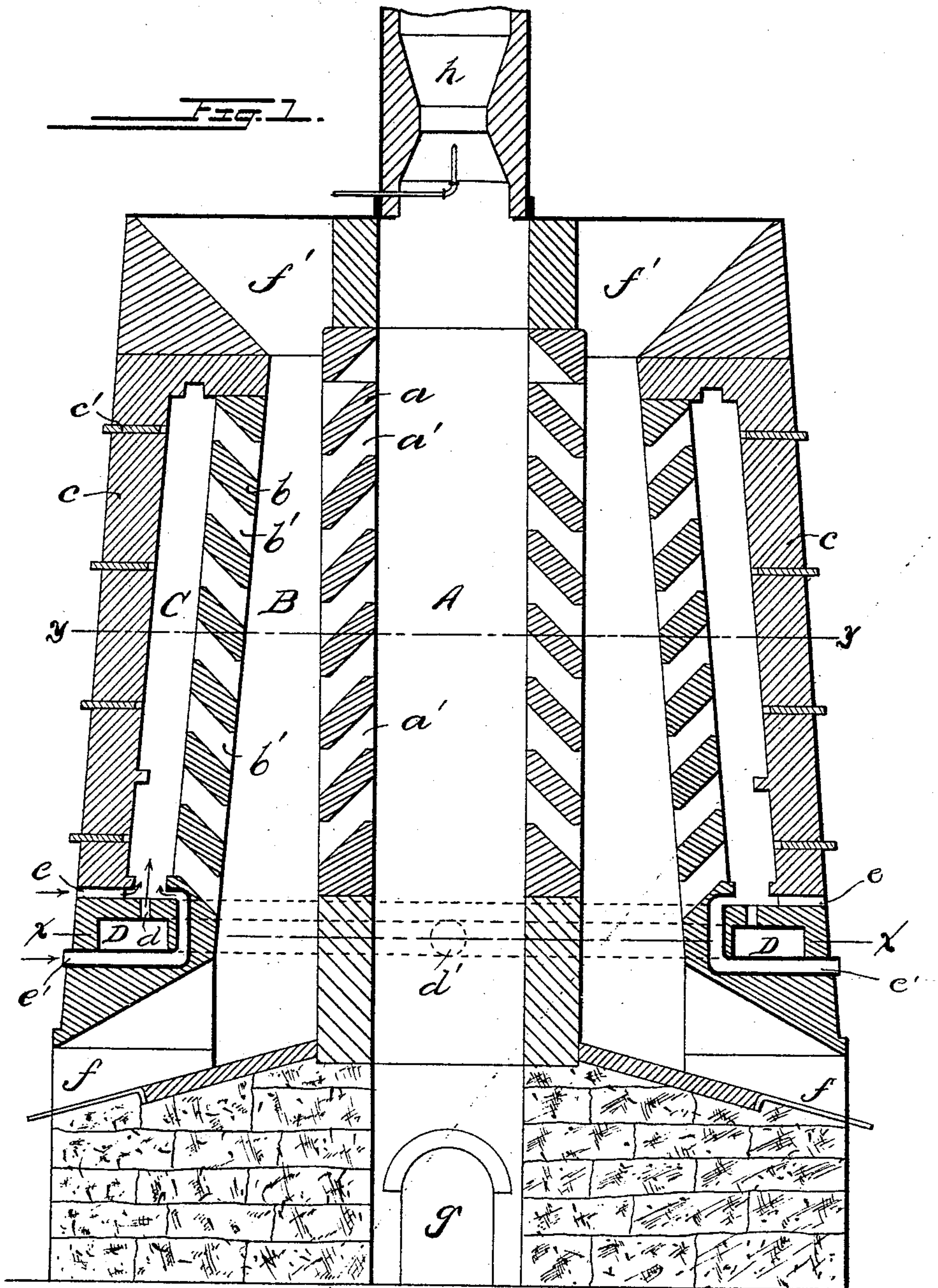


2 Sheets—Sheet 1.

No. 495,883.

Patented Apr. 18, 1893.



Witnesses

Eda Kelly
David Levan

Robert C. Green Inventor

By *his* Attorney

John S. Swank

(No Model.)

