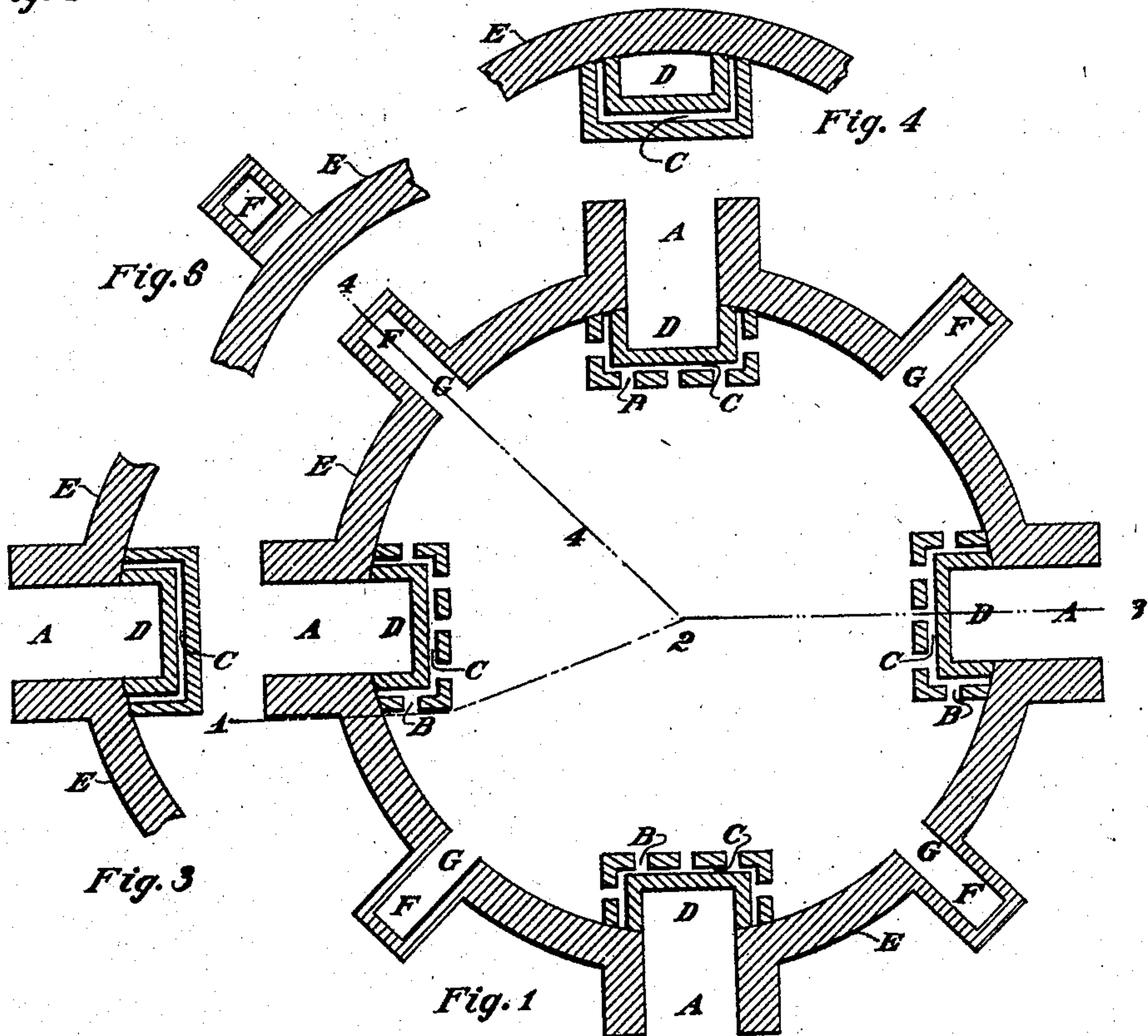
