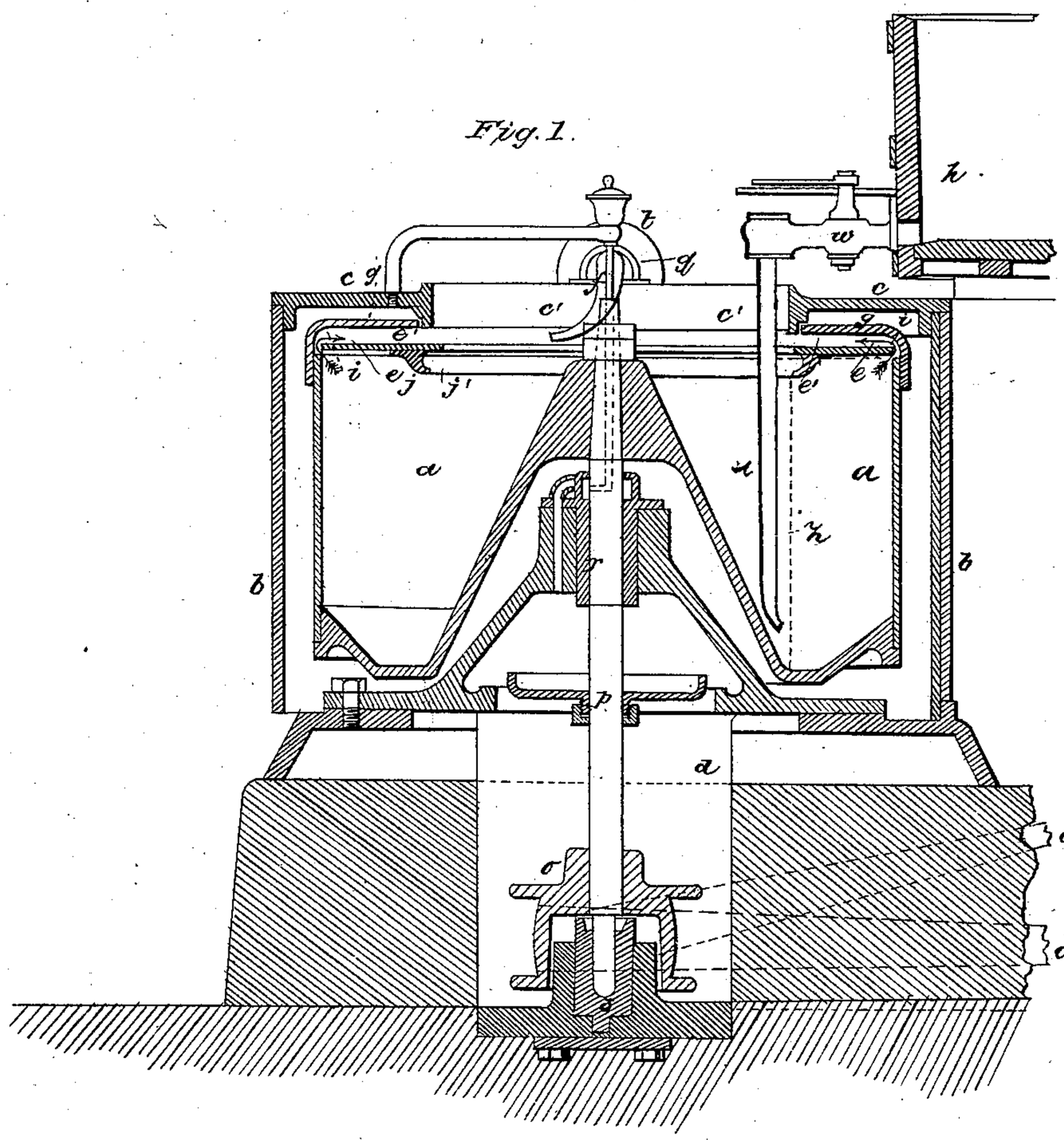
(No Model.) 2 Sheets—Sheet 1.

C. PETERSEN & L. C. NIELSEN.

CENTRIFUGAL CREAMER.

No. 256,365. Patented Apr. 11, 1882.

Fig. 1.



WITNESSES

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(No Model.) 2 Sheets—Sheet 2.

