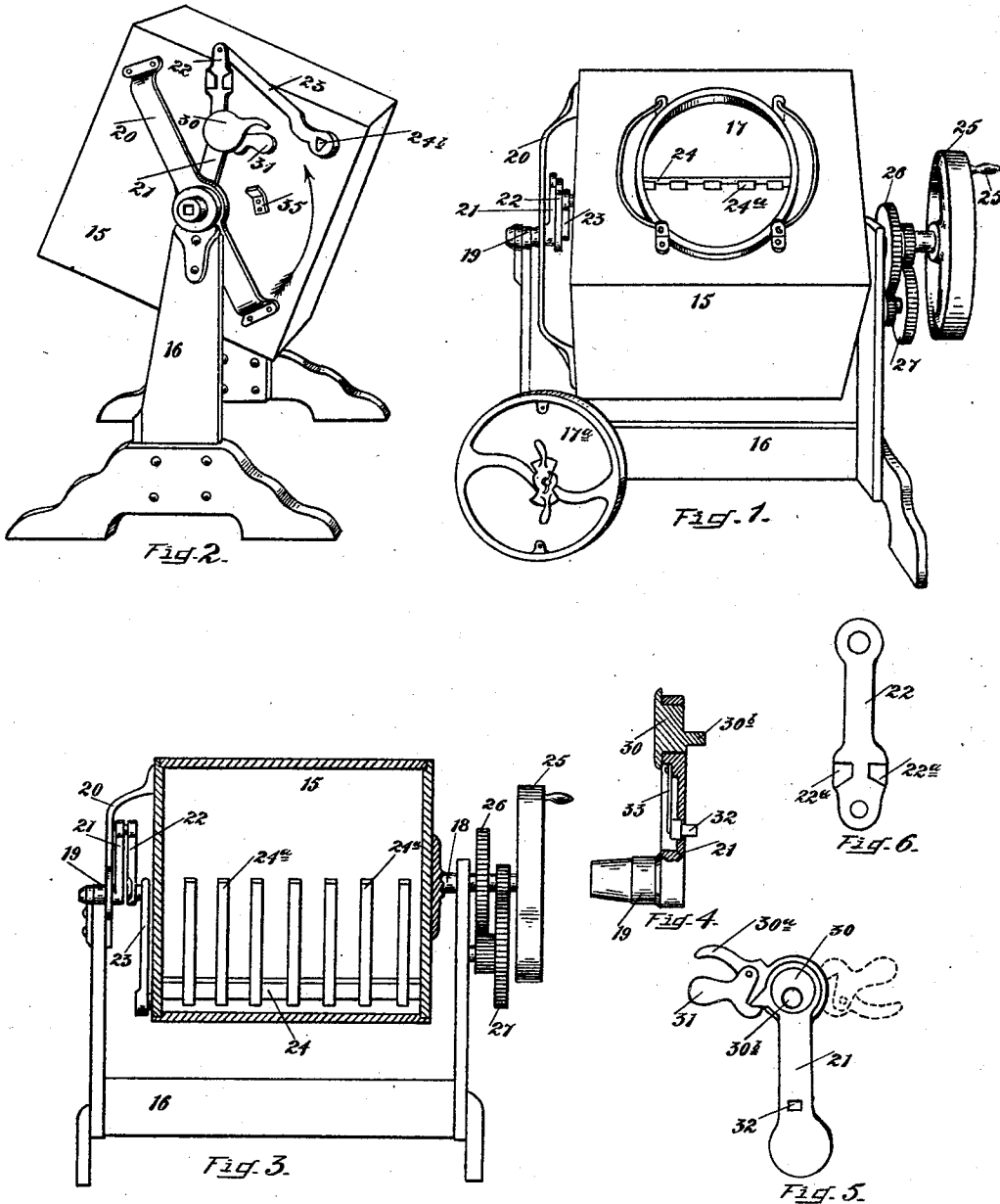


D. A. SPRAGUE.
COMBINED CHURN AND BUTTER WORKER.
APPLICATION FILED APR. 25, 1908.

937,725.

