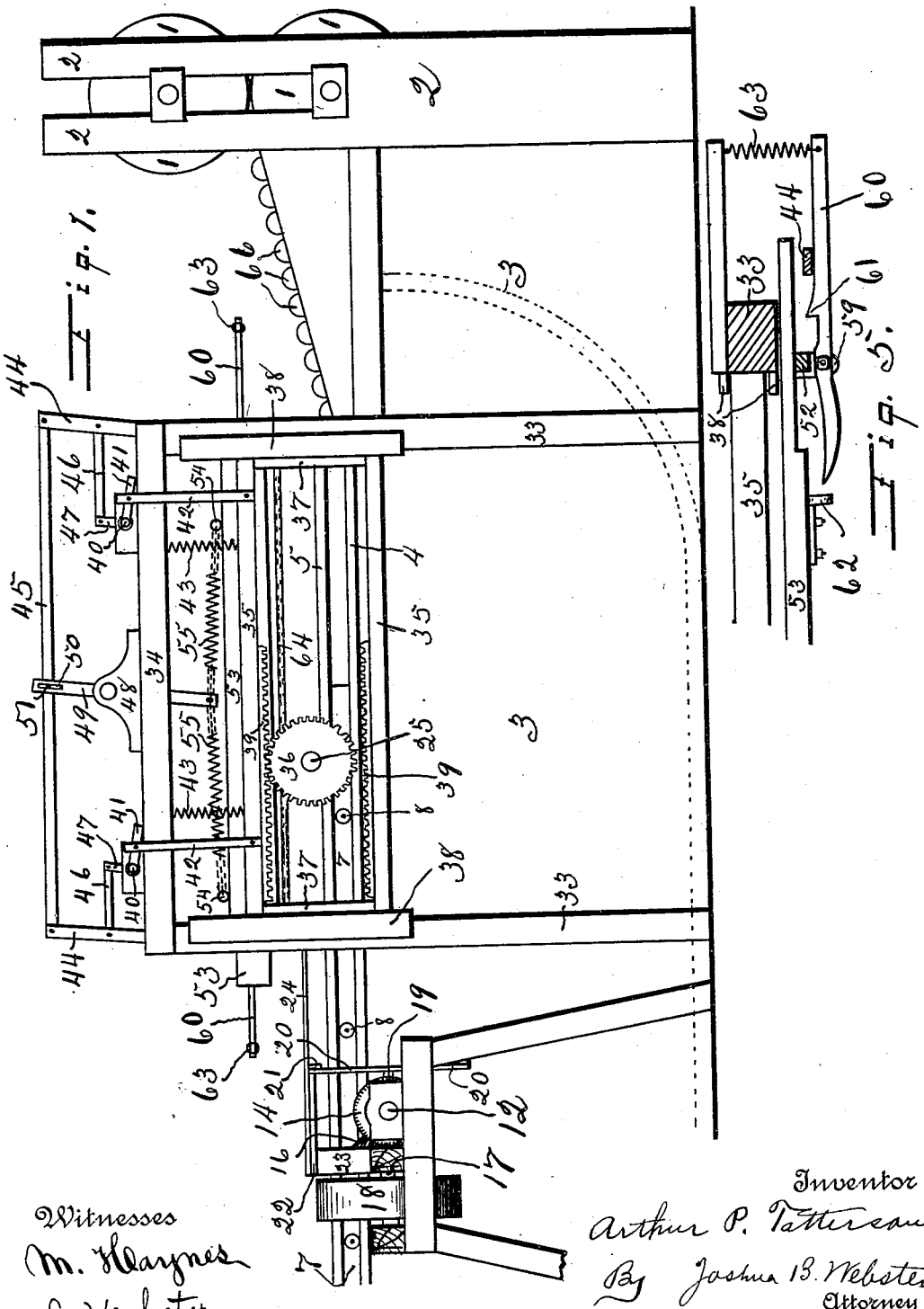
No. 648,641. Patented May 1, 1900.

