T. J. Loregrove.

Boring Artesian Wells.

No. 47,600. Patented May 2, 1865.

Fig. 2.

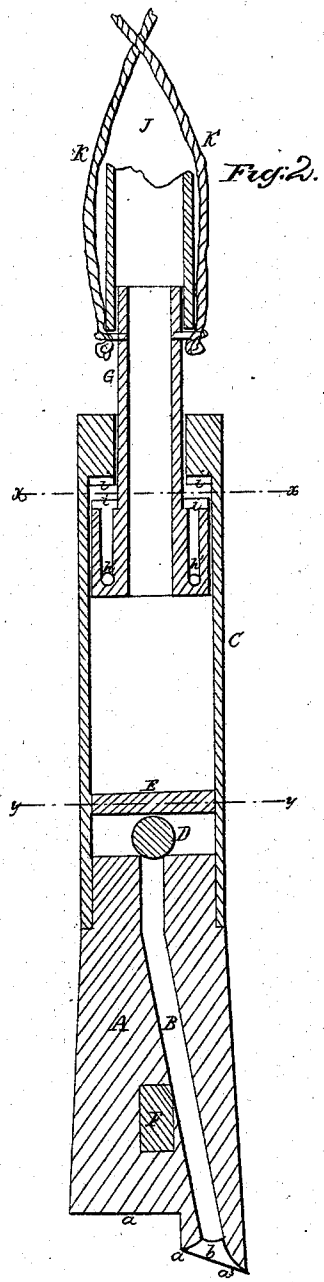


Fig. 3

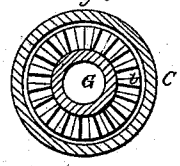


Fig. 4

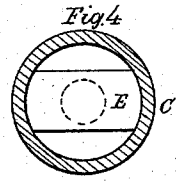


Fig. 5

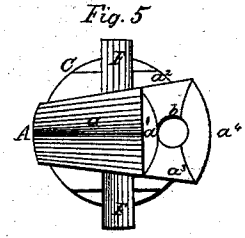
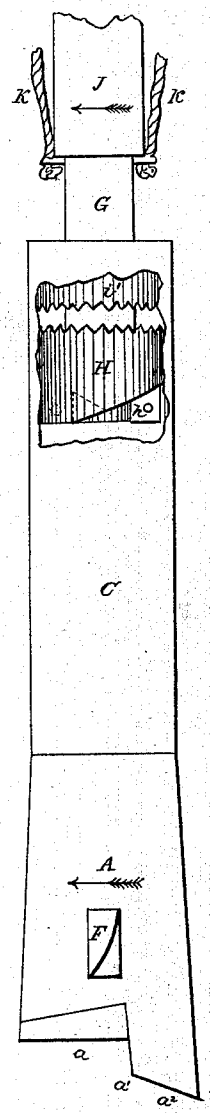


Fig. 1



Witnesses

S. S. Fahnestock.
C. Hesse.

Inventor

Thos. J. Loregrove
by his attorneys
Baldwin & Son

AM. PHOTO-LITHO. CO. N.Y. (OSBORNE'S PROCESS)

UNITED STATES PATENT OFFICE.

THOMAS J. LOVEGROVE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HMISELF AND HENRY BALDWIN, JR., OF SAME PLACE.

IMPROVED BORER FOR WELLS.

Specification forming part of Letters Patent No. **47,600**, dated May 2, 1865.

To all whom it may concern:

Be it known that I, THOMAS J. LOVEGROVE, of the city and county of Philadelphia, in the State of Pennsylvania, have invented a new and useful Improvement in Tools for Boring Artesian or Oil Wells, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which make part of this specification, and in which—

Figure 1 represents a view in elevation of my improved boring apparatus with a portion of the casing broken away to show the interior; Fig. 2, a vertical central section through the same; Fig. 3, a transverse section at the line *x x* of Fig. 2; Fig. 4, a similar section at the line *y y* of Fig. 2, and Fig. 5 a view in elevation of the face of the tool.