Patented Oct. 19, 1909.
2 SHEETS—SHEET 1.



Witnesses

Chas. A. Vardell
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Inventor

DANIEL A. SPRAGUE

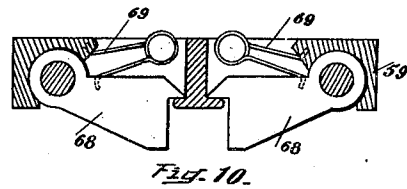
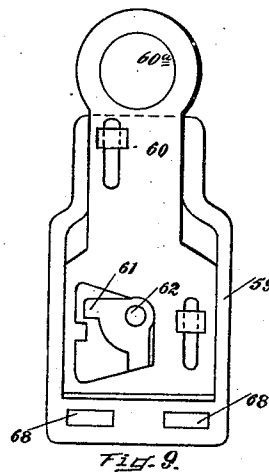
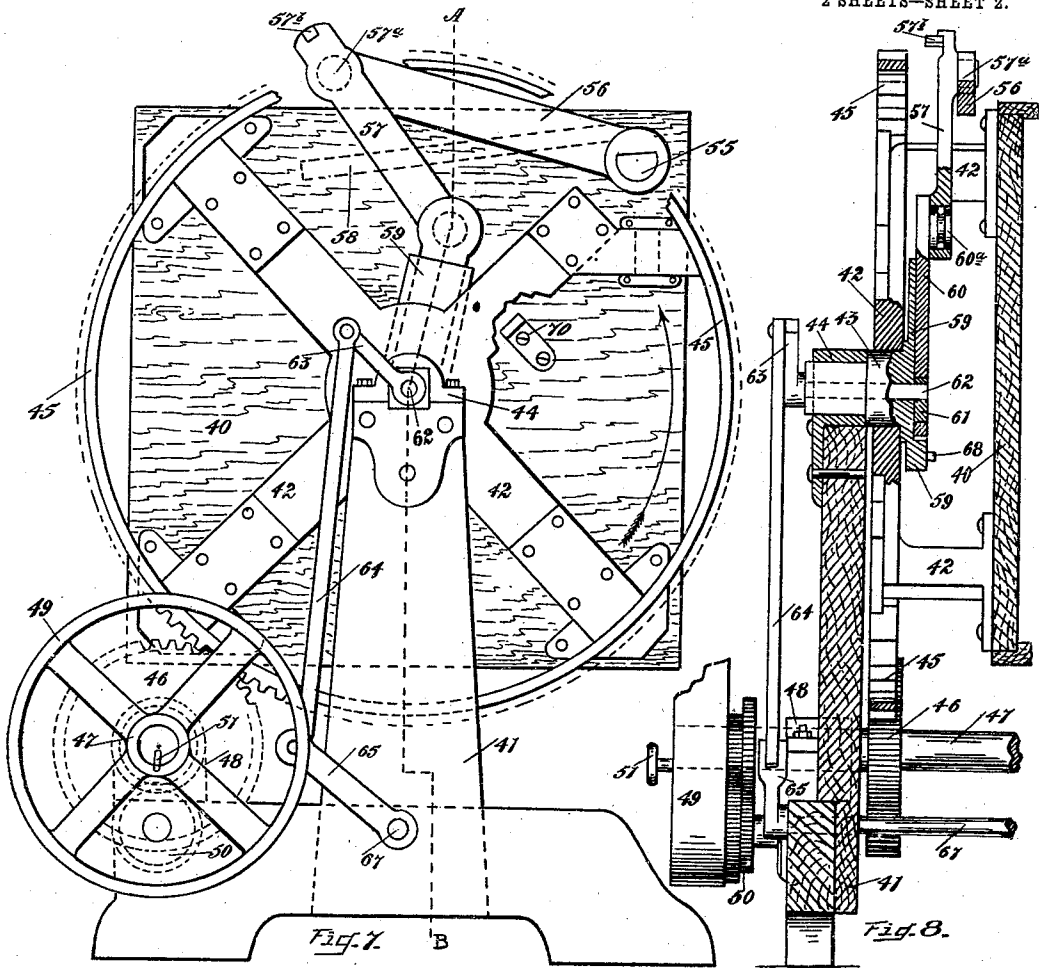
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UNITED STATES PATENT OFFICE.

