(No Model.)

J. W. & F. DRAPER & W. ELLSWORTH.

WELL DRILLING MACHINE.

No. 481,482. Patented Aug. 23, 1892.

Fig. 1.

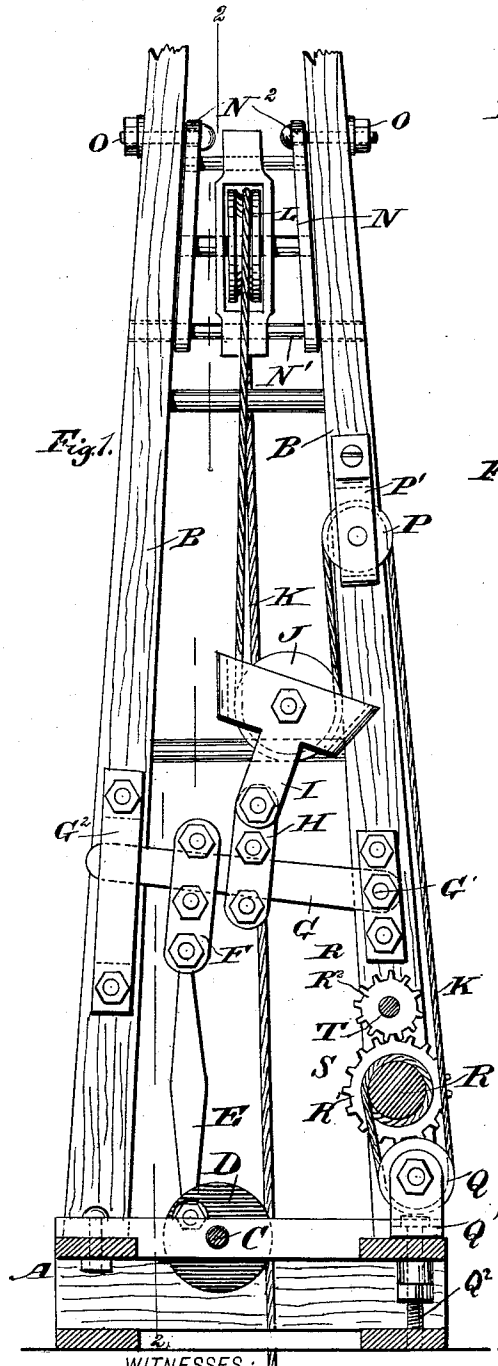

Fig. 2

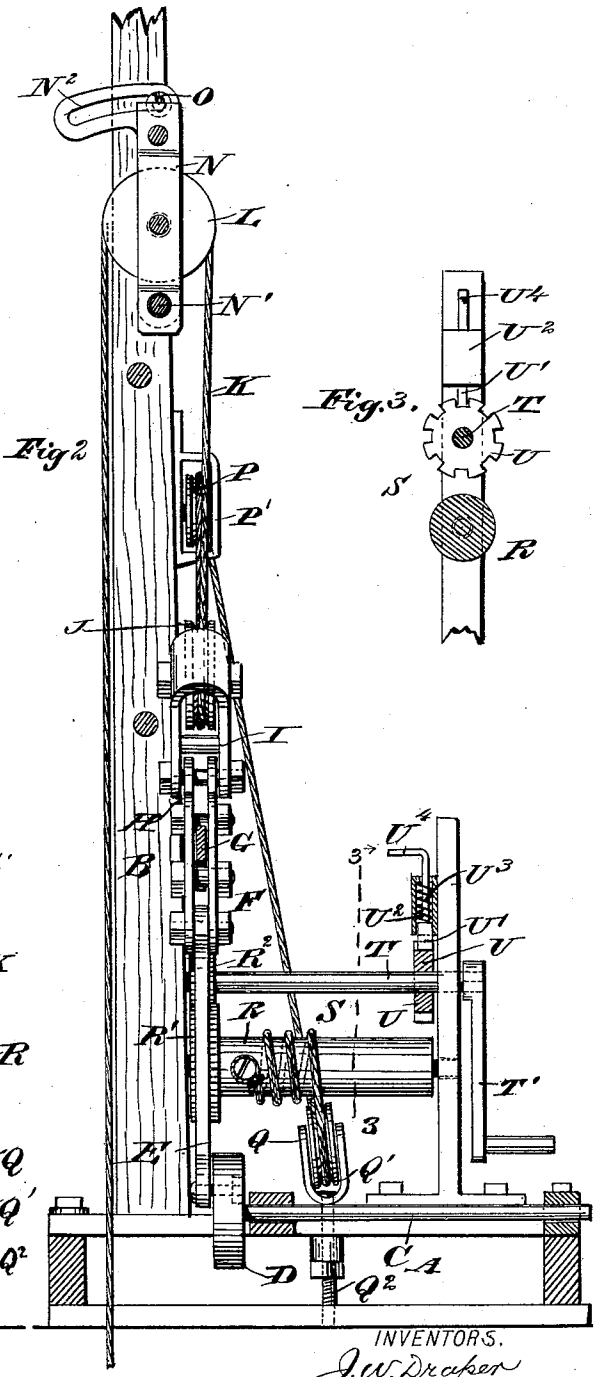

Fig. 3.

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WELL-DRILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 481,482, dated August 23, 1892.

Application filed January 13, 1892. Serial No. 417,956. (No model.)

To all whom it may concern:

Be it known that we, JAMES W. DRAPER, FREDERICK DRAPER, and WALTER ELLSWORTH, all of Alden, in the county of Hardin and State of Iowa, have invented a new and Improved Well-Drilling Machine, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved well-drilling machine, which is simple and durable in construction, very effective in operation, and arranged to be operated at a high rate of speed.

