

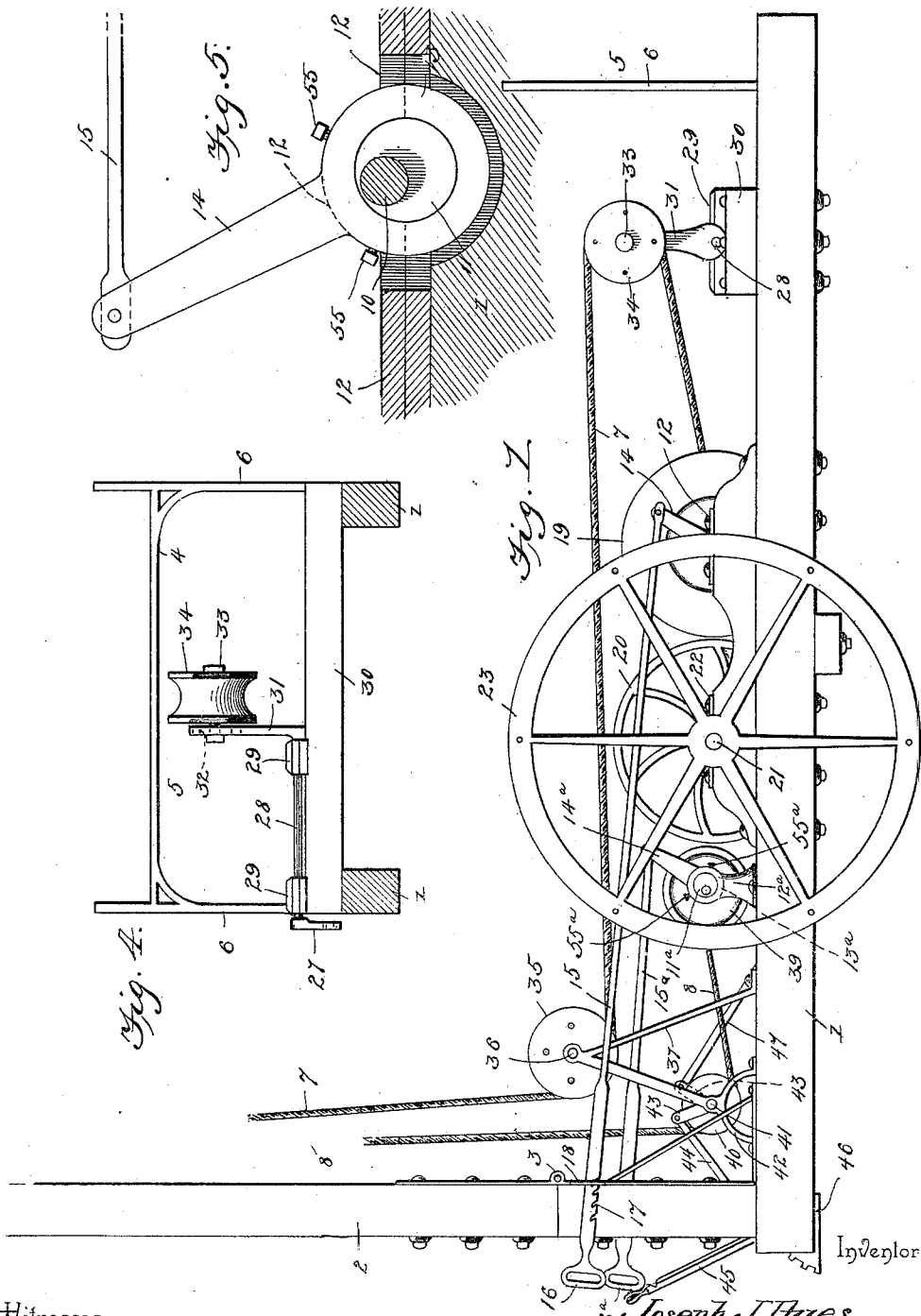
(No Model.)

2 Sheets—Sheet 1.

J. J. DUES.
WELL DRILLING MACHINE.

No. 566,383.

Patented Aug. 25, 1896.



