W. EARLE.

CHURNS.

No. 194,227. Patented Aug. 14, 1877.

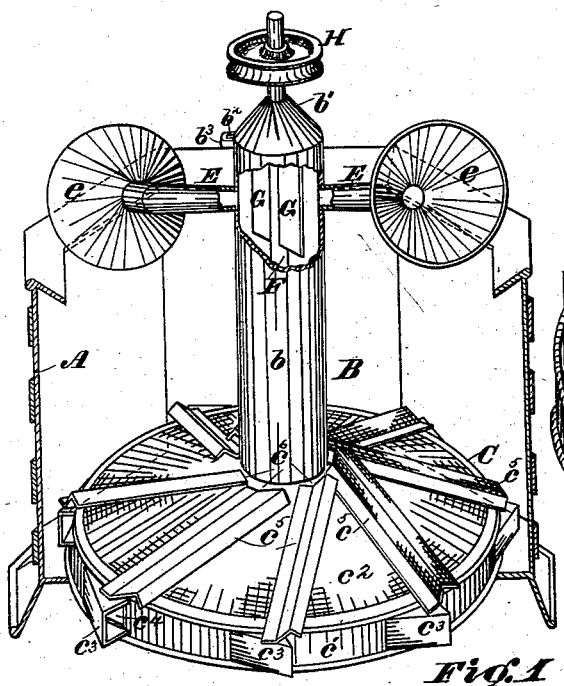

Fig. 1

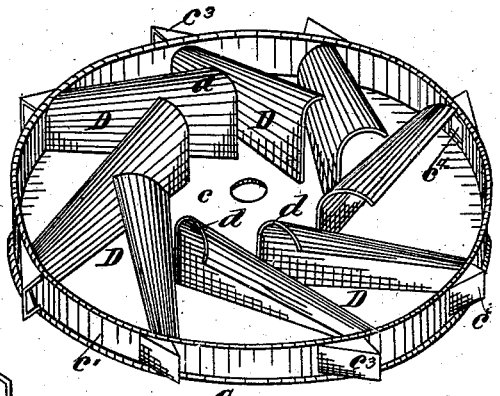

Fig. 2

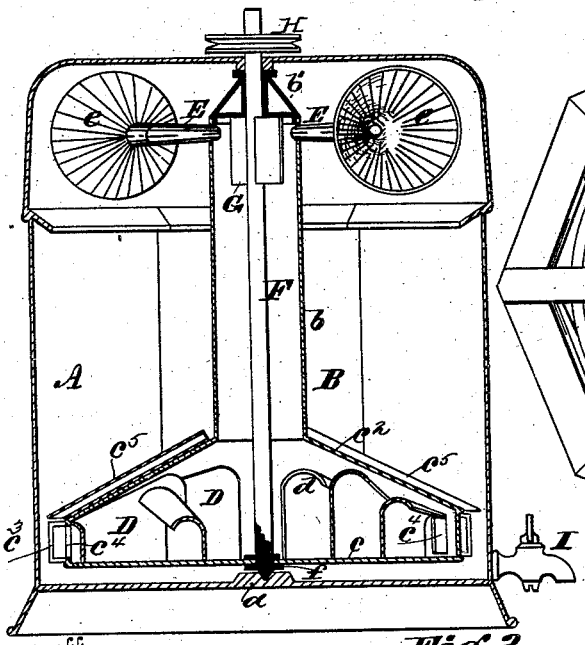

Fig. 3

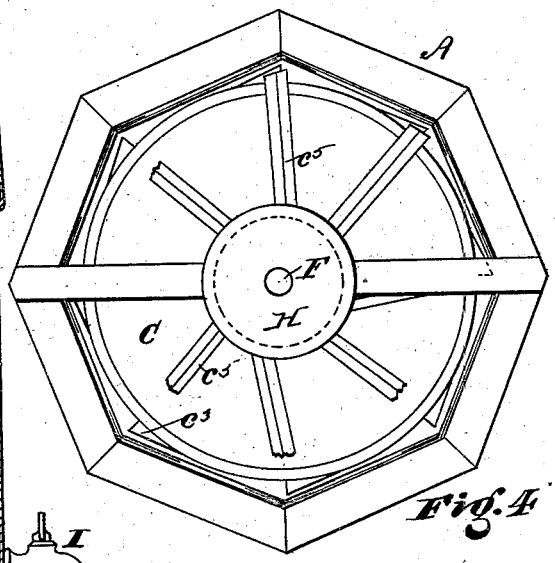

Fig. 4

Witnesses

Saml J. Van Stavoren

J. B. Connolly

Inventor

William Earle,

By Connolly Bros., Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM EARLE, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN CHURNS.