A. P. TATTERSON.

FORKING, ELEVATING, AND CONVEYING MACHINE.

(Application filed Nov. 29, 1899.)

(No Model.) 3 Sheets—Sheet 1.



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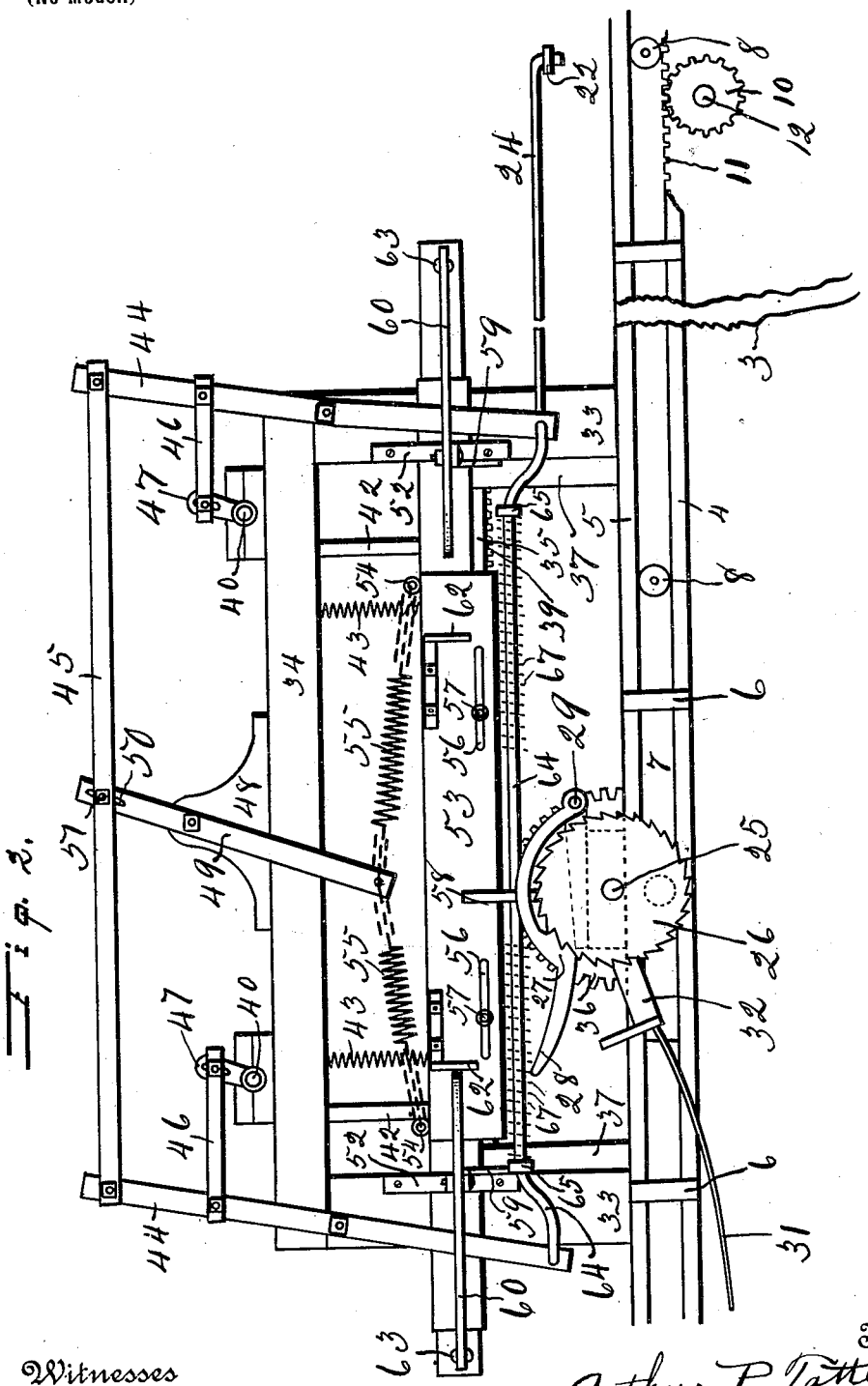

Fig. 2.

