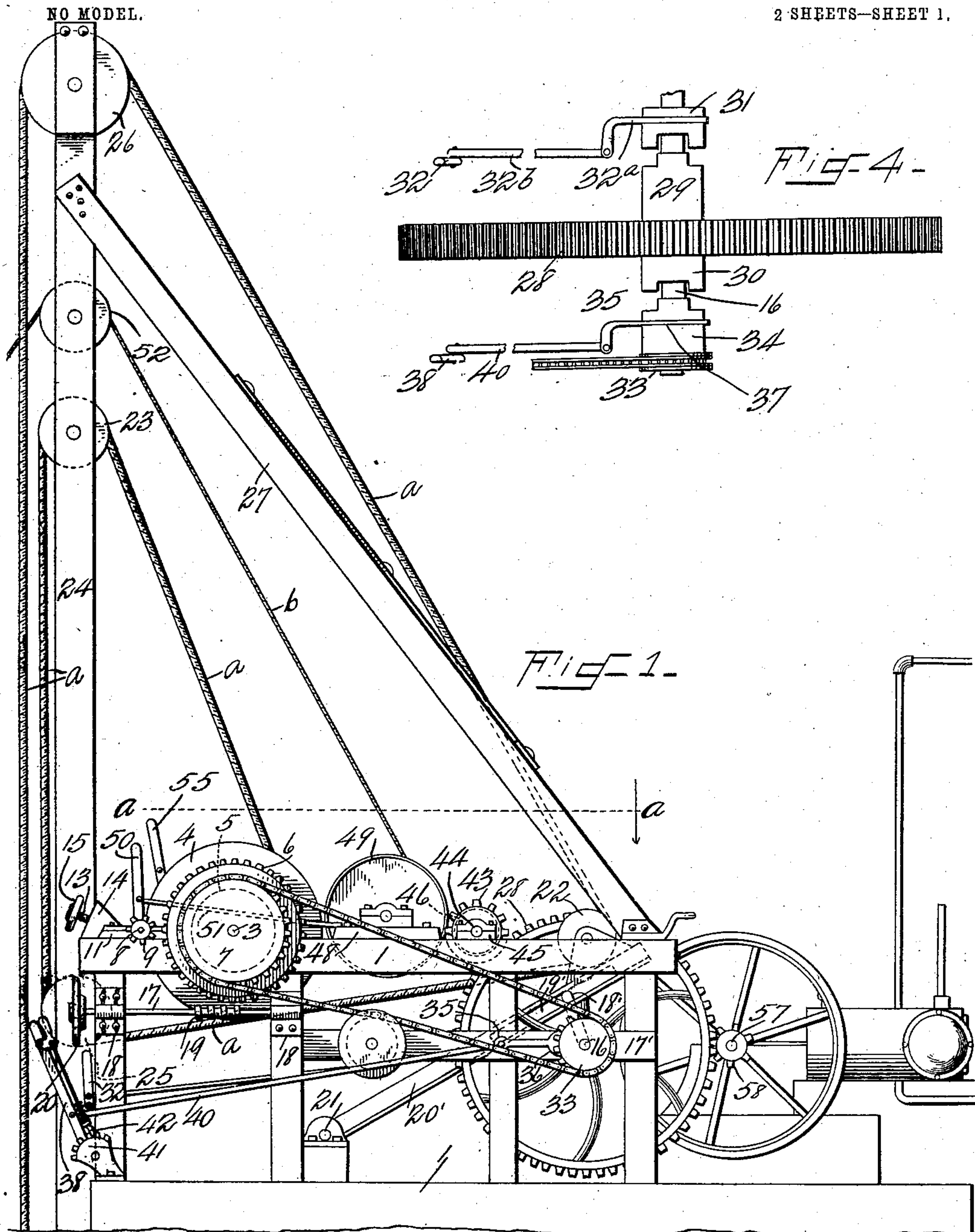


No. 726,174.

PATENTED APR. 21, 1903.

