

(No Model.)

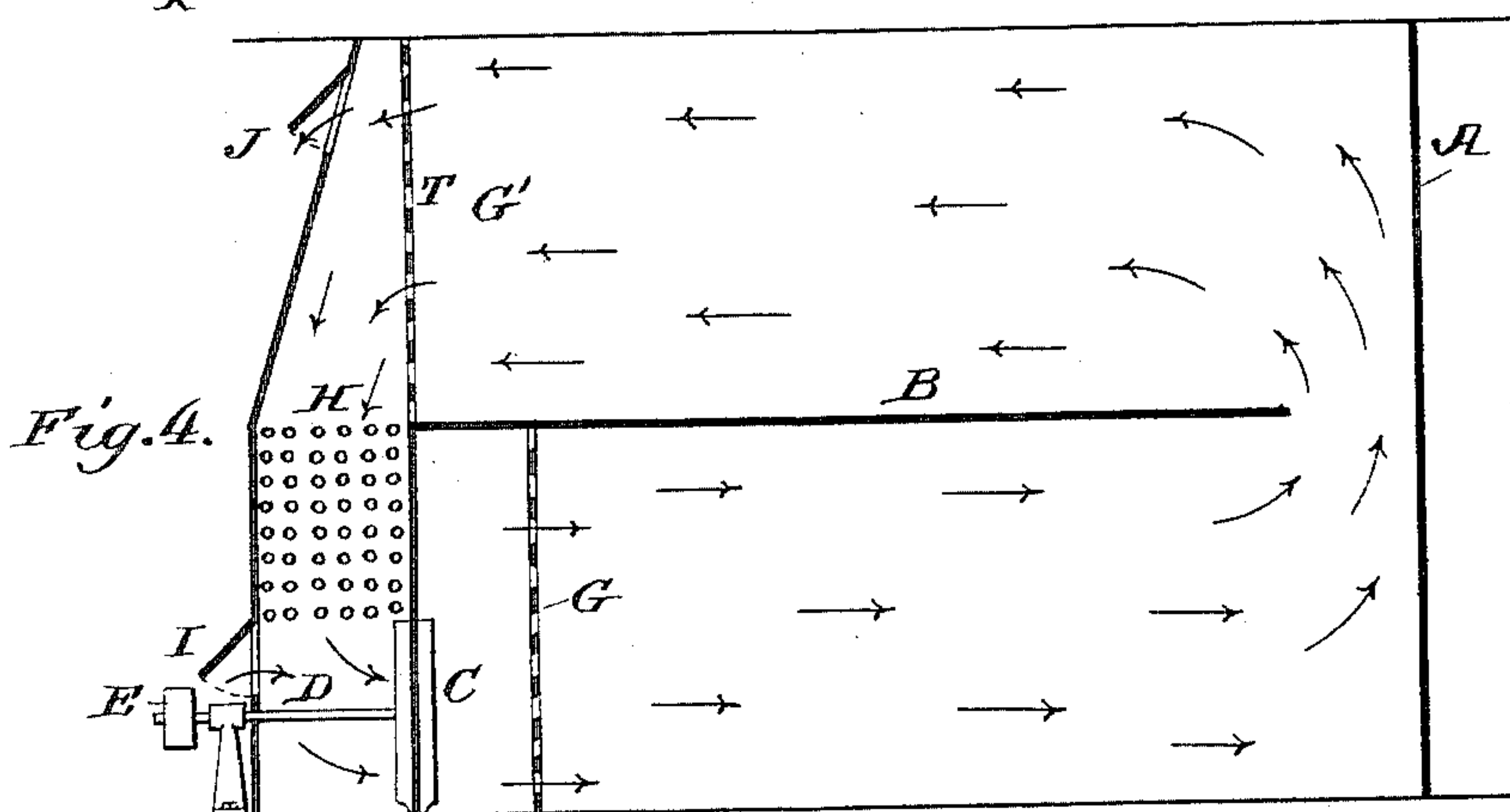
