

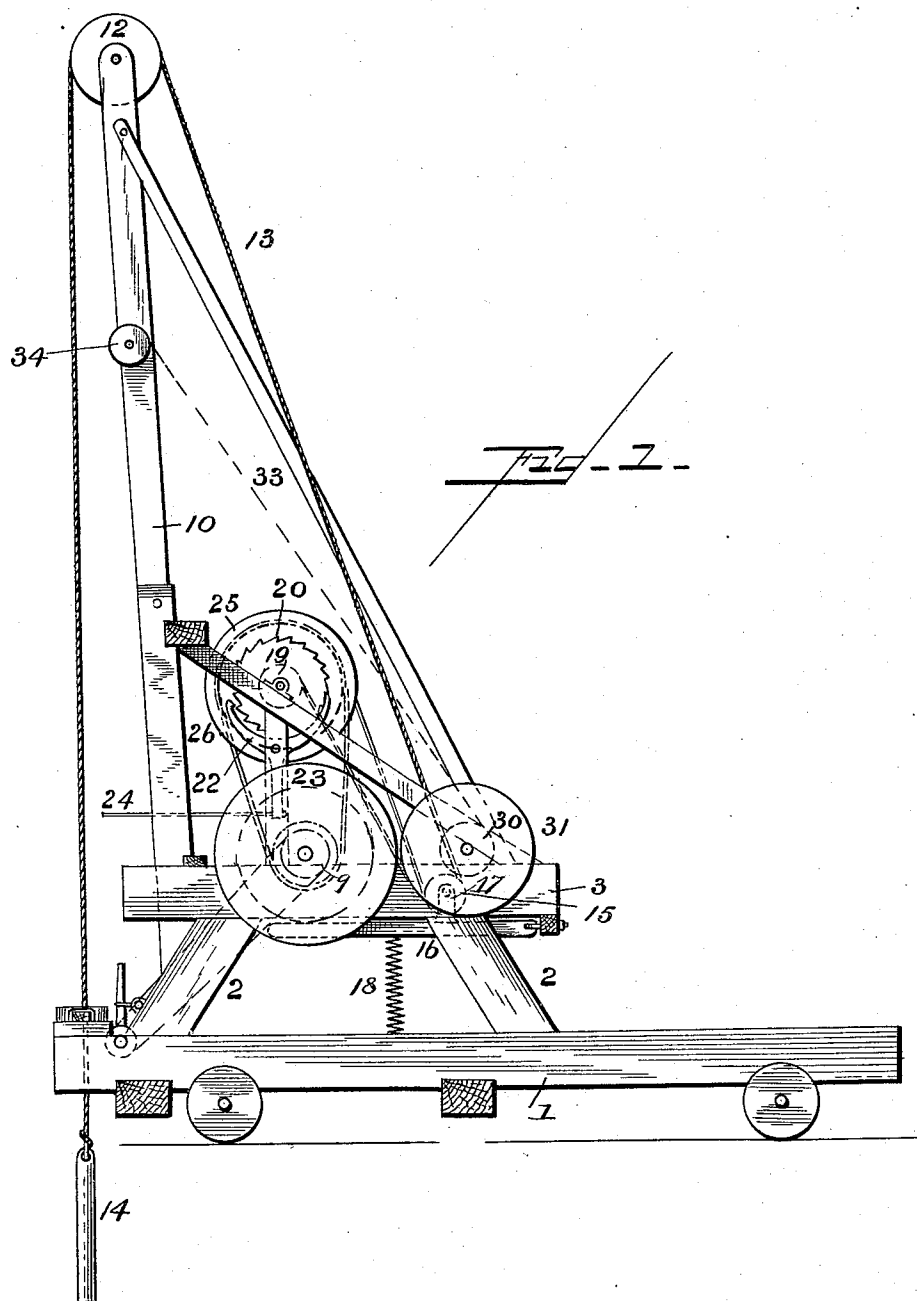
(No Model.)

3 Sheets—Sheet 1.

G. ZINK.
WELL DRILLING MACHINE.

No. 483,888.

Patented Oct. 4, 1892.



WITNESSES:
F. L. Curand
J. L. Leombs

INVENTOR:
George Zink,
by James P. Rogers & Co
Attorneys.

