

No. 629,479.

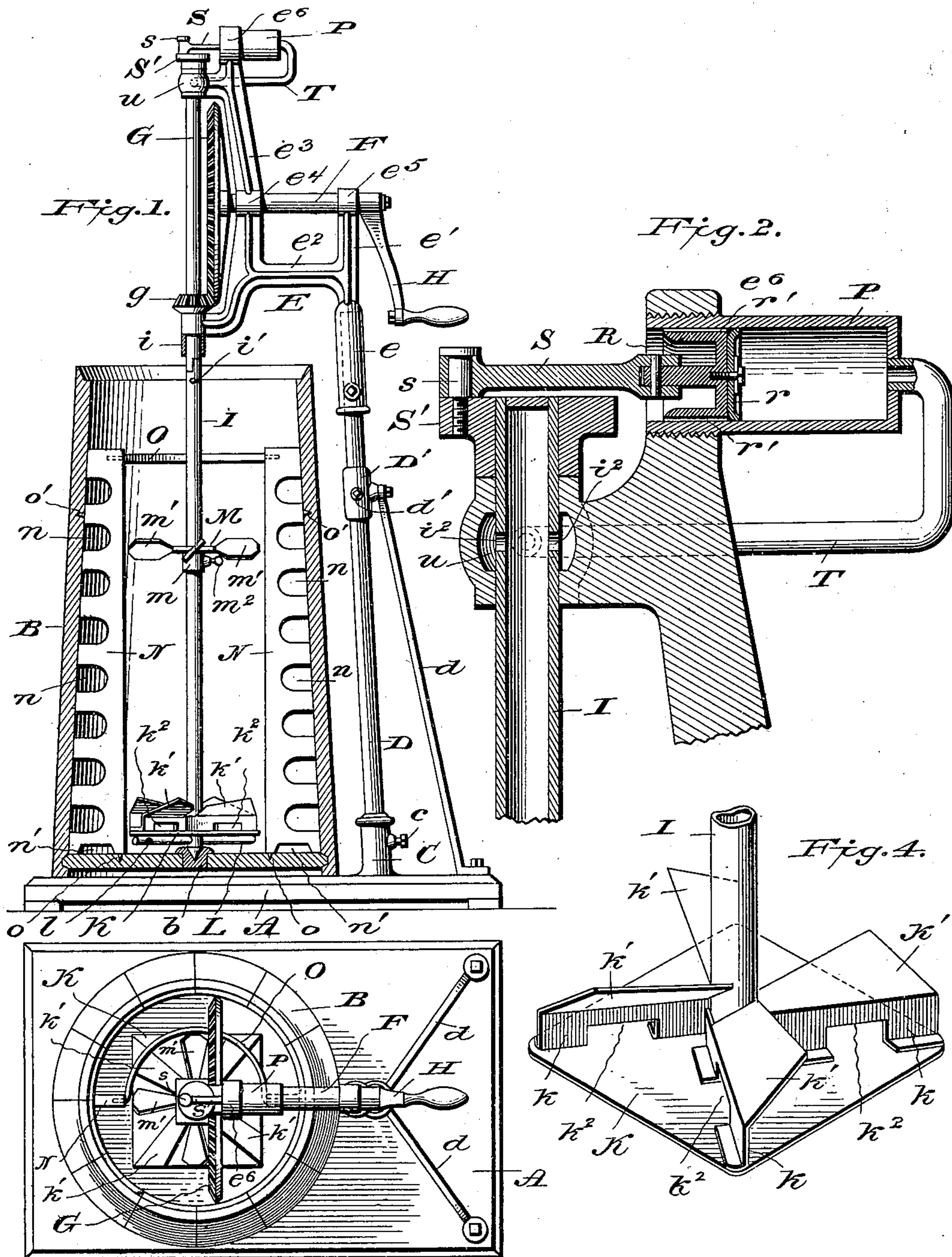
Patented July 25, 1899.

N. J. TUBBS.

CHURN.

(Application filed Aug. 18, 1898.)

(No Model.)



WITNESSES
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Fig. 3.

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UNITED STATES PATENT OFFICE.

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CHURN.

SPECIFICATION forming part of Letters Patent No. 629,479, dated July 25, 1899.

Application filed August 18, 1898. Serial No. 688,918. (No model.)

To all whom it may concern:

Be it known that I, NELSON J. TUBBS, a citizen of the United States of America, residing at Knoxville, in the county of Knox and State of Tennessee, 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 appertains to make and use the same.

