(No Model.) 2 Sheets—Sheet 1.

W. C. SHEAR.

WELL DRILLING MACHINE.

No. 345,181. Patented July 6, 1886.

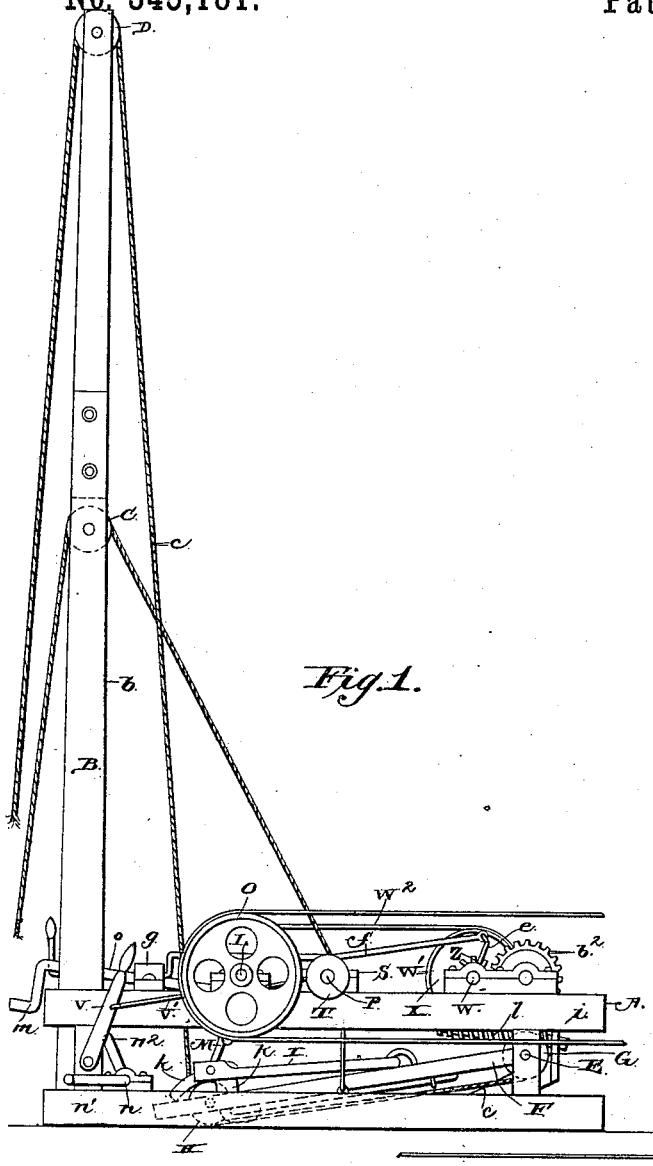

Fig. 1.

