

No. 736,745.

PATENTED AUG. 18, 1903.

J. L. KUBIN.
OSMOSE APPARATUS.
APPLICATION FILED DEC. 11, 1902.

NO MODEL.

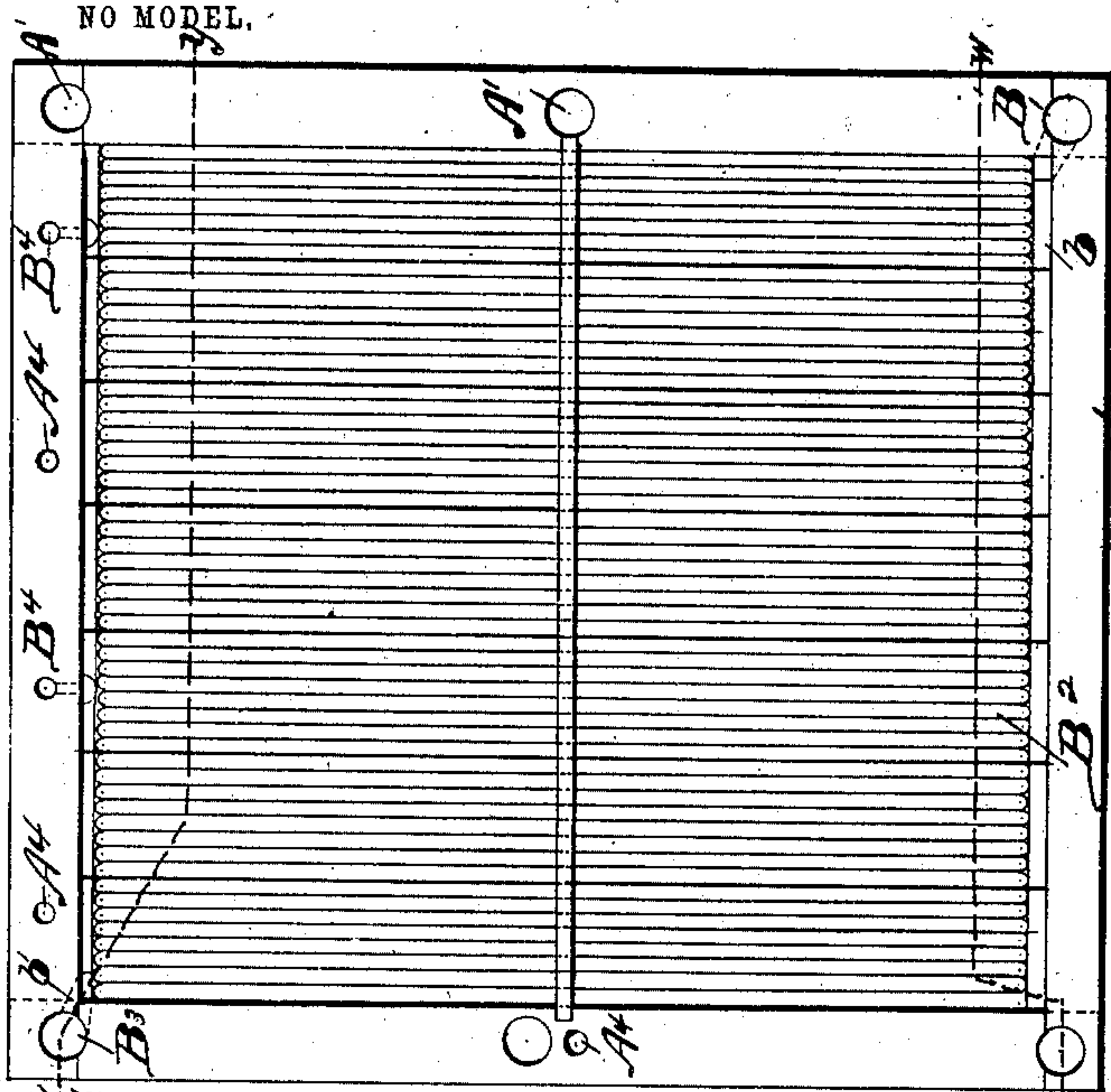


FIG 1.

