

O. D. KRAFT & L. W. FETZER.
WELL PULLING AND CLEANING MACHINE.
APPLICATION FILED JAN. 29, 1909.

986,181.

Patented Mar. 7, 1911.

2 SHEETS—SHEET 1.

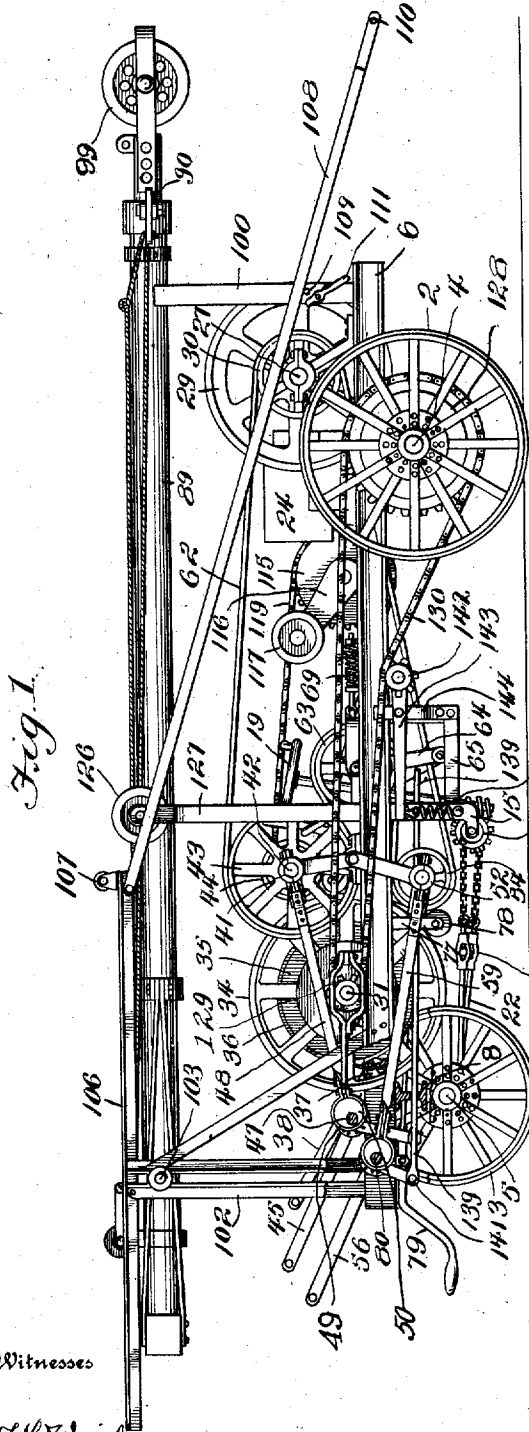


Fig. 1.

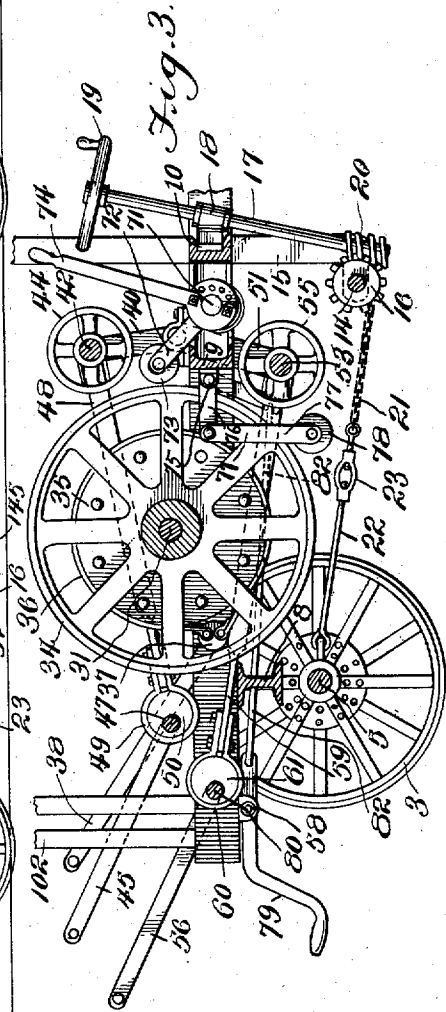


Fig. 3.

