

June 7, 1932.

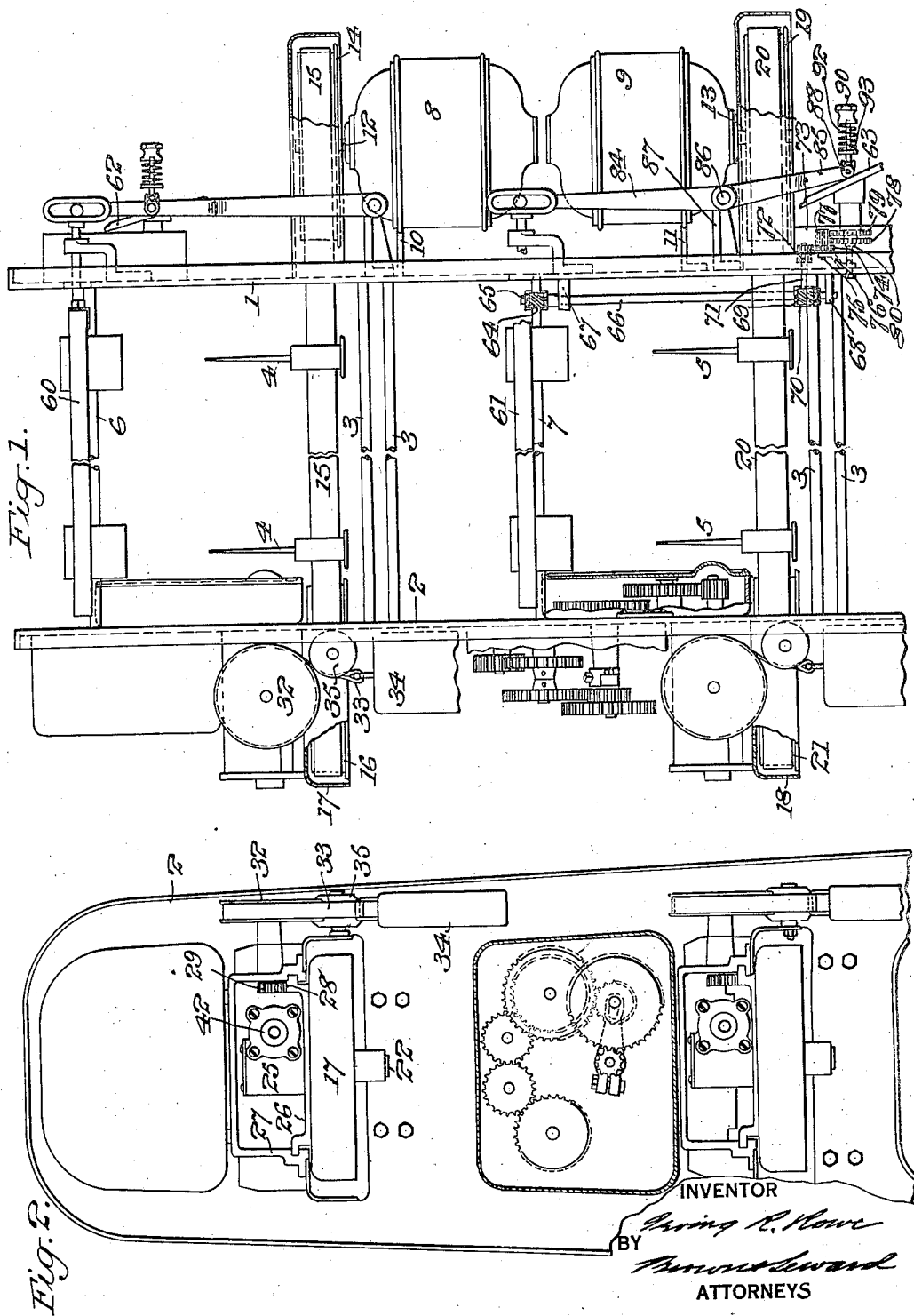
I. R. ROWE

1,862,162

DRIVING MECHANISM FOR SPINNING AND TWISTING MACHINES

Filed Jan. 28, 1931

3 Sheets-Sheet 1