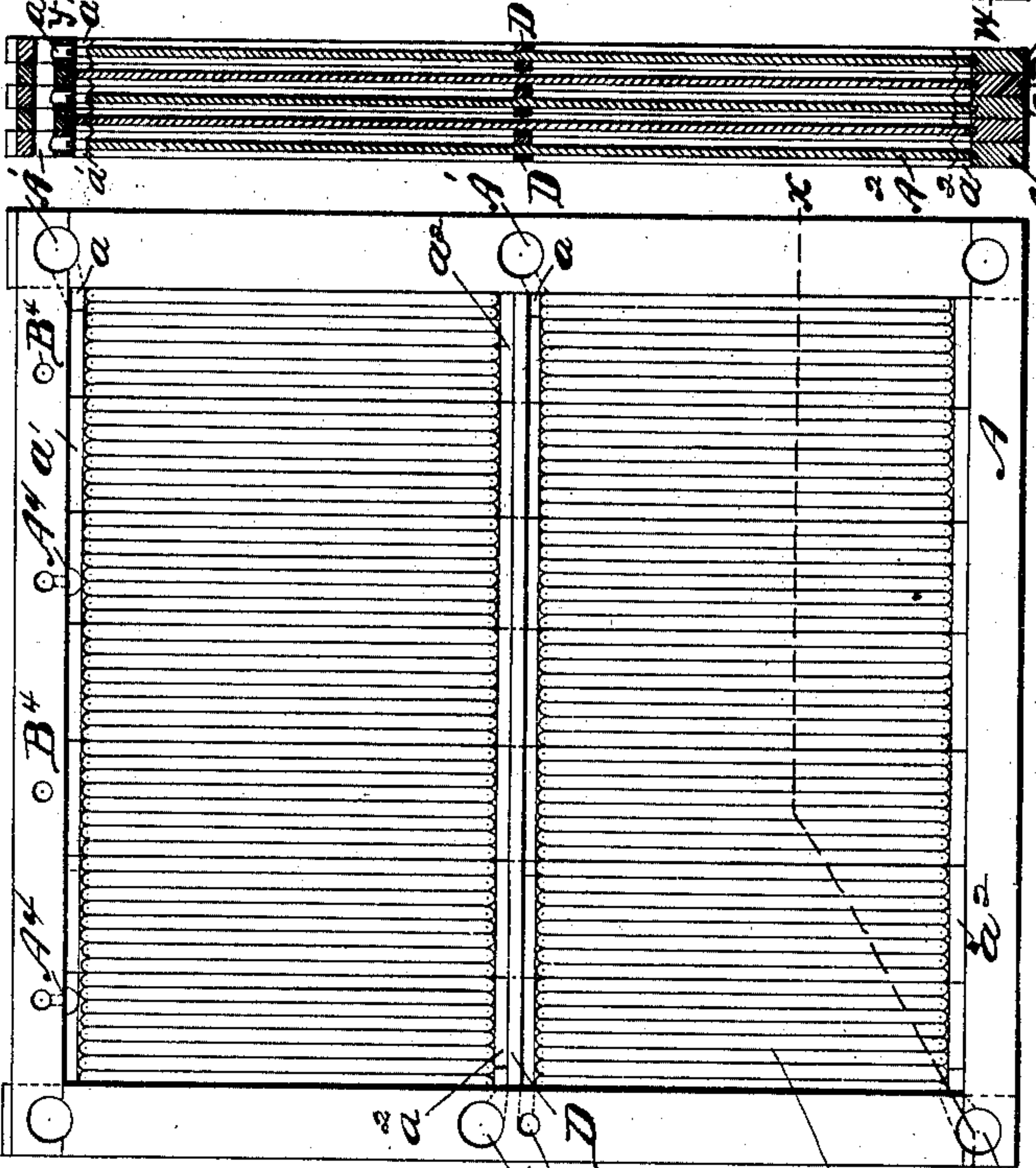


FIG 2.