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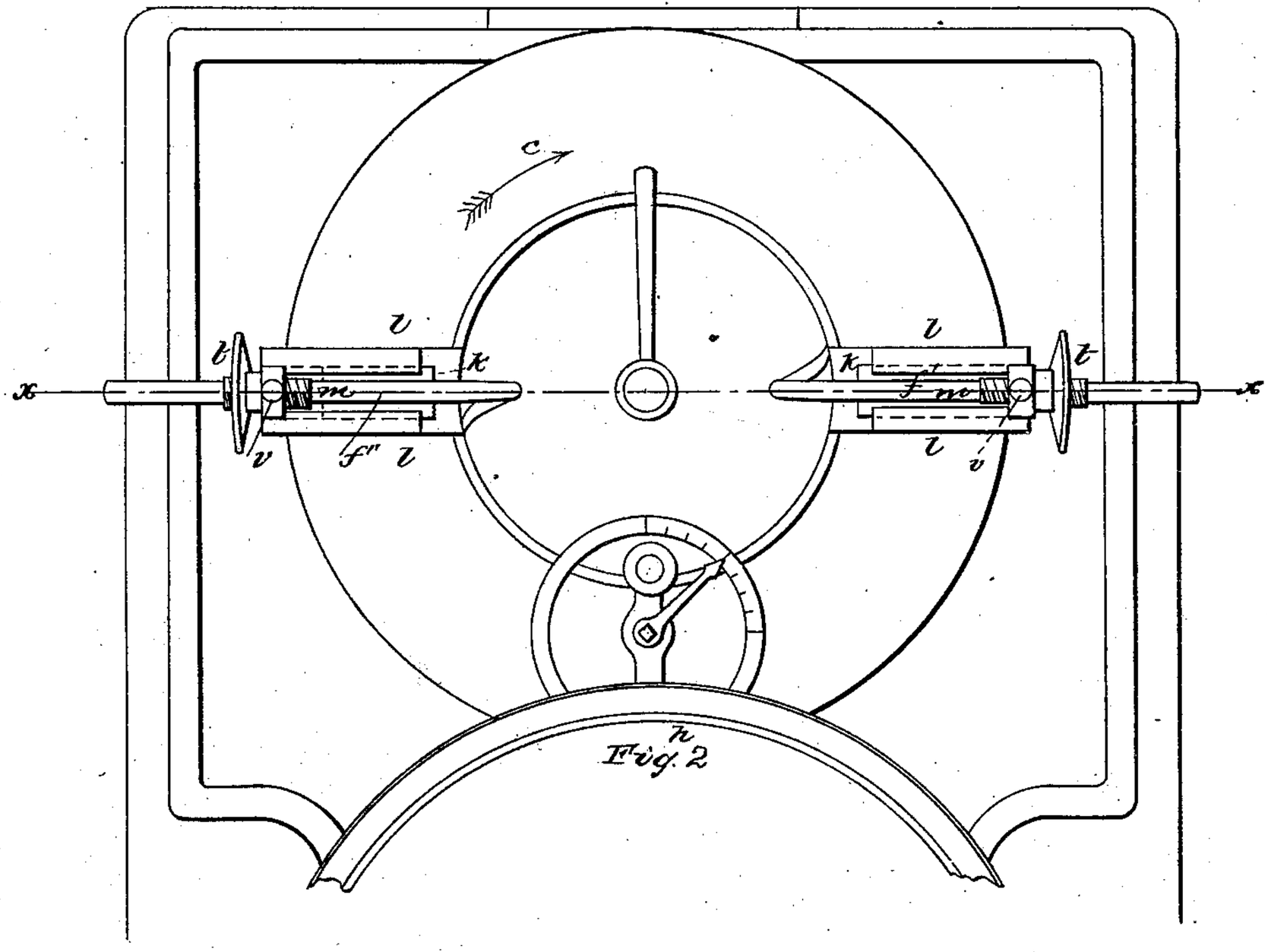

Fig. 2.

