

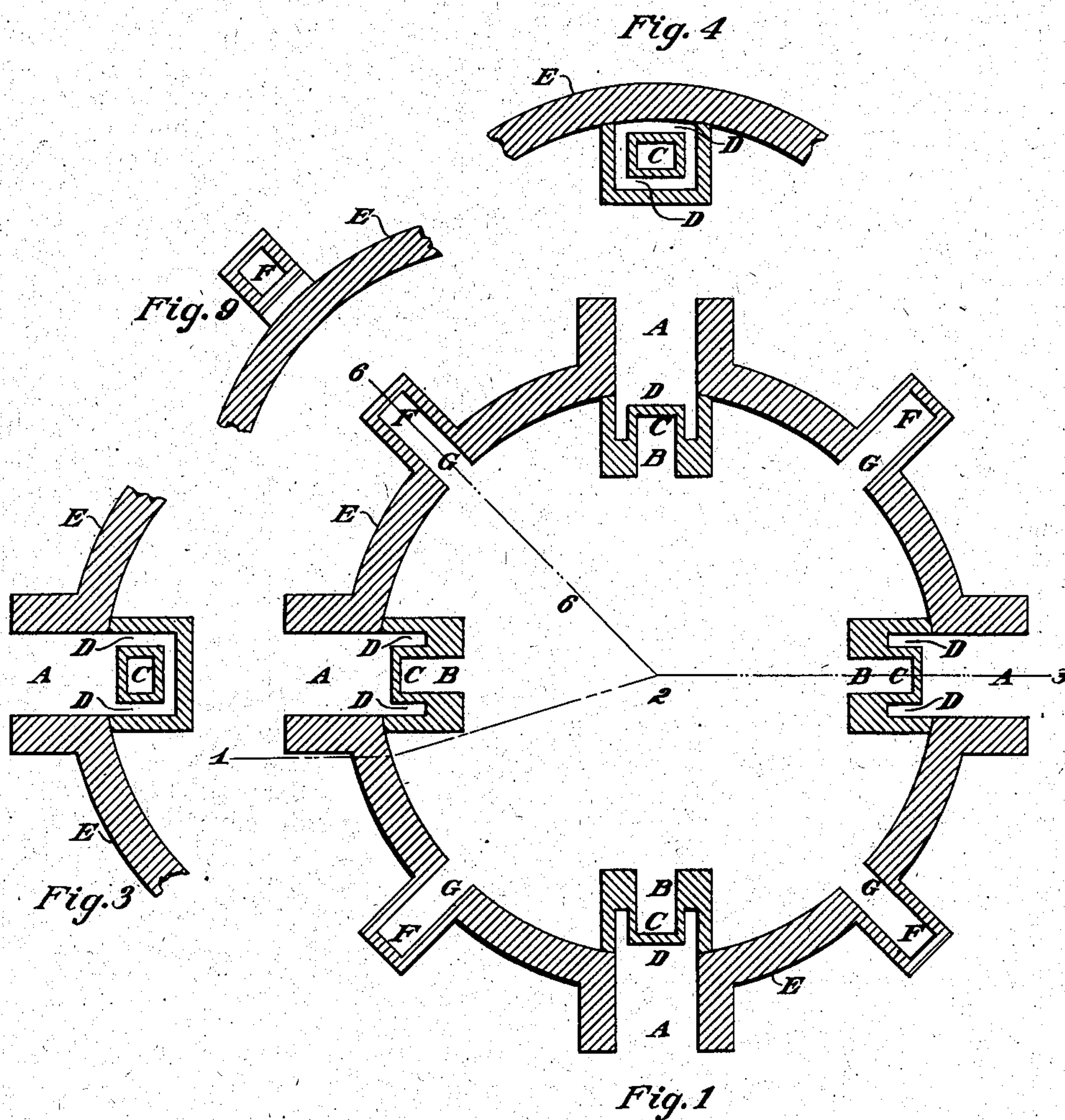
No. 815,387.

PATENTED MAR. 20, 1906.

R. W. STEWART.
KILN.

APPLICATION FILED DEC. 2, 1905.

2 SHEETS—SHEET 1.



Witnesses

Harry W. Hoadley.
Viola Pimple.

