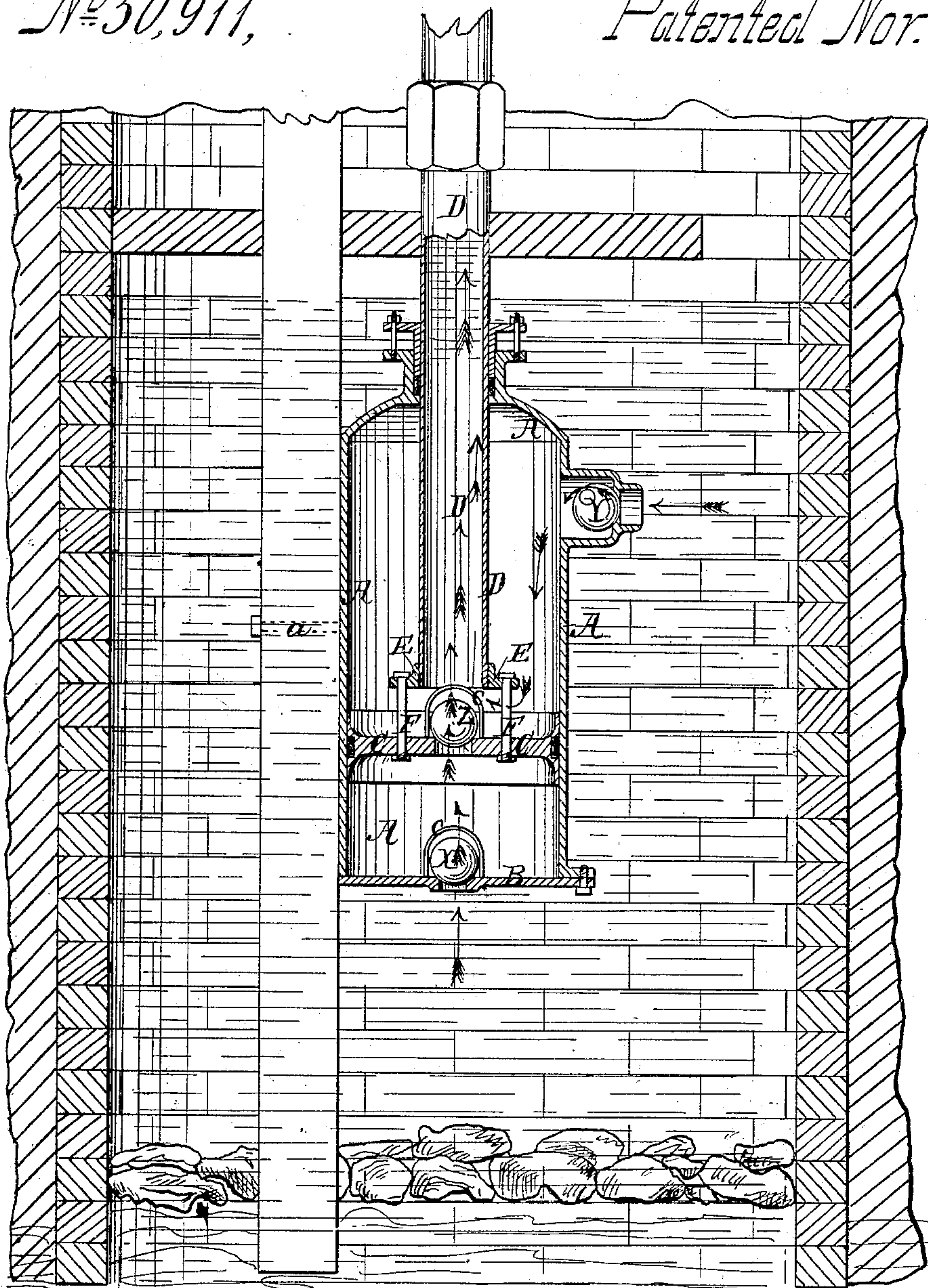


W.H. Culpn,
Pump Piston,

No. 50,911,

Patented Nov. 14, 1865.



Witnesses;
Henry A. Brewster
J. C. Clayton

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UNITED STATES PATENT OFFICE.

WILLIAM H. CULP, OF HAMMONDSVILLE, OHIO.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. 50,911, dated November 14, 1865.

