

No. 715,493.

Patented Dec. 9, 1902.

C. J. LUNDSTROM.

LINER FOR CENTRIFUGAL CREAM SEPARATORS.

(Application filed May 24, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

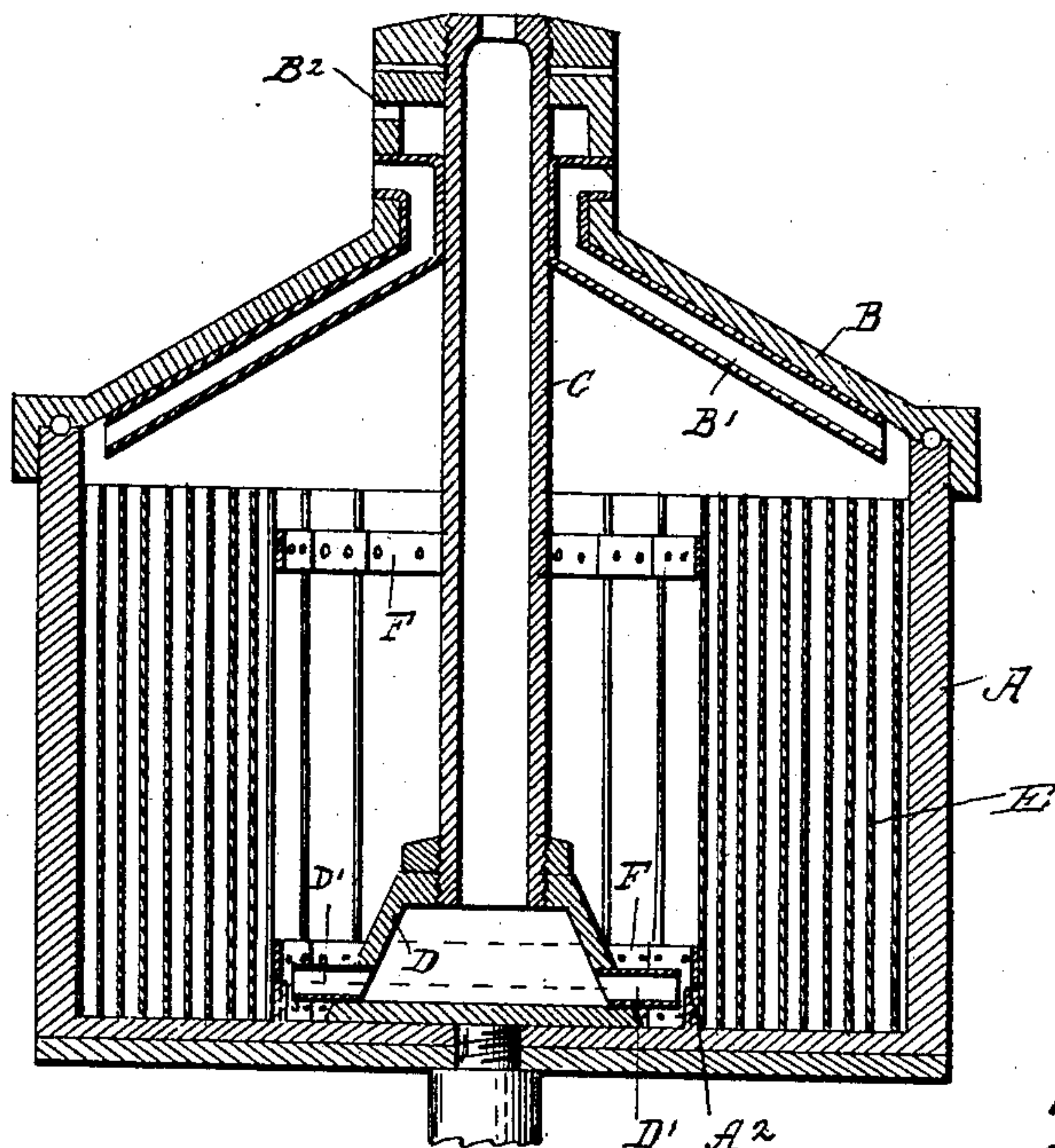


Fig. 2.