Witnesses

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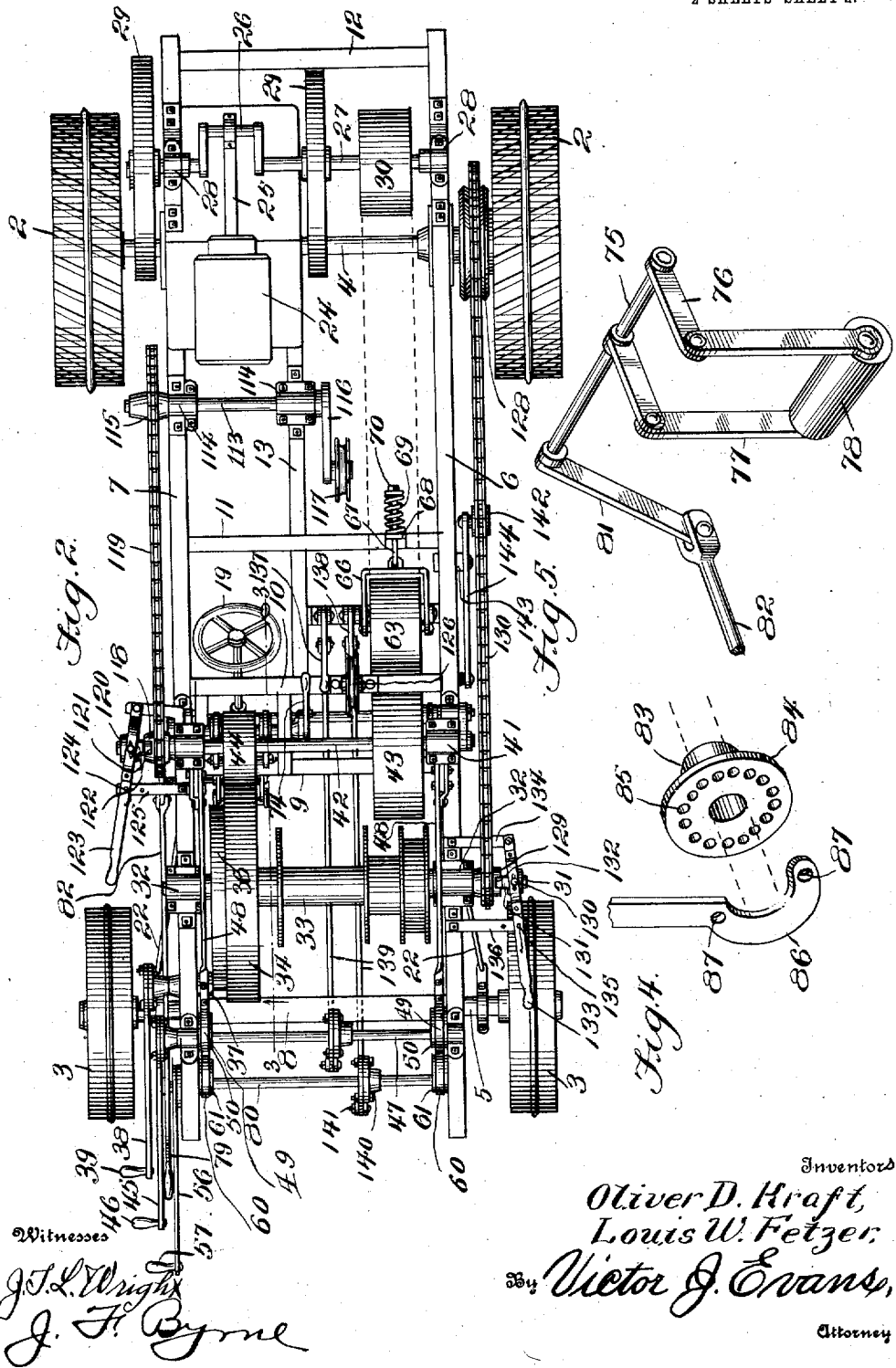
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2 SHEETS-SHEET 2.



