

No. 812,544.

PATENTED FEB. 13, 1906.

A. L. CHRISTENSON.
CENTRIFUGAL LIQUID SEPARATOR.

APPLICATION FILED NOV. 3, 1904.

3 SHEETS—SHEET 1.

Fig. 1.

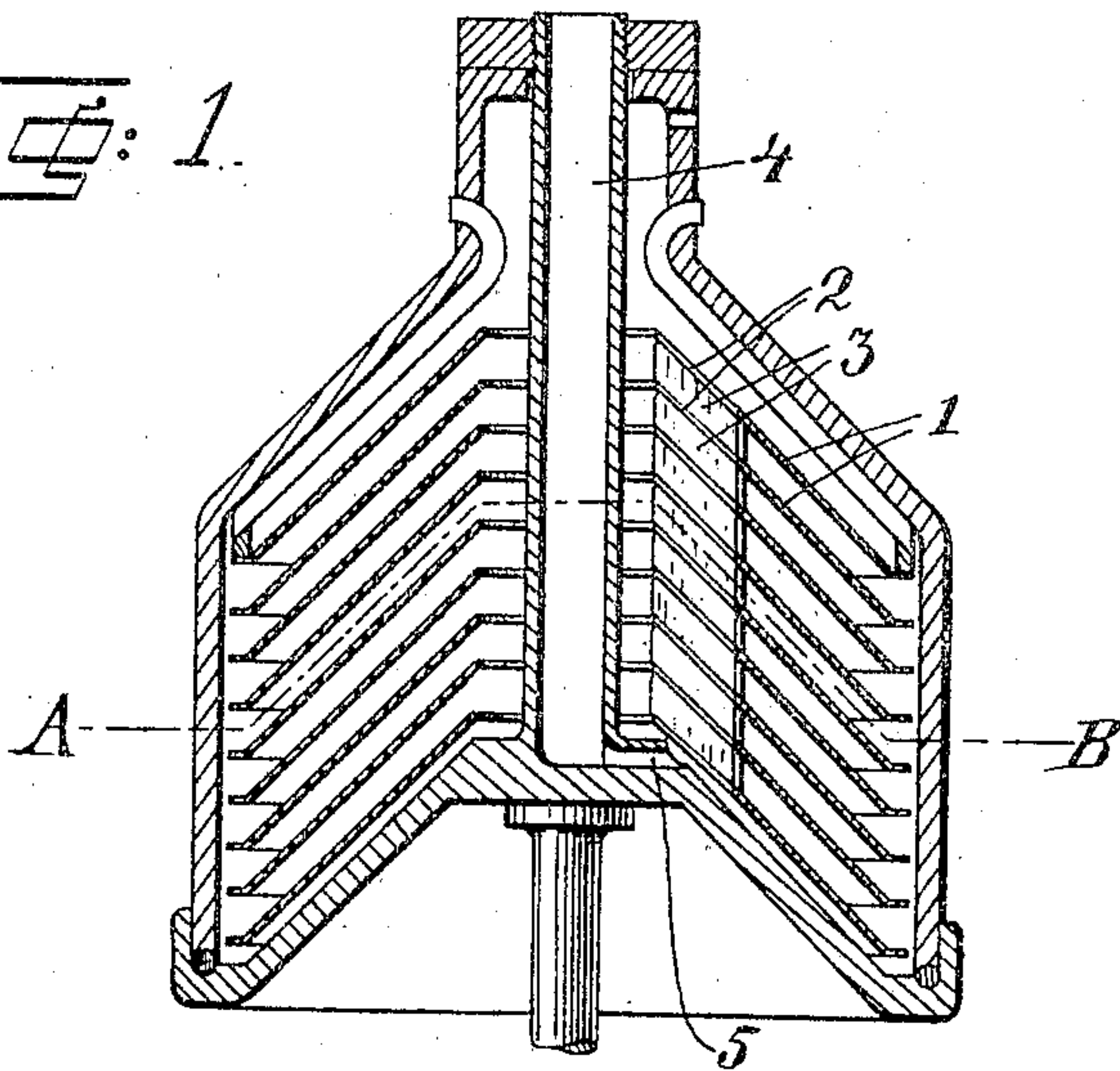


Fig. 2.