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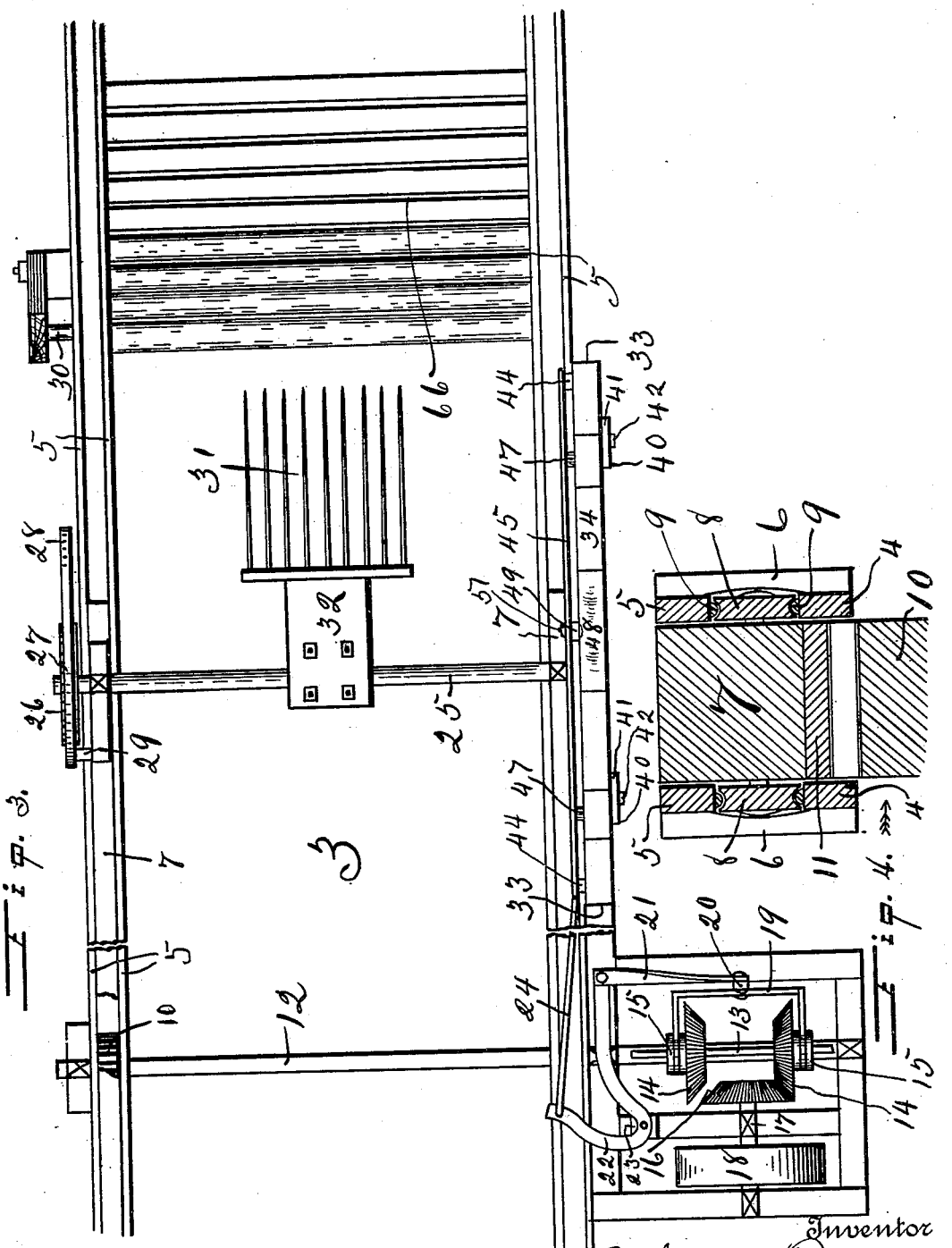

Fig. 3.

