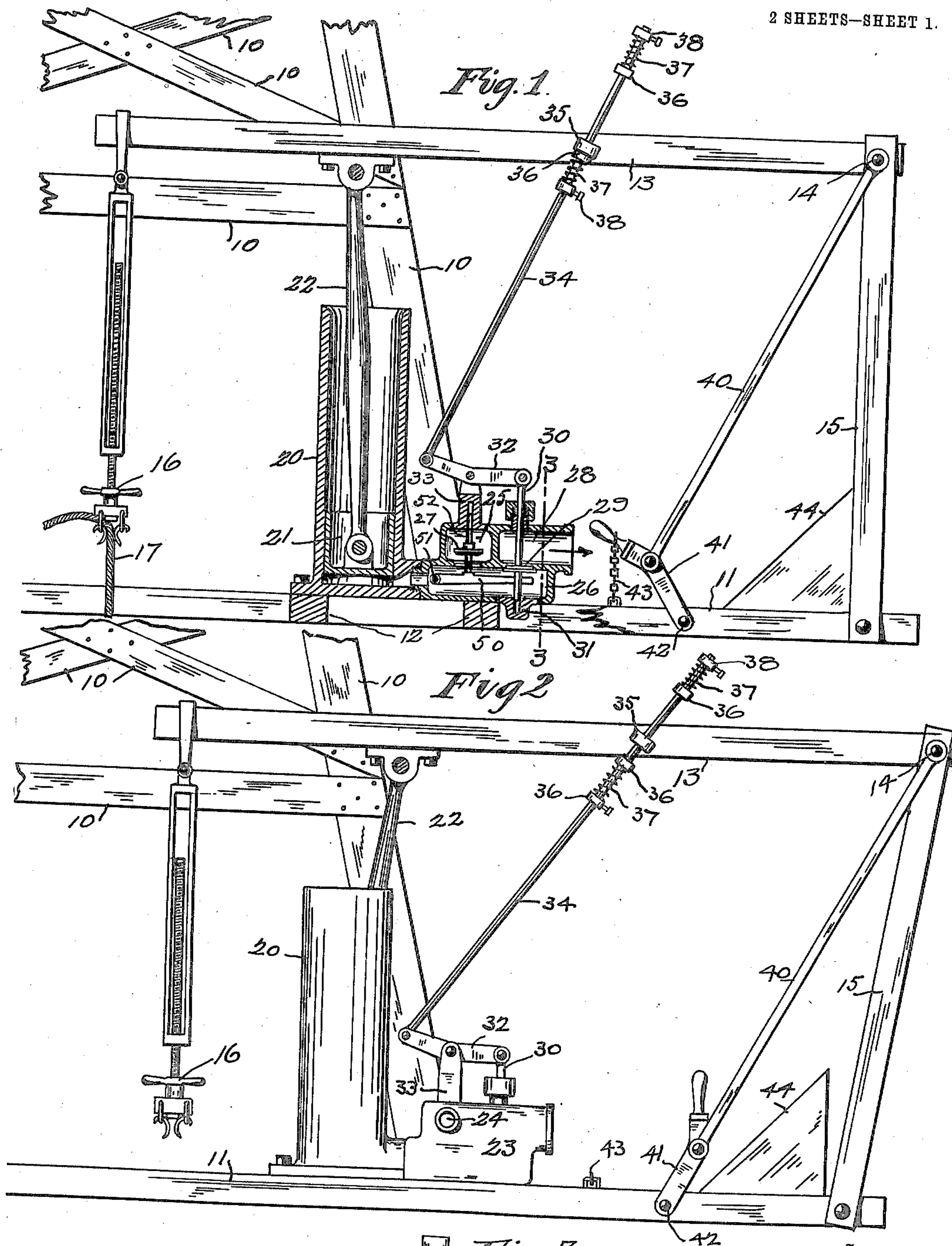


No. 811,947.

