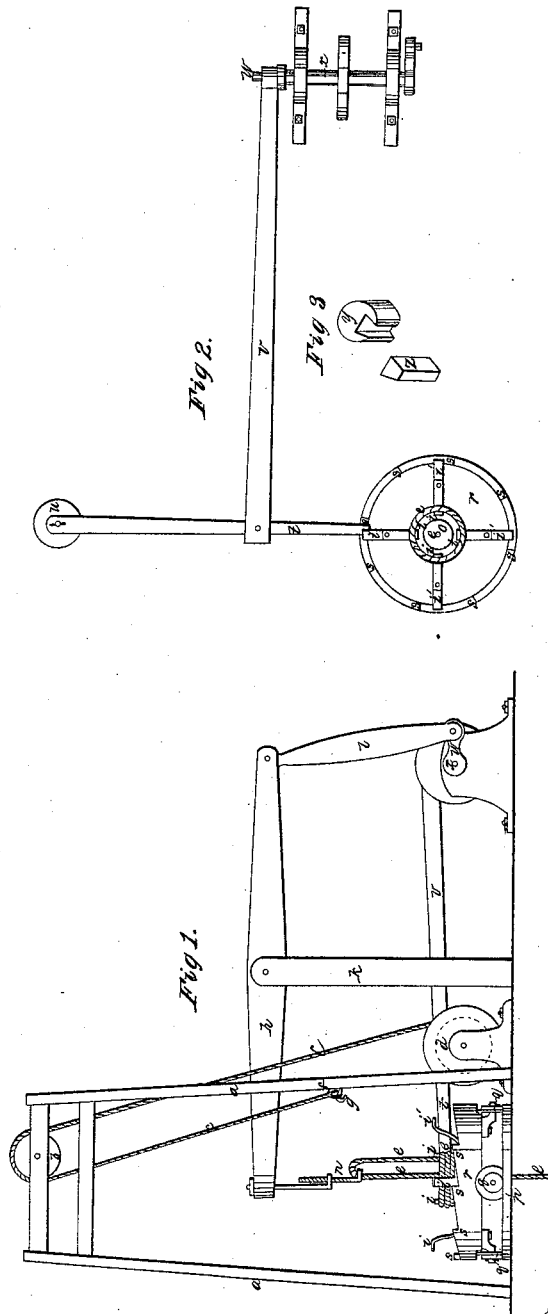


J. Ross,
Walking Beam for Stone Drills.
N^o 50,777. *Patented Oct. 31, 1865.*



Witnesses.

W. Lewis

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UNITED STATES PATENT OFFICE.

JOHNSTON ROSS, OF EAST LIBERTY, ASSIGNOR TO HIMSELF, A. H. GROSS,
AND C. W. BATCHELOR, OF ALLEGHENY COUNTY, PENNSYLVANIA.

IMPROVED MODE OF OPERATING BORING-TOOLS FOR ARTESIAN WELLS.

Specification forming part of Letters Patent No. 50,777, dated October 31, 1865.

To all whom it may concern:

Be it known that I, JOHNSTON ROSS, of East Liberty, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Operating the Boring-Tools for Artesian Wells; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of a derrick and apparatus for operating the boring-tools. Fig. 2 is a top view of the same without the derrick. Fig. 3 is a representation of a check-block used for holding the rope when detached from the walking-beam of the engine previous to raising the tool out of the well.

In the several figures like letters of reference denote similar parts.

In boring Artesian wells it is necessary that the bit of the boring-tool should turn partly round on its axis after each stroke, in order that the bit, which is chisel-shaped, shall cut a cylindrical hole by striking the rock at a different point on each successive stroke. In operating boring-tools for very deep wells it is much more convenient in every way to attach the boring-tool to the end of a rope with a weight or sinker attached to it, instead of using boring-rods of iron in sections screwed together, because a rope is more easily handled, can be more readily lowered, and may be had of any desired length in one piece. It is also very much cheaper. It is also found that a rope has a natural inclination to turn always in one direction when alternately raised and lowered by the stroke of the walking-beam of an engine.

In order to give the rope the necessary stroke up and down, its upper end is connected with the walking-beam of the engine or to a temper-screw depending from the walking-beam, so that the rope may be gradually lowered as the boring-tool sinks in the well. The necessity of continually splicing the rope as it sinks in the well is obviated by having a considerable length of surplus rope outside of the well which is usually wound around the bull-wheel or windlass used to raise and lower the boring-tool. A difficulty, however, occurs in this arrangement arising from the continual turning of the rope which is hanging in the well, when the point from which the revolution of the rope commences, is at its connection with the

temper-screw. As the rope in the well turns round the surplus rope above the temper-screw is twisted at the same time, and as the rope on the bull-wheel will not bear more than a certain amount of twist it becomes necessary very frequently to remove the surplus rope from the bull-wheel and allow it to untwist itself, and then, in order to keep it out of the way, it must be again wound around the wheel. This twisting of the rope outside of the well is a source of great trouble and annoyance, and the principal object of my improved apparatus for operating boring-tools for deep wells is to remove this difficulty, and at the same time to aid the rope to turn continually in the well during the operation of boring. This object I effect by winding the surplus rope outside of the well on a reel placed on a revolving platform so situate that the center of revolution of the platform and reel shall be in the same vertical line as the bore of the well, so that as the rope in the well turns on its axis the rope outside the well shall also turn, thus not only effectually preventing any twist in the rope, but also insuring the continuous rotation of the rope in the well in the proper direction.

To enable others skilled in the art to construct and use my improvement, I will proceed to describe its construction and operation.

