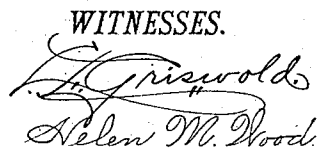


2 Sheets—Sheet 1.

No. 543,227.

Patented July 23, 1895.



INVENTOR.

Moses Bral
By Wing & Thurston
his attys

(No Model.)

2 Sheets—Sheet 2.

M. BEAL.
CORE DRILLING MACHINERY.

No. 543,227.

Patented July 23, 1895.

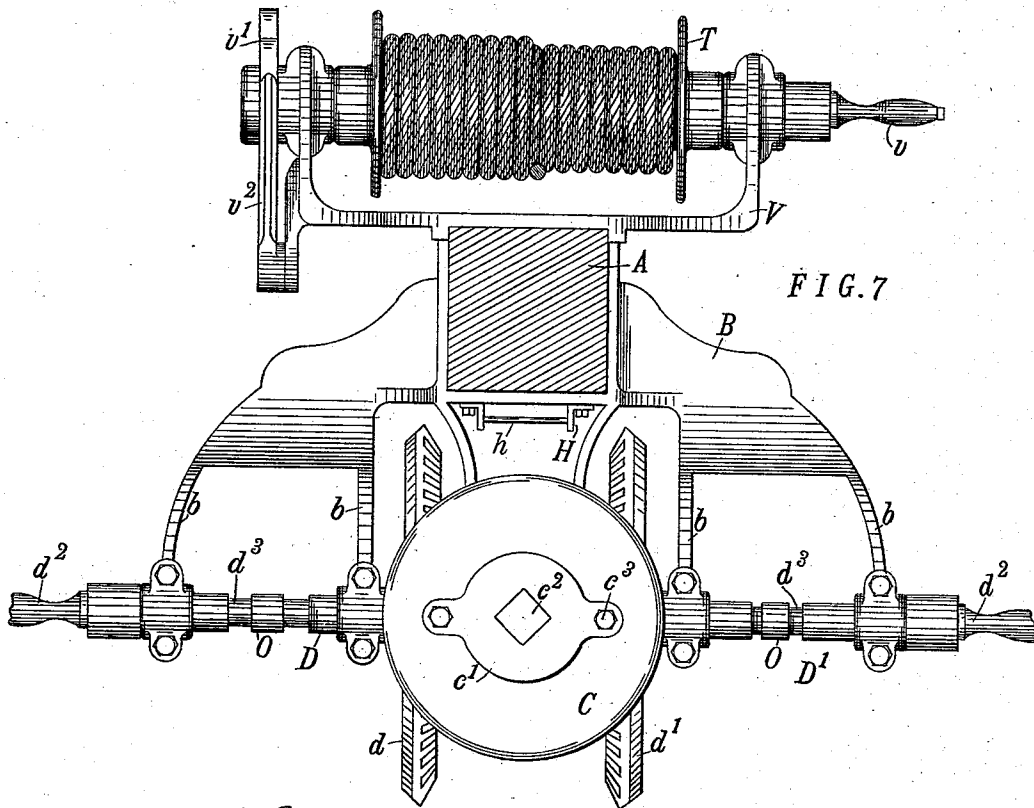


FIG. 7

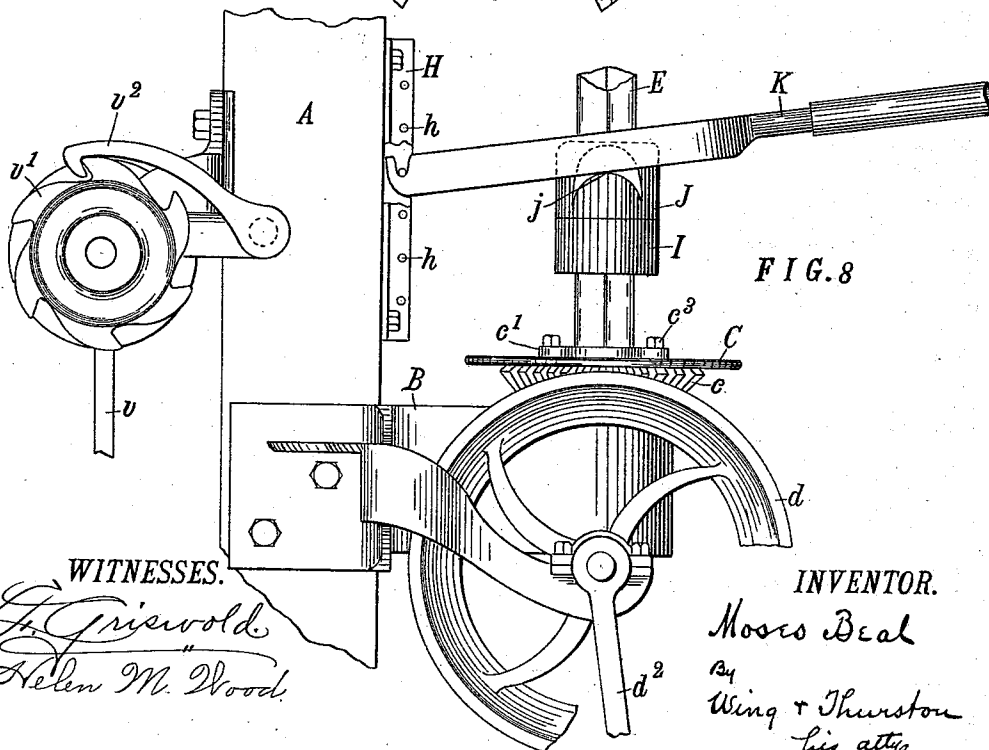


FIG. 8

WITNESSES.

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UNITED STATES PATENT OFFICE.

MOSES BEAL, OF ELYRIA, OHIO.

CORE-DRILLING MACHINERY.

SPECIFICATION forming part of Letters Patent No. 543,227, dated July 23, 1895.

Application filed February 8, 1894. Serial No. 499,255. (No model.)

To all whom it may concern:

Be it known that I, MOSES BEAL, a citizen of the United States, residing at Elyria, in the county of Lorain and State of Ohio, have invented certain new and useful Improvements in Core-Drilling Machinery; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in core-drilling machinery.

The machine as organized and shown in the drawings is a hand-drill, especially designed for easy transportation to places where larger machinery could not be taken.

Some of the improvements composing the invention are especially valuable because of their applicability to a portable hand-drill, while others are susceptible of more general use.

The invention consists in the details of construction and the combinations of parts hereinafter described, and pointed out definitely in the claims.

In the drawings, Figure 1 is a front elevation of my improved core-drilling machine, the upper part thereof being removed. Fig. 2 is a front elevation of the upper part of the apparatus, which is not shown in Fig. 1. Fig. 3 is a vertical section of the swivel for connecting the upper end of the revolving drill-stem with the non-rotating water-supply pipe. Fig. 4 is a side view of the collar and supporting-arms, which guide and steady the drill-stem. Fig. 5 is a top view of the collar J, and Fig. 6 is a top view of the collar I. Fig. 7 is a plan view of so much of the mechanism as is below the line 7 of Fig. 1 when the collars J I are removed, and Fig. 8 is a side view of the same parts of the apparatus with said collars in place.