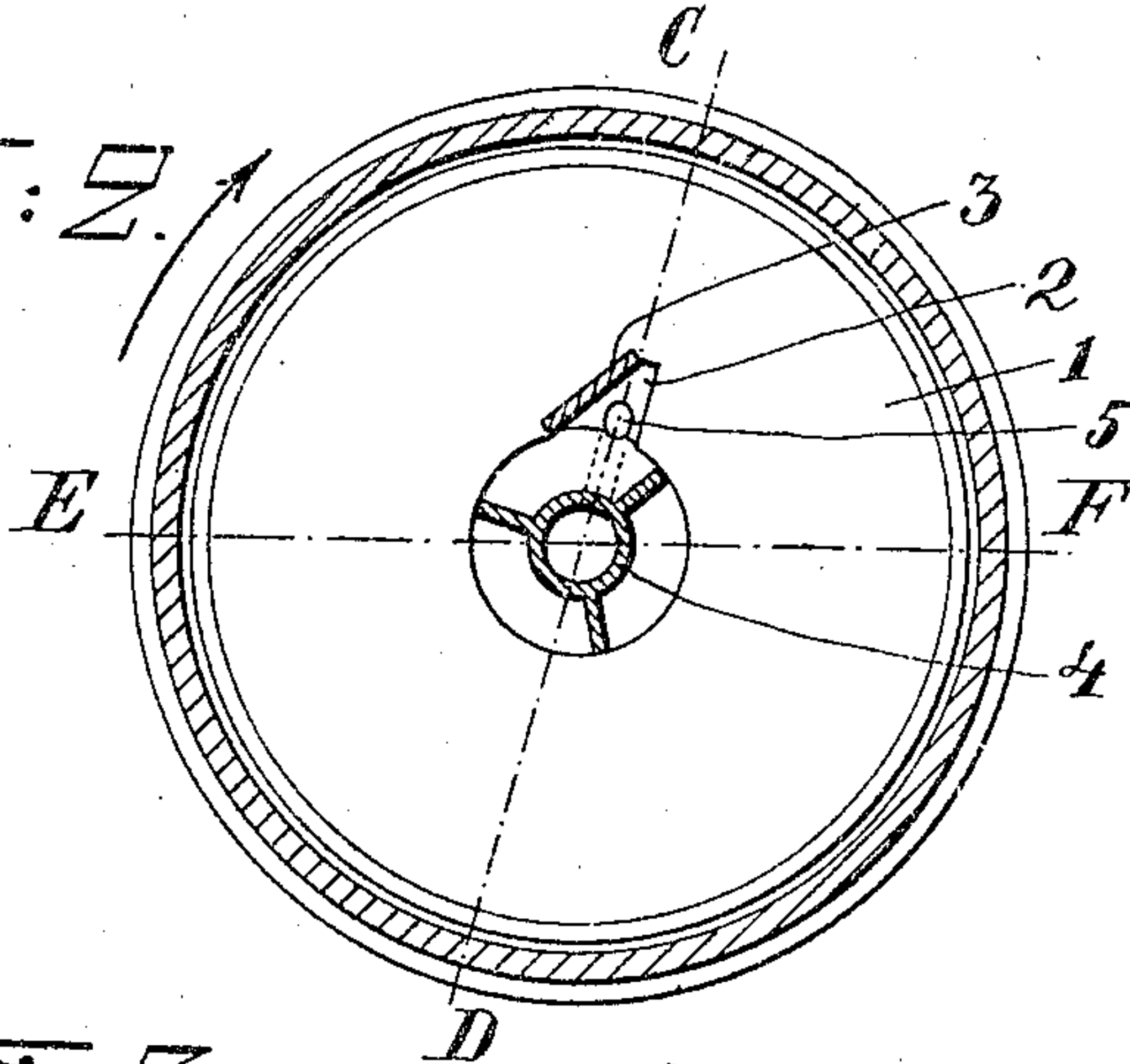
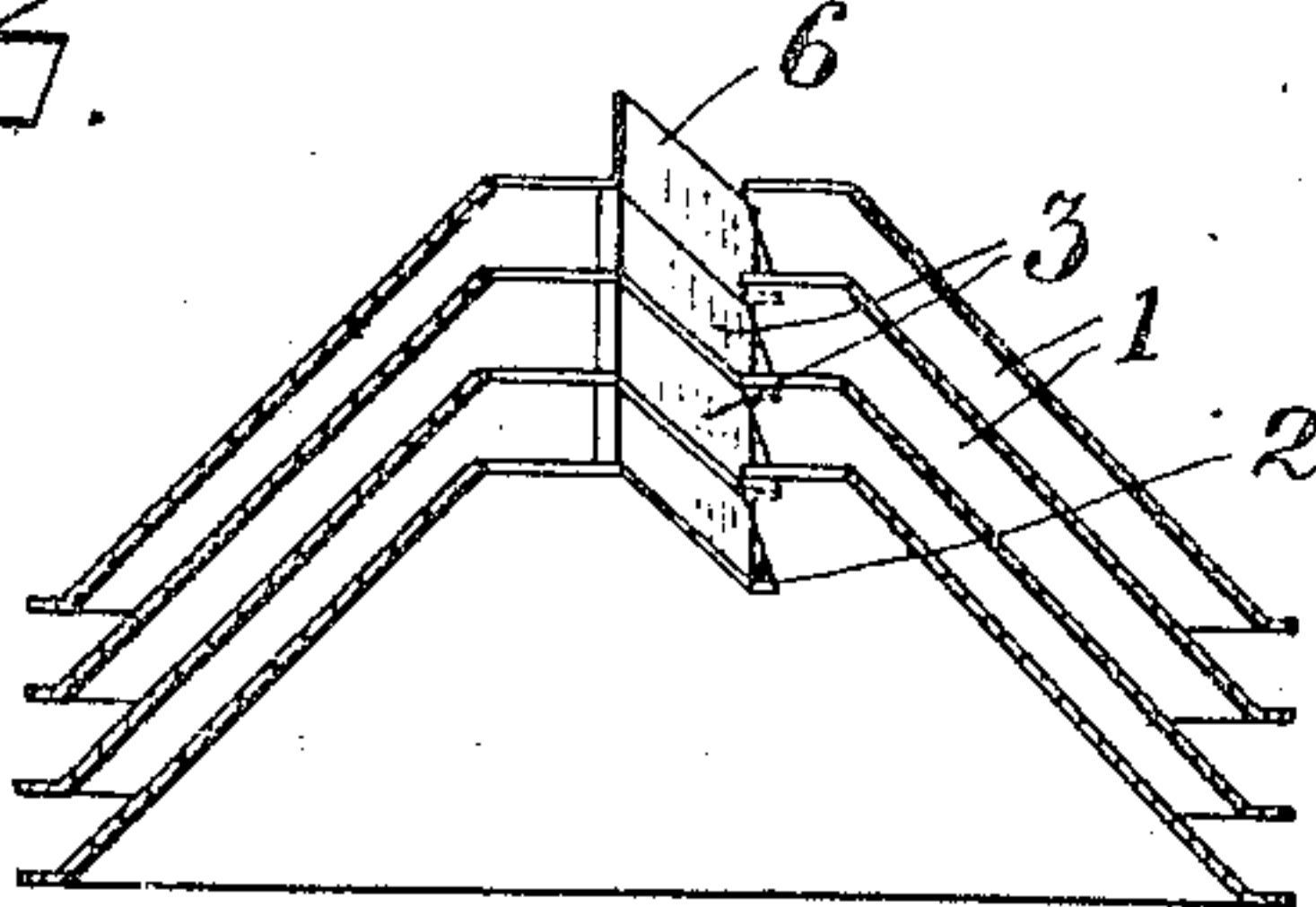


Fig. 3.



