

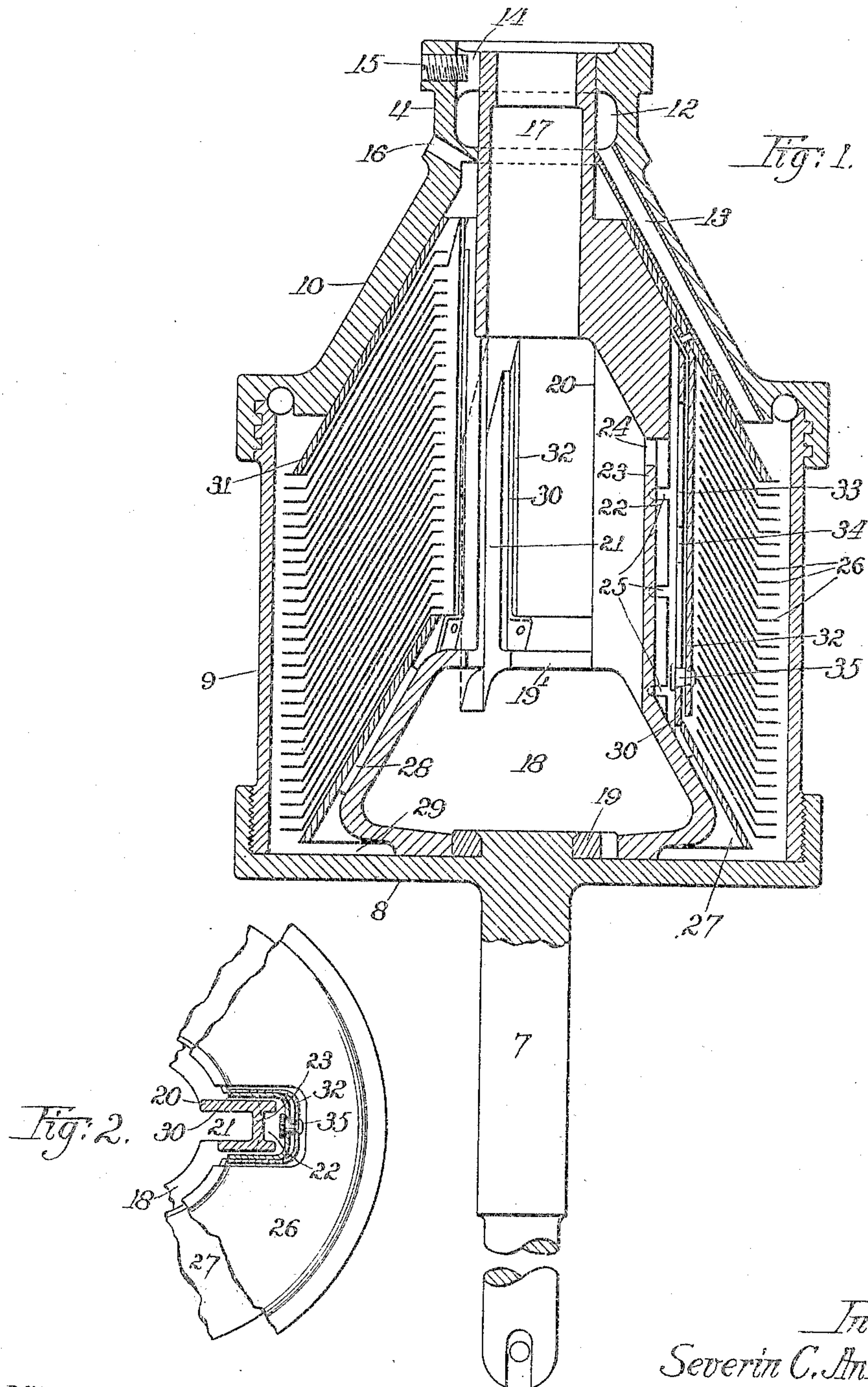
No. 793,759.

PATENTED JULY 4, 1905.

S. C. ANKER-HOLTH.
CENTRIFUGAL CREAM SEPARATOR.

APPLICATION FILED MAR. 17, 1905.