J. R. LEWIS.
WELL DRILLING MACHINE.
APPLICATION FILED DEC. 15, 1902.

2 SHEETS—SHEET 1.



Inventor

John R. Lewis

Witnesses

George Hilton

Ed Wilson

By

A. B. Wilson & Co

Attorneys

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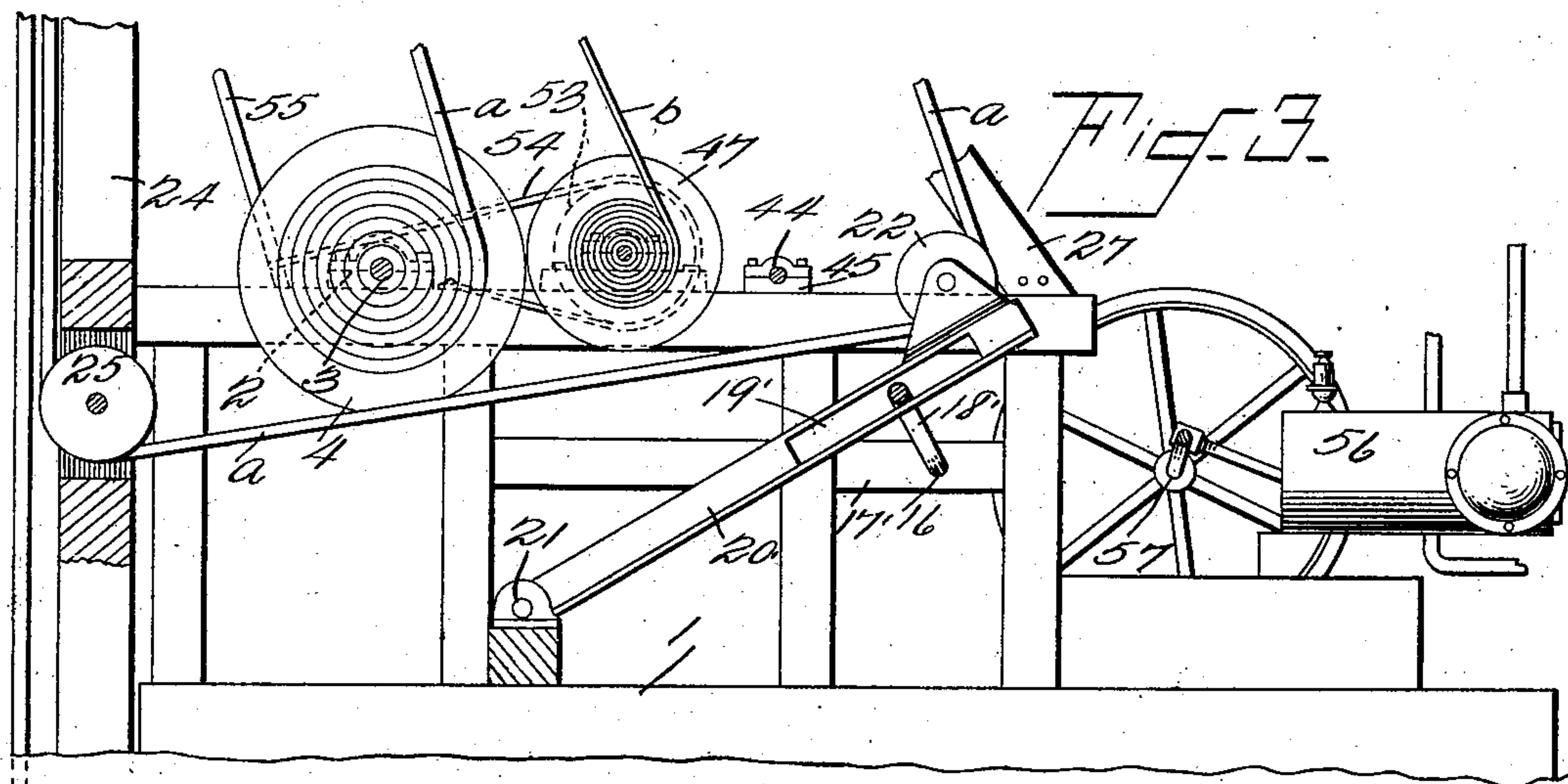
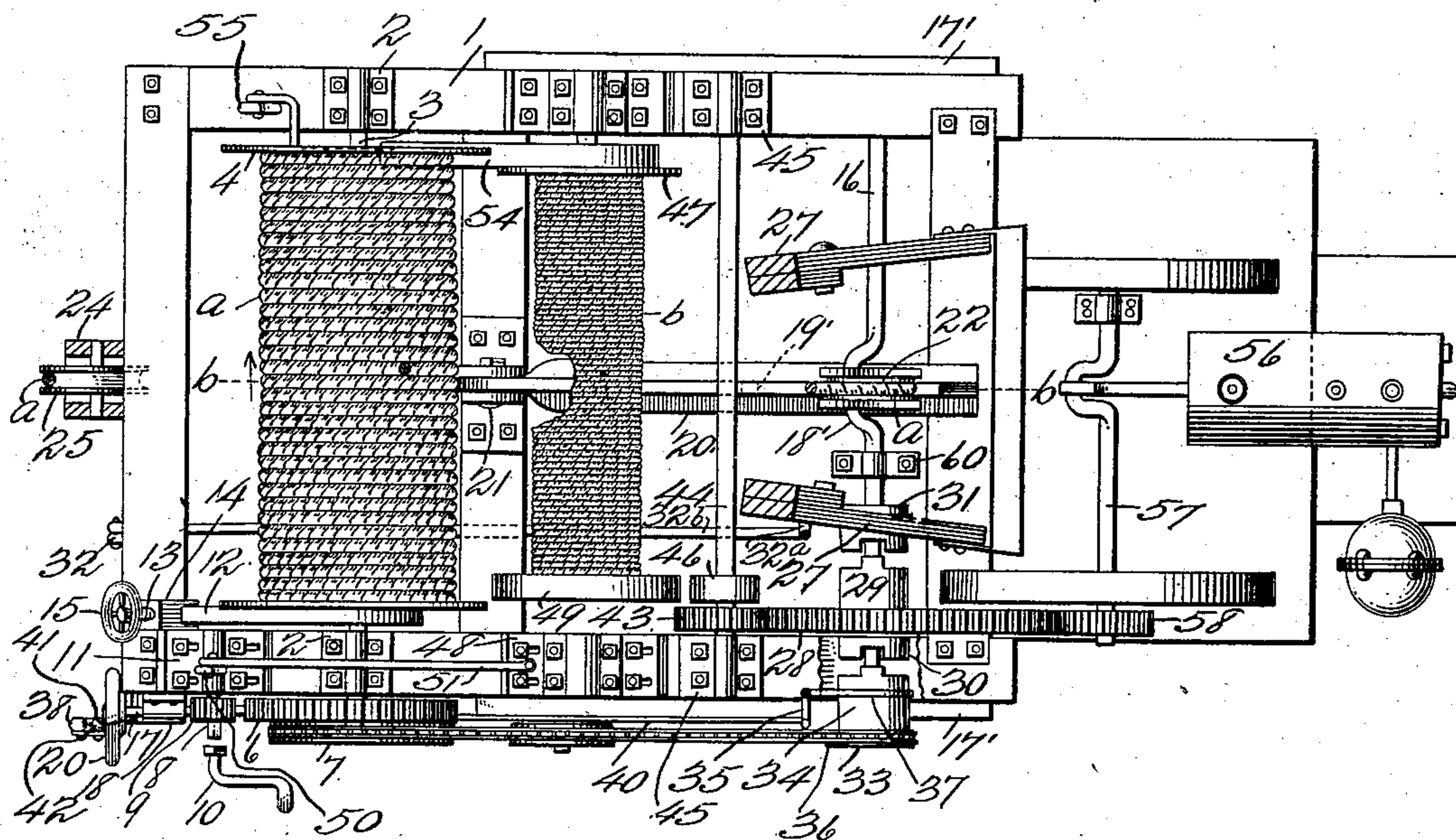
J. R. LEWIS.
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APPLICATION FILED DEC. 15, 1902.