Inventor
Robert W. Stewart

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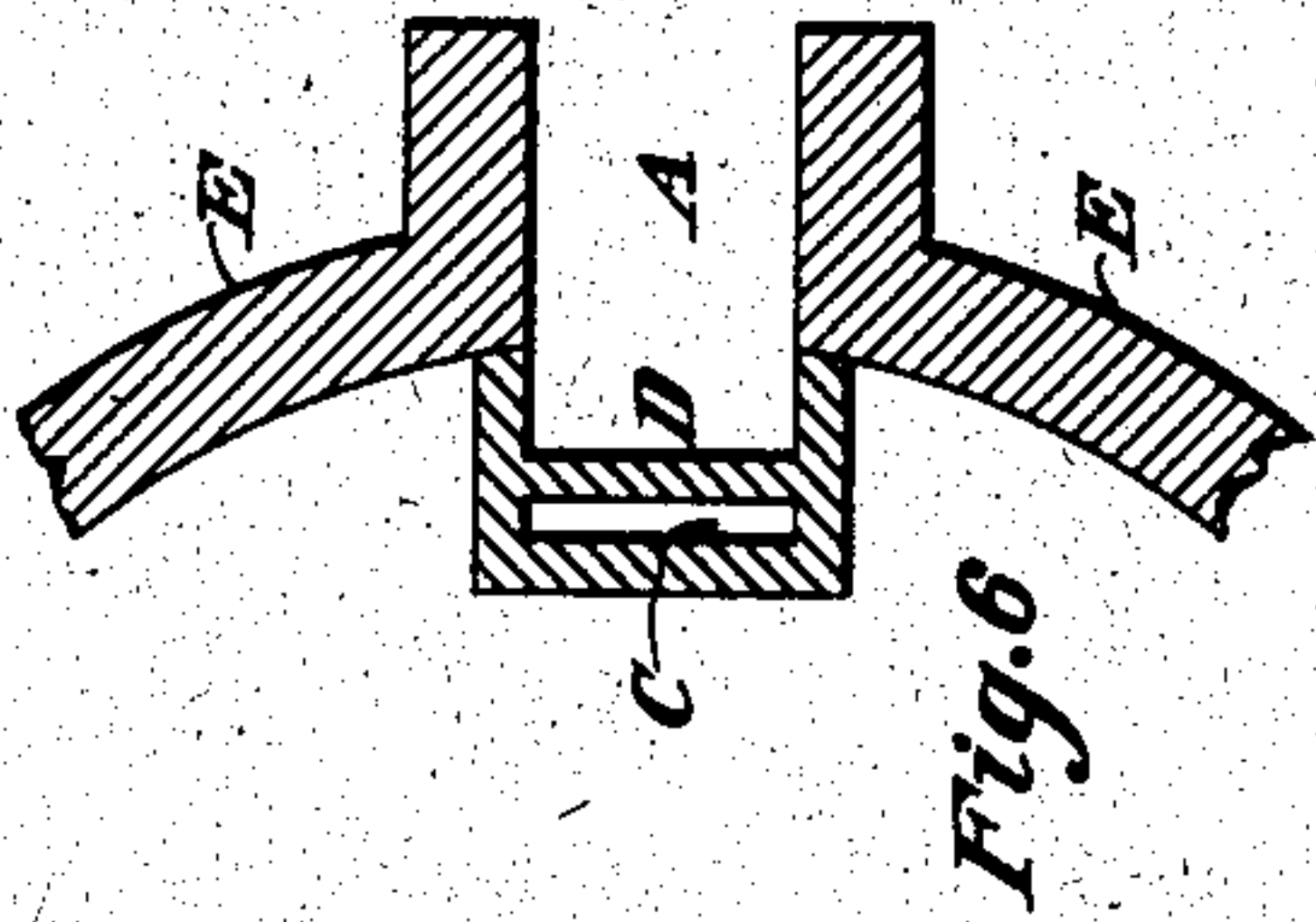


