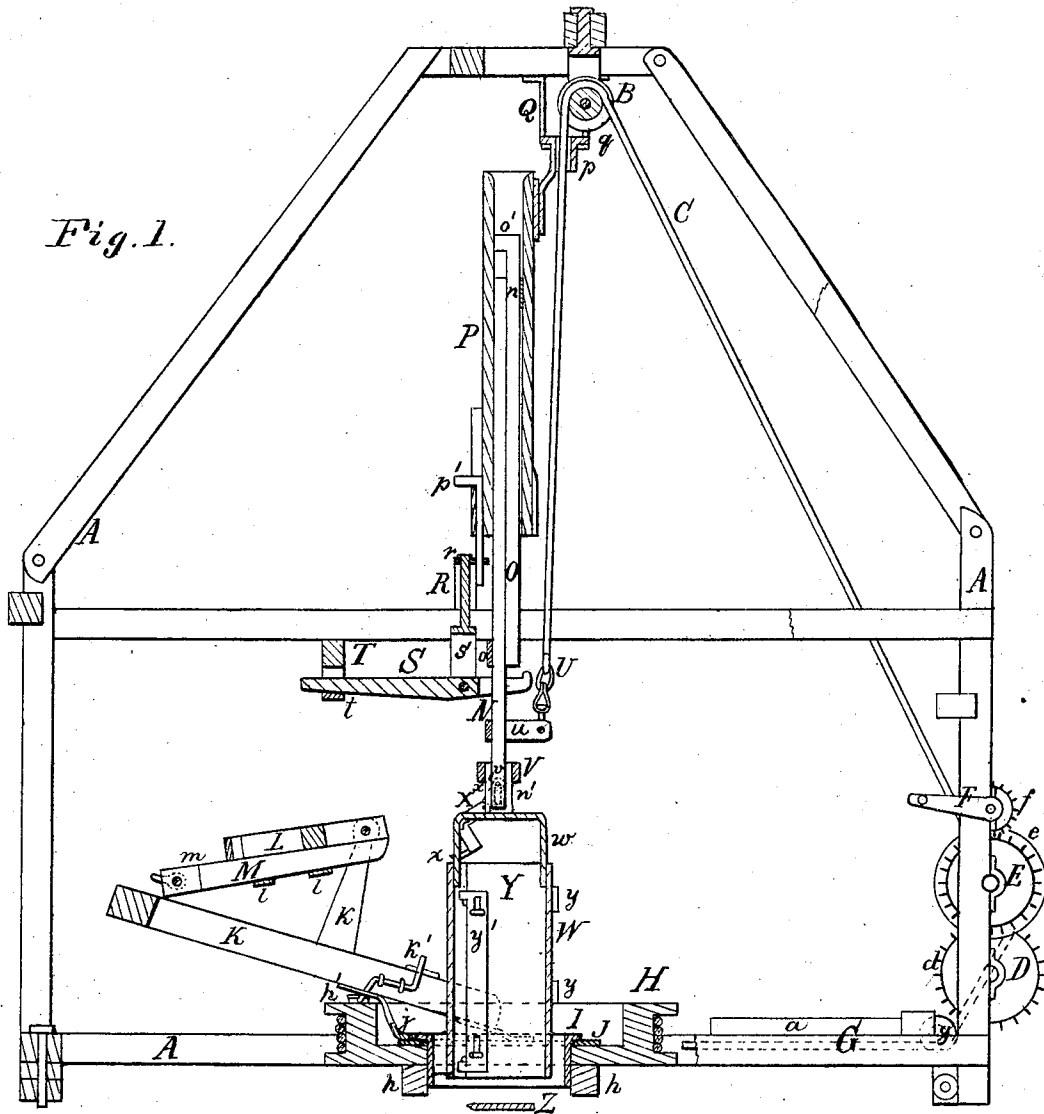


S. R. OWEN.
Earth-Boring Machines.

No. 145,007.

Patented Nov. 25, 1873.