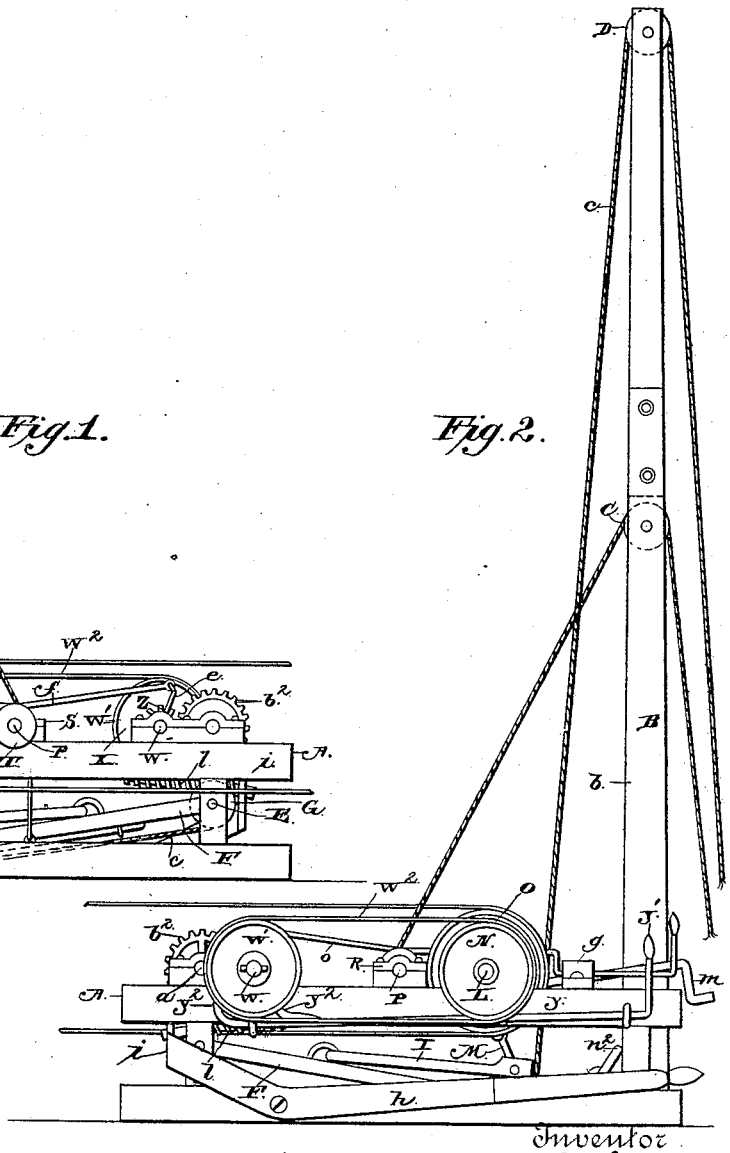

Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

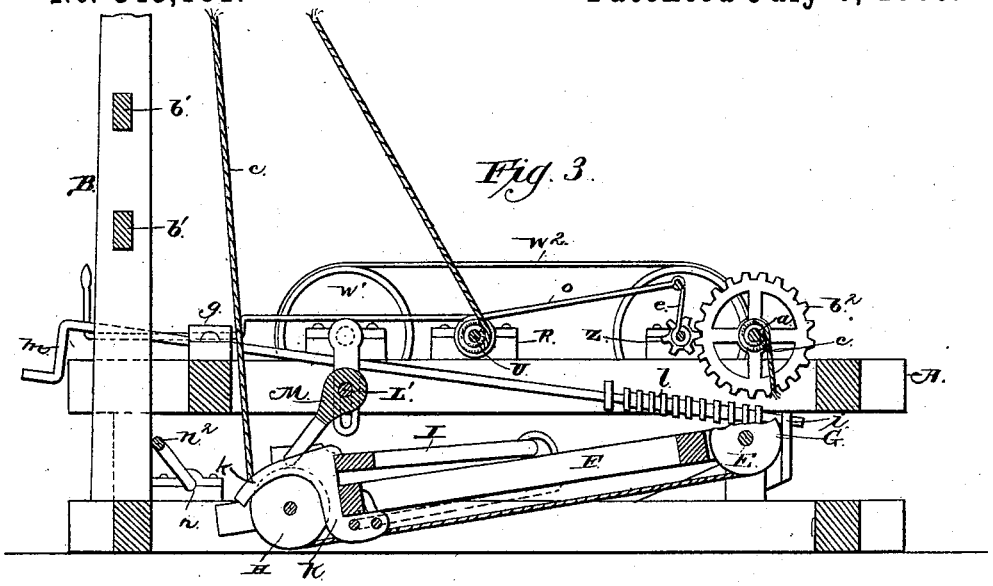
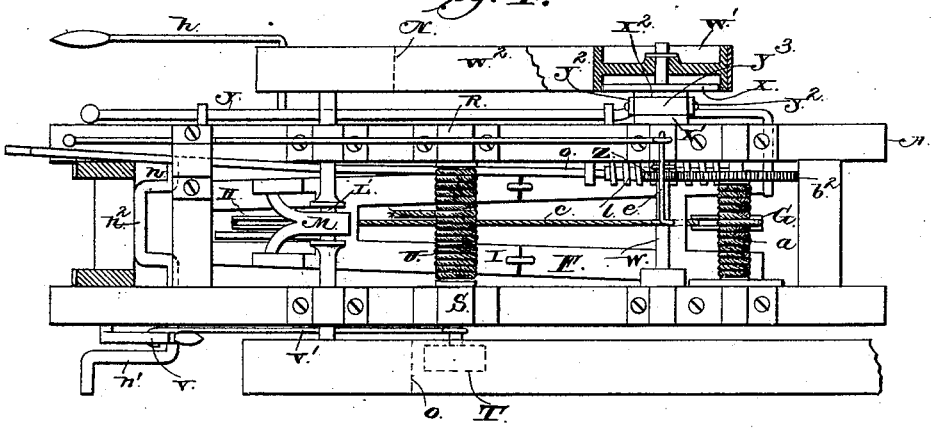


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM CHRISTOPHER SHEAR, OF PORT CRANE, NEW YORK.