2 SHEETS—SHEET 1.



Witnesses:
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D. A. Alfreds

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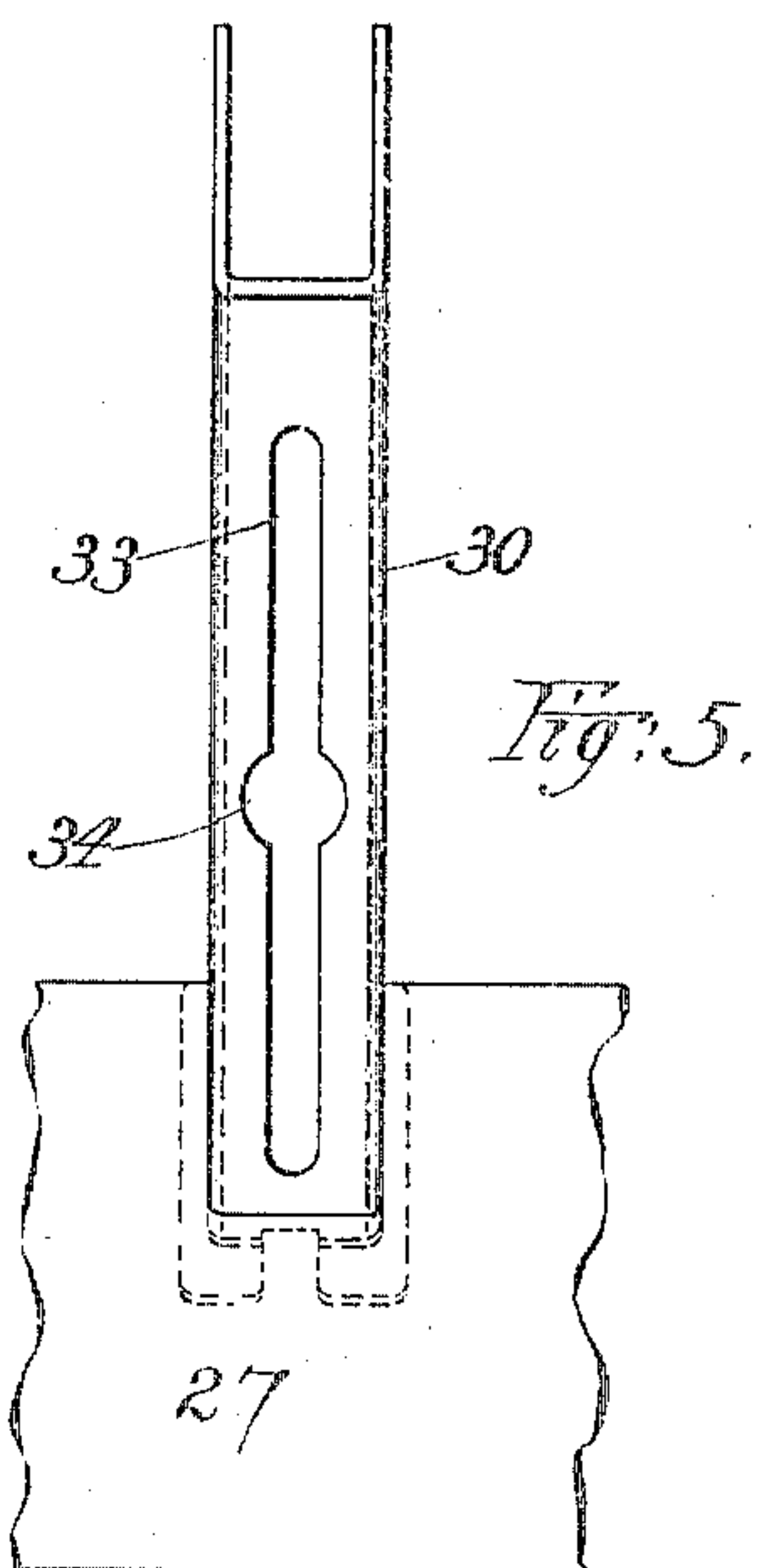
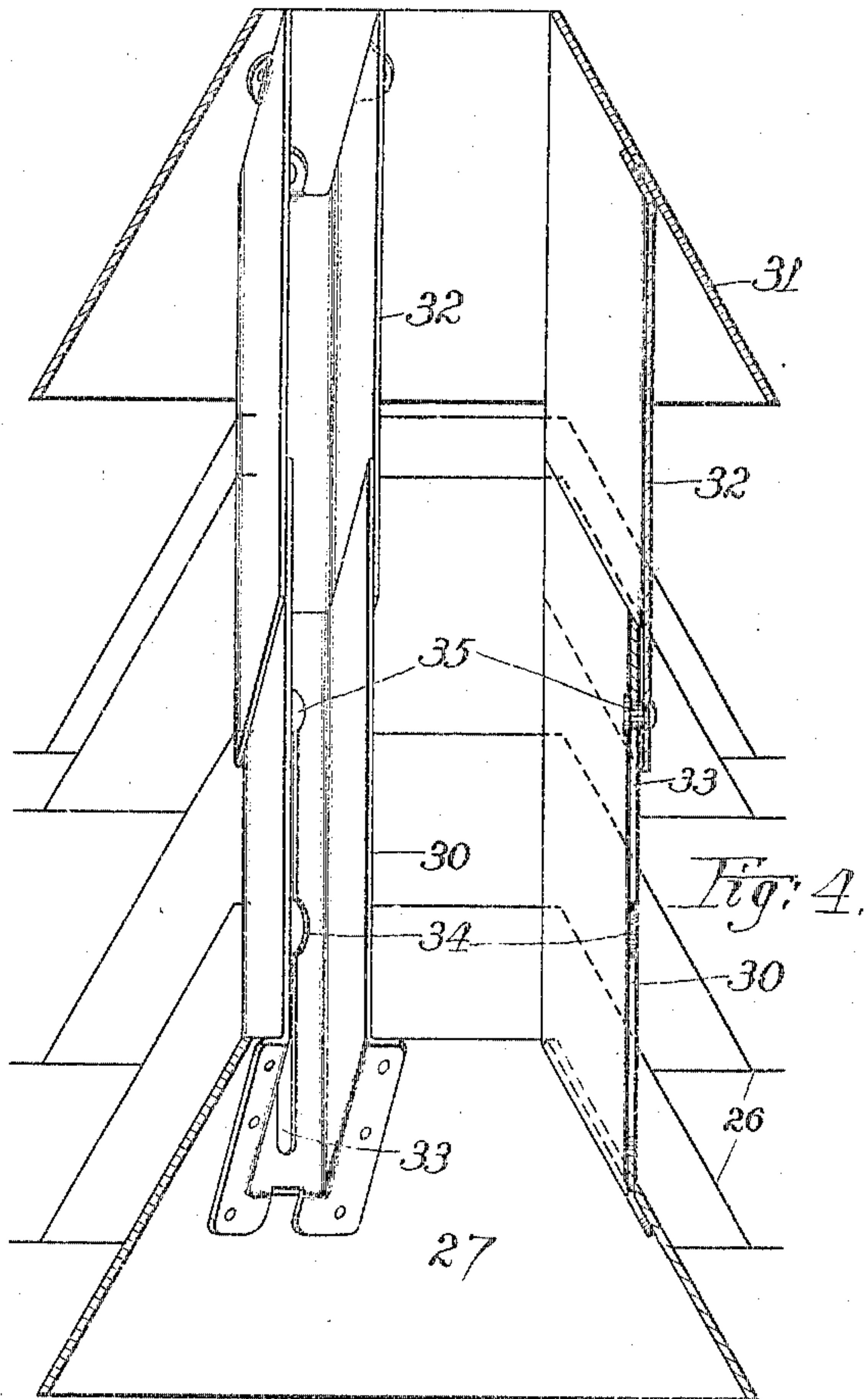