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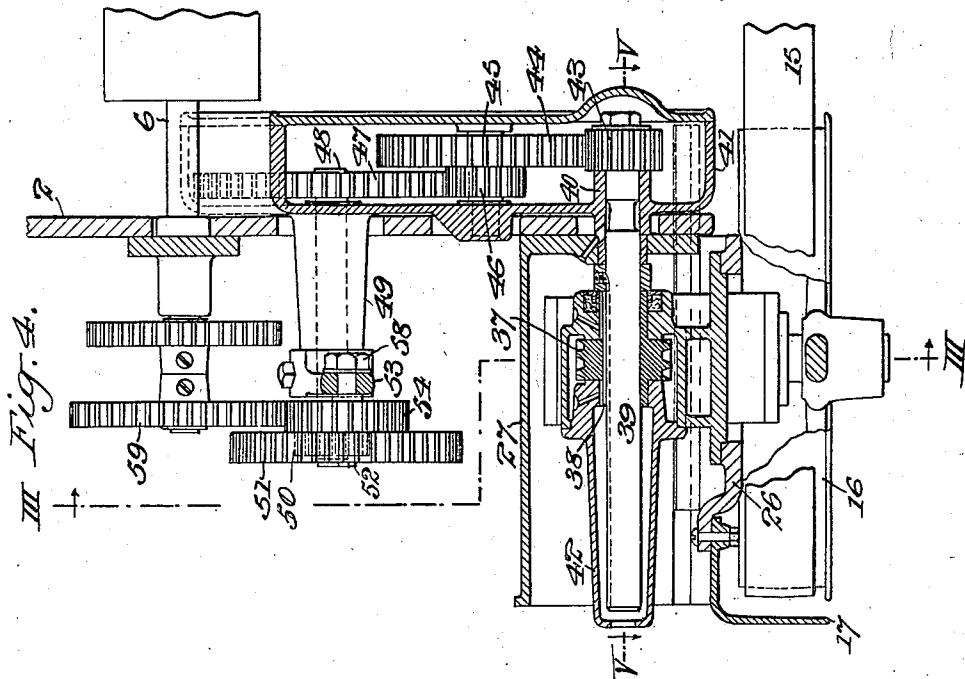
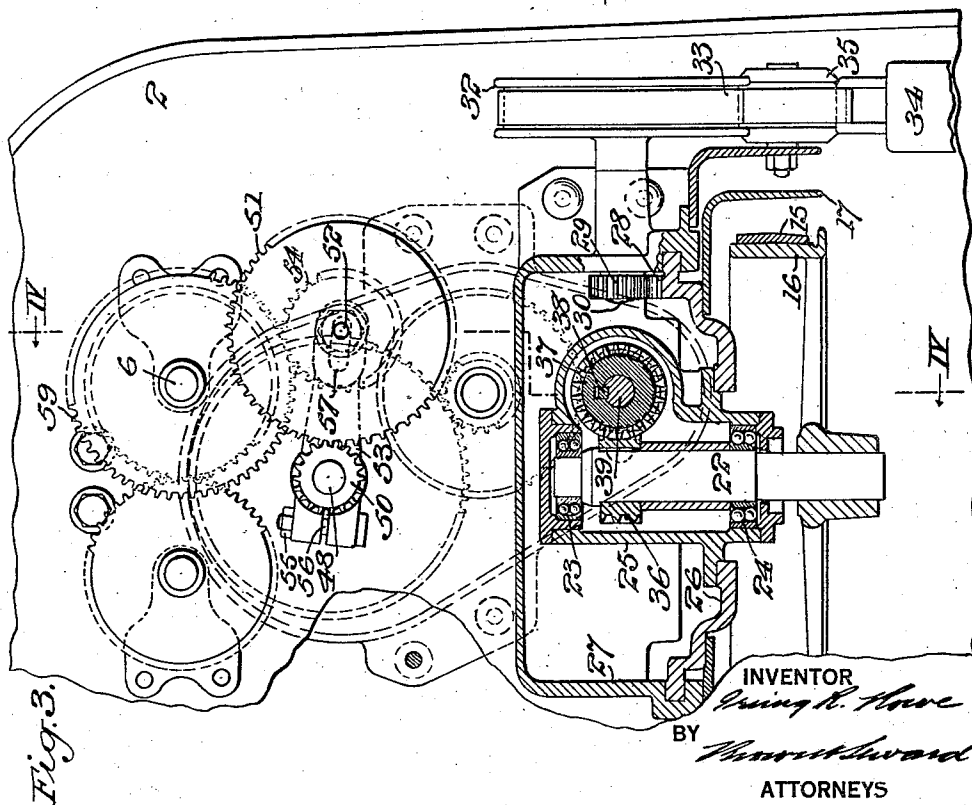
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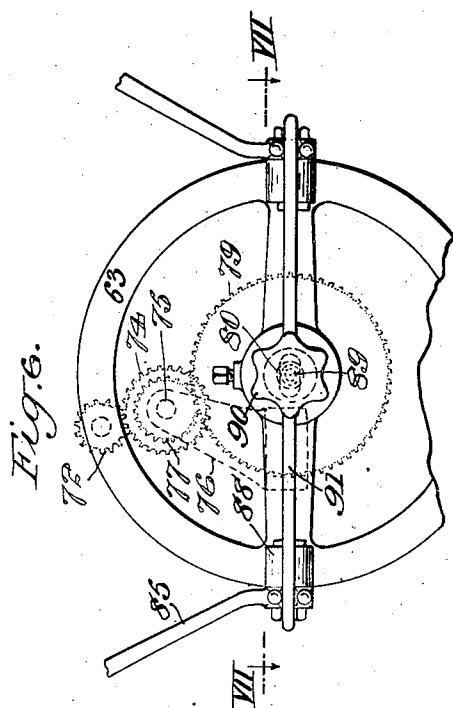
