W. S. DAVIS.

PUMP.

No. 189,306. Patented April 10, 1877.

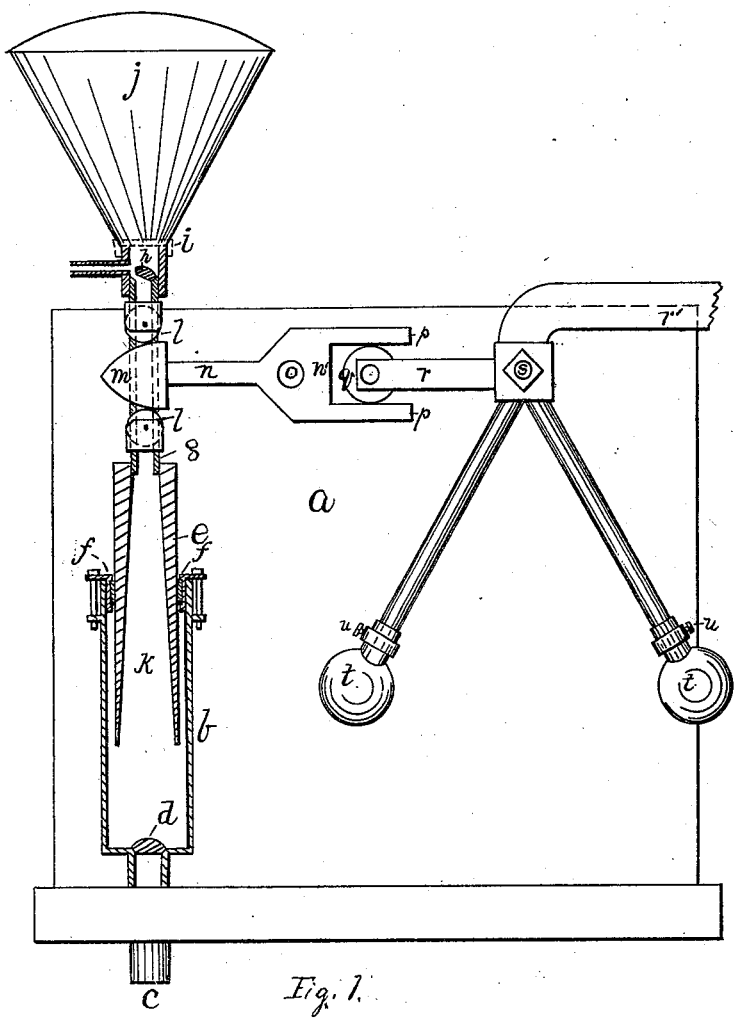

Fig. 1.

Witness
William Henry Clifford
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Inventor
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UNITED STATES PATENT OFFICE.

WILLIAM S. DAVIS, OF PITTSFIELD, MAINE, ASSIGNOR TO HIMSELF AND WARREN L. PARKS, OF SAME PLACE.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **189,306**, dated April 10, 1877; application filed February 26, 1877.

To all whom it may concern:

Be it known that I, WILLIAM S. DAVIS, of Pittsfield, in the county of Somerset and State of Maine, have invented certain new and useful Improvements in Pumps; and I do hereby declare that the following is a full, clear, and exact description thereof, that will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 shows a front view of my invention, partially in section.

My invention consists of an improved pump of simple construction, intended for use either as a force-pump, or, by a slight change, as an ordinary pump.

My invention will be readily understood by reference to the accompanying drawing, in which *a* shows a suitable support, to which the machinery is attached. At *b* is the cylinder of the pump, from which extends the suction-tube *c*, provided with a suitable valve, *d*, closing with the downward stroke of the piston *e*, which works in said cylinder through a packing, *f*. From the top of said piston, serving as a piston-rod, projects a hollow tube, *g*, into and through which the water passes, said tube having a valve, *h*, at its upper end, closing with the upward stroke of the piston. At the top of said tube, above the valve *h*, is the discharge pipe or nozzle of the pump, which may be surmounted by a simple cap, *i*, or may take the water from a chamber, *j*, thus permitting the pump to be used as a force-pump.

The piston *e* is cylindrical in form upon its outside, fitting the packing *f*, through which it works, but is hollow upon its inside, the cavity being conical in form, diminishing in size from bottom to top. This form is shown at K, and insures the filling of the piston and tube with the downward stroke of the piston.

The pump is operated by the vertical movement of the piston, and this may be effected by an ordinary pump-handle secured to the tube *g;* but in order to perform the work with as much ease as possible, I attach to said tube two friction-rollers, *l l*, between which works a cam, *m*, upon the end of a lever, *n*, having a fulcrum at *o*. As the lever is worked the cam raises or lowers the tube and piston, the rollers diminishing the friction and accommodating the motion of the lever to that of the piston.

The power may be still further increased by providing the end *n'* of the lever *n* with parallel arms *p p*, inclosing a friction truck or roller, *q*, secured upon a second lever, *r*, having a fulcrum, as *s*.

As the end *r'* of the lever *r* is depressed, the piston of the pump, acted on by the lever *n*, is also depressed, forcing the water into the tube *g*, and through and discharging from the nozzle.

The lever *r* may be balanced by a weight or weights, *t*, to give steadiness of motion, which weights may be adjustable, if desired, upon the rods supporting them, by means of set-screws *u u*.

I do not claim a pump provided with the common solid piston-rod, and boxes having valves therein in the ordinary form, even although said boxes may be hollowed out in conical form upon their inner sides. The object of the conical cavity in my piston is to gradually diminish the size of the column of water from the lower end of the piston to the opening in the hollow piston-rod, forming a continuous tube, flaring at the lower end, substantially avoiding angles. This tends to avoid counter-currents within the piston, as it is forced down, offering a straight upward vent for the water, and utilizing the power for raising it with as little waste as possible.

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

1. In a pump, the combination of a hollow piston-rod, *g*, with a piston, *e*, cylindrical in form externally, and having a conical cavity, K, therein, diminishing in size from the bottom to its junction with the rod *g*, at the top, forming, with said rod, a continuous tube, with its orifice flaring at the bottom, and substantially smooth upon its inner surface, substantially as and for the purposes herein set forth.

2. In combination with the piston-rod of a pump, the friction-rollers *l l*, attached thereto,

cam *m*, and lever *n*, substantially as shown and set forth.

3. In a pump, the combination of the piston and rod *e g*, friction-rollers *l l*, cam *m*, and lever *n*, the arms *p p*, roller *q*, and lever *r*, either with or without the weights *t t*, substantially as and for the purposes specified.

In testimony that I claim the foregoing I have hereunto set my hand this 17th day of February, 1877.

WILLIAM S. DAVIS.

Witnesses:

WM. FRANKLIN SEAVEY,

W. L. PARKS.