Fig. 6

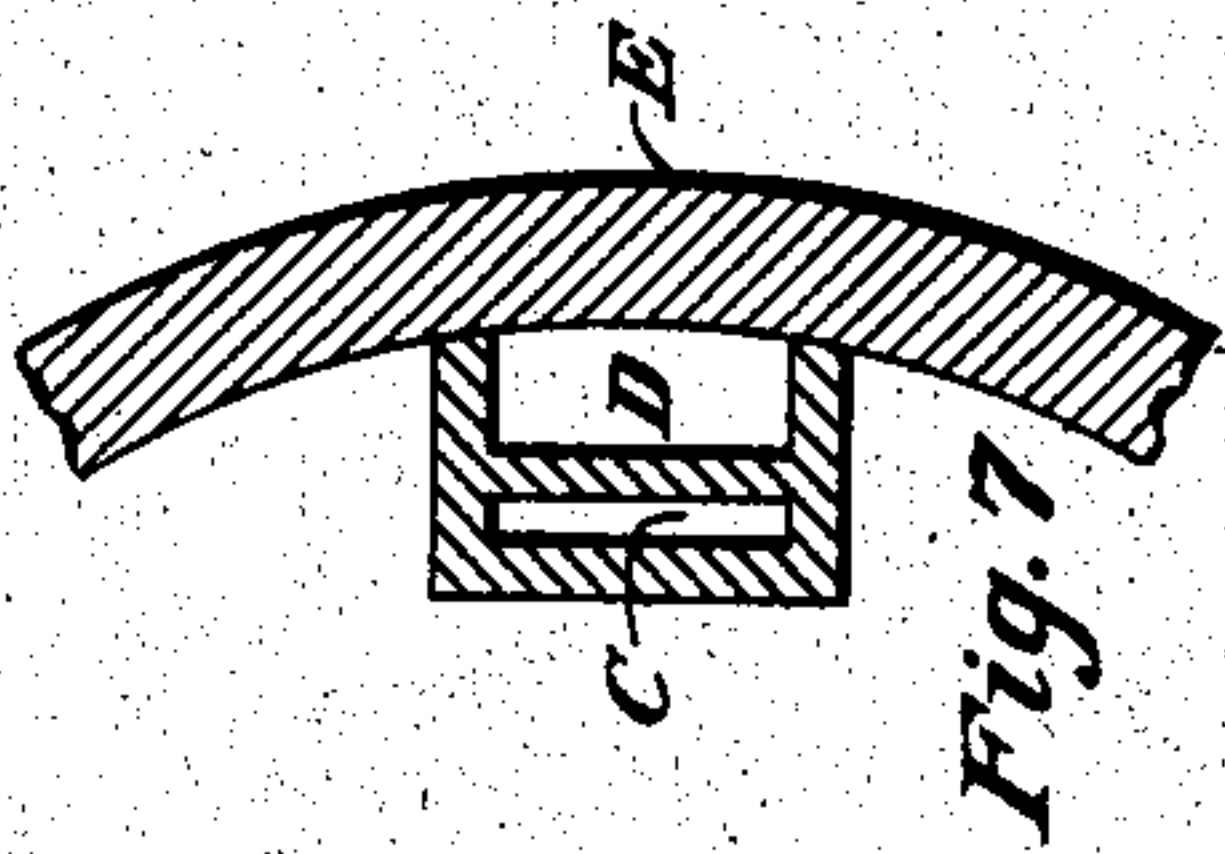


Fig. 7

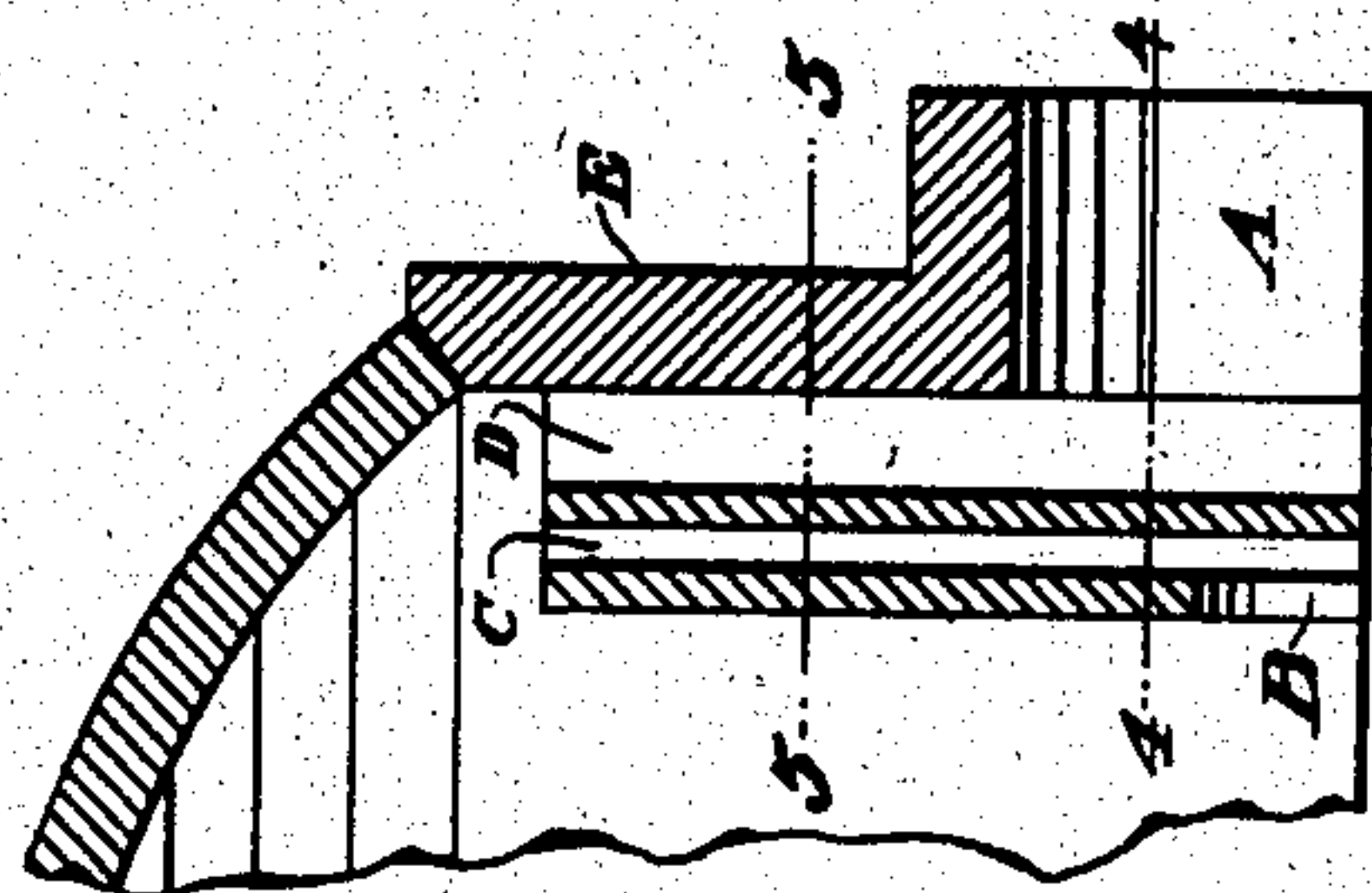


Fig. 5

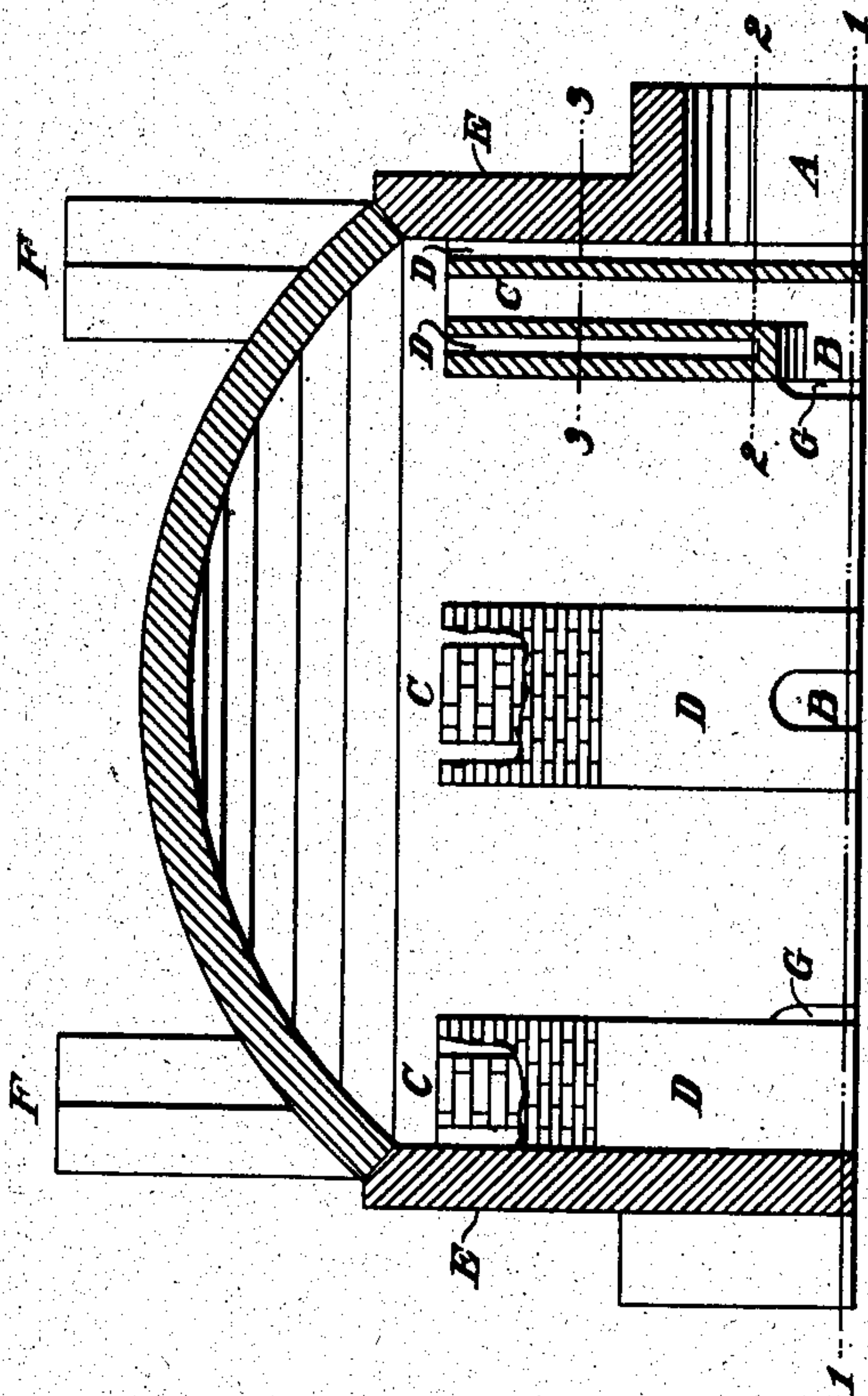


Fig. 2

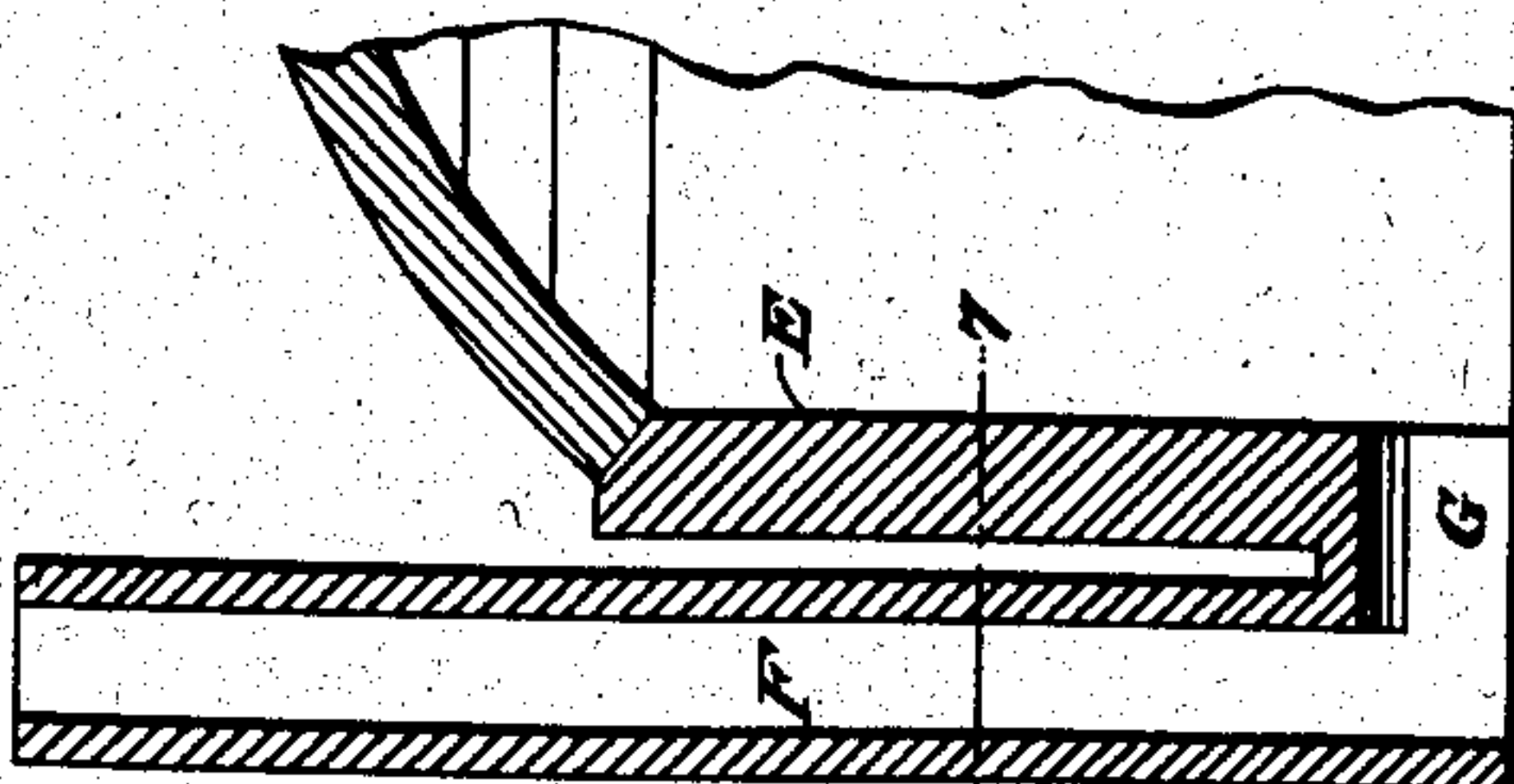


Fig. 8

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UNITED STATES PATENT OFFICE.

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No. 815,387.

Specification of Letters Patent.

Patented March 20, 1906.

Application filed December 2, 1905. Serial No. 289,990.

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 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 embodiments of the improvement, Figure 1 is a horizontal sectional view on the line 1 1, 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 3 3, Fig. 2. Fig. 5 is a