S. H. WHITTLESEY.

WELL BORER.

No. 52,632. Patented Feb. 13, 1866.

Fig: 1

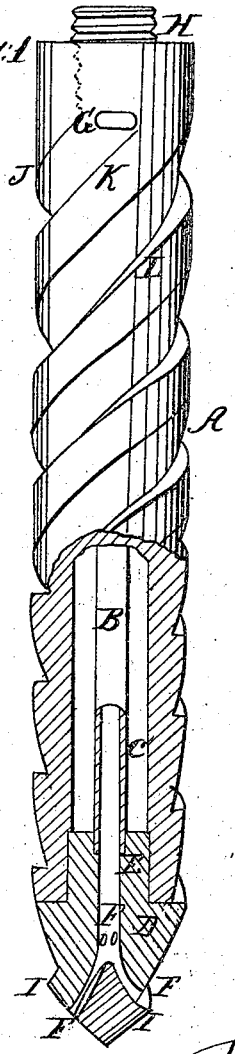


Fig: 2

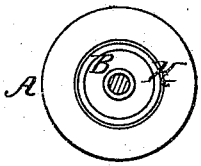
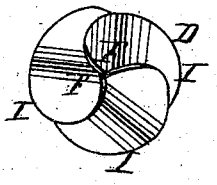


Fig: 3



Witnesses

Inventor

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UNITED STATES PATENT OFFICE.

SAMUEL H. WHITTLESEY, OF APPLETON, WISCONSIN.

IMPROVED WELL-BORER.

Specification forming part of Letters Patent, No. **52,632**, dated February 13, 1866.

To all whom it may concern:

Be it known that I, SAMUEL H. WHITTLESEY, of Appleton, in the county of Outagamie and State of Wisconsin, have invented a new and useful Improvement in Well-Boring Instruments; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others 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 device for boring oil and other deep wells made according to my invention, the lower part thereof being in section. Fig. 2 is a top view. Fig. 3 is a bottom view.

Similar letters of reference indicate like parts.

The object of my invention is to produce an instrument by means of which a well may be bored and reamed rapidly, cheaply, and efficiently, without the use of a sand-pump or a reciprocating drill.

In carrying out my invention, I make a conical or an ovoid-pointed burr or borer, having something of the character of a brace-and-bit iron reamer. Such burr is provided with three or more curved cutting-faces, placed at equal distances around its point, and is connected with the base of a hollow cylinder by a socket-joint. Its curved cutting-faces take a spiral form, and are continued up to the top of the cylinder, thereby forming parallel spiral grooves on the outside of the cylinder. The burr-cutters reduce the rock below it and along its sides, while the edges of the spiral grooves act as reamers, the grooves themselves performing the office of elevators and raising the silt or reduced rock nearly to the top of the cylinder, where the grooves are intersected by openings which admit the silt and reduced rock to the inside of the cylinder, from which they are discharged when it is full by raising the instrument from the well and removing the burr or borer.

The hollow cylinder may be made long enough to hold all the silt that will accumulate while the burr is being worn dull in boring ordinary rock. The burr and cylinder should be made of a combination of Franklinite or "crystallized iron," so called, for the purpose of obtaining a hard and tenacious substance. A water-pipe runs centrally through the hollow cylinder and through the burr, branching however, before reaching its point, so that a branch issues in each of the sunken faces that occur between the cutting-edges of the burr, and as near its point as the strength required to be given to that part will admit of. A column of water is allowed to descend this tube, (the tube being connected with a hollow drill-rod,) and issue at the end of the burr, so as to clear it of accumulations of reduced rock. The pressure of the water will cause it to ascend around the cylinder and thence to the top of the well, the heavier portion being received into the interior of the cylinder through its lateral openings, and the residue being carried with the current of water to the surface of the ground.

A designates a hollow cylinder, whose greatest diameter is the diameter to be given to the bore of the well. Its exterior is provided with three spiral grooves, which may be angular in cross-section, the base of their angles being at a right angle to the axis of the cylinder, and consequently forming cutting-edges J, K, and L, which extend from near the upper end of the cylinder down to its foot.

A square socket is formed in the foot of the cylinder to receive the square neck E of a borer or burr, D, of ovoid form, from whose end arise three curved cutting-edges, I, seen most plainly in Fig. 3, which, after describing about one-third of a circle on the sides of the borer, are continued upward to meet the spiral edges J K L, respectively, with which they form continuous spiral cutting-edges. The borer or burr D has an axial perforation from the top of the neck E down nearly to its point, when it branches off into several small passages, F, which open near its point just within the angles made by the cutting-edges I. This axial perforation communicates, when the borer D and cylinder A are joined together, with a small water pipe or tube, B, which runs through the center of cylinder A and is carried up through its neck H, so that it may also communicate with the usual hollow drill-rod that extends to the surface of the ground. The borer or burr D is firmly fixed to cylinder A by screws or other suitable fastenings.

In operating this instrument the borer cuts

its way down through the rock by being revolved, the rock being abraded by the cutters I and reduced to the state of fine sand or silt, in which state it can be easily removed by the pressure of a column of water, which, as before stated, is let down into the well through the tube B and channels F with sufficient pressure to produce an upward current outside of the cylinder A and outside of the usual drill-rod to the top of the well. The current will pass up in the grooves formed around the cylinder, and when it reaches the lateral openings G, only one of which is seen in the drawings, which lead to the interior of the cylinder, the heavier portions of the detritus will enter the openings and gradually fill the annular space in the cylinder around the inner tube, B, while the lighter portions will ascend with the water to the top of the well. In this way the bottom of the bore will be kept clear for the action of the boring-tool, which consequently need not be taken out of the well in order to apply the sand-pump, as is now customary. The cutting-edges J K L of the cylinder act as reamers while the boring-tool is deepening the well, and therefore it is not necessary to remove said tool in order to ream out the bore, as is the practice when using ordinary drilling-tools.

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

1. The burr or borer D, constructed, substantially as above described, with curved cutting-edges I, which spring from the point of the instrument.

2. In combination with the burr or borer D, the hollow cylinder A, having spiral grooves which are continuations of the grooves between the cutters I of the burr or borer and which terminate at openings G at the top of the cylinder, and having also spiral reaming-edges J K L, substantially as above described.

SAMUEL H. WHITTLESEY.

Witnesses:

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