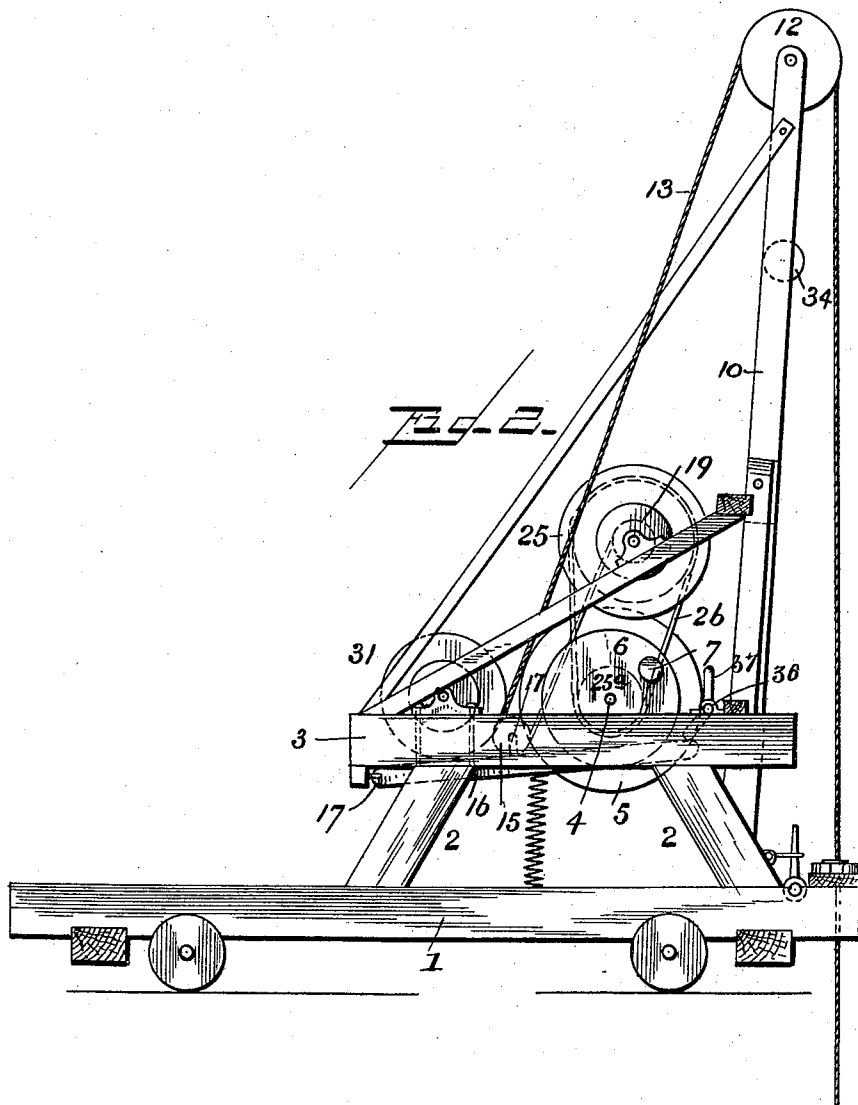
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WELL DRILLING MACHINE.

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WITNESSES:
F. L. Ourand
J. L. Coombs

INVENTOR:
George Zink
J. Sams Packer & Co.
Attorneys.