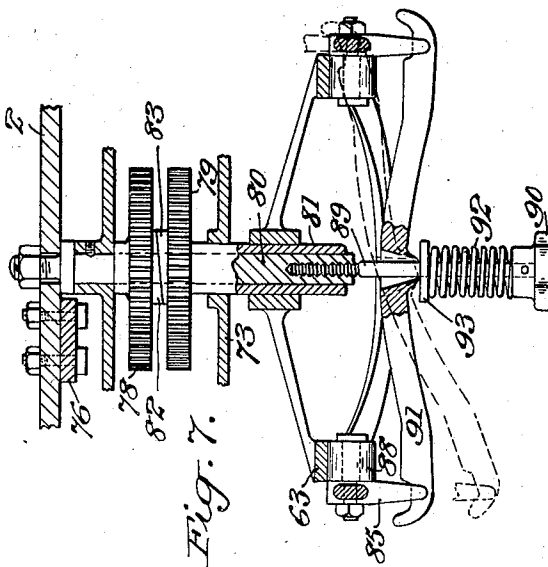
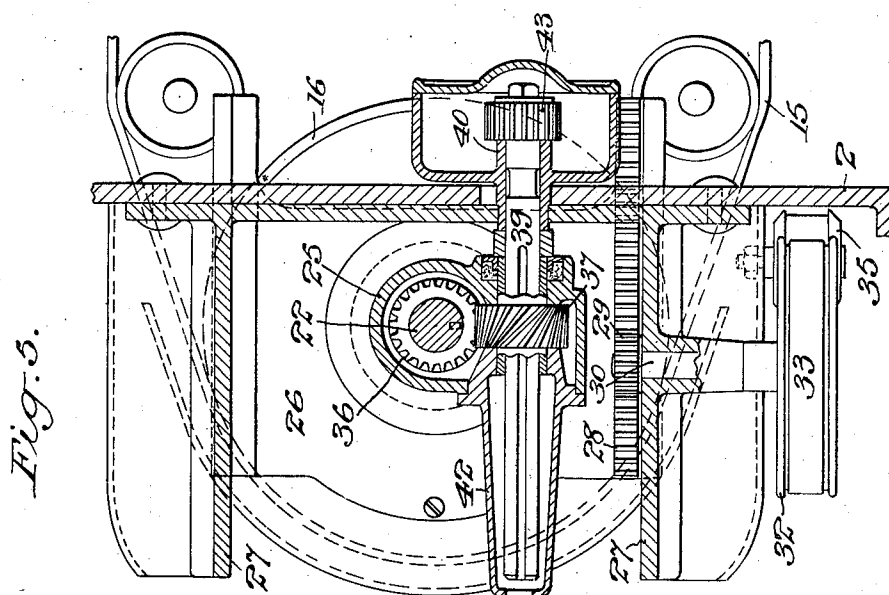
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DRIVING MECHANISM FOR SPINNING AND TWISTING MACHINES

