

(No Model.)

2 Sheets—Sheet 1.

L. M. LARSSON & C. J. BERGSTRÖM.
DRYING APPARATUS.

No. 515,913.

Patented Mar. 6, 1894.

Fig. 1.

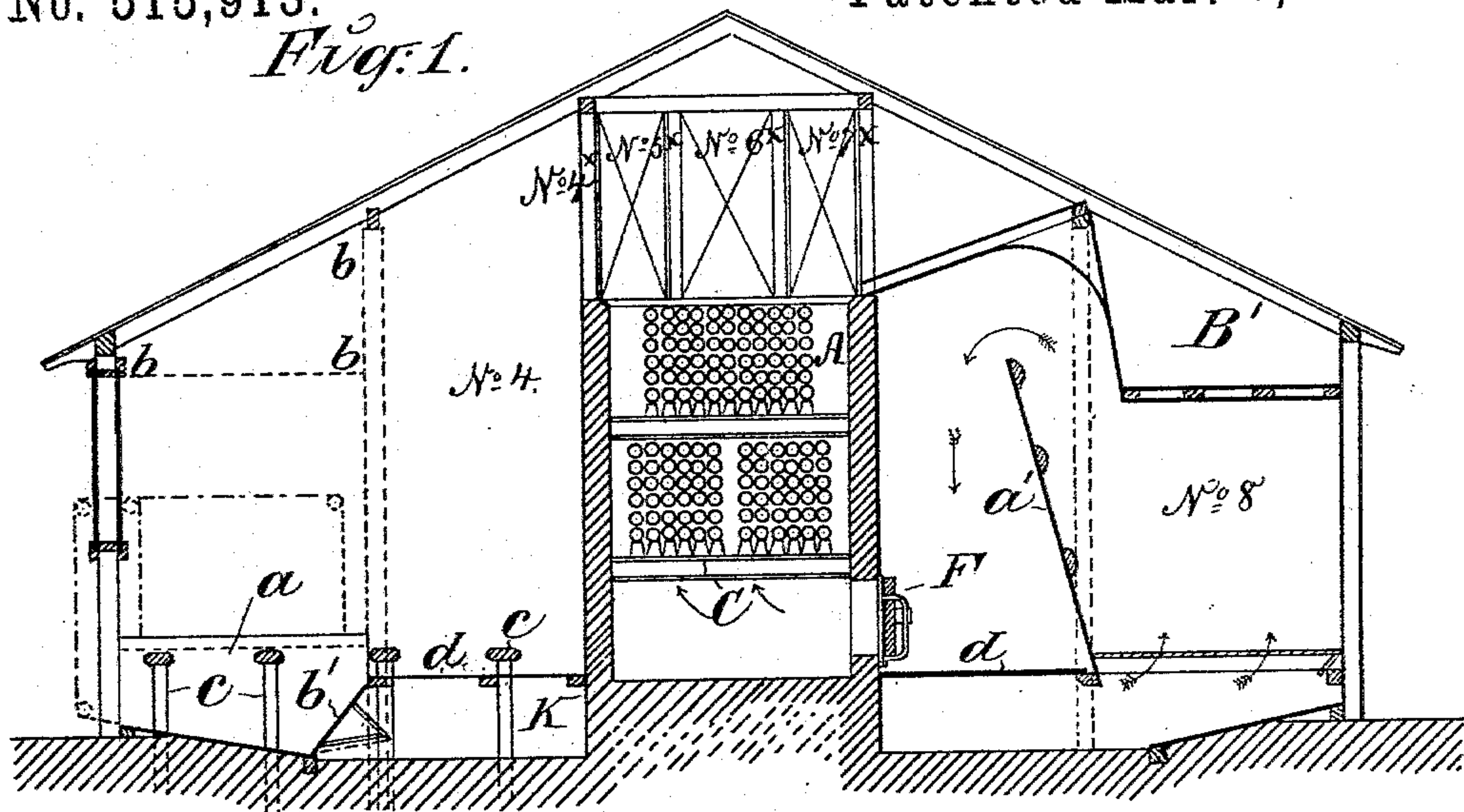
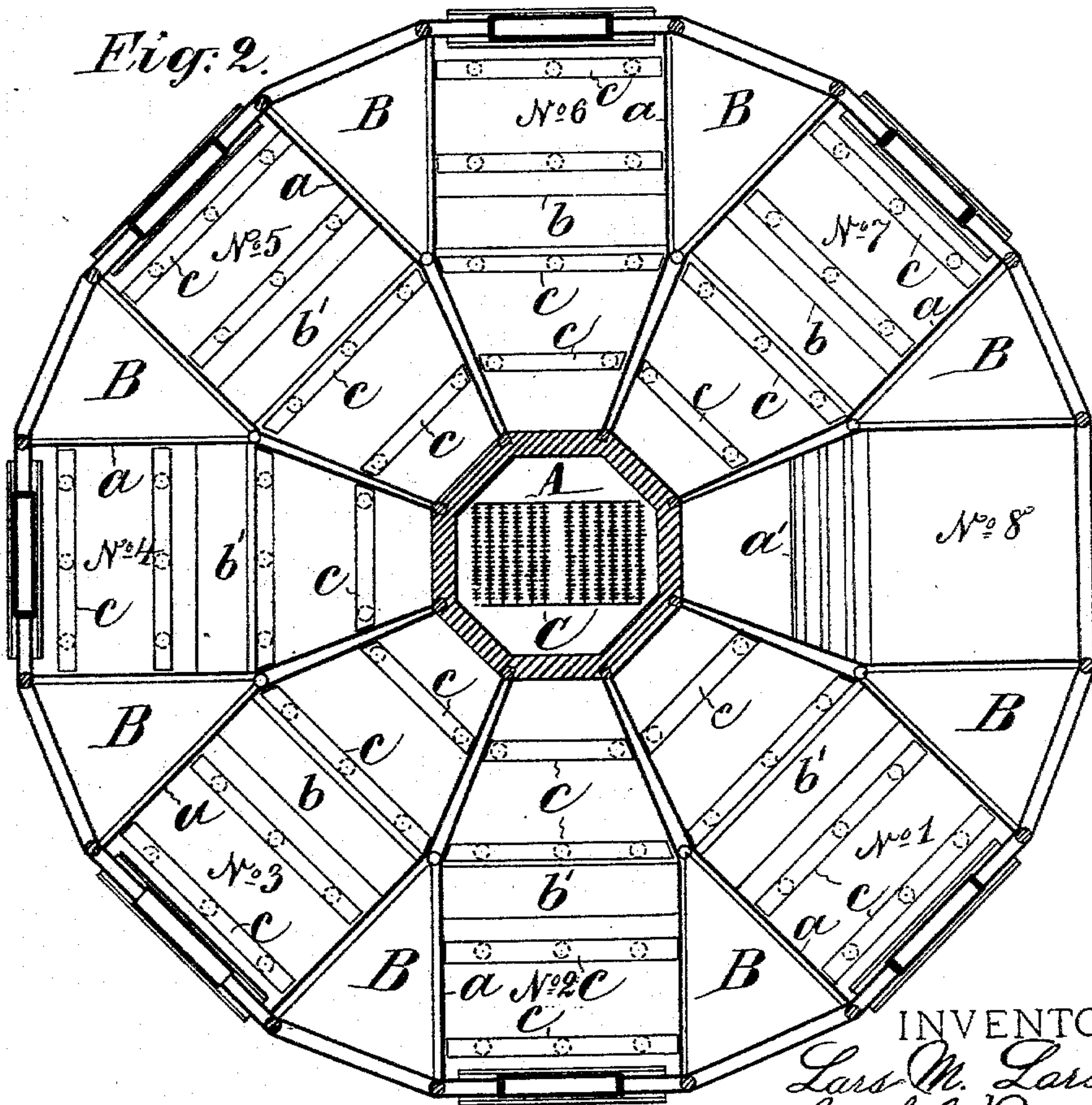


Fig. 2.



