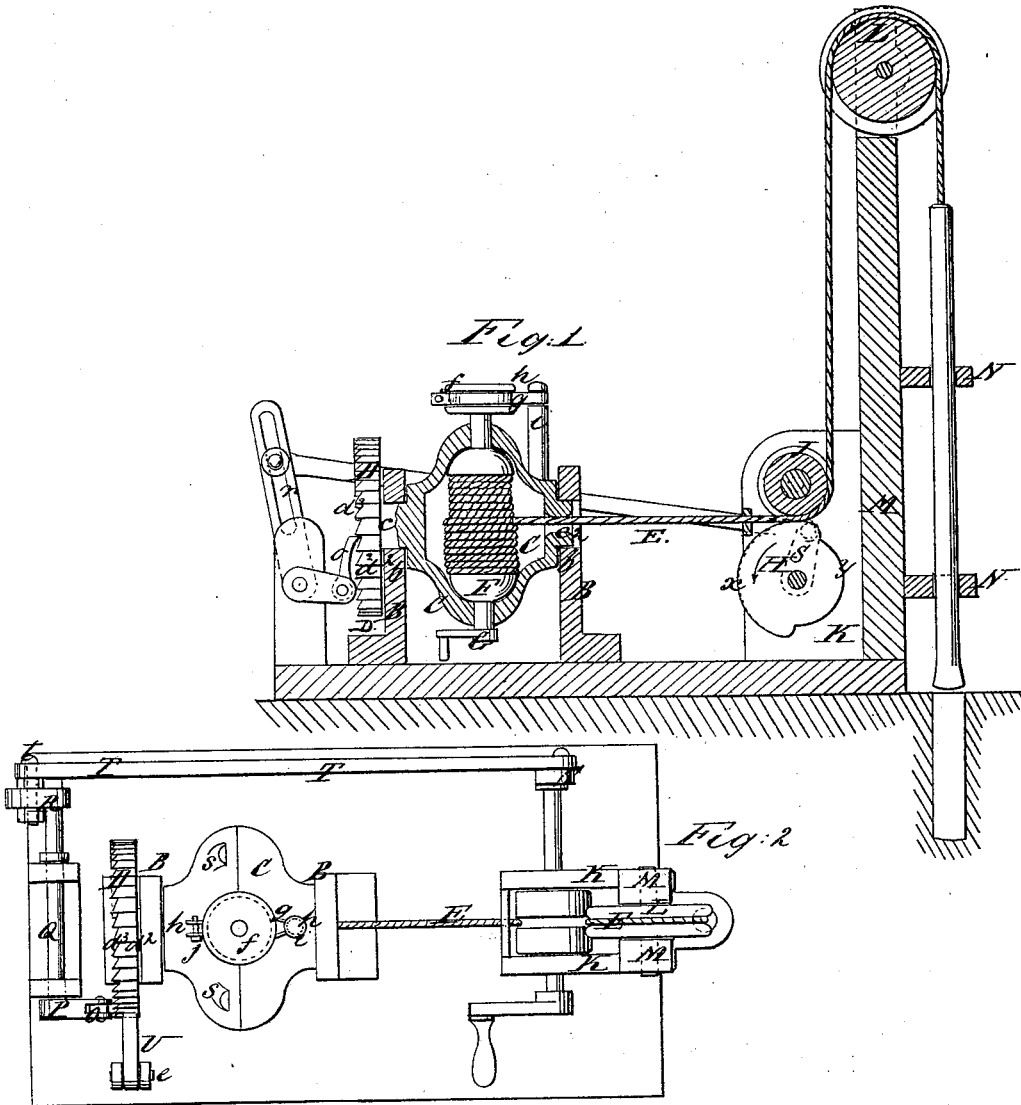


*G. P. Ganster,*  
*Stone Drill.*  
*N<sup>o</sup> 53,599.      Patented Apr. 3, 1866.*



*Witnesses*  
*Henry T. Brown*  
*L. Holmes Jr.*

*Inventor*  
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# UNITED STATES PATENT OFFICE.

GEORGE P. GANSTER, OF NEW YORK, N. Y.

## IMPROVED ROCK-DRILL.

Specification forming part of Letters Patent No. 53,599, dated April 3, 1866; antedated March 19, 1866.

*To all whom it may concern:*

Be it known that I, GEORGE P. GANSTER, of the city, county, and State of New York, have invented certain new and useful Improvements in Rock-Drilling and Well-Boring Machines; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a vertical central section of a drilling or boring machine constructed according to my invention. Fig. 2 is a plan view thereof.

