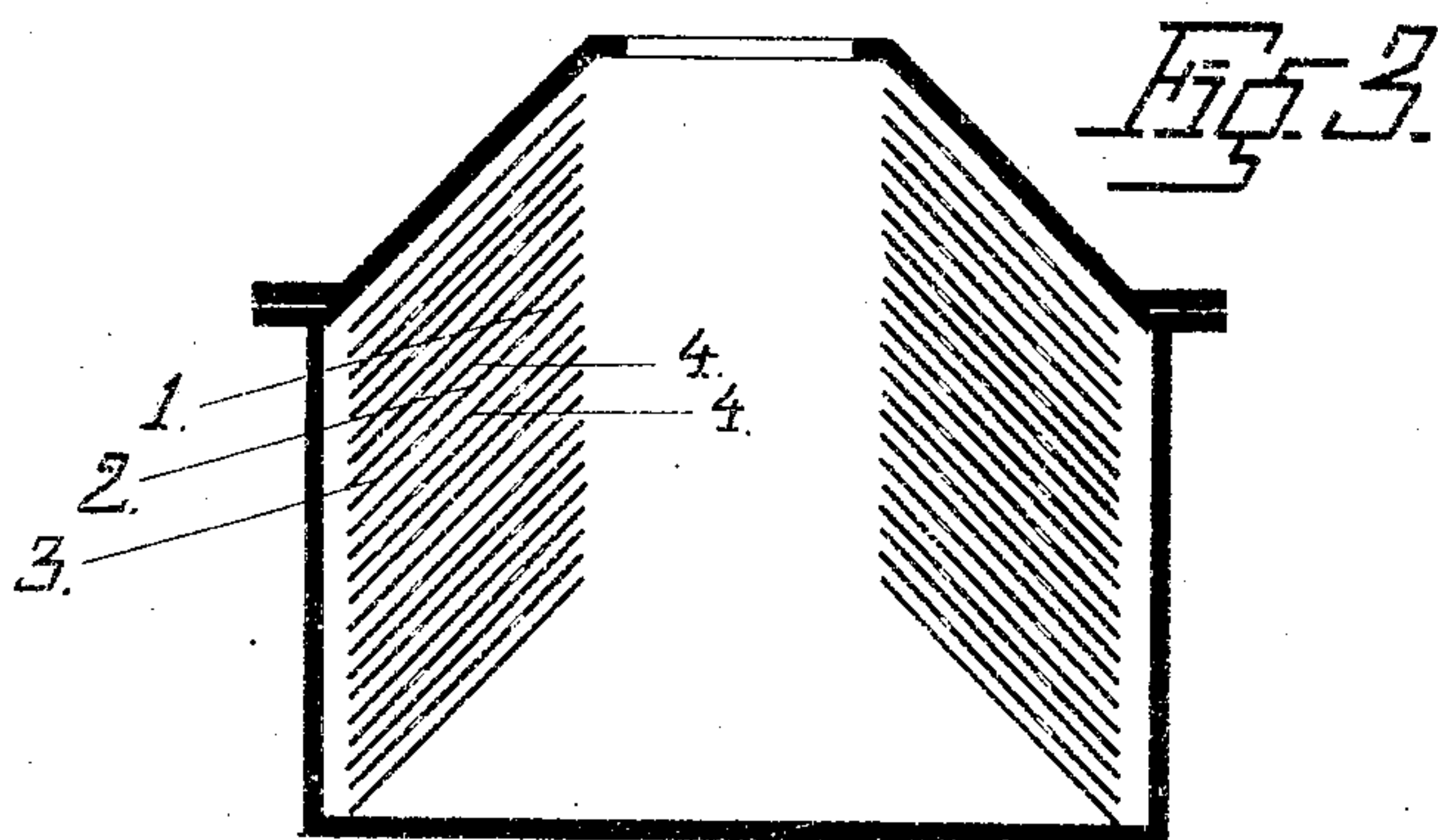