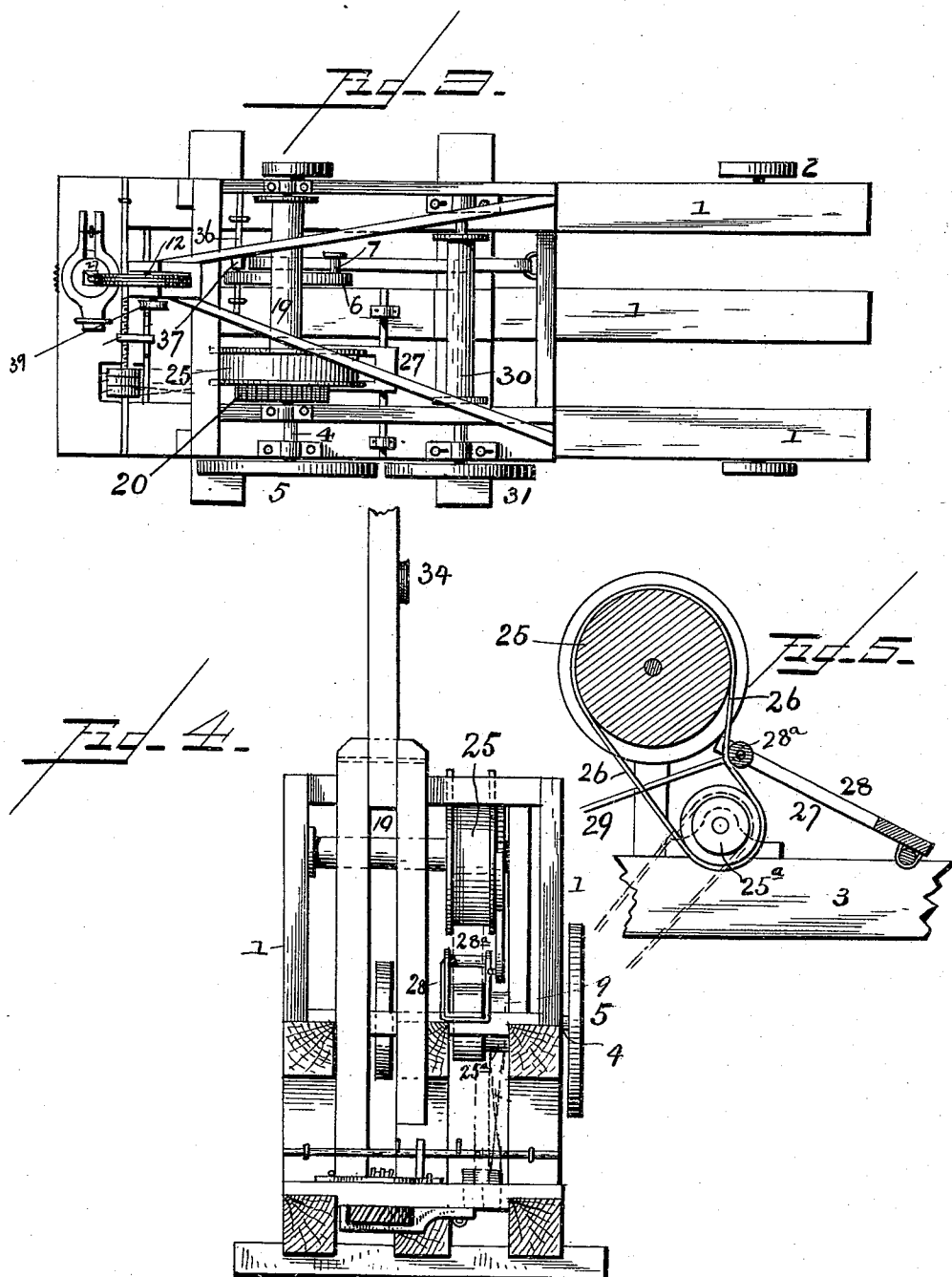
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W. L. Coombs

INVENTOR:
George Zink,
by Saml. Rogers & Co.
Attorneys.

UNITED STATES PATENT OFFICE.

GEORGE ZINK, OF CLEAR SPRING, MARYLAND.

WELL-DRILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 483,888, dated October 4, 1892.

Application filed November 23, 1891. Serial No. 412,788. (No model.)

To all whom it may concern:

Be it known that I, GEORGE ZINK, a citizen of the United States, and a resident of Clear Spring, in the county of Washington and State of Maryland, have invented certain new and useful Improvements in Well-Drilling Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to well-drilling apparatus.

The object of the invention is to improve the construction generally of apparatus of the above class, whereby superior advantages are gained with respect to efficiency of operation and simplicity and economy of construction.

The invention consists in the novel construction and combination of parts hereinafter fully described, and specifically defined in the claim.

In the accompanying drawings, Figure 1 represents a side view of a well-drilling machine constructed in accordance with my invention. Fig. 2 is a similar view looking from the opposite side. Fig. 3 is a plan view. Fig. 4 is an end view. Fig. 5 is a detail sectional view.

In the said drawings the reference-numeral 1 designates the base of the machine, consisting of transverse and horizontal bars provided with a suitable axle and wheels, so that the machine may be readily moved from place to place. Secured to the base are the uprights 2, which carry horizontal beams 3, in which are mounted the driving parts of the machine.

Journalled in suitable boxes on the beams 3 is the main driving-shaft 4, which carries at one end a pulley 5, which receives its motion by belt or otherwise from a suitable source of power. At the other end this shaft is provided with a disk 6, having a projecting pin or crank-arm 7. This shaft also carries a pulley 9, by which motion is transmitted by means of belt to the mechanism for intermittently rotating the drill, so that its point or cutting-edge will occupy a different position with respect to the material being drilled at each successive stroke, as is usual in

machines of this type. The numeral 10 designates an upright having at its upper end a pulley or sheave 12, over which passes a rope or cable 13, which is connected with the drill 14. This upright has its lower part bifurcated and is securely fixed to the frame of the apparatus. This rope or cable connected with the drill after passing over the sheave 12 is carried to a pulley 15, secured to a lever 16, pivoted to the machine-frame at 17, the lever being connected with the base 1 by means of a coiled spring 18. This lever is so constructed and arranged with respect to the pin or crank on the disk 6 that as said disk makes part of a revolution the pin will strike the lever and depress it and as it completes its revolution will release said lever and allow it to be elevated for a purpose to be hereinafter described.