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3 SHEETS—SHEET 2.

Fig: 4

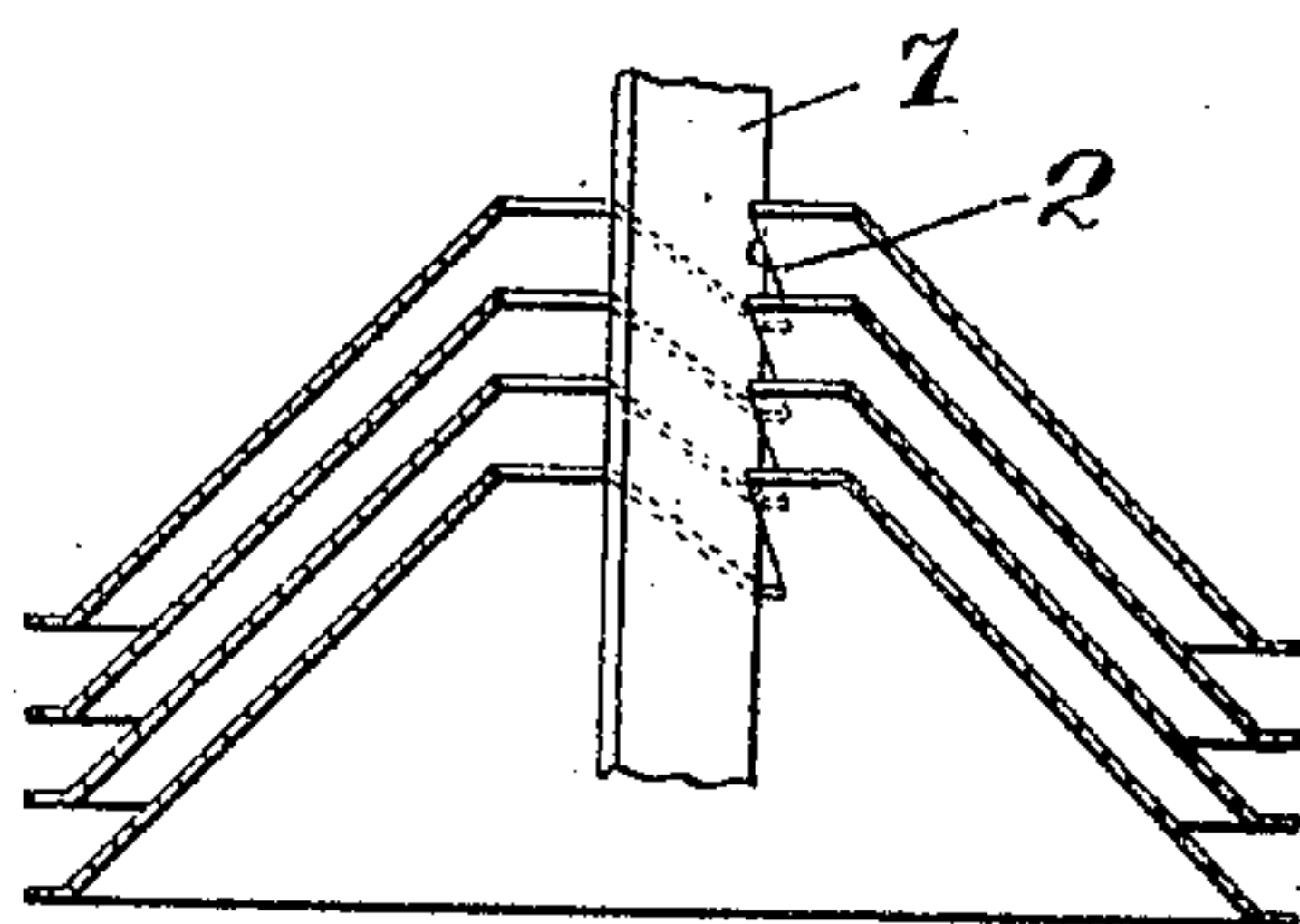


