

(No Model.)

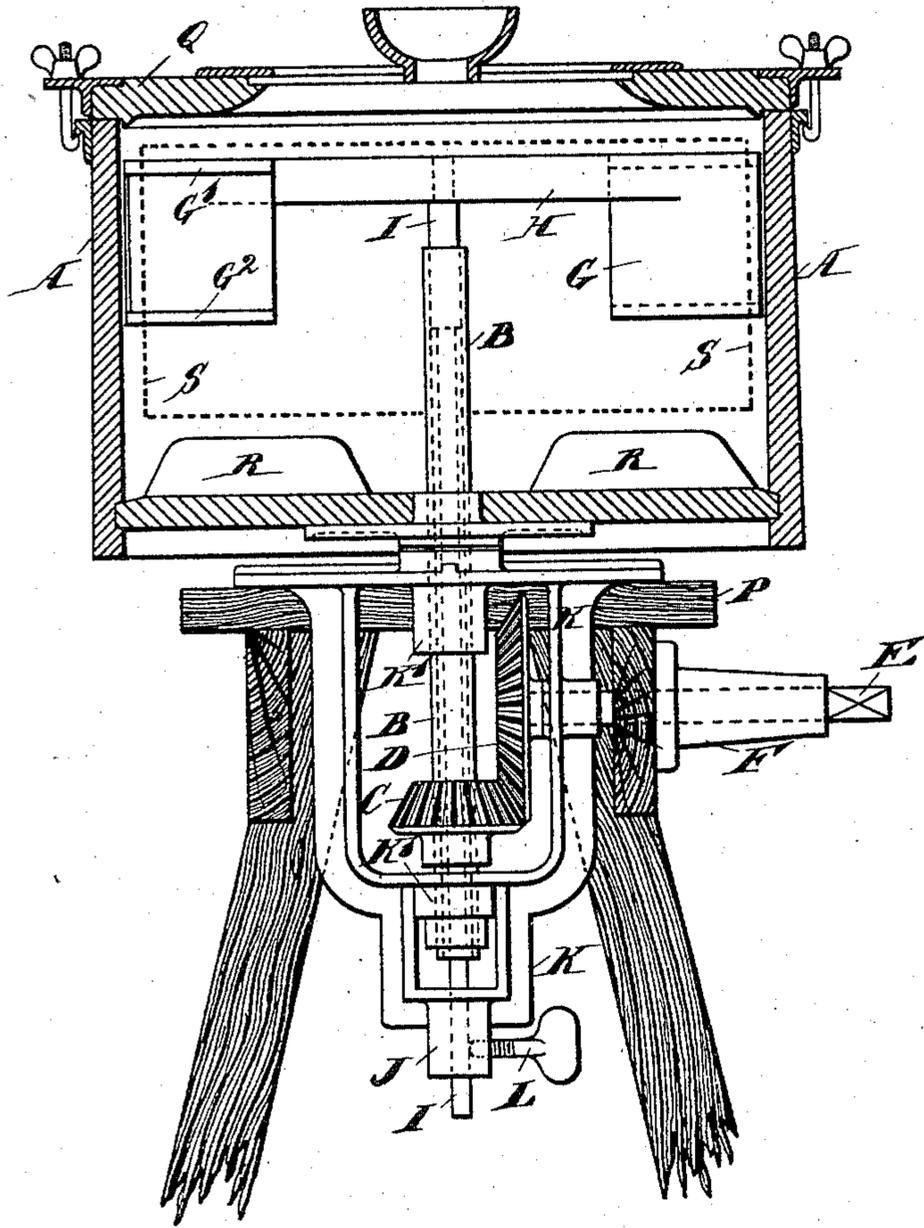
2 Sheets—Sheet 1.

S. CHEELD.  
CHURN.

No. 580,374.

Patented Apr. 13, 1897.

— Fig. 1. —



Witnesses.

Stephen Edward Cuyler -  
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# UNITED STATES PATENT OFFICE.

SYDNEY CHEELD, OF CHESHAM, ENGLAND.

## CHURN.

SPECIFICATION forming part of Letters Patent No. 580,374, dated April 13, 1897.

Application filed March 28, 1895. Serial No. 543,473. (No model.)

*To all whom it may concern:*

Be it known that I, SYDNEY CHEELD, engineer, a subject of the Queen of Great Britain, residing at Waterside Ironworks, Chesham, in the county of Buckingham, England, have invented certain Improvements in Machinery or Apparatus for Churning Butter, of which the following is a specification.