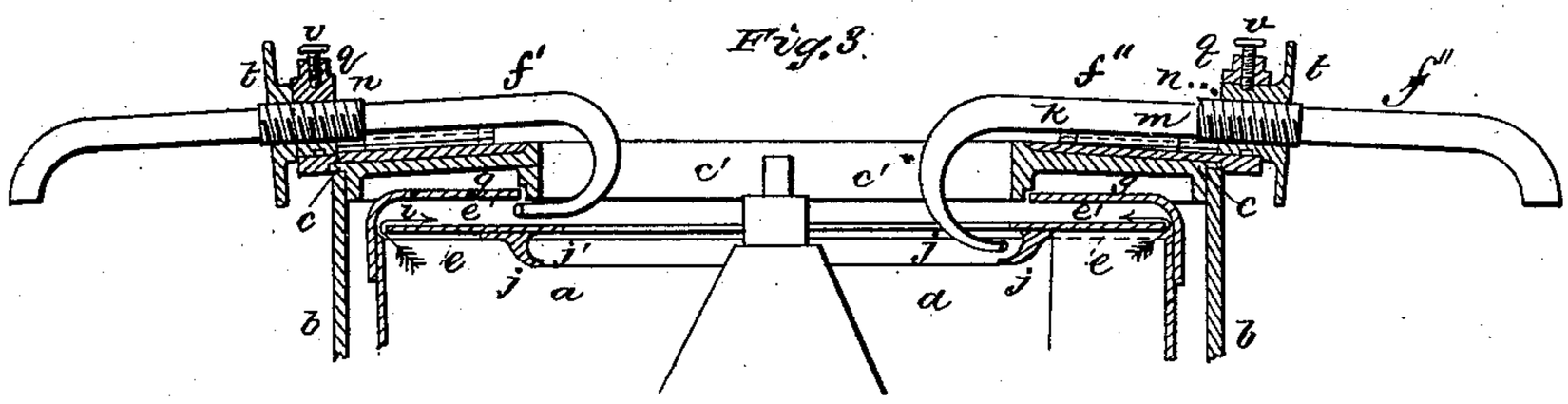

Fig. 3.

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UNITED STATES PATENT OFFICE.

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CENTRIFUGAL CREAMER.

SPECIFICATION forming part of Letters Patent No. 256,365, dated April 11, 1882.

Application filed October 24, 1881. (No model.) Patented in England July 1, 1881.

To all whom it may concern:

Be it known that we, CARL PETERSEN and LARS CHRISTIAN NIELSEN, both subjects of His Majesty the King of Denmark, and both residing in the city of Roeskilde, in the Kingdom of Denmark, have jointly invented certain new and useful Improvements in Centrifugal Machines; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying two sheets of drawings, which form a part of this specification, and in which—

Figure 1 is a vertical axial section of our improved centrifugal machine. Fig. 2 is a plan or top view of the same, and Fig. 3 is a sectional detail view of the machine through line *x x* in Fig. 2.

Similar letters of reference indicate corresponding parts in all the figures.

Our invention has relation to that class of centrifugal machines that are adapted for the separation of liquids, the component parts of which are of different specific gravity, such as the separation of sweet milk into its component parts of cream and skim-milk; and it consists in certain improvements in the construction and arrangement of parts of the same, whereby, first, the removal of the separated liquids (for example, the cream and the skim-milk) from the centrifugal chamber is effected without undue disturbance of the contents of the same; and, second, the nature or character of the separated liquids may be varied during the operation of the machine and without stopping the same. In other words, our improvement has relation to the specific means whereby these two results are obtained; and it consists in the detailed construction, arrangement, and combination of parts which constitute said means.

In the two sheets of drawings hereto annexed, *a* represents the centrifugal chamber, which is mounted upon a vertical shaft, *p*, within the stationary casing or safety-jacket *b*, which latter is provided with a removable flanged cover, *c*, of annular shape—*i. e.*, with a central circular opening, *c'*. Shaft *p* is, by preference, mounted in bearings *r* and *s*, and provided with a flanged pulley, *o*, at its lower end, by which it may be rotated at great speed by means of an endless band, *o'*, and any suitable motive power.

To the top part or rim of the centrifugal chamber or containing-vessel *a* is secured an annular plate, *e*, in such manner as to leave a narrow open part or space (denoted by the letter *e'*) between said plate *e* and the ring-formed or annular cover *g* of chamber *a*. The plate *e* has a series of narrow slots or openings, *i*, at its corner or point of contact with chamber *a*, through which the heaviest part of the liquid (the skim-milk) will, when the machine is in operation, be forced into the space or annular horizontal chamber *e'*, as indicated by the arrows in Figs. 1 and 3. From this chamber the liquid (skim-milk) is drawn by a pipe, *f'*, which is fastened adjustably upon the cover *c* of the safety-jacket, and is provided with a bent and tapering point or elbow, which extends into chamber *e'* in a direction opposite to or pointing against the rotation of the centrifugal chamber. The bent point of pipe *f'* should project a sufficient distance into the annular space or chamber *e'* to enable the liquid contained therein to be forced into the pipe and out through it in a steady stream by the velocity imparted to it (the fluid) by the rotation of chamber *a*. Any disturbance caused by pipe *f'* in the liquid contained in chamber *e'* is prevented by plate *e* from being communicated to or affecting the contents of chamber *a* below plate *e*.

