

No. 677,697.

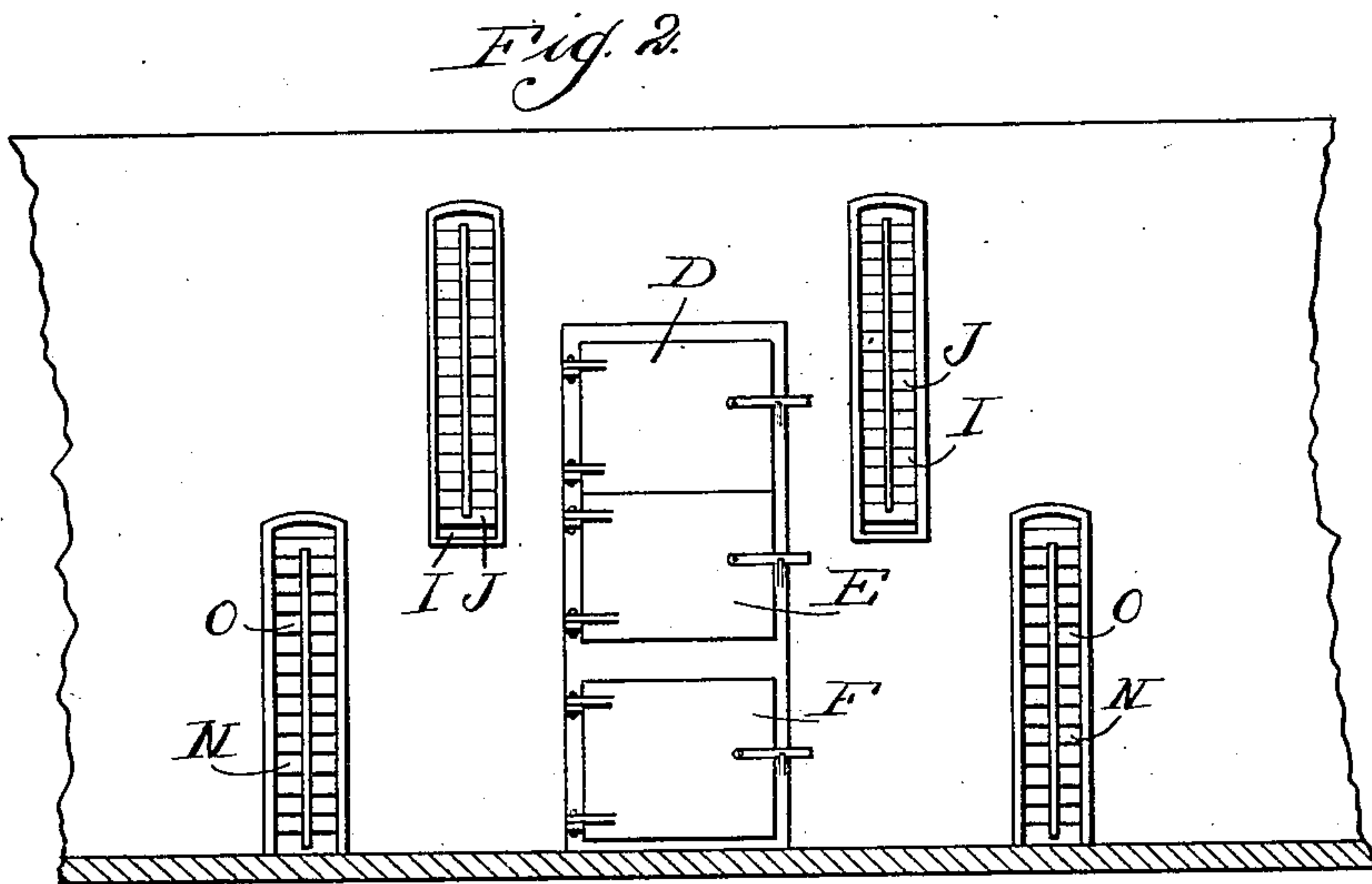
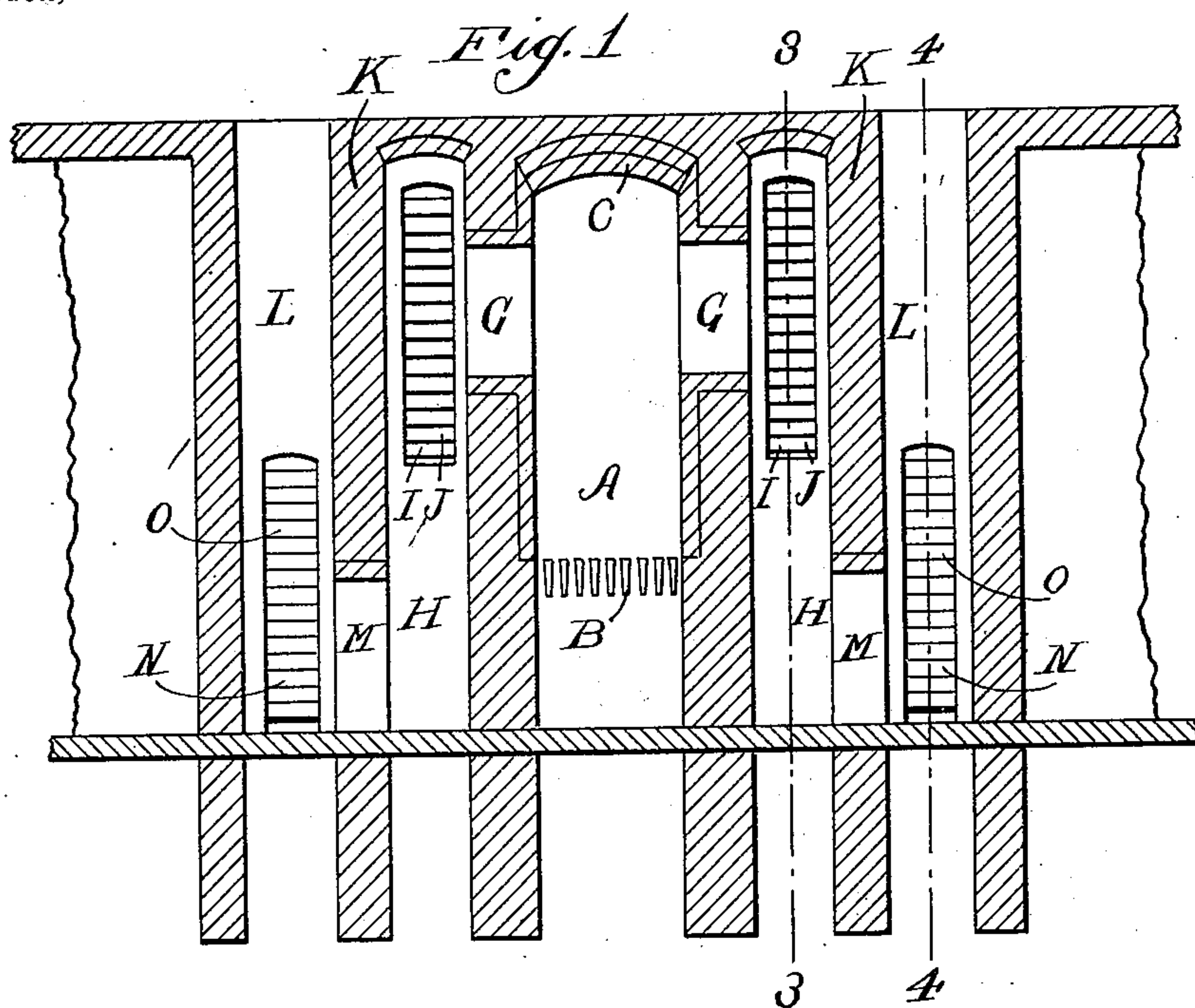
Patented July 2, 1901.

