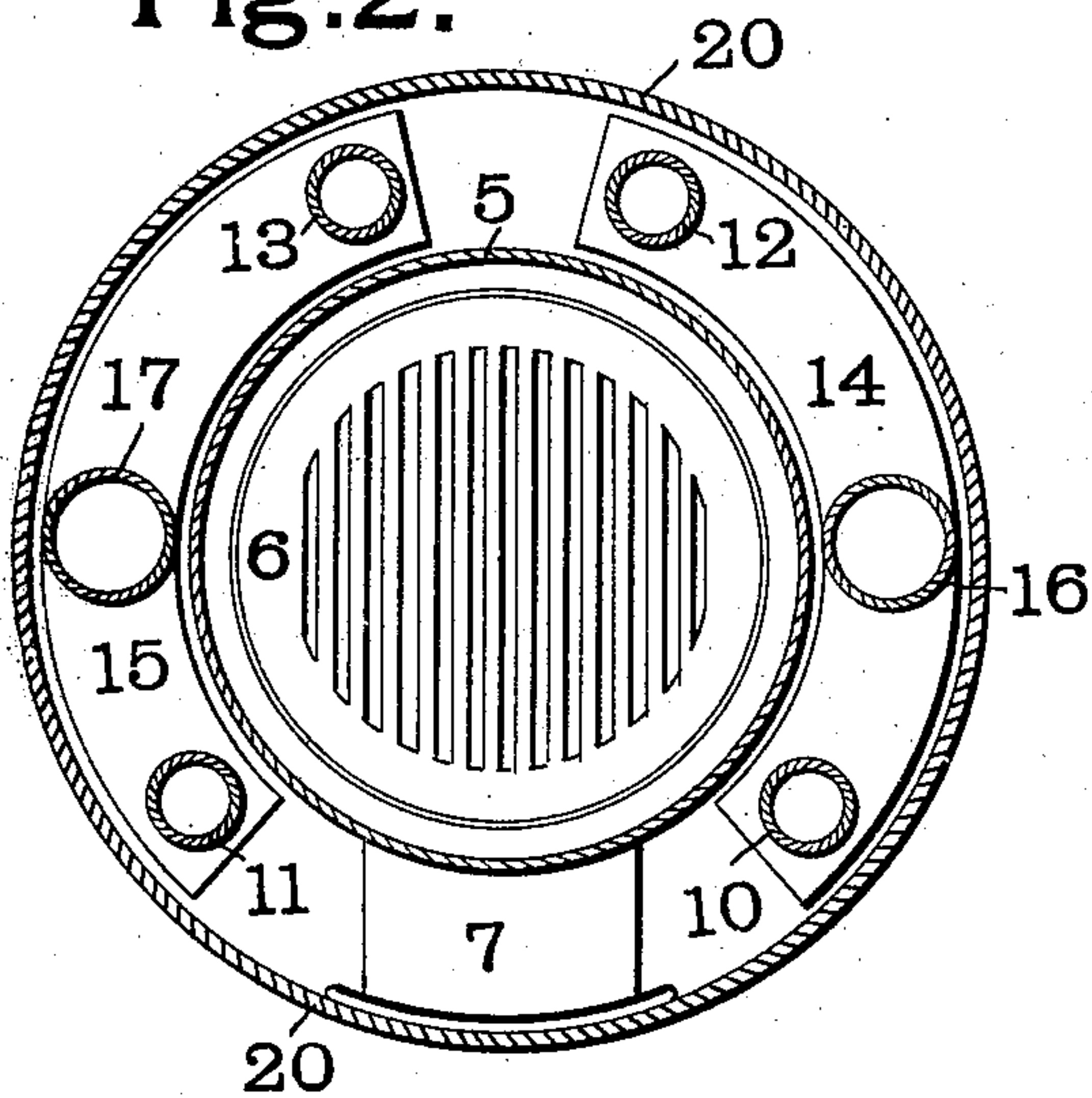
