

THOMAS C. SMITH & NORTON L. FRANCIS.
Improvement in Churns.

No. 119,193.

Patented Sep. 19, 1871.

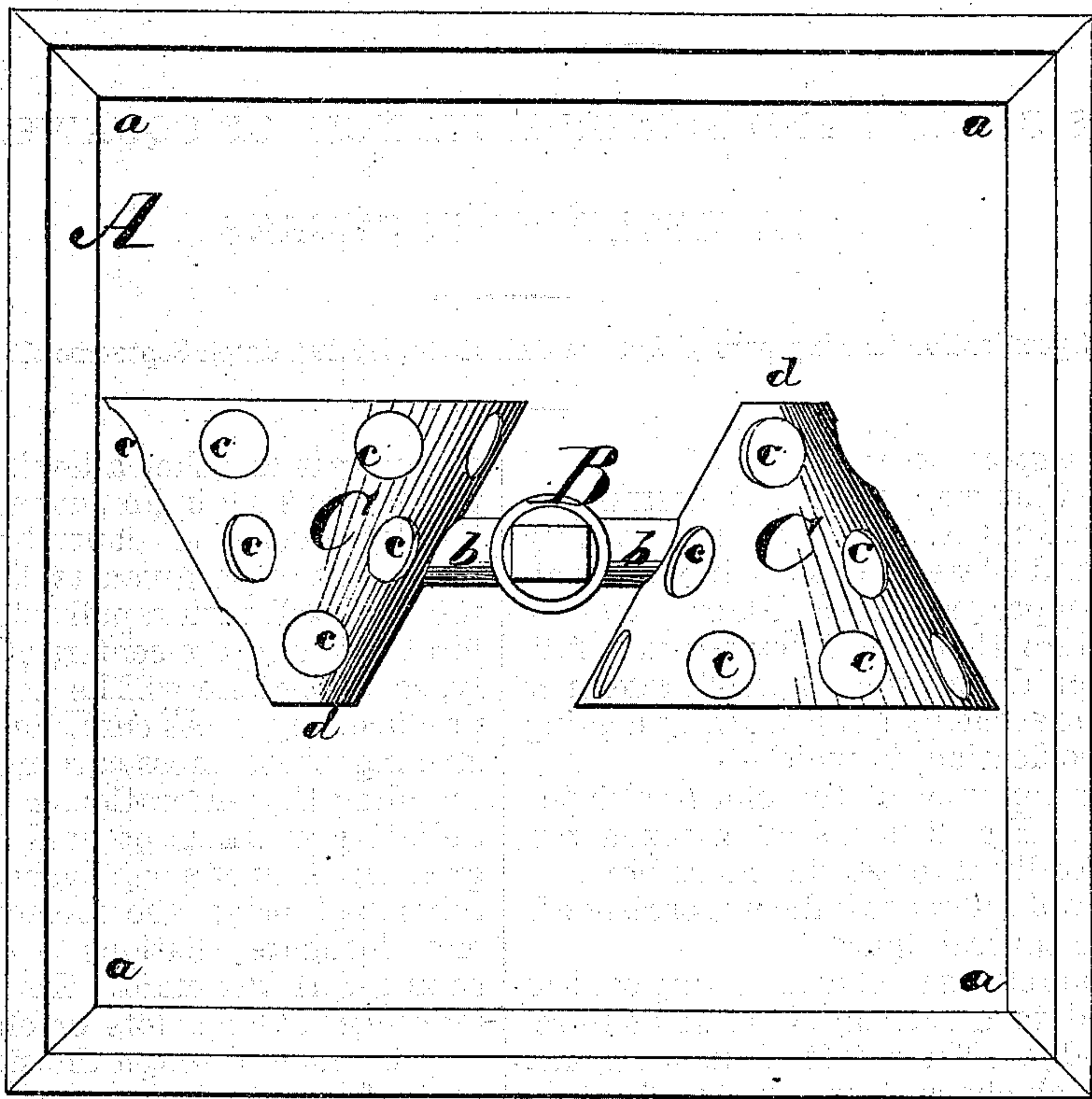
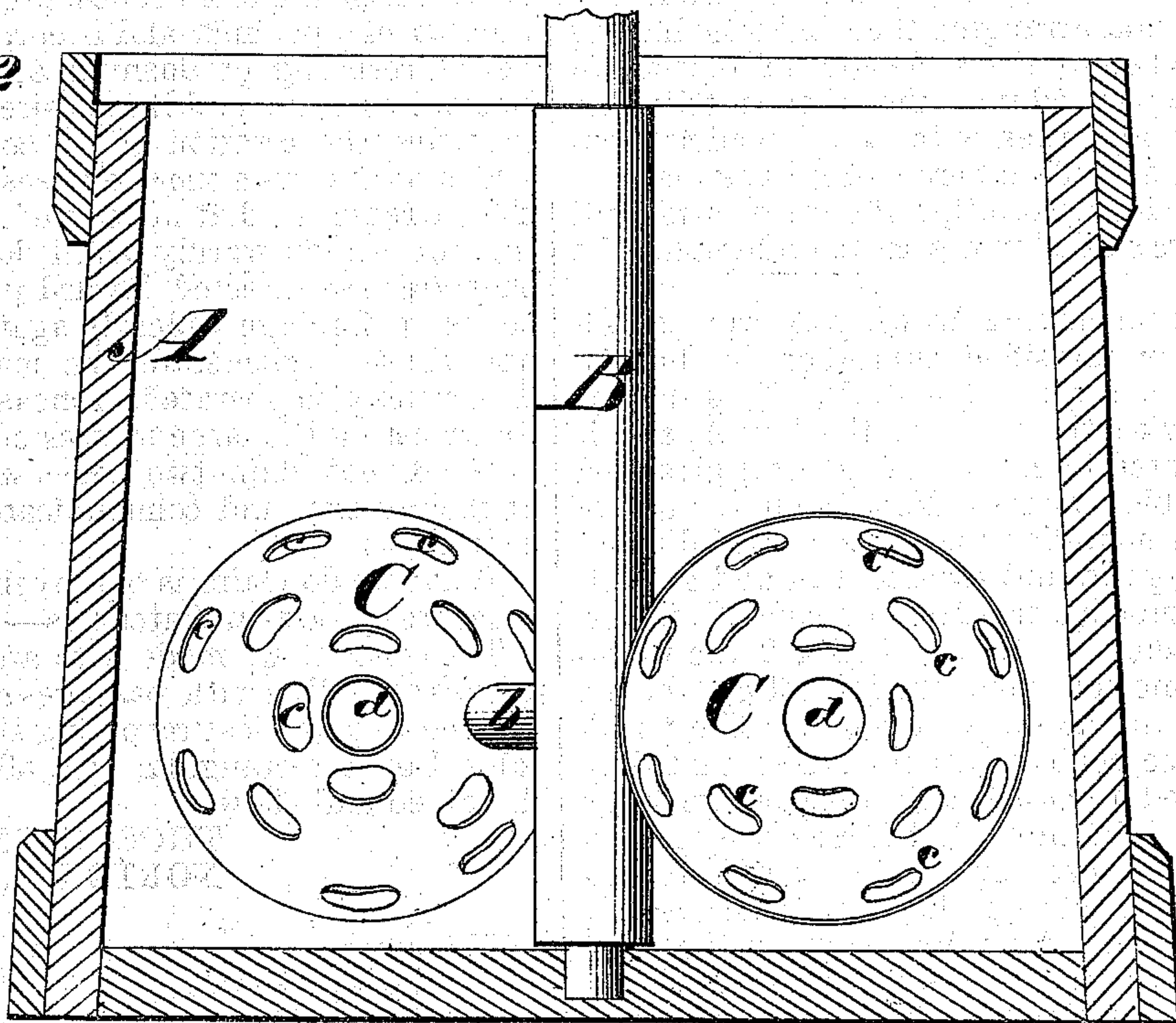