W. H. PRINZ.
FURNACE FOR DRIERS.

(Application filed May 31, 1900.)

(No Model.)

2 Sheets—Sheet 1.



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2 Sheets—Sheet 2.

Fig. 3.

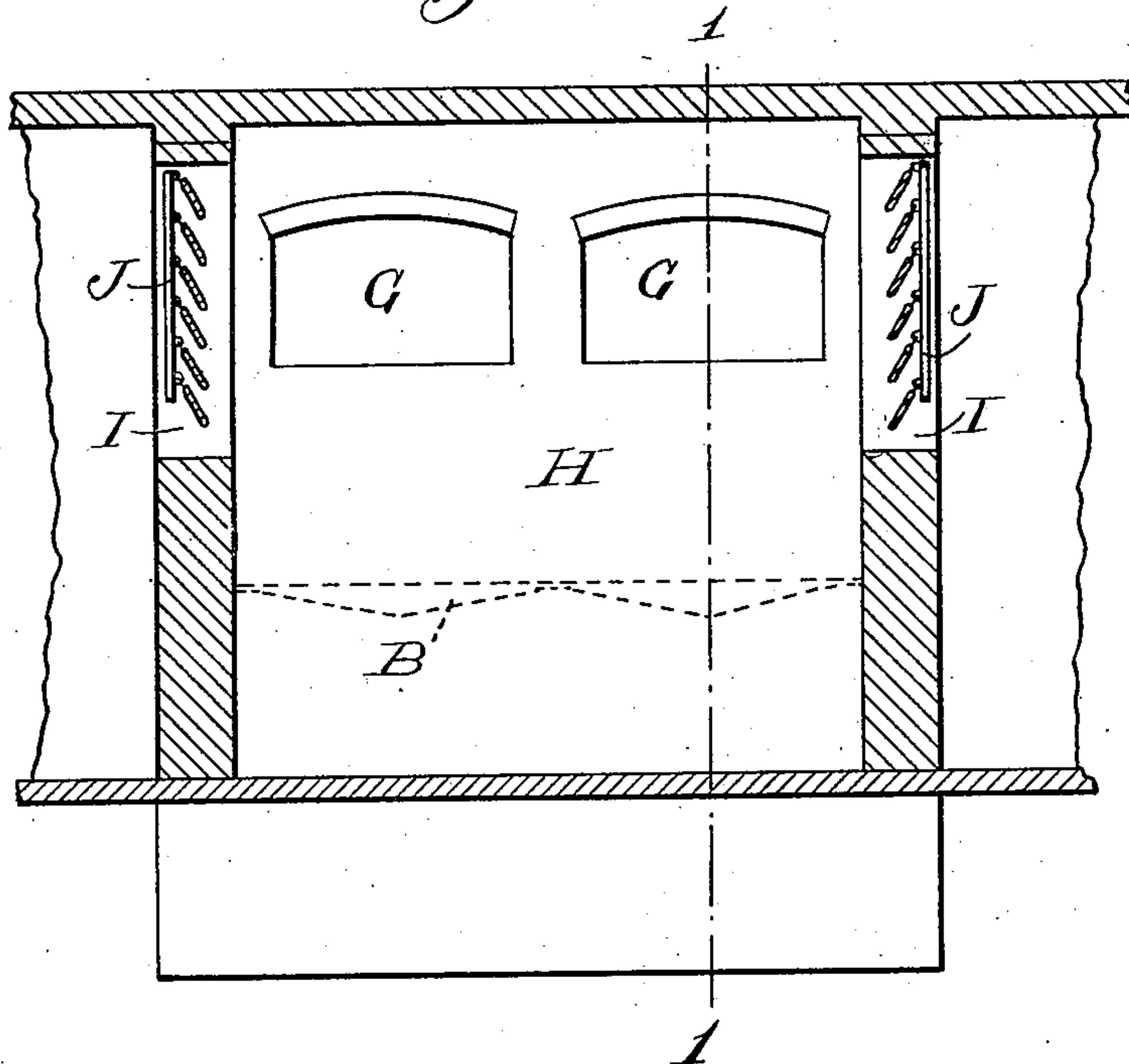
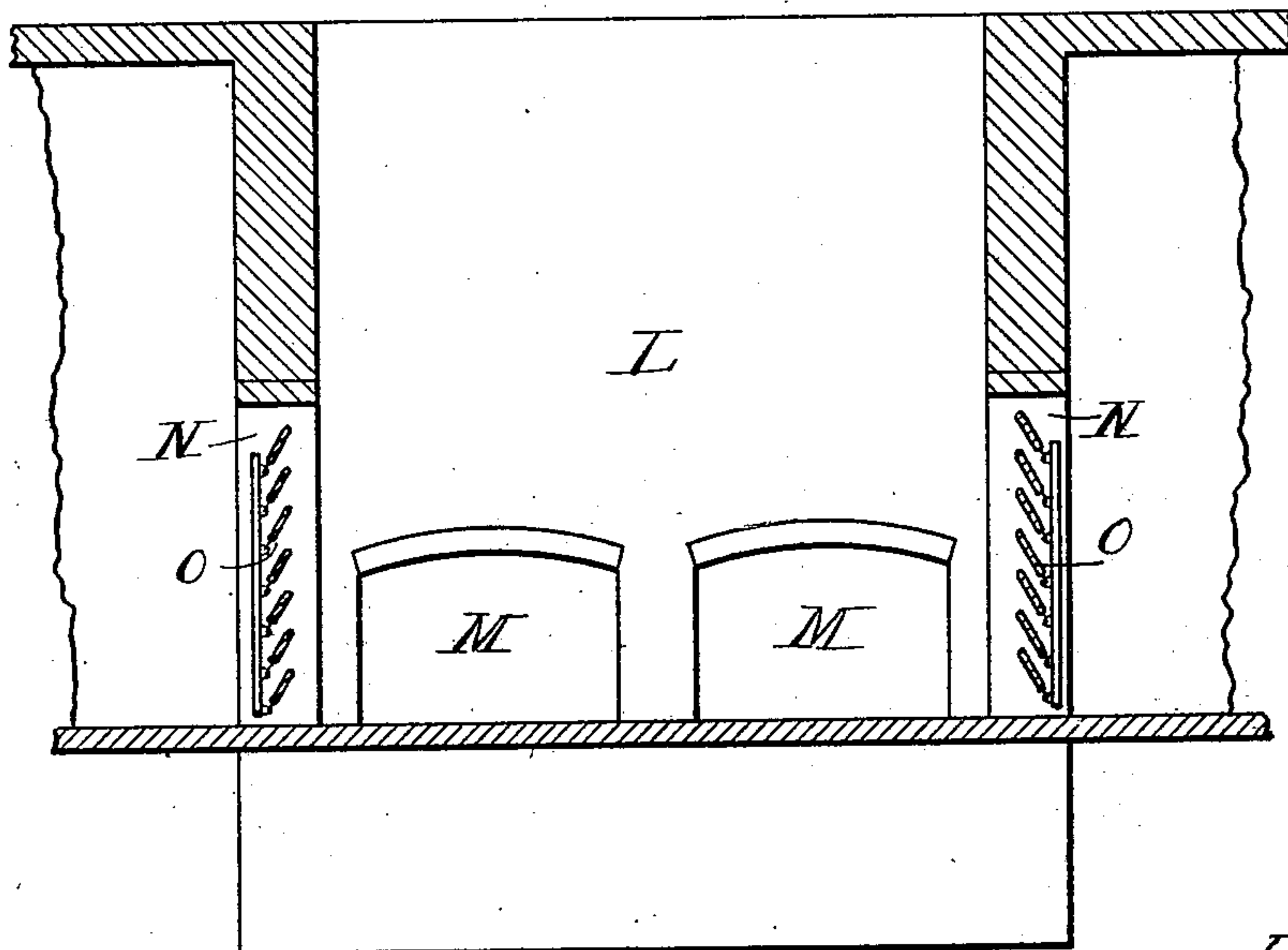


