

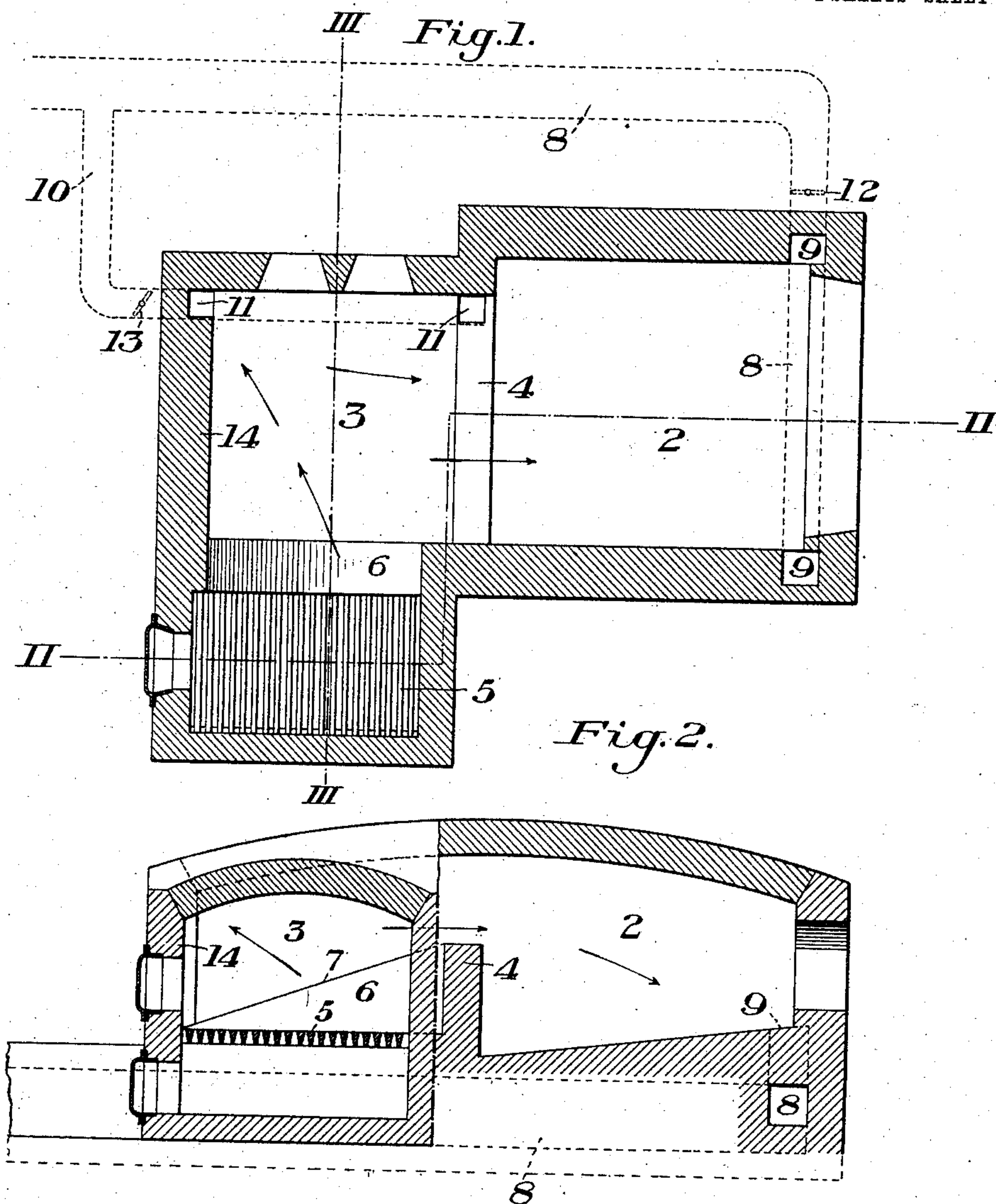
No. 883,747.