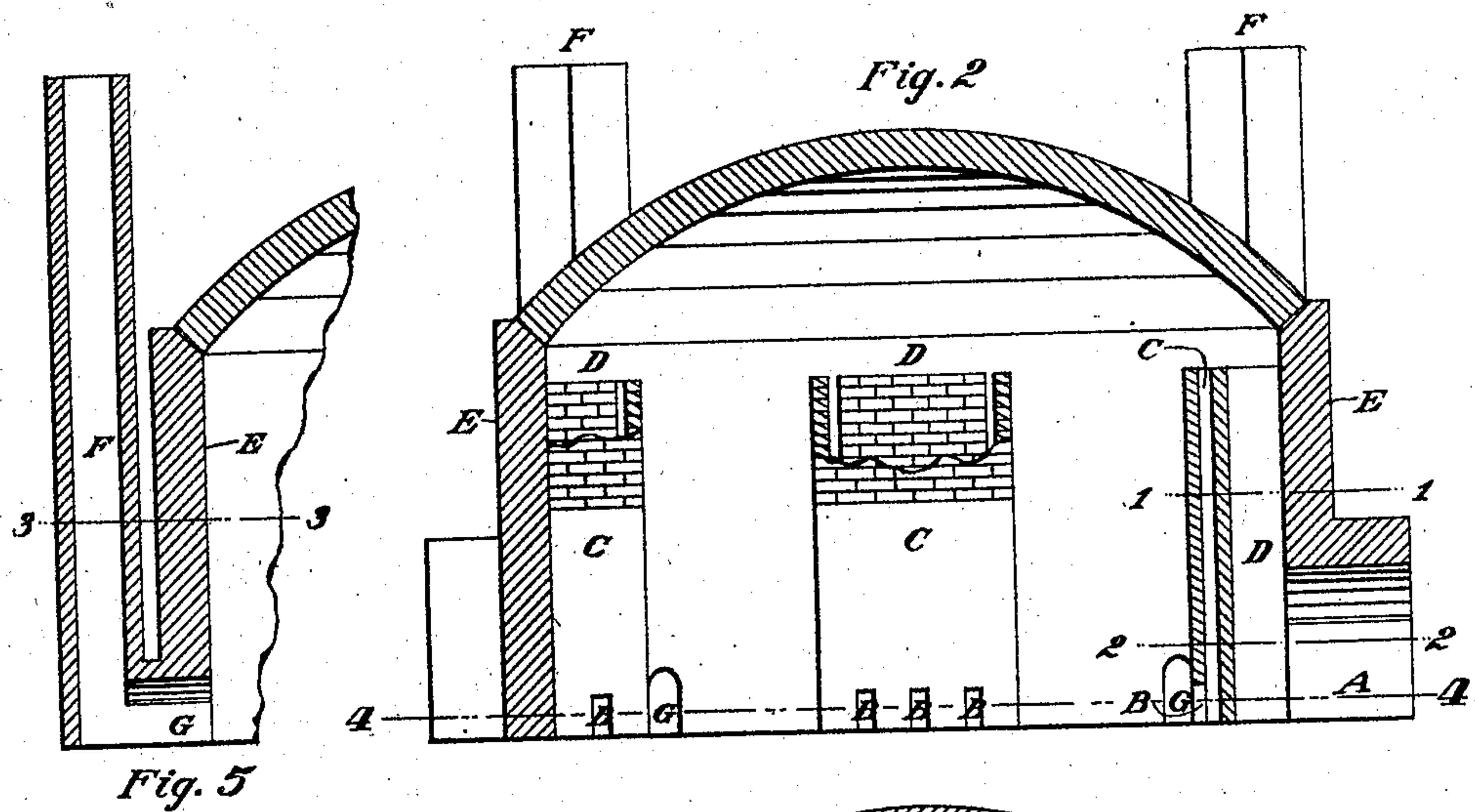