Fig: 5

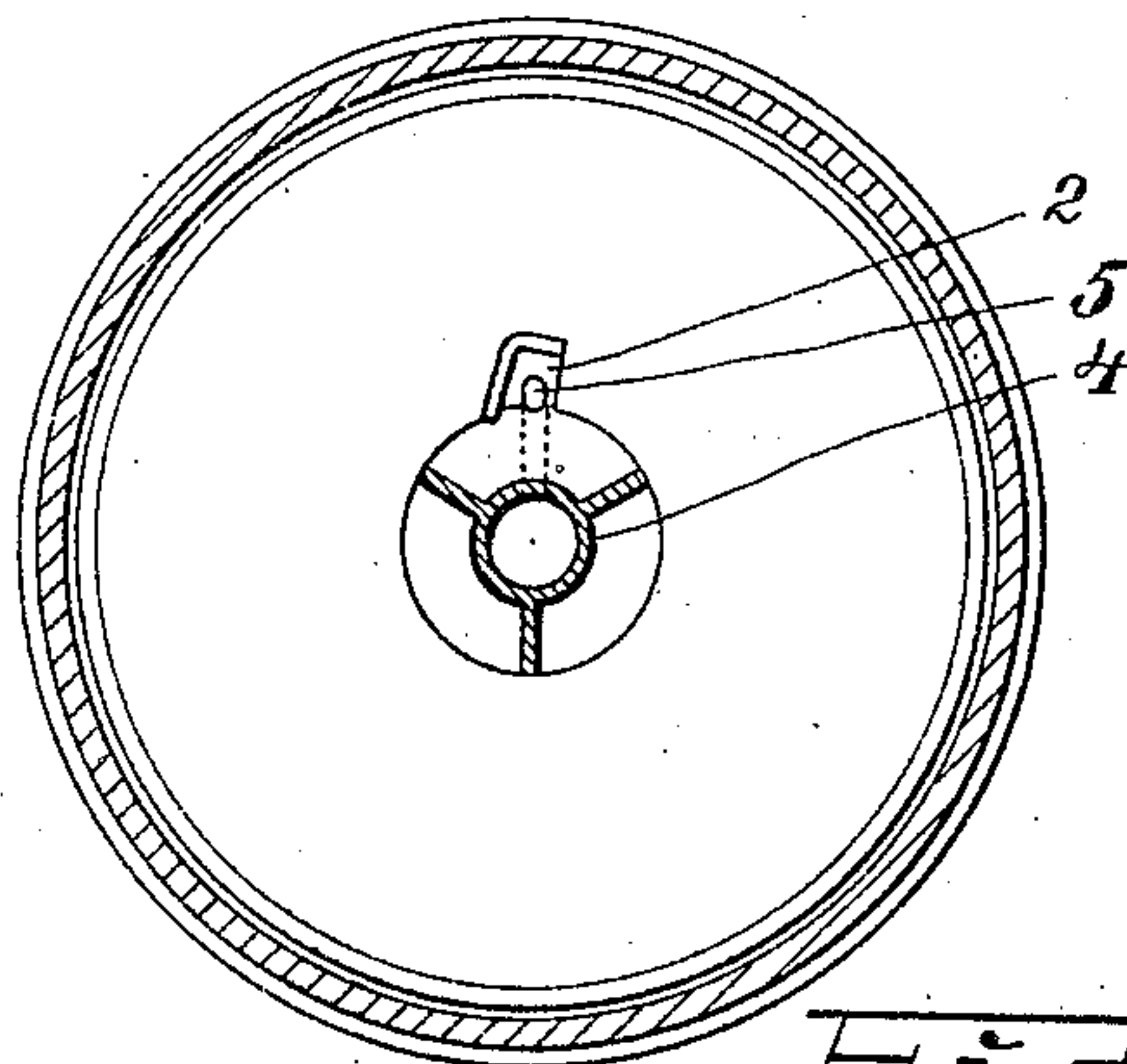


Fig: 6

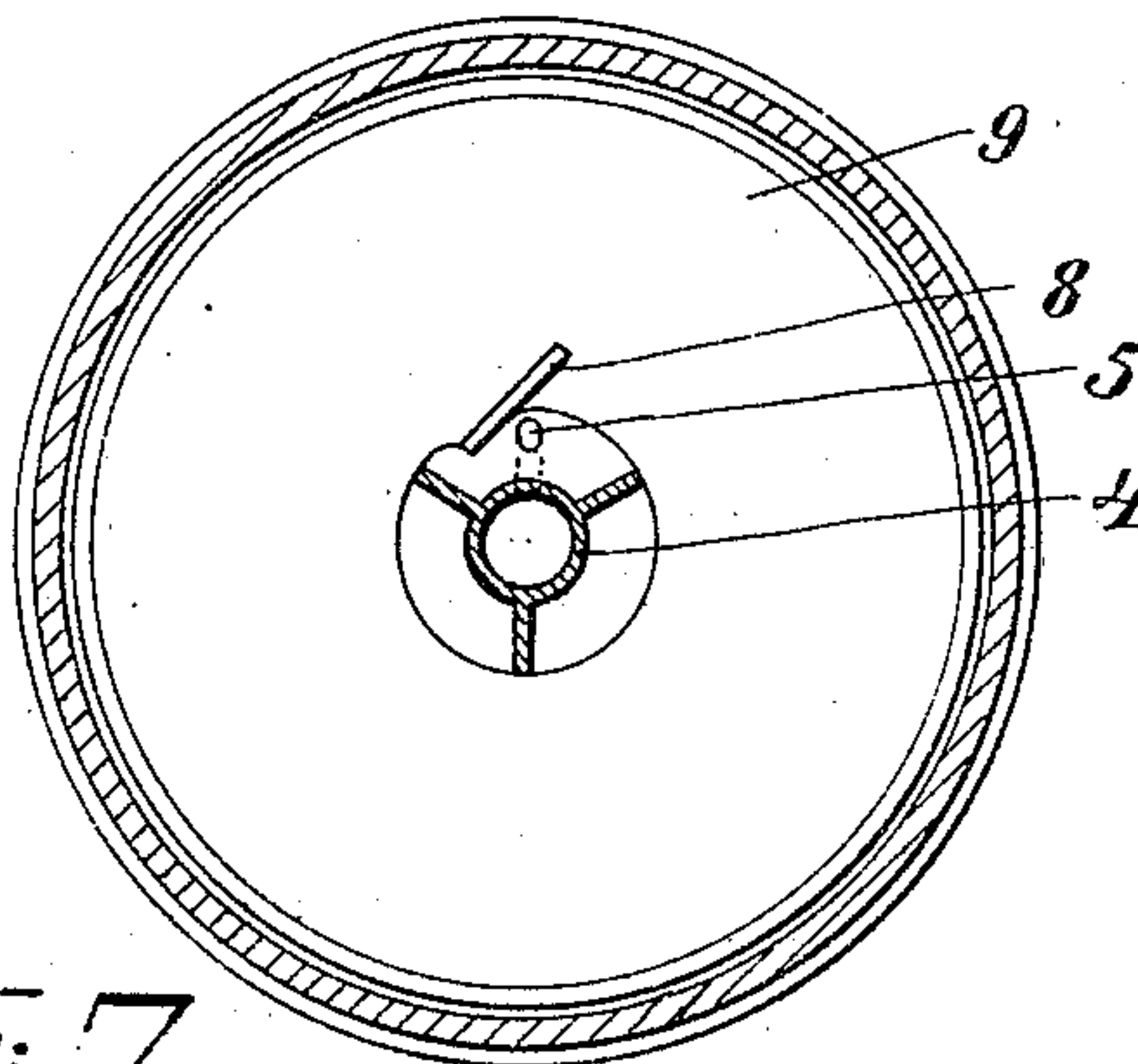
