

No. 785,771.

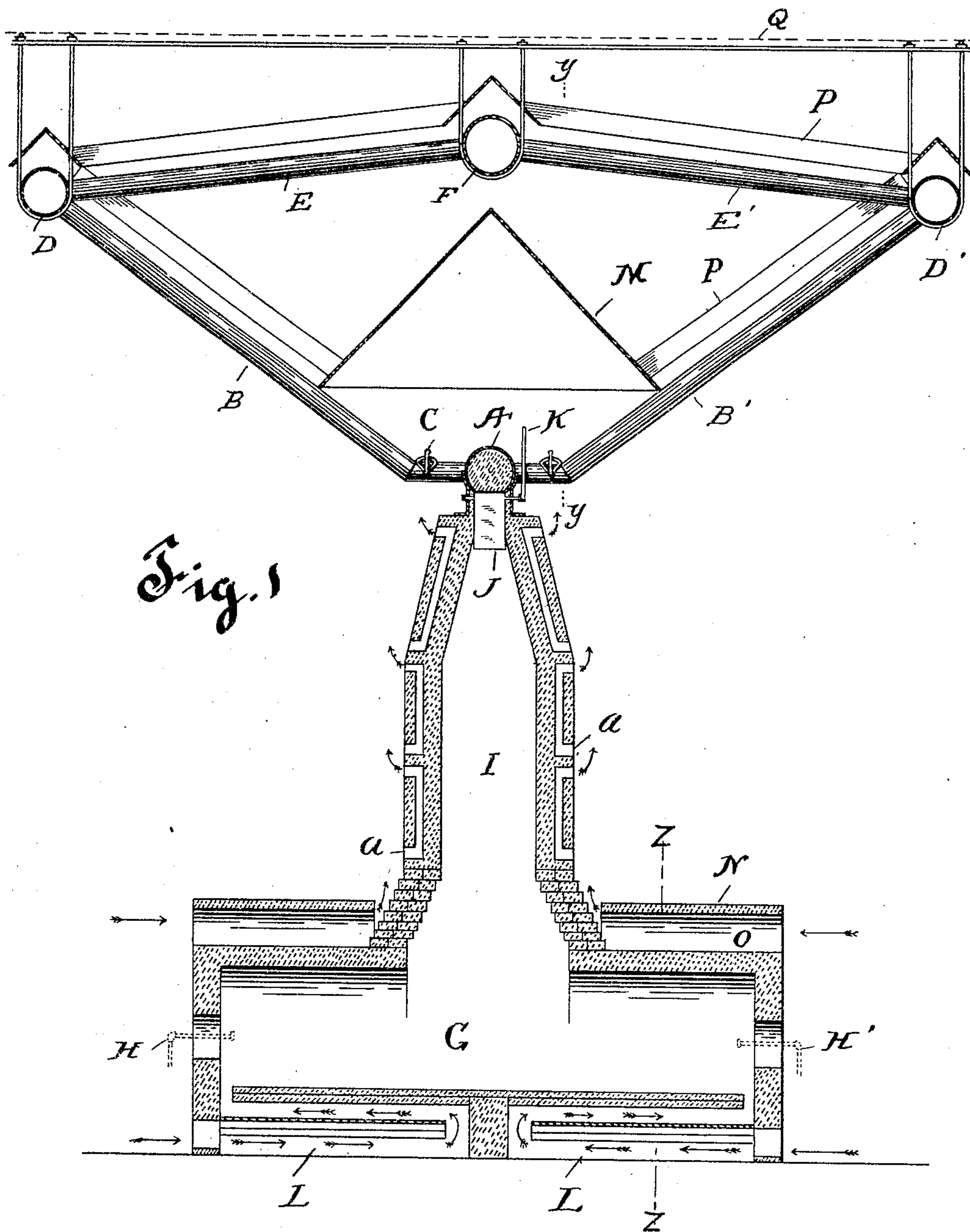
PATENTED MAR. 28, 1905.

G. W. F. STEINMANN.

SYSTEM OF PIPES WITH FURNACE FOR DRYING SPROUTED GRAIN.

APPLICATION FILED JULY 14, 1904.