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM H. PRINZ, OF AUSTIN, ILLINOIS, ASSIGNOR TO THE SALADIN
PNEUMATIC MALTING CONSTRUCTION CO., OF CHICAGO, ILLINOIS.

FURNACE FOR DRIERS.

SPECIFICATION forming part of Letters Patent No. 677,697, dated July 2, 1901.

Original application filed August 15, 1898, Serial No. 688,622. Divided and this application filed May 31, 1900. Serial
No. 18,593. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. PRINZ, a citizen of the United States, residing at Austin, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Furnaces for Driers; 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.

My invention relates to a novel construction in a furnace for driers, the object being to provide a furnace in which the products of combustion are thoroughly and intimately mixed with a large volume of fresh air, thereby not only reducing the temperature, but likewise providing a large volume of warm dry air, whereby the best results in drying grain, &c., are produced; and it consists in the features of construction and combinations of parts hereinafter fully described and claimed.

In the accompanying drawings, illustrating my invention, Figure 1 is a vertical transverse section of a furnace constructed in accordance with my invention, taken on the line 1 1 of Fig. 3. Fig. 2 is an end elevation of same. Figs. 3 and 4 are vertical longitudinal sections on the lines 3 3 and 4 4, respectively, of Fig. 1.

This application is a division of my application for Letters Patent for an apparatus for drying malt, filed August 15, 1898, Serial No. 688,622.

