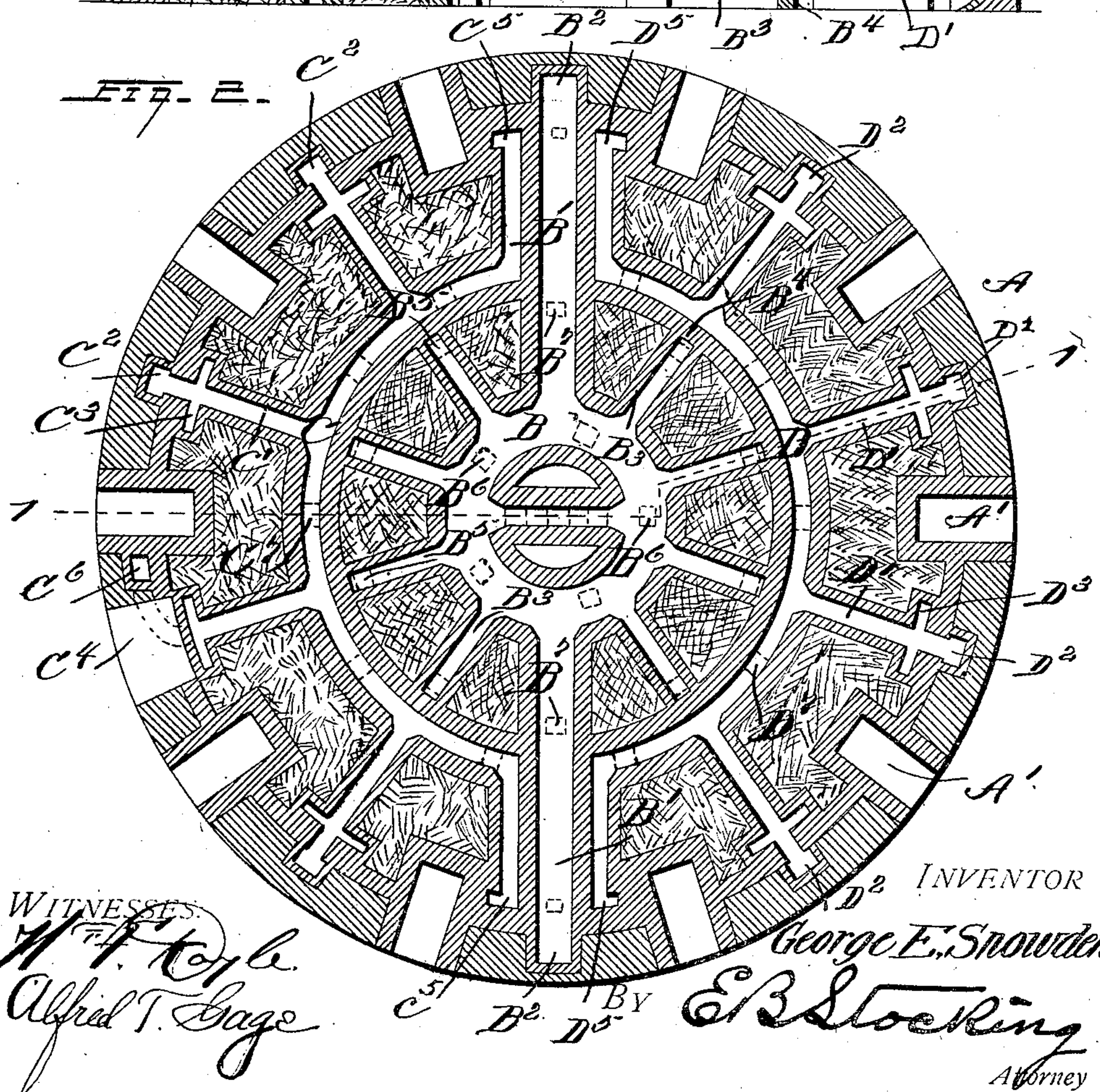