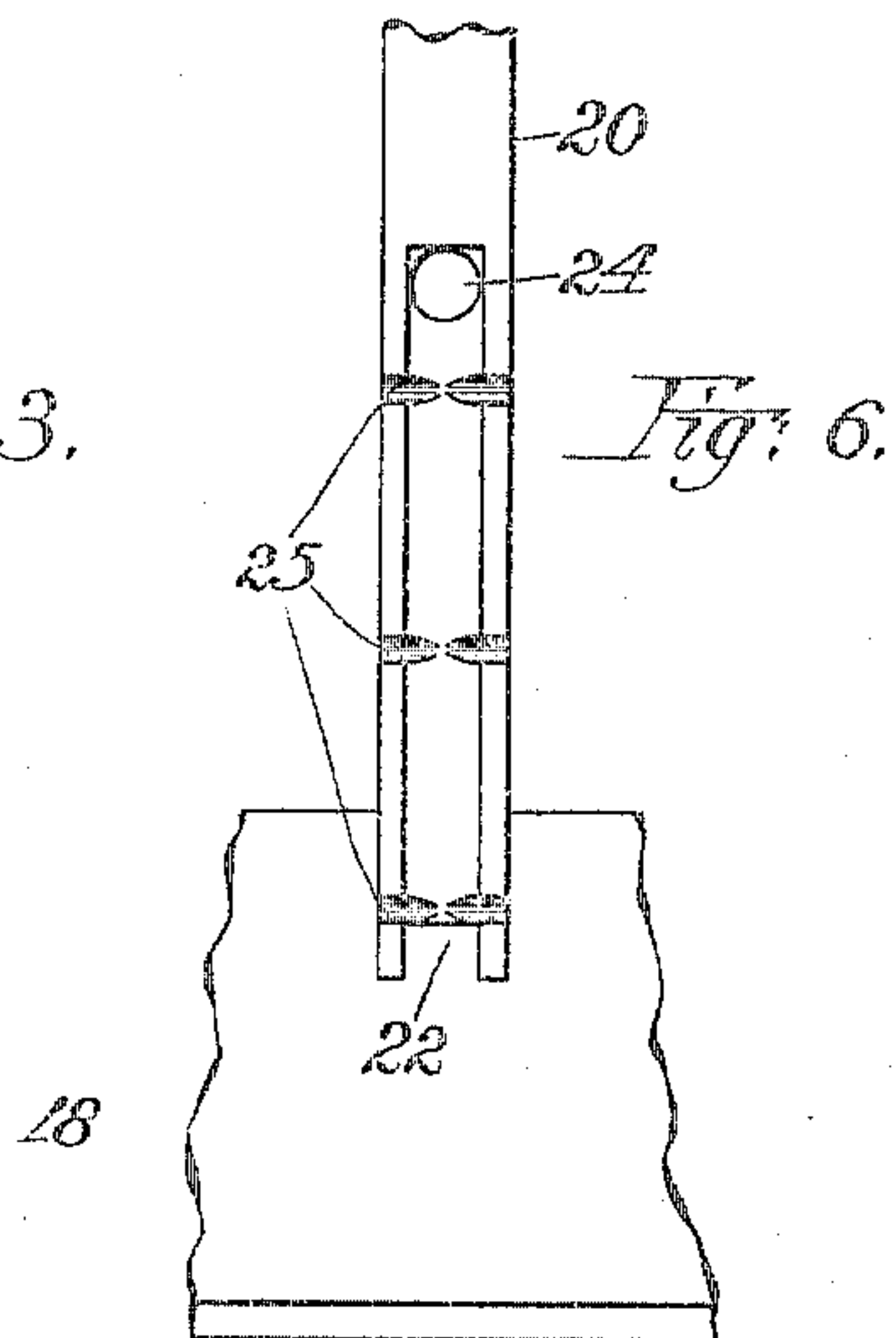
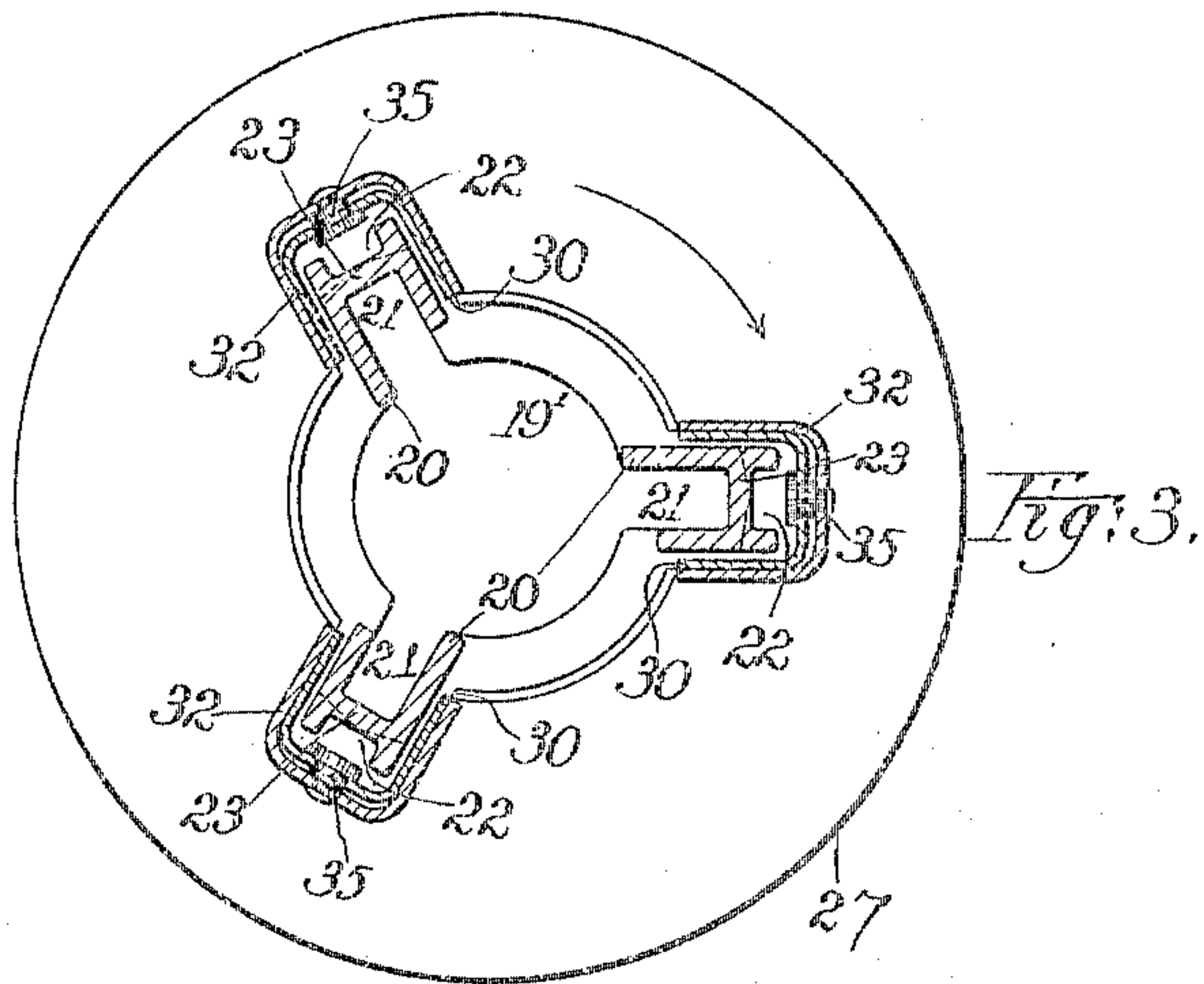
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

