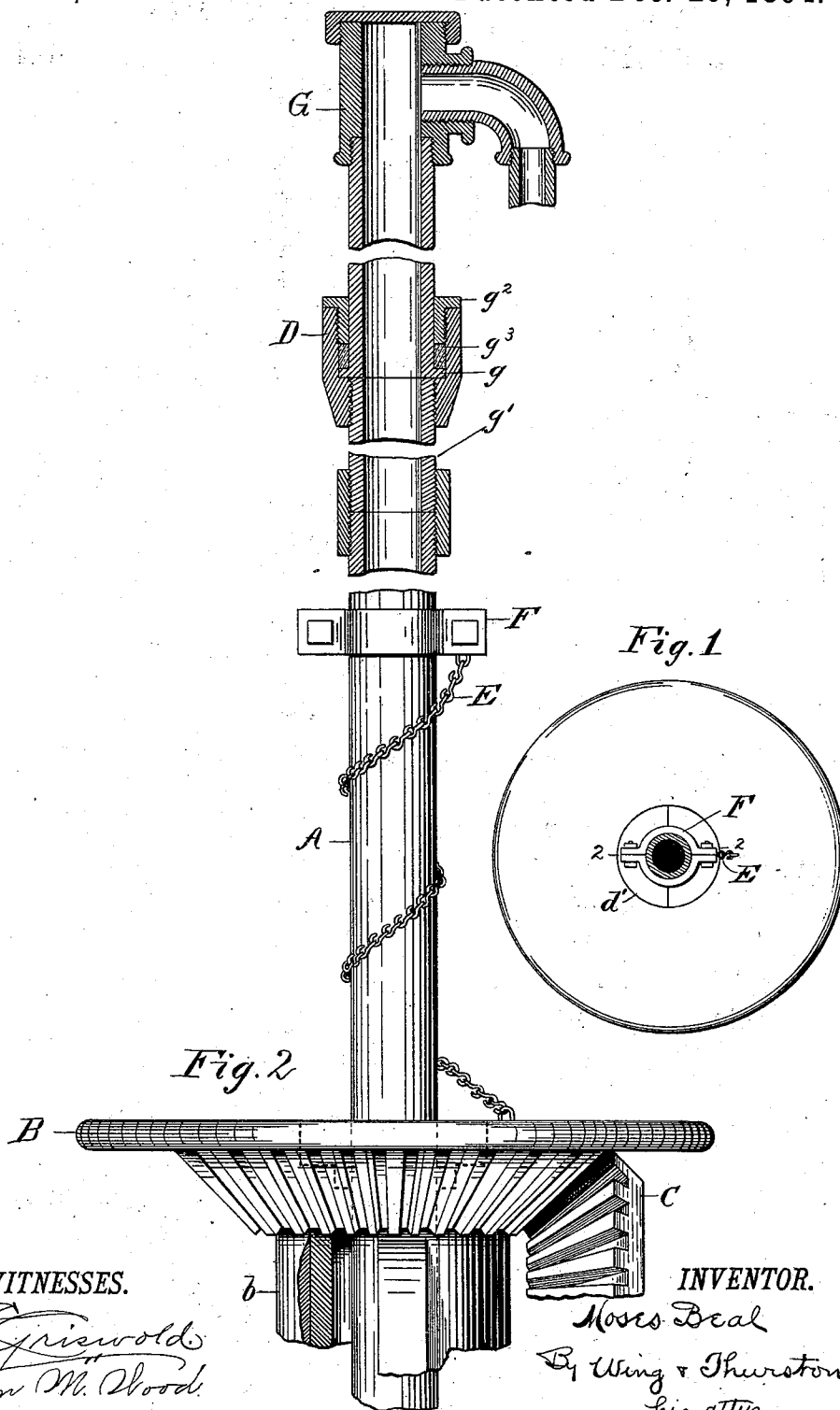


(No Model.)

M. BEAL.
ROCK DRILLING MACHINE.

No. 531,431.

