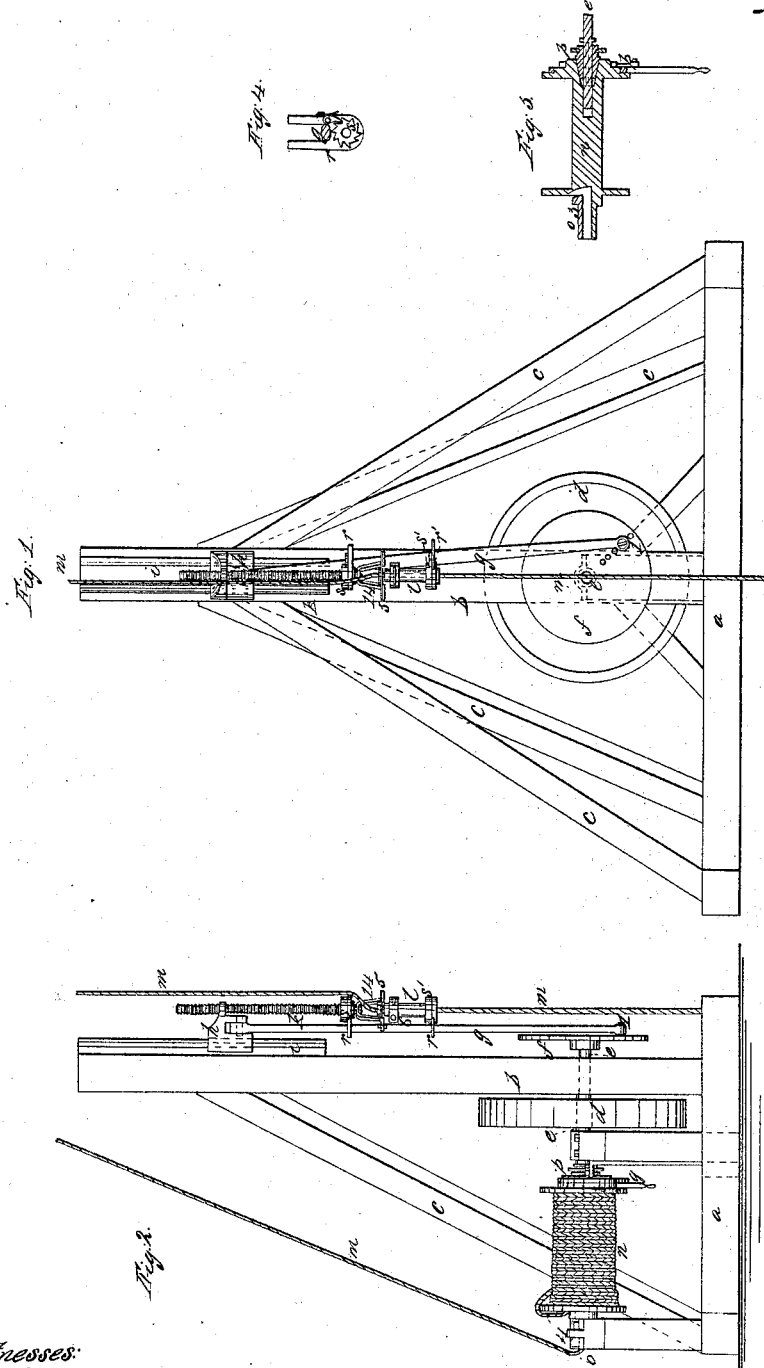


J. H. Clapham,
Boring Artesian Wells.

Nº 54,656.

Patented May 8, 1866.



Witnesses:

Wm. H. Garrison
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UNITED STATES PATENT OFFICE.

JAMES H. CLAPHAM, OF NEW YORK, N. Y.

IMPROVED METHOD OF BORING OIL-WELLS.

Specification forming part of Letters Patent No. 54,656, dated May 8, 1866.

To all whom it may concern:

Be it known that I, JAMES HENRY CLAPHAM, of the city and State of New York, have invented and made a certain new and useful Improvement in Apparatus for Operating Drills for Wells; and I do hereby declare the following to be a full, clear, and exact description of the said invention, reference being had to the annexed drawings, making part of this specification, wherein—

Figure 1 is a front elevation of said drilling apparatus. Fig. 2 is a side view of the same. Fig. 3 is a section of the barrel for the rope, and Fig. 4 is a plan of fork or lever for turning the temper-screw.

Similar marks of reference denote the same parts.

In drilling oil and other wells it has been usual to have a lever or walking-beam with a pitman and crank at one end and the temper-screw at the other, or else the pitman and crank have been placed some height up in the derrick and acting downward upon the slide that carries the temper-screw. This arrangement is very inconvenient and unreliable, because the crank and band wheel have to be so high up in the derrick that they shake and injure said derrick. This arises from the fact that the temper-screw and rope-clamp have to be at such a height that a man can easily handle the rope, and to prevent the wheel and crank being so high up in the derrick only a short connecting-rod or pitman is used.

Heretofore the rope has usually been turned by hand to make the tool strike successively around at the bottom of the hole. This causes the rope to twist until that portion which extends from the temper-screw up into the derrick has become considerably twisted, and then the rope untwisted by a reverse rotation of the tool.