This invention is an improvement in churns; and the object of the said invention is to provide a churn which shall be compact, strong, and durable and in operation will be economical in producing the greatest amount of butter with the least waste of material and with a minimum expense of power.

The invention is more particularly an improvement upon the apparatus shown and described in my Patent No. 601,389, dated March 29, 1898; and to this end the present invention consists in the peculiar construction and arrangement of the parts to produce a churn that will give the best results and attain the above objects in the easiest possible manner.

The following specification enters into a detail description of my invention, reference being had to the accompanying drawings and to letters thereon which designate the different parts, and what I consider to be the novel features of construction and combination of parts are more specifically set forth in the appended claims.

In the drawings forming part of this specification, Figure 1 is a vertical sectional view of a churn constructed in accordance with my invention. Fig. 2 is an enlarged detail view of the air-pump, including the devices for connecting the cylinder of said pump with the hollow piston-rod. Fig. 3 is a plan view of the churn. Fig. 4 is an enlarged detail view of the lower dasher.

With reference to said drawings, A designates the supporting-base of the apparatus, upon which the barrel or churn-body B is mounted, and adjoining the churn-body is bolted to said base or formed integrally a socket C, in which is stepped a tubular standard D, supporting the operating mechanism of the churn. The standard is secured in the socket by a set-screw *c* and firmly braced by

the inclined rods *d d*, bolted at their lower ends to the base and connected at their contiguous upper ends to a collar D', slidable upon the standard and held adjusted thereon by a set-screw *d'*. Supported upon the upper end of the tubular standard D is a casting or frame E, presenting a socket *e*, receiving said standard, a vertical bearing-arm *e'*, connecting portion *e*², and a vertically-disposed yoke *e*³, the latter comprising the bearings for the dasher-rod hereinafter described. The casting or frame just described is provided with lateral webs, as shown, permitting said frame to be made as light as possible consistently with the required strength, while the yoke portion has a boss *e*⁴, forming a bearing on a line with the bearing *e*⁵ at the upper end of the vertical arm *e'*.

A horizontal power-shaft F is journaled in the bearings *e*⁴ and *e*⁵, and to its inner end is keyed a large bevel gear-wheel G, while to the outer end is attached a crank H, by which power is applied to said shaft. The bevel gear-wheel meshes with a bevel-pinion *g*, fixed to the sectional dasher-rod I, said dasher-rod being hollow, for the purpose hereinafter explained, and is journaled in the bearing-boxes carried by the yoke of the casting or frame E, while its lower end is stepped in a socket *b* at the center of the bottom of the churn-body. The dasher-rod is spliced on a line with the upper end of the churn-body, the joint being covered and held fast by a sliding collar *i*, which fits the rod snugly, and is limited in its downward movement by a pin *i'*.

Secured to the lower end of the dasher-rod and located a slight distance above the bottom of the churn is a dasher, comprising a rectangular plate K, upon which are secured blades presenting vertical portions *k*, connecting with flaring wings *k'*, said wings being all disposed at the same angle with respect to the rotation of the dasher. The vertical portions of the dasher-blades are provided with openings *k*², for the purpose hereinafter explained. Extending diagonally across the under side of the plate K are tubes L, which are closed at their outer ends and at their inner ends open into the hollow dasher-rod, said tubes having perforations *l* near their outer ends, which discharge in the

direction of the rotation of the dasher. The lower end of the dasher-rod is conical and bears in a corresponding recess in the socket *b* to reduce friction and prevent lateral displacement of said rod. Adjustably mounted upon the dasher-rod is a second dasher *M*, consisting of a hub *m*, from which extend blades *m'*, disposed in a like manner to the blades of a rotary fan, the deflection of said blades being such with respect to the rotation of the dasher-rod as to force the cream downward. This dasher is held in an adjusted position upon the rod by means of a set-screw *m*².

Within the churn-body and at the sides thereof are located boards *N*, which are vertically disposed and are of such width as not to interfere with the rotary dashers, said boards being provided at their inner edge with a vertical series of openings *n* and at their lower ends with openings *n'*. These boards are held in place by a spur *o* at their lower end, which enters the bottom of the churn-body, and a spur *o'* at the inner side of their upper end, which enters the side of said churn-body, the upper ends being firmly held in such engagement by a cross-bar *O*, of spring-wire, the central portion of which is curved in the segment of a circle to give the required resiliency and not interfere with any desired adjustment of the upper dasher.