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Fig. 3.

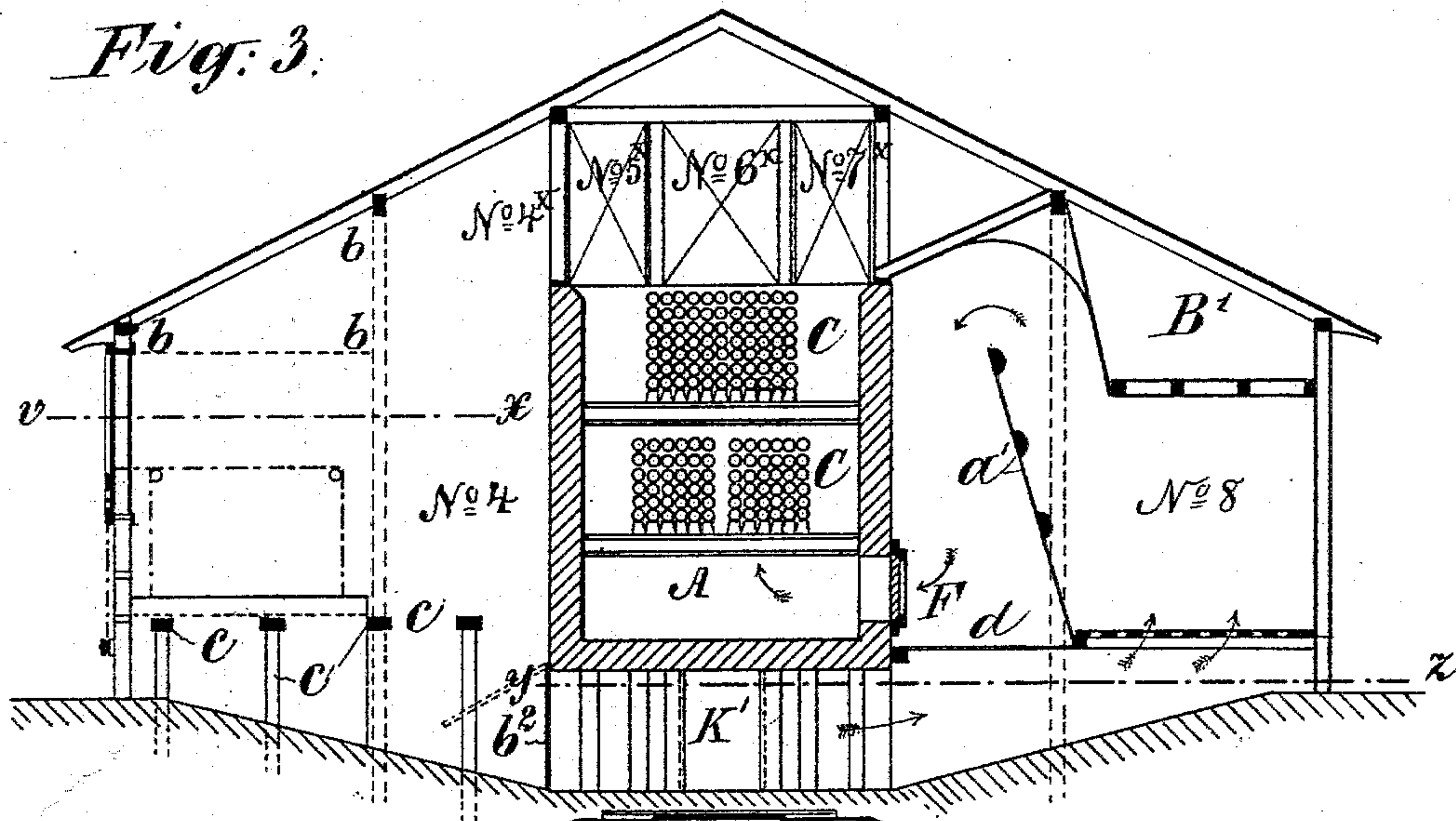
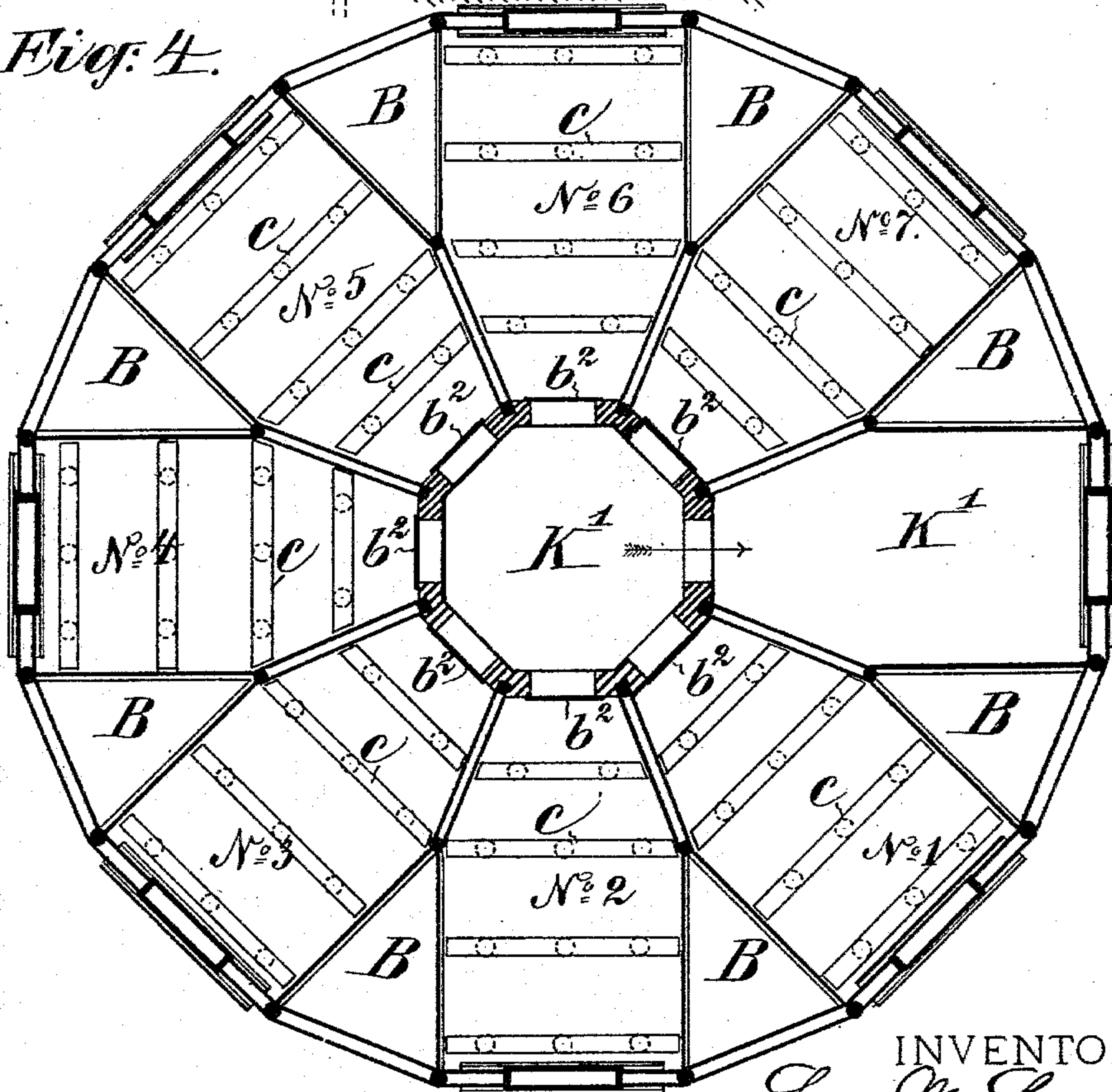


Fig. 4.