WELL-DRILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 345,181, dated July 6, 1886.

Application filed April 24, 1886. Serial No. 200,015. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM CHRISTOPHER SHEAR, a citizen of the United States, residing at Port Crane, in the county of Broome and State of New York, have invented a new and useful Improvement in Well-Drilling Machines, of which the following is a specification.

My invention relates to an improvement in machines for drilling artesian and oil wells; and it consists in the peculiar construction and combination of devices that will be more fully set forth hereinafter, and particularly pointed out in the claims.

In the drawings, Figure 1 is a side elevation of my invention. Fig. 2 is a similar view of the reverse side. Fig. 3 is a vertical longitudinal sectional view. Fig. 4 is a top plan view.

A represents a rectangular frame, which is provided at one end with a derrick, B. This derrick has its lower end bolted between the opposing sides of the frame, and is made in separable sections composed each of the side bars, *b*, and the transverse connecting-rungs *b'*. Near the upper end of the lower section of the derrick is journaled a sheave, C, and at the upper end of the upper section of the derrick is journaled a similar sheave, D. At one end of the frame, opposite the end to which the derrick is secured, is a transverse shaft, E, to which is pivoted a rocking arm, F, which extends nearly the entire length of the frame. On the said shaft is also loosely journaled a sheave, G. The outer end of the rocking arm carries a sheave, H, and on the upper side of the said arm is pivoted an operating-arm, I. A spring-actuated hook, K, is fulcrumed near the outer end of the rocking arm and engages the free end of the operating-arm so as to lock the latter to the rocking arm. This hook is provided with a forwardly-extending arm, *k*, which projects for a suitable distance beyond the outer edge of the sheave H.

Near the front end of the frame, in suitable bearing-blocks, which are secured on the upper side thereof, is journaled a transverse shaft, L, the center of which is provided with a crank, L'. The arms of the said crank are slotted, as shown, and the crank-pin is formed by a bolt which passes through the slotted arms and is provided with clamping-nuts by means of which the said crank-pin may be secured to the slotted arms at any desired adjustment. To the crank-pin is connected a pitman, M, the lower end of which is connected to the outer end of the operating-arm I, whereby when the shaft L is rotated the arms F and I will be rocked, as will be very readily understood. To one end of the shaft L is rigidly attached a pulley, N, and to the opposite extremity of the said shaft is attached a driving-pulley, O.

P represents a transverse shaft, one end of which is journaled in a bearing, R, that is secured on the upper side of the frame A at one side, the opposite end of the said shaft being journaled in a longitudinally-movable bearing-block, S, which is adapted to fly on the frame. This shaft carries at one extremity a friction-wheel, T, adapted to bear against the driving-pulley O, and the said shaft also carries a sand-pump reel, U. The rope from the sand-pump reel passes over the sheave C in the derrick.

V represents a hand-lever which is pivoted to the front end of the frame A. A rod, V', connects the said hand-lever with the free end of the shaft, so as to move the latter in order to cause the friction-wheel T to either bear against the driving-pulley or to disengage the same.

W represents a transverse shaft which is journaled in suitable bearings that are secured on the frame A near the rear end thereof. On one end of the shaft W is a loose pulley, W', which aligns with the pulley N, and is connected thereto by means of an endless belt, W^2.

X represents a friction-disk which slides on the projecting ends of the shaft W, and is adapted to bear against the opposing sides of loose pulley W', so as to lock the said pulley to the shaft. This friction-disk is feathered to the shaft W, so as to rotate therewith, and is provided with a hub, X', having an annular groove, X^2.