The invention consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claim.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a front view of the improvement with parts in section. Fig. 2 is a sectional side elevation of the same on the line 2 2 of Fig. 1, and Fig. 3 is a sectional end view of the locking mechanism for the hoisting-drum on the line 3 3 of Fig. 2.

The improved drilling-machine is mounted on a suitably-constructed derrick having a base A and standards B. On the base A is journaled in suitable bearings the main driving-shaft C, connected with suitable machinery for imparting a rotary motion to the said shaft. On the inner end of the shaft C is secured a crank-disk D, having a wrist-pin connected by a pitman E with a wrist-pin held in a clamp F, adapted to be clamped on a walking-beam G, fulcrumed at G′ on one of the standards B and engaging with its free end a guideway G^2, attached to the other standard. The clamp F may be fastened at any desired point along the walking-beam G, so as to increase or decrease the stroke of the walking-beam, it being understood that if the clamp F is placed nearer the pivot-point G′ the stroke is increased, and when placed near its free end the stroke is diminished.

On the walking-beam G is adapted to be clamped a second clamp H, pivotally connected with an arm of a frame I, carrying a sheave J, under which passes a rope K, extending upward and passing over a sheave L, held in a frame N, hung on a shaft N′, secured in the standard B, the upper end of the said frame N being provided with segmental slotted arms N^2, engaged by bolts O, held in the standards B and serving to secure the free end of the pivoted frame N in place, so as to bring the sheave L in proper position relative to the sheave J and the drilling-tools supported on that end of the rope K extending downward from the sheave L in the rear of the standards B. The rope K also extends from the sheave J upward over a pulley P, journaled in a suitable frame P′, attached to one of the standards B. The rope K then extends downward from the pulley P and passes over a second pulley Q, journaled in a frame Q′, mounted to turn on a bolt Q^2, held in the base A. The rope extends from the pulley Q upward and winds upon a drum R of a hoisting device S, the frame of which is attached to the base A, at one side thereof.

On one end of the drum R is secured a gear-wheel R′, in mesh with a pinion R^2, held on a shaft T, journaled in suitable bearings in the frame of the hoisting device S, the outer end of the said shaft T being provided with a suitable crank-arm T′ for conveniently turning the said shaft T, so as to impart by the pinion R^2 and gear-wheel R′ a rotary motion to the drum R to wind up or unwind the rope K, as hereinafter more fully described.

On the shaft T is secured a toothed wheel U, adapted to be engaged by a sliding pawl U′, mounted to slide vertically in a casing U^2, secured to one of the standards of the frame of the hoisting device S. A spring U^3 presses on the pawl U′, so as to hold the same in engagement with the toothed wheel U, thereby locking the latter, and consequently the shaft T, in position. The spring U^3 is inclosed in the casing U^2, as is plainly shown in Fig. 2. The upper end of the pawl U′ is made in the shape of a handle, so that the operator can conveniently move the pawl in an upward direction to disengage the same from the toothed wheel U to permit of turning the shaft T.

The operation is as follows: When the main shaft C is set in motion, a swinging motion is imparted to the walking-beam G, so that an

up-and-down motion is imparted to the frame I, carrying the sheave J. It will be seen that on the downstroke of the walking-beam G a pull is exerted on the rope K, which has one end fastened on the drum R, locked in place by the pawl U′, as previously described. Thus when the pulley J moves downward only that part of the rope K is drawn downward which extends from the sheave J to the sheave L, thus lifting the drilling-tools. As soon as the wrist-pin of the crank-disk D has passed the lowermost position the drilling-tools drop suddenly, exerting by their weight a heavy pull on the rope K, sheave J, frame I, clamp H, and walking-beam G, so that the latter quickly flies upward, drawing the clamp F and pitman E in the same direction. This operation is repeated—that is, on the downward stroke of the walking-beam the tools are lifted, and when the wrist-pin of the crank-disk D has passed its lowermost position the drilling-tools are quickly dropped. Now when it is desired to put out more rope K to lower the drilling-tools the operator withdraws the pawl U′ from the toothed wheel U and then turns the crank-arm T to unwind the rope K from the drum R. It is understood that as much rope is unwound from the drum R as is necessary to constitute the proper feed. The pawl U′ is then again engaged with the toothed wheel U, so that the drum of the hoisting device is locked in place. It will be seen that the amount of lift and drop given to the drilling-tools can be conveniently regulated by adjusting the clamps F and H on the walking-beam G in the manner above described. The frame N, carrying the sheave L, can also be adjusted longitudinally, so as to bring the rope K in the proper position relative to the well to be drilled and to the sheave J. It will further be seen that by fastening the rope over the pulleys P and Q before winding the same on the drum R the heavy strain is taken off the said drum, and consequently off the hoisting device, when lifting the tools.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

A well-drilling machine comprising a frame or base, a derrick projecting upwardly therefrom, a drive-shaft mounted on the frame, a vertically-rocking walking-beam mounted transversely on the derrick above the inner end of the drive-shaft and operated therefrom, a pulley J, adjustably connected with the walking-beam, a frame N, pivoted in the upper end of the derrick and having slotted arms through which pass adjusting-bolts, a pulley L, mounted in said frame, a pulley P, mounted on the derrick intermediate of pulleys J L, a winding-drum on the lower part of the derrick, and a rope extending upward over pulley P, thence under pulley J, and thence upward over the adjustable pulley L, and downward for connection with a drill, substantially as set forth.

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