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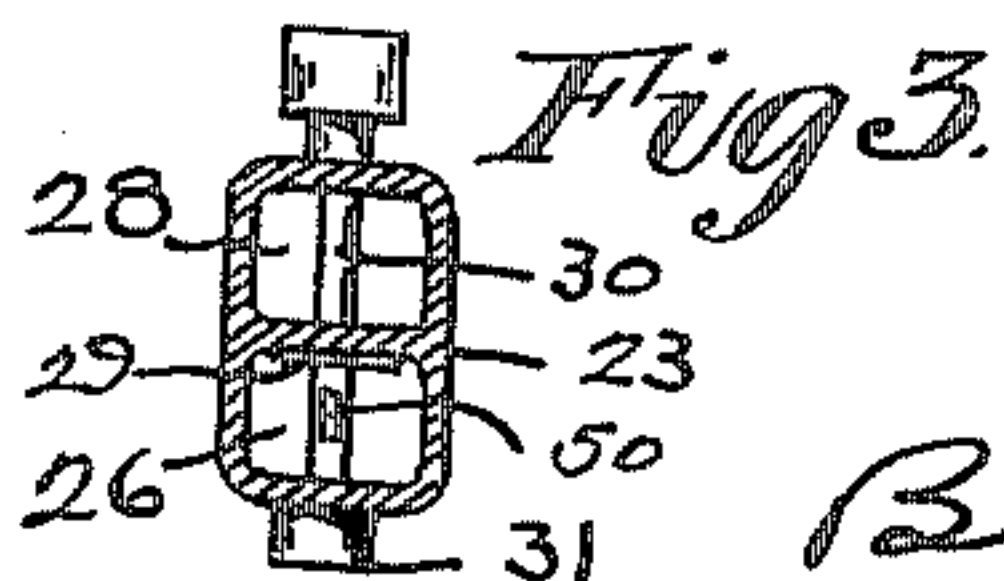
I. L. NEELY.  
WELL DRILLING APPARATUS.  
APPLICATION FILED APR. 23, 1904.

2 SHEETS—SHEET 1.



Inventor

Witnesses  
R. P. King.



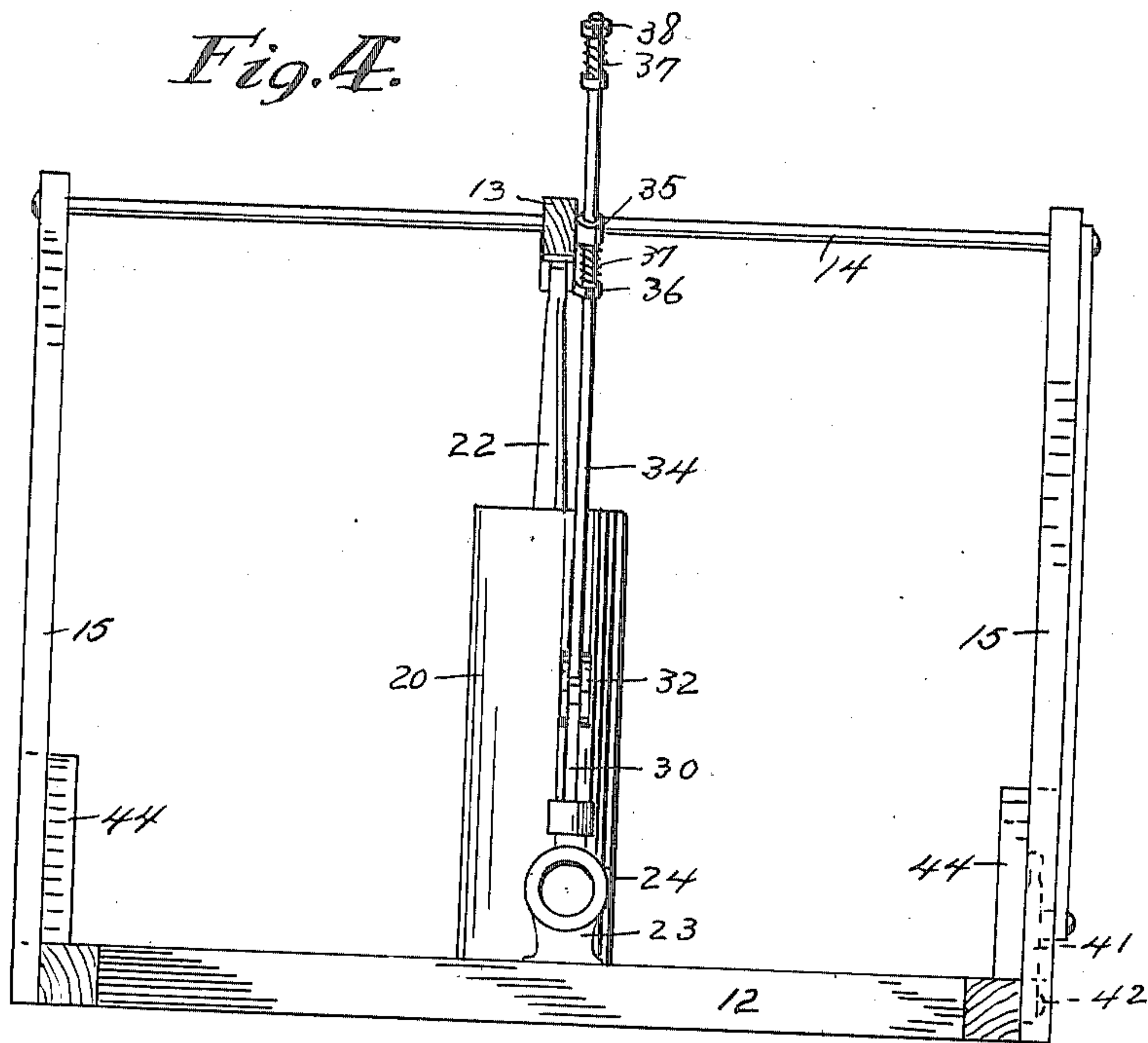
Ira L. Neely.  
By V. H. Lockwood. Attorney