SEVERIN C. ANKER-HOLTH, OF RIVERSIDE, ILLINOIS, ASSIGNOR
TO INTERNATIONAL HARVESTER COMPANY, A CORPORATION
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CENTRIFUGAL CREAM-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 793,759, dated July 4, 1905.

Application filed March 17, 1905. Serial No. 250,557.

To all whom it may concern:

Be it known that I, SEVERIN C. ANKER-HOLTH, a citizen of the United States, residing at Riverside, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Centrifugal Cream-Separators, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to centrifugal cream-separators; and it consists in an improved form of cover for the bowl, wherein the cream-outlet is placed near the lower end of the neck and below the annular channel into which the skim-milk is discharged, it being found in the operation of this class of machines having the cream-outlet near the top of the neck and above the skim-milk outlets that there was a frequent partial clogging of butter-fat in the contracted portion of the neck above the milk-outlet, and part of my invention is designed to remove that evil.

It further consists in providing an improved feed device for delivering the full milk to the division contrivances, which consists in a series of vertically-arranged channels opening inward and another series of channels opening outward and separated from the inwardly-opening channels by partitions extending upward between the side walls of the channels and having openings at their tops communicating with the inner and outer channels.

It further consists in an improved device for retaining the disks or conical liners in position when removed from the bowl for the purpose of being cleaned; and the objects of my improvements are to provide feeding and separating devices that will be both efficient in operation and easily placed in or removed from the bowl. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a sectional elevation of a separator-bowl complete having my improvements embodied therein. Fig. 2 is a sectional detail of a part of the disk-retaining device. Fig. 3 is a plan view, partly in section, of the disk-retaining device and feed device. Fig.

4 is a sectional elevation of the disk-retaining device. Fig. 5 is a detail of a part of the disk-retaining device, and Fig. 6 is a detail of part of the feed device.

Similar numerals refer to similar parts throughout the several views.

The driving-shaft 7 is secured to the bottom 8 of the bowl 9, having the conical cover 10 provided with the contracted upwardly-extending neck portion 11, having the internal skim-milk-receiving annular channel 12 into which a series of skim-milk tubes 13, extending outward and downward and communicating with the space near the inner surface of the bowl at its upper end, deliver the skim-milk thereto.

14 is a skim-milk outlet through the upper wall of the channel at the top of the neck, and 15 is a screw that serves to regulate the size of the opening.

The cream-outlet 16 is located at the lower end of the neck below the milk-receiving channel and is in position to receive and deliver the cream at a line near the upper surface of the division contrivances, avoiding the danger of clogging of the upper part of the neck with butter-fat. A tubular feed-throat 17 extends downward through the neck, and its outer surface forms the inner wall of the channel 12. At the bottom of the bowl is a receiving-chamber 18, having an opening in its bottom that fits over a boss 19 on the bottom of the bowl for the purpose of centering the chamber therewith. An axial opening 19' is made in the top of the chamber, and a series of channeled bars 20, concentrically arranged around the opening at a distance from the axis of the bowl, connects the chamber 18 with the throat 17. The bars are preferably made wider in a radial than in a circumferential direction and have deep inner radial channels 21, opening inward and communicating with the chamber 18 at their lower ends and inclined inward and upward to meet the throat at their upper ends, and outer shallow radial channels 22, opening outward and separated from the inwardly-opening channels by means of the partitions 23. Each parti-