Fig. 4.

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UNITED STATES PATENT OFFICE.

ARTHUR P. TATTERSON, OF STOCKTON, CALIFORNIA.

FORKING, ELEVATING, AND CONVEYING MACHINE.

SPECIFICATION forming part of Letters Patent No. 648,641, dated May 1, 1900.

Application filed November 29, 1899. Serial No. 738,681. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR P. TATTERSON, a citizen of the United States, residing at Stockton, in the county of San Joaquin and State of California, have invented certain new and useful Improvements in Forking, Elevating, and Conveying Machines; and I do 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to certain improvements in forking, elevating, and conveying machines, such as are used more particularly for manipulating wool during the washing process; and my object is to furnish a machine which will effectually operate upon wool while in the washing tub or vat, forking or stirring, conveying, and elevating said wool from said tub or vat by mechanical means automatically. This I accomplish by the use of a fork suitably attached to a shaft and set in a frame and adapted to revolve vertically in an imaginary elliptical figure, suitable shafts and pulleys, and such other devices and combination of devices, as will be more fully set forth in the following specification and pointed out in the claims hereunto annexed, reference being had to the accompanying drawings for a better understanding hereof, in which—

Figure 1 represents a front side elevation of my machine, showing the fork-manipulating gear in engagement with the shifting rack. Fig. 2 is a reverse view of the same. Fig. 3 is a top view of the same, and Fig. 4 is a sectional view of one side of the carriage which supports the fork-shaft.

Similar figures of reference indicate corresponding parts in the several views.

1 designates the wringing-rolls of a wool-washing vat or tub 3, which are mounted and journaled in suitable bearings 2, which are rigidly located on the sides of a tub or vat 3 of any desired size and pattern. On either side of said tub or vat 3 I arrange a double track composed of the lower rails 4, suitably secured to the sides of the tub or vat 3 at the desired distance apart, and the rails 5, which are located immediately above said rails 4 and attached thereto by ribs 6, rigidly attached at suitable intervals to the outer edges of said rails, as shown in Fig. 4. Between the rails 4 is located a carriage 7, which is arranged longitudinally therewith and provided at intervals on either side thereof with trucks or pulleys 8, which engage with metallic tracks 9, rigidly attached to the rails 4 and 5 aforesaid. These carriages 7, being located on opposite sides of the tub or vat 3, are operated simultaneously by means of cog-wheels 10, which engage with cog-racks 11, rigidly located on the under side of said carriages 7. The wheels 10 are rigidly mounted on a shaft 12, which is arranged transversely beneath the said carriages and journaled on the tub or vat or any suitable frame adjacent thereto. One end of the shaft 12 extends beyond the side of the tub or vat 3, as the front side, and is supported on suitable bearings and provided with a feather 13 in the side thereof, as shown in Fig. 3. Two opposing bevel gear-wheels 14, having grooved hubs 15 rigidly attached thereon, are inserted on the said shaft 12 and adapted to alternately engage with a similar bevel gear-wheel 16, which is rigidly attached to a shaft 17, arranged at right angles to the shaft 12, which shaft 17 is suitably journaled on a frame and provided with a pulley 18, to which any suitable power may be communicated to impart motion thereto. The bevel gear-wheels 14 are maintained at a uniform distance from each other and operated by a yoke 19, whose ends comprehend the grooved hubs 15 of said wheels 14. A vertically-disposed lever 20 is fulcrumed on the frame and pivotally attached at a suitable point on said yoke 19 near the center of said lever 20. The upper end of the lever 20 has a connecting-rod 21 attached thereto, whose other end is attached to one end of an elbow 22, horizontally disposed, which is pivotally attached at its angle to a lug 23, mounted on the frame. The free end of the elbow has a connecting-rod 24 attached thereto for the purpose as will be shown.