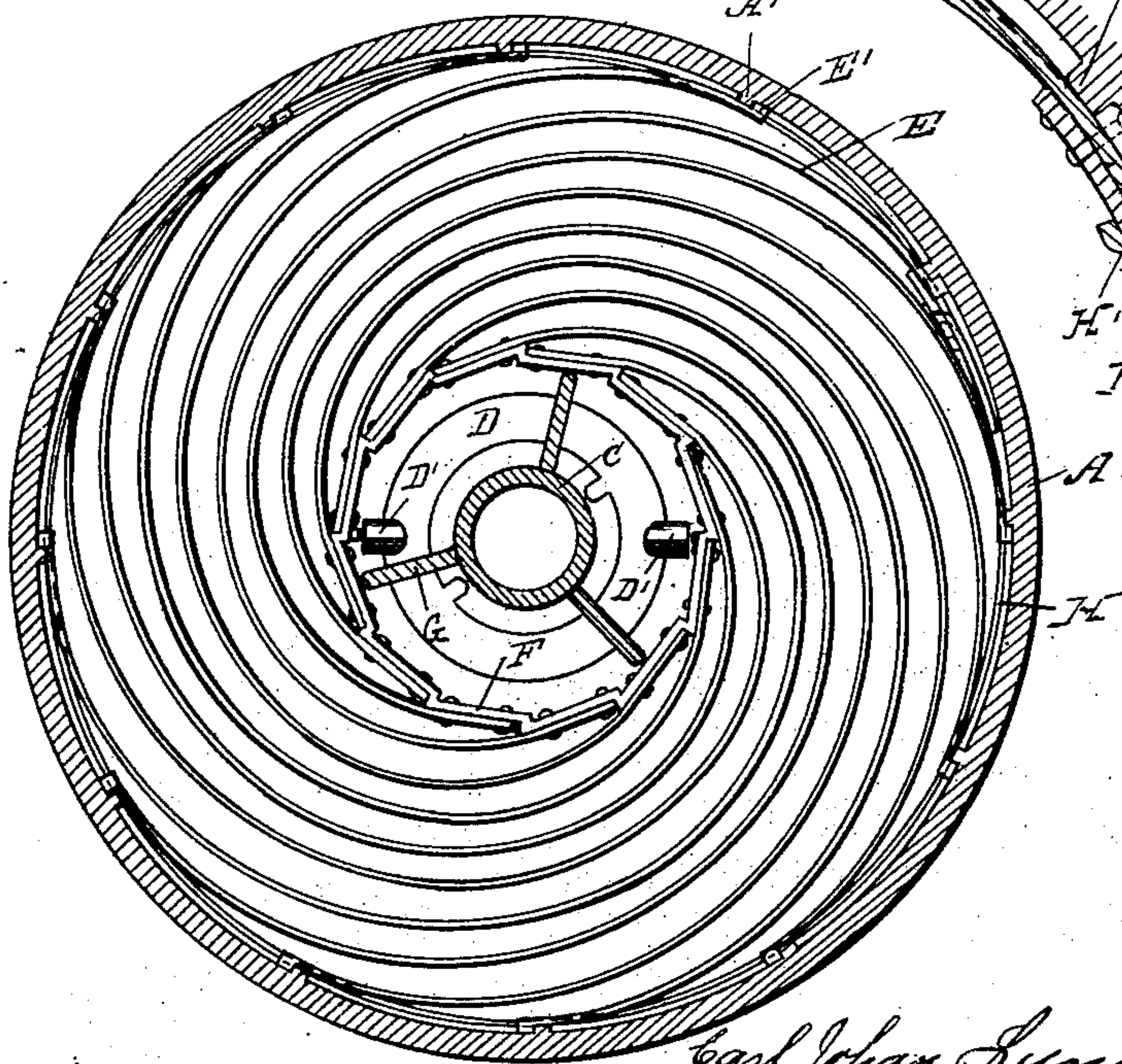
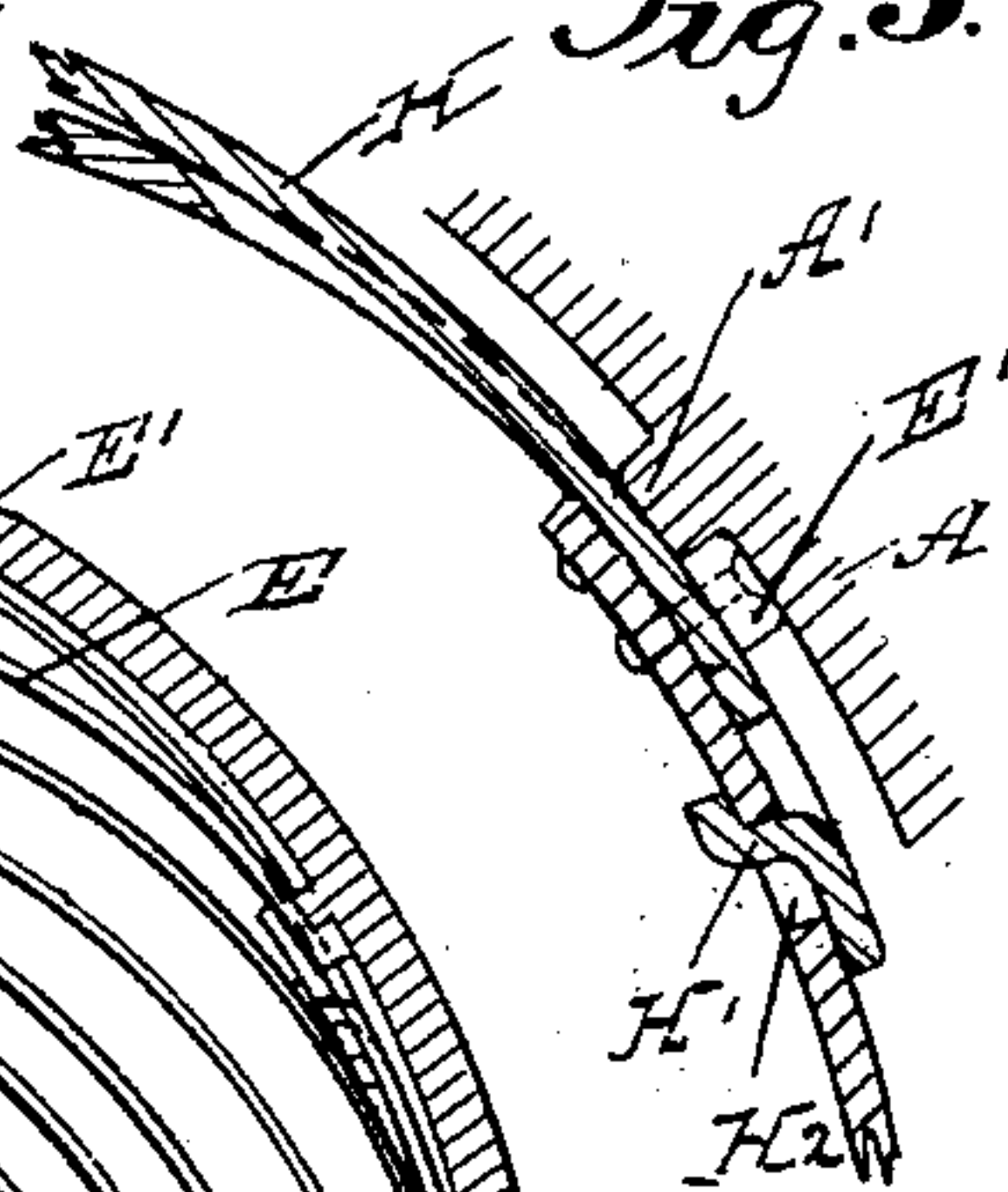