DANIEL A. SPRAGUE, OF POLAND, NEW YORK.

COMBINED CHURN AND BUTTER-WORKER.

937,725.

Specification of Letters Patent.

Patented Oct. 19, 1909.

Application filed April 25, 1908. Serial No. 429,248.

To all whom it may concern:

Be it known that I, DANIEL A. SPRAGUE, of Poland, in the county of Herkimer and State of New York, have invented certain new and useful Improvements in a Combined Churn and Butter-Worker; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form part of this specification.

The object of my present invention is to provide a combined churn and butter worker, which is simple in construction, effective in operation, easily and quickly changeable from a churn to a butter worker and vice versa, and not liable to injury or damage from careless use or manipulation of the adjusting or converting mechanism.

Figure 1 shows a perspective view of a small sized churn embodying the features of my present invention. Fig. 2 is a perspective end view of the same. Fig. 3 is a partial longitudinal sectional view. Figs. 4, 5 and 6 show details of the worker operating and handling mechanism. Fig. 7 is an end view of a larger machine intended for power use more particularly. Fig. 8 is a section of one end of the machine taken on line A—B of Fig. 7. Figs. 9 and 10 show details of construction appertaining to this modified form.

Referring to the reference letters and figures, 15 indicates the body of the churn which, in the form shown, is a rectangular box mounted on journals at 18 and 19 in the frame 16 to rotate on its axis. The journal at 19 is stationary with the frame 16 and the churn body at this end is carried on a spider 20 which turns on the journal 19. Between the spider 20 and the adjacent end of the churn body is provided a stationary arm 21 secured against rotation on the inner end of the journal bearing 19. To the outer end of the arm 21 is pivotally secured a connecting link 22, which connects the same with the swinging end of lever 23 secured on the outer end of the shaft which carries the worker 24. The worker 24 is provided with a set of fingers 24^a which preferably extend to or beyond the axis of

the churn body. The churn body 15 is provided with an opening 17 and a cover 17^a by which the opening may be closed.

For rotating the churn body, there is provided on the outer end of the journal 18 a wheel 25 which may serve to apply power by means of the belt, or as a crank in the use of the handle 25^a. It may be noted that arrangements are made for coupling the wheel 25 directly to the journal or by throwing in a set of back gears 26 and 27, whereby the speed of the revolution of the body is much reduced. The length of the lever 23 on centers is just equal to the distance from the center of the worker shaft 24 to the axial line of the churn body, which is also the axial line of the journals 18 and 19.

At its swinging end the lever 23 engages with the swinging end of link 22, while the pivotal end of link 22 engages on a pivot 30^b mounted eccentrically in the circular adjuster 30, which piece 30 is mounted in an eye in the outer end of the arm 21 and provided with a handle 30^a by means of which the part 30 can be given a half revolution from the position shown in full lines in Figs. 2 and 5 to the position shown in dotted lines in Fig. 5. For securing the part 30 in one of its normal positions, it is provided with a catch 31 engaging with a tooth-like projection on the arm 21, as clearly shown in Fig. 5. In the other position of adjustment, it does not require to be secure. The length of the link 22 on centers is exactly equal to the length of the arm 21 between the center of the pivot 30^b and the center of the journal 19 when the part 30 is in the position shown in dotted lines in Fig. 5. It is obvious that when the parts are adjusted to the position shown in full lines in Fig. 5, that the length of the link 22 between centers will carry the pivotal connection between the end of the link 22 and the arm 23 off from or out of the axial line between the journals 18 and 19.