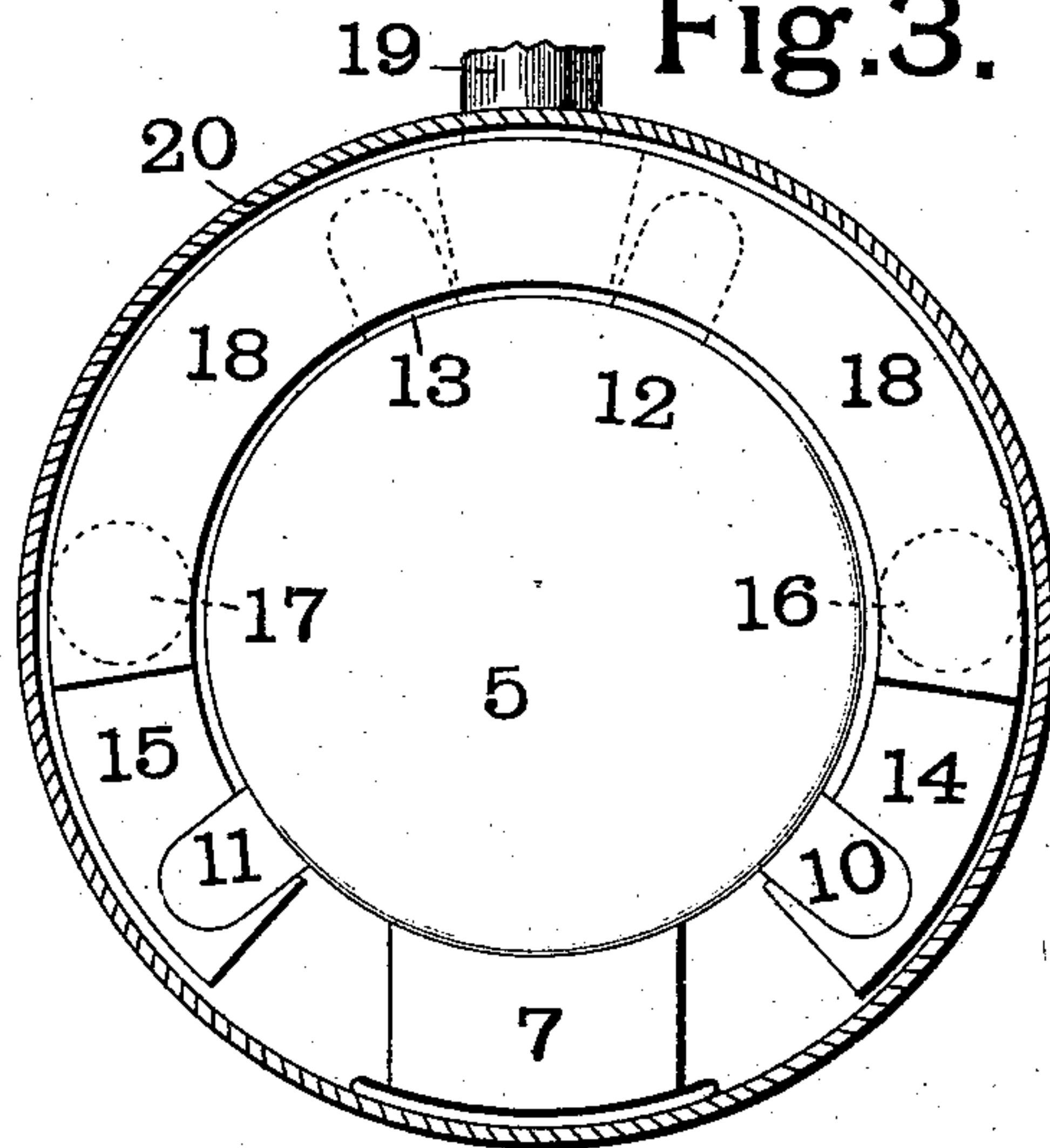