A shaft 25 is arranged transversely of the tub or vat 3, with one end journaled on each of the carriages 7. The rear end of said shaft 25 has a ratchet-wheel 26 rigidly attached

thereto, said wheel 26 being provided with a pawl 27, which has a forwardly-extending arm 28, adapted to engage therewith. The pawl 27 is pivotally attached to a lug 29, rigidly mounted on the journal-bearing adjacent thereto. The arm 28 has its free end slightly curved upward and is adapted to engage with a lug 30, which is adjustably attached to the side of the vat 3 at a suitable point thereon.

The shaft 25 has a fork 31, provided with a suitable number of tines and a suitable handle 32, attached rigidly near the center thereof for the purpose as will be shown.

The front end of the shaft 25 has a cog-wheel 36 of ordinary pattern rigidly attached thereon in the usual manner.

A frame composed of the vertical posts 33 and cap 34 is rigidly arranged on and attached to the front side of the vat 3 at a suitable point thereon longitudinally. A vertically-operating shifting rack or frame, composed of the longitudinal bars 35, arranged above and below the cog-wheel 36, and the vertical end bars 37, rigidly attached to and connecting the ends of said bars 35 and adapted to rest within the confines of the posts 33, where said frame is adapted to operate, is maintained in its position between the said posts 33 by cleats 38, rigidly attached to the sides of said posts 33. The aforesaid shifting frame 35 37 is provided with cog-racks 39 for a suitable distance on the opposing faces of the bars 35, at the left-hand end thereof, or the end remote from the wringing-rolls 1. Two or more rock-shafts 40 are journaled on the cap 34 and provided with horizontally-disposed cranks or arms 41, to each of which a vertically-disposed connecting-arm 42 is pivotally attached at one end and has its other end attached to the upper bar 35, wherewith said frame 35 37 is shifted and supported, together with two spiral springs 43, which are attached to the cap 34 and bar 35. On the inner sides of the posts 33, near the top ends thereof, two vertically-disposed levers 44 are pivotally attached. The upper ends thereof are adapted to extend above the cap 34, whereupon said levers 44 are connected by a bar 45. At a suitable point on the said levers 44 two bars 46 are pivotally attached, one on each lever, each being adapted to extend inwardly and each respectively adapted to pivotally engage with two crank-arms 47, one of each of which are rigidly attached to the inner end of each of the shafts 40 and disposed in a vertical manner. At or near the center of the cap 34 a lug 48 is rigidly attached, which has a vertically-disposed actuating-lever 49 pivotally attached at a suitable point thereon, the upper end of said lever 49 being provided with a slot 50, with which and a suitable bolt 51 said lever 49 is pivotally attached to the bar 45. I attach cleats 52 one on the inner side of each of the posts 33 about midway between the carriage 7 and the cap 34, said cleats 52 being adapted to comprehend and maintain in position a sliding bar 53, which is adapted to operate horizontally therein. The said sliding bar 53 has two eyes 54, rigidly attached to the top side thereof, one near either end, to which two spiral springs 55 are flexibly attached at one end, the other ends of said springs 55 being similarly attached to the lower end of the lever 49.

The bar 53 is provided with two slots 56, arranged horizontally therein, one about one-third the length of said bar from either end thereof. In each of the slots 56 a bolt 57 is adjustably attached and adapted to be engaged by a vertically-disposed finger 58, which is rigidly attached to one of the journal-bearings of the shaft 25.