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3 Sheets-Sheet 3



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DRIVING MECHANISM FOR SPINNING AND TWISTING MACHINES

Application filed January 28, 1931. Serial No. 511,786.

One feature of this invention resides in the improvements in the driving mechanism to be hereinafter described and claimed, whereby the belt take-up pulley of the belt tension mechanism is utilized for driving the take-up mechanism.

Another feature of this invention resides in the improvements in the traverse mechanism to be hereinafter described and claimed, whereby the construction, form and arrangement of the several parts of the twist mechanism are materially simplified.

A practical embodiment of this invention is represented in the accompanying drawings, in which

Fig. 1 represents in detail side elevation, partly in section, a spinning and twisting machine embodying this invention;

Fig. 2 represents a detail rear end view, partly in section, of the machine;

Fig. 3 represents a transverse vertical section taken in the planes of the line III—III of Fig. 4, looking in the direction of the arrows;

Fig. 4 represents a longitudinal vertical section taken in the planes of the line IV—IV of Fig. 3, looking in the direction of the arrows;

Fig. 5 represents a longitudinal horizontal section taken in the plane of the line V—V of Fig. 4, looking in the direction of the arrows;

Fig. 6 represents a detail face view of the traverse operating cam mechanism; and

Fig. 7 represents a detail longitudinal section taken in the plane of the line VII—VII of Fig. 6.

In the accompanying drawings I have shown a spinning or twisting machine in which separate direct electric motor drives are provided for the upper and lower decks of spindles and their take-up mechanisms, said drives comprising broadly upper and lower electric motors and their spindle driving means and more specifically comprising the mounting of the electric motors in vertical alinement on the front end frame exterior thereto and between the upper and lower decks of spindles.

The frame of the machine includes the

front end frame 1 and the rear end frame 2, which frames are suitably connected by the longitudinal spacing bars 3. The frame is shown as supporting upper and lower decks of spindles 4 and 5, respectively. The winding roll shaft for the upper take-up mechanism is denoted by 6 and the winding roll shaft for the lower take-up mechanism by 7.

The direct motor drive for the upper and lower decks of spindles and their take-up mechanisms comprises upper and lower electric motors 8 and 9, respectively, mounted on the machine frame exterior to the front end thereof. In the present instance these motors are shown as being carried by upper and lower brackets 10 and 11, respectively, projecting outwardly from the front end frame 1. These motors are located between the upper and lower decks of spindles in vertical alinement and in close proximity to each other, the upper motor 8 having its shaft 12 projecting a short distance upwardly beyond the motor and the lower motor 9 having its shaft 13 projecting a short distance downwardly beyond the motor.

The short upwardly projecting shaft 12 of the upper member is provided with a pulley 14 which drives the belt 15. This belt in turn drives the upper deck of spindles 4. Similarly the short downwardly projecting shaft 13 of the lower motor 9 is provided with a pulley 19 which drives the belt 20. This belt in turn drives the lower deck of spindles 5.

The rear end of the belt 15 passes around a pulley 16 of the upper belt tension mechanism, which pulley is provided with a suitable guard 17. Similarly the rear end of the belt 20 passes around the pulley 21 of the lower belt tension mechanism, which pulley is provided with a suitable guard 18.

As the upper and lower belt tension mechanisms are constructed, arranged and operated in the same manner, the upper belt tension mechanism only will be specifically described.