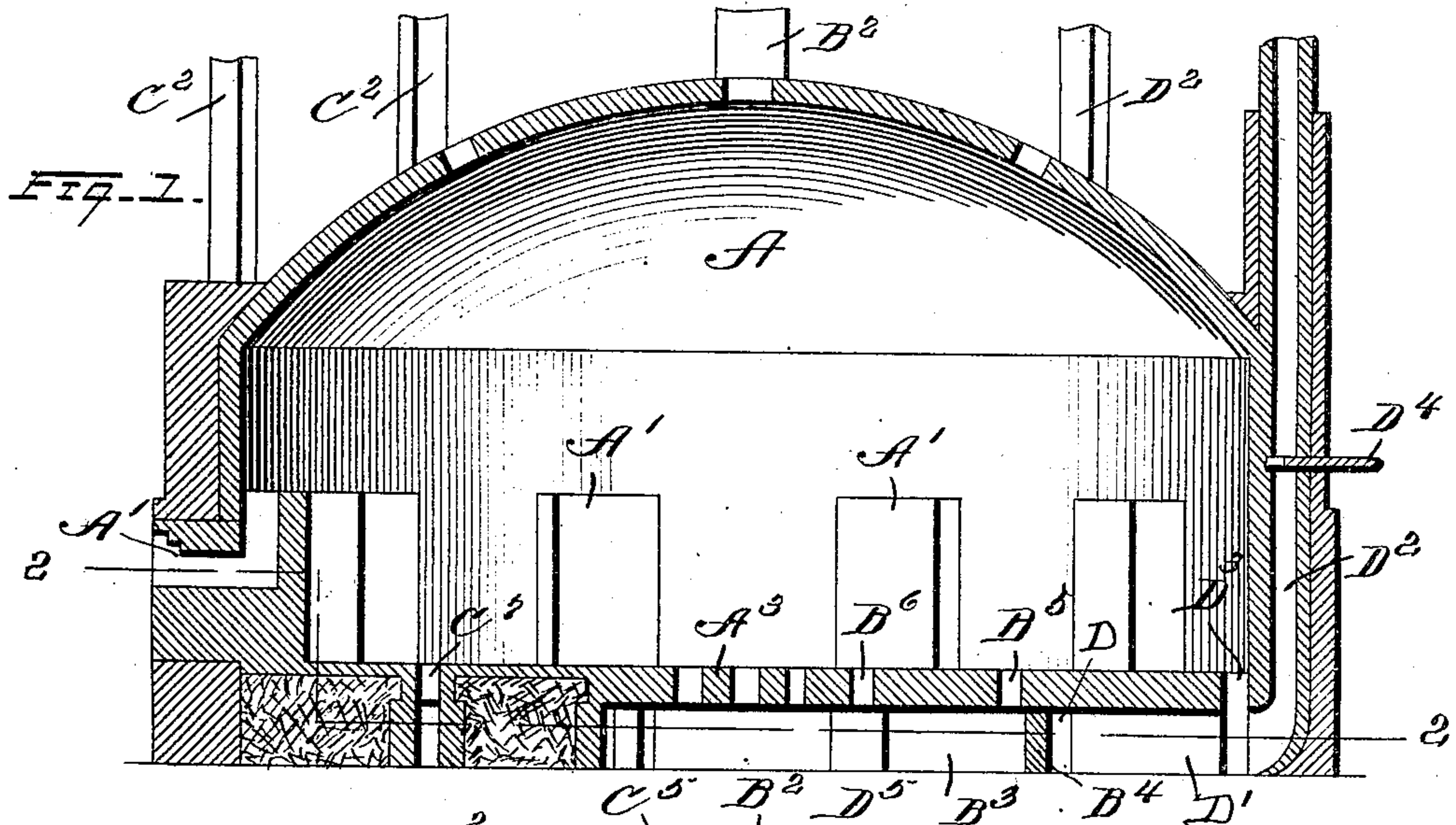