The objects of my invention are to prevent the jamming or sticking of the drill, to rotate it automatically, and to remove the detritus from the bottom as fast as formed; and to these ends the improvement herein claimed consists, first, in rotating a boring-tool by hydraulic pressure; second, in combining with a drill a tubular jar rotated by the fluids passing through it; third, in combining with a tubular jar, rotated in one direction by hydraulic pressure, a ratchet or other detent to prevent its rotation in the opposite direction; fourth, in so combining a rotating drill with a discharge-pipe that the drill can be rotated without turning or twisting the discharge-pipe or interrupting the discharge of the detritus; fifth, in suspending and vibrating a boring tool by two ropes in such manner that the reaction of their twist produced by the downward stroke will continue to turn the drill on the upward stroke; sixth, in combining a drill automatically rotated by flanges with a jar automatically rotated by hydraulic pressure.

In the accompanying drawings, which exemplify one mode of carrying out the objects of my invention, a hollow or perforated drill, A, is shown as constructed with a single radial cutting-edge, *a*, on one side, extending across about two-thirds of the diameter of the drill at a right angle to its line of vibration, and with four cutting-edges, a' a^2 a^3 a^4, in a lower horizontal plane. These edges form a chamber, *b*, in the face of the drill, from which a channel, B, leads to a jar-chamber, C, provided with a ball-valve, D, controlled by a stop, E. The drill is rotated on the downstroke by wings, wedges, or flanges F, provided with cutting-edges suitably inclined for the purpose. A tube, G, works snugly and turns freely in the jar-chamber C, carrying on its lower end a piston, H, having its end sloped in opposite directions, as shown in Fig. 1, so as to form vanes or wings. An annular chamber, h', runs around the piston, and into which the water, in passing up through the jar, may enter through openings *h* in the abutments on the downstroke, and flow out on the upstroke. The upper end of the piston has ratchet-teeth *i* taking into a corresponding ratchet, i', on the jar-chamber. A flexible hose, J, leads from the jar to the place of discharge. The boring-tool is vibrated by means of two ropes, cords, or chains, K, one being attached to each side of the jar-tube G. I prefer wire rope for this purpose.

The following is the operation of the apparatus: As the drill descends, the wings F scrape against the edges of the well and rotate the drill in the direction of the arrow in Fig. 1. The water, detritus, &c., in the well, in this instance, presses up through the channel B into the jar-chamber C. After the drill has struck, the piston H descends in the jar-chamber a distance greater or less, according to the force requisite for the upward blow. During its descent the weight of the piston presses against the water in the jar-chamber, forcing the larger portion up the tube G, while part enters the chamber h' and issues out through the holes or openings *h* into the space in the jar-chamber above the piston H. On the next upward stroke this water above the piston H is forced down through the channels h' and forced out at a tangent through the openings *h*, and thus turns the piston H in a direction opposite to that in which the drill was turned by its flanges, and twists the ropes K. When the upstroke begins, the ratchets *i* i' lock into each other and prevent the drill and piston from turning independently of each other, and as the rising movement continues the untwisting of the ropes causes the tool to rotate in the direction originally given on the downstroke, and this

movement is aided by the discharge of the water from the chamber h', as above described.

As the drill rotates, the lower cutting-surface chips out an annular groove around the circumference of the well, leaving a short stem or core in the center, which is removed by the radial cutting-edge a.

The details of my invention may be modified in various ways without departing from the spirit of my invention. For instance, the drill-head might be made solid and the water admitted into the jar-chamber through suitable valves without affecting the rotation of the tool by hydraulic pressure.

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

1. Rotating a boring-tool by hydraulic pressure, substantially in the manner described.

2. The combination, with a drill, of a tubular jar rotated by the fluid passing through it, substantially as described.

3. The combination, with a tubular jar rotated in one direction by hydraulic pressure, of a ratchet or other detent to prevent its rotation in the opposite direction, substantially as described.

4. The combination of a rotating drill with a discharge-pipe by a swiveling joint, substantially in the manner described, for the purpose of rotating the drill without twisting the pipe, as set forth.

5. Suspending and vibrating a rock-drill by two ropes, substantially in the manner described, for the purpose of rotating the drill by the reacting twist of the ropes, as set forth.

6. The combination of an automatically-revolving drill with an automatically-rotating jar, substantially as and for the purpose set forth.

In testimony whereof I have hereunto subscribed my name.

T. J. LOVEGROVE.

Witnesses:

DAVID BEITLER,

J. B. BRADLEY.