The upper belt tension pulley 16 is carried by a vertical shaft 22 which is hung in suitable upper and lower bearings 23 and 24, respectively, carried by the upper member 25 of a support, the lower member 26 of which is longitudinally slidable in a housing 27 and

carries the pulley guard 17. Tension is applied to the belt 15 through its pulley 16, shaft 22 and sliding support by means of a longitudinally disposed rack 28 on the member 26, which rack is engaged by a pinion 29 carried by the inner end of a cross shaft 30 mounted in suitable bearings in the side of the housing 27, the outer end of which cross shaft is provided with a pulley 32 to which is attached one end of a strap 33, the other end of which strap is attached to a weight 34. This strap 33 is guided in its movement by an idler pulley 35.

The means for driving the upper winding roll shaft 6 of the upper take-up mechanism from the belt tension pulley 16 is constructed, arranged and operated as follows:

The vertical shaft 22 of the belt pulley 16 is provided at its upper end within the member 25 of the sliding support with a spiral gear 36 which meshes at all times with a spiral gear 37 which is slidably interlocked by means of a spline 38, with a rearwardly projecting shaft 39, said shaft being rotatably mounted in suitable bearings in a hub 40 of the gear casing 41 secured to the rear end frame 2 of the machine. A suitable guard 42 carried by the upper member 25 of the slidable support surrounds the shaft 39.

This shaft 39 is provided with a pinion 43 within the gear casing 41, which pinion meshes with a gear 44 rotatably mounted on a stud shaft 45 carried by the gear casing 41. A pinion 46 is rotatably mounted on the stud shaft 45 and fixed to the gear 44, which pinion 46 meshes with a gear 47 carried by the inner end of a shaft 48 within the gear casing 41, which shaft is mounted in suitable bearings in a hub 49 projecting rearwardly from the gear casing 41 through the rear end frame 2. The rear end of this shaft 48 is provided with a pinion 50 which meshes with a gear 51 rotatably mounted on a stud shaft 52 carried by an arm 53 which is rotatably adjustable on the hub 49 about the axis of the shaft 48. A gear 54 which is also rotatably mounted on the stud shaft 52 is fast to the gear 51. The arm 53 may be adjusted rotatably to any position and there secured as, for instance, by the bolt and nut 55, 56. The stud shaft 52 is radially adjustable along a slot 57 in the arm 53 and may be secured in its proper adjustment by the nut 58. The gear 54 meshes with a gear 59 fast on the upper winding roll shaft 6.

A change gear arrangement may be provided between the shaft 6 and the shaft 48 as, for instance, by making the gears 51 and 54 on the stud shaft 52, change gears.

Proceeding to describe the upper and lower traverse mechanisms, the upper traverse bar is denoted by 60 and the lower traverse bar by 61. Their respective cams are denoted by 62 and 63. These traverse cams are each

adapted to impart a reciprocating motion to two traverse bars.

As both of the traverse cams are driven from their winding roll shafts by quite similar means except for a slight modification in the driving of the lower traverse cam, one only of these mechanisms will be specifically described, namely, the lower one.

The lower winding roll shaft 7 is provided at its front end just inside the front end frame 1 with a spiral gear 64 which meshes with a spiral gear 65 on the upper end of a vertical shaft 66 rotatably mounted in suitable brackets 67, 68 projecting rearwardly from the front end frame 1. The lower end of this shaft 66 is provided with a spiral gear 69 which meshes with a spiral gear 70 on the rear end of a short rotary shaft 71, the front end of which shaft is provided with a pinion 72 located within a gear casing 73. This pinion 72 meshes with a gear 74 rotatably mounted on a stud shaft 75 carried by a bracket 76. A wide face pinion 77 fast to the gear 74 meshes with two gears 78 and 79. These gears are mounted as follows:

An axle 80 projects forwardly from the front end frame 1, on which axle the gear 78 is loosely mounted against longitudinal movement thereon. The gear 79 is also loosely mounted on the axle 80, which gear is provided with a hub 81 which carries the cam 63. This gear 79 and the cam 63 are permitted a limited longitudinal movement on the axle 80. The outer face of the gear 78 is provided with a cam 82 which engages a cam 83 carried on the inner face of the gear 79 as one of these gears 78 or 79 is provided with a lesser number of teeth than the other gear and, as both of these gears are meshed with the wide face pinion 77, one of the gears 78, 79 will travel faster than the other gear, thereby causing the cams 82 and 83 to travel on each other and thereby constantly change the position of the cam 63 bodily.