UNITED STATES PATENT OFFICE.

OLIVER D. KRAFT AND LOUIS W. FETZER, OF FINDLAY, OHIO, ASSIGNORS OF ONE-THIRD TO SAID LOUIS W. FETZER AND TWO-THIRDS TO MARY A. CORTHILL, OF FINDLAY, OHIO.

WELL PULLING AND CLEANING MACHINE.

986,181.

Specification of Letters Patent.

Patented Mar. 7, 1911.

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To all whom it may concern:

Be it known that we, OLIVER D. KRAFT and LOUIS W. FETZER, citizens of the United States, residing at Findlay, in the county of Hancock and State of Ohio, have invented new and useful Improvements in Well Pulling and Cleaning Machines, of which the following is a specification.

Our invention relates to improvements in machines in the use of which sucker rods, tubings, or casings can be applied to and removed from oil wells, and in the use of which a well may be bailed or cleaned, the invention being particularly directed to improvements in a well pulling machine for which we were issued Letters-Patent of the United States, numbered 886,989, and dated May 5, 1908.

The invention consists in the construction, combination and arrangement of parts hereinafter fully described and claimed, and illustrated in the accompanying drawings, wherein:—

Figure 1 is a view in side elevation of a well pulling and cleaning machine constructed in accordance with our invention. Fig. 2 is a top plan view of the machine, the derrick, the derrick supporting standards, and the derrick guiding bars being omitted. Fig. 3 is a sectional view taken on the plane indicated by the line 3—3 of Fig. 2, looking in the direction indicated by the arrow. Fig. 4 is a detail perspective view of one of the levers and a member by which it is secured in applied position. Fig. 5 is a detail perspective view of one of the friction gears.

Like reference characters are used to designate corresponding parts throughout the several views.

Of our improved well pulling and cleaning machine, 2 designates the traction wheels and 3 the steering wheels thereof. Upon the axles 4—5 of the wheels is mounted the main frame of the machine, said frame comprising longitudinal beams or girders 6—7 and transverse beams or girders 8, 9, 10, 11, and 12. The main frame also comprises a longitudinal beam or girder 13, all of the beams or girders being suitably united and braced. The steering

wheels 3 can be controlled through the medium of a steering mechanism which includes a shaft 14 which is journaled in depending bracket arms 15, and which is provided with a worm-wheel 16. The steering mechanism also includes a steering post 17 which is journaled in a bearing 18 and which is provided at its upper end with a hand wheel 19. The bearing 18 is secured to the transverse beam or girder 10. A worm 20, which meshes with the worm-wheel 16, is secured to the lower end of the steering post 17. A chain 21 is suitably wound about the shaft 14, and it is secured at its ends to rods 22 which are suitably connected to the axle 5 of the steering wheels 3. The rods 22 include turn buckles 23, by means of which any slack occurring in the chain may be taken up.

An engine 24 of the explosive type, is secured to the longitudinal beams or girders 7 and 13, and the piston rod 25 thereof is connected to the crank 26 of the shaft 27 which is journaled in bearings 28, the bearings being secured to the longitudinal beams or girders 6 and 7. Fly wheels 29 are secured to the shaft 27, one on each side of the crank 26. A belt pulley 30 is also secured to the shaft 27, said shaft to be referred to hereinafter as "drive shaft."