From the pulley 15 the rope or cable passes to a shaft 19, upon which it is wound, said shaft being journalled in the diagonal bars secured to the frame of the machine. The shaft 19 is provided at one end with an escapement-wheel 20, with which engages a bifurcated escapement-lever 22, similar to any ordinary watch or clock escapement-lever. This lever is pivoted to the machine-frame and is provided with a downwardly-extending arm 23, provided with an operating-handle 24, by which it can be actuated. Secured to this shaft, also, is a wheel or pulley 25, which is connected by a loose belt 26 to a pulley 25^a on the driving-shaft. This belt passes between the bifurcated arms 27 of the frame 28, pivoted to the machine-frame. Near their outer ends the bifurcated arms are provided with a transverse roller 28^a, and said arms also have a handle 29, by which they may be actuated to press the roller into contact with the belt, which will cause it to tightly engage with the pulleys 25 and 25^a and cause the shaft 19 to be rotated. These devices are for rapidly winding up the drill-rope when it is desired to withdraw the drill from the well.

Journalled in the machine-frame at one end is a shaft 30, the journals of one end of which are slightly movable, so that this end of the shaft, which carries a friction-wheel 31, can be thrown into contact with pulley 5 of the driving-shaft 4, whereby said shaft may be revolved. Wound upon the shaft 30 is a rope

or cable 33, (shown in dotted lines,) which passes over a sheave 34, attached to the upright 10 and adapted to carry at its free end a sand-pump. By this construction the sand-pump and drill are connected with separate cables or ropes wound upon separate shafts, so that they may be used independently of each other.

At the front or drill end of the machine is a transverse bar or plate containing a hub having a central aperture and operated by means of a worm-wheel having a central aperture, in which said hub fits. This worm-wheel is rotated by means of a worm-shaft connected by belts with the driving-shaft, so that as the drill is fed to its work it is rotated so as to occupy a new position at each stroke of the drill. These devices, however, are made the subject of a separate application for Letters Patent filed of even date herewith, Serial No. 412,789, and need not therefore be specifically described herein.

The numeral 36 designates a pivoted bar having a radial arm 37, by which the lever 16 may be held out of contact with the crank on the disk 6 when desired, the arm being provided with an operating-lever 38.

The operation is as follows: Motion being communicated to the driving-shaft through the medium of any suitable motor, the disk 6 will be revolved and the crank 7 will depress the lever 16, causing the cable 13 to be drawn down by means of the sheave or pulley 15, which will raise the drill. As the disk continues its revolution the lever will rise and the drill will drop, as is obvious, and effect its work. This motion will be continuous, so that the drill will be alternately raised and dropped. In order to feed the cable or rope to which the drill is connected, the operator actuates the escapement-lever by means of its operating-lever, which will disengage its bifurcated arms from the escapement-wheel, thus allowing the said wheel to rotate notch by notch or step by step, according to the rapidity with which the drill performs its work. When

the well has been drilled to such an extent or depth that the disintegrated stone or other material interferes with the proper working of the drill and it is necessary to insert the sand-pump, the belt connecting the pulleys 25 and 25^a is tightened by actuating the bifurcated arms 27, which causes the roller 28 to press upon the belt and the shaft 19 to be rotated, which will raise the drill out of the well. The sand-pump is then inserted and will drop to the bottom of the well by gravity. When the sand-pump is to be raised, the wheel 31 is thrown into contact with the pulley on the driving-wheel, when the said wheel will be rotated, rotating in turn the shaft 30, which will wind up the cable or rope of the sand-pump and withdraw the latter from the well, when the drill can again be inserted to perform its work.

Having thus described my invention, what I claim is—

In a well-drilling machine, the combination, with a driving-shaft having a disk at one end, provided with a crank-pin, a pulley at the opposite end, and an intermediate pulley, and a lever carrying a sheave actuated by said crank-pin, of a shaft provided with an escapement wheel and lever and a pulley, a loose belt connecting said pulley with the intermediate pulley on the driving-shaft, the bifurcated yoke pivoted to the machine-frame, a transverse roller mounted in the opposite end of said yoke, the operating-handle, and the horizontally-movable shaft provided with a friction wheel adapted to be thrown into and out of contact with the pulley on the end of the driving-shaft for actuating the sand-pump, substantially as described.

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

GEORGE ZINK.

Witnesses:

BENNETT S. JONES,
E. A. BROWNE.