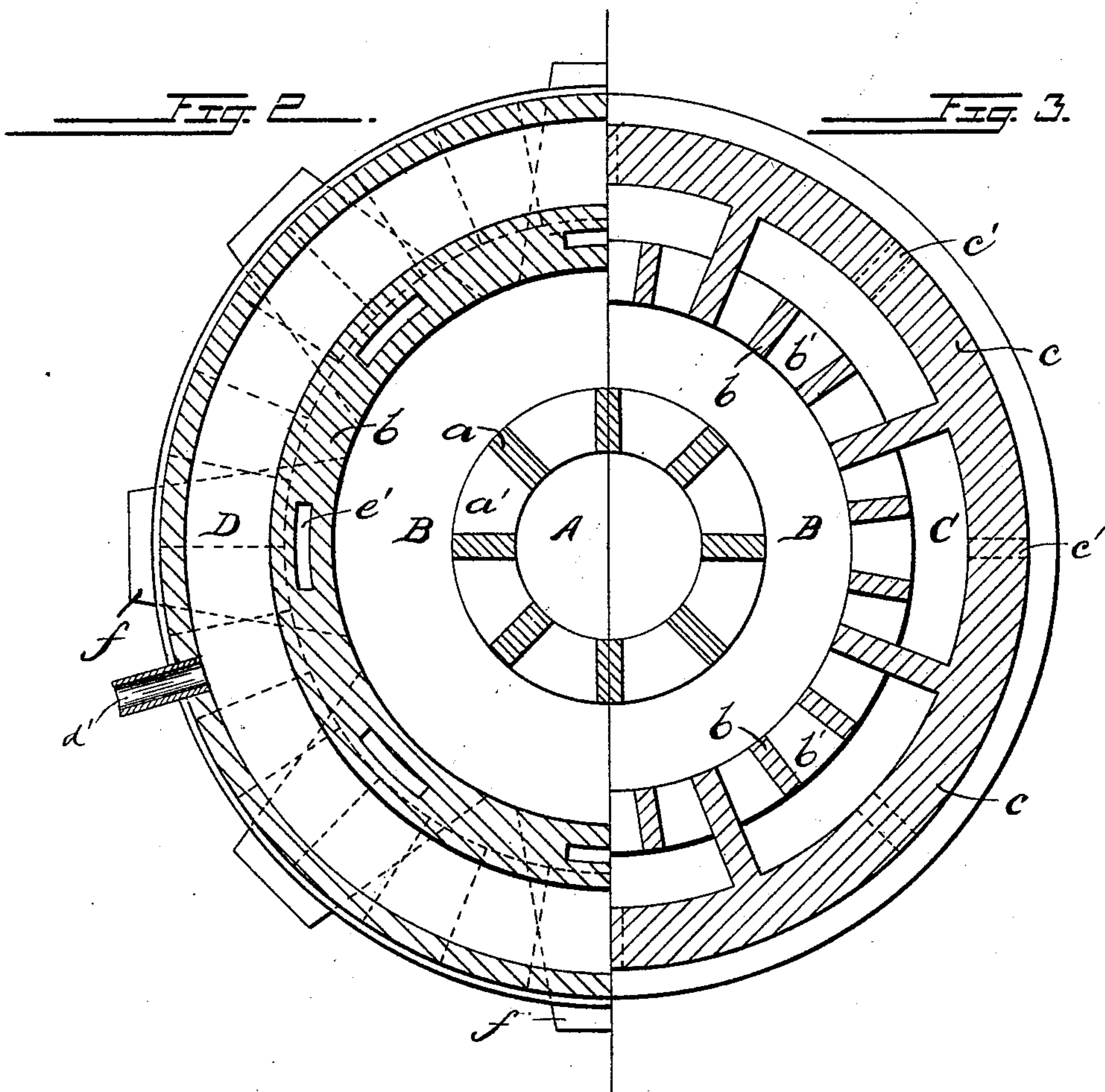
2 Sheets—Sheet 2.

R. C. GREER.

ORE ROASTING AND CALCINING FURNACE.

No. 495,883.

Patented Apr. 18, 1893.



Witnesses

Edw. Kelly
David Levan

Robert C. Greer

Inventor

By his Attorney

J. H. Stark

UNITED STATES PATENT OFFICE.

ROBSON C. GREER, OF LEBANON, PENNSYLVANIA.

ORE ROASTING AND CALCINING FURNACE.

SPECIFICATION forming part of Letters Patent No. 495,883, dated April 18, 1893.

Application filed March 12, 1892. Serial No. 424,620. (No model.)

To all whom it may concern:

Be it known that I, ROBSON C. GREER, a citizen of the United States, residing at Lebanon, in the county of Lebanon, State of Pennsylvania, have invented certain Improvements in Ore Roasting and Calcining Furnaces, of which the following is a specification.

My invention relates to furnaces intended more particularly for calcining or desulphurizing ores. Heretofore some furnaces of this class have been constructed with an annular roasting chamber surrounding and communicating with a central stack; the ore in such case being heated by a series of separate and independent openings or combustion chambers formed in the outer wall. Such a construction is shown in Patent No. 247,542, issued September 27, 1881.

The main purpose of my invention is to provide a simple form of roasting furnace which will produce a thorough and uniform treatment of the ore; and this I effect by means of the improved construction hereinafter fully described in connection with the accompanying drawings, the novel features of which are specifically pointed out in the claims.