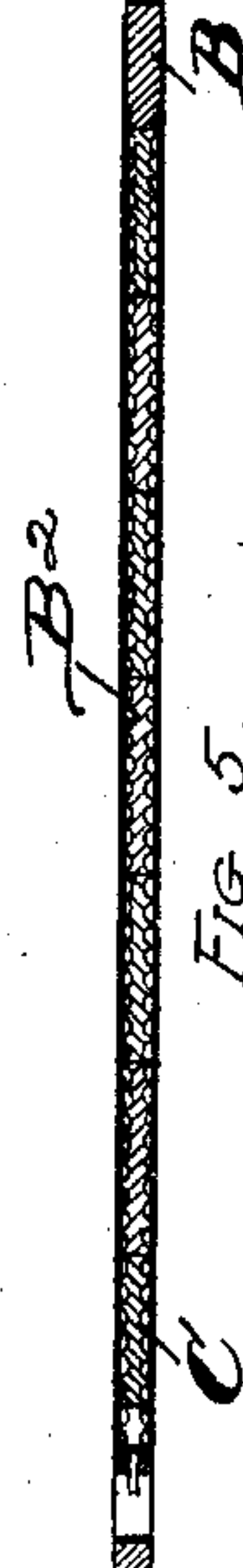


FIG 3.



FIG 4.

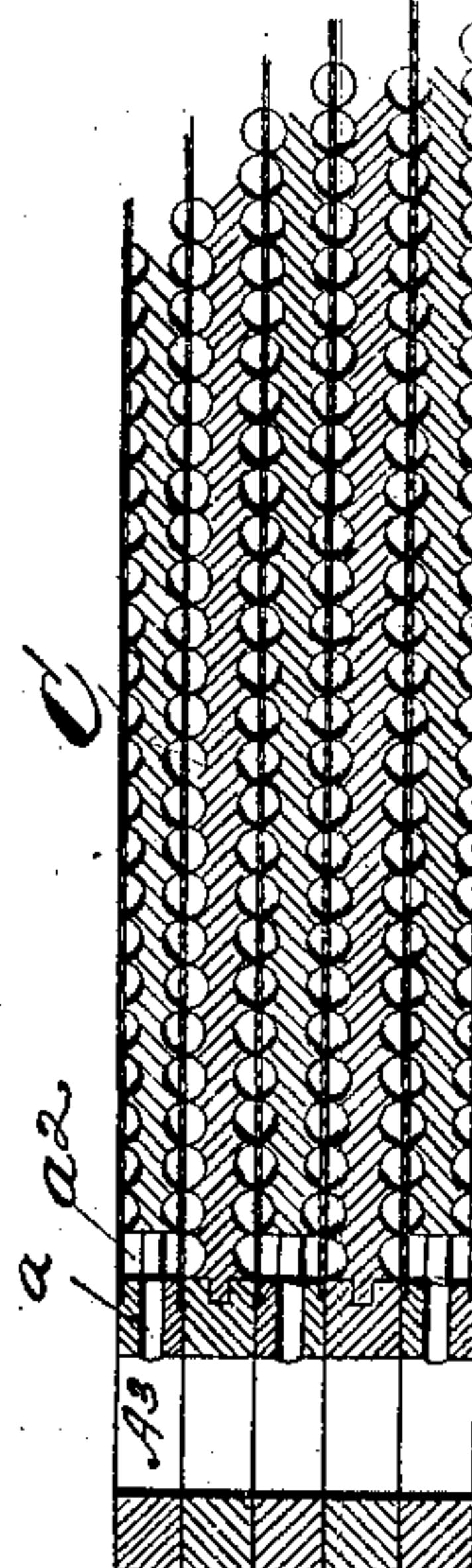


FIG 5.

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OSMOSE APPARATUS.