At the upper end of the frame *E* which supports the driving mechanism of the churn is integrally formed a ring *e*⁶, internally threaded to receive the open end of a pump-cylinder *P*, which is screwed thereinto. The cylinder incloses a reciprocating piston *R*, carrying a leather or flexible packing *r* and provided in the periphery of the head with longitudinal grooves *r'*, through which air passes into the rear end of the cylinder on the outstroke of said piston. The piston is operated by a pitman-rod *S*, connected to a wrist-pin *s*, carried by a wrist-wheel *S'*, keyed to the upper end of the sectional dasher-rod *I*, and turned by said rod through the intervention of the gearing mechanism hereinbefore described. This air-pump is for the purpose of forcing air into the churn-body or cream therein during the operation of churning, the air being conducted through the hollow dasher-rod and out through the perforations *l* below the lower dasher. To this end the pump-cylinder is connected to the hollow dasher-rod by a bent pipe *T*, extending from the rear end of said cylinder into a chamber *u*, formed in the center of the upper bearing for the dasher-rod, the latter having opposite perforations *i*², establishing communication between the chamber and bore in the dasher-rod.

From the foregoing description, in connection with the accompanying drawings, the construction, operation, and practical advantages of my invention will be readily apparent, for upon the rotation of the dasher-rod by means of the crank and interposed gearing a thorough agitation and complete aeration of the cream are effected, the dashers keep-

ing up a rapid circulation, forcing the cream against the side boards and through the openings therein, while the quantity of air that is introduced into the bottom of the churn will serve, in connection with the lower dasher, to cause a further or more complete agitation. It will also be noted that by providing the side boards or breakers with a vertical series of openings, as herein shown, instead of the openings at opposite ends, as in my prior patent referred to, the currents caused by the dashers are broken into fine streams, which creates a greater agitation of the cream. When the churning operation is completed, the frame *E* can be swung upon its supporting-standard to a position to one side of the churn-body after disjoining the sections of the dasher-rod and loosening the set-screw in the socket *e*. This will give free access to the barrel or churn-body and permit the breakers and lower section of the dasher-rod to be readily removed for the purpose of scraping the butter therefrom.

By the particular construction and arrangement of the parts constituting my improved churning apparatus the said parts can be readily disconnected and stored in compact form, so as to occupy but a minimum amount of space and also permit of the apparatus being readily assembled when required for use. The particular construction, furthermore, provides an apparatus of this character which is strong and durable and also compact, besides possessing the more important advantage of reducing to a minimum the labor of churning.

Having thus particularly described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a churn, the combination of the supporting-frame presenting bearings for the dasher-rod and driving-shaft, the upper bearing for the dasher-rod forming an air-chamber and the supporting-frame extended upward beyond said air-chamber and provided with a threaded opening; a hollow dasher-rod having an opening entering the air-chamber and extended above the latter, and bevel-gears for turning the dasher-rod from the driving-shaft; together with a wrist-wheel secured to the extended upper end of the dasher-rod, a cylinder screwed into the threaded opening of the supporting-frame, a pipe connecting the cylinder to the air-chamber, a piston working in the cylinder, and a pitman-rod connecting the piston to the wrist-wheel, as herein shown and described.

2. In a churn, the combination, of a supporting-frame for the driving mechanism, comprising a standard *D* and frame or casting *E*, the latter consisting of a socket *e* receiving the upper end of the standard, a vertical bearing-arm *e'* extending upward from said socket, an arm *e*² projecting horizontally from the former arm, and a vertically-disposed yoke *e*³ having upper and lower bearings for the dasher-rod, a central bearing on

a line with the bearing of the arm e' , and an upper extension e^6 provided with a threaded opening horizontally disposed, the upper bearing for the dasher-rod forming an air-chamber below the plane of the threaded opening; together with a jointed hollow dasher-rod extended above the air-chamber and having an opening entering the latter, a wrist-wheel fixed on the extended end of the dasher-rod, a cylinder screwed into the threaded opening of the frame, a pipe connecting the cylinder to the air-chamber, a piston working in the cylinder, and a pitman-rod connected to the piston and wrist-wheel, substantially as shown and described.

3. In a churn, the combination with the body, of the boards or breakers N provided with a vertical series of openings n and an opening n' at their lower end; spurs o and o'

projecting from the breakers, and a curved cross-bar engaging the upper ends of said breakers; together with a dasher comprising a plate, blades projecting upward from the plate and flared outward at their upper ends, the vertical portion of the blades having openings therethrough, and tubes on the under side of the plate provided with outlet-openings at their outer ends; a hollow dasher-rod carrying the dasher and connected to the tubes, and means for forcing air into the hollow dasher-rod, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

NELSON J. TUBBS.

Witnesses:

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NORMAN B. MORRELL.