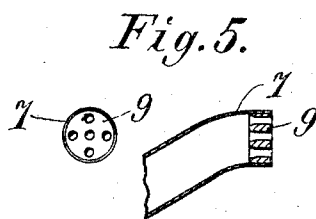
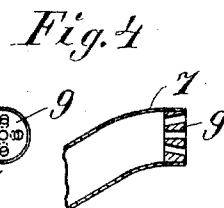
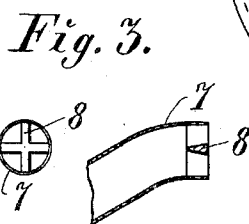
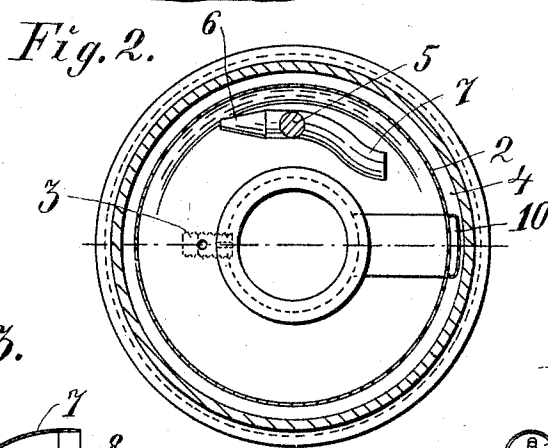
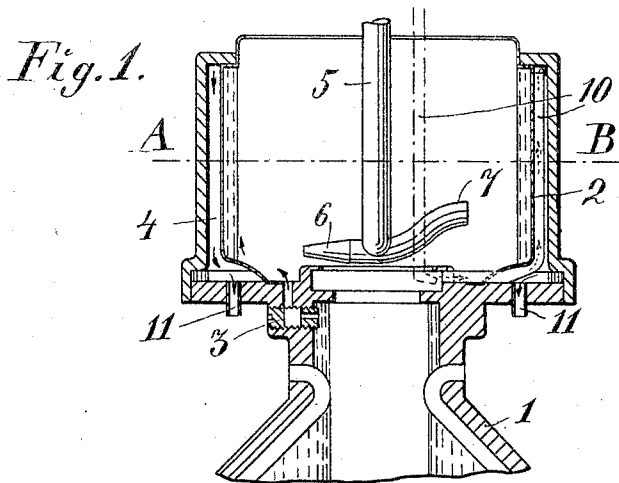


P. A. M. ARNBERG.
CENTRIFUGAL CHURN.
APPLICATION FILED MAR. 6, 1903.



Witnesses
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herald Lindkvist

Inventor
Per A. M. Arnberg
by Olof Oane
his att'y

UNITED STATES PATENT OFFICE.

PER AXEL MAURITZ ARNBERG, OF STOCKHOLM, SWEDEN, ASSIGNOR TO
NYA AKTIEBOLAGET RADIATOR, OF STOCKHOLM, SWEDEN, A STOCK
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CENTRIFUGAL CHURN.

SPECIFICATION forming part of Letters Patent No. 779,986, dated January 10, 1905.

Application filed March 6, 1903. Serial No. 146,552.

To all whom it may concern:

Be it known that I, PER AXEL MAURITZ ARNBERG, a subject of the King of Sweden and Norway, and a resident of Stockholm, Sweden, have invented new and useful Improvements in Centrifugal Churns, of which the following is a specification, reference being had to the drawings accompanying and forming a part hereof.

This invention relates to improvements in centrifugal churns in which the churning is accomplished by means of one or more skimming-pipes which take the cream from the inner wall of the liquid-cylinder inside the churning vessel and violently throws out the same against the said wall through suitable openings. The rear ends of such skimming-pipes heretofore used have been bent upward at a right angle, or approximately so, and the outlet-openings have been arranged in the upright part of the skimming-pipes, which has caused a large resistance against the movement of the cream through the said pipes, requiring a comparatively large power for driving the machine, inasmuch as a certain amount of power is wasted in changing the direction of movement of the liquid when the latter passes the angle of the pipe and when it is thrown out through the openings of the same.

The object of the invention is to provide a skimming-pipe by which the said inconvenience will be obviated.

The invention consists, briefly, in placing the skimming pipe or pipes horizontally, or substantially so, and in providing a perforated bottom or the like in the rear end of the said skimming pipe or pipes for spreading the liquid over a large surface. The skimming-pipe being only slightly bent for the purpose hereinafter set forth will, as easily understood, offer only a small resistance against the movement of the liquid, and by arranging the outlet-openings in the end of the skimming-pipe the liquid will be thrown out in the longitudinal direction of the said pipe without change of the direction of movement of the liquid.

In the accompanying drawings, Figure 1 shows a vertical section of the upper part of

a usual centrifugal drum and a churning vessel arranged thereon. Fig. 2 is a horizontal section on line A B in Fig. 1. Figs. 3, 4, and 5 show modified forms of the spreading device in the outlet end of the skimming-pipe.

Referring to the drawings, 1 represents a usual centrifugal separator-drum, and 2 an upper apartment arranged thereon and constituting in well-known manner a churn. The cream separated in the centrifugal drum 1 rises into the said upper apartment through one or more perforated screws 3 or the like. The said churning vessel 2 is in the usual manner surrounded by a ring-shaped cooling-chamber 4, containing a gas or liquid, whereby the cream will be gradually cooled off, according as it rises along the wall of the vessel 2. In the latter is provided a skimming-pipe 6 7, which may be attached to a fixed bar or the like 5, supported in any convenient manner by a fixed part of the frame of the machine. The one end 6 of the said pipe is in the usual manner arranged to skim the cream from the wall of liquid inside the churning vessel 2, while its other or rear end for the purpose hereinafter set forth is adapted to throw out the cream thus skimmed. The said skimming-pipe may, as shown in the drawings, be bent approximately after the wall of liquid inside the churning vessel and at the same time it may be slightly bent upward in order that the cream skimmed up by the same may be thrown out against a part of the wall of liquid, which has already been sufficiently cooled off for the churning. It will be understood that a skimming-pipe of the shape illustrated in the drawings will offer but a small resistance against the movement of the cream through the same, the direction of movement of the liquid being only slightly changed in the same. In order that the cream may be thrown out from the skimming-pipe with the smallest possible resistance, the outlet opening or openings are arranged in the end 7 of the said pipe, whereby the cream will be thrown out approximately in the longitudinal direction of the same. In order to distribute the cream over a larger surface, different means may be provided in

the rear end 7 of the skimming-pipe. For instance, the outlet end of the skimming-pipe may be provided with a cross consisting of wedge-shaped bars 8, as shown in Fig. 3, or
5 with a perforated bottom 9, the holes of which may be diverging, as shown in Fig. 4, or parallel, as shown in Fig. 5. In the latter case the holes of the said bottom 9 may suitably be wider at their inner ends in order to effect the
10 desired spreading of the cream.

In Figs. 1 and 2, 10 represents inlet-pipes for introducing a cooling liquid into the cooling-chamber 4, and 11 represents discharge-pipes for the said cooling liquid.

15 I do not limit myself to the exact shape of the skimming-pipe illustrated in the drawings, since the same may be modified in various manners, as will be easily understood by those

skilled in the art, without deviating from the principle of the invention. 20

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

The combination with a centrifugal churn 25 of, a substantially horizontally placed skimming-pipe, and a perforated plug in the rear end of the same, for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two sub- 30 scribing witnesses.

PER AXEL MAURITZ ARNBERG.

Witnesses:

JOHN DELMAR,
KARL RUNCCKOG.