2 SHEETS—SHEET 1.



WITNESSES:

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Charles W. F. Steinmann  
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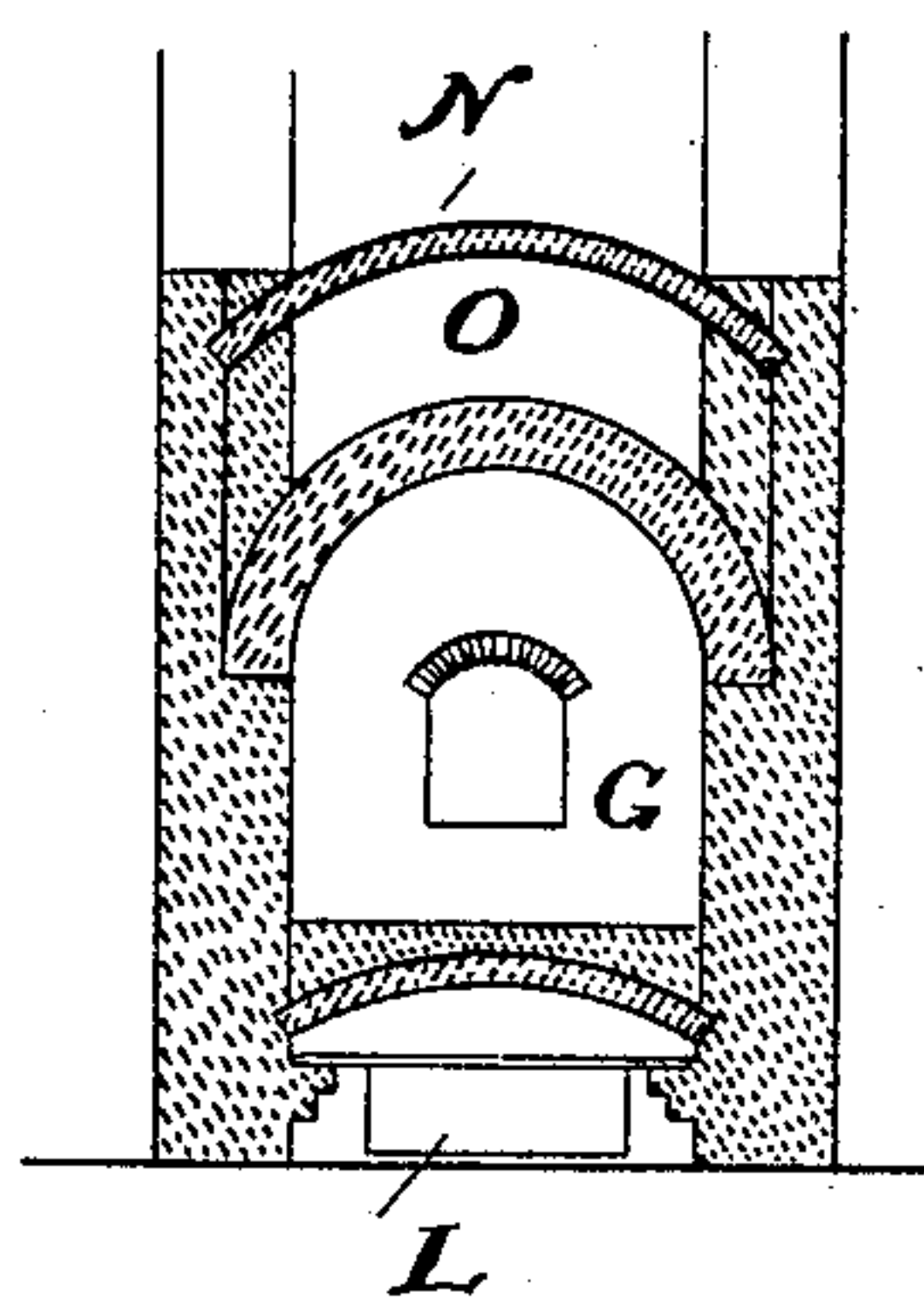
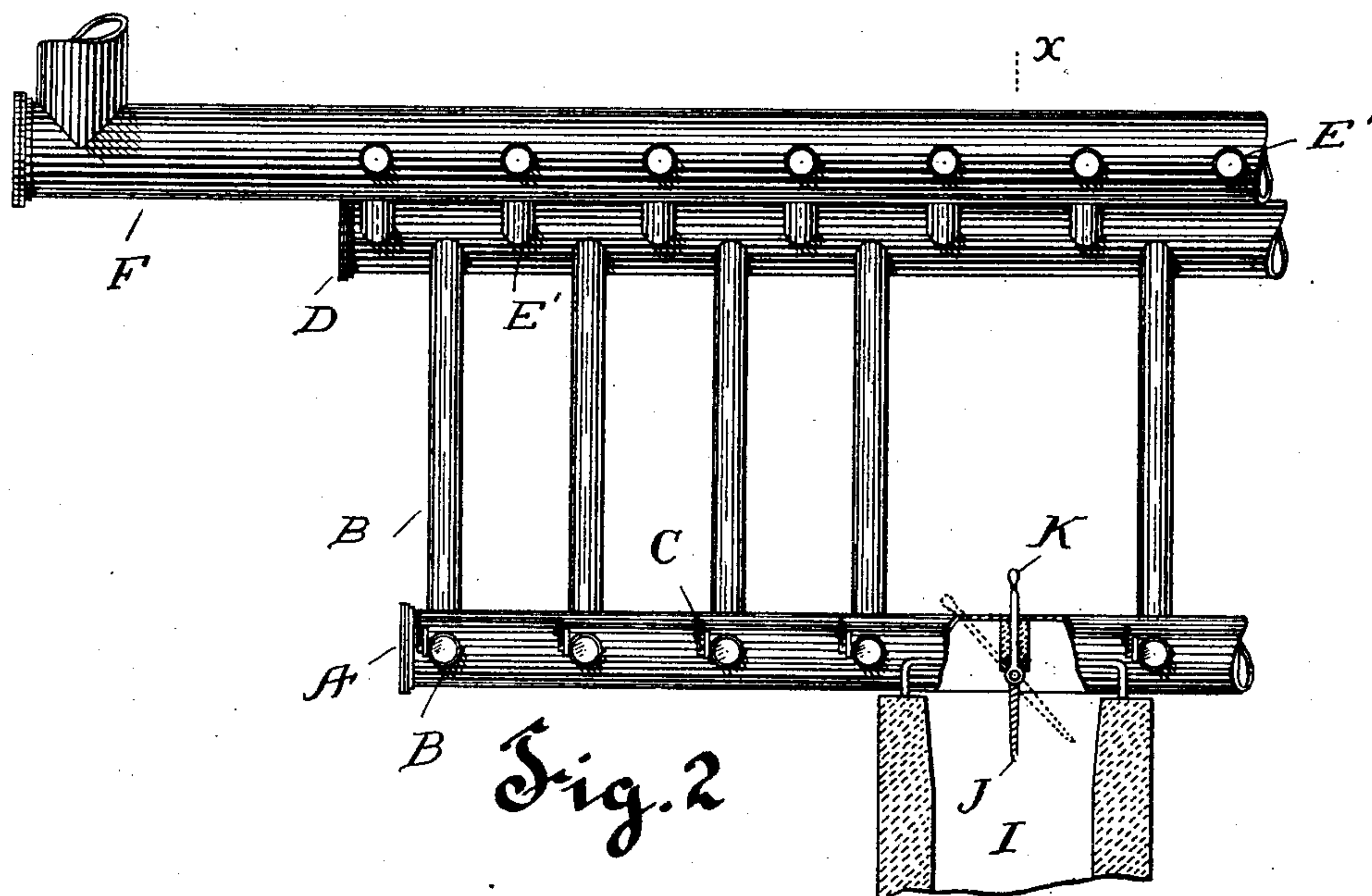
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# UNITED STATES PATENT OFFICE.