NO MODEL.

2 SHEETS—SHEET 2.

Fig. 2.



Inventor

John R. Lewis.

Witnesses

George Hilton
Lawson

By

A. B. Wilson & Co.
Attorneys

UNITED STATES PATENT OFFICE.

JOHN R. LEWIS, OF WEATHERFORD, TEXAS.

WELL-DRILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 726,174, dated April 21, 1903.

Application filed December 15, 1902. Serial No. 135,263. (No model.)

To all whom it may concern:

Be it known that I, JOHN R. LEWIS, a citizen of the United States, residing at Weatherford, in the county of Parker and State of Texas, have invented certain new and useful Improvements in Well-Drilling 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.

My invention is an improved well-drilling machine; and it consists in the peculiar construction and combination of devices hereinafter described and claimed.

The object of my invention is to provide an improved machine of this class which is adapted to be operated by a gasoline or other suitable engine or motor, which may be kept continuously in motion whether the machine is used for operating the drill-rope or the drum for raising or lowering the mud-bucket.

In the accompanying drawings, Figure 1 is a side elevation of a well-drilling machine embodying my improvements. Fig. 2 is a top plan view of the same, partly in section, on the line *a a* of Fig. 1; and Fig. 3 is a vertical longitudinal sectional view of the same, taken on the plan indicated by the line *b b* of Fig. 2. Fig. 4 is a diagrammatic detail top plan view showing the master-wheel, a portion of the crank-shaft, the clutches on the latter, the operating-levers for the clutches, and their connections.

The frame 1 of the machine may be of the construction here shown or of any other suitable construction. On the same, near one end thereof, in suitable bearings 2, is mounted the shaft 3 of the drill-rope drum 4. The said drill-rope drum has a friction-drum 5 preferably on one of its heads, and to the shaft 3, at one end thereof, are secured a spur gear-wheel 6 and a sprocket-wheel 7. A short shaft 8 is provided with a pinion 9 and is adapted to be revolved manually by a crank 10, which is detachable from said shaft. The latter is mounted in bearings 11 on the frame 1. A friction band or strap 12 engages the friction-drum 5 of drill-rope drum 4 and is connected at one end to an adjusting-screw 13, which is mounted in a suitable nut-bear-

ing 14, secured on the frame 1, and said shaft or adjusting-screw 13 is provided with a hand-wheel 15, whereby it may be turned to frictionally engage the band 12 with the drum 5 and to increase or diminish the tension of the band as may be required to control the speed with which the drill-rope drum rotates when lowering the drill or other tool. The function of the shaft 8 and pinion 9, as hereinbefore indicated, is to enable the drill-rope drum to be rotated manually to raise the drill-tool or start the same when it is fast in the bottom of the well to avoid the loss thereof by breaking the drill-rope.

A shaft 17, which is journaled in shiftable bearings 18, is provided with a worm 19 to engage the gear-wheel 6 and is also provided with a hand-wheel 20, by which it may be manually rotated. Any suitable means may be provided to enable the bearings 18 to be shifted. As here shown, said bearings are provided with slots through which extend the bolts that secure them to the frame. By means of the shiftable bearings 18 the worm may be moved into or out of gear with the gear-wheel 6. The function of the worm when engaged with the gear 6 is to enable the drill-rope to be paid out slowly from the drum manually as the tool nears the bottom of the well when lowering the same into the well. It will be understood that when the worm is engaged with the gear 6 the driller can lower the drill as the well is being drilled deeper. The worm acts as a let-out and allows a continuous lowering of tools as the well is drilled deeper.

A shaft 16 is journaled in bearings 17, with which the frame is provided, and said shaft has a crank 18' about midway between its ends, the wrist of which operates in a slot 19' in a beam 20', one end of which is pivotally connected to the frame, as at 21. The said beam carries at its outer end a sheave 22, which engages the drill-rope *a*. The latter passes from the drill-rope drum 4 over a sheave 23 at a suitable elevation in the mast 24, then downwardly around a sheave 25 near the foot of the mast, from thence under the sheave 22, carried by beam 20', and from thence over the sheave 26 at the upper end of the mast, passing from the latter downwardly

into the well and carrying the drill or other tool used in drilling the well. The mast is provided with a suitable brace 27.

