L. W. FETZER.

WELL PULLING, CLEANING, AND DRILLING MACHINE.

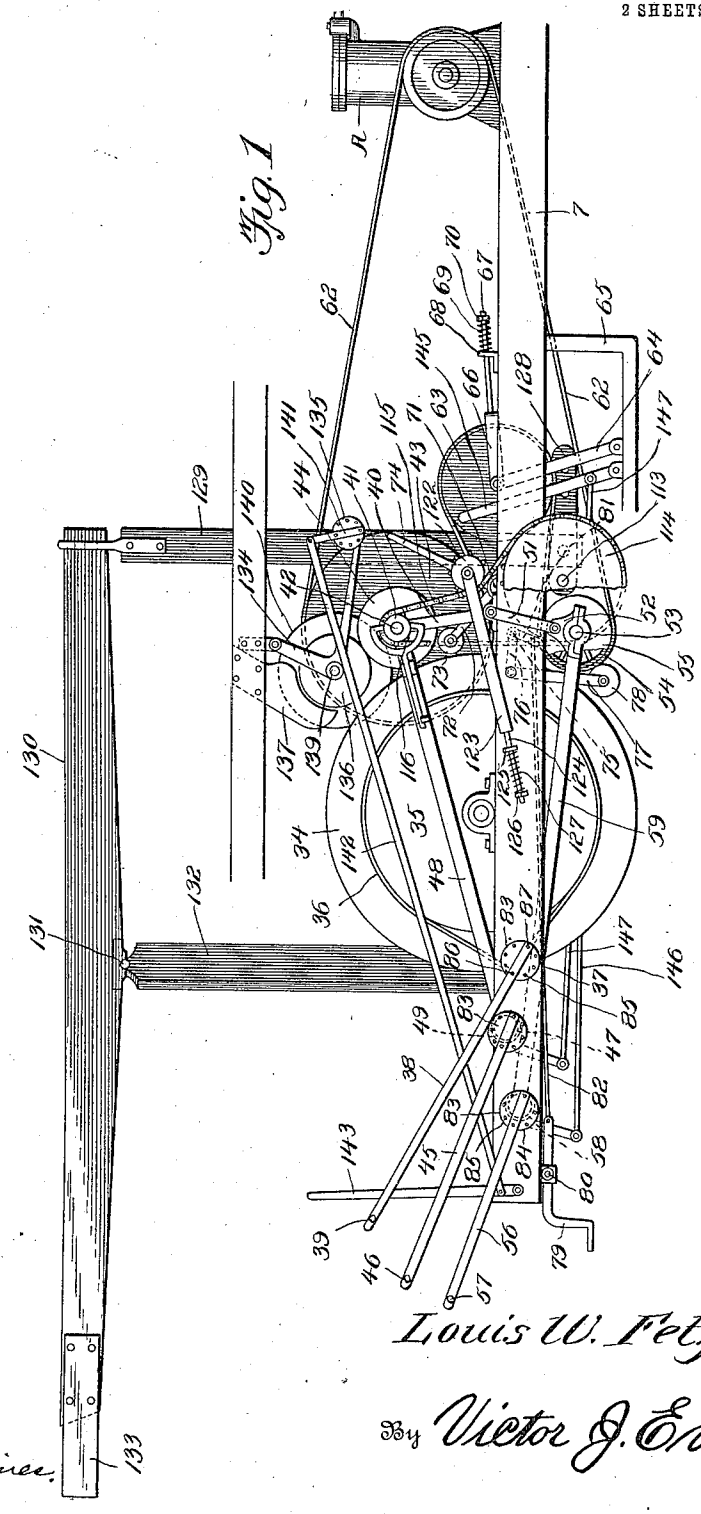
APPLICATION FILED NOV. 10, 1909.

1,041,453.

Patented Oct. 15, 1912.

