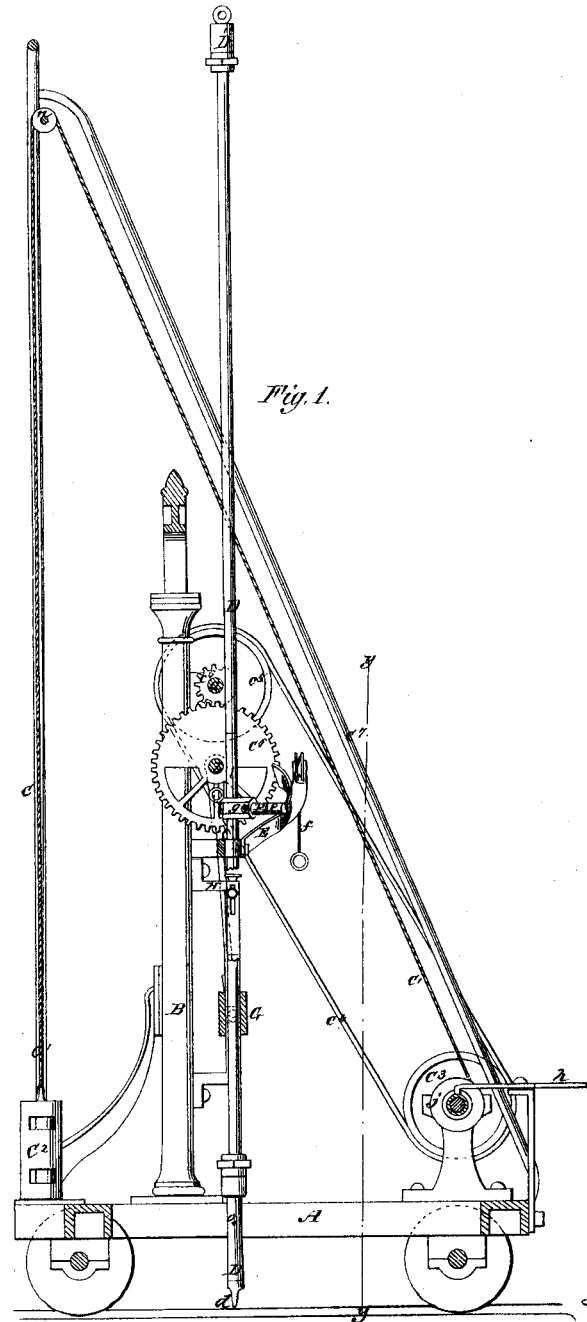


*L. Atwood,*  
*Boring Artesian Wells.*

*N<sup>o</sup> 47,609.*

*Patented May 9, 1865.*



*Witnesses:*  
*M. J. W. J. W.*  
*Charles A. W. J. W.*

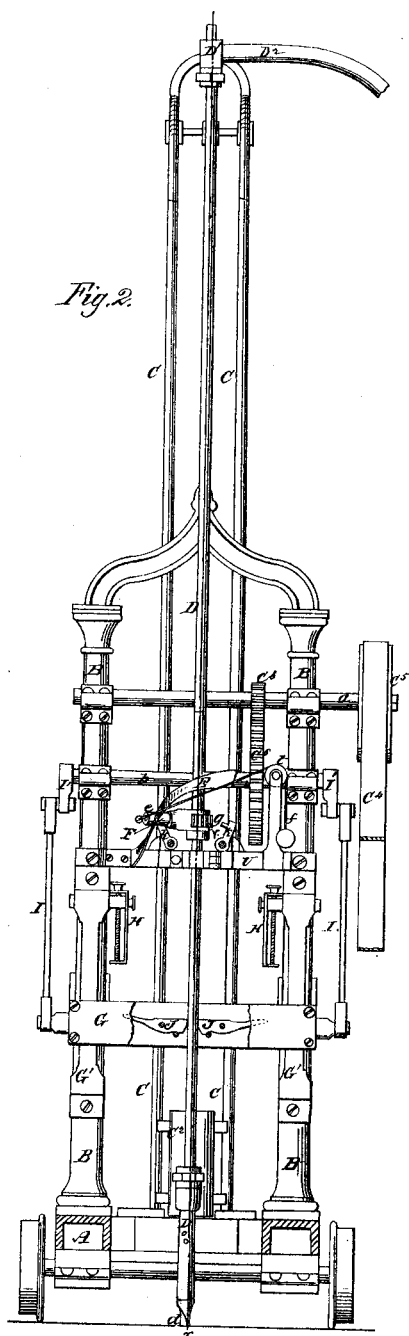
*Inventor:*  
*Leonard Atwood.*

*L. Atwood,*

## Boring Artesian Wells.

*N<sup>o</sup> 47,609.*

*Patented May 9, 1865.*



*Witnesses.*

M. M Livingston  
Guthrie District

*Inventor:*

Leonard Ottwood.

# UNITED STATES PATENT OFFICE.

LEONARD ATWOOD, OF NORWICH, CONNECTICUT.

## IMPROVEMENT IN OIL-BORING APPARATUS.

Specification forming part of Letters Patent No **47,609**, dated May 9, 1865.

*To all whom it may concern:*

Be it known that I, LEONARD ATWOOD, of Norwich, in the county of New London and State of Connecticut, have invented a new and useful Improvement in Apparatus for Boring-Oil and other Wells; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an elevation of a section of the apparatus, taken on the vertical line *x* of Fig. 2. Fig. 2 is an elevation of that part of the apparatus which lies upon the right of the vertical line *y* of Fig. 1.