PATENTED APR. 7, 1908.

C. A. ROBINSON.  
HEATING FURNACE.

APPLICATION FILED SEPT. 26, 1907.

2 SHEETS--SHEET 1.



**WITNESSES**

R. A. Balderson  
E. B. Blanning

INVENTOR

INVENTOR  
C. A. Robinson,  
by Bakewell, Byrnes & Parmelee,  
his Attys.

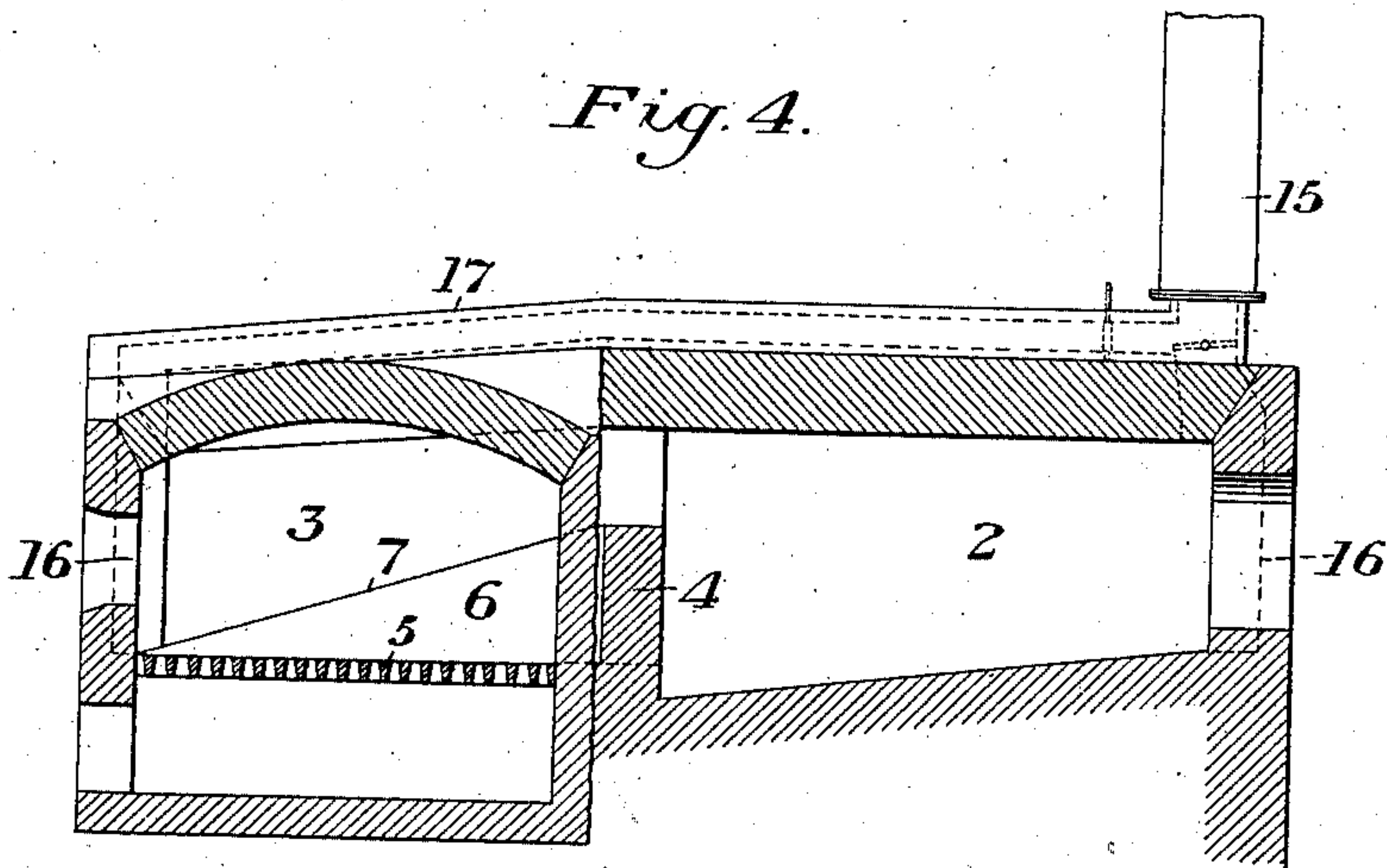
No. 883,747.

