R. B. DISBROW & C. M. CARLSON.

CHURN DRIVING MECHANISM.

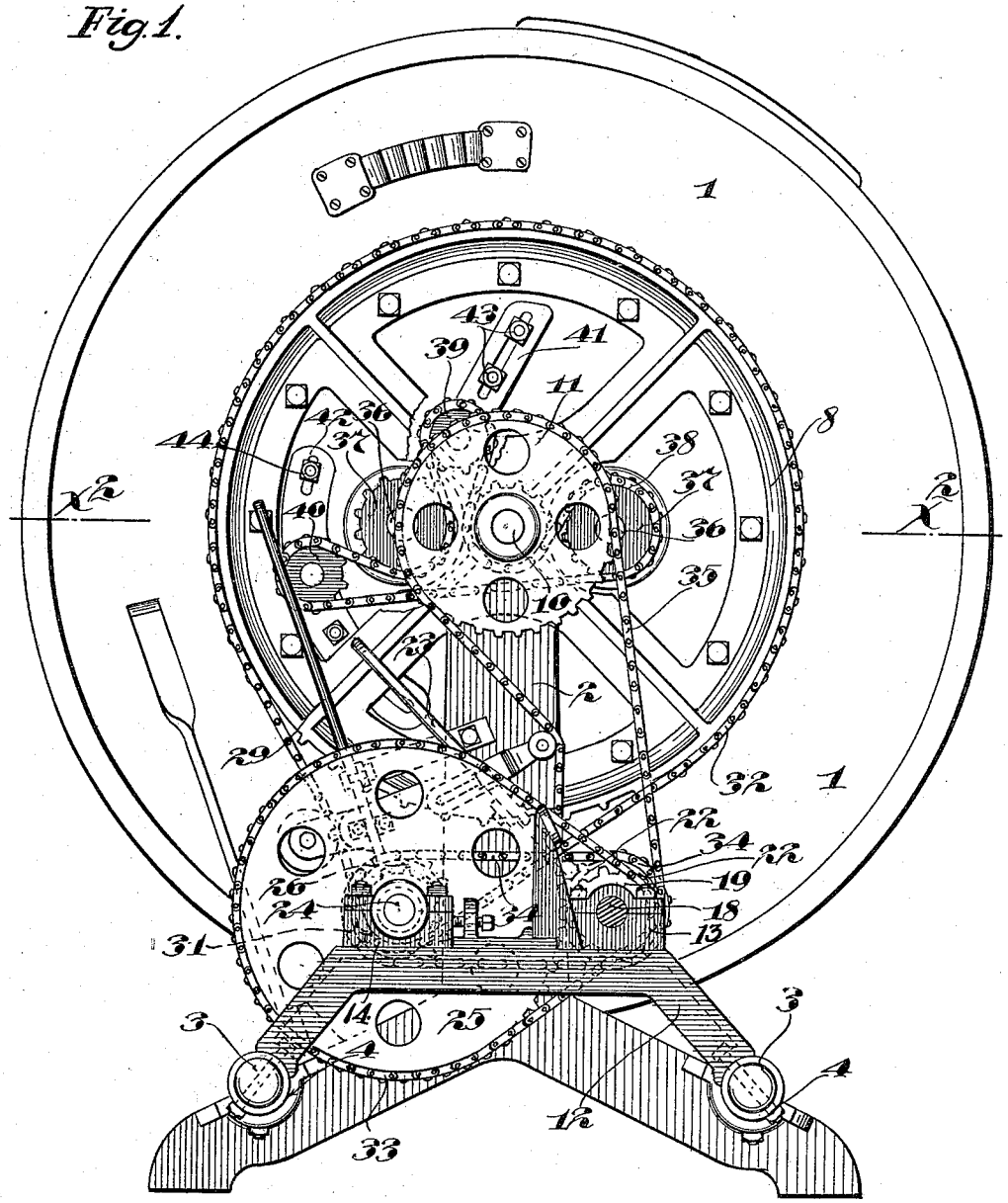
APPLICATION FILED AUG. 27, 1913.

1,146,480.