On the crank-shaft 16 is loosely mounted a master-wheel 28. The same is provided on opposite ends of its hub with clutch members 29 30. A clutch member 31 is splined on the crank-shaft and is shiftable into or out of engagement with the clutch member 29 by means of a shifting-lever 32, which is connected to a bell-crank 32^a by a rod 32^b, one arm of said bell-crank engaging said clutch. On the crank-shaft is also a sprocket-wheel 33, which is loose and is longitudinally shiftable thereon and is provided with a clutch member 34, which is adapted to be engaged with or disengaged from the clutch member 30. A bell-crank lever 35 is connected to the hub portion of sprocket-wheel 33 by a strap or yoke 36, which engages an annular groove 37, with which said hub portion is provided, and a hand-lever 38 is connected to the said bell-crank lever by means of a link-rod 40. I provide the usual segment-rack 41 and spring-pressed locking-dog 42 to secure the lever 38 at any desired position. Hence it will be understood that by means of said lever and its connections the sprocket-wheel 33 may be caused to rotate with the master-gear or may be disconnected therefrom. The master-gear 28 engages a gear 43 on a shaft 44, which shaft is journaled in bearings 45 on the frame 1. Said shaft is also provided with a friction-wheel 46. A mud-bucket drum 47 has its shaft journaled in shiftable bearings 48 on the frame 1. Said drum is provided with a friction-wheel 49, which is adapted to engage the friction-wheel 46. A shifting-lever 50 is also provided, which is connected by a rod 51 to one of the shifting bearings 48, and thereby the wheel 49 may be frictionally engaged with the wheel 46 to cause the mud-bucket drum to be rotated by power communicated thereto from the shaft 44 to pay out or wind up the mud-bucket rope *b*, which passes from the drum 47 over a sheave 52, with which the mast is provided. The mud-bucket drum is provided, preferably, on one of its heads with a friction-drum 53, which is engaged by a friction-band 54, controlled by a lever 55. When the friction-wheel 49 is disengaged from the friction-wheel 46 when lowering the mud-bucket in the well, the speed of the drum 47 may be controlled by means of this lever, as will be understood. In the drawings I show a gasoline-engine 56, which is mounted on one end of the frame 1 and the driving-shaft 57 of which is provided with a pinion 58, which engages the master-wheel 28.

When the well-drilling machine is in operation, the engine and the master-wheel are continuously in operation, as is also the shaft 44. An endless sprocket-chain 59 connects the sprocket-wheels 33 and 7. In order to operate the crank-shaft 16, and hence operate

the beam 20, to raise and lower the drill in the well when drilling, the wheel 33 is shifted out of engagement with the master-wheel and the clutch 31 is shifted into engagement therewith, and hence the crank-shaft is driven by the engine. When it is desired to raise the drill or other tool from the well, the clutch 31 is first disengaged from the master-wheel and the sprocket-wheel 33 engaged with the master-wheel, whereupon power is transmitted to the drill-rope drum, as will be understood, and the said drill-rope drum is rotated to wind up the drill-rope, and thereby raise the drill or other tool. When it is desired to lower the mud-bucket, this may be done by means of the lever 55 and friction-band 54, which coact with the friction-wheel 53 to control the speed of the mud-bucket drum. To raise the mud-bucket out of the well, the lever 50 is operated to shift the wheel 49 into frictional engagement with the wheel 46. It will be understood that during all these various operations of the drilling-machine the engine and the master-wheel will be continuously rotated. To prevent the crank-shaft from swinging, it is journaled near its central portion in a bearing 60.

From the foregoing description, taken in connection with the accompanying drawings, the construction, operation, and advantages of my invention will be readily apparent, it is thought, without requiring a more extended explanation.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of the invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a well-drilling machine, the combination of a master-wheel, means to rotate the same, a crank-shaft on which the master-wheel is mounted, a drill-operating element actuated by the crank-shaft, means to lock the master-wheel to the crank-shaft and to permit it to rotate independently thereof, a drill-rope drum, operating connections therefor including an element shiftable into and out of engagement with the master-wheel, a counter-shaft driven by the master-wheel, a mud-bucket drum, and means to gear the same to the counter-shaft and disconnect it therefrom, substantially as described.

2. In a well-drilling machine, the combination of a crank-shaft, a drill-beam operated thereby, a master-wheel loose on the crank-shaft, a clutch on the latter to connect the master-wheel thereto, a sprocket-wheel on the crank-shaft, a clutch to lock the sprocket-wheel to the master-wheel and to disconnect it therefrom, a counter-shaft having a gear engaging the master-wheel and having also a friction-wheel, a mud-bucket drum in shiftable bearings and having a friction-wheel to

engage and disengage that of the counter-
shaft, a drill-rope drum, a sprocket-wheel car-
ried thereby, an endless sprocket-chain con-
necting the sprocket-wheels of the drill-rope
5 drum and crank-shaft, and a motor geared
to the master-wheel, substantially as de-
scribed.

In testimony whereof I have hereunto set
my hand in presence of two subscribing wit-
nesses.

JOHN R. LEWIS.

Witnesses:

W. F. ARTHUR,
J. M. RICHARDS.