In the base end of the arm 21; that is to say, as near as convenient to the journal 19, there is provided a catch 32 impelled to projecting and locking position by a spring 33. This catch 32 is adapted to engage between the shoulders 22^a on the swinging end of the link 22 when the pivot 30^b is in its outer position with reference to the journal 19. These shoulders 22^a are beveled off outwardly so that as the link 22 swings into position, it will force the catch pin 32 back

until the link 22 registers with the arm 20, when the projecting end of the pin 32 will engage between these shoulders. The shoulders 22^a are so arranged, however, that when the pivot 30^b is adjusted to the position shown in full lines in Fig. 5, the shoulders 22^a will not engage with the catch 32. When the adjusting piece 30 is placed in the position shown in dotted lines in Fig. 5 and the churn body 15 is revolved, the link 22 will swing around until it becomes caught by the catch 32 and prevented from moving. In this position the pivotal connection between the swinging end of the worker arm 23 and the swinging end of the link 22 will be in the axial line of the churn. In this position the churn is free to revolve without the worker making any movement whatsoever with reference to the churn body, but being held stationary with reference to the churn body. This is the condition in which the parts will be held when the churn is being used as a churn. When it is desired to bring the worker 24 into operation, the adjustable part 30 is changed over to the position shown in full lines in Fig. 5 by the operator. In so doing the link 22 is given a longitudinal shift with reference to the arm 21, the link becomes released from the catch 32 and the pivotal connection between the end of the link 22 and the arm 23 is thrown off from the axial line of the churn. In order to avoid this being done at certain points of the revolution whereby the worker arm 23 would swing in the opposite direction from the center than that desired, there is provided on the end of the churn body a stop 35. When the churn body is revolved with the parts adjusted to the position last described, the link swings outwardly from the axial line and forces the worker arm outwardly, whereby the fingers 24^a of the worker are swung around toward and more or less against the bottom of the churn. It will be noted that the butter is caught first in the V-shape between the fingers and the bottom of the churn and the fingers are forced through the butter at or about the time the bottom of the churn is turned over until it is at the top, the butter being squeezed through between the fingers and thus worked. The effect of operating the adjusting piece 30 is to change the length of the stationary arm 21 between centers, so as to make it equal the length of the link 22 between centers, or to make it less than the length of the link between centers.

In the form of construction shown in Figs. 7 to 10 inclusive, the body is indicated by 40 and the same is mounted for rotation on its axis in frame 41 by being provided with spiders 42 at each end, which have bearing on stationary journals 43 secured against rotation in clamps 44 on the frame. For rotating the churn body on its axis, there is provided on the spider 42 a large

gear wheel 45 meshing with a gear pinion 46 provided on a shaft 47 extending the length of the frame and running at either end in a box as 48 on the frame. On one end the shaft 47 may be provided with a band wheel 49 adapted to be coupled directly to the shaft 47 or indirectly for slow speed through the medium of the gear pinions 50, the shift being accomplished by a sliding key 51. The worker within the churn is similar to that described with reference to the prior figures, and is mounted on a rock shaft 55 extending through the churn and provided at each end with a worker arm 56. The length of the worker arm 56 between centers is equal to the distance between the center of the shaft 55 and the axis of the churn. At its swinging end the arm 56 is connected by a pivot 57^a with the swinging link 57. The worker fingers are shown in dotted lines at 58. 59 indicates a stationary arm or extension on the inner end of the journal 43 within the space between the spider 42 and the end of the churn. 60 is a longitudinally sliding member mounted on the arm 59 carrying at its outer end a pivot 60^a on which the pivotal end of the link 57 engages. For adjusting the member 60 whereby the arm 59 is lengthened or shortened between centers, there is provided a cam 61 supported on the end of a rock shaft 62 extending through the journal 43, the cam 61 being located in a suitably formed opening in the member 60. For operating the cam 61, there is provided on the outer end of the shaft 62 a lever 63, and this lever is connected with a similar one on the opposite end of the churn by a connecting rod 64, crank 65 and rock shaft 67 mounted in bearings in the frame and extending the length thereof. The outer swinging end of the link 57 is provided with a pin or projection 57^b, which is adapted, when the pivot 60^a is adjusted to its outer position with reference to the axial line of the churn, to engage with and be caught between catches 68 mounted also stationarily in a portion of the arm 59. These catches 68 have outwardly inclined faces over which the projection 57^b may ride and springs 69 for impelling them to their locking position, which is shown in Fig. 10. It is evident that if the churn body is rotated when the pivot 60^a is adjusted to its outer position with reference to the axial line of the churn, that the link 57 will swing around until the projection 57^b becomes caught between the adjacent ends of the catches 68, where it will become locked with the pivot pin 57^a registering with the axial line of the churn. During the continued rotation of the churn, the worker will be held stationary with reference to the body. This is the condition in which the device will be used as a churn, the worker serving as a dasher. When it is de-

