

T. CALVER.  
FORCE PUMP.

Patented Nov. 6, 1883.



WITNESSES :

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# UNITED STATES PATENT OFFICE.

TIMOTHY CALVER, OF PORTSMOUTH, OHIO.

## FORCE-PUMP.

SPECIFICATION forming part of Letters Patent No. 288,007, dated November 6, 1882.

Application filed March 30, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, TIMOTHY CALVER, of Portsmouth, in the county of Scioto and State of Ohio, have invented a new and Improved Force-Pump, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved force-pump which can throw a large quantity of water and is very simple in construction.

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 longitudinal elevation of my improved force-pump, parts being shown in section. Fig. 2 is a plan view of the same on the line *x x*, Fig. 1. Fig. 3 is a front elevation of the upper part of the pump.

On a base-plate, A, which rests on the bottom of the well, cistern, &c., four horizontal pump-cylinders, B, are placed at right angles to each other and in such a manner that the central axes of the two opposite cylinders of each pair will form a continuous right line, the said two right lines crossing each at right angles. The cylinders are open at the outer ends and closed at the inner ends.

Each cylinder contains a piston, F, attached to the end of a horizontal piston-rod, G, passing through the inner closed end of its cylinder. The inner ends of the opposite piston-rods are attached to opposite sides of a plate or frame, H, provided with a slot, J, at right angles to the piston-rods, the slots J of the two plates or frames H crossing each other at right angles.

A vertical shaft, K, is journaled at its upper end in a cross-piece, L, uniting two standards, M, in the cover or top plate, N, of the well or cistern, and the lower end of the shaft K is journaled in the base-plate A, directly below the axes of the cylinders B. The shaft K also passes through a guide loop or ring, I, on the end of an arm, I', secured to the bottom of the cover N.

At its lower end the shaft K is provided with a crank, O, which passes through the slots J of the plates or frames H. A bevel-

pinion, P, is rigidly mounted on the upper end of the shaft H, and engages with a bevel cog-wheel, Q, mounted on a transverse shaft, R, journaled in the standards M, provided with a crank-handle, S.

The pump-barrel T, which is closed at the top, is provided with a spout, T', and at its lower end branches into four tubes, V, leading to the four cylinders B, and each tube V is provided with a suitable check-valve.

The piston-rods G are of such length that the pistons can be moved out of the open ends of the cylinders, to permit the water to enter and fill the cylinders.

By turning the crank-handle S the shaft K is rotated, and the crank O, acting against the edges of the slots J, reciprocates the two pairs of piston-rods at right angles to each other. For each revolution of the shaft K each piston is moved backward and forward in its cylinder, and each cylinder is filled and emptied, and thus for each revolution of the shaft K the contents of the four cylinders will be raised and discharged.

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

1. The combination, with the single crank O of the drive-shaft and the cylinders B, of two rods, G G, carrying a piston at each end, arranged at right angles to each other and transversely slotted in the middle, as shown, whereby only a single crank is needed and pitmen for connecting the crank with the piston-rods are dispensed with.

2. In a force-pump, the combination, with the cylinders B, arranged opposite each other in pairs and at right angles to each other which cylinders are open at the outer ends, of the pistons F, the piston-rods G, of such length that the pistons can be moved out of the outer ends of the cylinders, and devices for reciprocating the pistons simultaneously, substantially as herein shown and described, and for the purpose set forth.

TIMOTHY CALVER.

Witnesses:

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