Witnesses
E. H. Morrow
S. T. Holbrook

By his Attorneys,

Joseph J. Dues,
C. A. Snow & Co.

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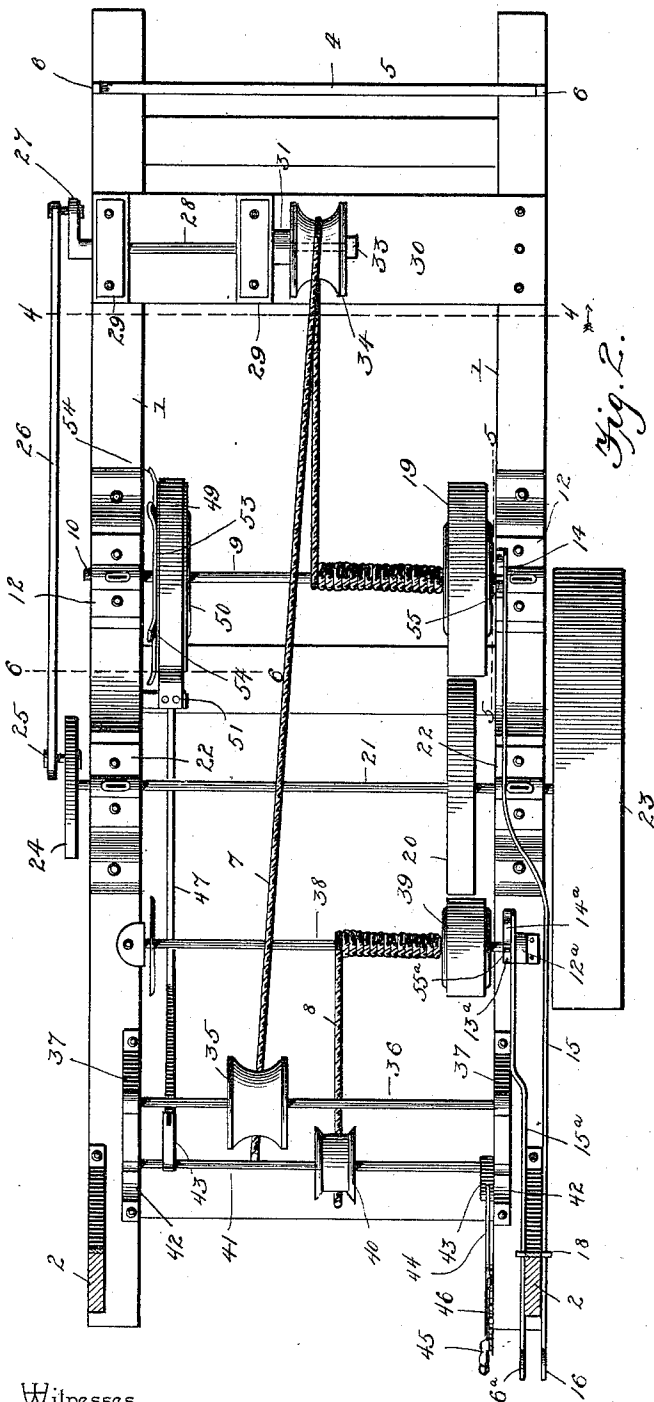


Fig. 2.

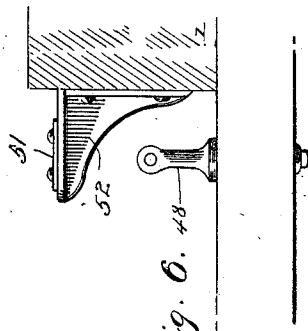


Fig. 6.