In the drawings, Fig. 1, *a* is a derrick constructed over the well to be bored, having a pulley, *b*, at top, one side of which is in a vertical line over the axis of the bore of the well. Around this pulley is passed a rope, *c*, one end of which hangs vertically over the bore of the well, and the other end is wound around the windlass or bull-wheel *d*.

The free end of the rope *c* is not, as is usual, passed through the end of the temper-screw *n* and thence down into the well with the boring-tool attached to it, but is furnished with a hook, *f*, at its extremity, which hook is attached to the end of the rope *e* of the boring-tool whenever it is desired to raise the boring-tool out of the well or to use the sand-pump. When the rope *c* is not in use the hook *f* is passed over a pin or hook, *g*, at the side of the derrick, so that it may not be in the way of the workmen.

The walking-beam *h* of the engine vibrates on a standard, *k*, and is operated by a pitman, *l*, attached to the crank-arm *m* of the driving-shaft of the steam-engine or other motive power in the usual way.

To the other end of the walking-beam *h* is hung the temper-screw *n*, of any ordinary construction, permitting of the turning and gradual lowering of the working-rope *e*, to which the boring-tool and sinker are attached in the well. The working-rope *e* is fastened to the lower end of the temper-screw *n* at any point in its length that may be required, that part of the rope which is beyond the temper-screw outside of the well being wound around a reel, as hereinafter described.

On a platform surrounding the bore of the well is placed an annular track of iron, *p*, the center of which lies immediately over the axis of the bore of the well. On this annular track *p* rest four flanged wheels, *q*, attached to a circular platform, *r*, so that the platform may revolve on its axis on the annular track *p*. The platform has a central hole through it which is over the bore of the well, and through which the working-rope *e* and tools, &c., are lowered into or raised out of the well.

Around the outer edge of the circular platform *r* are a number of inclined planes, *s s*, &c., all inclining in the same direction, the lower end of each incline being on a level with the top of the platform.

A finger, *t*, is pivoted to a standard, *u*, at a little distance to one side of the platform *r*, and its free end rests on the inclined planes *s s* on the circumference of the platform. The finger *t* is moved back and forth by means of a link, *v*, one extremity of which is pivoted to the finger *t*, near its free end, and the other extremity is attached to a crank, *w*, on the driving-shaft *x* of the engine. The stroke of the free end of the finger *t* is a little greater than the length of each of the inclined planes *s s*, so that as the driving-shaft *x* of the engine revolves it causes the finger *t* to rise up one of the inclined planes and drop over its highest point, so that on the return-stroke of the finger, as the driving-shaft *x* completes its revolution, it causes the platform *r* to make a partial revolution on its axis, and thus an intermittent motion of the platform is effected, which is repeated on each stroke of the walking-beam. The inclined planes *s s* are so arranged as that the platform revolves on its axis in the same direction as the working-rope *e* is desired to turn.

Around the edge of the central hole, *o*, in the platform *r* are placed upright pins *i i*, &c., forming a reel, around which the surplus portion of the working-rope *e* is wound, and the guards *i' i'*, near the circumference of the platform, prevent the rope from spreading over the inclined planes *s s*, which would interfere with the action of the finger *t*.

The revolution of the platform *r* may be effected by any other mode of gearing or attachment to the engine that may be preferred.

The operation of my apparatus is as follows: The working-rope being attached at some point between its two extremities to the temper-screw *n*, as before described, one end is sunk into the well with the boring-tool attached to it, and

the slack end is wound around the reel on the platform. On every up-stroke of that end of the walking-beam to which the rope is attached the platform *r* is caused to form a partial revolution, and the slack of the rope turns with and on it, and as the rope on the platform forms but a continuation of the rope in the well the revolution of the platform insures the turning of the rope in the well, because if that part of the rope did not also turn it would soon become tightly twisted; but the weight of the sinker and boring-tool, by keeping the rope extended, prevents its becoming twisted, which would shorten it, and the consequence is that the rope in the well turns uniformly and at the same time as the platform.

When it is desired to raise the boring-tool out of the well the working-rope must be removed from the temper-screw; but first it is desirable to hold the rope up by some other means while it is being attached to the bull-wheel or windlass. This is effected by means of a clamp, shown in Fig. 3, which is a block of iron or strong wood, *y*, which has a recess in one side, the sides of which are converging, so that a wedge-shaped key, *z*, may be driven into it. The clamp, with the key removed, is placed on the working-rope *e*, over the central hole, *o*, in the revolving platform, the clamp being too large to pass through the hole *o*, and then the key *z* is driven into the recess of the clamp *y*, so as to fasten the clamp securely on it. The working-rope *e* is then detached from the temper-screw *n*, which is swung out of the way, the hook *f* on the windlass-rope *c* is connected with a ring or hook at the free end of the working-rope *e*, and then the windlass or bull-wheel *d* being turned, the ropes *c* and *e* are wound around it, passing over the pulley *v* overhead, and thus the tools or sand-pump are drawn out of the well. The clamp *y* is removed from the rope as soon as the windlass begins to sustain the weight of the working-rope *e* in the well.

Having thus described my improvement, what I claim as my invention, and desire to secure by Letters Patent, is—

1. The revolving platform *r*, with its reel *i i'* placed centrally over the bore of the well and caused to revolve on its axis (while the boring-tool is being worked) in the same direction as the boring-tool and rope in the well, for the purpose of holding the slack or surplus rope outside of the well and preventing it from becoming twisted, substantially as hereinbefore described.

2. The use of the check-block with its wedge, for the purpose of securing the working-rope while it is being detached from the walking-beam of the engine, substantially as hereinbefore described.

In testimony whereof I, the said JOHNSTON ROSS, have hereunto set my hand.

JOHNSTON ROSS.

Witnesses:

A. S. NICHOLSON,
W. BAKEWELL.