PATENTED APR. 7, 1908.

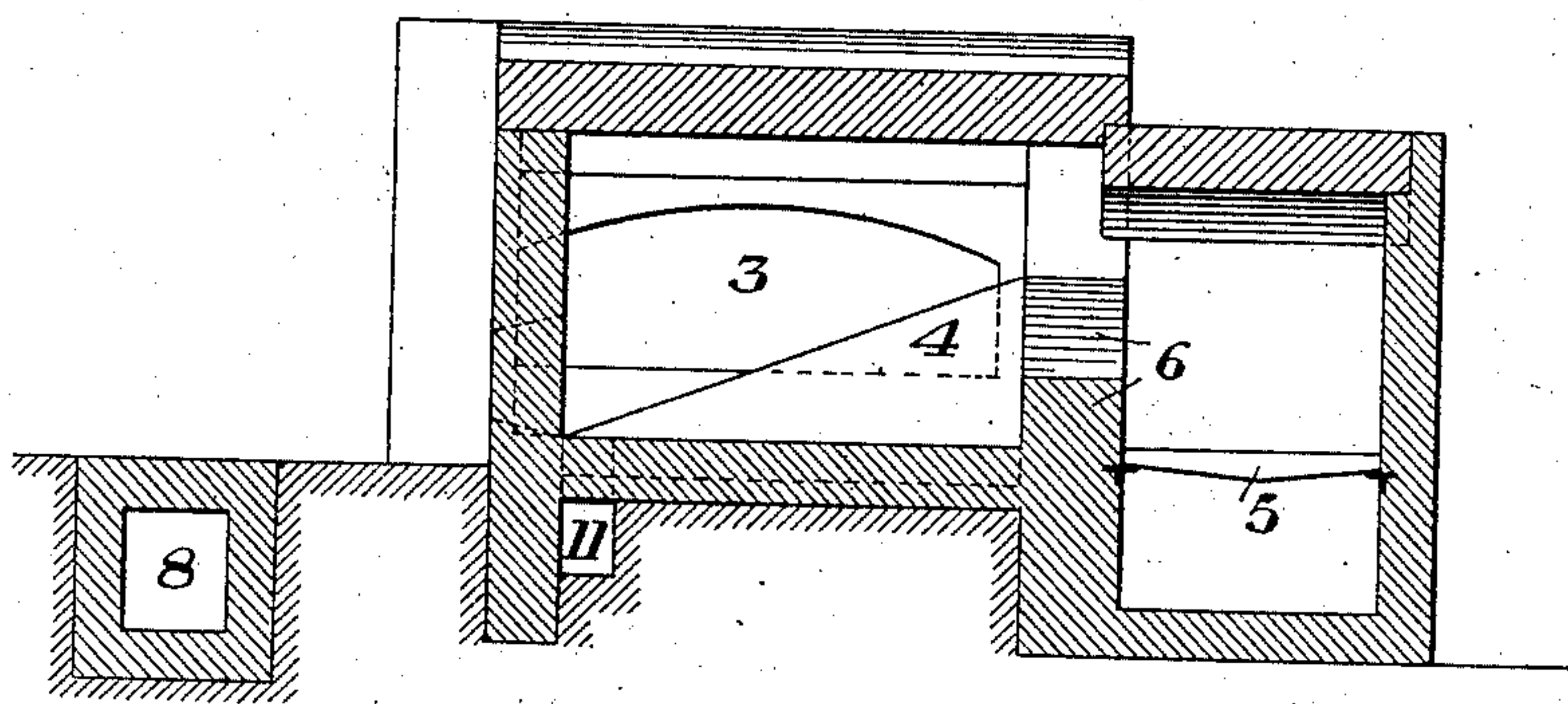
C. A. ROBINSON.  
HEATING FURNACE.  
APPLICATION FILED SEPT. 26, 1907.

