W. L. Jacobs,

Double Acting Pump

No. 2,785, Patented Sept. 23, 1842.

Fig. 2.

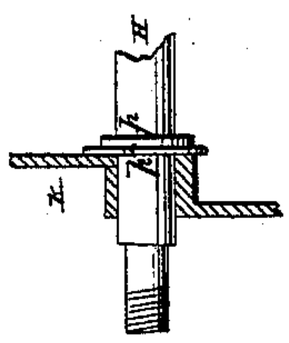
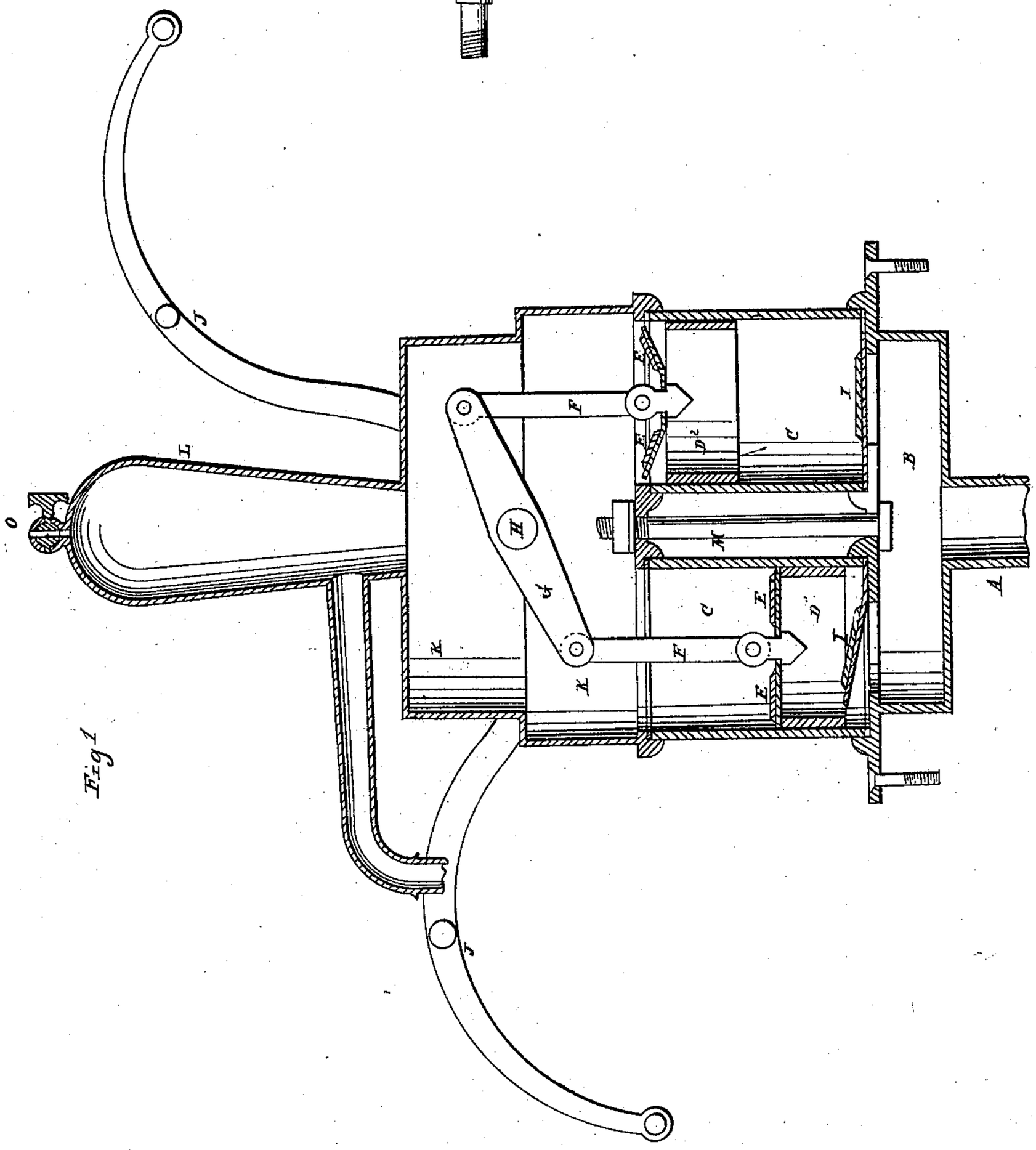


Fig. 1



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UNITED STATES PATENT OFFICE.