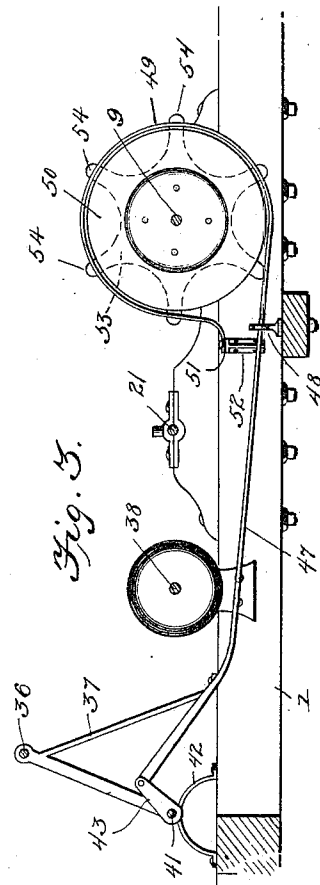


Fig. 5.

Inventor
Joseph J. Dues,

Witnesses,
E. H. Monroe,
S. P. McLaughlin

By his Attorneys,

C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

JOSEPH J. DUES, OF CHICKASAW, OHIO.

WELL-DRILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 566,383, dated August 25, 1896.

Application filed April 25, 1896. Serial No. 589,065. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH J. DUES, a citizen of the United States, residing at Chickasaw, in the county of Mercer and State of Ohio, have invented a new and useful Well-Drilling Machine, of which the following is a specification.

This invention relates to well-drilling machines, and has for its objects to effect certain improvements in machines of this character whereby a positive and efficient motion shall be imparted to the drilling-cable; also to provide simple and positive means for manipulating the main-cable spool and the sand-reel, so that these parts of the machine may be easily and readily controlled.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully illustrated, described, and claimed.

In the drawings, Figure 1 is a side elevation of a well-drilling machine constructed in accordance with this invention. Fig. 2 is a top plan view thereof. Fig. 3 is a central vertical longitudinal sectional view. Fig. 4 is a transverse sectional view on the line 4 4 of Fig. 2. Fig. 5 is a detail sectional view on the line 5 5 of Fig. 2. Fig. 6 is a detail sectional view on the line 6 6 of Fig. 2.

Referring to the accompanying drawings, the numeral 1 designates the main frame of the machine, which is usually supported on ground - wheels, (not shown,) whereby the same can be readily transported from place to place, and said frame 1 supports at one end thereof an upright derrick 2, which is provided at one or more points with a hinge-joint 3, whereby the same can be readily folded up when not in use and swung backward over the frame 1, so as to rest on the cross-bar 4 of the derrick-rest frame 5, which is arranged on the main frame 1 at the end thereof opposite the end on which the derrick is supported. The said derrick-rest frame 5 essentially comprises opposite side uprights 6, suitably secured at their lower ends on the opposite side bars of the frame 1 and connected near their upper ends by the transverse cross-bar 4, on which the derrick rests

when in its lowered folded position, as will be readily understood by those skilled in the art.

The upright derrick 2, at one end of the main frame 1, carries at its upper end the usual guide-pulleys for the main drilling and sand-pump cables 7 and 8, respectively, and in the present invention the main drilling-cable 7 is adapted to wind and unwind at one end on the main-cable spool 9, arranged transversely on the frame 1 at a point intermediate of the ends thereof. The main-cable spool 9 has its shaft extremities 10 journaled in suitable bearings at opposite sides of the frame 1, and the bearing for one of these shaft extremities is an adjustable eccentric collar 11, supported to turn in the boxing 12 at one side of the frame 1, and having adjustably fitted thereon a strap 13 at one end of the short adjusting-lever 14. The strap 13 at one end of the short adjusting-lever 14 is adjustably secured on the collar 11 by means of the set-screws 55, and at the end opposite the strap 13 the lever 14 has pivotally connected thereto one end of the adjusting-rod 15, extending to a point beyond one side of the derrick 2 and provided at its outer end with a handle 16. Adjacent to the handle 16 the rod 15 is further provided with a series of notches 17, adapted to engage a catch projection 18 on the derrick 2, whereby the rod 15 may be held rigid in its adjusted position, after the adjustment of the main-cable spool 9, by means of the eccentric collar 11, as will be more particularly referred to.