2 SHEETS—SHEET 1.

Fig. 1



Witnesses

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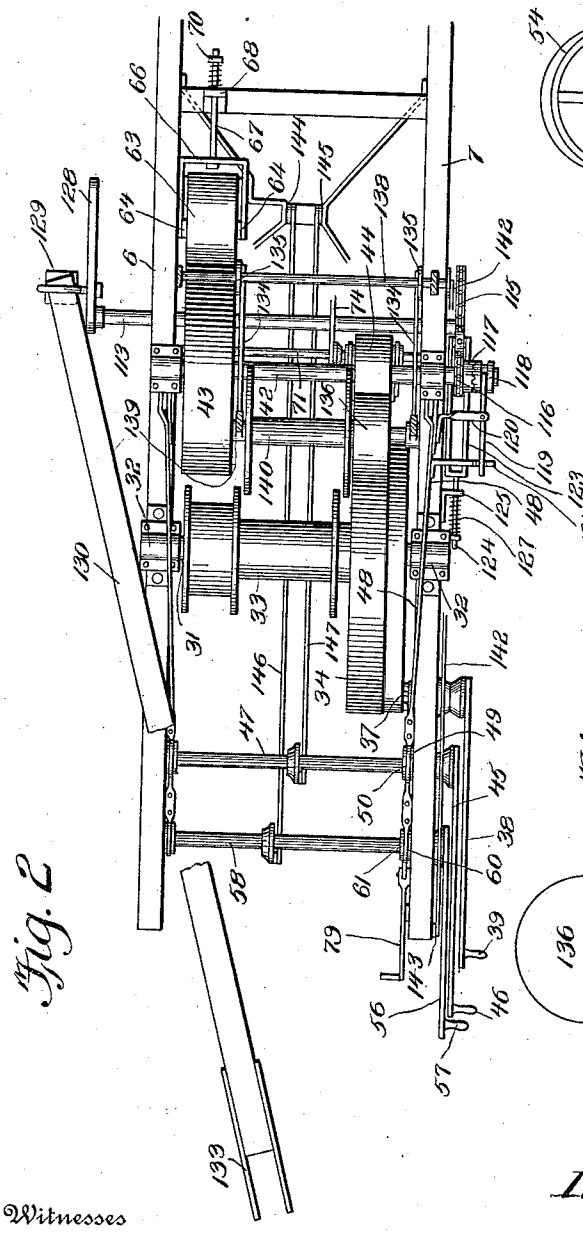

Fig. 2

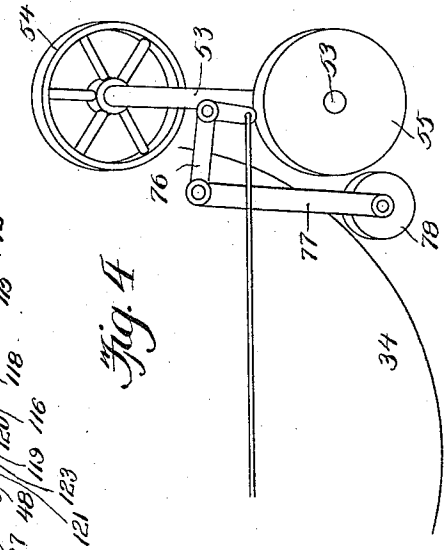

Fig. 4

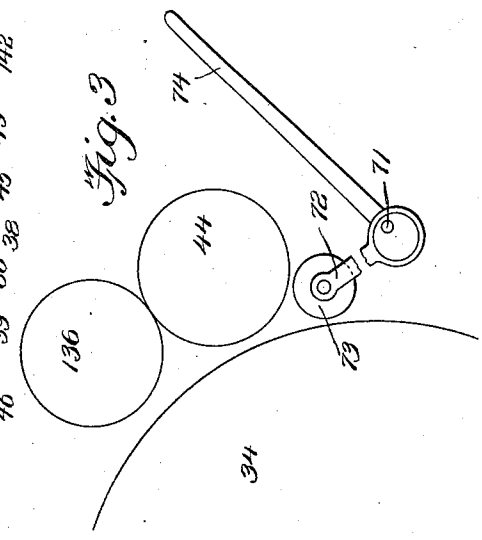

Fig. 3

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LOUIS W. FETZER, OF FINDLAY, OHIO.

WELL PULLING, CLEANING, AND DRILLING MACHINE.

1,041,453. Specification of Letters Patent. Patented Oct. 15, 1912.

Application filed November 10, 1909. Serial No. 527,255.

To all whom it may concern:

Be it known that I, LOUIS W. FETZER, a citizen 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, Cleaning, and Drilling Machines, of which the following is a specification.

This invention relates to improvements in well pulling, cleaning and drilling machines.

The objects of the invention are to provide a novel construction of friction gearing for operating the winding drum of a well-pulling mechanism at high or low speed in winding or unwinding direction; second, to provide a means for operating a sand line drum from said friction gearing for actuating a boiler or pump, and, third, to provide means whereby the walking beam of a drill mechanism may also be driven from the same friction gearing.

The invention consists of the features of construction, combination and arrangement of parts hereinafter fully described and claimed, reference being had to the accompanying drawings, in which:—

Figure 1 is a side elevation showing so much of a well drilling machine as is necessary to illustrate my invention. Fig. 2 is a top plan view of the same, parts of the frame structure appearing in section. Fig. 3 is a diagram of parts of the friction gearing. Fig. 4 is a diagrammatic view of other parts of the friction gearing.

The frame of the machine includes longitudinal beams or girders 6 and 7, and at the forward end of the machine is arranged a driven shaft 31 journaled in bearings 32 mounted upon said beams or girders. 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 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 it is elevated the brake band is loosened from about the wheel.

