J. Andrews.

Earth Auger.

No. 12,663. Patented Apr. 10, 1855.

Fig: 3

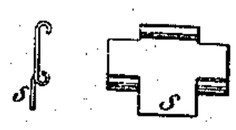

Fig: 1

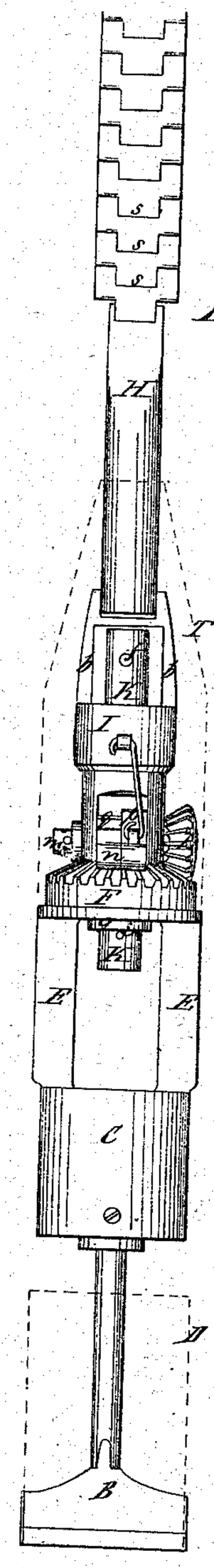

Fig: 2

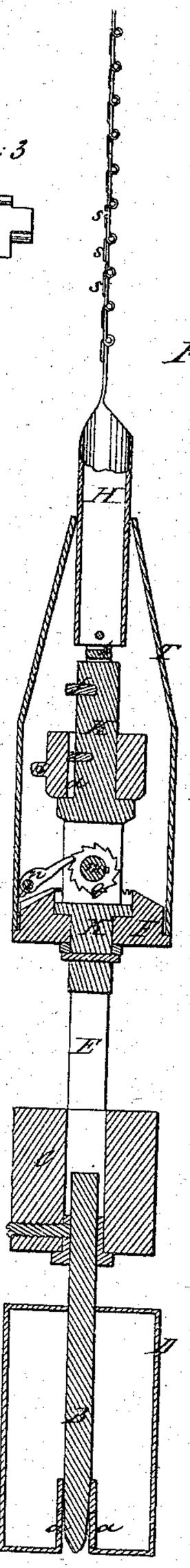

Fig: 4

Fig: 5

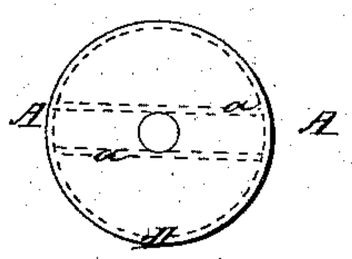

Fig: 6

THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

UNITED STATES PATENT OFFICE.

JOHN ANDREWS, OF WINCHESTER, MASSACHUSETTS.

IMPROVEMENT IN DRILLS FOR ARTESIAN WELLS.

Specification forming part of Letters Patent No. **12,663**, dated April 10, 1855.

To all whom it may concern.

Be it known that I, JOHN ANDREWS, of Winchester, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Drills for Drilling and Boring Vertically in Rocks, of which the following is a full, clear, and exact description, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a view of a rock-drill with my improvements attached; Fig. 2, a longitudinal vertical section through the same; Figs. 3, 4, 5, and 6, details, which will be referred to hereinafter.

In boring beneath the surface of the earth for the purpose of sinking Artesian wells and other similar works the augers and drills have either been attached to a flexible chain or to a rigid iron bar, the joints of which were added as the bore descended. In the former case it was not found practicable to rotate the drill, as becomes necessary when the bore is sunk through rocks, and in the latter case, although the drill was rotated without difficulty, the operation of raising it to clear out the pod was extremely tedious, as each joint of the bar required to be detached as it was raised and reattached as the auger or drill descended to its work.

The nature of my invention consists in the use of a chain of peculiar construction, which, while it is sufficiently rigid to enable the drill to be turned, is capable of being bent in one direction, and may thus be wound upon a drum or windlass for the purpose of raising the drill.

My invention also consists in a peculiar method of rotating the drill without turning the rod or chain.

To enable others skilled in the art to understand my invention, I will proceed to describe the method which I have adopted of carrying it out.

B is the drill, which is secured to the weight C in any appropriate manner. The pod D is carried by the drill and rises and falls with it, the pulverized stone entering at the holes *a* to the interior of the pod.

E are vertical arms, which rise from the weight C and support the cog-wheel F. This wheel, together with the weight C, rotates with the drill.

The parts above which do not rotate will now be described.

H is a short metallic bar secured to the extremity of the chain.

I is a collar, which is attached to the bar H by the straps *b* and rises and falls with it. Within the collar I slides the short shaft K, which is prevented from turning by the pin *c* in the vertical groove *d*. The vertical motions of the collar I and shaft K with respect to each other are limited by the screw *f*. The lower extremity of the shaft K passes through the cog-wheel F, and is secured by the washer *g* and pin *i* in such a manner that while the cog-wheel and shaft rise and fall together the former is permitted to turn freely upon the latter.

L is a pinion upon a short shaft *m*, which runs in an enlargement of the shaft K. To the shaft *m* is secured the ratchet-wheel *q*, with the teeth of which engages the pawl *n*. This pawl vibrates upon a pin *l*, projecting from an arm of the collar *p*, which fits loosely upon the shaft *m*. The collar *p* is connected by the rod *o* to the collar I.

The operation of these parts is as follows: When the drill is raised, the shaft K and the parts connected therewith remain stationary until the collar I strikes the pin *f*. At the same time, through the connections already explained, the shaft *m* and its pinion L are caused to make a portion of a revolution each time the drill is raised. The pinion L engages with the wheel F, and thus this wheel and the parts connected therewith, including the drill, are caused to rotate. The chain which I employ is composed of a succession of flat links with flaps *s* (seen detached in Fig. 3) and secured together by suitable joint-pins. The chain thus constructed may be bent in one direction, but will be rigid in all others, and it is evident that while it may be wound upon a windlass or drum for the purpose of raising the drill it will also possess sufficient rigidity to prevent it from twisting.

T is a metallic case or covering which surrounds the operating parts and protects them from dust and injury.

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

1. The use of a stiff chain for the purpose of operating a rock-drill or other Artesian borer, in the manner set forth.

2. The device for rotating the drill, consisting, essentially, of the cog-wheel F and pinion L, with the parts which set them in motion, constructed and operating in the manner substantially as herein set forth.

JOHN ANDREWS.

Witnesses:
JONATHAN ANDREWS,
G. W. JOHNSON.