Directly adjacent to the shaft extremity mounted in the eccentric collar 11, said main-cable spool 9 has mounted thereon a friction-wheel 19, which is adapted to be moved in and out of contact with the drive friction-wheel 20, mounted on the transverse drive-shaft 21 within the frame 1. The transverse drive-shaft 21 is journaled in suitable bearings 22 at opposite sides of the main frame 1, and carries upon one end the belt-wheel 23 to receive the driving-belt for operating the machine, and at the end opposite the belt-wheel 23 the said shaft 21 carries a crank-disk 24, provided with a crank-pin 25, to which is pivotally connected one end of the pitman 26. The pitman 26 extends from its connection with the disk 24 toward the end of the ma-

chine-frame opposite the derrick, and is pivotally connected at its end opposite the crank-pin 25 with the crank-arm 27 at the outer end of a short rock-shaft 28.

5 The rock-shaft 28 is journaled in suitable bearings 29, arranged on a cross-bar 30, connecting the opposite side pieces of the frame 1 near one end thereof, and at its inner end the short rock-shaft 28 carries an upwardly-
10 disposed crank-arm 31.

The upwardly-disposed crank-arm 31 of the shaft 28 is provided therein with a series of adjustment-openings 32, in any of which openings is adapted to be fitted one end of a
15 short spindle-bolt 33, on which is mounted a crank-roller 34, which provides means for imparting the drilling motion to the main drilling-cable 7. As already described, the main drilling-cable 7 is wound on the spool 9, and
20 in the present invention is extended from said spool, so as to pass around the crank-roller 34, carried by the crank-arm 31. From the crank-roller 34 the main drilling-cable 7 passes toward the derrick 2 at one end of the
25 main frame and under a guide-pulley 35, slidably supported to rotate on a supporting-shaft 36, arranged transversely of the machine-frame and fitted at its opposite ends in the upright brackets 37, secured on the opposite side pieces or timbers of the frame 1.
30 From the guide-pulley 35 the main drilling-cable 7 extends to the guide-pulley at the top of the derrick on almost a straight line, and is connected with the string of drilling-tools
35 at the front side of the derrick in the usual manner. At this point it will be noted that, by reason of guiding the main drilling-cable from the pulley 35 to the top of the derrick on almost a straight line, the said derrick is
40 relieved of considerable jar during the drilling operation, as will be readily understood by those skilled in the art.

At one side of the transverse drive-shaft 21 is arranged the transverse sand-reel 38, on
45 which winds and unwinds the sand-pump cable 8, which extends to the top of the derrick in the usual manner, and is connected with the sand bucket or pump for the ordinary purposes, and the said sand-reel 38 has one
50 of its shaft extremities supported to turn in an eccentric collar 11^a, turning in the bearing-box 12^a, supported at one side of the frame 1, and having adjustably secured thereon, by means of the set-screws 55^a, a strap 13^a, at one
55 end of the short adjusting-lever 14^a, the other end of which lever has pivotally connected thereto the inner end of an adjusting-rod 15^a, having a catch connection with the derrick similar to the catch connection for the rod
60 15, and provided at its outer end with a handle 16^a. It will be noted that the connections with one of the shaft extremities for the sand-reel 38 for adjusting said reel are identical to the similar connections with one of
65 the shaft extremities of the main-cable spool 9. Adjacent to the eccentric bearing for one