WM. L. JACOBS, OF LANCASTER, PENNSYLVANIA.

PUMP.

Specification of Letters Patent No. 2,785, dated September 23, 1842.

To all whom it may concern:

Be it known that I, WILLIAM L. JACOBS, of Lancaster city, in the county of Lancaster and State of Pennsylvania, have invented a new and useful Improvement in Pumps, which is described as follows, reference being had to the annexed drawings of the same, making part of this specification.

Figure 1 is a vertical section, representing the box D^1 ascending and the box D^2 descending. Fig. 2 is a section of the shaft H showing the collar and ring of packing and part of the box K.

This pump is made like others in use, except in the particulars hereafter described.

The conducting tube A, box B, cylinder C, pistons or boxes D, valves E of boxes D, connecting rods F that connect the valve boxes D to the vibrating beam *b*, the vibrating beam *b*, the axle H of the beam, and valves I in the bottoms of the cylinders are made and arranged in the usual manner. Also the brakes J for vibrating the axle.

The main improvement that I have made and for which I solicit Letters Patent is inclosing the vibrating beam and axle and the upper ends of the connecting rods of the valve boxes in a tight water box K in which they work and into which the water is raised secured to the upper ends of the cylinders having an air vessel L and pipe of the usual form and construction attached to said water box.

Grooves are formed on the under side of the water box K corresponding in size and shape with the upper ends of the cylinders inserted therein. Similar grooves are formed on the upper side of the box B into which the lower ends of the cylinders are inserted. Suitable packing is inserted in these grooves to render the joints tight.

The cylinders are held firmly between the boxes B and K and in the aforesaid grooves by a screw bolt or bolts such as that represented at M which has a head on the lower end and a nut on the upper end—or vice versa.

In order to lessen the liability of leakage at the joints only one end of the axle H is passed through the box K and that is secured from leaking at the joints of the seat in which it works by means of a collar *p* and a ring of packing p^2 Fig. 2 placed around the axle H and pressed by the water against the inside of the box. The other end of the axle needs no packing as its seat or box in which it vibrates passes only partly through the side of the water box K.

By the aforesaid arrangement the ordinary heads of cylinders, piston rods, and stuffing boxes are dispensed with—the working parts of the pistons or valve boxes being entirely inclosed within the cylinders and water chamber and operated in the water keeping the rubbing parts cool and less liable to wear and free from leakage by means of the aforesaid rings of packing pressed over the joints by the pressure of water in the pump and causing the water to have a continuous upward current unchecked in its course or arrested or turned aside as in the Newshane engine which has solid pistons and piston rods and which forces the fluid through lateral tubes into the air vessel after being raised by atmospheric pressure and whose working parts are exposed, complex and liable to produce much friction, besides being very expensive and easily put out of order.

The valves E in the boxes D are made in the usual manner.

By closing the cock O in the air vessel L the air will be compressed and by its elasticity will keep up a continuous stream. The cock O being opened the air in the air vessel will be excluded therefrom and its place will be supplied with water which will keep up a sufficient head and a constant stream.

For ordinary pumps a simple lever will answer instead of the brake J.

The axle may be extended through the water box on both sides and have a brake applied at each end thereof, the joints being packed in the manner before stated.

The operation of the pump will resemble that of some other pumps in use—namely on the ascent of piston D^1 in the cylinder a partial vacuum will be formed therein into which the water will rise by atmospheric pressure through the valve I, then on the descent of said piston valve I will close and valve E of the piston will open which will permit the piston to descend in the water and again on the ascent of the piston its valves will close and lift the water above them forcing it upward into the water box K and air vessel L at the same time pro-

ducing another vacuum in the cylinder in the same manner as just described and so on. And while this operation is going on a similar alternate action takes place in the other cylinder marked D^2. The alternate action of the pistons is produced by the vibration of the brake J, which is connected with the axle H.

I make no claim to the cylinders, pistons, valves and air vessels but—

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

Constructing the pump with the axle and vibrating beam to which the pistons are attached, arranged inside the water box and working therein as described in the manner and for the purpose herein set forth.

WM. L. JACOBS.

Witnesses:

WM. P. ELLIOTT,

E. MAHER.