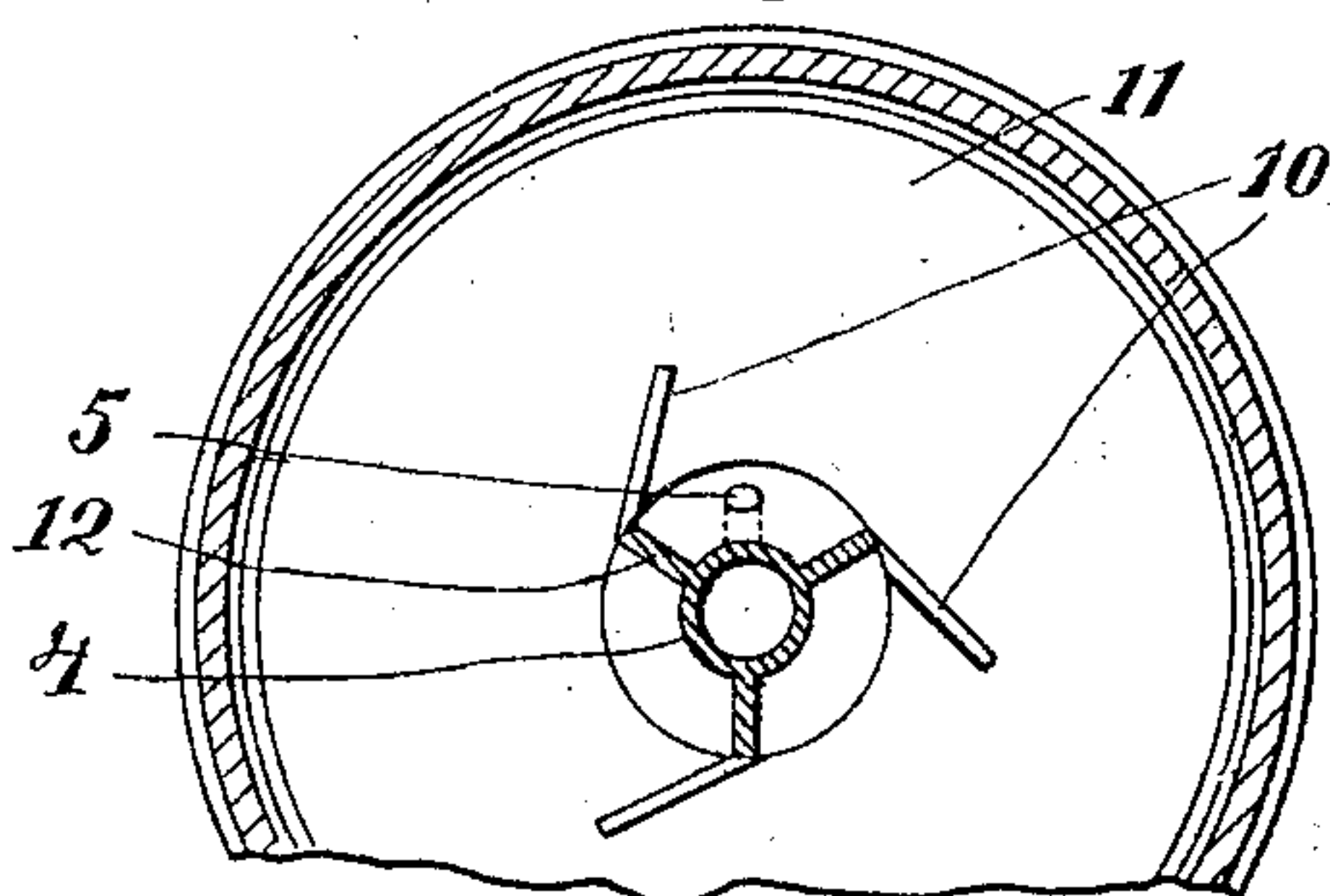


Fig: 7



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3 SHEETS—SHEET 3.

Fig. 8.

