F. G. Wynkoop,

Double-Acting Pump,

No. 45,551, Patented Dec. 20, 1864.

Fig: 1

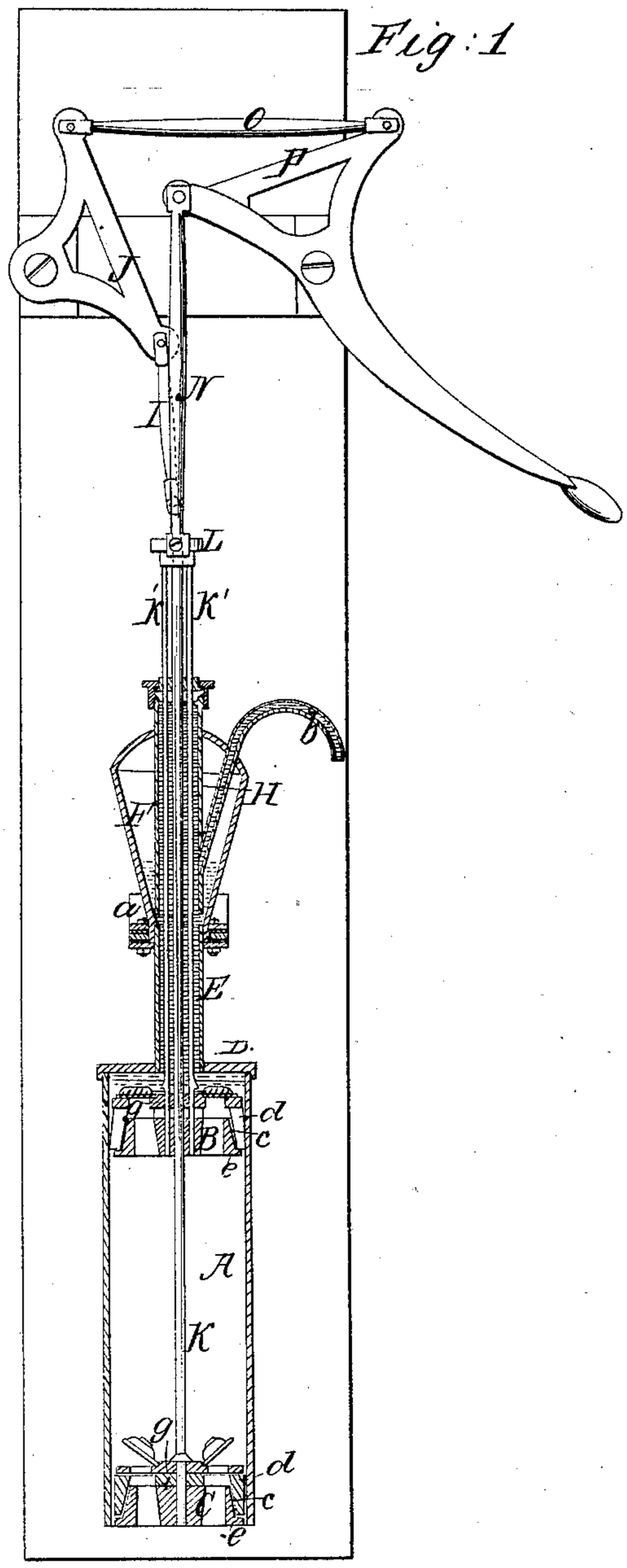


Fig: 2

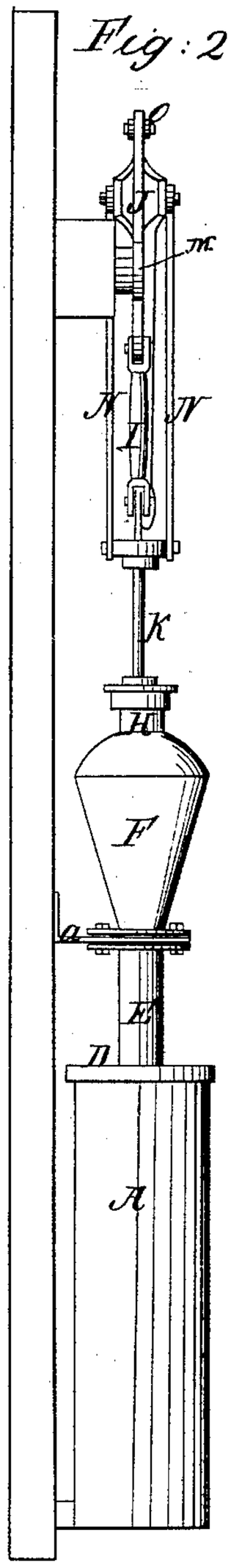
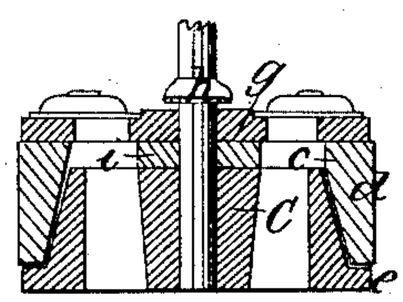


Fig: 3.



Witnesses;
James H. Dudley
Charles Smith

Inventor,
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UNITED STATES PATENT OFFICE.

FRANCIS G. WYNKOOP, OF CORNING, NEW YORK.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **45,551**, dated December 20, 1864; antedated April 29, 1863.