Bracket arms 40 are pivotally mounted upon the frame structure and are provided at their free ends with bearings 41 in which is journaled a main drive shaft 42. A pulley 43 and a friction gear 44 are fixed upon said shaft 42, which is under 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 shaft 42 by means of rods 48. The rods 48 are each secured at one end to the bearings 41, while their opposite ends are secured to eccentric straps 49 which pass about eccentrics 50 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 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 may be 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 58 which is journaled on the longitudinal beams or girders 6 and 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 around 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 driven from a suitable motor A passes around the pulleys 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 bracket 65 suitably fixed to the frame structure. A yoke 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 frame structure. A coiled expansion spring 69 is mounted upon said bolt between the guide 68 and a nut 70 on the bolt, whereby the pressure of the pulley may be regulated. The tension pulley not only keeps the belt 62 taut, but also normally retains the friction wheels 44 and 55 out of engagement with the drive wheel 34 and

permits said friction wheels to be thrown into engagement with the drive wheels. 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 either one of two speeds.

A shaft 71 is journaled on the beams 6 and 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 frame structure 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 said 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 control of the lever 79 which is pivotally secured at 80 to the frame structure and is connected to a crank arm 81 on the shaft 75 by means of a rod 82.

All the levers except the lever 79 are connected to their respective shafts through the medium of flanged collars 83, the flanges 84 of each of which are provided with an annular series of openings 85. Each lever is secured by means of pins or bolts 86 and 87 to the flange of its collar, the bolts passing through diametrically opposite openings 85 and being adapted for engagement with any pair of the openings, by which they may be set or adjusted to vary their throw to compensate for any wear on the friction gears 44, 45, 48 and 78, and the drive wheel 34, so that the parts may be adjusted with a degree of fineness with relation to each other.

In practice, a suitable derrick is employed upon the frame and provided with guide pulleys over which passes a cable connected with the drum 33, the shaft of which receives motion from the friction gearing, which latter is driven by the belt 62 passing as described around the pulleys 43, 54 and 63 and receiving motion from the shaft of the motor A. To the free end of the rope or cable suitable devices are attached for pulling wells. A shaft 113 is journaled in bearings on the frame structure and carries a sprocket wheel 114 which is connected by a sprocket chain 115 with a pinion 116 on the shaft 42. The pinion 116 is loosely mounted upon the shaft and provided with the clutch collar 117 adapted to be engaged by a clutch member 118 feathered to slide on and rotate with the shaft. The clutch member is annularly grooved to receive the forked end of a lever 119 pivoted upon a bracket 120 extending from the adjacent rod 48, by which the clutch members may be connected or disconnected to throw the shaft 113 into or out of action. The free end of the lever is adapted to engage a rack 121 on the rod 48 to secure it in its adjusted positions. The chain 115 is maintained sufficiently taut by an idler sprocket 122 carried by a yoked bracket 123 provided with a bolt 124 passing through a guide 125 on the beam 7. On said bolt is an adjusting nut 126 and between the nut and guide is arranged a coiled spring 127 by which the pinion is held in engagement with the chain and whereby its pressure may be regulated.

The shaft 113 carries at one end a crank arm 128 adjustably connected with a wrist or crank pin on the lower end of a pitman bar or rod 129 connected at its upper end with one end of a walking beam 130 pivotally mounted, as at 131, upon a standard 132 rising from the machine. To the opposite end 133 of said beam drilling means of any suitable type may be applied to be operated through the oscillatory motion of the beam from the action of the crank arm in the operation of the shaft 113, which will be driven from the shaft 42 of the friction gearing through the sprocket gearing described when the clutch 118 is in engagement with the pinion 116.

Mounted upon the frame are bell crank brackets or levers 134, one arm of each of which is pivotally mounted upon the frame, while the other arm thereof is connected with a crank disk 135 suitably journaled on the frame. Carried by these levers is a friction gear 136 adapted to be thrown into contact with the gear 44 so as to be driven thereby or to be thrown into engagement with a fixed brake shoe 137 through the movements of the crank disk 135. The disks 135 are preferably mounted upon a transverse shaft 138 for movement in unison, while the gear 136 is mounted upon a transverse shaft 139 journaled at its ends upon the bell crank levers and carrying a drum 140 to which one end of a sand line or cable may be attached, the other end of which is adapted to be connected with a bailer or pump for freeing the well from water during the drilling operation. One of the disks 135 has adjustably connected therewith a crank arm 141 connected by a rod or link 142 with a controlling lever 143 by which the gear 136 may be swung in reverse direction to engage the gear 44 on the brake shoe 137.