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2 SHEETS—SHEET 2.



Witness

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# UNITED STATES PATENT OFFICE.

IRA L. NEELY, OF INDEPENDENCE, KANSAS.

## WELL-DRILLING APPARATUS.

No. 811,947.

Specification of Letters Patent.

Patented Feb. 6, 1906.

Application filed April 23, 1904. Serial No. 204,526.

*To all whom it may concern:*

Be it known that I, IRA L. NEELY, of Independence, county of Montgomery, and State of Kansas, have invented a certain new and useful Well-Drilling Apparatus; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like numerals refer to like parts.

The object of this invention is to provide a simple and practical means for drilling wells—such as oil, gas, and Artesian wells—with the use of a wire cable.

It has long been desired by drilling contractors to use a wire cable in drilling wells on account of its longevity; but it has been heretofore unpractical, because of its inelasticity, and no practical means for utilizing the wire cable for such purpose has been provided, so far as I am aware.

The various features will be understood from the accompanying drawings and the following description and claims.

In the drawings, Figure 1 is a side elevation of the device with a steam-cylinder and valve mechanism in central vertical section and parts broken away. Fig. 2 is a side elevation of the device with the walking-beam and attached parts thrown over somewhat away from the well being dug, parts being broken away. Fig. 3 is a transverse section of the valve mechanism on the line 3 3 of Fig. 1. Fig. 4 is a rear elevation of the frame and parts of the device.

In the drawings the parts marked 10 are portions of the derrick, such as is usually found over oil-wells, and it constitutes no part of this invention.

A base-frame is made consisting of suitable longitudinal beams 11 and cross-beams 12, and this frame is placed in proximity to the well. A walking-beam 13 is pivoted at its rear end to a rod 14, that is mounted transversely in the upper ends of a pair of posts 15, only one of which is shown. The post 15 is pivoted at its lower end to the beam 11 of the base-frame.

A temper-screw 16, of any known construction, is connected with the free end of the walking-beam 13 and clamps the wire cable 17, to the lower end of which a suitable drilling-tool is secured; but said tool is not herein shown. The means for holding the wire cable 17 need not differ from the means generally employed for holding other kinds of cables.

The means for actuating the walking-beam in order to elevate the cable and drilling-tool is attached and acts between the fulcrum and the working end of said walking-beam. The actuating means which I employ permits the use of the wire cable for drilling and consists of a steam-cylinder 20, mounted on the base-frame, with the upper end thereof open, a piston 21 in said cylinder, and a piston-rod 22, connecting the piston with the walking-beam.