At the forward end of the machine, a driven shaft 31 is journaled in bearings 32 which are secured to the longitudinal beams or girders 6 and 7. A drum 33, which is provided with a plurality of winding surfaces of various diameters, is fixed upon the shaft 31. A drive-wheel 34 of the friction type is fixed upon the shaft 31 at one end of the drum 33, and is provided with a brake wheel 35 about which passes a brake band 36. The ends of the brake band 36 are secured to a stub shaft 37 journaled on the longitudinal beam or girder 7. A lever 38, which is provided with a handle 39, is secured to the stub shaft 37. When said lever is depressed the brake band 36 is tightened about the brake wheel 35, and when elevated the brake band is loosened from about the wheel.

A pair of bracket arms 40 are respectively pivoted to the longitudinal beams or girders

6—7, and are provided at their free ends with bearings 41 in which a transmission shaft 42 is journaled. A pulley 43 and a friction gear 44 are fixed upon the transmission shaft 42, this shaft being under the control of a lever 45 so that the friction gear may be thrown into and out of engagement with the drive wheel 34. The lever 45 is provided with a handle 46 and is secured to a shaft 47 which is connected with the transmission shaft 42 by means of rods 48. The rods 48 are each secured at one end to the bearings 41. The opposite ends of the connecting rods 48 are secured to eccentric straps 49 which pass about eccentrics 50 which are secured to the shaft 47. When the friction wheel 44 is thrown into engagement with the drive wheel 34, the drum 33 is rotated in winding direction at low speed.

Depending bracket arms 51 are respectively pivoted to the longitudinal beams or girders 6 and 7, directly beneath the bracket arms 40. Bearings 52 are secured to the free ends of the bracket arms 51, and journaled in said bearings is a shaft 53 upon which a pulley 54 and a friction gear 55 are fixed. The shaft 53 is under the control of a lever 56 so that the friction gear 55 is thrown into and out of engagement with the drive wheel 34. The lever 56 is provided with a handle 57 and is secured to a shaft 80 which is journaled on the longitudinal beams or girders 6—7. Connecting rods 59 are secured at one end to the bearings 52, and at their opposite ends to eccentric straps 60, the straps passing about eccentrics 61 which are fixed upon the shaft 58. When the friction gear 55 is in engagement with the drive wheel 34, the drum 33 is rotated in winding direction at high speed.

A belt 62 passes about the pulleys 30, 43, and 54, and about a tension pulley 63. The tension pulley 63 is journaled between the upper ends of a pair of bracket arms 64 which are pivoted at their lower ends to a member 65 which is suitably supported on the longitudinal beams or girders 6 and 13. A U-shaped bracket 66 is secured to the upper ends of the bracket arms 64 and has connected therewith a bolt 67 which passes through a guide 68 secured to the transverse beam or girder 11. A coiled expansion spring 69 is mounted upon the bolt 67 between the guide 68 and a nut 70 mounted upon the bolt. The tension pulley 63 keeps the belt 62 taut. As the pulley 54 is smaller than the pulley 43, the friction gear 55 is driven faster than the friction gear 44, permitting the drum to be rotated in winding direction at one of two speeds.

A shaft 71 is journaled on the longitudinal beams 6—7, and is provided with a forwardly projecting arm 72, at the free end of

which is journaled a friction gear 73. A lever 74 is secured to the shaft 71, and provides means by which said shaft may be moved to throw the friction gear 73 into and out of engagement with the drive wheel 34 and the friction gear 44. When the friction gear 73 is in engagement with the drive wheel 34 and the friction gear 44, the drum 33 is rotated in unwinding direction at low speed. A shaft 75 is journaled on the transverse beam or girder 9 and is provided with a pair of forwardly projecting arms 76 to the outer ends of which is pivotally secured a pair of depending arms 77. A friction gear 78 is journaled between the arms 77 and is adapted to be moved into and out of engagement with the drive wheel 34 and friction gear 55. When the friction gear 78 is in engagement with the drive wheel 34 and the friction gear 55 the drum is rotated in unwinding direction at high speed. The shaft 75 is under the control of the lever 79 which is pivotally secured at 58 to the longitudinal beam or girder 6. The lever 79 is connected to a crank arm 81 secured to the shaft 75 by means of a rod 82. All except the levers 79 are connected to their respective shafts through the medium of flanged collars 83 which are secured to the shafts in any suitable manner. The flanges 84 of the collars 83 are each provided with an annular series of openings 85. Each lever is provided with a curved end 86, and with openings 87, bolts passing through the openings 87 and through a pair of the openings 85 to secure the lever in applied position. In view of the manner in which the levers are secured in applied position, they may be adjusted upon the shaft to compensate for any wear in the friction gears 44, 55, 48 and 78, and in the drive wheel 34, whereby the levers may, at all times, occupy certain normal positions.