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G. E. SNOWDEN.
DOWNDRAFT KILN.

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DOWNDRAFT-KILN.

No. 816,752.

Specification of Letters Patent.

Patented April 3, 1906.

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To all whom it may concern:

Be it known that I, GEORGE E. SNOWDEN, a citizen of the United States, residing at New Cumberland, in the county of Hancock, State of West Virginia, have invented certain new and useful Improvements in Downdraft-Kilns, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to a downdraft-kiln, and particularly to improvements upon the construction shown in patent to T. I. Brett, No. 780,021, January 17, 1905, by which the improved features there disclosed are adapted for use in connection with a kiln in which the chimneys are built in the walls thereof.

The invention has for an object to provide an improved construction and arrangement of these flue connections with their chimneys whereby the draft may be balanced in the several parts of the kiln and an even temperature thereby maintained, so that the entire contents may be burned as quickly as the material will admit thereof, thereby effecting a material saving in time and fuel.

A further object of the invention is to provide a series of three flue systems, each adapted to be independently controlled by the chimneys communicating therewith, so that if one portion of the kiln is backward or slow in heating the operator may by proper adjustment of the dampers bring it to the desired temperature, and thus effect an even and thorough burning of all of the contents of the kiln before the same is opened.

Other and further objects of the invention will be hereinafter set forth, and the novel features thereof defined in the appended claims.

In the drawings, Figure 1 is a vertical section on line 1 1, Fig. 2; and Fig. 2, a horizontal section on line 2 2, Fig. 1.

Like letters of reference refer to like parts throughout both the views of the drawings.

The letter A designates a kiln structure, which may be of any desired configuration or construction and provided with the usual furnaces A', built in the walls thereof and alternating with the chimneys D², likewise formed as part of the kiln structure. The improvements presented by this invention relate particularly to the construction and arrangement of the flues beneath the floor A³ of the

kiln, and these flues comprise a central circular flue B, having at each side radially-disposed flues B' extending therefrom and at the outer ends communicating with a chimney B², so as to secure a constant downward draft in both directions from the center of the kiln. This circular flue is provided with radial flues B³ extending therefrom, of less diameter or area than the draft-flues B'. These radial flues B³ are closed at their outer ends by means of the wall B⁴, and the draft therethrough is downward through the openings B⁵ (shown by dotted lines, Fig. 2) and thence to the chimneys B². Intake-openings B⁶ into the central flue-spaces B are also provided and disposed at proper intervals from each other and at equal distances from the chimneys controlling the same, whereby the draft may be balanced. The radial flues B' are also provided with openings B⁷ therein.

The parts so far described comprise the central flue system, and upon each side thereof segmental flue systems C and D are provided, they being substantially similar in construction and each controlling one-third of the area of the kiln to be heated. These flues are each provided with radial flues C' and D', extending to the chimneys C² and D², constructed in the wall of the kiln, and adjacent to this wall are provided with elongated draft-openings C³ and D³ to properly spread the draft at the kiln-wall and to produce a proper heating of all sides of the material at that point. Each of the chimneys is provided with a suitable damper D⁴, as shown in Fig. 1. At the ends of the segmental flues C and D radial flues C⁵ and D⁵ are provided and extend parallel with the main flues B'. The kiln is provided with suitable door-openings of any desired character—for instance, as shown at C⁴—and the chimney at that point is deflected to one side and adjacent to the alternated furnace, as shown at C⁶. The flues C and D communicate with suitable openings C⁷ and D⁷, formed in the floor of the kiln, each of these being spaced at substantially equal distances from the chimneys controlling the same, whereby the draft is equalized at the different parts of the kiln. For the purpose of equalizing this draft the area or size of the flue systems C and D is less than that of the central flue and its radial extensions; but the total area of the flue-spaces

controlled by each of the systems is substantially equal.