Patented Dec. 25, 1894.



WITNESSES.

H. Griswold
Helen M. Wood

INVENTOR.

Moses Beal
By Wing & Thurston
his attys.

UNITED STATES PATENT OFFICE.

MOSES BEAL, OF ELYRIA, OHIO.

ROCK-DRILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 531,431, dated December 25, 1894.

Application filed November 29, 1893. Serial No. 492,328. (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 Rock-Drilling Machines; 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 rock drilling machines, and in particular to improvements in that variety of said machines known as core drills.

One object of my invention is to provide novel means for rotating the drill stem, and at the same time permitting and assisting its downward movement into the ground.

Another object is to provide means whereby water may be forced into and through the tubular drill stem to the cutting surfaces of the drill, while said drill stem is in operation.

With these ends in view, my invention consists in the combination with a revolving drill wheel, and a longitudinally movable drill stem passing centrally through said drill wheel, of a chain or rope wound about said drill stem and secured at its ends to said drill stem and drill wheel respectively; and it also consists in the construction and combination of parts hereinafter described and claimed.

Figure 1 is a plan view of the drill wheel with the drill stem in section. Fig. 2 is an elevation of a drill wheel, stem, clamp and connecting chain.

Referring to the parts by letter, A represents a tubular drill stem which passes loosely through the drill wheel B. The drill wheel has formed on its under side a bevel gear, which meshes with the driven bevel gear C. The drill wheel has a tubular arbor *b* which is suitably mounted in the frame work of the machine. It has not been thought necessary to show the frame work, nor the driving shaft to which the bevel gear C is secured. They are not parts of the invention and may be of any suitable construction.

The drill stem passes centrally through the drill wheel and its tubular arbor. It is steadied by a ring *d'* made in two parts which embrace the drill stem lightly, and rest in an

annular depression in the top of the drill wheel. The construction of these ring sections and their connection with the drill wheel may be seen in Fig. 2 and in the dotted lines in Fig. 1. Drill stems of various sizes may be used with one drill wheel, by employing ring sections of sizes suitable to the different drill stems.

The operative connection between the drill stem and the drill wheel is made by a chain or rope E which is wound spirally one or more times around the drill stem, and is connected at its ends with the drill wheel and drill stem respectively. The connection between the chain and drill stem is made by an adjustable clamp F to which the chain is attached.

When the drill wheel is revolved in the same direction as the chain is wound, the drill stem is likewise revolved. At the same time the drill stem is permitted to move downward through the drill wheel, and, in fact, is drawn downward by the action of the chain. In many cases this action is strong enough without any other expedient to drive the drill downward with sufficient force.

In operating core drills it is generally necessary to force water to the cutters through the tubular drill stem. In order that this may be done the upper end of the drill stem is swiveled to the lower end of a tubular section G having a lateral water inlet. The connection between said section G and drill stem is formed by a stuffing box D, the details of said connection being as follows: On the lower end of the section G is an annular flange *g*. A coupling member *g'* screws onto the upper end of the drill stem, and a gland *g²* screws into the upper end of said stuffing box and down onto the packing *g³* which surrounds the section G between its flange *g* and the gland *g²*.

The water inlet is connected with a pump, and the section G does not revolve, while the drill stem is revolving.

Having described my invention, I claim—

1. The combination of a driven drill wheel and a revoluble and longitudinally movable drill stem, which passes loosely through the center of said drill wheel with a flexible chain or rope which is wound spirally about said drill stem and is connected at one end with

the drill wheel and at the other end with the drill stem, substantially as and for the purpose specified.

2. The combination of a tubular revoluble
5 drill stem, a hollow irrevoluble section G having an annular flange on its lower end, a coupling piece secured to said drill stem and surrounding the lower end of said tubular section, a gland screwed into said coupling piece,

and packing inclosed in said coupling piece between said gland and annular flange, 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,
L. F. GRISWOLD.