tion is provided with an opening 24 at its upper end that communicates with both the inner and outer channels. The walls of the outer channels are preferably provided with cream
 5 notches or ducts 25, that terminate near the center line of the channels, as shown by full lines in Fig. 6 and dotted lines in Fig. 3. The bowl and feed device are designed to be rotated in the direction of the arrow, as shown
 10 in Fig. 3, and the walls of the channels facing the direction of rotation are preferably shortened radially. The body of the bowl surrounding the feed device is occupied by a series of division-plates or conical-shaped liners
 15 26, that are common to this class of machines, and they are usually held in place by means of inwardly-opening notches that embrace the radially-disposed wings of the feed device. In removing the disks from the body of the
 20 bowl for any purpose it is desirable that they be retained in the same position relative to the notches that they may be quickly and correctly replaced. It is also desirable that the disks be separated one from another a sufficient
 25 distance convenient for cleaning, and the particular means for attaining these objects will now be described.

A conical base 27, conforming in shape with the outer surface of the receiving-chamber 18
 30 and the angle of the conical liners, surrounds the chamber and suitable distance-ribs 28 are provided to keep their surfaces from contacting. The lower part of the base is in this manner supported at a distance from the bottom of the bowl, leaving a narrow space 29
 35 communicating with its interior. A series of inwardly-opening channels 30 are secured to the base and are arranged to embrace the channel-bars 20 upon three sides. A conical hood
 40 31 has secured thereto another series of channels 32, that are arranged to embrace three sides of the first-mentioned channels and to slide thereon. The first-mentioned channels are provided with longitudinally-extending
 45 slots 33 through their outer wall, having an enlarged central opening 34 therein. Near the lower ends of the channels 32 there are secured inwardly-projecting studs 35, provided with heads adapted to pass through the open-
 50 ings 34 when registering therewith and to engage with opposite sides of the slots 33 when the upper section is moved up or down on the lower section of the device. The two sections being thus connected, they are free to slide
 55 one upon the other and the device as a whole be lengthened or shortened. The inwardly-opening notches in the liners 26 are arranged to embrace the channels, as shown in Fig. 2, and may be moved up or down thereon, as
 60 shown in Fig. 4. When the liners are assembled upon either the upper or lower section of the retaining device, the two sections are coupled together and passed over the feed device, the outer wall of the channels of the re-
 65 taining device closing the direct outward

opening of the exterior channels of the feed device as the upper section is moved down over the lower, as shown in Fig. 1.

The liners are not removed from the retaining device for the purpose of cleaning. One
 70 section of the device is moved longitudinally along the other, and the increased length affords room for the liners to be separated sufficiently for that purpose.

When the parts are properly assembled, the
 75 feed device occupies the central portion of the bowl and the liners, with their retaining device, surround it. The liners are spaced apart by any of the usual means, and the conical
 hood 31, engaging with the interior conical
 80 surface of the cover, presses down upon the topmost one and secures them in position.

The full milk is delivered through the throat, and following the axial opening in the feed
 85 device is received by the lower chamber and flowing upward through the inwardly-opening channels and overflowing their sides is delivered to the division contrivances in the outer portion of the bowl. The separated
 90 cream ascends along the inner space outside the column of inflowing full milk to the outlet formed in the wall of the neck, while the milk is driven outwardly and ascends through
 95 the milk-tubes to the annular channel and thence through the opening provided for its discharge. A portion of the milk, flowing up-
 ward through the inwardly-opening channels and not overflowing their side walls, will pass
 100 through the openings in the partitions and reach the exterior channels and, flowing downward, will be distributed to the lowermost
 liners at the base of the disk-retainer, and a free flow of the separated cream is provided for
 105 by the cream notches or ducts through the walls of the channels.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a centrifugal cream-separator, the combination of a bowl, a feed device comprising one or more bars secured in a substantially
 110 vertical position near the axial line of said bowl, said bars having inner channels opening inward and outer channels opening outward, with an opening between them at their
 115 upper ends, and means for delivering the milk to said channels.

2. In a centrifugal cream-separator, the combination of a bowl, a feed device comprising one or more bars secured in a substantially
 120 vertical position near the axial line of said bowl, said bars having deep inner channels opening inward and shallow outer channels opening outward, said channels being separated by intervening partitions, said partitions having openings through them at their upper
 125 ends, and means for delivering the milk to said inner channels.