CHARLES W. F. STEINMANN, OF SAN FRANCISCO, CALIFORNIA.

## SYSTEM OF PIPES WITH FURNACE FOR DRYING SPROUTED GRAIN.

SPECIFICATION forming part of Letters Patent No. 785,771, dated March 28, 1905.

Application filed July 14, 1904. Serial No. 216,528.

*To all whom it may concern:*

Be it known that I, CHARLES W. F. STEINMANN, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented a certain new and useful System of Pipes with Furnace for Drying Sprouted Grain with Indirect Fire in Malting-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.

My present invention is a system of pipes with furnace for drying sprouted grain with indirect fire in malting-kilns, and by its employment the heat is directed to arrest at the proper stage the partial germination of the grain. By this operation the starch is converted into saccharine matter, the unfermented solution of which is the sweetwort of the brewer.

To properly direct, cause a perfect distribution, and bring under immediate and complete control the heat above referred to is the prime object of my invention, and I accomplish this result by the means illustrated in the accompanying drawings, in which—

Figure 1 is a central vertical section of the complete device, taken on the line  $xx$  of Fig. 2. Fig. 2 is a section taken on the line  $yy$  of Fig. 1. Fig. 3 is a section taken on the line  $zz$  of Fig. 1.

I will now describe the construction and relative arrangement of the several parts of my invention and subsequently explain the operation of the same, reference being had to the above views by letter.

The heated air is led from a suitable furnace, the construction of which I will hereinafter describe, into the horizontal receiving-header A. Radiating outward from opposite sides of the receiving-header A and inclining upward, as shown in Fig. 1, are the series of heating-pipes B and B'. Each of these pipes is provided with a regulating-damper C, which is positioned near their lower extremities. The upper extremities of the heating-pipes B and B' lead into parallel horizontal equalizing-headers D and D', respectively, while leading upward and inward from the equalizing-

headers D and D' are two secondary series of heating-pipes E and E', respectively. The upper ends of these pipes lead into a horizontal stack-header F. The air is heated in the fire-box G of the furnace by means of opposite oil-burners H and H' (shown in dotted lines) and after passing upward through the brick conduit I enters the horizontal receiving-header A. As a means for perfectly distributing the heat or bringing it under complete control I have arranged the pivoted plate J at a point where the conduit I enters the receiving-header A, and by means of the lever K the air may be diverted either to the right or left, as desired. In order to economize in the matter of fuel, I partially heat the air before it passes into the fire-box by causing it to follow the conduits L, as indicated in Fig. 1 by means of arrows. At intervals along the vertical walls of the conduit I are formed passages  $a$ , through which the ascending air passes and is heated to a certain extent and finally enters the hood M, which spreads it among the series of pipes above described. Below the upper arch N of the furnace is a space O through which the air passes, as shown.

From the description so far gone into, and assuming that the grain is spread on a perforated flooring Q, (indicated by broken line in Fig. 1,) above the series of pipes above described, it is manifest that the temperature of the pipes in the upper series is less than that in the lower series. Now in order to radiate these unequal temperatures in such a manner as to cause the temperature of the perforated floor to be uniform throughout its entire surface is the prime object of my invention, and this I accomplish by the above-specified manner of arranging the pipes and perfectly distributing the heat therein by means of the dampers and diverting-plate above described.

During the malting process an abundance of sprouts become separated from the grain and pass through the perforated floor and would naturally lodge on the series of pipes and eventually interfere with the proper radiation of heat or smolder and destroy the malt. To overcome this objection, I have arranged the V-shaped inclined hoods P, which are

hung over each pipe and cast aside the sprouts as they descend.

The construction and arrangement of the several parts of my invention being thus made  
5 known, the operation and the advantages of the same will, it is thought, be readily understood.

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

1. A device of the class described consisting of a receiving-header, a plurality of equalizing-headers, a series of inclined pipes connecting said headers, a series of dampers arranged to regulate the temperature of each  
15 pipe independently, and a diverting-plate arranged to guide the air as it enters the receiving-header for the purpose set forth.

2. A device of the class described consisting  
20 of a receiving-header, equalizing-headers arranged on opposite sides of said receiving-header, a series of inclined pipes connecting

said receiving-header with said equalizing-headers, a stack-header above said former headers and connected to said equalizing-headers by  
25 a series of heating-pipes, and a series of dampers arranged to regulate the temperature of said inclined pipes, for the purpose set forth.

3. A device of the class described consisting of a suitable fire-box, a conduit leading upward from said fire-box, a receiving-header above said conduit and opening therefrom, a diverting-plate between said header and said conduit, and a series of air-channels opening outward from the walls of said conduit substantially as and for the purpose set forth.  
35

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHAS. W. F. STEINMANN.

Witnesses:

GEORGE PATTISON,  
ELIZ. KINCAID.