

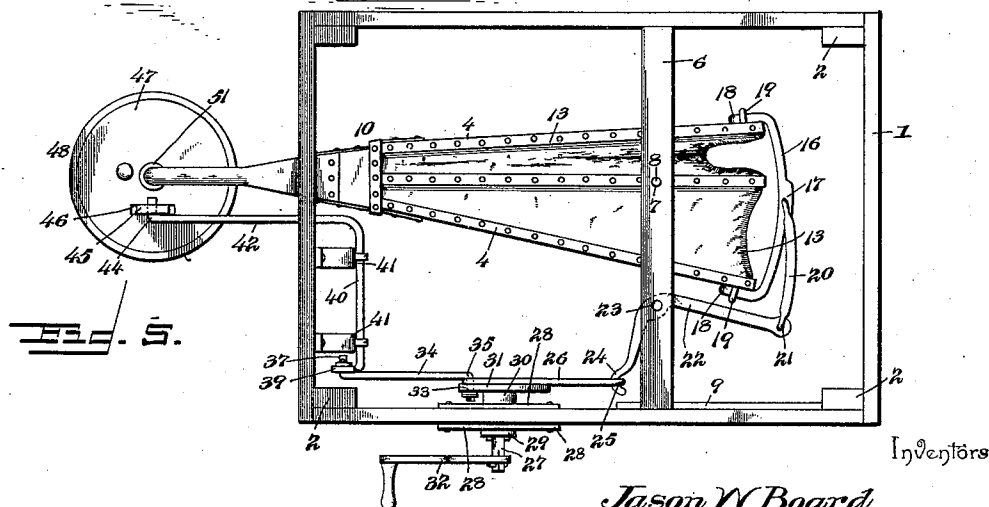
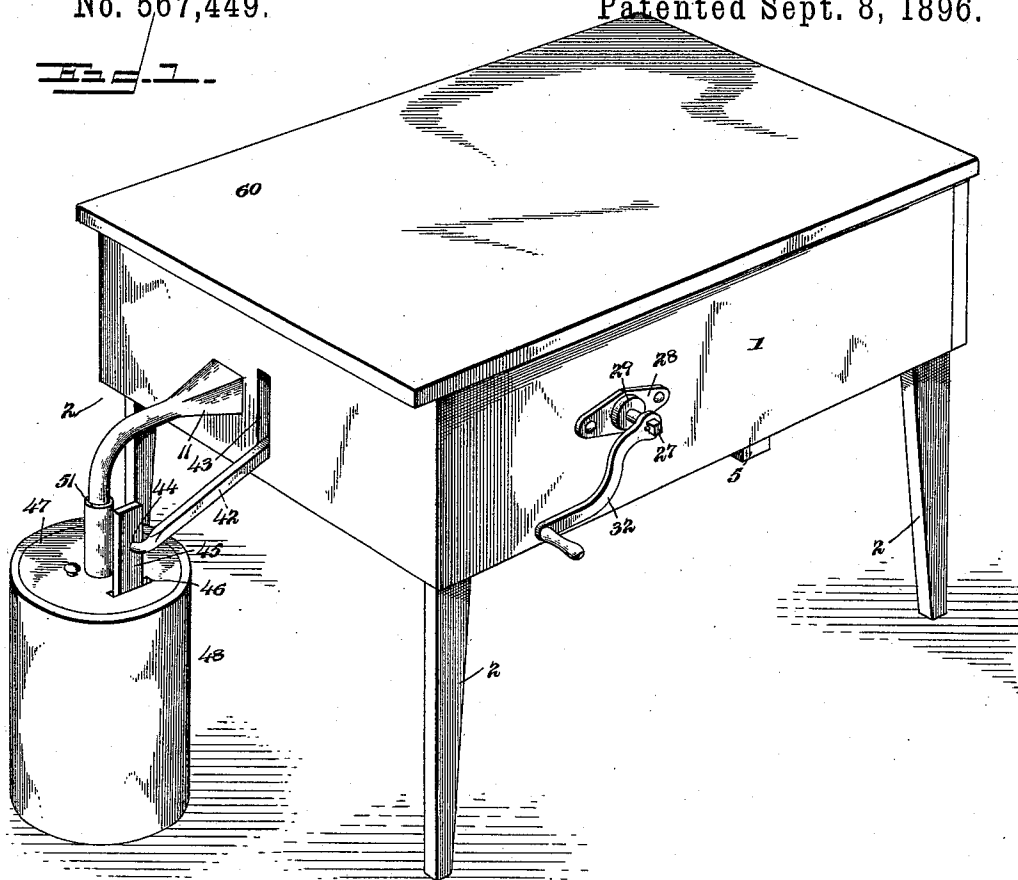
(No Model.)