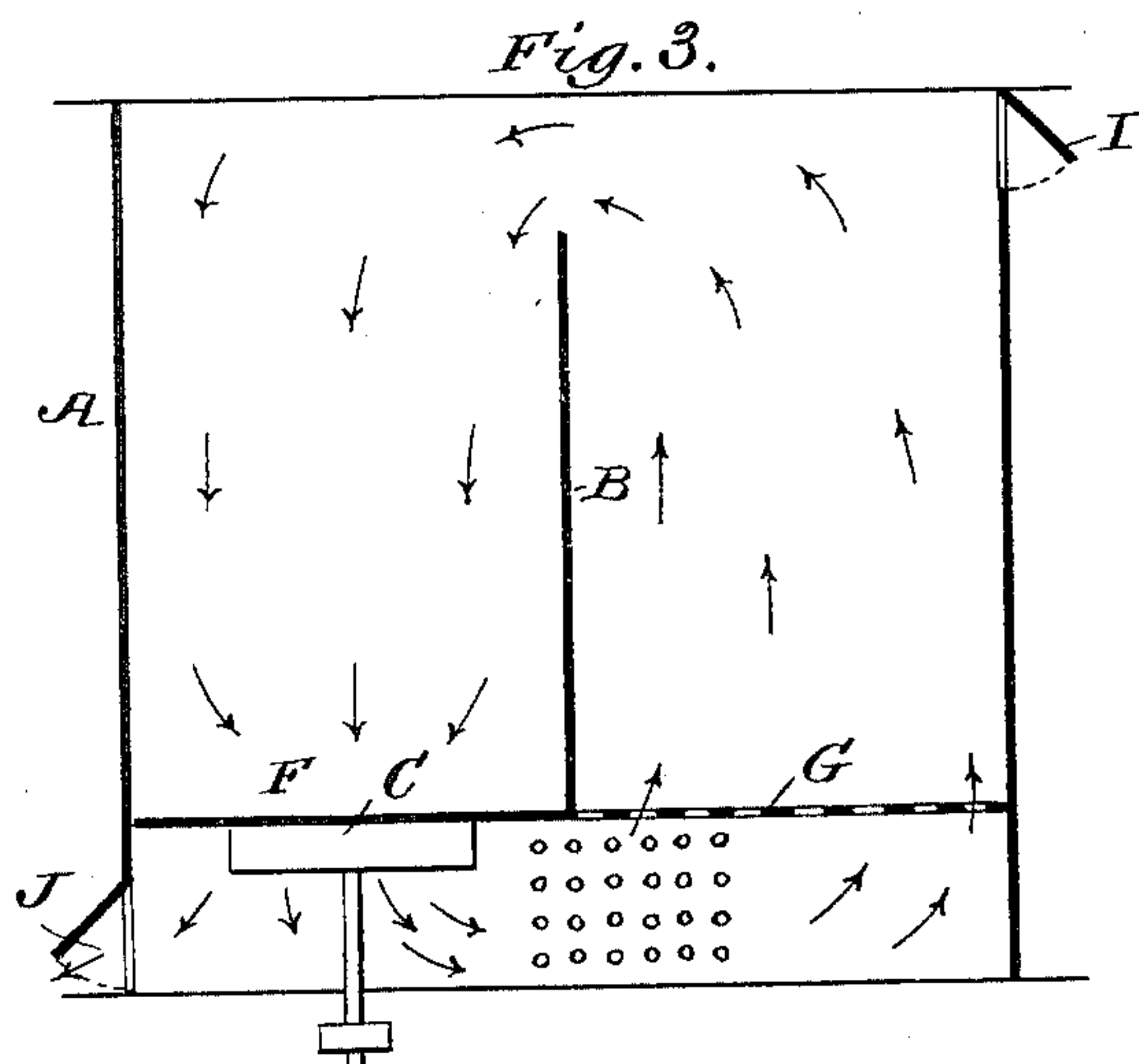
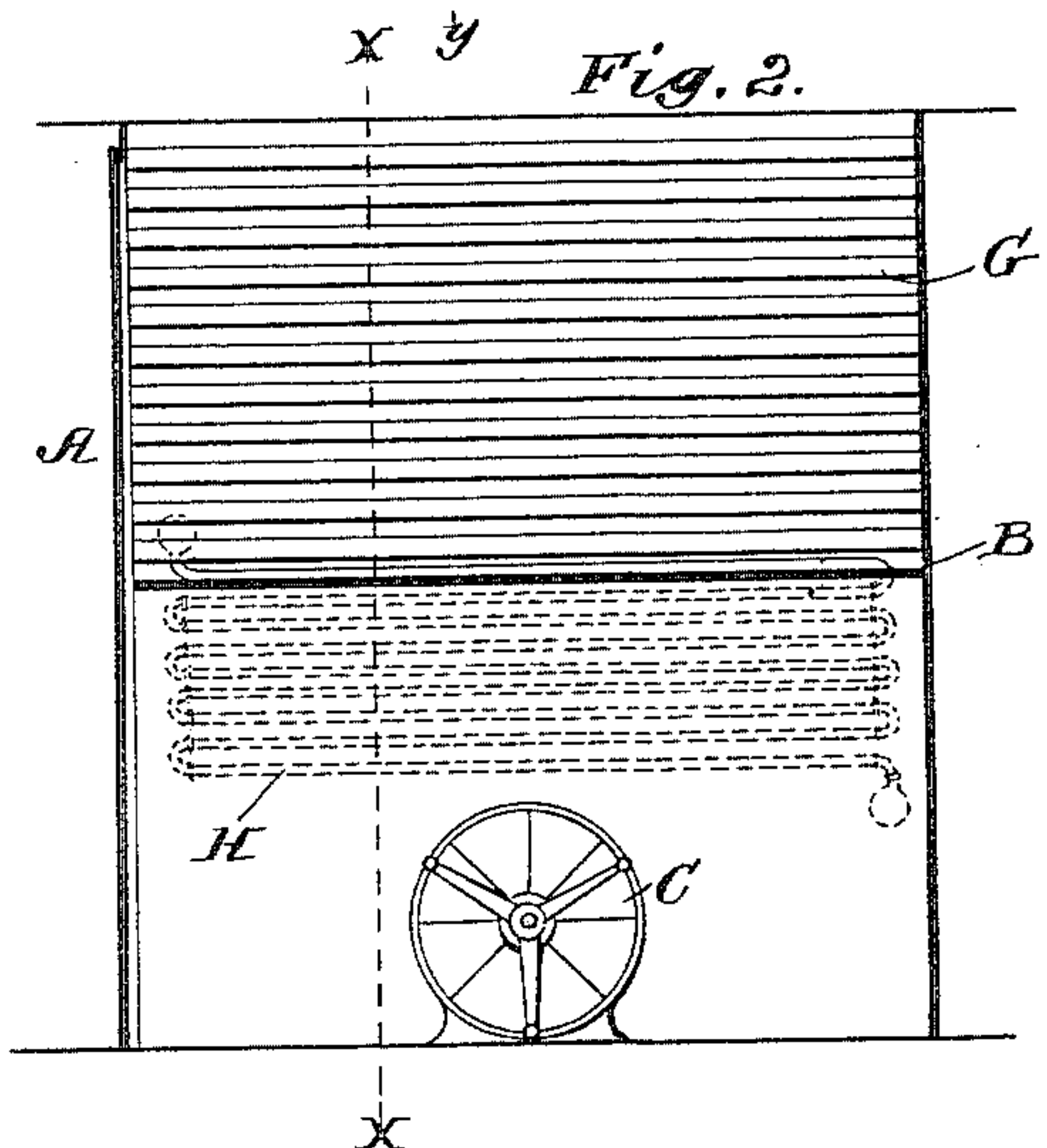