2 SHEETS—SHEET 2.

*Fig. 4.*



*Fig. 3.*



WITNESSES

*R. A. Balderson*  
*E. B. Blaming*

INVENTOR

*C. A. Robinson,*  
*by Bakewell, Byrnes & Parmelee,*  
*his Attys.*



# UNITED STATES PATENT OFFICE.

CECIL A. ROBINSON, OF WHEELING, WEST VIRGINIA, ASSIGNOR TO AMERICAN SHEET & TIN PLATE COMPANY, OF PITTSBURG, PENNSYLVANIA, A CORPORATION OF NEW JERSEY.

## HEATING-FURNACE.

No. 883,747.

Specification of Letters Patent.

Patented April 7, 1908.

Application filed September 26, 1907. Serial No. 394,643.

*To all whom it may concern:*

Be it known that I, CECIL A. ROBINSON, of Wheeling, Ohio county, West Virginia, have invented a new and useful Heating-Furnace, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a horizontal section of a furnace embodying my invention, the stack connections and dampers being indicated in dotted lines; Fig. 2 is a vertical section on the irregular line II—II of Fig. 1; Fig. 3 is a section on the line III—III of Fig. 2; and Fig. 4 is a view similar to Fig. 1 but showing a modification.

My invention has relation to heating furnaces, and has been more particularly designed for furnaces used for heating pairs and sheets, although it may be used for other purposes.

Heretofore in furnaces of this class it has been the practice to arrange the furnace chambers for the sheets and pairs in line with each other with an intermediate bridge wall over which the flames and products of combustion from the pair chamber or furnace pass into the sheet chamber or furnace, and to arrange the grate at the end of the pair chamber or furnace in line with the longitudinal axis of the two chambers or furnaces. I have discovered that very much better results may be obtained by arranging the grate to one side of the pair furnace in the manner hereinafter described and to employ in connection therewith a bridge wall and flues of novel arrangement, whereby the flames and products of combustion are deflected in such a manner as to secure a more uniform and better heating effect in the two furnaces.

The precise nature of my invention will be best understood by reference to the accompanying drawings, which will now be described, it being premised, however, that various changes may be made in the details of construction and arrangement by those skilled in the art without departing from the spirit and scope of my invention as defined by the appended claims.

Referring to these drawings, the numeral 2 designates the sheet-heating furnace chamber, and the numeral 3 the pair-heating furnace chamber.

4 is a bridge wall over which the flames

and products of combustion pass from the furnace chamber 3 to the furnace chamber 2. The upper edge of this bridge wall is preferably inclined, as shown in Fig. 3.

5 designates the grate, which in accordance with my invention is located to one side of the furnace chamber 3 instead of at the end thereof, as heretofore.

6 is a bridge wall over which the flames and products of combustion from the combustion chamber above the grate pass into the chamber 3. This bridge wall has an inclined upper edge 7, as shown in Fig. 2.

8 indicates a stack connection from the outer end of the chamber 2 and communicating therewith by the down openings or flues 9 at the corner portions thereof. The chamber 3 is also connected with the flue 8 by a flue 10 communicating with the chamber by the down openings 11 located at the corner portions of the chamber opposite the grate.

12 and 13 indicate dampers for controlling the flues 8 and 10.