The system of flues hereinbefore described permits an even temperature to be maintained throughout the entire contents of the kiln, and consequently the ware therein may be burned at an appreciable saving of time and fuel. It is also evident that if one portion of the kiln is at too high or too low a temperature the operator can readily control the draft to bring that portion to the desired temperature and then finish the burning of all of the contents of the kiln evenly and prevent the uneven burning of a portion thereof, which frequently occurs. The flue system is simple in construction and comprises only three sections, the two outer ones of which are controlled by the smaller chimneys C² and D², while the two larger chimneys B² control the central portion of the kiln, so that there is no complication of flues, as each system is entirely independent of the other. It will also be observed that the ports or draft-openings in the floor of the kiln are disposed at substantially equal distances from their respective chimneys in the two semicircular flues, so as to secure the most even and equal draft through each thereof, while the central flue is supplied with a greater number of ports in order to produce the same draft, as the ports nearest the chimneys have a greater draft than those removed therefrom. By this arrangement the central circular flue is adapted to balance with the two segmental flues. It will also be observed that the ports at the flue-walls are narrow and elongated, so as to spread the draft at that point and cause the material in the kiln next the wall thereof to receive the full draft on all sides. It will also be observed that the disposition of the chimneys at equal distances from the furnaces provides for the even heating of the kiln, as well as the balancing of the draft, which is absolutely essential in securing efficient results in the burning of material therein.

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

1. A downdraft-kiln provided with chimneys disposed at the outer kiln-wall, a central draft-flue beneath the kiln-floor provided with radially-extending flues each communicating with a chimney at its outer end, and independent segmental flue systems at each side of the central flue and provided with a plurality of radial flues each disposed intermediate of two floor-openings and communicating with an independent chimney of less area than the chimney of the central flue.

2. A downdraft-kiln provided with chimneys disposed at the outer kiln-wall, a central draft-flue beneath the kiln-floor provided with radially-extending flues each communi-

cating with a chimney at its outer end, independent segmental flue systems at each side of the central flue and provided with a plurality of radial flues each communicating with an independent chimney, and a floor structure provided with elongated draft-ports adjacent to each of the chimneys controlling the segmental flues.

3. A downdraft-kiln provided with chimneys disposed at the outer kiln-wall, a central draft-flue beneath the kiln-floor provided with radially-extending flues each communicating with a chimney at its outer end, independent segmental-flue systems at each side of the central flue and provided with a plurality of radial flues each communicating with an independent chimney, and a floor structure provided with draft-ports communicating with the segmental flues and disposed at substantially equal distances from the radial flues controlling the same.

4. In a downdraft-kiln, a central circular flue occupying substantially one-third of the floor area of the kiln, radial flues extending from this central flue and closed at their outer ends, independent segmental flues disposed at opposite sides of said central flue, a series of radial flues extending from the segmental flues and disposed between each pair of floor-openings therein, chimneys disposed in the kiln-walls and each communicating with said radial flues from the segmental flues, and heating-furnaces disposed in the kiln-walls alternating with said chimneys.

5. In a downdraft-kiln, a central flue having opposite radial extensions therefrom communicating with chimneys at their outer ends, independent segmental flues at opposite sides of said central flue of less cross-sectional area than the central flue, a plurality of radial flues extending therefrom and disposed between each pair of floor-openings in the segmental flues, and chimneys controlling said segmental flues.

6. A downdraft-kiln comprising central and segmental sections, direct flues from the central section to diametrically opposite chimneys, radial flues from the segmental sections each terminating in a chimney of less area than those connected with the central section, and suitable floor-openings communicating with said flues.

7. A downdraft-kiln comprising central and segmental sections, direct flues from the central section to diametrically opposite chimneys, radial flues from the segmental sections each terminating in a chimney of less area than those connected with the central section, and floor-openings in the segmental section each arranged intermediate two adjacent flues.

8. A downdraft-kiln comprising central and segmental sections, direct flues from the central section to diametrically opposite

chimneys, radial flues from the segmental sections each terminating in a chimney of less area than those connected with the central section, floor-openings in the segmental section each arranged intermediate two adjacent flues, floor-openings for the central section arranged at the terminal of radial flues extending from a central annular space

communicating with both diametrically opposite chimneys.

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

GEORGE E. SNOWDEN.

Witnesses:

FAY CAIN,

JOHN R. DONEHOO.