sired to bring the worker into operation, the cam 61 will be operated to shift the adjustable member 60 of the arm 59 to move the pivot 60^a toward the axial line of the churn.

5 The parts in this position of adjustment are shown in Fig. 9. This movement shifts the locking projection 57^b laterally outward from between the catches 68, leaving the link 57 free, and, at the same time, shifts the
10 pivot 57^a out from its position in the axial line. In order to prevent this shifting of parts or movement taking place at an inopportune position of the churn, there is provided on the end of the churn body a stop
15 70 against which the worker arm 56 is adapted to strike and prevent it from passing to the wrong side of the direct line between the center of the worker shaft 55 and the axial line of the churn. If it were allowed
20 to get on the wrong side of this line, the worker would work backwardly which would be objectionable. The worker shaft 55 is preferably mounted adjacent to what may be termed the bottom of the churn, and it is
25 evident that when the parts are adjusted as above described and the churn is revolved, the worker fingers will open and shut against the bottom of the churn. As shown in the drawings, the stationary arm 59 is thrown
30 a little off to one side from the vertical position in order to have the worker complete its closing movement prior to the bottom of the churn assuming its horizontal position on top. The movement of the worker, however, can be timed by constructing the mechanism to change the permanent position of the arm 59. It is evident, however, that the arm 59 should preferably be in the upper
40 half of the circle around the axis of the churn, in order that the worker may be opened with the fingers in suspended position and the butter allowed to accumulate in a lower corner of the churn before it is again caught and gathered for a succeeding working operation.

Both forms of churn shown are designed to be rotated in the working operation particularly in the directions indicated by the arrow in Figs. 2 and 7 respectively.

50 It is impossible to leave the shifting mechanism for throwing in or throwing out of operation the worker in either of the forms of construction shown in an intermediate position, whereby damage or harm may
55 ensue. The shifting mechanisms of either form will automatically assume one or the other of their natural positions when the churn is rotated, and do this without danger of injuring or permitting any of the parts
60 of the churn to be damaged.

While the mechanism herein shown and described seems better adapted for use with a churn body of rectangular form, a round or other form of body may be used.

65 It is evident that other modifications and

changes than those herein described may be made without departing from the invention claimed.

What I claim as new and desire to secure by Letters Patent is:

1. The combination of a churn body 70 mounted to be rotated on its axis, a worker mounted on a rock shaft in the body at one side of the axial line, an external worker arm mounted on the worker shaft and of a 75 length between centers equal to the distance between the axial line and the center of the worker shaft, a link pivotally secured to the swinging end of the worker arm and to a fixed pivot, and means for adjusting said 80 fixed pivot toward and from the axial line, substantially as set forth.

2. The combination in a butter working churn of a body mounted to be rotated on its axis, a worker within the body mounted 85 on a rock shaft mounted in the body to one side of the axis of the body, a worker arm secured on the worker shaft and of a length on centers substantially equal to the distance between the axis of the churn and the center 90 of the worker shaft, a stationary pivot supported at a distance from the axial line of the churn less than that between the axial line of the churn and the center of the worker shaft, a link connecting the swinging 95 end of the worker arm with said stationary pivot and means for adjusting said pivot toward and from the axial line of the churn, substantially as set forth.