It will thus be seen that a simple and compact type of friction gearing is provided for driving the line drums of pulling and bailing mechanisms and for operating the walking beam of a drilling mechanism, all from a common driving element, and that the parts of the friction gearing are so combined and arranged as to be easily controlled.

Levers 144 and 145 are connected by rods 146 and 147 to crank arms on the shafts 47 and 58, whereby said shafts may be rocked from the rear end of the frame, when desired.

I claim:—

1. In a machine of the character set forth, the combination of a shaft journaled in stationary bearings and carrying a winding drum and a friction wheel, a drive shaft adjustable toward and from said friction wheel and carrying a friction wheel and a pulley, a second drive shaft adjustable toward and from the first-named friction wheel and also carrying a friction wheel and a pulley, means for independently adjusting the adjustable shafts and friction wheels, a drive belt passing around said pulleys, and means acting upon said belt for normally holding the same under tension and the adjustable friction wheels in retracted position.

2. In a machine of the character set forth, the combination of a driven shaft journaled in stationary bearings and carrying a winding drum and a friction wheel, a second shaft adjustable with relation to said friction wheel and carrying a pulley and a coacting friction wheel, a third shaft adjustable with relation to the first-named friction wheel and carrying a pulley and a coacting friction wheel, means for independently adjusting the adjustable shafts to throw the friction wheels carried thereby into and out of engagement with the first-named friction wheel, a tension pulley disposed on a line between the adjustable shafts, a belt engaging the first-named pulleys and looped around the tension pulley, and a tension device acting on said tension pulley to hold the belt taut and the adjustable shafts in normal or retracted position.

3. In a machine of the character described, the combination of a shaft journaled in stationary bearings and carrying a winding drum and a friction wheel, a pair of shafts independently adjustable with relation to the first-named shaft and carrying friction wheels to engage with the friction wheel thereon, each of said adjustable shafts also carrying a pulley, means for adjusting said adjustable shafts, a drive belt passing around said pulleys, means for normally maintaining the belt taut and the friction wheels on the adjustable shafts out of engagement with the friction wheel on the drum shaft, other friction wheels adapted to be disposed between the first-named friction wheel and the friction wheels on the respective adjustable shafts, and means for independently adjusting the latter-named friction wheels.

4. In a machine of the character described, the combination of a shaft journaled in stationary bearings and carrying a friction wheel and a winding drum, a second shaft adjustable toward and from the first-named shaft and carrying a friction wheel to engage the friction wheel thereon, means for driving said adjustable shaft and yieldingly holding the same retracted, means for adjusting said adjustable shaft toward the stationary shaft to throw the friction wheels into contact, a brake member, a third shaft carrying a winding drum and a friction wheel and adjustable to move said friction wheel alternately into engagement with the brake member and friction wheel on the adjustable shaft, and means for adjusting the third-named shaft.

5. In a machine of the character set forth, the combination of a stationary shaft carrying a friction wheel and a winding drum, a drive shaft adjustable toward and from the first-named shaft and carrying a friction wheel to engage the friction wheel thereon, a third shaft, means for adjusting said adjustable shaft to throw the friction wheels into or out of engagement, gearing between said adjustable shaft and the third shaft for driving the latter, drilling mechanism, and a crank mechanism actuated by the third shaft for operating said drilling mechanism.

6. In a machine of the character set forth, the combination of a stationary shaft carrying a friction wheel and a winding drum, a pair of adjustable shafts carrying friction wheels movable toward and from the first-named friction wheel and each also carrying a pulley, a tension pulley disposed on a line between the adjustable shafts, a drive belt passing around the pulleys on the adjustable shafts and having a looped portion passing around said tension pulley, a tension device acting on the tension pulley to yieldingly hold the belt taut and the adjustable shafts in an inoperative position, and means operable from two opposite points for adjusting the adjustable shafts.

7. In a machine of the character set forth, the combination of a frame, a shaft journaled in stationary bearings thereon and carrying a winding drum and a friction wheel, brackets pivotally supported on the frame for movement toward and from the friction wheel, shafts journaled on said brackets and each carrying a pulley and a friction wheel, a movably supported tension pulley arranged on a line between the adjustable shafts, a belt passing around the pulleys on the adjustable shafts and having a looped portion passing around the tension pulley, a tension device acting on said ten-

sion pulley for yieldingly holding the belt taut and the brackets in retracted position, means for independently adjusting said brackets to throw the associated friction wheels into and out of engagement with the friction wheel on the stationary shaft, other friction wheels adjustable into engagement with the friction wheel on the stationary shaft and the friction wheels on the respective adjustable shafts, and means for adjusting the last-named friction wheels into and out of engaging position.

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

LOUIS W. FETZER.

Witnesses:
H. C. MILEY,
C. H. EMERSON.