Patented July 13, 1915.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 2

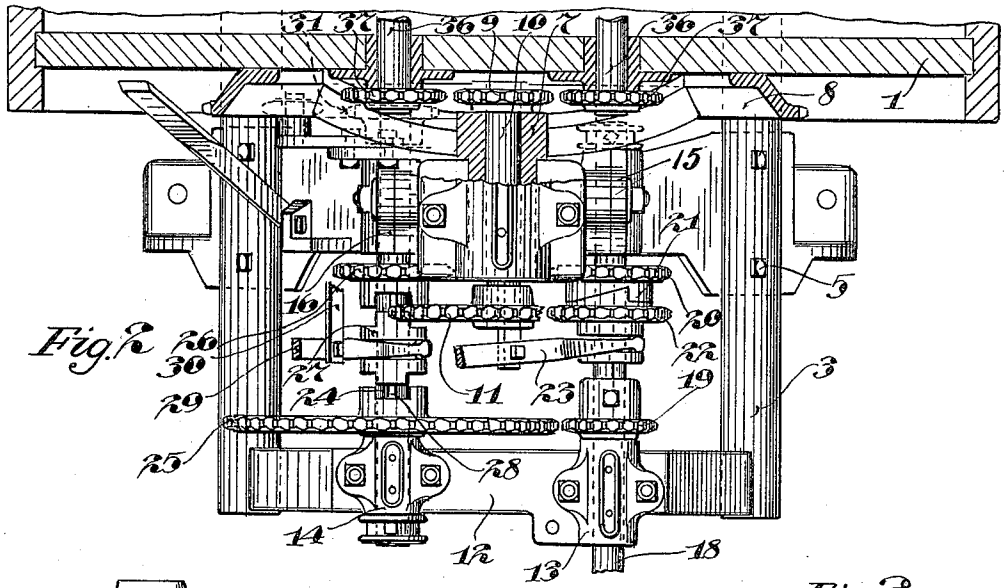


Fig. 4

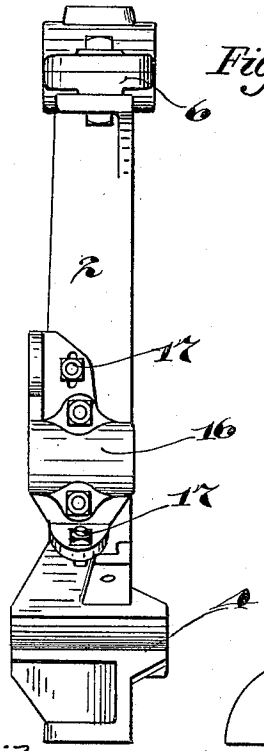
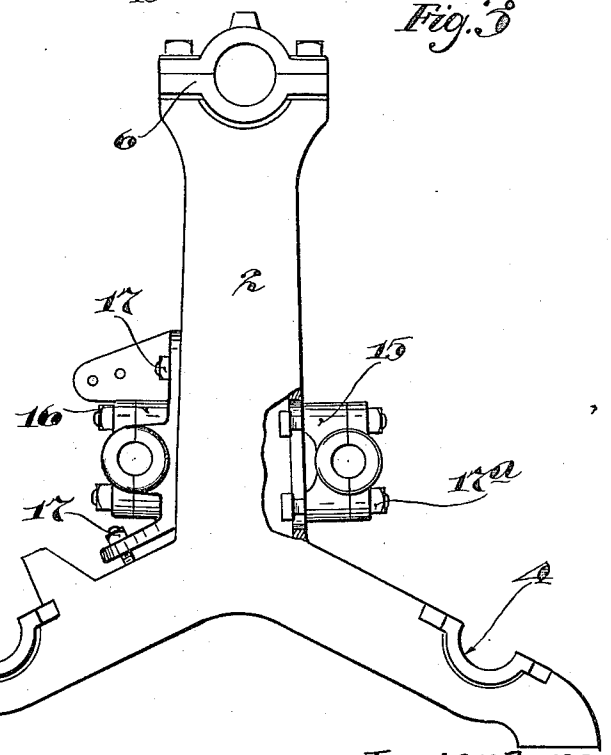


Fig. 3



Witnesses

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CHURN-DRIVING MECHANISM.

1,146,480. Specification of Letters Patent. Patented July 13, 1915.

Application filed August 27, 1913. Serial No. 786,915.

To all whom it may concern:

Be it known that we, REUBEN B. DISBROW and CARL M. CARLSON, citizens of the United States, residing at Owatonna, in the county of Steele and State of Minnesota, have invented certain new and useful Improvements in Churn-Driving Mechanism; and we 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.

Our invention relates to combined churns and butter workers, and has for its particular object the provision of an improved mechanism for driving the drum and the rollers within the drum, and to such ends, generally stated, the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

Particularly, this invention is designed as an improvement on the churn drive mechanism disclosed and broadly claimed in the Disbrow United States Patent No. 1,044,759, of date, November 19th, 1912, entitled "Driving mechanism."

In said prior patent, a novel arrangement of sprockets and chains is provided for driving the drum rollers from a driving sprocket located at the axis of rotation of the drum, and in our present application, we provide a modification of this churn drive, whereby the chain is given a more complete and better driving engagement with the driving and driven sprockets over which it runs. The invention also involves other features which will be hereinafter described and defined in the claims.