Similar letters of reference indicate corresponding parts in the two figures.

My invention consists in a novel construction of a machine for drilling rock for mining purposes and for boring oil or other Artesian wells, whereby the rope is made to turn a certain portion of a revolution previous to each stroke of the drill, and does not receive any kinks or counter-twist in consequence thereof.

My invention consists, further, in a novel construction of the device used in alternately lifting and letting fall the rope connected to the drill-boring tools. This device is composed of a hard unyielding roller having two concentric faces, the radius of one being greater than that of the other, and the face having the largest radius rolling in contact with an elastic grooved roller. Between these rollers the rope is drawn back to lift the drill at each contact of the more prominent face of the unyielding roller with the rope and elastic roller, and the drill drops by its own gravity when the rear end of the working-face of the unyielding roller has passed out of contact with the upper elastic roller.

In order to instruct others skilled in the art to make my invention and apply it to use, I will proceed to describe its construction and operation, having reference to the drawings.

Securely fastened vertically to a bed-plate, A, are two standards, B, each provided with a bearing, b, for the reception of one of the journals of a flier or box, C, which is made in two parts and united, as shown by the screws s s in Fig. 2. On the solid journal c of this flier or box is rigidly secured a ratchet-wheel, D, having two ratchet-toothed faces, the one, d<sup>2</sup>, on the edge, and the other, d<sup>3</sup>, on the face.

The other journal, c<sup>2</sup>, of the flier or other box is hollow for the passage of the rope E from the reel or drum F, the axis of which is at right angles to the axis of the flier or box, and the journals of which turn in bearings suitably arranged in the said flier or box. The rope is wound on the reel or drum F by power applied to a crank, G, secured to one end of the axle of said drum. From the drum F, through the hollow journal c<sup>2</sup>, the rope passes between the elastic grooved roller J and the roller H, which is made of any hard unyielding substance, and may be serrated or roughened on its biting or binding surface x, which is concentric, but is of a radius somewhat larger than the other portion, y, of the periphery. This roller, when in operation, is kept constantly revolving in bearings in the standards K, either by power applied to a crank, I, or by other suitable means, and is situated below and axially parallel with an elastic grooved roller, J, which is free to revolve in bearings in the standard K. After passing through between the rollers J and H, the rope passes upward and over the loosely-revolving grooved pulley L, supported either in the top of a derrick or, as shown in the drawings, on two standard-posts, M, secured perpendicularly to the bed A, and through two guide-blocks, N N, attached to these posts. To the end of this rope is attached the drill.

The flier or box containing the drum is turned by means of a pawl, O, working into the face-teeth of the wheel D. The said pawl is attached to a lever, P, on one end of a rocker-shaft, Q, which has on its other end a slotted lever, R, connected to a crank, S, on the axle S' of the roller H by a rod, T. The end t of this rod is provided with a bolt, collar, &c., to allow of its being adjusted in the slot r to alter the throw of the pawl. The flier is prevented from returning by a pawl, U, on a fixed bearing, e.

One end of the axle of the drum F has on it a pulley, f, around each side of which passes the strap g of a friction-brake, h, which is attached to the stud i on the outside of the flier C, and the friction of this brake is regulated by a binding-screw, j, in such manner as to prevent the rope from running off the drum faster than is required by the progress of the drill. The drill is lifted by the action of the

roller H against the rope and roller E, which indents the rope into the india-rubber, so that the rope is held as firmly as it would be by a chain-wheel. The rope is thus moved a distance equal to the length of the working-face  $x$  of said roller H, and at each upward stroke of the drill the flier containing the windlass is turned a certain distance, and turns with it the rope E, which, being connected with the drill or cutting-tool, turns the same a portion of a revolution, and as the whole length of the rope is turned at once, the turning is effected without any liability to kink. By this absence of liability to kink much saving of labor is effected.

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

1. The combination and arrangement of the flyer C, ratchet-wheel D, pawl O, rock-shaft Q, rod T, and a crank, S, on the axle S' of the roller H, or its equivalent, substantially as and for the purpose herein specified.

2. In combination with an unyielding roller, H, of the construction substantially as herein described, the elastic grooved roller J, constructed and operating in the manner and for the purposes set forth.

GEORGE P. GANSTER.

Witnesses:

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J. W. COOMBS.