Fig.3.



Witnesses

W. A. Alexander  
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# UNITED STATES PATENT OFFICE.

CHARLES H. FOSTER, OF OMAHA, NEBRASKA.

## HOT-AIR FURNACE.

SPECIFICATION forming part of Letters Patent No. 708,215, dated September 2, 1902.

Application filed March 13, 1902. Serial No. 98,070. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES H. FOSTER, a citizen of the United States, residing at Omaha, in the county of Douglas and State of Nebraska, have invented a certain new and useful Hot-Air Furnace, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

The object of my invention is to increase the radiation of the flues in hot-air furnaces and at the same time to avoid unduly enlarging the furnace-casing and also to secure an equal draft in the flues.

My invention consists in part in providing a combustion-chamber with two pairs of descending flues connected by base-flues and providing said base-flues with ascending flues connected to a suitable conduit communicating with the outlet-pipe.

My invention also consists in making two of the descending flues of such a furnace shorter than the other descending flues to provide room for the conduit and connecting the ascending flues to the base-flues at points nearer to the long descending flues, so as to equalize the draft.

In the accompanying drawings, which illustrate one form of furnace made in accordance with my invention, Figure 1 is a side elevation, the furnace-casing being shown in section. Fig. 2 is a horizontal section on the line 2 2 of Fig. 1, and Fig. 3 is a horizontal section on the line 3 3 of Fig. 1.

Like marks of reference refer to similar parts in the several views of the drawings.

5 represents the fire-pot or combustion-chamber. The fire-pot or combustion-chamber 5 is provided with a grate 6 and fire and ash-pit doors 7 and 8, respectively, all of the usual construction.

Connected with the combustion-chamber 5, adjacent to the top thereof, are two long descending flues 10 and 11, respectively.

12 and 13 are two short descending flues, which are connected with the combustion-chamber 5 at a point some distance below the top of the said combustion-chamber, as shown in Fig. 1.

The descending flues 10 and 12 and 11 and 13 form two sets of flues, which are connected by base-flues, the pipes 10 and 12 being connected by base-flue 14 and the pipes 11 and 13 being connected by a similar base-flue 15. The base-flues 14 and 15 communicate with ascending flues 16 and 17, respectively. In order to equalize the draft in the descending flues, these ascending flues 16 and 17 are connected to the base-flues 14 and 15 at points nearer to the long descending flues 10 and 11 than to the short flues 12 and 13, thus making the travel of the products of combustion equal in the long and short flues. The upper ends of the ascending flues 16 and 17 are connected by means of a conduit 18, which passes over the short descending flues 12 and 13 and is connected with the outlet-pipe 19, which pipe passes through the usual furnace-casing 20.

By using the long flues 10 and 11 the products of combustion are drawn off near the top of the combustion-chamber, thus securing the proper circulation in the top of said combustion-chamber, and by using the short flues 12 and 13 sufficient room is left for the passage of the conduit 18 without enlarging the furnace-casing 20, and by the connection of the pipes 16 and 17 the tendency to unequal draft between the long and short flues is overcome. I thus greatly increase the radiating-surface of the flues and at the same time avoid enlarging the furnace-casing or disturbing the equal draft in the descending flues.

I am aware that it is old to provide a hot-air furnace with two descending flues and two ascending flues, the ascending flues being connected with a suitable outlet-pipe, and therefore do not claim such construction.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a hot-air furnace, the combination with a combustion-chamber, of two sets of descending flues connected with said combustion-chamber, a base-flue connecting the pipes of one of said sets, a second base-flue connecting the pipes of the other of said sets, ascending flues connected with said base-flues, a conduit connecting said ascending flues, and an outlet leading from said conduit.

2. In a hot-air furnace, the combination

with a combustion-chamber, of a pair of long  
descending flues connected therewith, a pair  
of short descending flues also connected with  
said combustion-chamber, a pair of base-flues  
5 each connecting a long and a short descend-  
ing flue, a pair of ascending flues each con-  
nected with one of said base-flues at a point  
nearer to the long than to the short descend-  
ing flue, a conduit connecting said ascending  
10 flues and passing above said short descend-

ing flues, and an outlet leading from said con-  
duit.

In testimony whereof I have hereunto set  
my hand and affixed my seal in the presence  
of the two subscribing witnesses.

CHARLES H. FOSTER. [L. S.]

Witnesses:

J. H. BRYSON,

W. A. ALEXANDER.