The steam-valve mechanism 23 has an inlet 24 for the steam, which may be brought to said inlet by any suitable means. The steam-inlet opens into a steam-chamber 25, that communicates with a chamber 26, all the ports between said chambers being closed by the steam-valve 27. The chamber 26 communicates with the cylinder. An exhaust-chamber 28 communicates also with said chamber 26, and the port between is controlled by an exhaust-valve 29. This exhaust-valve has a stem 30 extending through it, the lower end reciprocating in a guiding-recess 31 and the upper end passing through a stuffing-box. It is actuated by the lever 32, fulcrumed between its ends to a stand 33, that is mounted above the steam-chamber 25. Said lever 32 is actuated by a connecting-rod 34, that passes through an eye 35, secured to the walking-beam. On each side of said eye 35 yielding stops 36 are mounted loosely on the connecting-rod 34. A spiral spring 37, surrounding the connecting-rod, lies adjacent each stop, and said spring is held from escape by collars 38, secured to the connecting-rod.

The stem 30 of the exhaust-valve has an opening in the portion thereof below the valve through which a lever 50 loosely extends. Said lever is fulcrumed at 51 at its other end within the chamber 26 and is used to elevate the valve-stem 52 of the steam-valve 27, and thereby opens the steam-inlet port. The upper end of said stem 52 is guided by the recess in the stand 33.

The operation is as follows: When the steam is introduced, it elevates the piston and walking-beam until the eye 35 on the walking-beam engages the upper spring-stop 36 on the connecting-rod 34 and elevates said rod, and through the lever 32 such movement of said connecting-rod lowers the exhaust-valve 29 and opens the exhaust-port. At the same time the stem 30 lowers the lever 50 and the steam-valve 27, so as to close the steam-inlet port. Then the walking-beam, wire cable,



and drilling-tool drop suddenly and with force as the steam escapes from beneath the piston. This downward movement of the walking-beam causes the eye 35 thereon to engage the lower spring-stop 36 on the rod 34 and push said rod downward somewhat, which causes a reversal of the valves and moves them in the position shown in Fig. 1, which permits the steam again to enter the cylinder. This returning of the steam into the cylinder preferably occurs at the moment the drill-tool strikes the rock and serves as a cushion to limit the downward movement of the piston and other parts, including the wire cable. The exact moment in the operation of the machine for the admission of the steam into the cylinder to effect this cushion is predetermined by the proper adjustment of the lower spring-stop 36 on the rod 34. This cushioned downward stroke of the parts prevents the kinking and bending of the wire cable, as would be the case if the walking-beam descended too far or descended any after the drilling-tool had struck the rock, and the prevention of this results from the steam-cushion under the cylinder being admitted at the proper time. This keeps the wire cable straight and reasonably taut, and since it has no kinks or bent shape at any point during the repeated strokes of the drill it does not break or wear, where if during each stroke of the drill the cable should kink at any point it would soon break at that point, and that difficulty has prevented the use of a wire cable in drilling heretofore.

The posts 15 of the construction are pivoted at their lower ends to the base-frame, which permits the walking-beam and the temper-screw mechanism to be swung rearward from over the well, as shown in Fig. 2, whenever this is desired. This is accomplished by the connecting-rod 40, which is pivotally mounted on the upper end of the rod 14, and at its lower end is pivoted to a hand-lever 41 between its ends. The hand-lever is fulcrumed at 42 to the base-frame.

By elevating the hand-lever from the position shown in Fig. 1 to that shown in Fig. 2 the walking-beam and temper-screw will be moved rearward. They are moved forward by throwing down the lever 41 to the position shown in Fig. 1, and it is held in that position by the chain 43, which has a hook on its upper end.

44 is a stop-block secured to the foundation-frame for limiting the movement of the tilting posts 15 in one direction—the direction toward the position of the well that is being drilled.

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

1. A well-drilling apparatus including a walking-beam adapted to operate well-drilling tools, an upwardly-extending support to which said walking-beam is fulcrumed, said upwardly-extending support being fulcrumed at its lower end, means for moving said upwardly-extending support so as to give the beam longitudinal movement, and a stop to limit the longitudinal movement of said walking-beam.

2. A well-drilling apparatus including a foundation-frame, upwardly-extending posts pivoted at their lower ends to said foundation, a rod connecting the upper ends of said posts, a walking-beam pivoted on said rod, means connected with one end of said walking-beam for grasping the drilling-cable, means for actuating said walking-beam, a hand-lever mounted on the foundation-frame, and a connecting-rod extending from said lever to the superstructure that tilts said superstructure rearward away from the well being drilled when such movement is desired.

In witness whereof I have hereunto affixed my signature in the presence of the witnesses herein named.

IRA L. NEELY.

Witnesses:

L. N. THRALL,

ERNEST SEWELL,