No. 629,781. Patented Aug. 1, 1899.

# W. M. & W. P. DRAKE.

## CHURN.

(Application filed Dec. 15, 1898.)

(No Model.)

Fig. 1.

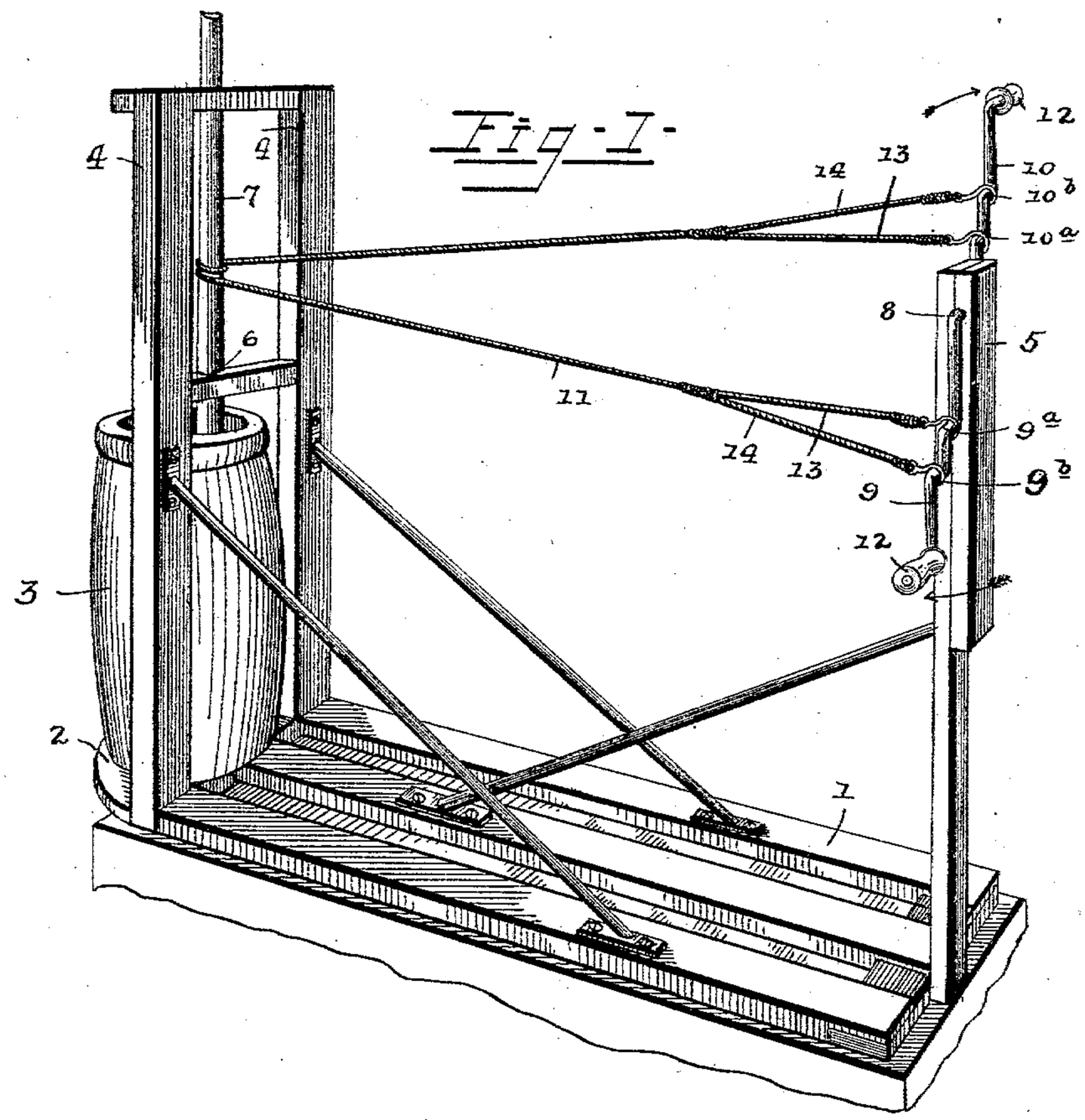
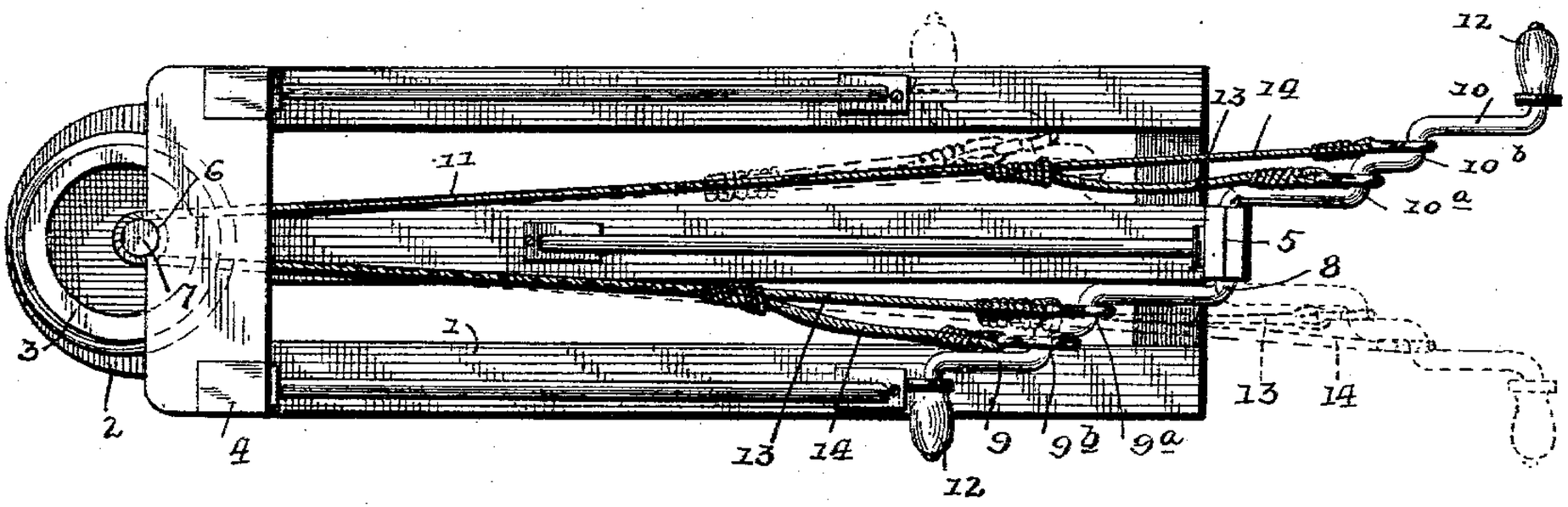