Referring now by the letters to the various parts of the apparatus, A represents a vertical post, by which the other parts are supported, which post when the apparatus is ready for use stands upright and is so held by guy-ropes *a*.

Bolted to the post A at a suitable distance from its foot is the bracket B, which supports the drill-wheel C and the mechanism for re-

volving the same. The drill-wheel is mounted with its axis vertical in the bracket B, near the center thereof and in front of the post A. On the under side of the drill-wheel is a bevel-gear *c*, which is in mesh with the bevel-gears *d d'* on the ends of the two independent crank-shafts D D'. These crank-shafts are mounted in the ends of the forwardly-projecting arms *b b*, which are integral parts of the bracket B. On the outer end of each crank-shaft is a crank *d²*, by which they are operated. Near the middle of each shaft is a crank *d³*, which is connected to and operates the connecting-rods O. These connecting-rods operate a pump of any suitable construction, (which it is unnecessary to show,) by which water is delivered to the water-supply pipe at the upper end of the drill-stem.

Through the drill-wheel is a vertical hole through which the drill-stem E passes loosely. It is necessary that the drill-stem be longitudinally movable while it is being revolved, and heretofore the drill-stem has been connected with the drill-wheel by means of a longitudinal groove in the drill-stem and a tongue in the drill-wheel. The cutting of this groove weakens the drill-stem (which must be tubular) and makes necessary the using of heavier pipe than would otherwise be required. To avoid the cutting of the groove, (which is an expensive operation in itself,) I employ a square pipe to form that section of the drill-stem which moves through the drill-wheel, and a plate *c'* having a square hole *c²*, through which the drill-rod passes; is secured to the drill-wheel by means of bolts *c³*, or other suitable devices.