3. In a centrifugal cream-separator, the combination of a bowl, a feed device comprising one or more bars secured in a substantially
 130

vertical position near the axial line of said bowl, said bars having inner channels opening inward and outer channels opening outward, with an opening between them at their upper ends, the walls of the outer channels having cream-notches therein, and means for delivering the milk to said channels.

4. In a centrifugal cream-separator, the combination of a bowl, a feed device comprising one or more bars secured in a substantially vertical position near the axial line of said bowl, said bars having inner channels opening inward and outer channels opening outward, with an opening between them at their upper ends, means for closing the outward openings of the outer channels from their upper ends to a point near their lower ends, and means for delivering the milk to said inner channels.

5. In a centrifugal cream-separator, the combination of a bowl, a feed device comprising one or more bars secured in a substantially vertical position near the axial line of said bowl, said bars having inner channels opening inward and outer channels communicating at their upper ends with the interior channels, and opening outward at their lower ends, and means for delivering milk to the interior channels.

6. In a centrifugal cream-separator, the combination of a bowl, a feed device comprising a series of bars secured in a substantially vertical position near the axial line of said bowl, said bars having inner channels opening inward and outer channels opening outward, with an opening between them at their upper ends, and supplemental channel-bars adapted to embrace the first-mentioned bars in a manner to close the outward opening of the channels therein excepting at their bottom portions.

7. In a centrifugal cream-separator, the combination of a bowl, a feed device comprising a series of bars secured in a substantially vertical position near the axial line of said bowl, said bars having inner channels opening inward and outer channels opening outward, with an opening between them at their upper ends, and other bars having inner channels arranged to telescope with the first-named bars in a manner to close the opening of the outer channels outward into the body of said bowl excepting at their lower ends.

8. In a centrifugal cream-separator, the combination of a bowl, a feed device comprising an upper conducting-throat, a lower receiving-chamber having an axial opening at its top, one or more bars arranged at a distance from the axis of said bowl and connecting said throat with said receiving-chamber, said bars having inner channels communicating with said receiving-chamber and opening inwardly, and outer channels opening outward, with an opening between them at their upper ends.

9. In a centrifugal cream-separator, the combination of a bowl, a feed device comprising an upper conducting-throat, a lower receiving-chamber having an axial opening at its top, a series of bars arranged at a distance from the axis of said bowl and connecting said throat with said receiving-chamber, said bars having inwardly-opening inner channels communicating with said receiving-chamber, and outer channels opening outward, with an opening between them at their upper ends, a plate surrounding said receiving-chamber, a series of vertically-arranged bars secured to said plate and adapted to close the openings of the outer channels outward excepting at their lower ends.

10. In a centrifugal cream-separator, the combination of a bowl, a feed device comprising an upper conducting-throat, a lower receiving conical chamber having an axial opening at its top, a series of bars radially arranged at a distance from the axis of said bowl and connecting said throat with said receiving-chamber, said bars having inner channels opening inward and communicating with said receiving-chamber, and channels in their outer faces opening outward and separated from said inwardly-opening channels by means of partitions, having openings there-through at the upper ends of the channels, a conical base portion adapted to surround said receiving-chamber and interspaced therefrom, a series of vertically-arranged channel-bars secured to said base and adapted to embrace the sides of said first-named bars and project across the outer channels in a manner to prevent the outward flow of milk and to conduct it downward to said conical base.

11. In a centrifugal cream-separator, the combination of a bowl, a feed device comprising an upper conducting-throat, a lower receiving conical chamber having an axial opening at its top, a series of substantially vertical bars radially arranged at a distance from the axis of said bowl and connecting said throat with said receiving-chamber, said bars having inner channels opening inward and communicating with said receiving-chamber, and channels in their outer faces opening outward and separated from said inwardly-opening channels by means of partitions, having openings at their upper ends communicating with said channels, a conical base portion adapted to surround said receiving-chamber interspaced therefrom and from the bottom of said bowl, a series of vertically-arranged bars having channels opening through said base and adapted to embrace the sides of said first-named bars and project across the outer channels in a manner to conduct the milk downward through the openings in said conical base.

12. In a centrifugal cream-separator, the combination of a bowl, a series of division-

plates, a retaining device engaging with said plates, said retaining device being contractile and extensible longitudinally.

13. In a centrifugal cream-separator, the combination of a bowl, a series of division-plates provided with openings, a retaining device engaging with said openings, said retaining device comprising two sections, said sections being longitudinally adjustable relative to each other.

14. In a centrifugal cream-separator, the combination of a bowl, a series of division-plates provided with axial openings, notches in said plates communicating with said openings, a retaining device engaging with said notches, said retaining device comprising two sections, said sections being longitudinally adjustable relative to each other.