This invention relates to machinery or apparatus for churning whereby the conversion of the cream into butter is effected much more quickly and with the expenditure of much less power than by the churns heretofore in use.

In order that the said invention may be fully understood, I will now proceed to describe the same with the aid of the accompanying drawings, in which—

Figure 1 is a sectional elevation of a centrifugal churning apparatus with my invention applied thereto; Fig. 2, a plan of same; Fig. 3, a section taken on line  $x x$  of Fig. 2, and Fig. 4 a sectional elevation showing a modification of the same apparatus.

A represents a churning vessel of cylindrical, conical, or other suitable shape of circular section in a plane transverse to the axis B, upon which it is mounted and with which it is adapted to be rotated at a suitable speed by means of bevel or other gearing C D, actuated by a crank-handle or a pulley applied to the shaft E, adapted to revolve in a suitable bearing F.

Inside the churning vessel A is or are placed one or more curved scoops, vanes, or deflectors G, the outer edge or edges of which comes or come as nearly as possible in contact with the internal periphery of the vessel A, but preferably without actually touching such periphery. These curved scoops, vanes, or deflectors G are of a curved form, as shown in Figs. 2 and 3, and are preferably provided with flanges  $G^1 G^2$  at top and bottom. They are fixed by any suitable means so that they remain stationary while the churning vessel A revolves.

In the arrangement shown in Fig. 1 the scoops, vanes, or deflectors G are formed with or secured to an arm H, fixed at the upper end of a spindle I, which passes down through the axis B of the churning vessel A, and into or through a boss J of the bracket or frame

K, in the bearings K' of which the said axis revolves. The spindle I is secured in any required position in the boss J by means of the set-screw L, and the scoops, vanes, or deflectors G can thereby be adjusted vertically to any required height in the churning vessel A. The spindle I passes quite freely through the axis B, so that the latter revolves without frictional contact therewith.

In the arrangement shown in Fig. 4 the scoops, vanes, or deflectors G are mounted, as before, on an arm H, but in this case the spindle I, to which the said arm is attached, passes upward and is secured by the set-screw L in the boss J of a cross-bar M, carried by two supports N N, secured to the table or base P, on which the apparatus is supported. The vertical adjustment of the scoops, vanes, or deflectors in the churning vessel is effected, as in the arrangement shown in Fig. 1, by sliding the spindle I up or down in the boss J until the required position is reached and then clamping it in that position by means of the set-screw L.

The churning vessel A may be provided with a cover Q or not, as may be preferred.

It will now be understood that when the churning vessel A is set in more or less rapid rotatory motion and cream is placed therein the latter is driven by the centrifugal force against the sides of the vessel and spreads out in a thin film over the surface thereof in the well-known way; but as this film of cream is carried round it comes in contact with the edges of the fixed curved scoops, vanes, or deflectors, and is thereby stripped off, as it were, and deflected at an angle across the vessel A by the curved inner surface of such scoops, vanes, or deflectors, so as to strike against another part of the surface thereof nearly opposite to that from which the scoop had just previously removed it, where it again becomes subjected to the centrifugal action, is again deflected, and so on over and over again, and is thereby effectually broken up and quickly becomes granulated and formed into butter.

The aforesaid fixed curved scoops, vanes, or deflectors are so placed that the outer part or front of the curve stands in a plane presented at a slight angle or more or less tangentially to the inner surface of the revolving

vessel A, while the inner or hinder part of the scoop stands in a plane which, if extended, would pass clear of the axis and at the same side thereof as the scoop and cut the opposite side of the revolving vessel at a point nearly opposite that at which the front part of the scoop begins to act on the cream. The result of this arrangement is that the cream deflected by one scoop strikes the surface of the revolving vessel nearly square to its surface and just behind the other scoop (when two are employed) at a point from which the film of cream or the greater part thereof has just been removed by the other scoop.

15 I claim—

In a centrifugal churning apparatus, the combination with the vessel A and means for rotating the same, of a pair of oppositely-

placed fixed scoops or deflectors of curved form, the outer or advanced edge of each scoop being arranged in close proximity to the inner surface of the vessel and occupying a plane presenting a slight angle to said surface while the inner or rearmost part of the curve of the scoop terminates in a plane which if extended would pass clear of the axis of the vessel at the same side thereof as the scoop and cut the opposite side of the vessel in the rear of and close to the opposite scoop, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

30 SYDNEY CHEELD.

Witnesses:

STEPHEN EDWARD GUNYON,  
WILLIAM ANDERSON SMITH.