UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **210,802**, dated December 10, 1878; application filed October 19, 1878.

To all whom it may concern:

Be it known that I, WILLIAM CLARK NELSON, of the city of Vallejo, in the county of Solano and State of California, have invented a new and valuable Improvement in Pumps; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters of reference marked thereon.

Figure 1 of the drawings is a representation of a side elevation partly in section, and Fig. 2 is a detail view of the piston-valve on the reverse motion.

My invention relates to a double-action suction and force pump; and the novelty consists in the construction and arrangement of parts, as will be more fully hereinafter set forth, and pointed out in the claims.

In carrying out my invention, I employ a cylinder and piston, suitable packing being provided at each end of the cylinder. The piston-rod is made in sections, of tubing or hollow metal, the middle section being internally partitioned and provided with apertures, on opposite sides, leading in opposite directions. A reciprocating piston-valve operates upon this middle section or body, and it is provided with inlet-apertures and a slot, which receives a pin. Suitable shoulders confine the piston-valve within proper oscillating bounds, allowing the proper working of the valves.

The packing in the cylinder ends consists of a perforated metal disk having a circumferential slot to receive fibrous packing, a shoulder to abut against the end of the cylinder, and a dishing outer surface to receive the packing around the piston, which is held firmly therein by a perforated screw-cap, as is shown.

In my device either the piston or the cylinder may reciprocate, and the same result will accrue; but in practice I prefer to have the cylinder reciprocate.

Referring to the drawings, A A represent the outer sections of the piston-rod, the inner ends of each of which are provided with shoulders *a* and male threads *a'*, the latter adapted to be received into and the former to abut against the body B of the piston-rod. This body B is provided with valve-ports *b b* upon one side, and intermediately between them, on the opposite side, is a valve-port, *b'*. A partition, B', extends from beyond the valve-ports upon one side to a point past the valve-port upon the other side, in an opposite direction. By this construction the ports *b b* lead outward in one direction, and the port *b'* leads outward in the opposite direction through the hollow piston-rod.

C represents the piston-valve, and C' the piston, made in one, and provided with ports *c c c c* upon opposite sides of and adjacent to the piston C'. *c'* represents a slot, in which operates a pin, *c''*, which prevents the piston-valve from turning or rotating. This piston-valve reciprocates between the shoulders *a*, and the construction and arrangement are such that the exit-port *b'* is always open on the side toward the end of the cylinder which is approaching, and the inlet-ports *b* are alternately open on the opposite—that is to say, when the water or the like is forced to exit from one end of the cylinder through *b'*, the other end of the cylinder is receiving from the part *b* on the opposite side of the piston, as shown by the arrows.

D represents the cylinder, of sufficient diameter and length to have a reservoir at each end of the same beyond the piston, and it is provided with male-threaded ends *d*, upon which operate the concavo-convex caps *d'*, through which work the piston-rods A.

To secure a tight packing at the ends of the cylinder I employ a disk, E, perforated to receive a rod, A, and it is provided with a circumferential slot, *e*, to receive packing, a shoulder, *e'*, to abut against the ends of the cylinder, and a dishing outer surface, E'. The packing, being wound around the rod A, is received within the concave E', and is pressed down and firmly held in that position by the caps *d*, making a tight joint.

The inlet and outlet ends of the hollow piston-rod may be provided with filter and nozzle, or other proper desired devices.

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

1. The disk E, having dishing outer surface E', recess *e*, and shoulder *e'*, in combination

I. H. PALMER.
Wind-Mill Motor.

No. 210,803. Patented Dec. 10, 1878.

Fig. 1.

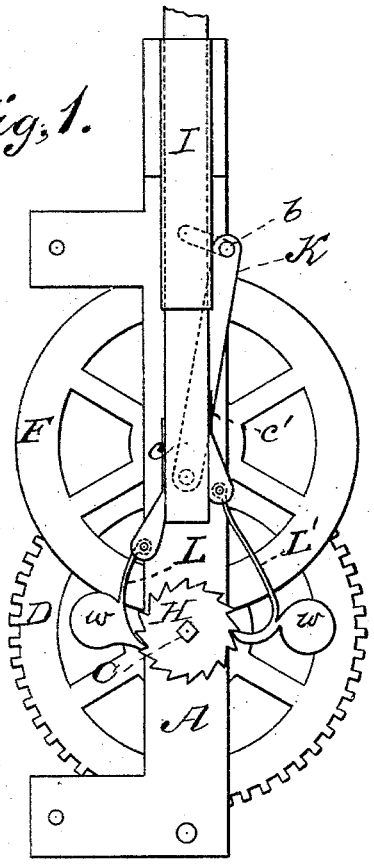


Fig. 2.

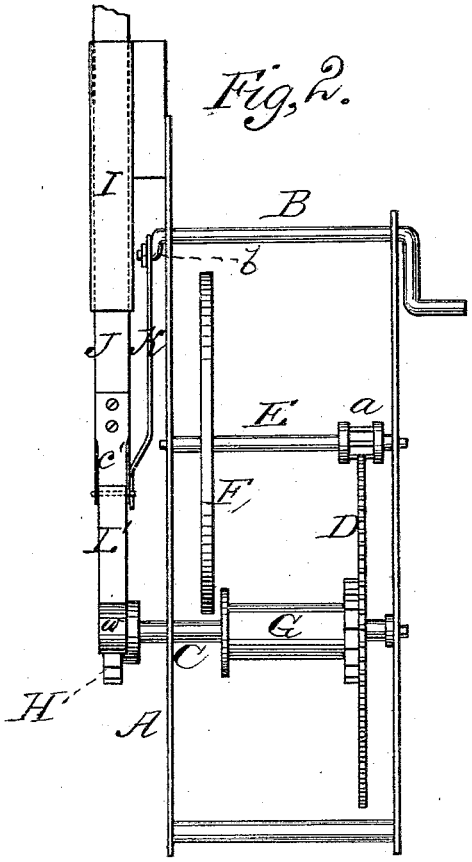
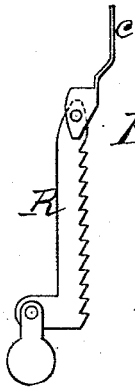


Fig. 3.



WITNESSES

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