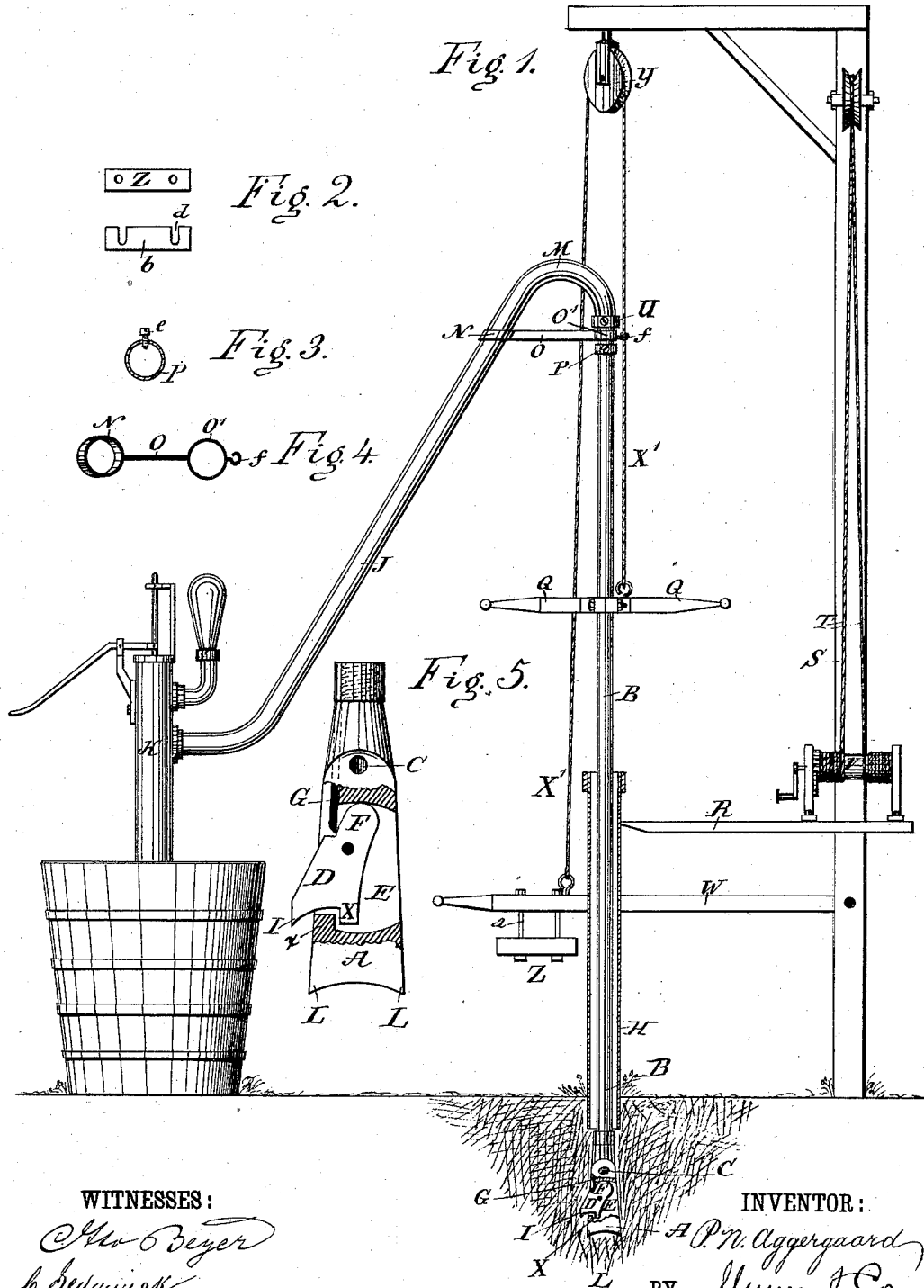


(Model.)

P. N. AGGERGAARD.
WELL BORING MACHINE.

No. 263,086.

Patented Aug. 22, 1882.



WITNESSES:

Chas. Beyer
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INVENTOR:

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UNITED STATES PATENT OFFICE.

PETER N. AGGERGAARD, OF DANVILLE, DAKOTA TERRITORY.

WELL-BORING MACHINE.

SPECIFICATION forming part of Letters Patent No. 263,086, dated August 22, 1882.

Application filed April 25, 1882. (Model.)

To all whom it may concern:

Be it known that I, PETER N. AGGERGAARD, of Danville, in the county of Turner and Territory of Dakota, have invented a new and Improved Well-Boring Machine, of which the following is a full, clear, and exact description.