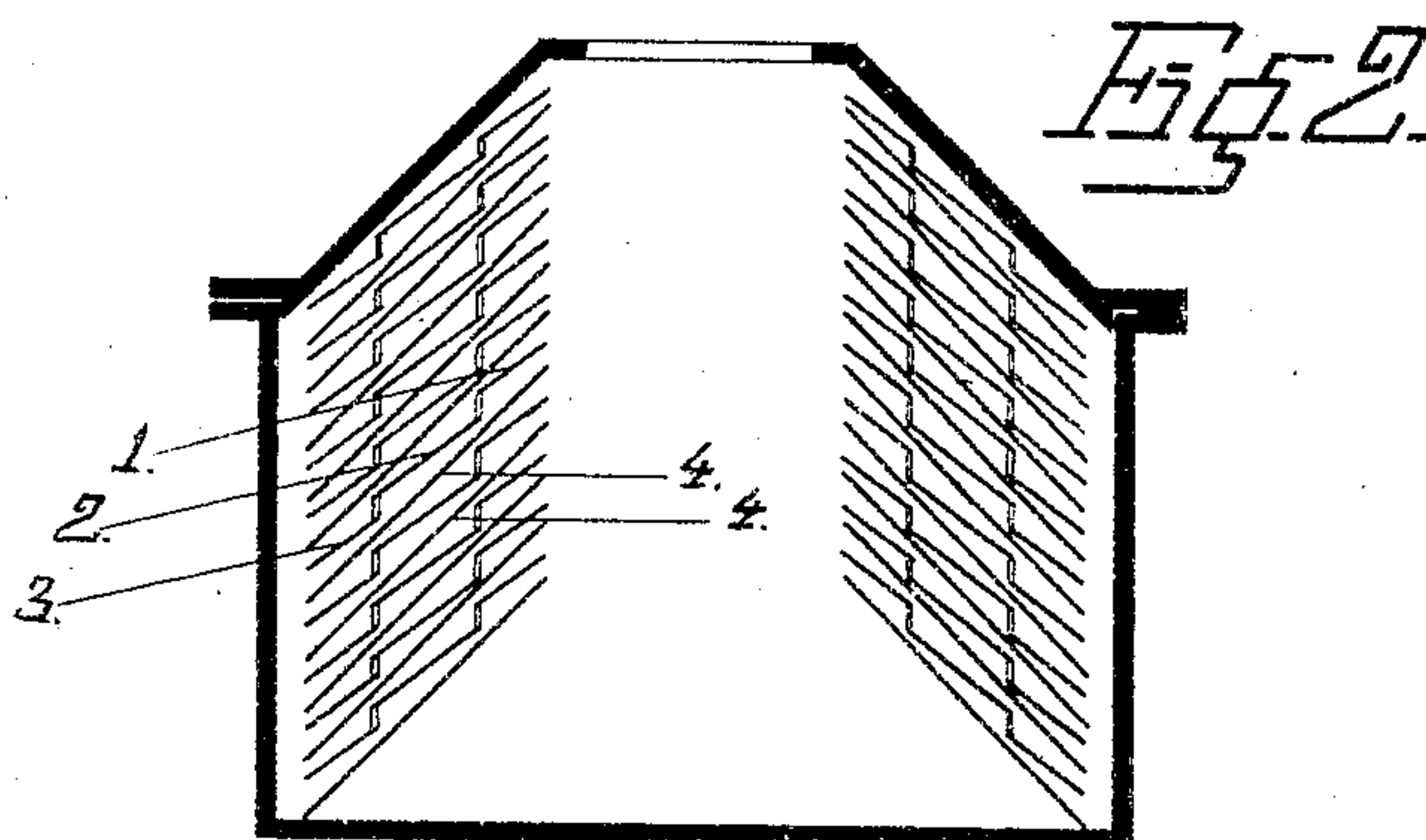