Witnesses.
E. A. Bates.
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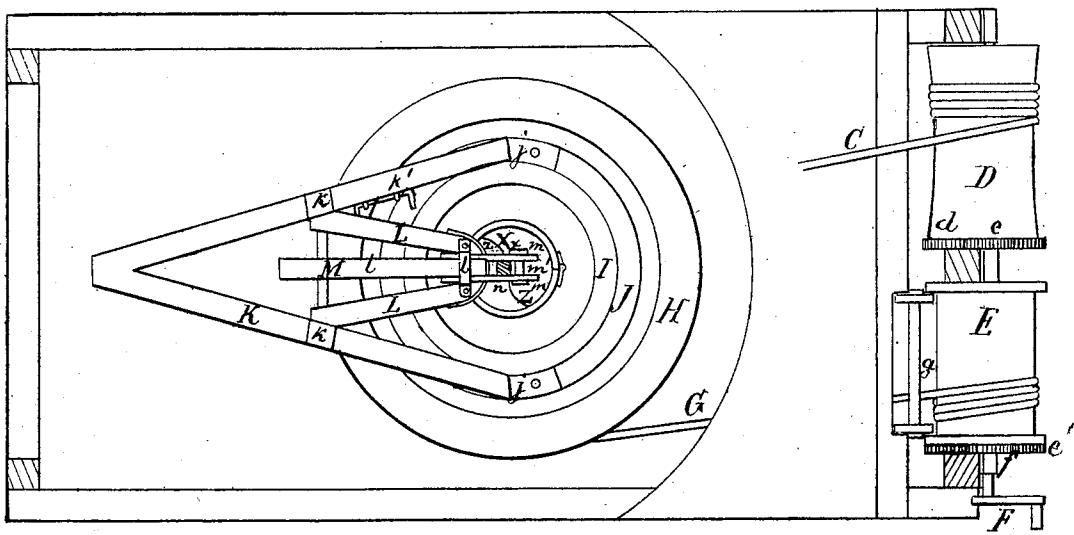
Inventor.
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Fig. 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

SILAS R. OWEN, OF STEWARTVILLE, MISSOURI.

IMPROVEMENT IN EARTH-BORING MACHINES.

Specification forming part of Letters Patent No. **145,007**, dated November 25, 1873; application filed April 19, 1873.

To all whom it may concern:

Be it known that I, SILAS R. OWEN, of Stewartville, in the county of De Kalb and State of Missouri, have invented a new and valuable Improvement in Well-Boring Machinery; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a vertical longitudinal section of my well-boring machine. Fig. 2 is a plan view of the same with a part of frame and machinery removed.

The first part of my invention relates to an improved mode of transferring power to the drill or auger, by which the operator is enabled to connect or disconnect the working parts and the motor with greater ease and rapidity than he could according to the old method. The second part of my invention relates to an improved mode of raising the auger from the well. The third part of my invention relates to an improved mode of coupling the boring-bars.

A represents a frame or derrick, which may be mounted on axles and wheels for the purpose of locomotion. To the top of said frame a pulley, B, is fastened, around which a chain or rope, C, is passed, one end of which is attached to a windlass, D, supported by frame A. To the end of said windlass a gear-wheel, *d*, is fastened, which drives a pinion, *e*, on the shaft of another windlass, E, supported by frame A. The other end of windlass E is provided with a wheel, *e'*, which gears into a pinion, *f*, on the shaft of a crank, F. A rope, G, passing over a guide-pulley, *g*, connects the windlass E with a capstan, H, supported by two cross-bars, *h h*, of frame A, and kept in place by a flanged cylinder, I. Between the upper bearing-surface of the capstan and the rim of cylinder I an annular plate, J, is inserted, which, by means of strong braces *j j*, supports a forked sweep for the application of horse-power. Said sweep K is provided with two upright posts, *k k*, the heads of which are the fulcrums of a pair of coupled levers, L L, with clasps *l l*, em-