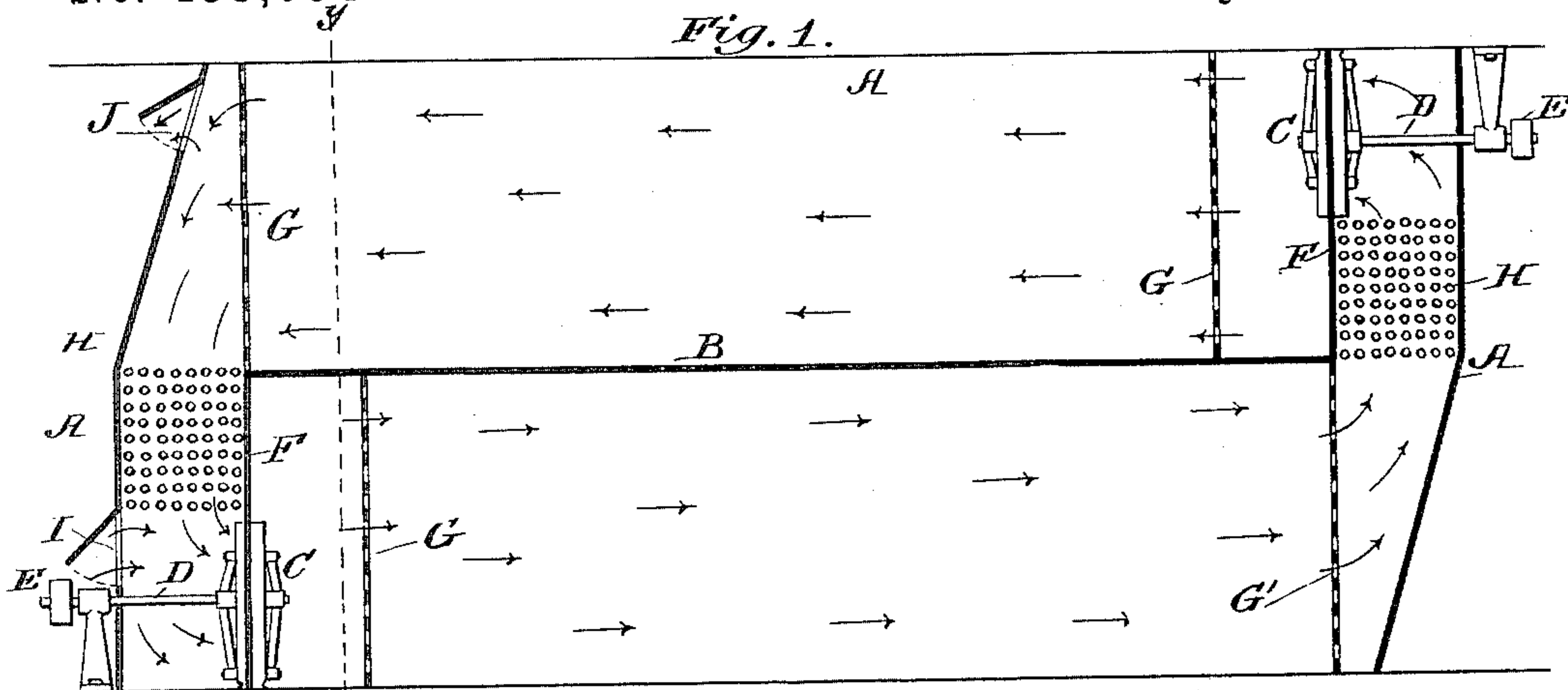
2 Sheets—Sheet 1.