15. In a centrifugal cream-separator, the combination of a bowl, a series of division-plates, a retaining device, said device comprising upper and lower members connected by one or more bars engaging with said division-plates, said bars being longitudinally adjustable relative to each other.

16. In a centrifugal cream-separator, the combination of a bowl, a series of conical division-plates, a holder for said plates comprising upper and lower conical members adapted to embrace said series of plates, and a series of members connecting said upper and lower conical members, said connecting series being longitudinally adjustable relative to each other.

17. In a centrifugal cream-separator, the combination of a bowl, a series of division-plates, a holder for said plates comprising upper and lower members adapted to embrace said plates, and one or more pairs of bars, having inwardly-opening milk-receiving channels engaging with said plates and secured to said upper and lower members at one end and adapted to slide one upon the other at their opposite ends in a manner that will allow the said plate-holder to be lengthened or shortened.

18. In a centrifugal cream-separator, the combination of a bowl, a series of division-plates, a holder for said plates comprising upper and lower members adapted to embrace said plates, one or more pairs of bars secured at one end to said upper and lower members and overlapping each other at their opposite ends, one bar of each pair having a longitudinal slot and the other bar provided with a stud adapted to engage with said slot.

19. In a centrifugal cream-separator, the combination of a bowl, a series of division-plates, a holder for said plates comprising upper and lower members adapted to embrace said plates, one or more pairs of bars secured at one end to said upper and lower members and overlapping each other at their opposite ends, one bar of each pair having a longitudinal slot with an enlarged opening, and a

stud secured to the other bar, said stud having a head adapted to pass through said opening and engage with the adjacent bar upon opposite sides of said slot.

20. In a centrifugal cream-separator, the combination of a bowl, a series of division-plates having axial openings and radially-arranged notches communicating therewith, a feed device comprising vertically and radially arranged wings near the axis of said bowl, a holder for said division-plates comprising inwardly-opening channels embracing said wings and engaging with the notches in said division-plates.

21. In a centrifugal cream-separator, the combination of a bowl, a feed device axially arranged within said bowl, a series of division contrivances occupying the body of said bowl, a holder for said division contrivances, said holder adapted to embrace said feed device and move longitudinally thereupon.

22. In a centrifugal cream-separator, the combination of a bowl, a series of division-plates having axial openings and radially-arranged notches communicating therewith, a feed device comprising vertically and radially arranged wings near the axis of the bowl, a holder for said division-plates comprising upper and lower sections engaging with the notches in said division-plates and embracing said wings, said sections being connected in a longitudinally-adjustable manner relative to each other.

23. In a centrifugal cream-separator, the combination of a bowl, a series of division-plates having axial openings and radially-arranged notches communicating therewith, a feed device comprising vertically and radially arranged wings near the axis of the bowl, said wings having longitudinal channels in their outer sides, a holder for said division-plates comprising upper and lower sections having inwardly-opening channels embracing said wings in a manner to close the outward opening of the channels in said wings and to conduct the milk downward, said sections being connected in a longitudinally-adjustable manner relative to each other.

24. In a centrifugal cream-separator, the combination of a bowl, a conical cover therefor, a series of conical division-plates having axial openings and radially-arranged notches communicating therewith, a feed device comprising a conical receiving-chamber at the bottom of the bowl, a conducting-throat embraced by said cover, radially-arranged wings connecting said throat with said conical chamber, a holder for said division-plates comprising a conical base adapted to surround said receiving-chamber and be seated thereon, a conical hood adapted to be seated within said conical cover and bear upon the uppermost division-plate, said hood and base being connected by channeled bars adapted to embrace said radial wings and engage with the notches

in said division-plates, said bars being connected in a longitudinally-adjustable manner relative to each other.

25. In a centrifugal cream-separator, the combination of a bowl, a cover for said bowl having an upwardly-extending contracted neck and a lower conical body, having an outlet for the cream at substantially the junction of the body and neck, a feed-throat within said neck, an inner annular flange at the top of said neck surrounding said throat, and having a milk-outlet therethrough, an inner annular flange within said neck below the top

flange, and above the cream-outlet, a series of milk-conducting tubes penetrating said lower flange and communicating with the channel between the two flanges with their upper ends and having their lower ends communicating with the bowl near the interior surface of its outer wall. 15 20

In witness whereof I hereto affix my signature in presence of two witnesses.

SEVERIN C. ANKER-HOLTH.

Witnesses:

GEO. W. HENDERSON,
ALFRED M. CHRISTIAN.