SPECIFICATION forming part of Letters Patent No. 736,745, dated August 18, 1903.

Application filed December 11, 1902. Serial No. 134,848. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH L. KUBIN, a subject of the Emperor of Austria-Hungary, residing at Wallaceburg, county of Kent, and Province of Ontario, Canada, have invented a certain new and useful Improvement in Osmose Apparatus; and I 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 pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to an improvement in osmose apparatus and frames shown in the accompanying drawings, and more particularly set forth in the following specification and claims.

In the drawings, Figure 1 is a side elevation of one of the water-frames. Fig. 2 is a similar view of one of the molasses-frames. Fig. 3 is a vertical sectional view through a plurality of water and molasses frames alternately grouped. Fig. 4 is a horizontal sectional view on line X X of Fig. 1. Fig. 5 is a similar view on line Y Y of Fig. 2. Fig. 6 is a horizontal sectional view on line W W through a plurality of the water and molasses frames alternately grouped.

The object of my invention is to provide means in the construction of my improved osmose frames whereby the water and molasses are distributed over a relatively large area and in the case of the molasses in a comparatively thin strata, the discharge of water and molasses being in diametrically-opposed directions during their whole passage through the frames; also, the means employed for stiffening the frames and rendering the parchment less liable to stretch or expand, due to pressure of liquids of different density when opposed to each other; also, in the means employed whereby pure fresh water of the usual temperature is introduced in opposition with the entrance of molasses in the adjacent frame and the water thus introduced discharged from the frame midway or at any desired point and fresh water again introduced to meet the molasses and further assist in the desired separation, thereby greatly increasing the effectiveness of the osmogene, the construction being such that the osmose-water

once discharged from between the diaphragm is forever removed from further entrance in the frames. My invention also consists in other details of construction, which will hereinafter appear.

Referring to the letters of reference shown in the drawings, A is a rectangular frame forming what I shall hereinafter refer to as a "water-frame." B is a similar frame and will be referred to hereinafter as a "molasses-frame." A plurality of these frames are provided, the molasses-frames being separated from the water-frames by a parchment diaphragm, as in the usual construction. The water and molasses frames are assembled alternately and bolted tightly together.

Referring to the water-frame, A' A' are the water-inlets, consisting of holes bored through all of the assembled frames, both water and molasses, but having only discharge-openings *a*, communicating with the channel *a' a'*, in the water-frames.

A² is a fluted partition separating the parchment diaphragms, the outer edge of the corrugations coming in close contact with the diaphragms C. For convenience of manufacture these fluted partitions may be made in sections, as shown in Fig. 4, or, if preferred, can be of one piece. The channels formed by these corrugations discharge into a duct *a*², leading to the water-outlets A³ A³.

A⁴ A⁴ are air-vents in the water-frame. These air-vents also have a discharge-opening through the molasses-frames, but have no communication between the diaphragms in the latter case.

D is a wall or partition dividing the water-frame practically in two parts.

The construction of the molasses-frame is similar to that of the one just described except there is no dividing-wall, but instead the passage of the molasses is from its inlet B' along the duct *b*, up through the channels formed in the fluted partition B², (which in this case are relatively more shallow than those in the water-frame,) out through the discharge-openings B³, connected by the passages *b* with each of the molasses-frames.

B⁴ represents air-vents having communication only with each of the molasses-frames, the discharge-openings, however, being through the water-frames, but having no

communication between the diaphragms adjacent thereto.

The operation of my apparatus will be readily understood. Molasses is introduced through the inlet B between the diaphragms of the molasses-frames. The fluted partition serves to force the molasses over the entire area of the diaphragm in a comparatively thin film, and as it passes up between the diaphragms, seeking the discharge-opening B³, it encounters the water in the adjacent frame passing in a diametrically-opposed direction, and the separation desired takes place through the diaphragms. In order that water of less density and lower purity may be opposed to the molasses during its progress through the frame, I have provided partitions designed to divide the water expanse exposed to the molasses in order that the water affected by the presence of the molasses on the opposite side of the diaphragm may be discharged and fresh water introduced during the passage of the molasses to complete more easily the separation desired.