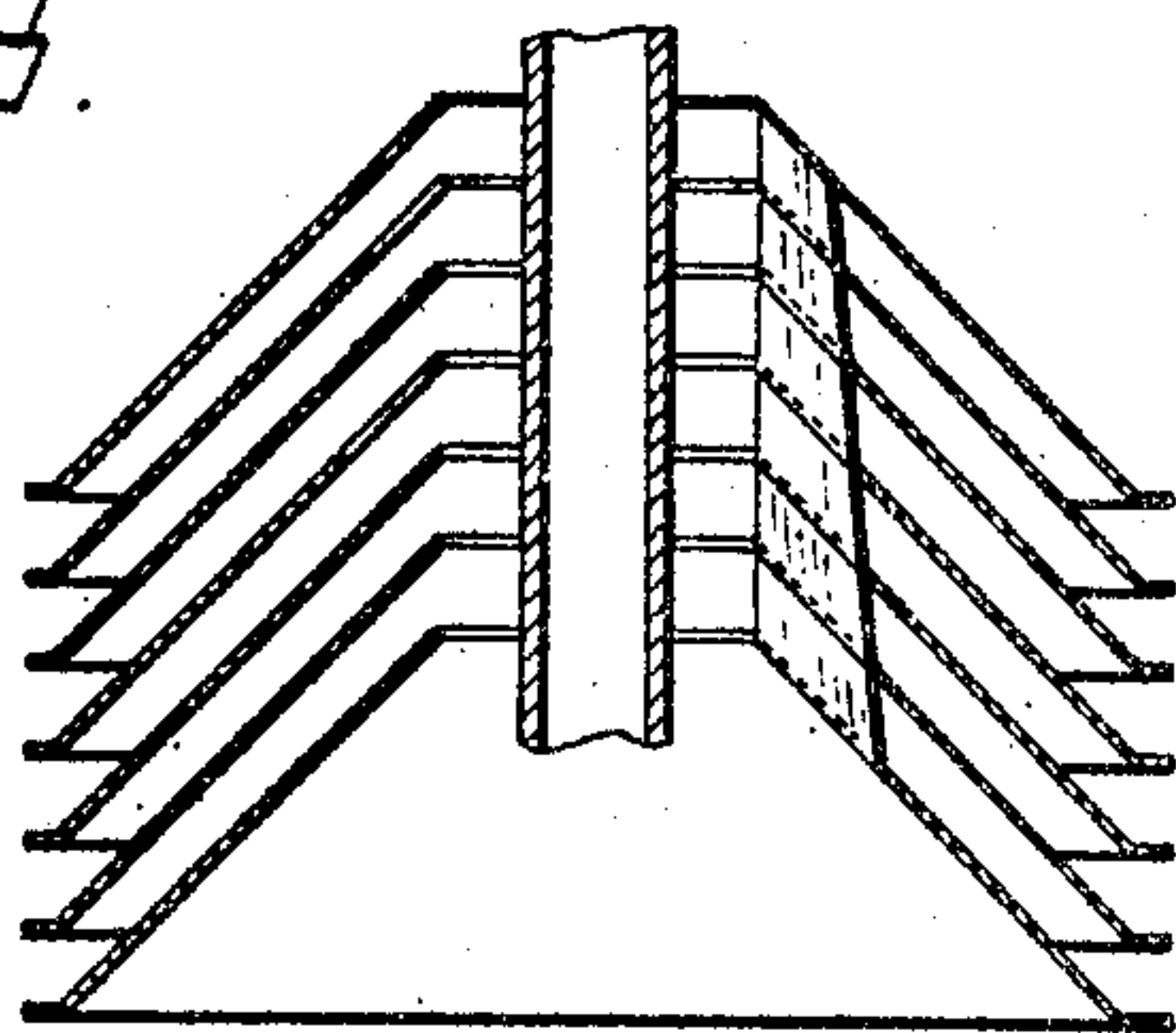


Fig. 9.