To all whom it may concern:

Be it known that I, WILLIAM H. CULP, of Hammondsville, Jefferson county, in the State of Ohio, have invented certain new and useful Improvements in Double-Acting Force-Pumps; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference thereon marked.

To enable others to make and use my invention, I will describe its construction and operation.

My invention relates to that class of pumps in which the water passes up through a hollow piston-rod, and is thence discharged. Most pumps of this kind which are double-acting, or capable of throwing a continuous stream, are constructed with two chambers, as may be seen in the patent of A. J. Reynolds, of March 3, 1863. The chief but not only difference between these pumps and mine is that I have only the single straight cylinder and dispense with the supplemental chamber, thus greatly simplifying and cheapening the pump without lessening its efficiency.

In constructing my improved pump, I first cast a cylinder, A, of suitable size, (from three to twelve inches internal diameter, and from one to four feet in length,) open at top and bottom, and provided with a heavy side plate and bolts, *a*, to be secured to a suitable beam near the bottom of the well. The top of this cylinder is contracted somewhat and provided with a suitable packing-box to fit snugly around the piston-rod. To the open bottom of the cylinder is screwed a cast-iron bottom plate, B, which is provided with a (rubber) ball-valve, X, in the center. This valve seats itself on the upper surface of plate B and plays up and down in the cage *c*. At the top of the cylinder A is another valve, Y. This valve is also a ball, and is represented as being confined in a small nozzle or short cylinder projecting somewhat from the cylinder A.

The piston-head C, which works in the cylinder A, is cast with a valve-opening in its center, and is so provided with a rim around it (in which the packing is placed) as to form a concavity or bowl on each side, upper and under, of the piston-head. A valve, Z, also

working in a cage, rises and falls so as to seat itself in the valve-opening in center of piston-head. The bowls direct the force of the water to the center of the piston-head. The hollow piston-rod D extends upward through the packing-box, and is provided with a suitable discharge-nozzle, and is operated by any desired lever arrangement. The lower end of the piston is provided with an annular flange, E, which screws onto the piston-rod.

F are three short rods, made fast to the piston-head C and extending up and passing freely through holes in the flange E. These rods or bolts are of such a length as to allow the piston-head to rise up against the open lower end of the piston-rod on the descending stroke, so that the water must pass through the valve Z, and also to allow the piston-head to separate itself from the end of the piston-rod on the ascending stroke sufficiently to permit the passage of the water into the piston-rod through the space between said rod and piston-head. I have represented ball-valves, but other kinds of valves may be used.

In the drawings, A is the cast-iron pump-cylinder; B, the cast-iron bottom plate; C, the piston-head; D, the piston-rod; E, the flange on bottom of piston-rod; F, the bolts for attaching the piston-head to the piston-rod; X, the valve at bottom of pump; Y, the valve at top of pump; Z, the valve in piston-head; *a*, bolts for securing pump to beam near the bottom of the well; *c*, the cages for retaining the valves X Z.

The red arrows indicate the course of the water at the rising stroke.

The blue arrows indicate the course of the water at the descending stroke.

The operation is as follows: Supposing the piston-head to be at the bottom of the pump. In this position (the pump being submerged) the water rushes through valve Y, filling the cylinder above the piston-head and closing the valve Z. The piston-head is now raised by the hand-lever. This separates the piston-head from the piston-rod for a short space, (see drawing,) and as there is no other outlet the water must rush up into the piston-rod, as shown by the red arrows. As the piston-head ascends it creates a partial vacuum in the cylinder, and causes the water to force open the

valve X and rush up into the cylinder, filling it. The piston-rod now descends and seats itself upon the upper surface of the piston-head, which it forces downward. As it descends the valve X is closed by the water, and there is no outlet for the water, except through the valve Z in the piston-head, so that the water is forced up through this valve into the hollow piston-rod, and is discharged in a copious and continuous stream.

A careful consideration of my invention will show that I have produced a double-acting force-pump cheaper of construction, less liable to disorder, and easier of repair than any pump heretofore presented.

Having thus fully described my invention,

what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The piston-head C, in combination with bolts F and hollow piston-rod D, substantially in the manner described.

2. The piston-head C, constructed and operating substantially in the manner and for the purposes herein set forth.

In testimony that I claim the above I have hereunto set my hand this 12th day of June, 1865.

WM. H. CULP.

In presence of—

JOHN ANDREWS,

THOMAS CULP.