On each of the posts 33 a lug 59 is rigidly attached, on which a clutch or retaining-lever 60 is pivotally secured, said clutch or retaining-lever 60 being provided with a lug or tooth 61 on its inner side, which is adapted to engage with the levers 44, as hereinafter described. The inner ends of the said clutches or retaining-levers 60 are curved, as shown in Fig. 5, and adapted to engage with trip-lugs 62, which are attached at a suitable point on the bar 53. The outer ends of the clutches or retaining-levers 60 have suitable springs 63 arranged transversely therewith, with one end attached thereto and having their other ends attached to the frame 33 34 for the purpose of pressing said clutches in engagement with the levers 44. A rod 64 is flexibly attached to and connects the lower ends of the levers 44 for the purpose of maintaining the lower ends of said levers 44 more rigidly in position. Said rod 64 may be provided with a lug or collar 65, rigidly located near either end, and have springs, as shown in dotted lines, Fig. 2, located on said rod and adapted to engage with said collars in lieu of the springs 55.

66 represents a series of rollers usually employed on machines of this character for the purpose of receiving the wool and conveying the same to the wringer-rolls 1.

The connecting-rod 24 is flexibly attached to the lower end of one of the levers 44, as shown in Fig. 2, for the purpose of reversing the bevel-gears 14, as hereinafter described.

The mode of operating my improved forking, elevating, and conveying machine is as follows: The different parts are placed in their positions, as described, and suitable power communicated to the pulley 18, which, as herein shown, is adapted to rotate, with its top progressing in the direction from front to rear of the tub. The outer bevel-gear 14 engages with the bevel-gear 16, thereby propelling the carriages 7 toward the wringing-rolls 1 by means of the shaft 12 and cog-wheels 10. The shaft 25, carrying the fork 31 32, being mounted on said carriages 7, is carried, together with the wheel 26 and its pawl 27, forward toward the wringing-rolls 1. As the shaft 25 is carried forward the same is rotated rearwardly by reason of the wheel 36 engaging with the cog-rack 39 on the upper

bar 35 of the shifting frame. As the shaft 25 and its supporting-carriages are pressed forward toward the wringing-rolls 1 the fork 31 32 is adapted to extend downwardly into the tub or vat 3, agitating and carrying the wool contained in said tub or vat toward the rolls 1, and as the fork is rotated to a horizontal position, with the tines 31 pointing toward and slightly above the rolls 66, the cog-rack 39 being of that desired length, the wheel 36 passes beyond the end of said cog-rack 39, whereupon said wheel 36 discontinues to rotate, and the fork, which is laden with wool dipped from the tub or vat 3, is maintained in its elevated position by reason of the pawl 27 engaging with the teeth of the ratchet-wheel 26. The fork 31 32 is carried forward by a steady continuous motion until the same is immediately over the rolls 66, whereupon the projecting arm 28 of the pawl 27 engages with the lug 30, said pawl 27 being pressed upwardly, thereby disengaging the wheel 26, which allows the fork 31 32, by reason of its own weight