It is obvious that any number of inlets and outlets separated by a corresponding number of partitions may be employed in the water-frames, the surface of the molasses-frames being preferably a single expanse.

Having thus described my invention, what I claim is—

1. In an osmose apparatus, a plurality of water-frames and a plurality of molasses-frames alternately assembled, a membranous diaphragm between each frame, means whereby water may be introduced and discharged and fresh water again introduced and discharged in the water-frames between the diaphragms during the passage of the molasses past the several introductions of fresh water, substantially as described.

2. In an osmose apparatus, a plurality of water-frames and a plurality of molasses-frames alternately assembled, each provided with the usual supply and discharge openings, a membranous diaphragm between each of said frames, a corrugated wall forming channels for the passage of water or molasses, said wall dividing each of the molasses and water frames whereby the supply of liquid is evenly distributed over the surface of the diaphragms thereby compelling the liquids to flow in diametrically-opposed directions, substantially as described.

3. In an osmose apparatus, a plurality of water-frames, partition-walls dividing said frames, said water-frames provided with openings leading from common inlet-orifices and openings leading to the common discharge-orifices between each partition, a plurality of molasses-frames alternately assembled with the water-frames, a membranous septum between each frame, said molasses-frames provided with openings leading from a common inlet-orifice and openings leading to a common discharge-orifice, the construction being such that the passage of molasses through

the molasses-frames is opposed to one or more introductions and passages of fresh water through the adjacent water-frames, substantially as described.

4. In an osmose apparatus, a plurality of water-frames, a plurality of molasses-frames assembled alternately with the water-frames, said molasses-frames provided with openings leading from a common inlet and provided with openings leading to a common discharge, said water-frames provided with two or more openings connected with a common inlet and an equal number of passages leading to common discharge-pipes, partitions dividing said water-frame between each set of inlet and discharge openings whereby fresh water may be introduced and discharged from the water-frame two or more times during the continuous passage of the molasses from its entrance to its exit in opposition to the several introductions of fresh water in the water-frame, substantially as described.

5. In an osmose apparatus, a plurality of molasses-frames provided with vertical partitions and openings leading from a common inlet into the frames and openings leading therefrom to a common discharge, a plurality of water-frames assembled alternately with the molasses-frames, a membranous diaphragm separating the frames, said water-frames provided with partitions to divide them vertically, horizontal partitions to form two or more distinct compartments on each side of the vertical partitions, said water-frames provided with openings leading from a common supply and openings leading to a common discharge for each of said compartments, the construction being such that water may be introduced and discharged and fresh water again introduced and discharged during one continuous passage of the molasses in the adjacent frame, substantially as described.

6. In an osmose apparatus, a plurality of water-frames having openings leading from a common supply to a common discharge for said frames, and a plurality of molasses-frames alternately assembled having openings leading from a common supply and to a common discharge for said frames, a membranous diaphragm between each frame, corrugated walls dividing each of the water and molasses frames and adapted to support the diaphragms, the channels serving to conduct the fluids over the entire area of the diaphragm, substantially as described.

7. In an osmose apparatus, a plurality of water-frames and a plurality of molasses-frames alternately assembled, membranous diaphragms between each frame, said water-frames provided with partitions to form separate compartments in the water-frame, a common supply and a common discharge for each row of compartments in the water-frames, said frames provided with openings in each compartment leading to said supply and discharge, and a common supply and

discharge for the molasses-frames, said frames provided with openings leading from and to said supply and discharge, the construction being such that the flow of molasses through
5 the molasses-frame is opposed by water introduced and discharged in the adjacent frame and by the fresh water again introduced and discharged in the water-frame dur-

ing the continuous passage of the molasses, substantially as described. 10

In testimony whereof I sign this specification in the presence of two witnesses.

JOSEPH L. KUBIN.

Witnesses:

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