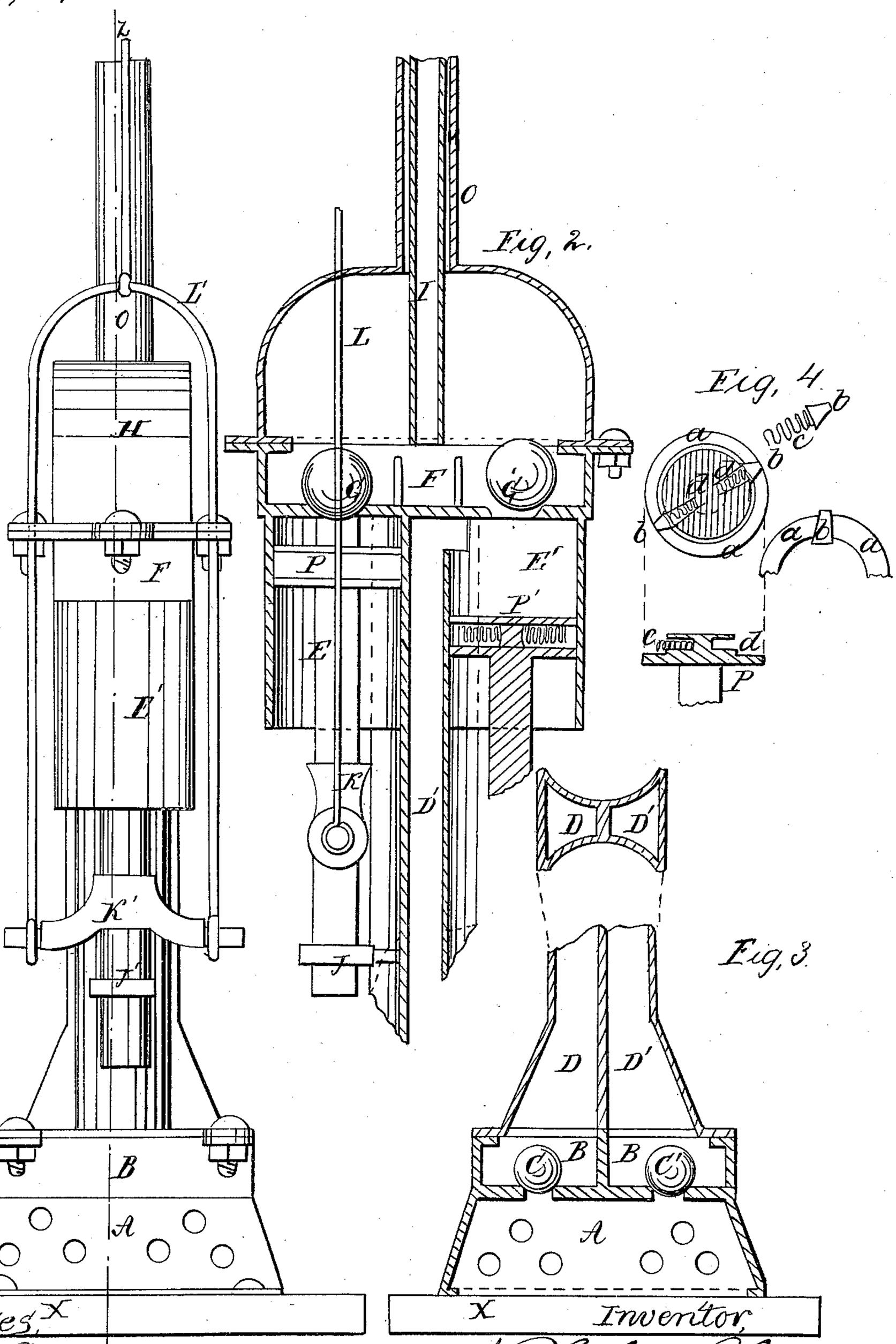
N. Clute.

Force Pump.

No. 86,645. Patented Feb. 9, 1869.



Witnesses.

X

Wm. Dennis

Daniel Breed

X

Inventor.

Nicholas Clute

By his Atty. I. Dennis Jr

United States Patent Office.

NICHOLAS CLUTE, OF SCHENECTADY, NEW YORK.

Letters Patent No. 86,645, *dated February* 9, 1869.