The derrick used in connection with the machine may be of any appropriate type. The one shown in Fig. 1 of the accompanying drawings consists of the mast 89 to the upper end of which is secured a pulley 99. At its lower end the mast 89 is pivotally and slidably mounted on standards 102 by means of a shaft 103. The standards are mounted upon the front end of the machine frame. In view of its connection with the standards 102, the mast 89 may be folded down upon the machine and when so folded it is supported by cross bars, not shown, one cross bar being carried by standards 100 rising vertically from the rear end of the machine. The frame 106 is pivotally secured to the standard 102 and is provided with a pulley 107. The frame may also be folded down upon the machine and is adapted to be supported in an upright position by rods 108. The rods 108 are each secured at one end to the frame 106 and are adapted to be detach-

ably secured at their rear ends to the standards 100 by pins 109, openings 110 and levers 111. The guy rope of the derrick is adapted to pass over the pulley 107 when the machine is in use.

The standards 100 and 102, and the derrick are not shown in Fig. 2 of the drawing.

When it is desired to pull or clean a well, the derrick is erected and the engine started, after which a cable, not shown, is partially wound upon the drum 33. The cable passes over the pulley 99 of the derrick, and a suitable cleaning or pulling device is secured to the free end thereof. When it is desired to wind the cable upon the drum at low speed, the friction gear 44 is thrown into engagement with the drive wheel 34 through the medium of the lever 45, and when it is desired to wind the cable upon the drum at high speed the friction gear 44 is thrown out of engagement with the drive wheel 34, and the friction gear 55 is thrown into engagement with such wheel, the friction gear 55 being operable through the medium of levers 56. When it is desired to unwind the cable from the drum at low speed, the friction gear 73 is thrown into engagement with the friction gear 44 and the drive wheel 34, while when it is desired to unwind the cable from the drum at high speed the friction gear 73 is thrown out of engagement with the friction gear 44 and the drive wheel 34 and the friction gear 78 is thrown into engagement with the friction gear 55 and the said wheel. The gear 73 is operable through the medium of the lever 74, and the gear 55 through the medium of the lever 79. To secure the drum 33 against rotation the brake band 36 is tightened on the brake wheel 35 through the medium of the lever 38.

A shaft 113 is journaled in bearings 114 secured to the longitudinal beams or girders 7 and 13. A sprocket wheel 115 is secured to one end of the shaft 113, and a crank 116 is secured to the opposite end of said shaft, a grooved pulley 117 being journaled on the outer end of the crank. A sprocket wheel 118 is loosely mounted upon the shaft 42, and a sprocket chain 119 passes about said wheel and the wheel 115. A clutch element 120 is splined upon the shaft 42 and is provided with lugs 121 which are adapted to enter recesses 122 in the hub of the sprocket wheel 118. When the lugs 121 are in engagement with the recesses 122, the sprocket wheel 118 is fixed on the shaft 42 for rotation therewith, rotating the grooved pulley 117. The clutch element 120 is carried by a lever 123 by means of which it may be thrown into and out of engagement with the sprocket wheel 118. The lever 123 is secured in applied position by means of a pin 124 which passes through the lever and through an arm 125 carried by the longitudinal beam or girder 7. When cleaning a

well, the cable passes over a grooved pulley 126 journaled on a standard 127 which is secured to and rises from the transverse beam or girder 10, and under the grooved pulley 117, the rotation of the pulley 117 alternately raising the cleaning tool from and dropping it on the bottom of the well.