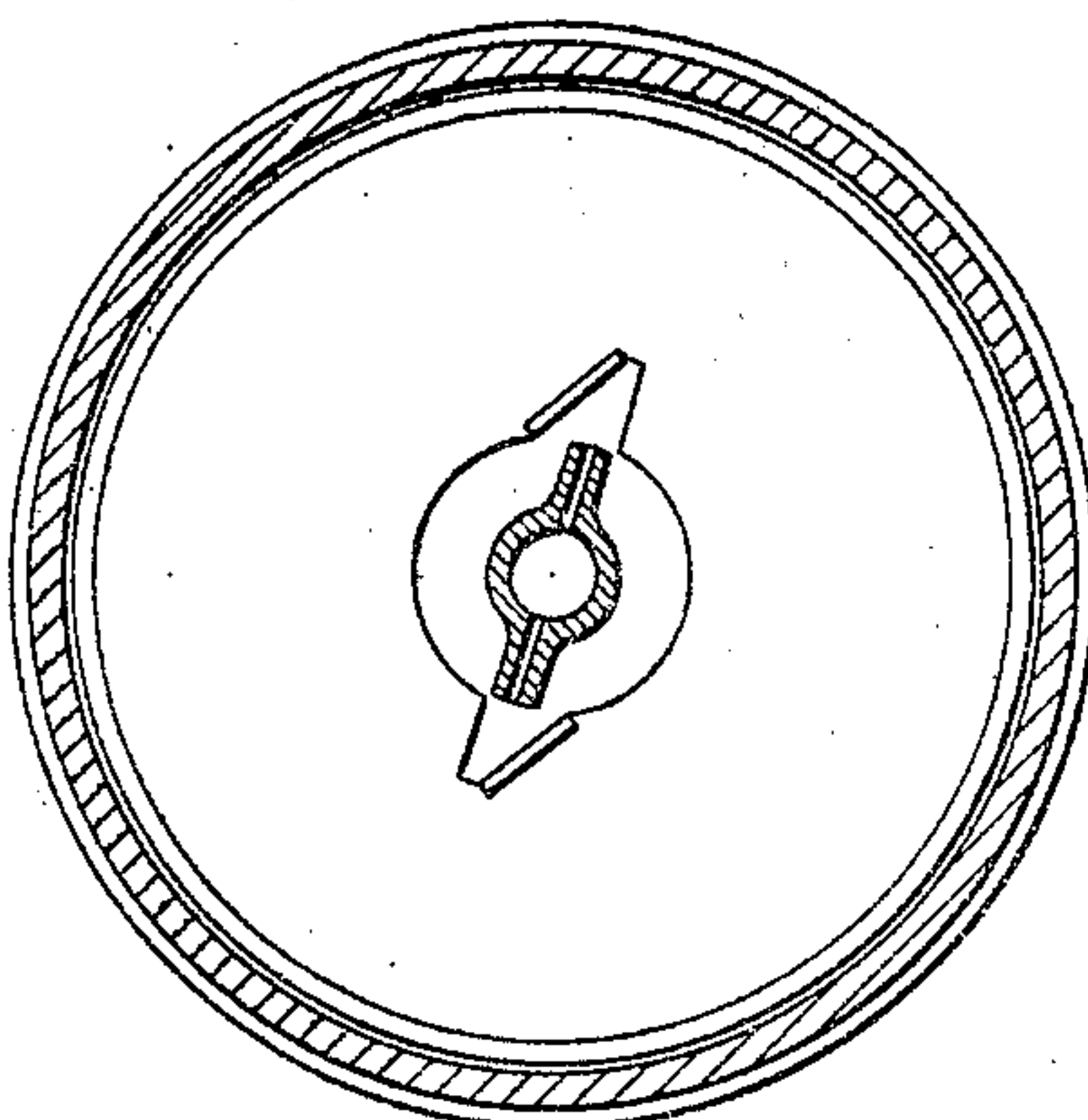
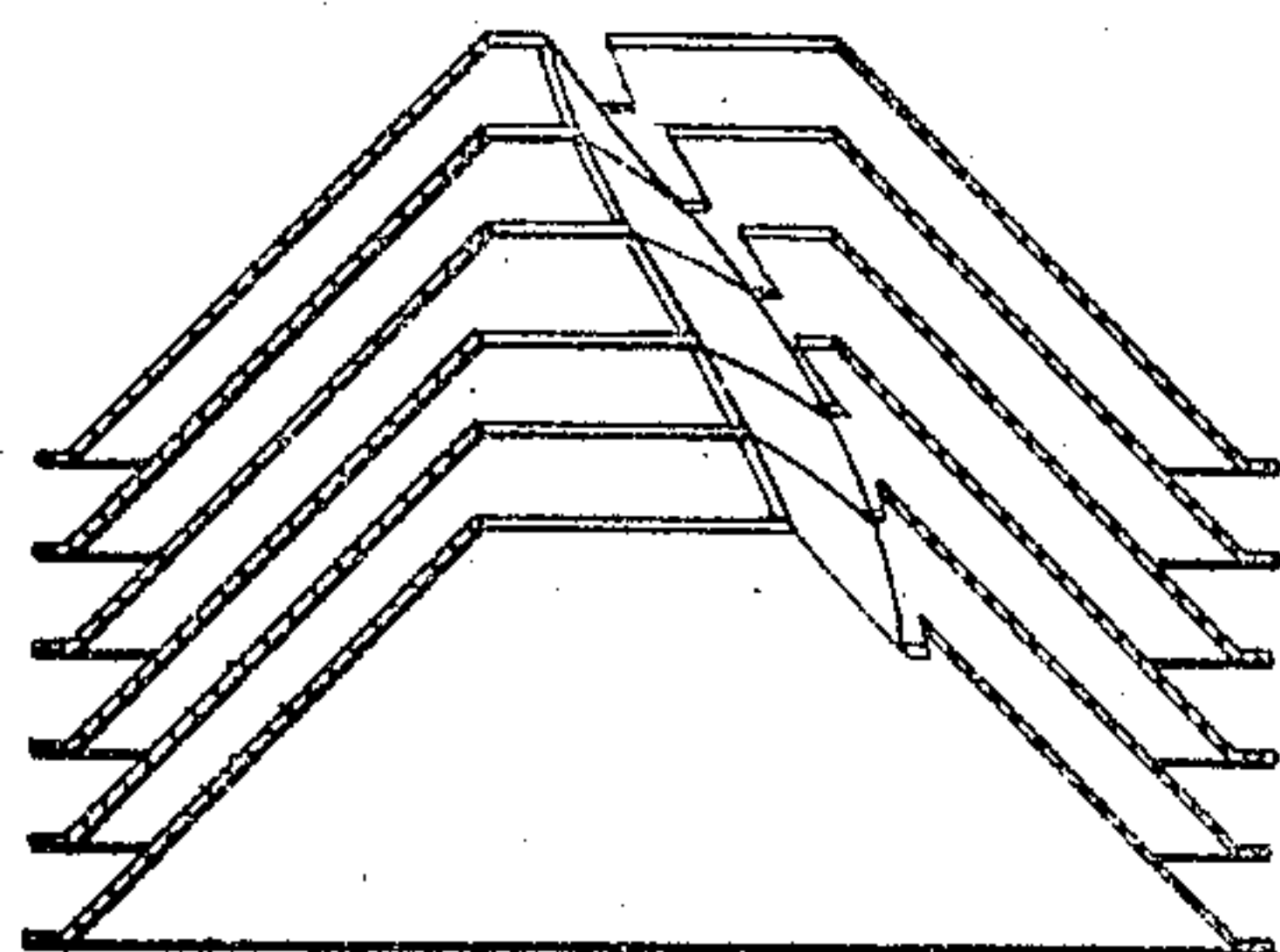


Fig. 10.



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UNITED STATES PATENT OFFICE.

ALGOT LEVIN CHRISTENSON, OF STOCKHOLM, SWEDEN.

CENTRIFUGAL LIQUID-SEPARATOR.

No. 812,544.

Specification of Letters Patent.

Patented Feb. 13, 1906.

Application filed November 3, 1904. Serial No. 231,306.

To all whom it may concern:

Be it known that I, ALGOT LEVIN CHRISTENSON, a subject of the King of Sweden and Norway, and a resident of Stockholm, Sweden, have invented new and useful Improvements in Distributing Devices for Centrifugal Separators, of which the following is a specification, reference being had to the drawings accompanying and forming a part hereof.

This invention relates to a distributing device for such liners for centrifugal separators which consist of conical plates superposed on one another.

The object of the invention is to provide a simple and reliable distributing device which will be able to evenly distribute the full-milk between the plates of the liner.

The invention consists, chiefly, in the combination, with the conical plates constituting the liner, of means for preventing the tangential off-flow of the full-milk and to create a counter pressure at the place or places where the full-milk is introduced in the spaces between the plates in order to compel the full-milk to rise along the whole height of the liner and evenly enter all the spaces of the same. The said means may consist of one or more walls or the like extending axially or principally axially through the bowl and intersecting the liner at the inner part of the same and being so placed in relation to the direction of rotation of the bowl that they act as the blades of a centrifugal pump or the like.

In the accompanying drawings I have shown some liners embodying my invention.

Figure 1 shows a vertical section on line C D in Fig. 2 of a centrifugal separator-bowl having a liner of the kind set forth. Fig. 2 shows a horizontal section on line A B in Fig. 1. Fig. 3 shows a vertical section of some plates on line E F in Fig. 2. Figs. 4, 5, 6, 7, 8, 9 and 10 show modifications.