and that of the wool thereon, to fall upon said rolls 66. As the fork 31 32 nears the rolls 66 the finger 58 engages with the bolt 57, which is properly adjusted in the slot 56 and carries the bar 53 forward, causing a tension on the spring 55 until the trip-lug 62 thereon engages with the curved end of the clutch or retaining-lever 60, whereupon said lever 60 being pressed inward by said lug 62 the lever 44 is released simultaneously with the release of the fork 31 32 by the lug 30 and pawl 27. The tension on the spring 55 after the lever 44 is released by means of the lever 49 presses the rod 45 and the levers 44 rearwardly or from the rolls 66, whereupon the heretofore-released lever 44, located at the reverse end of the frame 33 34, being carried by the rod 45, is engaged by the tooth 61 of the clutch or retaining-lever 60 and maintained in engagement therewith by means of the spring 63 and, as will be seen, holds the levers 44 and the parts connected thereto in rigid position. The rearward movement of the levers 44, by means of the crank-arms 41 and 47, the bar 46, and arms 42, raises the shifting frame 25 37, so that the wheel 36 will engage with the lower cog-rack 39, as hereinafter described. Simultaneously with the raising of the frame 35 37 the engaged bevel-gear 14 is disengaged from the bevel-gear 16, and the disengaged wheel 14 is engaged with said wheel 16 by means of the connecting-rod 24, which is pressed forwardly by the lever 44, to which it is engaged. The inner end of the elbow 22 is drawn forward by said rod 24, which presses the outer end of the same outwardly, (more readily seen in Fig. 3,) which by the connecting-rod 21 presses the lever 20 likewise outwardly. The yoke 19 being attached to the lever 20 is moved outwardly, carrying with it the bevel-gears 14, with the result hereinbefore memtioned, thereby reversing the motion of the shaft 12, which causes the carriage 7 to recede, drawing the fork 31 32 from and depositing the wool on the rolls 66, which, having proper motion imparted thereto, convey the wool to the wringing-rolls 1. As the fork recedes the same is maintained in horizontal position by the pawl 27 and ratchet-wheel 26, and the wheel 26 after having traveled a suitable distance engages with the cog-rack 39 on the lower bar 35 of the shifting frame, which causes the fork 31 32 to revolve rearwardly over the shaft 25 as the carriage 7 recedes until said fork attains a horizontal position, whereupon the trip 62 engages with the clutch 60, which retains the lever 44, the bar 53 having been pressed forward by the finger 58 engaging with the bolt 57, which causes the release of the lever 44. As will be readily seen, the shifting frame 35 37 is lowered to its former position with the rack 39 on the upper bar 35 in engagement with the wheel 36, the lever 44 at the other end of the frame 33 34 is engaged by the clutch 60, the bevel-gears 14 are reversed by their controlling rods and levers, and the carriages 7 are carried forward, taking with them the fork which enters the tub or vat and engages the wool, depositing the same on the rolls 66, as heretofore described. The shaft 25 and its immediate parts rotate in one direction, and the ends of the fork-tines 31 describe an ellipse in their circuit around the shaft 25.