In the accompanying drawings which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings, Figure 1 is a view in side elevation showing the invention applied to a combined churn and butter worker; Fig. 2 is a section taken through the drum on the line x^2 x^2 on Fig. 1, the main portion of the drum being broken away, and showing in plan view our improved driving mechanism, some portions of which are broken away; Fig. 3 shows one of the drum supporting pedestals in side elevation; and Fig. 4 shows the pedestal looking at the same edgewise, or from the front of the churn.

The drum 1 which may be of the usual or any suitable construction, is provided with axially located trunnions journaled in suitable supporting pedestals, only one of these trunnions and one pedestal being shown. The pedestal 2, which is shown in the drawings, is of inverted Y-shape, the legs thereof being engageable with the floor or ground. Parallel tie bars 3, preferably in the form of wrought iron pipe, connect the pedestal 2 to the other pedestal, not shown, and the said pedestals are provided with approximately semi-cylindrical flanged seats 4 that receive the pipes 3. The pipes 3 are, as shown, rigidly secured to the flanges of the seats 4 by bolts 5, and they project in a direction away from the drum considerably beyond the pedestal 2. At its upper end, the pedestal 2 is provided with a divided shaft bearing 6 in which is journaled a heavy tubular drum trunnion 7 shown as cast integral with and forming a hub of a large sprocket wheel 8, the flange of which is rigidly bolted to the adjacent drum head. The tubular trunnion 7, at its inner end, is offset from the drum head to afford room for a sprocket 9 secured on the inner end of a short shaft 10 journaled in and extended through the tubular trunnion 7 and provided at its outer end with a sprocket wheel 11. The sprockets 9 and 11 and shaft 10 have coincident axes located on line with the projected axis of the drum 1.

A bridge bar 12 rests upon and is bolted, or otherwise rigidly secured to the projecting ends of the frame pipes 3. Bearing boxes 13 and 14 are rigidly secured on the bridge bar 12, the said bearing 14 being adjustable toward and from the bearing 13. Rigidly secured on the upright portion of the pedestal 2 are bearing boxes 15 and 16 that are axially alined, respectively, with the bearing boxes 13 and 14. The upright portion of the pedestal 2 is vertically tapered, and the bearing boxes 15 and 16 are rigidly but adjustably secured to the said pedestal, as shown, respectively by means of nut-equipped studs 17 and bolts 17^a.

The driving shaft 18 extends through and is journaled in the alined bearing boxes 13 and 15, and at its outer end is, in practice, provided with a pulley, not shown, but over which a power driven belt would run to impart rotation to the said shaft 18, and through the latter, to all of the running

parts of the machine, as will presently appear. Rigidly secured on the driving shaft 18 are sprockets 19 and 20. The sprocket 20 has a half clutch 21 that coöperates with a half clutch on a sprocket 22 that is normally free to rotate on the shaft 18 and to slide thereon. The sprocket 22 is adapted to be moved laterally to thereby engage its half clutch with the half clutch of the sprocket 21, or to disengage the same therefrom, and, as shown, this movement is adapted to be accomplished by a shipper lever 23 pivoted to a suitable projection from the pedestal 2. The sprocket 22 is in line with the sprocket 11 on the outer end of the shaft 10.

Journaled in the alined bearings 14 and 16, is a counter shaft 24, and on this counter shaft are loose sprockets 25 and 26, the former of which is much larger than the latter. A clutch hub 27 is mounted to slide on the counter shaft 24 between the sprockets 25 and 26, but is caused to rotate with said counter shaft by a key 28. This clutch hub 27 is provided on its opposite ends with half clutches that are arranged to be engaged, at will, with half clutches formed on the hubs of the sprockets 25 and 26. The clutch hub 27 is adapted to be moved into engagement with the hub of either of the said sprockets 25 and 26, at will, by means of a suitable shipper lever 29 journaled to a suitable projection 30 from the pedestal 2. On the extreme inner end of the counter shaft 24 is a small sprocket 31 that is located below but in the plane of the larger sprocket 8 on the drum 1. A sprocket chain 32 runs over the said sprockets 31 and 8. A sprocket chain 33 runs over the alined sprockets 19 and 25, a sprocket chain 34 runs over the alined sprockets 20 and 26. A sprocket chain 35 runs over the alined sprockets 22 and 11.