Y represents a rock-shaft which is journaled in suitable bearings that are secured on one side of the frame A. To the front end of the said rock-shaft at the front end of the machine is attached a hand-lever, Y', and the rear end of the said rock-shaft has arms Y^2, which are connected by a concentric strap, Y^3, which fits in the annular groove X^2. By moving the hand-lever Y' it will be readily understood that the friction-disk will be moved outwardly so as to lock the pulley W' to the shaft W, or

the said friction-disk may be moved inwardly on the shaft in order to release the said pulley W'. The shaft W carries a spur-pinion, Z.

a represents the reel for the drill-rope, which is journaled in the frame A in rear of the shaft W, and is provided with a spur-wheel, b^2, that meshes with the spur-pinion Z. The drill-rope *c* is coiled upon the reel *a* and passes therefrom under the sheave G, and then forwardly under the sheave H at the front end of the rocking arm, and from thence up over the sheave D at the upper end of the derrick. The usual drilling-tool is attached to the pendent end of the drill-rope.

e represents a detent which is pivoted to the shaft W, and is adapted to engage the spur-wheel b^2. To the said detent is attached a rod, *f*, which extends forwardly on the frame A to the front end of the latter, and is guided on a keeper, *g*. By moving the said rod *f* the detent may be released from the wheel b^2 to enable the drill-rope wheel to rotate, or the said detent may be caused to engage the said wheel b^2 in order to prevent the drill-rope wheel from rotating.

h represents a lever which is fulcrumed near one end of the frame A on one side thereof. One end of this lever extends to the front end of the machine, and the rear end of the said lever is bent upwardly and then inwardly at right angles, forming a bearing, *i*, in which is journaled the rear end of a shaft, *o*. This shaft is provided with a screw, *l*, and at the front end of the said shaft is a crank-handle, *m*.

n represents a transverse rock-shaft, which is journaled in its front end on the machine-frame, and has at its outer end a crank-handle, *n'*, and is provided with a rocking arm, n^2, which is adapted to engage the protection-arm *k* of the hook K.

The operation of my invention will be readily understood. The shaft L is rotated by an endless belt which passes over the driving-pulley from a suitable engine or other motor. The rotation of the shaft causes the rocking arm F to be moved up and down, and as the said arm carries the sheave H which bears on the drill-rope it follows that the said rope will be alternately tightened and loosened, thereby imparting a reciprocating motion to the drilling-tube in the well. When it is desired to discontinue the operation of the drilling-tool without stopping the machine, the rock-shaft *n* is turned so as to cause the arm n^2 to trip the hook K and disengage the same from the operating-arm I, thereby causing the latter to be operated by the rotation of the crank-shaft L and permitting the arm F to remain stationary. By making the crank-pin of the shaft L adjustable in or out from the said shaft, the length of the stroke of the arm F may be regulated. In order to operate the sand-pump reel, the hand-lever V is moved to cause the shaft S to bring the wheel T against the periphery of the driving-pulley.

The function of the screw which engages the spurred wheel of the drill-rope reel is to permit said wheel to be rotated while the remainder of the machine is not in operation, and by pivoting one end of the said screw in the lever H it will be readily understood that by moving the said lever the screw may be caused either to engage the gear-wheel of the said drill-rope reel or disengage the same.

Having thus described my invention, I claim—

1. The combination, in a drilling-machine, of the rotating crank-shaft, the rocking arm, the operating-arm pivoted to the rocking arm, means connecting the operating-arm with the crank-shaft, and means for connecting the rocking arm with the operating-arm, substantially as described.

2. The combination, in a drilling-machine, of the rotating crank-shaft, the rocking arm carrying the sheave to bear upon the drill-rope, the operating-arm pivoted to the rocking arm and connected to the crank-shaft, and the hook for connecting the rocking arm and the operating-arm together, substantially as described.

3. The combination, in a drilling-machine, of the rotating crank-shaft, the rocking arm, the operating-arm pivoted thereto and connected to the crank-shaft, the hook connecting the rocking arm with the operating-arm, and means for disengaging the hook, substantially as described.

4. The combination, in a drilling-machine, of the rotating crank-shaft, the rocking-arm carrying the sheave to bear upon the drill-rope, the operating-arm pivoted to the rocking arm and connected to the crank-shaft, the spring-actuated hook or detent for locking the rocking arm and operating-arm together, and the rock-shaft having the tappet-arm for disengaging the said hook, for the purpose set forth, substantially as described.

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

WILLIAM CHRISTOPHER SHEAR.

Witnesses:
ORLANDO L. ANDREWS,
OBADIAH PARKER.