A differential gearing 128 is mounted upon the rear axle 4, and a sprocket wheel 129 is mounted upon the shaft 31 of the drum 33. A sprocket chain 130 passes about the differential gearing 128 and the sprocket wheel 129, whereby to permit the machine to be propelled from the drum shaft 31. The sprocket wheel 129 is loosely mounted upon the drum shaft 31 and is adapted to be fixed thereon for rotation therewith by means of a clutch element 120 which is provided with lugs 131 adapted to enter recesses 132 in the sprocket wheel. The clutch element 130 is adapted to be thrown into and out of interlocking connection with the sprocket wheel 129 by means of a lever 133 which is pivotally mounted upon an arm 134 secured to the longitudinal beam or girder 6. The lever is adapted to be secured in adjusted position by means of a pin 135 which passes through the lever and through an arm 136 secured to the longitudinal beam or girder 6.

A seat, not shown, is secured to the main frame of the machine in rear of the hand wheel 19, and it is adapted to be occupied when the machine is under way. To permit the occupant of the seat to control the speed of the machine, levers 137 and 138 are pivotally mounted at a point adjacent the seat, said levers being respectively connected to the shafts 50 and 80 by rods 139. The rods 139 are adjustably connected to the shafts through the medium of flanged collars 140 and bolts 141. The construction of the flanged collars and the manner in which the levers are secured thereto is fully disclosed in Fig. 4 of the drawings.

The drive chain 130 is tensioned by a sprocket wheel 142 which is journaled on a spring pressed lever 143. The lever 143 is pivotally mounted upon an arm 144 depending from the longitudinal beam or girder 6, and a spring 145 is secured at one end to the lever and at its opposite end to the bracket arm 15.

It should be apparent from the above description, taken in connection with the accompanying drawings, that we provide a machine which is admirably adapted for the purpose for which it was intended, which is comparatively simple of construction, and which may be manufactured and sold at a comparatively low cost.

While we have described the method of operation of the invention together with the apparatus which we now consider to be the best embodiment thereof, we desire to have it understood that the apparatus shown

is merely illustrative, and that such changes may be made when desired as are within the scope of the claims.

Having thus described the invention, what is claimed as new, is:—

1. A machine of the character set forth comprising a wheeled frame, a power shaft journaled on the frame, an engine connected with the power shaft, a driven shaft journaled on the frame, a drum fixed on the driven shaft, transmission shafts journaled on the frame, a friction drive wheel fixed to the drum, friction gears fixed upon the transmission shafts, pulleys fixed upon the transmission shafts, a pulley fixed upon the power shaft, a belt passing about the pulleys, and means for controlling the transmission shafts to permit one or the other of the friction gears to be thrown into engagement with the friction drive wheel.

2. A machine of the character set forth comprising a wheeled frame, a power shaft journaled on the frame, an engine connected with the power shaft, a driven shaft journaled on the frame, a drum fixed on the driven shaft, a friction drive wheel fixed on the drum, pivotally mounted arms, transmission shafts journaled on the arms, friction wheels fixed on the transmission shafts, pulleys fixed on the transmission shafts, a pulley fixed on the power shaft, and means for controlling the transmission shaft to permit one or the other of the friction gears to be thrown into engagement with the friction drive wheel.

3. A machine of the character set forth comprising a wheeled frame, a power shaft journaled on the frame, an engine connected with the power shaft, a driven shaft journaled on the frame, a drum secured to the driven shaft, a friction drive wheel fixed to the drum, arms pivotally mounted upon the frame, transmission shafts journaled on the arms, other shafts journaled on the frame, eccentrics secured to said other shafts, connection between the eccentrics and the arms, levers secured to said other shafts, friction gears fixed on the transmission shafts, pulleys fixed on the transmission shafts, a pulley fixed on the drive shaft, and a belt mounted on the pulleys.