J. K. PROCTOR & J. H. KNOWLES.

DRYING APPARATUS.

No. 433,094.

Patented July 29, 1890.



Witnesses:

David S. Williams
Henry Dwyer

Inventors:

J. K. Proctor
and
J. H. Knowles
by their attorney
[Signature]

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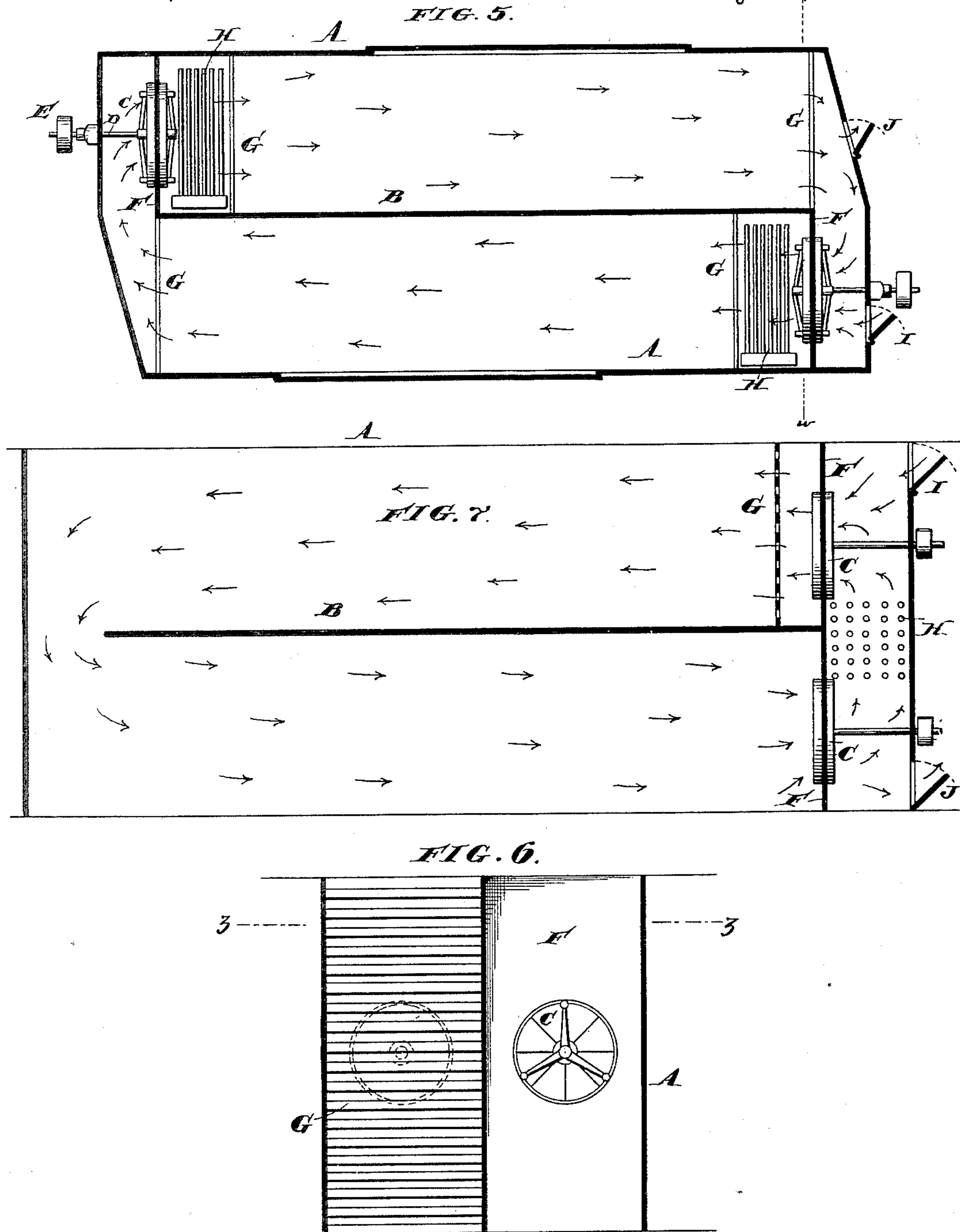
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[Signature]