The lever for reciprocating the lower traverse bar 61 comprises an uprising arm 84 and a depending arm 85, said lever being pivoted at 86 to a bracket 87 projecting forwardly from the front end frame 1. The lower arm 85 of this lever is provided with a stud or roller 88 arranged to engage the face of the traverse cam 63. The means which is shown for holding the stud or roller 88 against the face of the cam and for yieldingly holding the cam at the limit of its rearward bodily movement to keep the cams 82 and 83 of the gears 78 and 79 in engagement with each other, is constructed, arranged and operated to take care of the traverse bar reciprocating levers for both sides of the machine as follows:

A pin 89 is screw-threaded into the outer end of the axle 80, which pin is provided at its forward end with a suitable handle 90 for turning the pin in the said axle. A yoke

91 is loosely mounted on the pin 89, the free ends of which yoke engage the depending arms 85 of the traverse bar reciprocating levers. A tension spring, in the present instance a coil spring 92, is interposed between the yoke 91 and the handle 90 of the pin 89, pressing the yoke yieldingly inwards along the pin 89, a wearing plate 93 being preferably provided between the inner end of the spring and the yoke. It will be seen that the tension of this spring 92 may be readily adjusted to obtain the required pressure by screwing the pin 89 inwardly or outwardly.

The only difference in the traverse cam mechanism for the upper traverse bars 60 is that the upper winding roll shaft 6 carries the pinion 72, the vertical shaft 66 and its gear connections being unnecessary.

From the above description it will be seen that the machine is well balanced as to weight by the mounting of the motors and traverse cam mechanisms on the front end frame, and a mounting of the belt tension mechanisms and their driving connections with the twist mechanisms on the rear end frame. This arrangement leaves the spindle space between the end frames quite free and clear.

Furthermore, it will be seen that novel means have been provided whereby each of the winding roll shafts and its traverse cam shaft, is driven from the belt tension pulley and whereby a change speed mechanism may be readily included for securing the desired speeds in a very simple and effective manner.

Novel means have also been provided whereby the traverse mechanism may be driven from the winding roll shaft of the take up mechanism at the front end of the machine by very simple and effective mechanisms.

It is obvious that various changes may be resorted to in the form, construction and arrangement of the several parts without departing from the spirit and scope of my invention; and hence, I do not intend to be limited to the details herein shown and described except as they may be included in the claims.

What I claim is:

1. In a spinning and twisting machine, a belt driving motor and a traverse cam both carried by the front end frame, a belt tension pulley, its shaft, a longitudinal reciprocating support therefor, a winding roll shaft extending between the end frames, a gear connection between the tension pulley and winding roll shaft at the rear end frame, and a gear connection between the winding roll shaft and traverse cam shaft at the front end frame.

2. In a spinning and twisting machine, a belt driving motor and a traverse cam both carried by the front end frame, a belt tension pulley, its shaft, a longitudinal reciprocating support therefor, a winding roll shaft extend-

ing between the end frames, a gear connection, including a change gear, between the tension pulley and winding roll shaft at the rear end frame, and a gear connection between the winding roll shaft and traverse cam shaft at the front end frame.

3. In a spinning and twisting machine, a winding roll shaft, a traverse cam shaft, and a train of gears operatively connecting the two shafts at the front end frame of the machine, said train of gears including a vertically disposed shaft mounted along the inner side of the front end frame.

4. In a spinning and twisting machine, a spindle driving belt, a belt tension pulley and its shaft, a longitudinal reciprocating support therefor, a fixedly mounted longitudinally disposed rotary shaft, a sliding gear connection between said shafts, a winding roll shaft, and a gear connection between said fixedly mounted shaft and said winding roll shaft.

5. In a spinning and twisting machine, a spindle driving belt, a belt tension pulley and its shaft, a longitudinal reciprocating support therefor, a fixedly mounted longitudinally disposed rotary shaft, a sliding gear connection between said shafts, a winding roll shaft, and a gear connection, including a change gear, between said fixedly mounted shaft and said winding roll shaft.

In testimony, that I claim the foregoing as my invention, I have signed my name this 26th day of January, 1931.

IRVING R. ROWE.