bracing an adjustable bar, M. The end of said bar is provided with a pair of strong parallel plates, *m*, which clasp the boring-bar N, and, with the aid of bolt and nut *m'*, are firmly attached to it, when needed as a coupling between the sweep K and the said boring-bar. When motion is to be applied to the capstan H, it is coupled to the sweep K with the aid of a cranked hook, *K'*, fastened to the sweep, and a stop or catch, *h'*, fastened to the capstan. This is for the purpose of winding rope G from windlass E on the capstan, and also for the purpose of winding rope C on windlass D to lift the auger, which is effected by gear-wheels *d* and *e*. The boring-bar N, by preference made of rectangular iron, is joined to an extension-bar, O, by means of a clasp, *o*, fastened to bar O, and embracing bar N, and another clasp, *n*, fastened to bar N, and embracing bar O. A stop, *o'*, on the bar O, prevents it from sliding downward out of the clasp *n*. These joined bars are inclosed in a box, P, which serves to steady them in their descent, and in which they may slide up or down with ease. When the bars N and O are to be drawn up into the box P, or when the auger is to be raised from the well, the box P, which is suspended by a hollow swivel, *p*, to a bearing-plate, *q*, with hangers Q Q, is kept steady by a bolt, *p'*, passed down into an eye, *r*, on a cross-bar, R, fastened to frame A. The hangers Q Q are fastened to the top of the frame A in such position that the hole in the swivel *p* permits the rope C to pass through it in a vertical direction. The end of said rope is fastened to a swivel, U, to prevent twisting, and this swivel is connected with an arm, *u*, fastened to the bar N. As long as the extension-bar O is not in use it may be held firmly in the box by means of a bolt or set-screw, or otherwise. A forked lever, S, with a swiveled fulcrum, *s*, fastened to cross-beam R, serves to elevate the extension-bar O to its proper height, and to keep it there, until it is fastened in the box P. For this purpose a swinging beam, T, is turned on its pivot, until the end of lever S passes into a clasp, *t*, on the said beam. The lower end of the bar N is passed into a strong socket, V, on the top of brace *w* of the auger W. The said socket has two vertical slots, *v*, on two opposite sides, through which a pin, *n'*,

passes, which is fastened to the end of bar N for the double purpose of sustaining the auger when hoisted and of operating a knife, X. The said knife enlarges the diameter of the hole to any size required, for the insertion of curbing or lining into the well, and it is made movable, so it may be withdrawn within the diameter of the auger as soon as the same is to be hoisted from the well. The knife X is of bell-crank shape, with its fulcrum on the brace *w*, the cutter *x* on the end of its vertical arm, and a link, *x'*, connecting the end of its horizontal arm with the pin *n'*. This construction makes the operation of knife X automatic, for, in hoisting the auger, the pin *n'* slips to the upper termination of slot *v*, withdrawing the cutter toward the inside of the auger, while, when boring, the pin *n'* rests on the lower termination of slot *v*, thereby pushing the cutter outward. The auger W is provided with a door, Y, swinging on hinges *y y*, and a drop-bolt, *y'*, of any known construction, to fasten the door when shut, which then, with the auger, forms a perfect hollow cylinder. The lower end of the auger W is provided with cutters Z, which are so constructed as to cut a hole of the same diameter as that of the auger, so as to make the well-hole a natural guide for the auger. The rope G is protected against injury by a bridge, *a*. The windlass E may be provided with a brake or a double pawl-and-ratchet wheel as a safeguard against untimely starts.

When a well is to be bored, a hole of the diameter of the auger is dug a few inches deep, in which the auger is to be started. The frame A is then put in position, the auger is lowered by turning the crank F, the bar O is adjusted

in the box P, and fastened there with the aid of lever S, as above described. The beam T is then swung back to disengage the lever S, which is also disengaged from the bar N and swung aside, and, lastly, the bolt *p'* is withdrawn from the eye *r*. The coupled levers L L are then turned over toward the auger, the bar M is slid toward the boring-bar N, and fastened thereto in the above-described way, and the drop-hook *k'* is raised. Horse or other power is now applied to sweep K, and the auger is thereby set to work, the feed being effected by its own weight, and that of the bar N, by which weight the rope C is also unwound from its windlass D. If the auger is to be raised, the bar M is disengaged from the boring-bar N, the levers L L thrown back on the sweep K, the drop-hook *k'* dropped, and the bolt *p'* pushed into the eye *r*.

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

1. The combination of ropes C and G with pulley B, swivel U, windlasses D and E, wheels *d*, *e e'*, and *f*, crank F, and capstan H, substantially as specified.

2. The combination of sweep K, levers L L, adjustable bar M, ring J, drop-hook *k'* and catch *h'*, substantially as specified.

3. The combination of bars N O, box P, bolt *p'*, and swivel-eye *p*, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

S. R. OWEN.

Witnesses:

A. BORTLER,
M. O. BROWN.