Fig. 2.

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# UNITED STATES PATENT OFFICE.

WILLIAM MONROE DRAKE AND WILBER POPE DRAKE, OF SALLISAW, INDIAN TERRITORY.

## CHURN.

SPECIFICATION forming part of Letters Patent No. 629,781, dated August 1, 1899.

Application filed December 15, 1898. Serial No. 699,366. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM MONROE DRAKE and WILBER POPE DRAKE, citizens of the United States, residing at Sallisaw, in the county of Sequoy, Cherokee Nation, Indian Territory, have invented a new and useful Churn, of which the following is a specification.

Our invention relates to churns, and particularly to those of the rotary-dasher type, and the object in view is to provide a simple and efficient construction of dasher-operating mechanism wherein the motion of a crank is communicated to a rotary dasher-staff.

The particular object in view is to provide such a connection between the operating-crank and the dasher-staff as to equalize the strain upon the sides of the connection and insure the accurate communication of power without the risk of slacking the connection sufficiently to allow it to slip upon the drum or spindle portion of the dasher-staff.

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 claims.

In the drawings, Figure 1 is a perspective view of a churn embodying operating mechanism constructed in accordance with our invention, showing the crank-arms in vertical positions. Fig. 2 is a plan view of the operating mechanism, showing the crank-arms in horizontal positions and indicating the same in diametrically opposite positions, respectively, in full and dotted lines.

Similar numerals of reference indicate corresponding parts in both figures of the drawings.

