

R. I. KNAPP.
DOUBLE-ACTING PUMPS.

No. 194,604.

Patented Aug. 28, 1877.

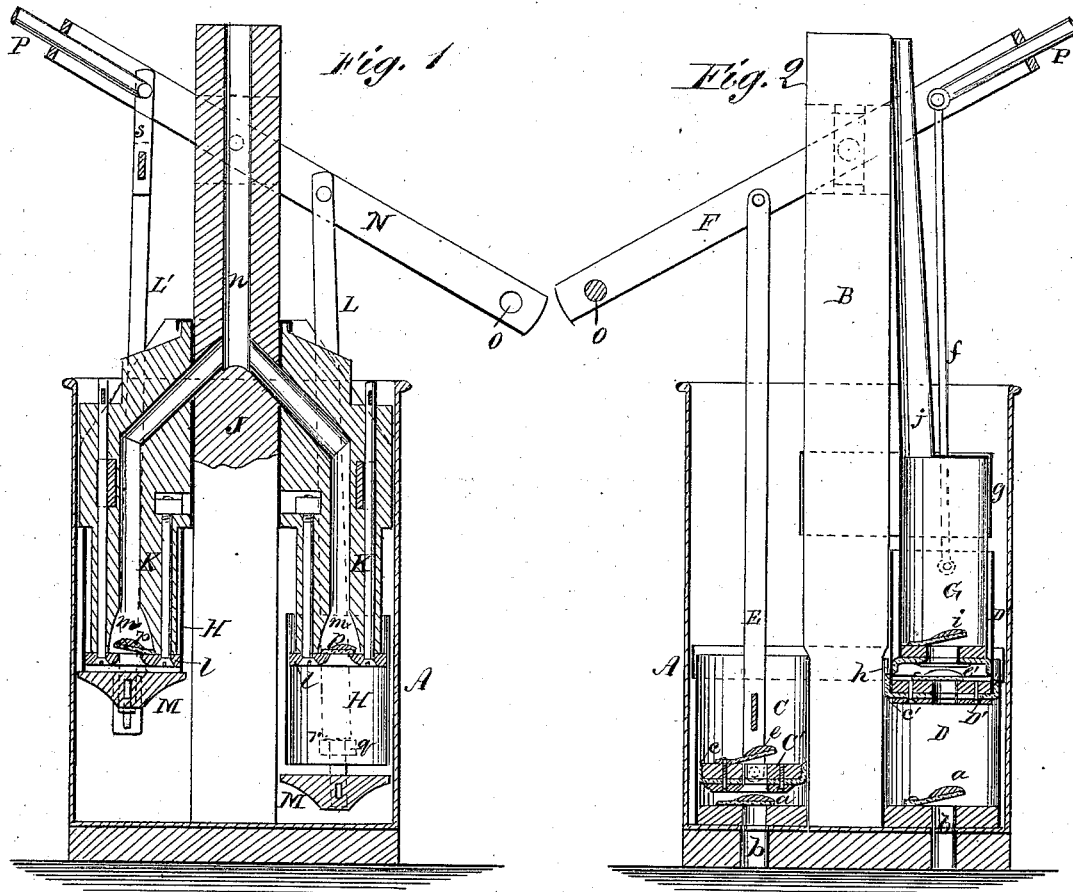
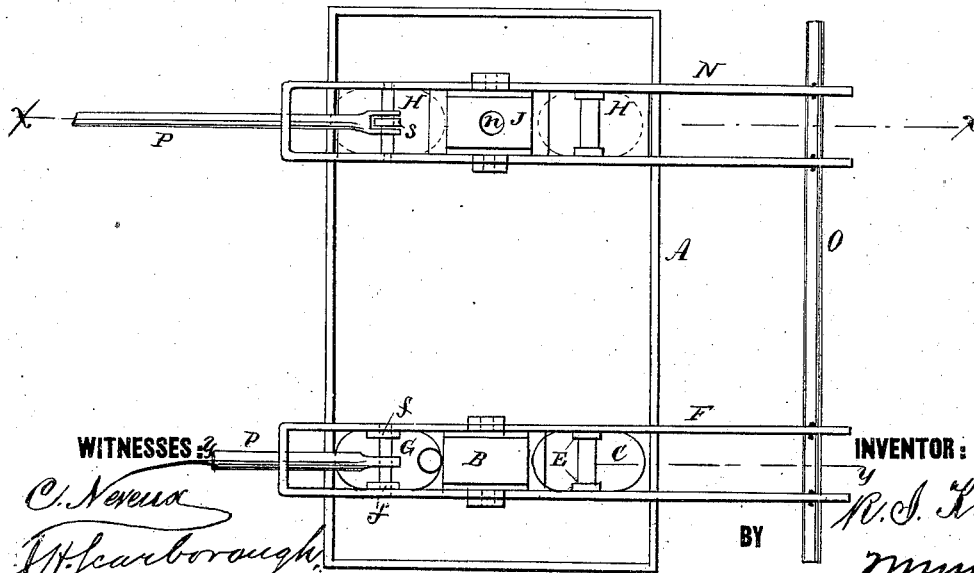