IMPROVEMENT IN FORCING-PUMPS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, NICHOLAS CLUTE, of Schenectady, Schenectady county, State of New York, have invented an Improved Double Forcing-Pump; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains, to make and use my said invention or improvements without further invention or experiment.

The nature of my invention and improvements consists in constructing and arranging the several parts of a double-acting forcing-pump in such a manner as to make it compact in form, cheap to make, and highly efficient in operation, said construction and arrangement being particularly set forth in the following description.

In this specification I shall refer to the accompanying drawings, forming part of the same—

Figure 1 being an elevation of one of my improved pumps;

Figure 2, a sectional elevation of the upper portion of the pump, at the line *z z* on fig. 1;

Figure 3, a sectional elevation of the lower portion cut at right angles to the above section; and

Figure 4, a horizontal section of one of the pistons.

The bottom of the pump consists of a block, X, supporting and forming part of the pyramidal box A, perforated to receive the water, and surmounted by a valve-chest, B, which is divided into two separate parts, and provided with the valves C and C′.

Upon this chest is secured, with suitable packing between, the pump-stock, consisting of the two conduits D and D′, to correspond with the two divisions of the chest B.

Two opposite sides of this stock are made cylindrical, hollowing inward to receive the two pump-cylinders, E and E′, which are secured to it, and may form a part of the cylindrical sides.

The cylinders and stock together are surmounted by the valve-chest E, provided with the two valves, G and G′, opening respectively from the cylinders E and E′.

The top of the chest F is made sufficiently capacious to form the air-chamber H, the discharge-pipe I extending down through this chamber, and opening into the chest.

A pipe or jacket, O, surrounds the pipe I, to support or strengthen it, and to protect it from the cold.

The cylinders E and E′ are open at the bottom, and are each provided with a solid piston, P and P′, the rods of which extend downward through the guides J and J′, and have on them, between the guide and the cylinder, the cross-heads, K and K′, provided with the rods L and L′, to which the moving or operating-power is to be applied.

The pistons, P and P′, are provided with a packing, (see fig. 4,) consisting of the divided ring *a*, pressed out by the wedges *b b*, and acted upon by the springs *c c*, in the recesses *d d*; the wedges *b b* separating the parts of the ring, and having their outer ends curved to conform to the outer surface of the ring, so as to form, themselves, a portion of the wearing-surface. As the wedges are exposed to wear equally with the ring, and are made of a softer metal, or one that will wear more easily or faster than the ring, they will always keep up a pressure, both against the ring and the cylinders, so as to make a tight packing.

Operation.

The parts of the pump being properly secured together, and the perforated box A immersed in water, a reciprocating rectilinear motion must be given to the two pistons, by connecting the rods L and L′ to the opposite ends of a lever with equal arms, and pivoted in the middle, or by other suitable device, so that the rising of one piston may be simultaneous with the descent of the other, and *vice versa*, or the rods L L′ may be connected by a cross-head, so as to cause the two pistons to rise and fall together.

Then, as each piston rises, the air above it and in the conduit connecting with it, will be compressed, the conduit D opening at the top into the cylinder E, and the conduit D′ into the cylinder E′, and the air being prevented from escaping below by the lower valves, consequently a portion of it will escape, by its increased elastic force, through the valve above, and on the descent of the piston, the space occupied by the remaining air being increased, its elastic force will be lessened, and the pressure of the air on the water outside, will cause a portion of it to rise through the lower valve to restore the equilibrium.

This operation being continuously repeated, the water will soon rise so as to flow into the cistern from the conduit, on the descent of the piston, and be forced up through the upper valve, on its ascent, the pressure of the air without causing the water to rise and fill the cylinder above the piston, as often as it descends and forms a vacuum, or a partial vacuum, behind it.

1. I claim the combination, with the open cylinders E and E′, of the conduits D and D′, the valves C and C′, and perforated box A, for supplying water to the same, substantially as described.

2. I claim a piston-packing, consisting of a divided ring, *a*, pressed out by a wedge or wedges, *b*, of soft metal, acted upon by springs, said wedges filling the space between the separated parts of the ring, so as to form a portion of the exterior or wearing-surface of the packing, substantially as described.

NICHOLAS CLUTE.

Witnesses:

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