Specification forming part of Letters Patent No. **194,227**, dated August 14, 1877; application filed July 27, 1877.

To all whom it may concern:

Be it known that I, WILLIAM EARLE, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Churns; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a sectional perspective of my invention. Fig. 2 is a detail perspective. Fig. 3 is a transverse vertical section, and Fig. 4 a plan view, of my improved churn.

My invention has for its object to provide an improved churn-dasher, by means of which air will be drawn into and forced through the cream. A further object of my invention is to provide an improved construction of vertical churns, such construction being designed to break the swirl of the cream within the vessel, and thereby hasten the "making" of the butter.

My invention consists in the peculiar construction hereinafter set forth.

Referring to the accompanying drawing, A designates a vertical churn, which is octagonal in cross-section, the effect of this shape being to produce a multiplicity of corners and angles, which will constantly impede the free rotation of the milk, breaking up the circling currents produced by the dasher, and increasing the agitation generally.

Within this vessel, and stepped in the bearing *a*, is the dasher B, having a hollow shaft, *b*, surmounted by a conical removable cap, b^1, and terminating at its lower extremity in a hollow drum or wheel, C. The wheel C has a horizontal bottom, *c*, vertical annular wall or periphery c^1, and conical ceiling or sloping top c^2.

D represents tangential partitions or air-guides, located between the bottom *c* and top c^1, the office of these partitions being to break the air-current descending through the hollow shaft *b*, and direct the sub-currents to the openings c^4 in the annular wall c^1. The partitions D are bent out of a vertical line, as shown, to form arches *d*, and the openings c^4 are protected by hoods c^3, which are wedge-shaped, so as to permit the easy passage of the air-currents outwardly, and at the same time to throw away the cream from the openings c^4. The air which enters the shaft *b* is drawn in through hollow radial arms E, terminating in flaring or funnel-shaped mouths *e*. The air-currents which emerge through the openings c^4 pass up along the top c^2, beneath tangential arches c^5, which are secured at one side to the top c^2, their other side not extending downwardly far enough to meet said top. Leaving these arches, which are arranged in the direction opposite to that of the partitions D at c^6, the air-currents pass upwardly through the body of the cream, increasing the agitation of and aerating the latter. F represents a spindle secured to the conical cap b^1, and passing through the bottom *c*, where it is fastened by a nut, *f*. G represents a partition in the shaft *b*, extending downwardly from the cap b^1 to a point below the arms E E, the object of said partition being to prevent the air-currents entering through said arms from interfering with each other. H is a pulley mounted on the spindle F, and b^2 is a fin on the top b^1, entering a guide or groove, b^3, in the body of the shaft, so as to cause the said body and top to move together when said spindle is rotated. The spindle F may have its upper bearing in a fixed bail attached to the vessel A, or, in large-sized churns, in a beam of the ceiling of the room in which the vessel is stationed.

After the churning operation has concluded the milk and butter may be drawn from the vessel A by means of a spigot or gate, I, and any liquid remaining in the drum, and which has entered after the rotation of the shaft *b* has ceased, will be expelled from said drum by reversing the action of the said shaft.

What I claim as my invention is—

1. The hollow shaft *b*, having air-induction arms E E, and a partition, G, between said arms, to prevent the interference of entering air-currents, as set forth.

2. In combination with the hollow shaft *b*, the drum C, having internal partitions or air-guides D, and air-eduction openings c^4, protected by hoods c^3, substantially as shown and described.

3. In combination with the drum or wheel C, having sloping top and air-eduction openings c^4, the arches c^5, substantially as and for the purposes set forth.

4. The combination of hollow shaft b, removable top b^1, drum C, and spindle F, said spindle being fixedly secured to said top, and passing through said bottom, and said shaft and removable top being fitted together, substantially as described and shown.

5. The vertical churn-vessel A, provided with a revolving shaft and made octagonal in cross-section, so as to break the circular current produced by the revolution of said shaft, as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 24th day of July, 1877.

WILLIAM EARLE.

Witnesses:

SAML. J. VAN STAVOREN,

CHAS. F. VAN HORN.