Figure 1 is a sectional elevation of a furnace or kiln embodying my invention. Fig. 2 is a half cross-section on the line X X of Fig. 1 and Fig. 3 is a similar section on line Y Y of Fig. 1.

The furnace is represented as of the usual circular form. The central cylindrical chamber A which forms, in connection with the upward extension *h*, the smoke stack of the furnace, is surrounded by a wall *a* having numerous apertures *a'* arranged at an angle so as to open upwardly into the central chamber; a passage *g* in the base of the furnace provides access for cleaning. The annular roasting chamber B formed between the stack wall *a* and the intermediate wall *b*, is provided as usual with a feed opening *f'* at the top and with ore-drawing openings or chutes *f* at the bottom. This wall *b* is provided with numerous apertures *b'* corresponding with those in the wall *a* but angled in the opposite direction so as to open downward into the roasting chamber. Between the wall *b* and the outer wall *c* of the furnace is formed another annular chamber C which extends from practically the highest point of the ore-chamber

B to near the bottom of the latter. This third chamber C is adapted to serve as a single large combustion chamber wherein the fuel gases are ignited and consumed, and from which the products of combustion are brought, by means of the numerous openings *b'*, into intimate contact with every portion of the mass of ore stored in the chamber B, through which they must pass in order to reach the stack A.

The gas chamber D, by means of which the heating is effected, circles the entire roaster and forms the base of the combustion chamber C into which a series of ports *d* open from it, while gas is fed to the chamber D from any convenient source through the connection *d'*. Air-conduits *e* and *e'*, the latter passing to the rear of the gas chamber, open into the combustion chamber adjacent to and on opposite sides of each gas inlet *d*, thus insuring an intimate blending of air with the lighted gas; peep-holes *c'* are also provided at numerous points in the outer wall from which the plugs which close them may be readily removed if an additional supply of air to the chamber C be required to insure perfect combustion.

By means of my improved construction not only is a very simple form of furnace produced requiring but a single gas chamber and a single combustion chamber, but better and more economical results are produced in operating it;—the large combustion chamber and the facility with which a sufficient amount of air is admitted to it, insure superior combustion, and the uniformity with which the entire contents of the roaster are treated, greatly increases its capacity and the thoroughness of the work.

Having thus fully revealed my invention, I do not limit myself to the exact construction described and illustrated; but what I claim is—

1. An ore roasting or calcining kiln, having a central stack, an ore roasting chamber surrounding said stack, and a single combustion chamber encircling said roasting chamber and of substantially the same height as the same, said roasting chamber having communication on one side with said stack and on its opposite side at different points in its height with said combustion chamber, substantially as described and for the purposes specified.

2. An ore roasting or calcining kiln, having a central stack, a combustion chamber, and an ore roasting chamber between said combustion chamber and stack, the wall between said roasting chamber and stack having inclined openings *a'* at different points in its height, and the wall between said roasting and combustion chamber also having inclined openings *b'* at different points in its height, the inclination of said openings *a'* and *b'* being in opposite directions, all substantially as described and for the purposes specified.

3. In an ore roasting or calcining furnace, the combination with the stack and an ore roasting chamber, of a combustion chamber having communication with said roasting chamber, said combustion chamber having in its base a gas chamber D formed in its top with exit openings *d*, and also having air ports *e e'* opening into it adjacent to the gas exits *d*.

4. In an ore roasting or calcining furnace the combination with the stack and an ore roasting chamber, of a combustion chamber having communication with said roasting chamber, said combustion chamber having in its base a gas chamber D formed in its top with exit openings *d*, and also having air ports *e* and *e'* opening into it adjacent to the gas exits *d*, and holes *c'* opening into it at various points, and means for closing said holes *c'*.

5. In an ore roasting or calcining furnace,

the combination with the central stack, an ore roasting chamber surrounding said stack and having communication therewith, and a combustion chamber surrounding said roasting chamber and having communication therewith, said combustion chamber having ports *e* and *e'* of a gas chamber D located in the base of said combustion chamber and having exits *d* adjacent to the mouths of said ports *e* and *e'* substantially as described.

6. In an ore roasting or calcining furnace the combination with the central stack, an ore roasting chamber surrounding said stack and having communication therewith, and a combustion chamber surrounding said roasting chamber and having communication therewith, said combustion chamber having ports *e* and *e'* in its base, and opening *c'* at different points in its height, of a gas chamber forming the base of said combustion chamber, said gas chamber having outlets *d* to the combustion chamber located between the mouths of said ports *e* and *e'* and plugs for closing said openings *c'*, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ROBSON C. GREER.

Witnesses:

WILLIAM H. TICE,

J. GASTON DREW.