Similar letters of reference indicate corresponding parts.

This invention has for its object the boring of oil and other deep wells; and it consists among other things of a method of clearing the bore of the well of the débris produced by the action of the drill by forcing water down through the drill-rod, which is made hollow, and compelling it to ascend outside of the rod to the surface of the earth, bringing with it the said débris from the bottom of the bore.

A is a truck, which carries the apparatus. B B are two standards which support the mechanism for operating the tubular drill-rod D. C C are guides of a pile-driving apparatus connected at their upper ends, at which point they are attached to guy-rods C', only one of which is seen in Fig. 1, whose lower ends are fixed to the right-hand end of the truck. C<sup>2</sup> is the monkey of the pile-driver, its rope C' being conducted over a pulley, *n*, and thence down to a rod, *j*, on a shaft, *i*, which also carries a pulley, C<sup>3</sup>. *h* is a lever which operates a clutch that slides on the shaft *i*, and is made to engage the end of the rod *j*, when the monkey of the pile-driver is to be raised. C<sup>4</sup> is a belt which passes around the pulley C<sup>3</sup> and the pulley C<sup>5</sup> of the drilling apparatus.

The pile-driver is to be used in sinking those sections of the tube of a well which are to be driven through the ground that overlies the rock. Since the construction and operation of machines of this kind are familiar, it is not necessary that I give any further description of the pile-driving apparatus.

The drill-rod D is hollow, and it carries a

drill stock and drill, *d*, at its lower end, and at its upper end it carries a loose collar, D', which has attached to it a flexible pipe, D<sup>2</sup>, a portion of which is here shown. The upper end of the tubular drill-rod is closed, and that part of the rod which is inclosed by the collar is perforated so as to open a communication between the interior of the rod D and the pipe D<sup>2</sup>. The pipe D<sup>2</sup> is to be connected with any proper head of water or with a force-pump, or with a body of water under great pressure, so that the water will be forced down through the tubular drill-rod D to or near the drill where it is allowed to escape through perforations *o* into the bore of the well. The perforations are to be of any proper size, and they may be circular, as here shown, or vertical slots, or of any other suitable form. The water will issue from the drill-rod through the perforations and be forced upward in the well between its sides and the outside of the drill-rod, and the pressure applied thereto must be great enough to force it upward about the drill-rod to the surface of the earth, and to bring up with it from the bottom of the bore the pulverized rock and débris produced by the action of the drill. The drill will thereby be kept more or less clear of accumulations of the reduced rock or débris.

The drill-rod is raised for each successive stroke by means of the cranks I' and pitman-rods I through the shaft *b*, the said shaft being rotated by means of the gear-wheels C<sup>6</sup> C<sup>6</sup>, one of which is on the same shaft *a* with the pulley C<sup>5</sup>. The pitman-rods I are connected to a movable cross-head, G, which is moved vertically along guides G' on the standards B. The cross-head is made of two vertical plates set somewhat apart so as to receive within it the levers J, which have rotary motion about pivots fixed in the said cross-head. The drill-rod passes through the cross-head between the inner ends of the levers J. The outer ends of the levers extend toward the guides G' so as to be beneath the adjustable stops, H H, which extend downward from the upper inner parts of the guides. When the cross-head moves upward, the levers J grasp the drill-rod, which is then carried upward by them until the outer ends of the levers meet the stops H H, when the inner ends of the levers are thrown upward and the drill-rod is allowed to fall, and the drill to give its stroke

at the bottom of the bore. When the drill-rod is to be held up and out of action, the hinged clamps K K, which are placed on the upper face of a cross-piece, U, through which the drill-rod passes, are brought down against the sides of the drill-rod so as to hold it up.

V is a movable collar, placed on the drill-rod above the cross-beam U. It supports an arm, F, which is attached to the drill-rod by means of a bifurcated loose collar, within which is placed a ratchet-wheel, *g*, which is fixed to the drill-rod. The arm F carries a pawl, which engages the teeth of the ratchet-wheel *g*. The outer end of the arm F carries also a friction-roller, *e*, which rests upon a curved plate, E, that rises spirally about the drill-rod from the cross-beam U. A weighted cord, *f*, attached to the end of the arm and passing over a pulley, *t*, tends to draw the arm F toward the right when the drill-rod ascends. When the rod is falling, the pawl of the arm engages the ratchet *g*, and gives a partial rotation to the rod toward the left as the arm is carried down over the curved plate E.

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

1. The combined pile-driver and boring apparatus, when made, constructed, and operated in the manner and for the purpose herein set forth.

2. The combination of a hollow tube and drill attached thereto, through which water can be forced by any usual power when said tube rod or drill has at its lower end slots or holes through which the water is forced into the well, expelling therefrom the débris or detritus from the well upon the outside of the drill rod or tube, when the same is combined with the gear-wheels C<sup>6</sup> C<sup>5</sup>, drill-rotating apparatus F, *e*, *f*, and *g*, when constructed in the manner and for the purpose herein described.

3. The movable cross-head G, the pitman-rods I, guides G', and standards B, in combination with the levers J, in the manner and for the purpose herein described.

4. The adjustable stops H H, in combination with the levers J J, in the manner and for the purpose herein described.

5. The hinged clamps K K, in combination with the cross-piece U and drill-rod D, in and for the purpose herein described.

6. The movable collar V in drill-rod D, and combined therewith, and with the arm F, ratchet and pawl *g*, friction-roller *e*, and curved plate E, in and for the purpose herein described.

LEONARD ATWOOD.

Witnesses:

M. M. LIVINGSTON,  
C. L. TOPLIFF.