Fig. 3.



Witnesses
Geo. E. Fuch.
H. H. Horn.

Inventor
Carl Johan Lundstrom

No. 715,493.

Patented Dec. 9, 1902.

C. J. LUNDSTROM.

LINER FOR CENTRIFUGAL CREAM SEPARATORS.

(Application filed May 24, 1900.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 4.

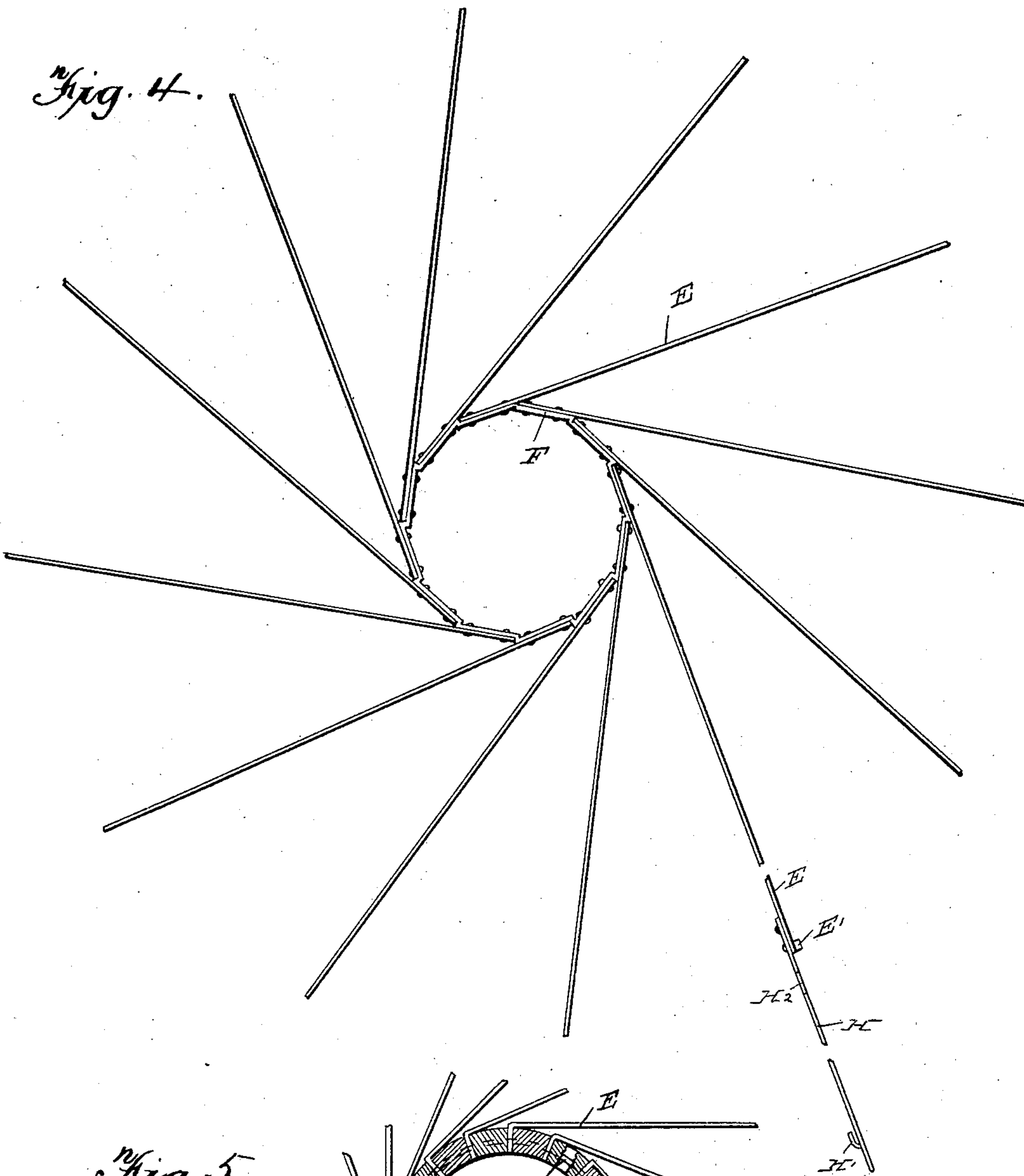
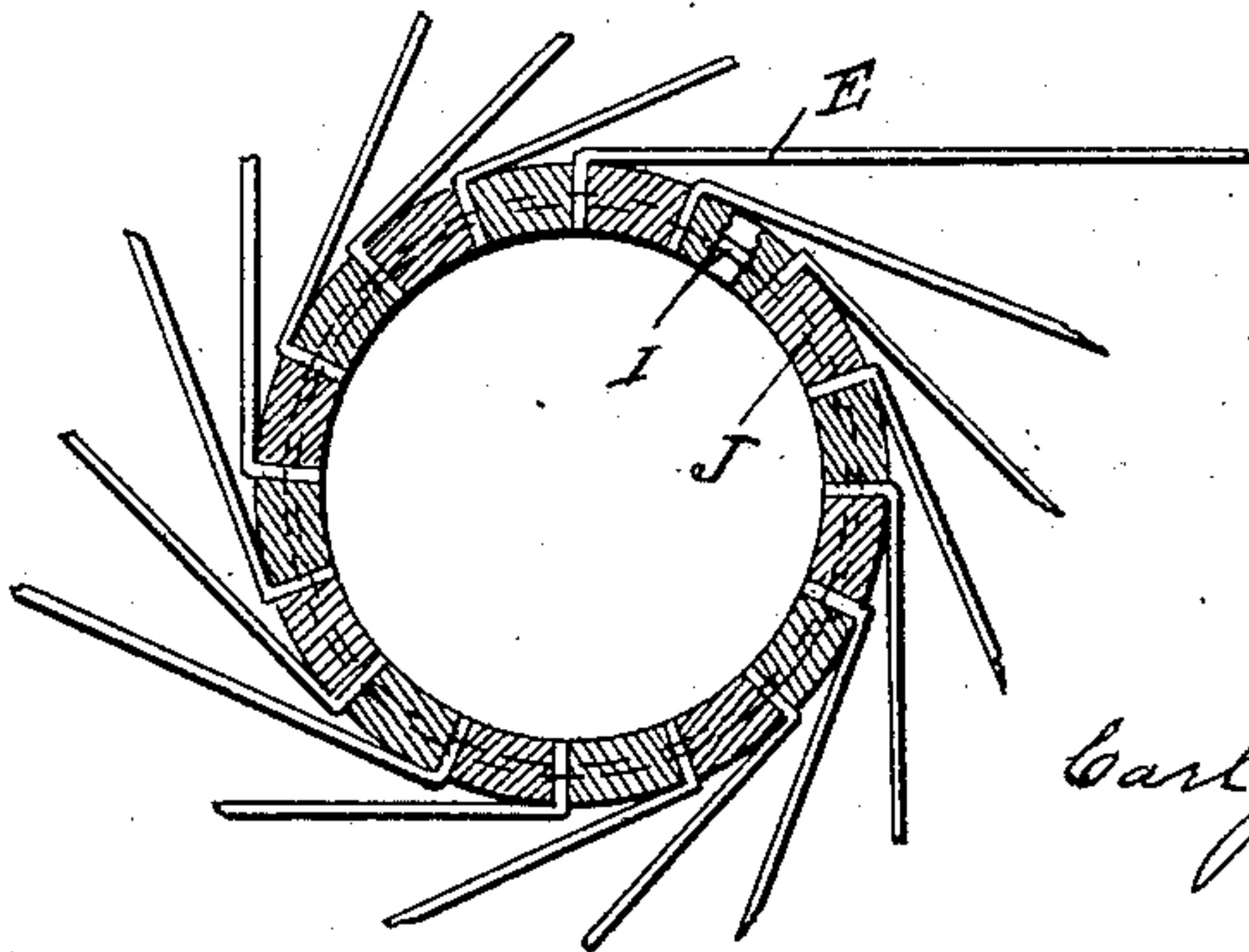