vertical section through a fire-box and chimney, illustrating a modification consisting of a single chimney construction with a partition-wall. Fig. 6 is a horizontal section on the line 4 4, Fig. 5. Fig. 7 is a horizontal section on the line 5 5, Fig. 5. Fig. 8 is a vertical section on the line 6 6, Fig. 1. Fig. 9 is a horizontal section through the line 7 7, Fig. 8.

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, and B an opening thereto at its lower end.

The supplemental chimney C, as shown in

Fig. 2, is a separate and distinct one inclosed within the chimney D, so that the heat and products of combustion rising in said chimney D surround the chimney C.

As shown in Figs. 5, 6, and 7, the chimney is a single structure divided by a single partition-wall to separate the flues D and C; but in both forms of the invention the heat of the flue D is blanketed by a parallel column of 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.

The arrangement of a flue or chimney within a chimney, as shown in Fig. 2, so that the products of combustion from the furnace surround the inner flue or chimney is preferable; but a single chimney structure divided by a partition into the separate compartments, as shown in Figs. 5, 6, and 7, is entirely practicable and may be used. In this present application I intend to claim the invention broadly and the species an embodiment of which is shown in Fig. 2. In another application filed concurrently herewith I claim specifically another species of the 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.

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

1. In a kiln, a chimney having separate and distinct compartments, to wit: a compartment leading from the furnace to the interior of the kiln, and a compartment communicating with the interior of the kiln near the bottom thereof and discharging back into the interior the kiln.

2. 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 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.

3. In a kiln, a chimney having a main or fire flue that takes air from the exterior of the kiln, and a supplemental flue within the main flue and surrounded by said main flue, said supplemental 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.