The ends *e e'* of the square pipe are made cylindrical, and these ends are threaded, so that said stem may be readily connected at its lower end with the drill F or the other sections of the drill-stem and at its upper end with the swiveling sleeve P.

Secured to the post A is the rack H, having horizontal pins or teeth *h* with which the inner hook-shaped ends of the fork-lever K are adapted to engage. Secured to the drill-stem, in front of this rack, is a collar I, and resting on this collar is a collar J, having a round hole through which the square drill-stem loosely passes and in which it may freely revolve.

The sides of this collar are cut away from the top downward a short distance, leaving the shoulders *j j*. The fork-lever *K* rests upon these shoulders, the upper part of the collar *J* lying between the forks of the lever. When the lever is in this position and its inner ends are under one of the rack teeth or pins *h*, the collar *J* is pressed down upon the fixed collar *I*, thereby forcing the drill-rod downward without subjecting the lever to any wear either from the collar or the drill-stem.

At a suitable distance above the drill-wheel the two curved fingers *M M* are bolted to an ear *m*, projecting outward from the post *A*. The outer ends of said fingers are oppositely curved, whereby they loosely embrace a collar *N*, lying in the annular groove *u* in the periphery. The drill-stem passes loosely through a square hole *n'* in this collar, and the collar revolves in the embrace of said fingers, whereby the upper end of the drill-stem is guided and steadied.

A swiveling sleeve *P* is screwed onto the upper end of the drill-stem. A water-supply pipe *R*, having a lateral inlet *r*, passes up through said swiveling sleeve, and a flange *r'* on the lower end of said pipe lies in an annular recess in the lower end of said sleeve just below the annular shoulder *p*. Suitable packing *p'* lies in an annular recess in the upper end of said sleeve surrounding the pipe *R*, and a gland *p²* screws into said sleeve down into said packing. The top of said pipe *R* is closed by a cap *r²*, and the rope *S* for lifting the drill is secured to this cap, passing therefrom up over the sheave *s* at the top of the post and thence down to the hoisting-drum *T*. This drum is mounted in bearings in the bracket *V*, which is bolted to the rear side of the post *A* at a convenient point above the bracket *B*. A crank *v* is secured to the drum-shaft. A ratchet *v'* is also secured to the said shaft, and the drum is prevented from unwinding by the engagement of the pawl *v²* with said ratchet.

It will be noticed that all of the parts of the mechanism are bolted to a single post *A*, whereby the entire apparatus is easily removed from place to place. When it is desired to carry the drill through the woods or up and down hills the parts may be removed from the post and carried along and secured

to a post cut near the place where the drill is to be used.

Having described my invention, I claim—

1. In a core drill, in combination, a revoluble drill wheel having a square axial hole, mechanism for revolving said drill wheel, a square tubular drill stem longitudinally movable through said hole, a collar *I* secured to said drill stem, a collar *J* revoluble on said drill stem resting on the collar *I* having flattened sides and the shoulders *j j*, a rack fixed behind said drill stem, and a fork lever adapted to embrace the flattened sides of said collar, and to engage with said rack and with the shoulders *j j*, substantially as and for the purpose specified.

2. In a core drill, in combination, a post *A*, a bracket *B*, bolted to its front side, having the four forwardly projecting arms *b* integral with said bracket and arranged two on each side thereof, a drill wheel mounted in said bracket on a vertical axis, two shafts mounted one on each side of the drill wheel in the ends of said arms *b* and having each a crank *d³*, meshing bevel gears on the drill wheels and the inner ends of the said crank shafts, a longitudinally movable drill stem passing axially through the drill wheel, and mechanism connecting the drill wheel and stem whereby both revolve in unison, substantially as and for the purpose specified.

3. In a core drill, in combination, a post *A*, a bracket *B* secured thereto, a drill wheel mounted with its axis vertical, in said bracket, a crank shaft mounted in said bracket, bevel gears connecting said drill wheel and crank shaft, a tubular drill stem longitudinally movable through said drill wheel, a water supply pipe swiveled to the upper end of said drill stem, a bracket secured to the rear side of said post, a rope drum mounted on said bracket, a sheave mounted at the upper end of said post, and a rope secured at one end to the water supply pipe, and passing over the said sheave to said rope drum, substantially as and for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

MOSES BEAL.

Witnesses:

E. L. THURSTON,
F. GRISWOLD.