Fig. 5.



Witnesses

Geo. E. Fuch.

H. D. Brown.

Inventor
Carl Johan Lundstrom

UNITED STATES PATENT OFFICE.

CARL JOHAN LUNDSTROM, OF LITTLEFALLS, NEW YORK.

LINER FOR CENTRIFUGAL CREAM-SEPARATORS.

SPECIFICATION forming part of Letters Patent No. 715,493, dated December 9, 1902.

Application filed May 24, 1900. Serial No. 17,828. (No model.)

To all whom it may concern:

Be it known that I, CARL JOHAN LUNDSTROM, a subject of the King of Sweden and Norway, residing at Littlefalls, in the county of Herkimer and State of New York, have invented a new and useful Improvement in Liners for Centrifugal Cream-Separators, of which the following is a specification.

This invention relates to the liners or division contrivances which are used in the bowls of centrifugal cream-separators for increasing the separating capacity of the bowl, and particularly to that kind of division contrivance which is composed of an annular series of blades of fixed curves, the blades being attached to each other at their inner edges by means of hinges or links, the object of having the blades so hinged to each other being to permit each blade in the series to be swung away from the adjoining blade on either side when the structure has been removed from the bowl, so as to give ample room for cleaning each side of each blade, which would not be practicable if such blades were rigidly secured or connected with each other because of the very limited space between the blades. Among the several objectionable features of such construction is the necessary limitation in the width of the blades. Being made to a fixed curve, the blades must be made very narrow in order to open or separate sufficiently to permit of their cleaning, as stated above. Should, for instance, the blades in such a construction be extended so as to describe one or more convolutions around the axis of the bowl, it is obvious that the blades would not be capable of spreading apart at all, and the structure consequently be rendered impracticable to clean. In order to obtain a high separating efficiency with such construction, a great number of blades must accordingly be used. This necessitates the use of exceedingly delicate hinges for connecting the blades, resulting in a structural weakness which greatly impairs the usefulness and practicability of the device. These objectionable features are overcome in my improved liner. By rigidly assembling at their inner edges a series of flexible operatively-curved but normally straight blades, as shown in the accompanying drawings, I provide a liner which may be

easily cleaned and which will permit the use of a small number of blades of high separating efficiency, whereby the strength and practicability of the structure are greatly promoted.

My invention consists in certain other novel features of construction, which will be hereinafter fully described, and finally embraced in the clauses of the claim.