In drying grain and the like the best results are produced by using a large volume of warm air of practically uniform temperature, as such large volume of warm air is obviously capable of absorbing a very much larger quantity of moisture than a limited volume of very much hotter air. Another advantage of the use of a larger volume of warm air as against a lesser volume of hot air is that it cannot injuriously affect malt or grain in the manner of hot air, which is apt, without the exercise of great care, to roast the malt or grain. Another disadvantage of the use of hot air is the fact that the temperature of the grain is greatly increased and a slight draft of cold air is apt to chill it in parts, thereby rendering it acidulous. Heretofore it has been very difficult to provide a large volume of warm air of a practically uniform

temperature throughout, for the reason that the fresh admitted to mix with the hot air was admitted at points more or less remote from the furnace, and thereby a number of currents of greatly-varying temperatures were produced which acted injuriously on the malt or grain. Then, again, in the furnaces heretofore used the hot gases were admitted directly to the drying-chamber and carried a large quantity of fine ashes, which mixed with the grain.

My present device is designed to overcome the above-named disadvantages by intimately commingling the hot and cold air entering the drying-chamber, so that the temperature throughout the latter is maintained uniformly, and, further, by providing passages to cause the products of combustion to take a zigzag course to free the latter of the fine ashes usually carried thereby.

To these and other ends my device consists of a firing-chamber A, provided midway between its top and bottom with a grate B and having a covering C. The said firing-chamber A is open at both ends and is provided with hinged doors D, E, and F at said ends. In the side walls of said firing-chamber A, above said grate B, is a plurality of openings G, leading to covered downdraft mixing-chambers H on each side of said firing-chamber A. In the end walls of said mixing-chambers H are openings I, in which movable slats or blinds J are mounted, which can be adjusted to close said openings I or to admit air thereto. In the lower ends of the walls K, separating said mixing-chambers H and the mixing-chambers L beyond the same, are openings M, connecting said mixing-chambers H and L. The latter are open at their upper ends and discharge into the drying-chamber above. (Not shown.) In the end walls of said mixing-chambers L are openings N, likewise controlled by blinds O.

The operation of my furnace is very simple. A hard-coal fire is built upon the grate B and is controlled by means of the doors D, E, and F. The products of combustion and hot air then pass through the mixing-chamber H and draw in fresh air through said blinds J, which intermingles with said hot gases. The latter carry fine ashes with them,

and these fine ashes settle in the bottom of said mixing-chamber H, being deposited when said gases turn through the openings M into mixing-chamber L. Thence said hot gases, 5 partially mixed with fresh air, pass upwardly through the chambers L and during their passage are further mixed with fresh air admitted through said blinds O. Said mixing-chambers H and L are narrow and flue-like, 10 this being essential to produce an ultimate mixture of the hot gases with fresh air, and hence when the mixed gases are discharged their temperature throughout is practically uniform. The temperature of said gases can 15 also be readily controlled by adjusting the blinds and the doors of the firing-chamber to admit varying quantities of fresh air at various points, thus enabling the operator to secure any result he may desire.

20 It is an essential feature of my invention that the mixing-chambers be so proportioned to the drying-chamber that the gases must pass through said mixing-chambers at very high speed, because in this way only can an 25 intimate mixture of the products of combustion and fresh air be accomplished.

I claim as my invention—

1. A device of the kind specified, comprising a covered combustion-chamber, a covered 30 mixing-chamber at the side of said combustion-chamber and opening thereto adjacent the top of each, a second mixing-chamber at the opposite side and substantially coextensive with said first mixing-chamber, and open

thereto at the bottom of each, and air-flues 35 entering each mixing-chamber on a level with its induction-flue.

2. A device of the kind specified, comprising a combustion-chamber covered by an arch, a mixing-chamber having a discharge-open- 40 ing at the top, an intermediate mixing-chamber located between the combustion-chamber and the first-named mixing-chamber, a flue connecting said combustion-chamber and said intermediate mixing-chamber at the top 45 of each, a flue connecting said mixing-chambers at the bottom of each, and air-flues entering the top of said intermediate and bottom of said first-named mixing-chamber.

3. A device of the kind specified, comprising a combustion-chamber covered by an arch and provided with discharge-flues adjacent 50 the top, a downdraft mixing-flue on each side of said combustion-chamber, air-valves in said mixing-flues, a mixing-flue beyond each of 55 said downdraft-flues, open at the top and communicating with the latter at the bottom of each, and air-valves in said last-named mixing-flues, whereby the hot air and products of combustion from said combustion-chamber 60 are divided and mixed with cool air and discharged at divergent points.

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

WILLIAM H. PRINZ.

Witnesses:

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