2 Sheets—Sheet 1.

J. W. BOARD & E. B. HYRE.
CHURN.

No. 567,449.

Patented Sept. 8, 1896.



Witnesses

C. H. Stewart,

J. R. Owens,

By their Attorneys.

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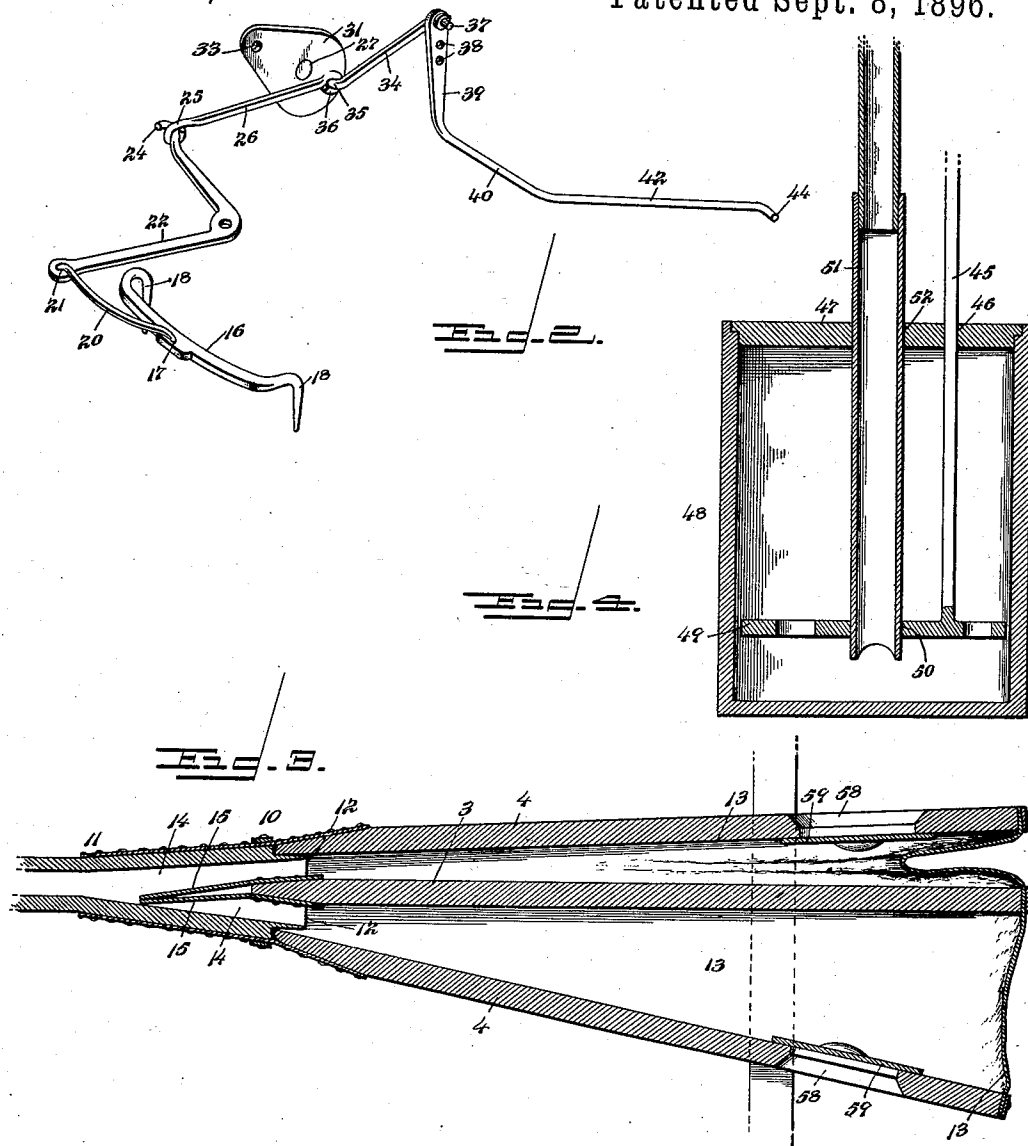
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Inventors

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UNITED STATES PATENT OFFICE.