of the shaft extremities of the reel 38 the latter carries a friction-pulley 39, which is adapted to be thrown in and out of contact with the drive friction-wheel 20 on the drive-shaft 21 to provide for starting and stopping of the rotation of the sand-reel, as desired. The sand-pump cable 8, which winds and unwinds on the sand-reel 38, extends from said sand-reel around a guide-pulley 40, slidably supported and rotating on the transverse supporting-shaft 41, the opposite ends of which shaft are fitted in the supporting-brackets 42 at opposite sides of the machine-frame, and from the pulley 40 the cable 8 passes up
75 to the top of the derrick and down on the other side thereof, as usual. In connection with the sliding support of the guide-pulleys 35 and 40 on their respective supporting-shafts, it will be noted that said pulleys are
80 free to move toward either end of said shafts to insure a straight winding of the cables 7 and 8 on their respective spools, and this is a feature of considerable importance, as uneven winding of drilling-cables on their spools oftentimes seriously affects the drilling operation. The shaft 41 not only provides a support for the guide-pulley 40 of the cable 8, but also acts in the capacity of a rock-shaft, and is provided at opposite ends with the
85 rock-arms 43, to one of which rock-arms is connected one end of a short connecting-rod 44, the other end of which rod connects with an adjusting-lever 45, suitably mounted at one end of the machine-frame and having a
90 suitable catch device 46 for holding the same in any adjusted position. The other of said short rock-arms 43 has pivotally connected thereto one end of a brake-rod 47, the other end of which brake-rod passes through a
95 guide-bracket 48, supported within the frame 1 at an intermediate point, and connects with the free end of a band-brake 49, encircling a brake-wheel 50, and fastened at its free end, as at 51, to an angle-bracket 52, secured at
100 the inner side of one of the side timbers of the main frame 1 of the machine. The brake-wheel 50 is fitted on the main-cable spool 9, near the end thereof opposite the friction-wheel 19, and has secured to its outer side a
105 spider guard-plate 53, the radial arms 54 of which are curved at their tip ends and project beyond the periphery of the brake-wheel 50 to provide for properly holding the band-brake in position thereon.
120

In the operation of the machine it will be understood that when the proper length of drilling-cable has been paid out, and with the wheel 19 relieved from the wheel 20, the band-brake is applied to hold the main-cable
125 spool stationary, and with the parts thus adjusted the rotation of the shaft 21, through the medium of the connections described, provides for the oscillation of the short rock-shaft 28. The oscillation of the shaft 28 provides means for giving a very sudden fall of
130 the crank-roller 34 at the time when the

crank-pin 25 passes over the center of the crank-disk 24, and this motion suddenly relieves the drilling-cable, and allows the drilling-tools to rapidly and sharply drop in the well, and this motion being rapidly repeated at quick intervals provides a very positive and efficient drilling motion. When it is desired to draw the string of tools out of the well, the rod 15 is manipulated so as to turn the eccentric collar 11 and throw the friction-wheel 19 against the wheel 20, and the wheel 20 will then impart motion to the spool 9, and provide for winding up the drilling-cable. In this connection it will also be noted that to operate the sand-reel 38 for winding up the sand-pump cable thereon, the rod 15^a is manipulated so as to throw the friction-pulley 39 of the sand-reel against the drive friction-wheel 20. A manipulation of the lever 45 provides for applying and releasing the band-brake of the drilling-cable as the work demands.

Changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

What I claim is—

1. In a well-drilling machine, the combination with the main frame and the upright derrick at one end thereof; of the main-cable spool mounted transversely on the frame, a short rock-shaft arranged parallel with the main-cable spool near one end of the frame and provided at its inner and outer ends with crank-arms, a crank-roller adjustably mounted on the inner of said crank-arms, a transversely-arranged drive-shaft carrying at one end a crank-disk, a pitman connection between said disk and the outer

crank-arm of said rock-shaft, a fixed supporting-shaft arranged transversely of the frame directly at one side of the derrick, a guide-pulley mounted to rotate on said supporting-shaft and having an unlimited sliding movement longitudinally of the shaft, and the main drilling-cable winding on the spool and passed around said crank-roller and said guide-pulley, substantially as set forth.

2. In a well-drilling machine, the combination with the main frame and the derrick at one end thereof; of the main-cable spool journaled on the frame, a friction-wheel mounted on the spool at one end, a brake-wheel mounted on the spool at a point opposite the friction-wheel, a spider guard-plate attached to the outer side of the friction-wheel and having arms projecting beyond the periphery thereof, a band-brake encircling the brake-wheel at one side of the spider-arms and secured at one end to a fixed point of attachment, a transversely-arranged rock-shaft having a pair of rock-arms and an adjusting-lever connection with one of said arms, a brake-rod connected at one end with the other of said rock-arms and at its opposite end with the free end of said band-brake, the main drive-shaft carrying a drive friction-wheel, and means for adjusting the friction-wheel of the spool against and away from the drive friction-wheel, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOSEPH J. DUES.

Witnesses:

W. E. TOUVILLE,
H. A. MILLER.