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UNITED STATES PATENT OFFICE.

LARS MAGNUS LARSSON, OF DEJEFORS, NEAR DEJE, AND CARL JOHAN BERGSTRÖM, OF FINSHYTTAN, SWEDEN.

DRYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 515,913, dated March 6, 1894.

Application filed May 5, 1893. Serial No. 473,170. (No model.)

To all whom it may concern:

Be it known that we, LARS MAGNUS LARSSON, residing at Dejefors, near Deje, and CARL JOHAN BERGSTRÖM, residing at Finshyttan, Sweden, subjects of the King of Sweden and Norway, have invented certain new and useful Improvements in Drying Apparatuses, of which the following is a specification.

Our invention relates to an apparatus, house, or plant for drying lumber or wood in considerable quantities, and the plant comprises a series of drying rooms or compartments arranged about a central chamber containing a heater. The drying compartments are adapted to be operated snugly or together, whereby some may be emptied and re-filled while the lumber in the others is being dried.

In the drawings which serve to illustrate our invention—Figure 1 is a vertical section of a drying apparatus embodying our invention, taken in the plane indicated by line 1, 1, in Fig. 2; and Fig. 2 is a horizontal section or sectional plan of the same. Figs. 3 and 4 are views similar, respectively, to Figs. 1 and 2, illustrating a slightly varied construction of the plant.

The drying apparatus, house, or plant, as here illustrated, is a substantially circular building with a conical roof. In the center of the building is a compartment A, where a heating apparatus, C, of some kind is situated. Radially arranged around the central compartment A, is a series of compartments, designated in Fig. 2 by No. 1, No. 2, No. 3, No. 4, No. 5, No. 6, No. 7 and No. 8. The first seven are drying compartments and No. 8 is the condensing compartment or room. The seven drying compartments are so arranged that they can at will be put in communication with, or cut off from each other, and connected with, or cut off from the source of heat. So that while some of the compartments are filled with lumber being dried with artificial heat, others may be open for emptying and filling. For effecting the drying, heated air is used, and this is permitted to pass through one compartment after another as long as it will take up moisture. The air enters a drying compartment at the upper part, passes downwardly through the lumber in the compartment, out at the bottom of

the compartment, and upwardly through suitable conduits or passages arranged between adjacent compartments. The humid air is carried away through a main conduit, as will be explained.

The several drying compartments will be sufficiently deep, radially, to receive boards or lumber of the usual length, and between their outer portions are arranged triangular interspaces, B, which serve as air canals or conduits. Near the roof, the central compartment, A, is provided with doors leading into the respective, radial drying compartments; in Fig. 1, such of these doors as appear are numbered, to correspond with the compartments they open into, No. 4^x, No. 5^x, &c. The hot air from the central compartment thus enters at the upper part of the several drying compartments at these doors, and after passing down through the compartment it passes into an interspace B through an opening in the side wall of the drying compartment, this opening being provided with a sliding door *a*, adapted to be raised by cords, ropes, or chains, as indicated by dotted lines at the left in Fig. 1.

The air passes upward in the space B and enters the adjacent drying compartment on the opposite side of the space at an aperture in the side wall thereof. This aperture is provided with a door which is not seen in Fig. 1, but is indicated by the triangle *b, b, b*. The drying compartments are provided with trestles, *c*, to support the lumber, and low down, about the central apartment is formed a space or air-passage, K, by means of boxing or boarding *d*. This space is always open to the condensing compartment, No. 8, and communication is established between it and each of the several drying compartments by inclined doors *b'*. F is a fan in the wall between the condensing compartment No. 8 and the heating chamber A; this fan is adapted to draw the air from the compartment No. 8 and force it into the base of the chamber No. 8. The arrows show the course of the air-current from the space K up through the open floor thereof into the compartment No. 8, thence up and over a screen or deflector, *a'*, in said compartment, and thence down to the blower F. Of the two triangular spaces B, between the drying com-

partments No. 1 and No. 7, only one is used as an air-passage or conduit. Over the condensing compartment No. 8 there is an air-conduit B', (see Fig. 1) through which the air flows from said space B to the next drying compartment.