My invention relates to well-boring machines; and it consists in the peculiar construction and arrangement of parts, as herein-
after more fully set forth.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the drilling apparatus and section of the tube to be sunk in the well. Fig. 2 represents weights employed for balancing the drill as the successive sections of drill-rod are added. Fig. 3 is a section of a collar employed in the connection of the flexible tube with the drill-tube for the application of the hydraulic column; and Fig. 4 is a plan of an arm and rings, also employed in the same connection. Fig. 5 is a side view of the drill-point, partly in section.

A represents the drill, which is attached to the lower end of the hollow drill-rod B, said drill being hollow in the upper end, and having orifices O in the sides for the issue of the water-column to be employed, in combination with the drill, for washing out the sand, earth, pulverized rock, and other matter too hard for the water alone to disintegrate, and which have to be removed by the sand-pump when the drill is used alone.

D represents an auxiliary drill-bit, which I attach to the main drill in a slot, E, on a pivot, F, and with a spring, G, to thrust it out below the end of the tubing H, to ream out the bore of the drill large enough to allow the tubing to settle down of its own weight and save the labor of forcing it down. The lower end of the bit D is provided with the shoulder X, which in the outward movement of the bit comes in contact with the shoulder *x* on the drill A and arrests its outward movement, the inward movement of the bit being limited by its point coming in contact with the shoulder *x*. The point L of this bit is slightly rounded, so that when it descends from the lower end of the tube, into which it is drawn each time

the drill is raised, it will not catch and cut the tube.

The top section, B, of the hollow drill-rod has the flexible hose J connected to it for the application of a hydraulic column of great pressure by a force-pump, K, to wash out the drill-cuttings through the tube H. In practice a powerful steam-pump will be employed. The said connection of the hydraulic hose J is made by means of a collar, U, clamping the end of the hose to the top of the rod rigidly; and in order that the rod may work up and down properly, and also turn forward and backward for shifting the drill, as required, without breaking down the bend M in the upper end of the hose, said hose is passed through the ring N below the bend, said ring being suitably inclined to suit the angle of the hose, and also being supported on the arm O, attached by collar O' to the drill-rod just below the collar U, where it is supported by the tight collar P, attached by set-screw *e*, so that the rod B can turn in it. The band M, being thus supported, allows the drill-rod to turn a half-revolution, or thereabout, each way without injury to it, and the connection thus established is strong and tight, whereas a swivel-joint would leak more or less.

The drill-rod is turned forward and backward for shifting the drill by an attendant using the arms Q, the said attendant standing upon the platform R above the tube-sections H. The platform is suspended on the post S of a derrick by the rope T and windlass V, in order that the attendant may raise and lower himself as the height of the arms Q varies by the adding of new drill-rod sections and the sinking of the drill in the earth.

The drill is worked by the lever W, to which it is connected by cord X' over pulley Y on the derrick, said cord passing through a guide, *f*, on the collar O'.

Z represents a weight permanently attached to lever W, to balance the weight of the first section of the drill-rod. It is suspended below the lever by rods *a* for the application of other weights, *b*, over it from time to time as each additional section of rod is applied, the additional weights being notched, as at *d*, for applying to rods *a* above weight Z.

It will be seen that by the employment of the

hydraulic column in combination with the drill the drill may be worked right along without taking it out and using the sand-pump, as it always has to be used in the common method, and which is a very slow process, involving the repeated removal of the drill; and it will also be seen that by the said combination the advantages of the hydraulic column are available in rock-drilling; when used alone, as heretofore, it would be wholly useless.

It will also be seen that the auxiliary under-cutting bit D will save considerable labor heretofore expended in forcing the tubes down the bore, and it will also enable the well to be tubed through rock, where it cannot be when the ordinary drill is used.

The drill-points L and I can be made detachable, so that when requiring sharpening other points may be substituted therefor, thereby doing away with the necessity of having a number of hollow drill-shanks, as well as making a saving in the time required for sharpening said drill-points.

I am aware that the upper ends of the hose and drill-rod have heretofore been connected

by a bent metallic tube, and I therefore lay no claim to such construction.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of hollow drill-rod B, flexible hose J, arm O, and collars N and O', substantially as described.

2. The combination of vertically-adjustable platform R on derrick-post S with the drill-rod B and arms Q thereon, substantially as described.

3. The platform R, windlass V, cord T, and post S, in combination with the drill-rod B and arm Q, substantially as described.

4. The combination, with the drill A, provided with the slot E and the shoulder x, of the pivoted bit D, provided with the shoulder X, and point I and spring G, substantially as shown and described.

PETER N. AGGERGAARD.

Witnesses:

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