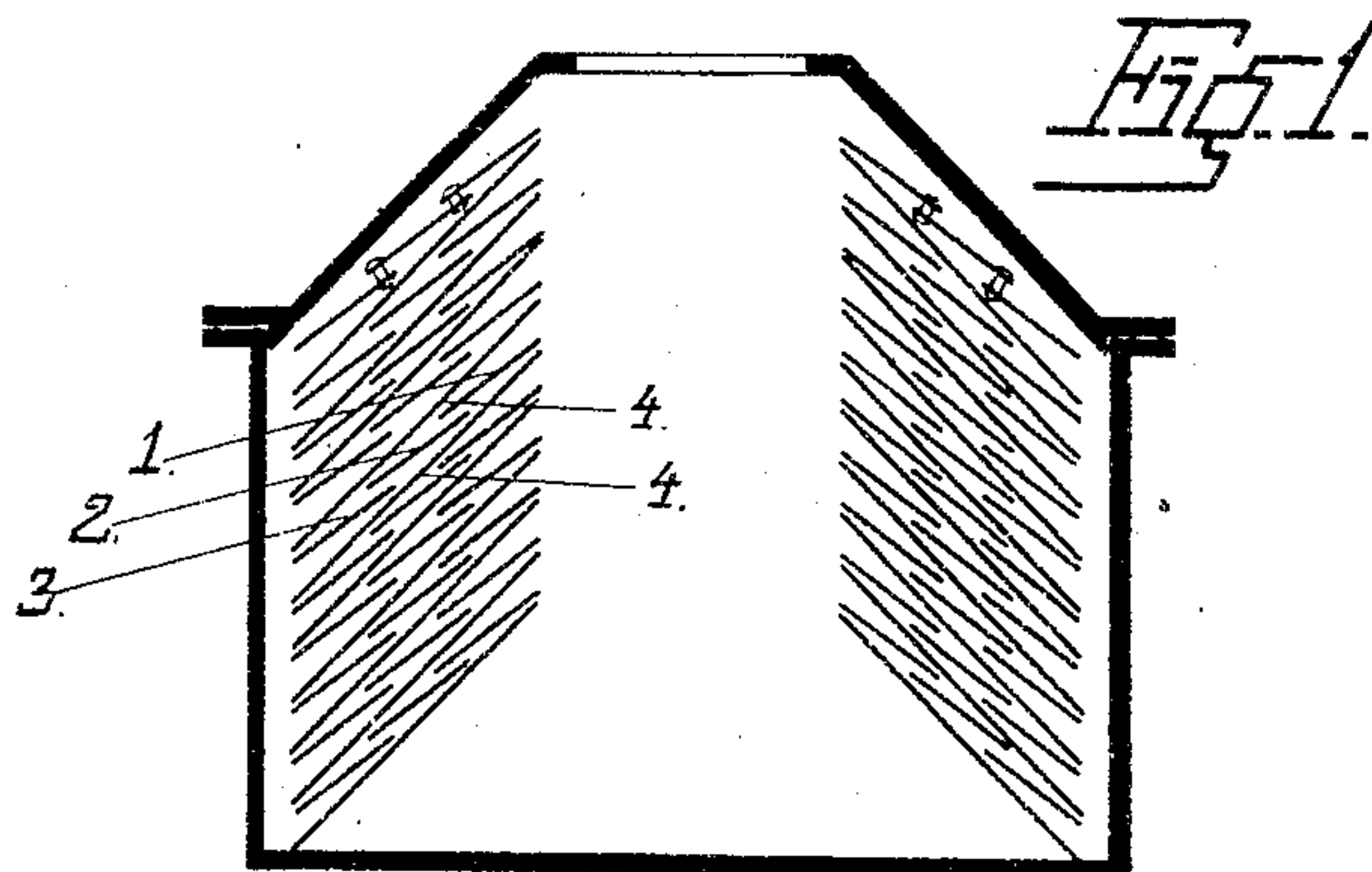