Referring to Figs. 1 to 3, each plate 1 is at the inner edge provided with one or more notches 2, placed above each other, so as to form one or more axially-running distributing-channels. At the rear side in relation to the direction of rotation of the bowl (indicated by the arrow in Fig. 2) the said notches may be provided with ribs 3 or the like of preferably the same height as the distance between the plates. The said ribs 3, together with the intermediate edges of the plates, form walls limiting at the one side the dis-

tributing-channel formed by the said notches 2. For introducing the full-milk into the bowl may in well-known manner be used a central inlet-pipe 4, communicating at the lower end with a channel (or channels) 5, provided at or, as is shown, in the bottom of the bowl. The outer ends of the said channel 5 may be arranged below the lower end of the distributing-channel formed by the notches 2.

The distributing device described above works as follows: The full-milk let into the central inlet-pipe 4 flows out through the channel 5 and strikes the wall formed by the said ribs 3, and the intermediate edges of the plates 1, spreads itself along the said wall, and enters thereupon into the spaces between the plates 1, the distribution of the full-milk along the said wall depending, essentially, on that the latter on account of their oblique position act as the blades in a centrifugal pump or the like, and thereby cause a counter pressure against the outflow of the full-milk in the spaces between the plates. The said counter-pressure will to a certain extent prevent the flowing off of the milk through the lower part of the liner, through which the larger part of the milk would otherwise flow, thereby causing a uniform distribution of milk in the liner.

The device illustrated in Figs. 1 to 3 may be modified in many ways without departing from the principle of the invention. Thus, for instance, the wall or walls formed by the ribs 3 and the intermediate edges of the plates may be obtained by bending up (or down) the one edge 6 of the notches 2, as is shown at the uppermost plate 1 in Fig. 3. The channel or channels formed by the notches 2 may further be limited at the one side by a plate 7 or the like, extending along the whole height of the liner, as is shown in Fig. 4. The wall limiting the channel or channels formed by the notches 2 need not be plane, but may be made of curved or angle-shaped horizontal section, as is illustrated in Fig. 5.

In the modifications illustrated in Figs. 6 and 7 the notches forming the axially or approximately axially running channel (or channels) are dispensed with. In this case the ribs 8 or the like on the plates 9, Fig. 6, may extend beyond the inner circumference of the plates, or ribs 10 on the plates 11, Fig. 7, may extend outward from the outer edges of the usual wings 12 of the central inlet-pipe 4. In the first-mentioned case the full-milk will rise

along the parts of the ribs 8 extending beyond the inner circumference of the plates 9, while in the modification shown in Fig. 7 the full-milk, on account of the counter-pressure
 5 caused by the ribs 10, will be compelled to rise along the wings 12 of the central inlet-pipe 4.

Instead of the inlet device illustrated in Figs. 1 and 2 I may make use, for instance, of
 10 an inlet-pipe having radially or approximately radially extending slotted flanges, as shown in Fig. 9, or of any other kind of inlet devices, as will be easily understood by those skilled in the art.

15 The devices described above may finally be modified in such manner that the wall or walls effecting the counter-pressure against the outflow of the milk are placed inclined in relation to a horizontal plane, as shown in
 20 Fig. 10, so as to facilitate the upward movement of the full-milk and in such manner that the said wall or walls are made wider in radial direction at the lower part of the liner than at the upper part of the same, as shown
 25 in Fig. 8, in order to effect a counter-pressure decreasing toward the top of the liner.

Having now particularly described my invention and in what manner the same may be performed, what I claim as new, and de-
 30 sire to secure by Letters Patent, is—

1. The combination with a centrifugal separating-bowl and a liner therein consisting of conical plates superposed on one another, of walls extending axially through the bowl and
 35 being placed obliquely in relation to a radius, and means for introducing the full-milk in front of the said walls in relation to the direction of rotation of the bowl, substantially as and for the purpose set forth.

40 2. The combination with a centrifugal separating-bowl and a liner therein consisting of conical plates superposed on one another, of imperforate walls extending axially through the bowl and intersecting the liner at the in-
 45 ner part of the same and being placed obliquely in relation to a radius, and means for introducing the full-milk in front of the said walls in relation to the direction of rotation

of the bowl, substantially as and for the purpose set forth.

3. The combination with a centrifugal separating-bowl and a liner therein consisting of conical plates superposed on one another the said plates having notches at their inner parts forming axially-running distributing-channels, of imperforate walls limiting the rear
 55 sides of the said channels in relation to the direction of rotation of the bowl, the said walls being placed obliquely in relation to a radius, and means for introducing the full-milk
 60 in front of the said walls in relation to the direction of rotation of the bowl, substantially as and for the purpose set forth.

4. The combination with a centrifugal separating-bowl and a liner therein consisting of
 65 conical plates superposed on one another, the said plates having notches at their inner parts forming together axially-running distributing-channels, of imperforate ribs on said plates placed at the rear sides of said notches in re-
 70 lation to the direction of rotation of the bowl and in alinement with each other so as to form together with the intermediate edges of the plates walls extending axially through the bowl, and means for introducing the full-
 75 milk in front of the said walls in relation to the direction of rotation of the bowl, substantially as and for the purpose set forth.

5. The combination with a centrifugal separating-bowl and a liner therein consisting of
 80 conical plates superposed on one another, of a central inlet-pipe having longitudinal wings, imperforate walls intersecting the liner at the inner part of the same and extending outward from the outer edges of the said wings ob-
 85 liquely to a radius, and means for introducing the full-milk in front of the said walls in relation to the direction of rotation of the bowl, substantially as and for the purpose set forth.

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

ALGOT LEVIN CHRISTENSON.

Witnesses:

EVALD DELMAR,
 KARL RUNESKOG.