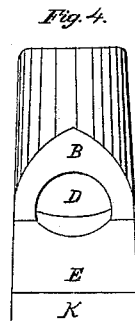
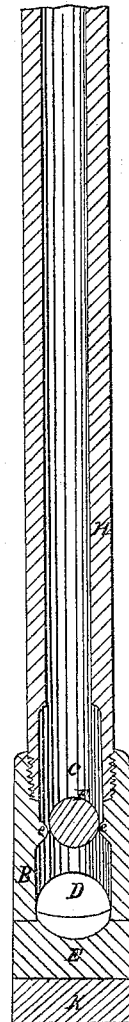
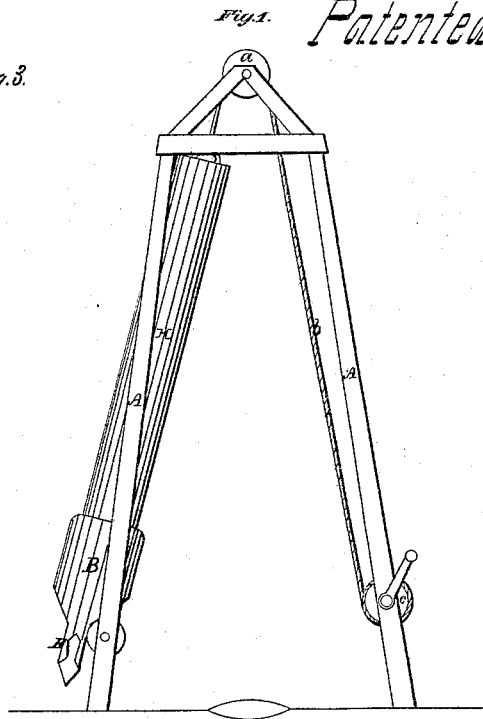
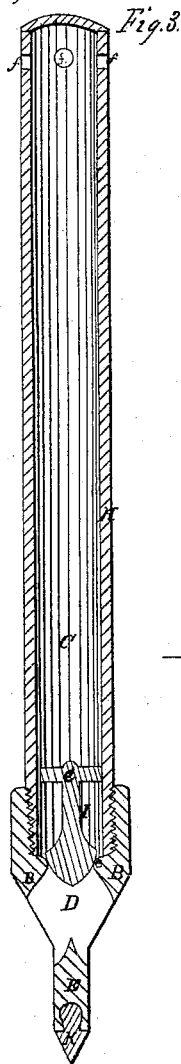


# *E. R. Morrison,*

## *Boring Artesian Wells.*

*N<sup>o</sup> 45,068.*

*Patented Nov. 15, 1864.*



*Witnesses.*

*J. B. Woodruff*  
*A. M. Cornell*

*Inventor.*

*Enoch R. Morrison*

# UNITED STATES PATENT OFFICE.

ENOCH R. MORRISON, OF NEW YORK, N. Y.

## IMPROVED DRILL AND SAND-PUMP.

Specification forming part of Letters Patent No. 45,068, dated November 15, 1864.

*To all whom it may concern:*

Be it known that I, ENOCH R. MORRISON, of the city, county, and State of New York, have invented certain new and useful improvements in the construction of the drills in which is combined the sand-pump for the purpose of boring oil-wells, &c.; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents the combined drill and pump drawn up on the derrick and carried off from the well, in position to discharge the detritus. Fig. 2 shows a section cut through the drill and sand-pump with ball-valve. Fig. 3 is an edge-view section of same, showing a cone-valve. Fig. 4 shows the drill with the opening in it to take in the detritus.

The object of my invention is to facilitate the boring of oil-wells and remove the detritus with facility.

My invention consists in the construction of the drill for boring oil-wells, its internal arrangements being such that it operates to take up at every stroke the loose material it is liberating from the mass, holding it in the hollow shaft by the action of a ball-valve, while it is raised with the shaft and drill, and brought into a position where the detritus is drawn off at the orifice at the bottom.

To enable others skilled in the art to make and use my invention, a frame or derrick, A, of any desired height, is placed directly over the well, it having a sheave or pulley, *a*, a rope, *b*, and windlass *c*, or such other appliances as may be desired to raise and lower the shaft and drill into the well, and when the drill B is raised out of the earth so that its point is above the surface, allows it to be swayed off on one side in any direction, so that the contents it has received into the cavity *c* or hollow shaft while boring is drawn off at the orifice D on both sides of the drill B, above the point E, the drill-head B' being made hollow with a seat, *e e*, on which rests a ball, F, which serves the purpose of a valve to open and close the orifice D both sides of the point.

A long hollow tube, H, is secured to the drill-head B by being screwed in or otherwise fastened. The drill, and shaft H, that works it, forms the most perfect and complete sand-

pump, the drill-head B being of such form and constructed in such a manner that the detritus cut up will, with the water in the well, force itself into the orifice D, lift the ball-valve F, and pass by it into the tube or hollow shaft C at every stroke of the drill, thereby keeping its way clear.

The drill-shaft, which is the hollow tube C H, may be of any desired length, it having vents *f f* at the upper end to let the air, gas, or water off, and when a sufficient quantity of the detritus is forced in, so as to make it labor or shake, it is drawn up out of the well by the windlass, swung off to one side, and the ball-valve raised by thrusting a stake or bar into the orifice D, and the accumulated matter is discharged from the shaft or tube C.

Thus it will be seen that a most perfect and efficient sand-pump is combined with the drill, so that no time is lost in keeping the well clear of all such matter as will force itself into the tube.

A cone-valve, I, (as seen in Fig. 3,) may be placed in the cavity D and will operate to admit the detritus into the hollow shaft C and let it off in the same manner as the ball-valve F.

The drill-head B may be made of cast or wrought iron. The bit or cutting-point K is made of steel and tempered, and so dovetailed and fitted into a groove in the nose E of the drill-head B that it can be taken out for the purpose of sharpening and replaced firmly with facility.

It will readily be seen that by my mode of constructing drills and combining with them my improved sand-pump, to be constantly operating in taking up the detritus when the drill is at work, that much time and labor will be saved. The openings in the drill-head being so near the cutting edge or point of the drill, the detritus and water is forced up and lifts the cone or ball valve at every downward stroke, and is then retained by the closing of the valve in the hollow shaft and lifted with it, so that at no time while the sand-pump or hollow shaft is at work and being filled will there be any accumulation of the detritus under the drill to obstruct its cutting, as is the case with all the drills known and used, and which have to be taken up (no matter at what depth) every few inches and the sand-pump thrust down several times to clear the well, because the detritus gets so compressed and

hard that the drill ceases to cut any below it. With my combined drill and pump it continues to operate with increased force until the hollow shaft is filled, the downward motion of the shaft having a tendency to throw up the contents in it above the valve, which gradually increases its weight and gives it momentum in falling.

It is being demonstrated that "artesian" or oil wells can be bored to any depth with my combined improved apparatus in less than one-half of the time and with less than half of the expense attending that of any other that has come to my observation.

Having thus fully described my invention,

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

1. The peculiar form of the drill-head, so constructed and combined with a cone or ball valve and a hollow shaft as to perform the double action of a drill and sand-pump for boring oil-wells, as herein described.

2. The manner of taking up the detritus in boring wells and discharging the same from the openings at the lower end, near the bottom of the drill, as herein specified.

ENOCH R. MORRISON.

Witnesses:

J. B. WOODRUFF,

A. McCONNELL.