To all whom it may concern:

Be it known that I, FRANCIS G. WYNKOOP, of Corning, in the county of Steuben and State of New York, have invented a new and Improved Pump; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a sectional elevation of my improved pump. Fig. 2 is a rear elevation of the same. Fig. 3 is a sectional elevation of the lower piston and a portion of its rod on an enlarged scale.

Similar letters of reference indicate corresponding parts in the several figures.

The object of this invention is to obtain a double-acting force-pump of simple construction for household and garden purposes, and one which, when it fails to perform by reason of the packing becoming too much worn to fill the chamber when compressed, can be taken apart and refitted or put in working order at small expense and without the aid of a practical plumber; and to this end the invention consists in the use of an annular piece of rubber fitting the inclined or conial face of the piston, in combination with a loose metallic disk or valve-plate, whereby the rubber, by the weight of the superincumbent water, is expanded and caused to fill the space between the piston and chamber during the ascent of the former, and is retracted or restored to its original shape by its resiliency and that of the gasket, aided by the force of the water passing through the valves of the piston during the descent of the latter, thus entirely relieving the packing or annular piece of rubber from contact with the chamber, and at the same time allowing it to lubricate and free itself from any sediment or sand which may have been drawn into the chamber by the water passing through the space between it and the chamber. Also, in combination with the above the rubber gasket, all as will be hereinafter fully explained.

To enable others skilled in the art to fully understand my invention, I will proceed to describe its construction and operation.

A represents a chamber or cylinder, in which two pistons, B C, are fitted to work alternately in opposite directions. The lower part of the cylinder A is left open and the upper part is covered by a plate, D, from which projects upward a pipe, E, connecting the cylinder with the upper part of the pump. F is an air-vessel provided at its lower end with a flange, to which the union or forcing pipe E is bolted, a bracket, *a*, and suitable packing or gaskets being interposed, the former to serve as a support for the upper part of the pump and the latter to form a close joint between the air vessel and pipe E. A pipe, H, which is cast axially within the air-vessel F, protrudes through the upper part thereof, and is furnished on its upper end with a stuffing-box through which the piston-rods work. Said pipe H extends nearly to the bottom of the air-vessel, and, with the exception of a small space left between it and the pipe E, and which forms a communication between the pump, cylinder, and air-vessel, is a continuation of the forcing-pipe E. The delivery-pipe *b* in the accompanying illustrations is shown leading from near the lower part of the pipe H upward on the inside of the air-vessel F and out through the top; but I generally prefer to have it extend out horizontally from the pipe H until it reaches the outside of the air-vessel F; thence upward, terminating in a goose-neck.

The lower piston, C, is attached to the lower end of a rod, K, which passes upward through the center of the upper piston, B, and pipes E H, and is conected by a rod or pitman, I, to the lower end of bell-crank lever J, which vibrates on a pivot, M.

The upper piston, B, is attached to the lower ends of the rods K′ K′, which extend upward on opposite sides of the piston-rod K through the stuffing-box and are attached at their upper ends to the cross-head L, which is attached by pivots to rods or pitmen N, whereby the piston B is connected to the bell-crank P. This lever P is connected to and imparts motion through the medium of rod O to the lever J.

The pistons B and C are alike and packed in the following manner: An annular piece of rubber, *d*, which is formed with an inclined inner face, *c*, is drawn over the conical portion of the piston, resting at its bottom edge on the flange *e* and supporting on its upper edge the valve-plate *g*. The valve-plate *g* is loosely fitted on the piston-rod and allowed to play up and down thereon within certain limits, being governed in its upward movement by a collar or projection, *h*, on the piston rod or

rods, and in its downward direction by the annular piece of rubber *d* and the rubber gasket *i*, which latter is interposed between the central portion of the valve-plate and the piston. This gasket serves to pack the central opening in the valve-plate at the same time the annular piece of rubber *d* packs the piston.

As each of the pistons descends in the cylinder the valve-plate, being loosely fitted on its rod, is forced upward by the the resiliency of the rubber, which, at the same time, in its effort to contract, rises on the conical portion of the piston, thus reducing its diameter, leaving a space between it and the cylinder, through which space water passes and lubricates the piston.

When the piston rises, the weight of the column of water upon the valve-plate compresses the rubber ring *d* and causes it to fill the space between the piston-rod and cylinder and to fit closely the sides of the latter.

As the handle of the lever P is worked the pistons move alternately up and down in the cylinder, the ascending piston lifting and forcing water while the descending piston is taking in water. A portion of the water forced upward in the pipe F enters the air-vessel and compresses the air therein confined; and when the second or other piston commences to force upward a fresh portion this air expands and drives out the water that compressed it, and thus renders the stream of water continuous.

This pump is more especially designed for deep wells, the pump-cylinder to be submerged, and the union pipe to be of such length as to allow the air-vessel and parts of the pump above it to remain above the ground.

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

1. The annular piece of rubber *d*, provided with an inclined inner face, *c*, in combination with the piston and loose valve plate *g*, when arranged to operate in the manner substantially as described.

2. Also, in combination with the above the rubber gasket *i*, arranged in the manner and for the purpose specified.

FRANCIS G. WYNKOOP.

Witnesses:

JAMES H. GRIDLEY,
OCTAVIUS KNIGHT.