In combined churn and butter workers of the type shown in our prior patent, above identified, coöperating working rollers are provided within the drum and are located eccentric to the axis of the drum, usually equi-distant from the walls of the drum and at diametrically opposite points. However, this exact location of the rollers may be varied. In the drawings, the said rollers are not shown, but their shafts 36 are shown, and these project through suitable bearings in the drum head and are provided at their outer ends with sprockets 37. The sprockets 37 are located in the plane of the sprocket 9 and the roller shafts 36 are driven from the shaft 10, through a sprocket chain 38 that runs over the driving sprocket 9, over the driven sprockets 37 and also over two idle guide wheels 39 and 40. The idle guide wheels 39 and 40 are preferably in the form of sprockets and they are journaled to supporting brackets 41 and 42 that are adjustably secured to the adjacent drum head, by suitable nut-equipped bolts 43 and 44. The adjustments of the brackets 41 and 42 permit adjustments of the sprockets 39 and 40, necessary to keep the slack of the driving chain 38 always taken up. By the above novel arrangement of the guide wheels or sprockets 39 and 40, the chain is given very good engagement with or travel around the driving sprocket 9 and driven sprockets 37. By reference to Fig. 1, it will be noted that the said chain passes half way around the driving sprocket 9, approximately half way around the left hand driven sprocket 37 and about two-thirds way around the other driven sprocket 37. This is a much better driving connection than was attained in the sprocket and chain drive disclosed in my said prior patent.

The operation is probably obvious from the foregoing description but may be briefly summed up as follows: The driving shaft 18 is a continuously driven shaft, so that the sprockets 19 and 20, through the chains 33 and 34, will continuously drive the sprockets 25 and 26, the said sprocket 25, however, on account of its size, being driven at a much higher rate of speed than the sprocket 26. By shifting the clutch hub 27, it is, therefore, evident, that the counter shaft 24 may, at will, be driven at a relatively slow speed from the sprocket 25, or at a relatively high speed from the sprocket 26. The drum 1 is driven from the counter shaft 24 through the sprockets 31 and 8, through the sprocket chain 32, and hence, may, at will, be driven either at high or low speed.

The roller shafts 36, and, consequently, the rollers, not shown, are driven through the sprockets 22 and 11 and sprocket chain 35, and through the above fully described sprocket and chain drive, which includes the sprocket chain 38. The rollers will be driven from the driving shaft 18, however, only when the half clutch of the sprocket 22 is engaged with the half clutch of the sprocket 20. Hence, the rollers may be driven or run, as desired, while the drum is being rotated either at high or low speed. This adapts the machine for use both in churning and in working butter. When the clutch hub 27 is in an intermediate position shown in Fig. 2, the drum will not be rotated.

What we claim is:

1. The combination with a rotary body and means for rotating the same, of a pair of driven sprockets journaled to and carried by said rotary body and located on opposite sides of the axis thereof, a driving sprocket having its axis co-incident with the axis of the rotation of said body, a pair of idle guide wheels journaled to said rotary body and located adjacent to one of said driven sprockets, nearly diametrically opposite each other, the said sprockets and guide wheels being located in the same plane, and

a single sprocket chain passed over the said driving and driven sprockets and guide wheels, on a line extending from said axially located driving sprocket, first to one of said driven sprockets, thence to one of said guide wheels, thence to the other driven sprocket, thence over the other guide wheel, and thence back to said driving sprocket.

2. The combination with a rotary body and means for rotating the same, of a pair of driven sprockets journaled to and carried by said rotary body and located on opposite sides of the axis thereof, a driving sprocket having its axis co-incident with the axis of the rotation of said body, a pair of idle guide wheels journaled to said rotary body and located adjacent to one of said driven sprockets, nearly diametrically opposite each other, the said sprockets and guide wheels being located in the same plane, and a single sprocket chain passed over the said driving and driven sprockets and guide wheels, on a line extending from said axially located driving sprocket, first to one of said driven sprockets, thence to one of said guide wheels, thence to the other driven sprocket, thence over the other guide wheel, and thence back to said driving sprocket, one of said guide wheels being adjustable on said rotary body to take up the slack of said chain.

3. The combination with a rotary body and means for rotating the same, of a pair of driven sprockets journaled to and carried by said rotary body and located on opposite sides of the axis thereof, a driving sprocket having its axis co-incident with the axis of the rotation of said body, a pair of idle guide wheels journaled to said rotary body and located adjacent to one of said driven sprockets, nearly diametrically opposite each other, the said sprockets and guide wheels being located in the same plane, and a single sprocket chain passed over the said driving and driven sprockets and guide wheels, on a line extending from said axially located driving sprocket, first to one of said driven sprockets, thence to one of said guide wheels, thence to the other driven sprocket, thence over the other guide wheel, and thence back to said driving sprocket, both of said guide wheels being adjustable on said rotary body to take up the slack of said chain at different points.

In testimony whereof we affix our signatures in presence of two witnesses.

REUBEN B. DISBROW.
CARL M. CARLSON.

Witnesses:
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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."