No. 815,388.

PATENTED MAR. 20, 1906.

R. W. STEWART.  
KILN.

APPLICATION FILED DEC. 4, 1905.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## KILN.

No. 815,388.

Specification of Letters Patent.

Patented March 20, 1906.

Application filed December 4, 1905. Serial No. 290,148.

*To all whom it may concern:*

Be it known that I, ROBERT W. STEWART, a citizen of the United States, residing at Findlay, in the county of Hancock and State of Ohio, have invented certain new and useful Improvements in Kilns; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates especially to what are known as "downdraft-kilns" for burning brick, tile, pottery, and other ceramic products.

The chief objects of the invention are, first, to insure the production of more evenly burned ware; second, to effect a reduction in the proportion of damaged ware, and, third, to save time and fuel required in the burning. These objects I accomplish by providing a construction in which supplementary ascending currents of air in specific parts of the kiln and descending counter-currents in other and cooler parts of the kiln are created.

The invention consists in the construction hereinafter described and claimed, the claims not being limited to the precise forms or proportions of parts shown.

In the accompanying drawings, showing an embodiment of the improvement, Figure 1 is a horizontal sectional view on the line 4 4, Fig. 2. Fig. 2 is a central vertical sectional view through the line 1 2 3, Fig. 1, some parts being left in full and other parts broken out. Fig. 3 is a horizontal sectional view on the line 2 2, Fig. 2. Fig. 4 is a horizontal sectional view on the line 1 1, Fig. 2. Fig. 5 is a vertical sectional view on the line 2 4, Fig. 1, showing the flue for carrying off the smoke and waste products of combustion. Fig. 6 is a horizontal section on the line 3 3, Fig. 5.

In the several views, E designates the kiln-wall, A a fire-box or furnace therein, and D a chimney therefor that opens into the interior of the kiln near the crown thereof. C designates a supplemental or circulating flue or chimney built out from the kiln-wall around three sides of the flue D, and B B are openings thereto at its lower end.

The supplemental chimney C, as shown in Fig. 2, is a separate and distinct one surrounding on three sides the chimney D, so that the heat and products of combustion

rising in said chimney D correspondingly heat the air in the flue C.

F designates the outer chimney or stack for conveying away the smoke and waste products of combustion, and G designates the opening from the kiln to said outer chimney.

The operation of the improvement is as follows: The products of combustion from the furnace pass up the chimney D and heat that chimney, and therefore the air in the flue C, above the temperature of the air in the body and bottom of the kiln. The warmer air rising through the chimney C mixes with and moderates the intensity of the heat direct from the furnace, and therefore protects the ware in the upper part of the kiln, and especially that near the chimney. The air from the flues C and D then descends through the ware into the cooler parts of the kiln and in its descent carries with it and transmits to the surrounding air the heat gained in its ascent. Provision can be made by suitably placing the ware within the kiln, so that the heated descending air will pass through the ware near the floor or through passages under the floor and return to the chimneys, thus maintaining the circulation until an equilibrium of temperature is established throughout the kiln.

In another application filed concurrently herewith I broadly claim this invention.

It is obvious that the flues C and D need not be of exactly the same height and that the products of combustion can be disposed of otherwise than by a stack F.

A chimney outside of a chimney is preferable when it is desired to construct any part thereof of common brick or unburned plastic ware instead of all fire-brick. If refractory wares are to be burned, a single chimney having a partition-wall may be substituted for the separate chimneys.

What I claim, and desire to secure by Letters Patent herein, is—

1. In a kiln, a chimney having a main or fire flue that takes air from the exterior of the kiln, and a supplemental flue adjacent to and surrounding three sides of the main flue the air therein being heated by the wall of the main flue, said supplemental flue communicating at its upper and lower ends with the interior of the kiln.

2. In a kiln, a chimney having a main or  
fire flue that takes air from the exterior of the  
kiln and discharges into the interior of the  
kiln, and a supplemental flue surrounding  
5 three sides of the main flue, said supplemen-  
tal flue communicating at its upper and  
lower ends with the interior of the kiln.

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

ROBERT W. STEWART.

Witnesses:

VIOLA TEMPLE,  
MINOR BRANCHLEY.