By reference to Figs. 1 and 3 it will be seen that plate *e* has on its under side a downward-projecting curved flange or collar, *f*, which, with the projecting inner rim of plate *e*, forms an annular convex groove or chamber, *j'*, on the under side of plate *e*. While the surface of the contents of chamber *a* is, by the proper regulation of the feeding and drawing-off devices, so regulated as to be always at a point or line a little within or back of the edge of the collar *j*, and while the heaviest part of the contents of chamber *a* is forced up along the

wall of the same and out through slots *i* into the chamber *e'*, the lightest part of the contents (cream) will enter and collect in the annular groove *j'* on the under side of plate *e*, from which it is drawn by a pipe, *f''*, constructed and attached to the machine in like manner as pipe *f'*. The bent and tapering mouth of pipe *f''* projects into groove *j'*, as will be seen more clearly by reference to Fig. 3 of the drawings, so as to draw off the contents of said groove or chamber *j'* without disturbing the contents of the upper chamber, *e'*, or lower chamber, *a*.

In order to change or vary the nature or character (in so far as this may be effected by varying the degree of density or specific gravity at which the separated liquids are drawn off) of the liquids separated by the machine without stoppage of the same, I make the drawing-off or discharge pipes *f'* and *f''* adjustable in the direction of their length. If, for example, it is not desired to separate the sweet milk into its component parts of cream and skim (blue) milk with any great degree of accuracy or exactness, as may sometimes be the case, according to the purposes for which the cream and the skim-milk are to be used, then the tube or pipe *f'* for drawing off the skim-milk is so adjusted as to project with its bent and tapering mouth farther into the annular chamber *e'* than otherwise, while at the same time pipe *f''* is adjusted with its mouth at a little greater distance from the inner end of groove *j'* than otherwise. This is because the velocity with which the fluids contained in the chambers *e'* and *j'* will enter their respective discharge-pipes *f'* and *f''* depends upon the distance between the mouths or inner openings of said pipes, respectively, and the central axis of the machine. In order to effect this adjustment of the discharge-pipes they are each provided with a flanged bed-plate, *k*, (see Figs. 2 and 3,) which slides in a grooved plate or bed-piece, *l*, affixed upon cover *c*. Each pipe has a screw-threaded section, *m*, which passes through and engages with a correspondingly-threaded nut, *n*, having a milled thumb-disk, *t*, for rotating it to either side—right or left. The nut *n* works in a box or bearing, *q*, and has an annular groove or channel, into which projects the inner end of a stop-screw, *v*, inserted through box *q*. Thus it follows that by turning disk *t* and nut *n* the pipe which is inserted with its screw-threaded section through the nut may be adjusted forward or back to regulate the distances which pipes *f'* and *f''* are to extend respectively into the discharge-chambers *e'* and *j'*.

The centrifugal chamber or receiver *a* is fed while in operation continuously from the reservoir *h* through the feed-pipe *u*, which is provided with a faucet, *w*, for regulating the supply, and extends down to near the bottom of chamber *a*, as shown in Fig. 1. During the operation of the machine the contents of chamber *a* will form a hollow cylinder, as shown by the dotted line marked *z* in Fig. 1, so that the feed-pipe *v* will not operate to disturb the contents of the centrifugal chamber or receiver.

Having thus described our invention, we claim and desire to secure by Letters Patent of the United States of America—

1. In a centrifugal machine of the described class, the annular plate *e*, located a short distance below the annular top plate or cover, *g*, of the centrifugal vessel or receiver *a*, and provided on its under side with the curved flange or collar *j*, whereby two ring-formed chambers, *e'* and *j'*, are formed in the top part of the centrifugal vessel or receiver *a*, concentric with one another and with said receiver, substantially as and for the purpose herein shown and specified.

2. The combination of the centrifugal vessel or receiver *a*, having the horizontal concentric ring-formed chambers *e'* and *j'*, arranged substantially as described, and stationary discharge-pipes *f'* and *f''*, adjustable in the direction of their length, and curved at their inner ends to form tapering mouth-pieces, which project respectively into the ring-formed chambers *e'* and *j'*, substantially as and for the purpose herein shown and set forth.

3. The combination of the discharge-pipe *f'*, having a screw-threaded section, *m*, and flanged bed-plate *k*, grooved nut *n*, having thumb-disk *t*, nut box or bearing *q*, having stop-screw *v*, and fixed bed-piece *l*, provided with parallel grooves for the reception of the adjustable plate *k*, substantially as and for the purpose herein shown and described.

In testimony whereof we have signed our names to the foregoing specification in the presence of two subscribing witnesses.

CARL PETERSEN.
LARS CHRISTIAN NIELSEN.

Witnesses:
VIGGO C. EBERTT,
V. SCHWAUER.