4. A machine of the character set forth comprising a wheeled frame, a power shaft journaled on the frame, an engine connected with the power shaft, a driven shaft journaled on the frame, a drum fixed on the driven shaft, a friction drive wheel fixed on the drum, transmission shafts journaled on the frame, friction gears fixed on the transmission shafts, pulleys fixed on the transmission shafts, a spring pressed frame, an idler pulley journaled on the frame, a pulley fixed on the power shaft, a belt passing over the pulleys, and means by which the transmission shafts may be controlled to permit

one or the other of the friction gears to be thrown into engagement with the friction drive wheel.

5. A machine of the character set forth comprising a wheeled frame, a power shaft journaled on the frame, an engine connected with the power shaft, a driven shaft journaled on the frame, a drum fixed on the driven shaft, a friction drive wheel fixed on the drum, a brake wheel fixed on the drum, a brake band passing about the brake wheel, means for controlling the brake band, transmission shafts journaled on the frame, friction gears fixed on the transmission shafts, means for controlling the transmission shafts to permit one or the other of said gears to be thrown into engagement with the friction drive wheel, other friction gears, means for controlling said other friction gears to permit one of them to be thrown into engagement with one of the first-named friction gears and the friction drive wheel, pulleys fixed on the transmission shafts, a pulley fixed on the power shaft, and a belt passing about the pulleys.

6. A machine of the character set forth including a rotatably mounted drum, a friction drive wheel fixed upon the drum, pivotally mounted arms, transmission shafts journaled on the arms, friction gears fixed on the transmission shafts, other shafts, a connection between said other shafts and the arms, and levers adjustably secured to said other shafts.

7. A machine of the character set forth including a rotatably mounted drum, a friction drive wheel fixed upon the drum, pivotally mounted arms, transmission shafts journaled on the arms, friction gears fixed upon the transmission shafts, other shafts, connections between said other shafts and the arms, sleeves fixed upon said other shafts and provided with flanges, and levers adjustably secured to the flanges.

8. A machine of the character set forth including a rotatably mounted drum, a friction power wheel fixed upon the drum, pivotally mounted arms, transmission shafts journaled upon the arms, friction gears fixed upon the transmission shafts, levers connected with the arms, pulleys fixed upon the transmission shafts, a spring pressed idler pulley, a power means, a pulley fixed on the shaft of the power means, and a belt passing about all of the pulleys.

9. A machine of the character set forth including a rotatably mounted drum, a friction drive wheel fixed upon the drum, transmission shafts driven at different speeds, friction gears fixed on the transmission shafts, means for controlling the shafts to permit one of the friction gears to be thrown into engagement with the friction drive wheel, other friction gears, and means by which one or the other of said other friction

tion gears may be moved into engagement with one of the first-named friction gears and the friction drive wheel.

10. A machine of the character set forth including a rotatably mounted drum, a friction drive wheel fixed upon the drum, transmission shafts, means for rotating the transmission shafts at different speeds, friction gears fixed upon the transmission shafts, and means for controlling the transmission shafts to permit one or the other of the friction gears to be moved into engagement with the friction drive wheel.

11. A machine of the character set forth including a main frame, a drum rotatably mounted upon the frame, a friction drive wheel fixed to the drum, arms pivotally mounted upon the frame, transmission shafts

journale d upon the arms, friction gears fixed upon the transmission shafts, shafts 20 journaled upon the frame, a connection between the shafts journaled upon the frame and the shafts journaled upon the arms, hand levers secured to the shaft journaled upon the frame, hand levers pivotally 25 mounted upon the frame, and a connection between the hand levers pivotally mounted upon the frame and the shafts journaled upon the frame.

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

OLIVER D. KRAFT.
LOUIS W. FETZER.

Witnesses:

MARION G. FOSTER,
ETHEL HERRICK.

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