UNITED STATES PATENT OFFICE.

JOSIAH K. PROCTOR AND JOHN HENRY KNOWLES, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNORS TO THE PHILADELPHIA TEXTILE MACHINERY COMPANY, OF SAME PLACE.

DRYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 433,094, dated July 29, 1890.

Application filed March 5, 1889. Serial No. 301,821. (No model.)

To all whom it may concern:

Be it known that we, JOSIAH K. PROCTOR and JOHN HENRY KNOWLES, both of the city and county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Drying Apparatus, (Case 5,) of which the following is a specification.

Our invention relates to drying apparatus; and it consists of certain improvements, which are fully set forth in the following specification, and shown in the accompanying drawings, which form part thereof.

Our invention relates to that class of drying apparatus in which the air is circulated through or among the material to be dried by means of suitable air-circulating mechanism. It is not confined to the drying of any particular kind of material, but relates with equal pertinency to any kind of material or goods which can be so distributed through the drying-room as to provide numerous air-spaces somewhat evenly disposed throughout the room and of considerable aggregate area.

The purpose of this invention is to provide a drying room or rooms with fans or other air-circulating devices and steam-heaters arranged in such a manner that the air shall be circulated through the said room or rooms, so as to produce a rapid drying with the least possible waste of heat, and also to control the temperature and humidity of the air in the room or rooms to suit the nature of the particular material that is being dried.

In carrying out our invention we employ a single inclosure or room, which is divided longitudinally by a close partition, forming two adjoining compartments or drying-rooms, placed either side by side or vertically one over the other, and the air is circulated by suitable means through these two rooms and is heated by passing through heaters. It is immaterial to the principles of our invention whether this dividing-partition is arranged vertically or horizontally so that the two rooms are side by side or one above the other.

In the drawings, Figure 1 is a longitudinal vertical sectional view of our improved drying apparatus through the line $x x$ of Fig. 2. Fig. 2 is a transverse vertical sectional view

of the same through the line $y y$ of Fig. 1, looking to the left. Figs. 3, 4, and 7 are longitudinal vertical sectional views of modifications of our apparatus. Fig. 5 is a horizontal sectional view of a modification through the line $z z$ of Fig. 6; and Fig. 6 is a transverse vertical sectional view through the line $w w$ of Fig. 5, looking to the left.

In all the figures the same letters of reference refer to similar parts, and the arrows show the direction of the air-currents.

A is the main room or inclosure divided by the partition B into two rooms, which, as heretofore stated, may be either side by side or one over the other. The ends of this main room or inclosure A may be made slanting or inclined, as shown in Figs. 1, 4, and 5, for the purpose of more effectively guiding the air-currents, but this is not an essential feature. The room A is provided with suitable doors for the entrance of the workman into the rooms. This partition B, by which the main room or inclosure is divided into the two rooms or compartments, is shorter than the main room, so as to leave an opening at each end from one room to the other.