In the drawings, Figure 1 is a sectional view of my improved liner mounted in a bowl of a centrifugal cream-separator. Fig. 2 is a horizontal cross-section of the same. Fig. 3 is an enlarged detail view of the locking device for the collecting-band. Fig. 4 is a fragmentary plan view of the liner as it appears after it has been removed from the bowl. Fig. 5 shows a modified form of assembling the blades.

Similar letters refer to similar parts throughout the several views.

A represents the bowl of a centrifugal cream-separator having a cover B, in which the skim-milk-escape tubes B' and the cream-outlet B² are located.

C represents the feed-tube through which the new milk is fed into the bowl.

D represents the distributing-cup for the new milk and which is provided with horizontal discharge-tubes D', which conduct the milk into the liquid space of the bowl.

Removably mounted in the liquid space of the bowl is my improved liner or division contrivance, comprising an annular series of elastic operatively-curved but normally straight division-blades E, which are rigidly secured at their inner edges to two assembling-rings F. These blades are preferably made of flat or straight pieces of spring-tempered sheet-steel capable of being bent against their tendencies into curves, as shown in Fig. 2, and straighten themselves when unrestrained, as shown in Fig. 4. In order to preserve the proper curvature of the blades when the same are subjected to the action of centrifugal force, I lock the blades in their operative positions in the bowl by providing the outer edges of the blades with ribs or projections E', which engage corresponding ribs A', formed on the inner sides of the bowl, the inner end portions of the blades being held against any rotary movement by means of two studs A², located in the bottom of the

bowl and which engage two slots cut in the lower assembling-ring. The blades being thus locked in their operative positions removes all danger of having the blades crowd together or otherwise impair the efficiency of the structure when the bowl is running and permits the use of very light material in the construction of the blades. It does away with the objectionable spacing projections heretofore used for keeping the division-blades apart, and in providing an unobstructed passage between the blades increases the separating capacity of the device. In order to strengthen the joints between the blades and the assembling-rings, I provide the said rings with oblique or tangential bearing-surfaces coinciding with the direction in which the blades are bent.

The assembling-rings are centered in the bowl by means of three upright wings G, which are secured to the feed-tube.

H represents a flexible collecting-band for the blades and which has one end connected with the outer edge of one of the blades. By winding this band around the free end portions of the blades the same are bent and collected into their operative positions previously to inserting the liner into the bowl. In order to secure the band after the same has circumscribed the blades, I provide the band with a locking device, comprising a button or hook H', located in the free end of the same and adapted to engage a slot or opening H², located in the other end of the band.

In the modified construction, as illustrated in Fig. 5, the inner end portions of the blades are bent at an angle to the main portions of same and assembled by means of a segmental ring I, held together by a spring-ring J, which runs through coinciding perforations or holes in the segments and the angular end portions of the blades.

In operating the device the blades are collected and bent into their operative positions by means of the collecting-band. The liner is then inserted in the bowl and adjusted so that the lugs in the bottom of the bowl engage the slots in the lower assembling-ring, and the ribs or projections on the outer edges of the blade engage the ribs on the sides of

the bowl. This is easily accomplished by slightly rotating the structure after it has been inserted in the bowl. After the cover has been secured on the bowl the machine is then ready for use and is operated in the usual manner. The new milk enters the feed-tube and is conducted into the liquid-space of the bowl by the horizontal tubes extending from the distributing-cup in the bottom of the bowl. As the milk gradually ascends between the blades the cream is separated from the blue milk by the centrifugal action, the cream particles passing inwardly to the cream wall or zone and the blue-milk particles outwardly into the zone adjacent to the inner side of the bowl, the separated cream and blue milk being finally discharged through their respective outlets.

I do not desire to limit myself to the particular construction herein shown and described, as I am aware that some changes may be made therein without departing from the spirit and scope of my invention.

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

1. A liner for cream-separators consisting of an annular series of normally flat spring-metal blades each adapted to assume a curved form when inserted into the separator.

2. A liner for centrifugal separators comprising an annular series of normally flat spring-blades bent into a curved form when in operative position, said blades having their inner ends rigidly assembled and means to hold the blades in curved position.

3. A liner for centrifugal separators consisting of an annular series of normally flat spring-metal blades each adapted to assume a curved form when inserted into the separator and means to hold the blades in curved position, said means comprising a flexible band secured to one of the blades and adapted to be wound around the liner, and means for locking the free end of the band.

CARL JOHAN LUNDSTROM.

Witnesses:

A. OHLSSON,

WALTER A. COOPER.