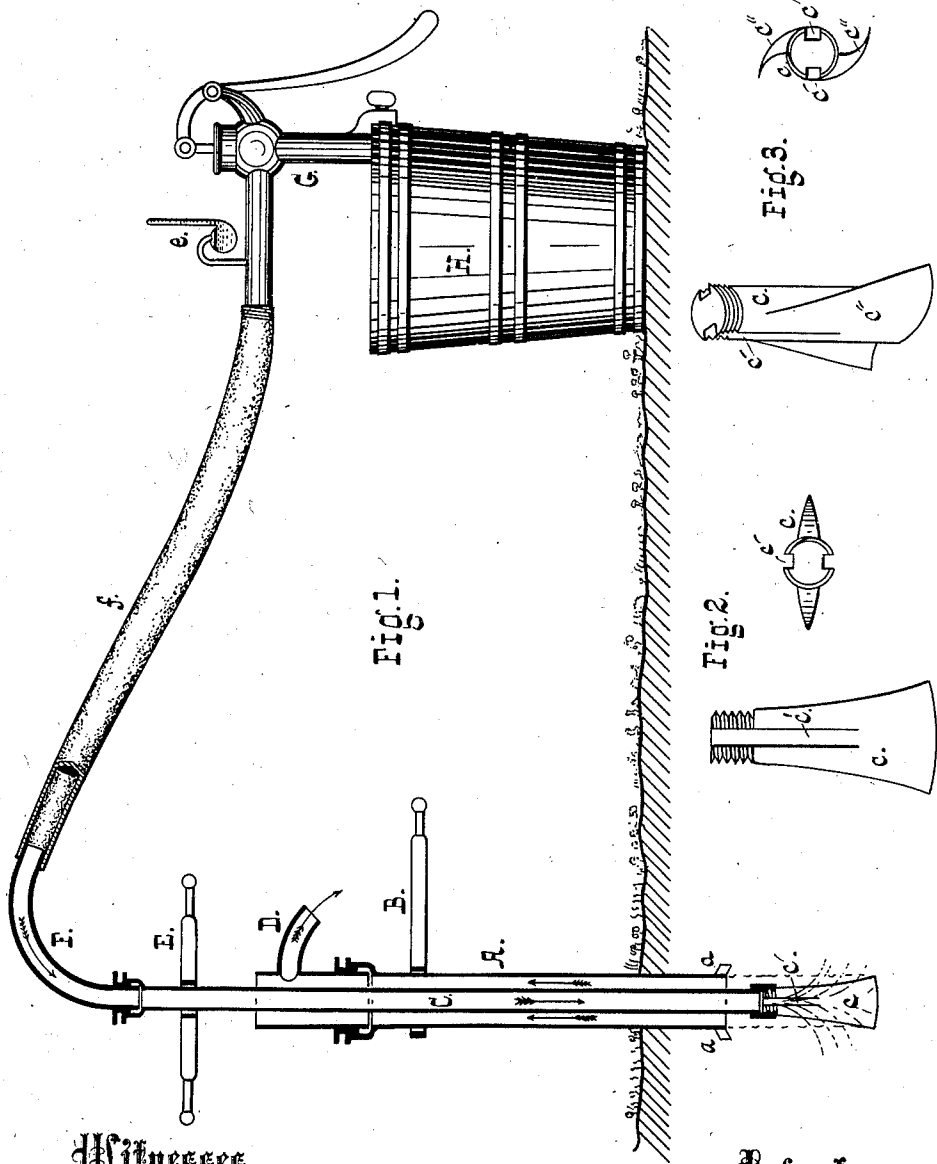


(No Model.)

T. VON RINGHARZ.  
Earth-Boring Apparatus for Artesian and other Wells.  
No. 228,780. Patented June 15, 1880.



Witnesses,

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# UNITED STATES PATENT OFFICE.