The operation is conducted as follows: Suppose all of the drying compartments are filled but one, as No. 7, for example, which latter is being emptied and refilled, and that the hot air is first admitted to compartment No. 1. The door (No. 1^x) leading from the compartment A to compartment No. 1, is opened. The hot air passes down through the lumber in No. 1', escapes under the raised door α , at the side, into an interspace B, passes up this interspace to the open triangular door (b, b, b) leading into the upper part of the compartment No. 2. From this compartment it passes in the same manner through all of the intermediate compartments until it reaches No. 6. In this compartment the door α , is closed and the door b' open, so that the now humid air flows into the space K, and thence directly to the compartment No. 8. On reaching this compartment the moisture in the air is removed, or partially removed, and the air passes thence again to the heating compartment A, as before explained. Thus a constant circulation of the air is attained. If the material to be dried is so wet that the air will be saturated after passing through one or more compartments, as three for example, then it may be led out of the last compartment of the series,—the third in this case,—directly to the condensing chamber. It will be obvious, from the above description, that if necessary each single drying compartment may be employed alone, or any two or more adjacent compartments may be employed together.

If the moist air be let out of the building, and the fan F be arranged to take air from the outside, the condensing chamber could be dispensed with.

The space K, into which the moist air flows from the several drying compartments, may be limited to the compass of the central compartment A, and be beneath the same, as indicated in Figs. 3 and 4, the latter of which is a horizontal section taken, as to its central part, in the plane of the line y, z , in Fig. 3. This compartment, K', which receives the moist air from the several drying compartments at doors b^2 , may be open to the compartment No. 8, or to the outer air, as preferred. The plane of the section of the drying compartments in Fig. 4, is indicated by the line v, x , in Fig. 3.

Any means of closing the openings herein shown as closed with doors, may be employed in lieu of simple doors.

Our apparatus or plant may be employed advantageously for drying other things or materials than lumber, and it is especially well adapted for drying bulky materials.

The drying compartments may be filled from the outside, doors being provided in each for the purpose.

The heating apparatus C shown somewhat diagrammatically herein, comprises two banks or sets of steam coils, arranged one above the other.

Having thus described our invention, we claim—

1. A drying house or apparatus comprising a central heating compartment A containing an air-heating apparatus, a series of drying compartments arranged around said compartment A and each communicating with the upper part of the latter by a door, air conduits or interspaces between adjacent drying compartments communicating at the bottom by a door with one adjacent drying compartment, and at the top, by a door with the other adjacent drying compartment, and a compartment or air-conduit K, communicating by doors with the lower parts of the several drying compartments, whereby the humid air may be drawn off from the latter, substantially as set forth.

2. A drying house or apparatus comprising a central heating compartment A, containing an air-heating apparatus, a condensing compartment adjacent to the compartment A, an air-forcing apparatus adapted to force air from said condensing compartment into the compartment A, a low compartment or air-conduit K, open to the condensing compartment and supplying air thereto, a series of drying chambers arranged around the compartment A, and communicating therewith at their upper parts by doors, and with the lower compartment or air-conduit K, below by doors and air-conduits or interspaces between the drying compartments, said interspace communicating with the lower part of one adjacent drying compartment and with the upper part of the other adjacent compartment, substantially as set forth.

In witness whereof we have hereunto signed our names in the presence of two subscribing witnesses.

LARS MAGNUS LARSSON.
CARL JOHAN BERGSTRÖM.

Witnesses:

ERNST SVANGVIST,
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