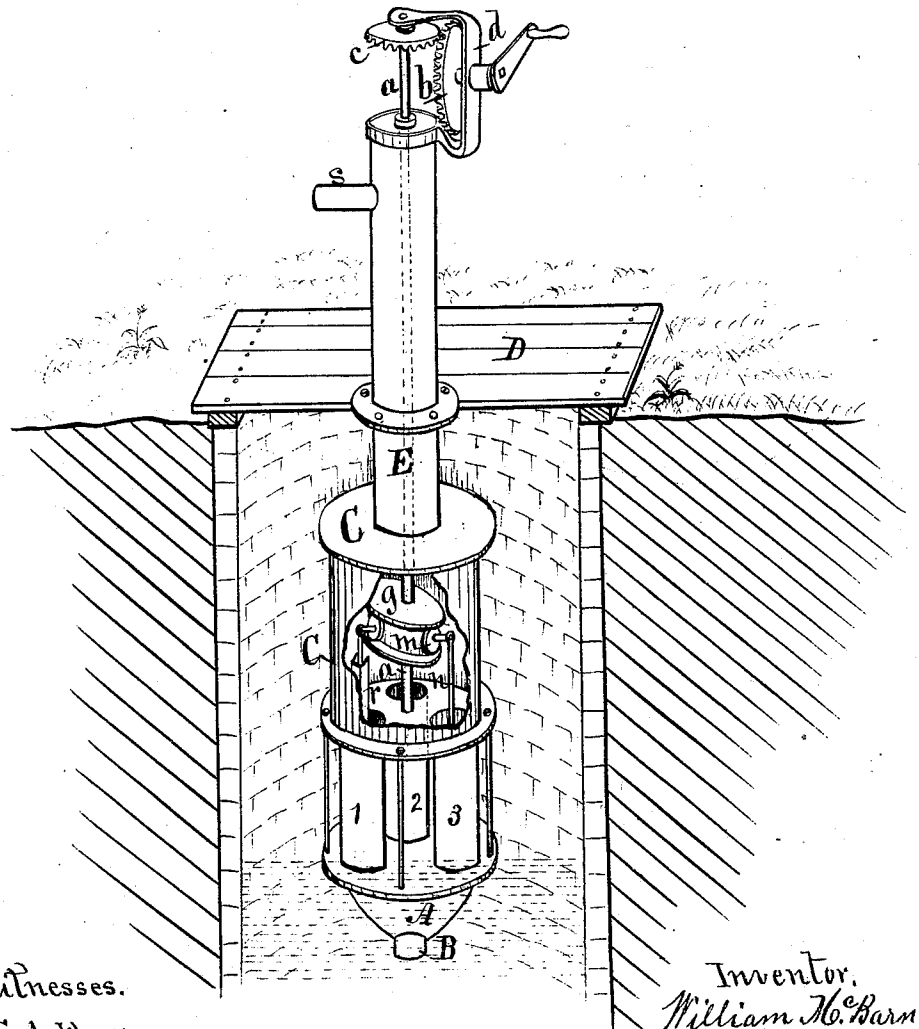
W. McBARNARD.

PUMP.

No. 170,680. Patented Dec. 7, 1875.



Witnesses.

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UNITED STATES PATENT OFFICE.

WILLIAM McBARNARD, OF CLARKSVILLE, IOWA.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **170,680**, dated December 7, 1875; application filed August 25, 1875.

To all whom it may concern:

Be it known that I, WILLIAM McBARNARD, of Clarksville, in the county of Butler and State of Iowa, have invented an Improved Pump, of which the following is a specification:

My invention is a pump specially adapted to elevate water from a well in a continuous forced stream by rotating a shaft. It consists in arranging and combining a reservoir, a series of cylinders and pistons, a receiving-chamber, a well-tube and air-chamber, and a rotating shaft carrying a grooved cam, as hereinafter fully set forth.

My drawing is a perspective view, illustrating the construction and operation of my invention.

A represents a metal reservoir, the base-piece of my complete pump. B is an induction port or tube at the center and bottom of the reservoir A. C C is my receiving-chamber, corresponding in form and size with the reservoir A. Nos. 1 2 3 represent a series of independent pump-cylinders made of metal, wood, glass, earthenware, or any suitable material. They are fitted and fixed between the reservoir A and the receiving-chamber C, which two parts are rigidly connected by means of suitable rods or screw-bolts being passed through the flanges. These cylinders connect the two water-chambers A and C, and the pistons operating in the cylinders lift the water from the reservoir to the receiving-chamber, and from thence force it up through a well-tube.

D represents the cover or platform of the well. E is a well-tube rigidly attached to the top and center of the receiving-chamber C. It passes up through the well-cover D sufficiently high to discharge the water in the manner of a common pump, and to support a driving mechanism. The tube is secured to the platform or cover D in any suitable way. *a a* is a rotating shaft passed through a suitable stuffing-box at the top of the tube E, and then down through the tube and the receiving-chamber C, where it rests in a bearing in the center of the base-plate of the chamber C. *b c* are common bevel-gear wheels supported in a suitable bearer, *d*, rigidly attached to the top of the tube E. The wheel *c* is rigidly fixed to the top of the shaft *a a*. *g* is a grooved cam-wheel rigidly fixed to the shaft *a*, and in a central position in the receiving-chamber C. It stands at an angle relative to its shaft, and its inclined groove may be termed a double inclined plane. *m m* represent studs or anti-friction rollers in the groove of the cam *g*. They are rigidly connected with the piston-rods *n*, which carry the pistons up and down in the cylinders 1 2 3. The pistons have suitable valves for the passage of water, and are directed in suitable grooves or guides *r*, attached inside of the wall of the chamber C.

In the practical operation of my pump the bevel-gear wheel *b* may be turned right or left by a crank, a pulley, or drive-wheel on the same shaft, operated by hand or any suitable power to rotate the mating wheel *c* and the shaft *a*. The grooved cam-wheel *g*, rotating with the shaft *a*, will alternately raise and lower the anti-friction rollers *m*, and thereby, through the connected piston-rods *n*, impart a reciprocating motion to the pistons in the series of pump-cylinders 1 2 3. The pistons will be thus actuated independently and successively to elevate water from the reservoir A to the receiving-chamber C, and their concerted action will force a continuous stream upward through the tube E to be discharged therefrom by means of a common spout, *s*. That portion of the tube E above the spout *s*, closed air-tight at its top by means of the stuffing-box, through which the shaft *a* passes, becomes an air-chamber to aid the pistons in forcing the water from the well-tube, and makes the tube E a combined well-tube and air-chamber. Suitable hose may be attached to the spout *s*, for throwing the water when desired.

I am aware that a series of cylinders and pistons have been used to pump a continuous stream, and that a cam-wheel having an inclined groove has been used to actuate the pistons in succession to force the water successively through the same number of connected cylinders in a continuous stream.

I am also aware that in a double-acting pump, wherein two pistons are actuated by an oscillating arm, a reservoir, two cylinders, a receiving-chamber, and a combined water-

tube and air-chamber are connected to lift and force water. But I claim that my combination, wherein a rotating shaft passes through the entire length of the well-tube and air-chamber, is new and greatly advantageous, in that it forms a pump equally well adapted for shallow and deep wells.

I claim as my invention—

In a pump, the combination of the reservoir A, the series of cylinders and pistons 1 2 3, the receiving-chamber C, the combined well-tube and air-chamber E, and the rotating shaft *a* carrying the grooved cam *g*, substantially as and for the purposes shown and described.

WILLIAM McBARNARD.

Witnesses:
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