THEODORE VON RINGHARZ, OF BALTIMORE, MARYLAND, ASSIGNOR OF ONE-HALF OF HIS RIGHT TO EDWARD F. DONKIN, OF SAME PLACE.

## EARTH-BORING APPARATUS FOR ARTESIAN AND OTHER WELLS.

SPECIFICATION forming part of Letters Patent No. 228,780, dated June 15, 1880.

Application filed March 31, 1880. (No model.)

To all whom it may concern:

Be it known that I, THEODORE VON RINGHARZ, of Baltimore city, State of Maryland, have invented certain new and useful Improvements in Earth-Boring Apparatus for Artesian and other Wells; and I hereby declare the same to be fully, clearly, and exactly described as follows, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section, of the device; Fig. 2, a side elevation and top plan of the bit, and Fig. 3 a similar view of a modified form of the same.

My invention has reference to boring apparatus for metallurgical prospecting, as well as for making oil, salt, or Artesian wells; and it consists in a tubular boring-shaft provided with a laterally-apertured bit and a tubular follower or casing, adapted for use in connection with a forced fluid-supply, and in certain features and details of construction, as hereinafter fully set forth and claimed.

In the accompanying drawings, A is a tubular casing for the well, provided at its lower end with a cutting-spur, *a*, and having an overflow-pipe, D, and handle or lever B, by means of which it may be reciprocated or turned.

C is a tubular shaft, similar to that of an ordinary diamond drill, passing freely through the casing A, and armed at its lower end with a bit, *c*, provided with lateral grooves *c'*, leading into the interior of the pipe C.

The bit is of a size to nearly fit within the pipe A, and is either a chisel-bit, as shown in Fig. 2, or is provided with curved wings *c''*, as shown in Fig. 3, the shape depending upon the nature of the soil in which the boring is to be done.

The tube C is fitted with a swivel-neck, F, to which is coupled a flexible tube, *f*, communicating with a continuous supply force-pump, G, located in a water-supply tank, H.

A manometer, *e*, is in communication with any convenient part of the pipe for delivering the water, under pressure, to the tubular shaft C. E is a lever or handle, by means of which the shaft C may be reciprocated or turned.

In operation, the boring is effected by means of the shaft C and bit *c*, the casing A being made to follow the bit as it descends. Meanwhile a current of water is driven by means of the pump down the shaft C, and rises around

it after finding egress through the grooves *c'* of the bit. The material disintegrated by the bit is thus carried up and is delivered with the water at the spout D. Here the water is received into subsiding-tanks, where the earthy and mineral matter subsides and may be removed for examination or analysis. The clear water may be returned to the tank H in case the supply is inadequate.

As long as the drill is cutting through earthy or mineral matter the manometer *e* indicates a constant pressure; but the instant a stratum of water, brine, or oil is struck by the drill the fact is indicated by the behavior of the manometer. An Artesian stratum of liquid—*i. e.*, one under pressure—makes itself apparent in a rise of the mercurial column, while one not under pressure is noted by a fall. Thus all danger of perforating a liquid stratum without notice is avoided.

As the casing and shaft descend new sections are jointed to them in the usual way.

I am aware that it is not broadly new to remove the earth upward about a tubular drill by means of a current of water pressing either down the tube and up around it, or down around it and up the tube, and such I do not claim.

What I claim is—

1. In an earth-boring apparatus, a tubular boring-shaft carrying an apertured bit and inclosed in a casing descending thereafter, and a forced liquid-supply in communication with the tubular boring-shaft, as set forth.

2. The combination, in an earth-boring apparatus, of a casing having a terminal cutting bit or spur, an inclosed tubular boring-shaft having a laterally-apertured bit, and a forced liquid-supply in communication with the boring-shaft.

3. The combination, with a liquid-forcing apparatus and a tubular boring apparatus, of a manometer, as and for the purpose set forth.

4. In combination with the liquid-forcing apparatus and manometer, the casing A and tubular boring-shaft having apertured bit, as described.

THEODORE VON RINGHARZ.

Witnesses:

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