In operation, the damper 13 is always kept partly open thereby creating a draft, which in connection with the inclined upper edge of the bridge 7 and the similar inclination of the bridge 4, has the effect of drawing the flames toward that corner of the chamber 3 nearest the damper 13, the result being that the flames strike against this corner of the chamber and against the end wall 14 thereof, and are thence deflected in the manner shown by the arrows over the bridge 4 into the sheet furnace chamber. All the heat needed in the sheet furnace must first pass through the pair furnace, but the heat in the sheet furnace can be regulated at will by means of the damper 12. When there is more heat in the sheet furnace than is needed, the damper 12 is closed so that all the flame will pass to the stack through the flue 10.

In the modification shown in Fig. 4, the construction of the furnace proper is similar to that shown in the other figures, but the stack 15 is above the roof of the furnace, the ports corresponding to the ports 9 and 11 of Fig. 1, being connected by vertical passages 16 in the walls of the furnace with a flue 17 on top of the furnace which communicates with the stack. The flues may of course be arranged in various other ways.

It has been found in practice that this fur-



nace is much more economical in its use of fuel than those heretofore in use, and that a larger output can be obtained therefrom, this being due to the peculiar manner in which the flames are deflected so that uniform heat is obtained throughout the two furnace chambers.

A further advantage of the furnace is the fact that where the floor space is small the grate can be fired from any one of three sides, and the ash pit can be correspondingly located.

What I claim is:—

1. A heating furnace having two heating chambers arranged in line with each other, with an intermediate bridge wall over which the gases pass from one chamber to the other, and a grate arranged at one side of one of the said chambers and opening thereto in a direction at substantially right angles to the longitudinal axis of the said chambers; substantially as described.

2. A heating furnace having two heating chambers arranged in line with each other, with an intervening bridge wall over which the gases pass from one chamber to the other, a grate arranged at one side of one of said chambers and opening into the same in a direction at substantially right angles to the longitudinal axis of the furnace, and a bridge wall over which the flames and products of combustion pass from the grate into the adjacent chamber; substantially as described.

3. A heating furnace having two heating chambers in line with each other, a grate arranged at one side of one of said chambers and communicating therewith, and a bridge wall having its upper edge over which the flames and gases of combustion pass from the grate into said chamber inclined in a vertical plane and having its lowest point at its end portion nearest the rear end wall of the adjacent chamber; substantially as described.

4. A heating furnace having two heating chambers in line, and communicating with each other, a grate arranged at one side of one of said chambers, a bridge wall over which the flames pass from the grate into the adjacent chamber said wall having its upper edge inclined to decrease its height from one

end to the other, and having its lowest point at its end portion nearest the rear end wall of the adjacent chamber, and a stack flue communicating with said chamber at the side opposite the grate; substantially as described.

5. A heating furnace having two heating chambers in line with each other, a grate arranged at one side of one of said chambers and communicating therewith, and a bridge wall and flue connections arranged to deflect the flame towards the opposite rear outer corner portion of said chamber; substantially as described.

6. A heating furnace, having two heating chambers in line with each other, with an intermediate inclined bridge wall over which the gases of combustion pass from one chamber into the other; substantially as described.

7. A heating furnace, having two heating chambers in line with each other, with an intermediate inclined bridge wall over which the gases of combustion pass from one of the chambers into the other, a combustion chamber at one side of one of the heating chambers, and an inclined bridge wall between the combustion chamber and the adjacent heating chamber; substantially as described.

8. In a furnace of the character described, two heating chambers arranged in line with each other with an intervening bridge wall between the two chambers over which the gases pass from one chamber to the other, a grate arranged at one side of one of said chambers and opening thereto at substantially right angles to the longitudinal axis of the chambers, a bridge wall over which the gases pass from the grate into said chamber, both of the said bridge walls having inclined upper edges and having their highest points at the ends which are nearest each other, and flue connections cooperating with the bridge walls to distribute the gases throughout said chambers; substantially as described.

In testimony whereof, I have hereunto set my hand.

CECIL A. ROBINSON.

Witnesses:

CHARLES H. COPP,  
B. KLIEVES.