3. The combination in a combined churn 100 and butter worker of a churn body mounted to be rotated on its axis, a worker within the body, a rock shaft on which the worker is mounted supported in bearings in the body to one side of the axis, a worker arm secured 105 to the rock shaft externally of the body, means for supporting a fixed pivot adjustably toward and from the axis and a connection between the worker arm and said pivot, substantially as set forth. 110

4. The combination in a combined churn and butter worker of a churn body mounted on journals to be rotated, a worker within the body, a rock shaft mounted in bearings 115 in the body to one side of the axis of rotation and by which the worker is operated, a worker arm secured on the said rock shaft externally of the body, a fixed extensible arm mounted on the journal and carrying a fixed pivot, a connection between the worker 120 arm and the pivot on said extensible fixed arm, means for adjusting the length of said fixed arm operating through the journal, substantially as set forth.

5. The combination in a combined churn 125 and butter worker of a churn body mounted on journals to be rotated, a worker within the body, a rock shaft mounted in bearings in the body to one side of the axis of rotation by which the worker is operated, a 130

worker arm secured to the said rock shaft externally of the body, and being of a length on centers equal to the distance from the center of the rock shaft to the axis, an extensible fixed arm supported on the journal and carrying an adjustable pivot, a link connecting the worker arm with said fixed arm pivot and a catch for securing the link against movement with reference to the fixed arm, substantially as set forth.

6. The combination in a combined churn and butter worker of a churn body mounted on journals to be rotated, a worker within the body, a rock shaft mounted in bearings in the body to one side of the axis of rotation and by which the worker is operated, a worker arm secured on the end of said rock shaft externally of the body and of a length on centers equal to the distance between the said rock shaft and the axis of rotation, an adjustable stationary pivot supported from the journal, means for adjusting the position of said pivot toward and from the axis operating through the journal, and a link connecting the worker arm with said fixed-adjustable-pivot, substantially as set forth.

7. The combination in a combined churn and butter worker of a churn body mounted on journals to be rotated, a worker within the body, a rock shaft mounted in bearings in the body to one side of the axis of rotation and by which the worker is operated, a worker arm secured on the end of the rock shaft externally of the body and of a length on centers equal to the distance between the rock shaft and the axis of rotation, a fixed arm or part secured on the journal against rotation and carrying an adjustable pivot, means for adjusting said pivot operating through said journal, a link connecting the worker arm with said adjustable pivot, and

a catch for securing the link and fixed arm or part against relative movement and arranged to be disengaged by the movement of said adjustable pivot, substantially as set forth.

8. The combination in a combined churn and butter worker of a churn body mounted at each end by means of spiders on journals to be rotated, a worker within the body, a rock shaft mounted in bearings in the body to one side of the axis of rotation and by which the worker is operated, worker arms secured on the ends of said rock shaft externally of the body, longitudinally adjustable fixed arms located within the spreaders respectively, links connecting the worker arms with adjustable stationary pivots on said fixed arms, means at each end of the churn body for adjusting said pivots toward and from the center of rotation of the body, and connections between said adjusting means, substantially as set forth.

9. The combination in a combined churn and butter worker of a churn body mounted to be rotated on its axis, a worker within the body, a rock shaft on which the worker is mounted supported in bearings in the body to one side of the axis, a worker arm secured to the rock shaft, means for supporting a fixed pivot and adjusting the same toward and from the axis, a connection between the worker arm and said pivot and a fixed catch for securing the swinging end of the worker arm, substantially as set forth.

In witness whereof, I have affixed my signature, in presence of two witnesses, this 18 day of April 1908.

DANIEL A. SPRAGUE.

Witnesses:

SARAH E. CLARK,
GEO. E. RENDELL.