JASON W. BOARD AND EDWARD B. HYRE, OF ELK FORK, WEST VIRGINIA;
SAID HYRE ASSIGNOR TO SAID BOARD.

CHURN.

SPECIFICATION forming part of Letters Patent No. 567,449, dated September 8, 1896.

Application filed December 6, 1894. Serial No. 531,026. (No model.)

To all whom it may concern:

Be it known that we, JASON W. BOARD and EDWARD B. HYRE, citizens of the United States, residing at Elk Fork, in the county of Jackson and State of West Virginia, have invented a new and useful Churn, of which the following is a specification.

Our invention relates to an improvement in that class of churns wherein the operation of churning is effected by means of a blast of air discharged into the cream in connection with means for mechanically agitating the cream simultaneously with the operation of the blast; and the object in view is to provide blast and agitating mechanisms mounted upon a frame constructed to form a table, the operating parts being so arranged entirely beneath the top of the table and constructed to allow the use of either or both mechanisms. Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claim.

In the drawings, Figure 1 represents a perspective view of a churn constructed in accordance with our invention. Fig. 2 is a perspective view of the preferred form of driving mechanism detached from the frame of the apparatus alone. Fig. 3 is a longitudinal horizontal section of the bellows. Fig. 4 is a vertical section of the churn, tub, or receptacle, showing the blast-introducing tube and dasher. Fig. 5 is a plan view of the churn with the top of the frame omitted.

The frame of our churn consists in the side and end boards 1, which are rigidly connected at their ends in rectangular form and supported by the legs 2, arranged at the angles.

The bellows are of duplex construction and include a central partition 3, which is rigidly mounted in place upon the cross-bar 5, connecting the lower edges of the sides of the frame and beneath a second cross-bar 6, which connects the sides of the frame near their upper edges. The bar 6 is provided with an opening 7, in which a pin 8 is arranged, said pin projecting vertically from the partition 3 of the bellows to assist in holding the same securely in place. The cross-bar 6 is secured in position by means of a cleat 9, which is

fixed to one side of the frame and which has a notch formed in its upper side, in which notch the adjacent end of the bar 6 is received.

10 indicates the nose of the bellows, which is rigidly secured to or formed integral with the front end of the partition 3 and is angular in cross-section and tapered toward the nozzle 11. The nose 10 of the bellows is formed with shoulders 12, in which rabbets are formed for the reception of the front ends of the movable sides 4 of the bellows, said sides being hinged thereto, as may be seen in Fig. 3.

13 indicates a flexible web which connects the rear edges of the partition 3 and sides 4. The connection between the web 13 and the sides and partition of the bellows is accomplished by means of strips arranged along the edges of the sides and partition and secured by screws. The nose 10 of the bellows is formed with a throat 14, which communicates with spaces upon both sides of the partition 3, so that both sections or compartments of the bellows discharge through a common outlet.

15 indicates a valve consisting of flexible tongues respectively secured to the opposite sides of the partition 3 and projecting forwardly and into the throat 14, the front ends of said tongues being arranged to lie against each other to form at the front portion practically a single tongue which is capable of swinging laterally to lie first against one vertical side of the throat 14 and then against the other. By this construction as the blast from one compartment of the bellows is forced out through the throat 14 the tongues 15 will be forced to lie against the opposite side of the throat, thereby closing communication with the inactive compartment of the bellows. As the conditions of the compartment are reversed the tongues 15 will be correspondingly moved.

16 indicates a metallic yoke provided at its center with an enlarged and perforated portion 17 and at its ends with laterally and vertically bent portions 18, arranged in contact with the outer surfaces of the sides 4 of the bellows and secured in place by means of staples 19.