The above-described movements are continuous, as described during the operation of the machine.

I have dispensed in both the description and drawings with many features used in conjunction with my invention which are old and have shown such old parts only as are necessary to illustrate the operation and connection of my invention.

I am well aware that machines have been constructed for mechanically manipulating wool during the washing process; but those are defective in operation. Therefore I do not claim the above feature of handling or washing wool by mechanical means broadly; but

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

1. In a machine of the class described the combination with a suitable tub or vat having the usual conveying and wringing rolls of a rotatable fork journaled on suitable carriages mounted on the sides of the tub or vat, said carriages having cog-racks attached thereon, the pinions 10 mounted on the shaft 12 and adapted to engage with said cog-racks, said shaft 12 suitably journaled on the tub or vat, the bevel gear-wheels 14 loosely mounted on the said shaft 12, the bevel-gear 16 adapted to alternately engage the wheels 14 and suitable means for imparting motion thereto, the yoke 19 adapted to engage with the wheels 14, suitable means for controlling and operating said yoke, the shifting rack or frame 35 37 suitably mounted on one side of the tub or vat, the cog-wheel 36 suitably attached to the fork and adapted to engage the

rack or frame 35 37 and suitable means for controlling and operating said rack or frame all arranged and operating substantially as shown and described.

2. In a forking, elevating and conveying machine, the combination with a suitable wool-washing tub or vat and its conveying and wringing rolls, of suitable carriages mounted on either side of said tub or vat, a rotating shaft 25 journaled transversely on said carriages, a suitable fork rigidly attached to said shaft, a ratchet-wheel 26 rigidly attached to the rear end of the shaft 25, the pawl 27 28 flexibly attached to the carriage and adapted to engage with the ratchet-wheel 26, the lug 30 adapted to engage with the pawl 27 28, the cog-wheel 36 rigidly attached to the front end of the shaft 25, the shifting frame 35 37 supported between the posts 33, said posts 33 attached on one side of the tub or vat and having the cap 34, the cog-racks 39 attached to the opposing faces of the shifting frame 35 37 and adapted to alternately engage with the wheel 36, the connecting-arms 42 attached to the frame 35 37 and to the arms 41, said arms 41 rigidly attached to the rock-shafts 40, the shafts 40 suitably journaled on the cap 34, the vertical arms 47 rigidly mounted on the shafts 40, the arms 46 attached to the said arms 47 at one end and having their other ends attached to the lever 44, such levers 44 pivotally attached to the posts 33, the bar 45 flexibly attached to and connecting the top ends of the levers 44, the rod 64 connecting the lower ends of said levers 44, the actuating-lever 49 pivotally mounted on the cap 34 and engaging with the bar 45, the springs 55 attached to the lower end of said actuating-lever 49 and extending in either direction therefrom, the eyes 54 to which the free ends of the springs 55 are attached, the sliding bar 53, suitably secured in position on the side of the posts 33, in which the eyes 54 are secured, the slots 56, in the bar 53, having the bolts 57 adjustably secured therein, the finger 58, rigidly secured to the carriage, aforesaid, and adapted to engage with the bolts 57, the lugs 62 rigidly attached to the bar 53, the clutches 60 pivoted to the sides of the posts 33, adapted to engage with the levers 44 and be engaged by the lugs 62, the springs suitably attached to the free ends of said clutches 60 and to the frame 33 34, the connecting-rod 24 attached at one end to the lower end of one of the levers 44 and having its other end flexibly attached to an elbow 22, such elbow 22 suitably pivoted on the frame, the arm 21 connecting the free end of the elbow 22 and the top end of the vertical lever 20, the vertical lever fulcrumed on the frame, the yoke 19 flexibly attached to the lever 20 and adapted to engage with two bevel gear-wheels 14 mounted on the shaft 12, the shaft 12, having the feather 13, journaled transversely on the tub or vat, beneath the carriages, the pinions 10 rigidly mounted on the said shaft 12 and adapted to engage with cog-racks 11, said cog-racks 11 rigidly attached to the carriages, the bevel gear-wheel 16 rigidly attached to the shaft 17 and adapted to engage with the bevel gear-wheels 14 aforesaid, said shaft 17 suitably journaled on a frame and having a suitable pulley 18 attached thereon and suitable power for operating the same all arranged and operating substantially as shown and described and for the purposes set forth herein.

3. In a machine of the class described the combination with a suitable tub or vat 3, of a frame 33 34 attached on the side of said tub or vat 3, the levers 44 pivoted to the frame 33 34, the connecting-bar 45 and rod 64 attached to the upper and lower ends respectively of the levers 44, the actuating-lever 49 pivoted to the frame 33 34 and engaging with the bar 45, the springs 55 attached to the lower end of said actuating-lever 49, the eyes 54 to which the springs are also attached, the sliding bar 53 suitably secured on the side of the frame, and having the lugs 62 attached thereon and the slots 56 with their attendant bolts 57 therein, the arms 46 attached at one end at a suitable point thereon, the vertical crank-arms 47 attached on the shafts 40 and adapted to engage with the other end of the arms 46, the said shafts 40 journaled on the frame 33 34, the arms 41 attached to the free ends of the shafts 40, the vertical arms 42 attached to the arms 41 and to a shifting frame 35 37, said shifting frame 35 37 suitably mounted within the frame 33 34, the cog-racks 39 attached to the opposing faces of the frame 35 37, the clutches 60 attached on the posts 33 and having the springs 63, the reversing-gear 14 16, the yoke 19 engaging with said gear, the connecting-rods, levers and elbow arranged between said gears and the levers 44, a suitable fork suitably located on the tub or vat and suitable power imparting motion thereto all arranged and operating substantially as shown and described and for the purposes specified.

In testimony whereof I affix my signature in presence of two witnesses.

ARTHUR P. TATTERSON.

Witnesses:
M. HAYNES,
J. B. WEBSTER.