C are the fans or air-circulating devices, having the shafts D and the pulleys E for driving them. F are closed end partitions in which these fans C are placed, located in the manner hereinafter set forth. G are perforated partitions or barriers—such as are set out in our application, Serial No. 291,181, filed November 17, 1888—and H are heating-coils. I and J are respectively air inlet and outlet passages in the main room or inclosure, provided with suitable doors or gates, by which the quantity of air passing through them may be regulated. These parts are arranged in the following manner, referring first to the arrangement shown in Figs. 1 and 2: The end partitions F are located at opposite ends of the central partition B, one in each room, placed in a little distance from the ends of the main room or inclosure and forming an air-passage from one to the other. These partitions are provided with openings, in which are located the fans C. In the air-passages formed between the partitions F and the ends

of the main room are placed the heaters H, which are preferably steam-coils. The perforated partitions or barriers G are placed in front of the fans C within the rooms for the purpose of dividing up the air circulated by the fans and distributing it evenly among the material, and, if desired, additional barriers or perforated partitions G' may be used, located opposite to the partitions F at the ends of the central partition B, and preferably made continuous with the partitions F of the adjacent room, the part F being closed with the exception of the opening for the fan C and the part G being perforated, or the location of these barriers may be changed, as desired, or may be entirely dispensed with.

I is an inlet-opening, and J an outlet-opening, for the air, provided with suitable doors, by the adjustment of which the temperature and humidity of the air in the rooms may be regulated, as desired. The particular location of these inlet and outlet openings is immaterial, provided they are located to suit the relative atmospheric pressure in the different parts of the room. The location of the heaters H may be varied, as desired, though we prefer to place them in the position shown.

The construction shown in Figs. 5 and 6 is the same as that of Figs. 1 and 2, except that the central partition B is arranged vertically and that the heaters H are placed on the inside of the partitions F. In place of using two fans, only one may be used, as shown in Figs. 3 and 4, with a free passage-way from one room to the other at the opposite end, and with only one perforated partition G or G', and only one heater may be used.

In the modification shown in Fig. 7 two fans are used, located at the same end of each room.

In operating this device the material to be dried is placed in the drying-rooms and the air is circulated by the fan or fans. The doors over the inlet and outlet passage are adjusted to admit additional cold and dry air or to allow the escape of the damp and heated air, according to the temperature and humidity required to perfectly dry the particular material in hand. Where a nice adjustment of temperature and humidity is not required, the doors over the inlets and outlets I and J may be dispensed with.

We do not limit our invention to the mere details of construction here shown, as it is evident they may be varied in many ways without departing from the principles of the invention.

Having now described our invention, what

we claim as new, and desire to secure by Letters Patent, is—

1. A drying room or inclosure, relatively long and narrow, divided into two inner rooms or compartments by the centrally-located longitudinal partition B and the cross-partitions F, extending one from each end of the partition B to opposite sides of and at relatively-short distances from the ends of the main room or inclosure, said partitions F being each provided with an opening whereby a continuous passage-way is formed round through the two rooms, the said partitions B and F being closed or air-tight except as to said openings, in combination with an air-circulation fan located in each of said openings, heating-coils H, placed one at each end of the inclosure, for heating the air as it is circulated, and inlet and outlet passage-ways provided with adjustable doors to allow a limited exchange of air between the drying-rooms and external atmosphere for the purpose of regulating the temperature and humidity of the air in the said rooms or compartments.

2. A drying room or inclosure, relatively long and narrow, divided into two inner rooms or compartments by the centrally-located longitudinal partition B and the cross-partitions F, extending one from each end of the partition B to opposite sides of and at relatively-short distances from the ends of the main room or inclosure, said partitions F being each provided with an opening whereby a continuous passage-way is formed around through the two rooms, the said partitions B and F being closed or air-tight except as to said openings, in combination with an air-circulation fan located in each of said openings, heating-coils H, placed one at each end of the inclosure, for heating the air as it is circulated, a perforated screen or barrier located within each room or compartment adjacent to and in front of the partition F and fan C, and inlet and outlet passage-ways provided with adjustable doors to allow a limited exchange of air between the drying-rooms and external atmosphere for the purpose of regulating the temperature and humidity of the air in the said rooms or compartments.

In testimony of which invention we hereunto set our hands.

JOSIAH K. PROCTOR.

JOHN HENRY KNOWLES.

Witnesses:

SAMUEL W. THACKRAL,
WALTER A. KREIDER.