Fig. 3



WITNESSES
C. Nevada
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INVENTOR:
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UNITED STATES PATENT OFFICE.

RILEY I. KNAPP, OF GUILFORD, ILLINOIS.

IMPROVEMENT IN DOUBLE-ACTING PUMPS.

Specification forming part of Letters Patent No. 194,604, dated August 28, 1877; application filed May 28, 1877.

To all whom it may concern:

Be it known that I, RILEY I. KNAPP, of Guilford, in the county of Winnebago and State of Illinois, have invented a new and Improved Pump, of which the following is a specification:

Figure 1 is an elevation, in section, on line *x x* in Fig. 3. Fig. 2 is an elevation, in section, on line *y y* in Fig. 3. Fig. 3 is a plan view.

Similar letters of reference indicate corresponding parts.

The object of my invention is to provide a simple and efficient pump that may be used either as a lift or force pump.

In the drawing, A is a tank, in one end of which the vertical standard B is secured.

Upon one side of this standard at the bottom of the tank the cylinder C is placed, and at the other side of the said standard a similar cylinder, D, is placed, and in each of these cylinders valves *a* are arranged over openings *b* that extend through the bottom of the cylinders and through bottom of the tank A.

To the cylinder C a piston, C', is fitted, which is attached to the parallel rods E. This piston is provided with the usual leather packing *c*, and with a central opening that is closed by a valve, *e*.

In the cylinder D a tubular piston, D', is placed, which is provided with a valve, *e'*, and packing *c*. To this piston rods *f* are attached which extend upward, and are pivoted to a lever, F, that is pivoted to the standard B. The piston D' is fitted to a stationary hollow piston, G, which is attached to the standard B by means of the strap *g*. This piston is provided with the packing *h* and the valve *i*, and to its upper end a pipe, *j*, is attached. This hollow piston serves as an air-chamber in equalizing the flow of water through the pipe *j*.

At the end of the tank opposite the cylinders C D cylinders H are placed on opposite sides of a standard, J, upon pistons K that are rigidly attached to the standard J, and are provided with a suitable packing, *l*, and with passages *m* that lead to a central passage, *n*, in the standard J. There are valve-seats at the lower end of the passages *m*, which are closed by valves *p*.

At the sides of the cylinders H near their lower ends loops *q* are attached, through which the lower ends of the rods L L' pass. These

rods are provided with shoulders *r*, and to the lower end of each pair of rods a head, M, is attached, which is capable of closing the lower end of the cylinder H.

The upper ends of the rods L are pivoted to a lever, N, which is pivoted to the standard J, and the upper ends of the rods L' are attached to a cross-bar, to the center of which a short bar, *s*, is secured, the upper end of which is pivoted to the lever N.

The pump's cylinders at each end of the tank are connected with the levers F N, and these levers are connected by a rod, O, which forms a brake by which all of the cylinders may be operated. The levers F N are forked so that they are pivoted at both sides of their standards and handles P project from the ends opposite the rod O.

On moving the levers the piston C' draws the water through the opening *b* and discharges it over the top of the cylinder C into the tank A. The piston D' in the cylinder D takes the water in a similar way and forces it into the hollow piston G, whence it passes through the pipe *j*.

For some purposes it is designed to draw water and deliver it to the tank A by means of the piston C' and cylinder C, and to take it from the tank and force it by means of the piston D' and cylinder D.

At the opposite end of the tank A the upward movement of the rods L or L' first draws the head M against the lower end of the cylinder H, and then carries the cylinder upward together with the water it contains.

The water passes from the cylinder H through the passage *m*, and is delivered to the passage *n*. When the rods L L' move downward they first move the heads M, so as to open the lower end of the cylinders, and when the shoulders *r* strike the straps *g*, the cylinders H are carried down and filled.

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

In pumps, the combination, with cylinders H arranged on pistons K, of the head M and rods L L', the latter connected with a lever, N, as and for the purpose specified.

RILEY INGERSOLL KNAPP.

Witnesses:

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