The supporting-frame of the churn-motor embodying our invention consists of a base 1, having a rest or platform 2 to support a churn-receptacle 3, and upright frames 4 and 5, rising from the base contiguous to its opposite ends, the former being provided with open-sided bearings 6, in which is mounted a rotary dasher-staff 7. Mounted in a bearing in the other upright frame 5 is an operating or cranked shaft 8, having terminal crank-arms 9 and 10 for connection by means of a belt or cord 11 with the dasher-staff, the intermediate portion of said connection being coiled to form a plurality of wraps around the dasher-staff. The crank-arms may terminate, as illustrated, in grips or handholds 12, and each of said arms is provided with a plurality of spindle portions arranged at different distances from the axis of the shaft. The proximate spindle portions $9^a$ and $10^a$ of the crank-arms are connected with the body or main portion of the belt or cord 11 by means of short belt or cord branches 13, and the remote spindle portions $9^b$ and $10^b$ of the crank-arms are connected with said main or body portion of the belt or cord 11 by means of long belt or cord branches 14.

The crank-shaft is arranged in a position axially perpendicular to the dasher-staff or the rotary spindle which is to receive motion from the crank-shaft, and when the crank-arms are in a position parallel with the axis of said driven spindle the long and short branches are taut. As the crank is turned in the direction indicated by the arrows in Fig. 1 toward the position illustrated in full lines in Fig. 2 the spindle portion $10^b$, through the long branch 14, applies the strain to the advancing or strained side of the connection 11, while the spindle portion $9^a$, through the branch 13, holds the returning side of the connection from becoming slacked. This is due to the fact that the spindle portion $10^b$ advances more rapidly, so far as actual distance is concerned, than the spindle portion $9^a$ recedes. Obviously the branch 13, which is connected to the spindle portion $10^a$, and the branch 14, which is attached to the spindle portion $9^b$, are slacked and rendered inoperative during this movement of the crank-shaft. After leaving the horizontal position (indicated in full lines in Fig. 2) the proximate spindle $9^a$ of the arm 9, through the branch 13, applies strain to the then-advancing side of the connection 11, and the reverse of the operation above described is otherwise accomplished. When, however, the parts have reached a position opposite to that indicated in Fig. 1—namely, with the arm 9 elevated and the arm 10 in a pendent position, the shaft being rotated in the same di-

rection as that above indicated—the remote spindle $9^b$, through the branch 14, will apply advance strain to the connected side of the belt or cord 11, while the spindle portion $10^a$, through the branch 13, attached thereto, will prevent too rapid slacking of the other or retreating side of the belt or cord. In this way the operative strain due to the motion of the crank-shaft is transferred from one branch to the other of the connection by the alternate effective movements of the spindle portions of the crank-arms, with the result that the belt or cord is permanently maintained in a taut or operative condition to prevent slipping thereof upon the driven spindle without the necessity of fastening the same thereto. By avoiding the fastening of the belt or cord to the driven spindle we are enabled to secure a greater number of rotations of said spindle for each complete revolution of the crank-shaft without winding the belt or cord upon said spindle to form a number of wraps upon each side of said point of connection necessary to allow the full stroke of the crank-shaft without affecting the connection. In other words, when the belt or cord is permanently attached at an intermediate point to the driven spindle said belt must be coiled upon the spindle above and below the point of connection to form a length of belt which is equal to the complete throw of each crank-arm from its point of nearest approach to the driven spindle to its point of greatest removal therefrom. Hence an important advantage of the construction described resides in the fact that by forming one complete wrap of the belt or cord around the driven spindle we are enabled to employ a driving-crank having arms of sufficient length to cause a plurality of complete revolutions of the driven spindle for each movement of the crank and without risking the slipping of the belt or cord by reason of the slacking thereof. The described arrangement of transferring spindles on the crank-arms maintains the belt or cord at both sides in a taut condition in all positions of said arms.

Various changes in the form, proportion, and the minor details of construction may 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—

1. The combination with a driven spindle, of a crank-shaft having oppositely-extending crank-arms provided with spindle portions located at different distances from the axis of rotation, and a flexible connection coiled upon said driven spindle at an intermediate point, and having terminal branches respectively connected to said spindle portions of the crank-arms, substantially as specified.

2. The combination with a driving-belt coiled at an intermediate point around a driven spindle, of an operating crank-shaft having oppositely-disposed crank-arms each provided with proximate and remote spindles, the spindles of each arm being independently connected with one end of the driving-belt, whereby the operative strain of the crank-arms, upon each side of the driving-belt, is transferred from one spindle to the other during the operation of the crank-shaft, 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.

WILLIAM MONROE DRAKE.
WILBER POPE DRAKE.

Witnesses:
W. T. GALYEAN,
F. M. TEMPLE.