No. 779,445.

PATENTED JAN. 10, 1905.

A. T. SALENIUS.
CENTRIFUGAL LIQUID SEPARATOR.
APPLICATION FILED JAN. 3, 1903.



WITNESSES

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ANDERS THORBJÖRN SALENIUS, OF STOCKHOLM, SWEDEN, ASSIGNOR TO
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CENTRIFUGAL LIQUID-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 779,445, dated January 10, 1905.

Application filed January 3, 1903. Serial No. 137,670.

To all whom it may concern:

Be it known that I, ANDERS THORBJÖRN SALENIUS, engineer, a subject of the King of Sweden and Norway, residing at Handtverkaregatan, No. 20^A, Stockholm, in the Kingdom of Sweden, have invented a certain new and useful Improvement in Centrifugal Liquid-Separators, of which the following is a specification, reference being made to the accompanying drawings.

The present invention relates to such liners of centrifugal separator-drums as consist of annular and conical walls or plates which divide the separating-chamber of the drum into a number of shallow strata.

The object of the invention is to increase the efficiency or skimming power of such liners.

In such liners for centrifugal drums—*e. g.*, in liners with annular conical plates—in order that a good effect of the liner may be obtained the plates must lie very close to each other; but still the effect is not so considerable as might be expected with such placing of the plates, which is due to the fact that the two fluid-currents which pass between a couple of successive plates—namely, in the separation of milk, the current of skimmed milk moving outwardly along one side (the inner side) of the plate and the current of cream traveling along the counter side (the outer side)—are too close together, so that they exercise friction against each other, and thus oppose each other's movement. According to the present invention this drawback is obviated by placing between two successive liner-plates which are arranged at a greater distance from each other than the main plates in ordinary liners of the kind in question walls or plates which, on the one hand, extend in the same or approximately the same direction as the main plates, so that they do not by reason of their position offer any obstacle to the fluid-current, and, on the other hand, have passages there-through, so that they, while at the same time acting as gatherers and conductors of the particles separated from each other, permit the assembled particles to flow through said passages directly to the sides of the main plates

along which the particles have to travel. Thus while retaining the assembling and conducting power of a whole main plate, which the intermediate plate members may thus be considered in a certain respect as replacing, the result is that there is achieved a separating or conducting away from each other of the fluid-currents moving in opposite directions, and in consequence a diminution of the friction between the said currents, and thus an increased effect of the inset.

On the annexed drawings are shown, by way of example, liners for centrifugal separators provided with intermediate plates arranged according to this invention.

Figures 1, 2, and 3 show each a vertical section of a centrifugal separating-drum and the liner placed therein.

In the insets shown on the drawings are three plates 1, 2, and 3, hereinafter called "plate members," disposed between two successive main plates 4. By the term "plate members" I intend to include members which are so formed as to have passages therethrough, which passages preferably are arranged in a circular row or rows, coaxial with the liner, irrespective of whether the passages are formed by leaving spaces between adjacent sections of the plate members, which sections are suitably connected together, or whether the members consisting each of a single plate or ring have openings therein forming the passages. In the construction shown in Fig. 1 the intermediate members are formed of a plurality of plate-sections having overlapping edges suitably riveted together so that a passage is provided between said edges. In this form the sections are not inclined to so great a degree as the main plates. In the form shown in Fig. 2 each member consists of a single plate having portions struck at an angle to the remaining portions, these angularly-struck portions having passages formed therein. In this form also the inclination of the plate portions which correspond to the sections 1, 2, and 3 of Fig. 1 may have an inclination different from that of the main plates. In Fig. 3 the intermediate members are shown to have the same conicity as the main plates

and are each preferably formed of a single sheet of material, having passages which, in effect, divide each member up into sections.

When separating milk by means of a centrifugal liner made according to this invention, the process is as follows: When the whole milk has entered the liner, the separation of the same takes place in agreement with the separation in ordinary liners in so far that the heavier particles of skim-milk assemble at the surfaces of the plates turned inwardly and pass along the same, while the lighter particles of cream assemble at the outwardly-turned surfaces of the plates and travel along these latter. At the outwardly-turned surfaces of the intermediate plate members there thus takes place an inwardly-directed current of (principally) cream while an outwardly-directed current of (principally) skim-milk is passing at the inwardly-turned surfaces of these plates. When the particles reach the passages in the intermediate plate members, they enter immediately or almost immediately in an inwardly-directed respectively outwardly-directed current of cream respectively skim-milk passing along the outside respectively the inside of main plate. The consequence is that the plates 1 3, disposed between two adjacent main plates, conduct a large portion of the skim-milk traveling outward out of the way of the cream flowing along the outside of the one main plate inwardly, in consequence of which both currents exercise less opposition to each other than if instead of the intermediate plates 1 3 there had been a main plate along the inner side of which the skim-milk in such a case had had to flow. The condition will obviously be the same—*i. e.*, a diminution of the resistance which both the currents exercise to each other in consequence of the cream being conducted out of the way of the skim-

milk. Owing to the lesser conicity of the intermediate plate members, respectively, owing to the same inclining somewhat toward the main plates, the quantities of cream and skim-milk which have assembled upon the same are led more directly into the currents passing along the main plates than if the intermediate plate members have the same conicity as the main plates.

Instead of being milk the matter to be separated may obviously consist of any separable matter whatsoever.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a centrifugal separator, the combination with conical plates which are coaxial with the separating-drum, of a series of conical plate members between the first-mentioned plates, said members each comprising a plurality of sections with passages between the sections.

2. In a centrifugal separator, the combination with conical plates which are coaxial with the separating-drum, of a series of conical members between the first-mentioned plates, said members each comprising a plurality of sections with their adjacent edges in different planes, substantially as described.

3. In a centrifugal separator, the combination with conical plates which are coaxial with the separating-drum, of a series of conical members between the first-mentioned plates, said members each comprising a plurality of sections with their edges overlapping, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

ANDERS THORBJÖRN SALENUS.

Witnesses:

HANS B. OHLSSON,
C. TH. SUNDHOLM.