The nature of my said invention consists in an arrangement of barrel for the rope that allows the rope to pass through its axis, so that a rotation of the barrel causes the rope to be revolved to untwist it at the same rate as the twist is given to said rope in operating the tool.

I also arrange the band-wheel, crank, and pitman below the slide and temper-screw, so that the parts rest firmly down upon the ground or foundation and the usual vibration is avoided. A much longer pitman can be used and the movement is more free from friction than here-

tofore, and the whole operative mechanism is in a compact form that can be made separate from and independent of the derrick, and easily moved, if required.

In the drawings, *a* is the frame or sills of the machine on a suitable foundation, and carrying the uprights or posts *b* and braces *c*.

d is a band-wheel on the shaft *e*, supported in boxes in *b*, said wheel and shaft being rotated by a belt from competent power.

f is a disk on the end of the shaft *e*, with a crank-pin, *1*, which may be moved to any of the holes in said disk, so as to vary the length of stroke given to the drill-slide and drill.

g is a connecting-rod from the crank-pin *1* to the drill-slide *h*, set to move on the ways *i* attached to *b*.

k is the temper-screw passing through a nut in *h*, which nut, for convenience in running the screw up, may be made in halves to open.

l is the clamp for the rope *m*, and said rope extends to the tool or its holder, employed as usual in boring the well. This rope *m* passes over the sheaves in the upper part of the derrick, as now generally provided, then goes to the barrel *n*. If this rope *m* passed to the side of the barrel *n*, the said rope would be twisted by the turning of the tool, as aforesaid. I therefore pass the rope into the hollow axle *o* of the said barrel *n*, thence through an opening to the barrel, and cause the said barrel to be rotated to revolve the rope as fast as it is twisted in operating the tool.

The barrel *n* is mounted on the end of the shaft *e*, as seen in Fig. 3, and provided with a friction-coupling, *p*, operated by a lever, so that the barrel can be rotated by the shaft *e* or remain stationary.

In the hollow axle *o* is a movable section, *3*, that can be taken out when the cap of the bearing *4* is removed, so that the rope can be lengthened as the drilling progresses by being unwound from the barrel and then be replaced in the hollow axle for being untwisted, as aforesaid. This arrangement allows the well-rope and tools to be drawn up directly when the rope is disconnected from the clamp and the rope removed from the hollow axle *o*, thus greatly facilitating the operations and simplifying the mechanism.

A lever and pawl, *q*, are provided, taking a ratchet on the barrel *n*, by which said barrel can be turned by hand from time to time to

take the twist out of the rope, and this lever and pawl become a powerful hand-purchase to the rope in case the drill may stick, or when the well-tubing may be raised or lowered, or other duty performed by the rope.

I make use of a fork or slotted lever, *r*, and ratchet *s* on the lower end of the temper-screw *k*, to turn said temper-screw progressively, said fork or lever being operated by the swaying of the connecting-rod *g*, over which rod said fork passes.

I hang the rope-clamp *l*, by a yoke, 14, and clips 5, from the end of the temper-screw, the said clips being made to open on a hinge, and grasping, when closed, a neck in the rope-clamp, so that said rope-clamp can be turned independent of the temper-screw *k*, and said rope-clamp is made in two pieces hinged together and pressed to the rope by a screw, 6, and at the bottom of the said clamp is a ratchet-wheel, *s'*, operated by a pawl on a forked lever, *r'*, that also sets over the connecting-rod *g*, so that the motion of said rod *g* shall rotate the rope-clamp progressively for turning the tool.

This apparatus effects a great saving by lessening friction, vibration, and wear, and is much less costly and cumbersome than the devices heretofore employed, the bull-wheel, &c., for winding the rope being dispensed with.

It will be evident that a wire rope may be applied with this apparatus in place of the usual hemp rope, and that the pump-rods for operating the pump in the well may be connected to the cross-head in place of the temper-screw, the arrangement of the band-wheel, crank, and connecting-rod causing the force to operate downward to hold the apparatus to its place, thereby avoiding the usual vibration to the derrick and mechanism.

I do not claim, broadly, a windlass with a hollow axis for the delivery of the rope, as that is old.

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

1. The arrangement of the band-wheel *d*, crank-pin 1, connecting-rod *g*, and slide *h*, in the manner specified and for the purposes set forth.

2. The friction-clutch *p* and rope-barrel *n*, in combination with the shaft *e*, connecting-rod *g*, and slide *h*, for operating the boring-tools, as specified, so that the said boring-tools can be drawn up by the direct application of power to the tool-rope in the manner set forth.

3. The fork or slotted lever *r*, actuating the temper-screw progressively by motion from the pitman, as set forth.

4. The fork or slotted lever for rotating the rope-clamp progressively by motion from the pitman, as set forth.

5. Connecting the temper-screw directly to the reciprocating cross-head, as specified, thereby dispensing with the slings heretofore employed for suspending the said temper-screw.

6. The combination of the rope *m*, clamp *l*, with its rotating device *r'* and *s'*, temper-screw *k*, with its rotating device *r* and *s*, and connecting-yoke 14, and the windlass *n*, arranged, constructed, and operated as described, as and for the purpose set forth.

In witness whereof I have hereunto set my signature this 17th day of November, A. D. 1865.

JAS. HY. CLAPHAM.

Witnesses:

LEMUEL W. SERRELL,
CHAS. H. SMITH.