20 indicates a link having its ends bent downwardly to form journals which are ro-

tatably seated in a perforation in the flattened portion 17 of the rod 16 and in an opening 21 of a bell-crank lever 22. This lever 22 is arranged upon a vertical axis, and its spindle 5 23 is extended to and mounted in the bars 5 and 6, whereby the lever is adapted to swing in a horizontal plane. The forward arm of the lever 22 is formed with a hook 24, with which the eye 25 of a pitman-rod 26 is connected. 10

27 indicates a revoluble shaft which has bearings in the plates 28, secured one to each side of the left-hand portion of the frame 1, while the shaft is held from longitudinal 15 movement by means of a washer 29 and enlarged portion or head 30, the latter being located on the inner end of the shaft and having rigidly fixed thereto or formed integral therewith a crank-disk 31. The outer end of 20 the shaft 27 is squared and provided with a removable crank-arm 32, secured in place by means of a key, and the crank-disk 31 is provided with two openings 33, which are arranged at different distances from the center 25 of the disk and are provided to permit the connection of the link 34 and pitman-rod 26 with the disk. The link 34 has its rear end formed with a trunnion-like portion 35, which fits into one of the openings 33, while the pitman-rod 26 is provided at its forward end 30 with an eye 36, which embraces the trunnion-like portion 35, whereby the pitman-rod 26 is connected to the disk 31. Thus it will be seen that as the shaft 27 is revolved in the 35 operation of the churn the crank-disk 31 will impart to the pitman-rod 26 a movement which will be reciprocal at its rear end to swing the bell-crank 22 on its vertical axis. As the bell-crank 22 rocks the link 20 will be 40 reciprocated to impart motion to the yoke 16, and hence to the sides 4 of the bellows. The link 34 has its front end formed with a stud 37, which fits into one of the openings 38 of the crank-arm 39, forming a member of a 45 rock-shaft 40, mounted in bearings in the blocks 41, fixed to the inner surface of the front end of the frame 1. The shaft 40 is arranged transversely and is provided at its inner end with an arm 42, which projects 50 through a slot 43 in the front end of the frame to swing in a vertical plane as the rock-shaft is operated. The front end of the arm 42 is formed with a stud 44, extending transversely into an opening in the dasher-rod 45, which 55 reciprocates through an opening 46 in the top 47 of the churn tub or receptacle 48.

The rod 45 carries the dasher 49, which is circular in form and is provided with a series of perforations surrounding a central opening 50, through which extends the air-introducing tube 51, the dasher being guided by said tube. The air-introducing tube extends 60 vertically through an opening 52 in the top 47 of the receptacle and terminates at its lower end adjacent to the bottom of the receptacle. 65

The nozzle 11 of the bellows is extended

longitudinally and thence downwardly, and is fitted in the upper end of the tube 51, so that a blast from the bellows will be introduced into the tube. 70

58 indicates inlet - openings, which are formed, respectively, in the side walls 4 of the bellows, and are controlled by the clack-valves 59. By hanging them downwardly 75 they are held by gravity in a closed position, which will assist in the effective operation thereof.

60 indicates a top for the frame 1, and this is made to cover the upper side of the frame, 80 so as to hide and protect the mechanism within the churn and at the same time form an unobstructed table-top. The operating mechanism, including the bellows, is arranged within the horizontal frame between the 85 planes of the upper and lower edges thereof, and hence is concealed and protected from accumulations of dust or other injury, and the table-top 60 being unobstructed is adapted to perform its ordinary function irrespective 90 of the churning operation or at other times. The crank by which motion is communicated to the driving-shaft is removable, as described, and when detached the frame differs but 95 slightly in appearance from an ordinary table, and is adapted, either in the kitchen or dairy, to perform the double function described.

Various changes in the form, proportion, and the minor details of construction may 100 be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described our invention, what we claim is— 105

In a churning apparatus, the combination with a supporting-frame, of a bellows having movable and fixed walls, a bell-crank lever, a yoke terminally attached to the movable walls of the bellows and connected with one 110 arm of the bell-crank lever, a rotary driving-shaft provided at one end with a disk having a plurality of perforations arranged at different distances from the center of rotation, a rock-shaft having one of its arms connected 115 to a dasher-rod, a pitman connected to a crank-arm on said rock-shaft and provided with a lateral trunnion 35 fitted in one of the perforations in said disk, and a second pitman connected at one end to the second arm of 120 the bell-crank lever and provided at the other end with an eye fitting loosely upon said lateral trunnion of the first-named pitman, whereby the trunnion forms a common axis and a common means of attachment for both 125 pitmen, substantially as specified.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

JASON W. BOARD.
EDWARD B. HYRE.

Witnesses:

C. C. STUNTS,
H. C. FERGUSON.