Fig. 2



Witnesses:

R. F. Campbell,
J. N. Campbell.

Inventor

T. C. Smith
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by
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UNITED STATES PATENT OFFICE.

THOMAS C. SMITH AND NORTON L. FRANCIS, OF OQUAWKA, ILLINOIS.

IMPROVEMENT IN CHURNS.

Specification forming part of Letters Patent No. 119,193, dated September 19, 1871.

To all whom it may concern:

Be it known that we, THOMAS C. SMITH and NORTON L. FRANCIS, of Oquawka, in the county of Henderson and State of Illinois, have invented a new and Improved Rotary Churn; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing making part of this specification, in which—

Figure 1 is a top view of the churn with the cover removed. Fig. 2 is a section taken vertically and centrally through the churn-box.

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

This invention relates to churns having conical dashers applied to a vertical shaft so as to revolve horizontally. The object of our invention is to improve such churns by thickly perforating the dashers and arranging them in boxes having flat sides, whereby the molecules of butter can be rapidly separated from the other constituents of the milk and then with equal facility conglomerated, as will be hereinafter explained.

The following description of our invention will enable others skilled in the art to understand the same.

In the accompanying drawing, A represents a rectangular or flat-sided churn-box, in the center of which is a vertical shaft, B. This shaft is removable with the cover of the box A, and it may be rotated by means of gearing arranged in any suitable manner. Near the lower end of this shaft a metallic tube, *b*, is passed diametrically through it, and secured fast and to each end of this tube *b* a frustum of a cone, C, is permanently secured. As seen in Fig. 2, the smallest end of one cone and the largest end of the other point in the same direction. The peculiarity of these conical dashers C C is, that they are perforated at *c c* and *d* for the passage of the compressed fluid through them as they are revolved. The cones revolve in a circle concentric to the axis of the shaft B; consequently those portions of them furthest from the shaft move fastest through the milk, and the imperforated portions dash against the fluid, momentarily

compress it, and then allow it to rush through the perforations *c d* in an outward direction against the flat sides of the churn-box A. When a very rapid motion is given to the cones currents of the fluid will rush rapidly through all of the perforations from the centers of the cones outwardly, so that there will be considerable agitation produced by cross-currents and by the cones striking these cross-currents. The edges surrounding the perforations *c* are presented to the radiating currents of fluid, and operate, like a great number of small dashers, to divide the currents and bring the molecules of butter into more intimate relations to each other while escaping with the fluid. Instead of circular perforations, oblong slots or elliptical perforations may be made through the sides of the cones, so as to form skeleton cones presenting a large number of openings and a corresponding number of resisting or dashing edges. When the butter has come and it is desired to gather the particles, the rotation of the cones is reversed, which at the same time reverses the direction of the currents, so that instead of the currents being thrown outwardly, as in the first instance, they are now directed inwardly into each cone, so as to impinge violently against one another and thus conglomerate the masses of butter. The cones also operate in a measure as strainers for arresting the large masses of butter.

We do not claim two cones which are closed at their apexes and communicate with a hollow shaft; but

What we do claim as our invention, and desire to secure by Letters Patent, is—

The cones C C, made with an escape at their apexes as well as with passages *c c* in their sides, applied to a vertical revolving shaft which is arranged in a rectangular box, all in the manner described and shown.

THOS. C. SMITH.
NORTON L. FRANCIS.

Witnesses:

CEPHUS PARK,
WM. C. RICE.

(26.)