R. M. Lafferty,

Lift Pump.

NO. 104,604. Patented June 21. 1870.

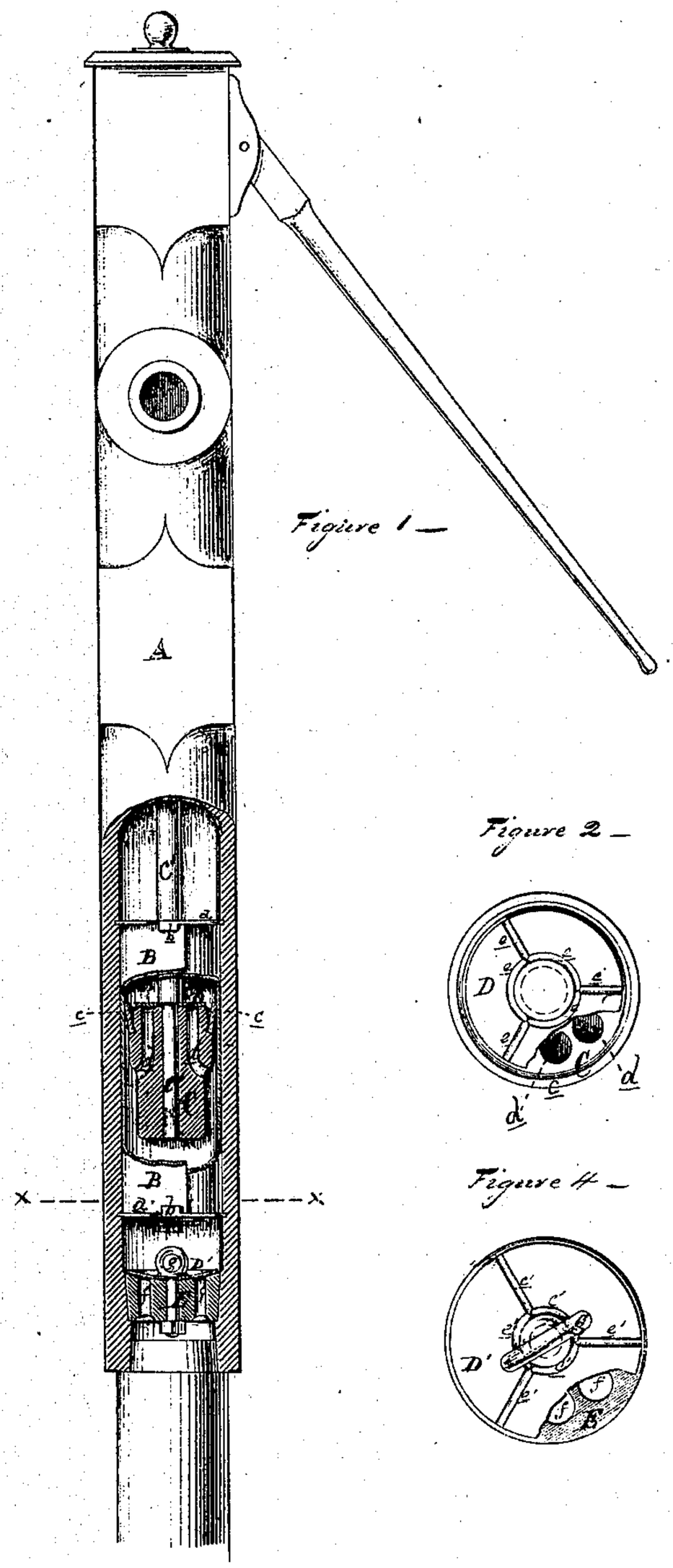

Figure 1—

Figure 2—

Figure 3—

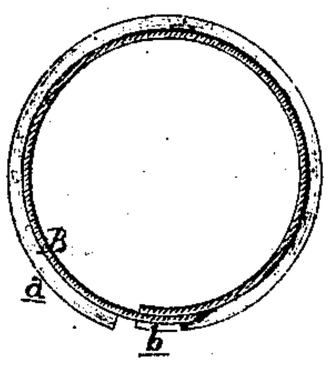

Figure 4—

ATTEST.
James Thierry
G. S. Sprague.

INVENTOR:
R. M. Lafferty
Per his Attorney
Thos S. Sprague

United States Patent Office.

ROBERT M. LAFFERTY, OF THREE RIVERS, MICHIGAN, ASSIGNOR TO HIMSELF AND EDWARD P. SMITH, OF SAME PLACE.

Letters Patent No. 104,604, *dated June* 21, 1870.

IMPROVEMENT IN PUM

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

To whom it may concern:

Be it known that I, ROBERT M. LAFFERTY, of Three Rivers, in the county of St. Joseph and State of Michigan, have invented a new and useful Improvement in Pumps; and I do declare that the following is a true and accurate description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon, and being a part of this specification, in which—

Figure 1 is an elevation, partially in section, of my improved pump.

Figure 2 is a plan, partially in section, of the pump-piston.

Figure 3 is a horizontal section of the lining of the barrel, taken on the line *x x*, in fig. 1; and

Figure 4 is a plan of the foot-valve, also partially in section.

Similar letters of reference indicate corresponding parts in each figure.

The nature of this invention relates to an improved construction of wooden pumps, and consists in the peculiar construction of and arrangement within the barrel of a sheet-metal lining or bushing, and in the peculiar construction of the piston and the valves.

In the drawing—

A represents a wooden pump-head or stock, which is attached to a pipe or tube terminating in the water, and in which the working parts are arranged, as shown in fig. 1.

B is a lining, of sheet metal, having a flange, *a*, turned outward on its upper and lower edges, and extending nearly around it.

b is a lip, formed at the commencement of each flange, said lips pointing toward each other. The sheet of metal so arranged is formed into a cylinder by inserting the side, where the flange is cut off, into the lips *b*; the lining is then inserted in the barrel, where it is held in place by the flanges entering the walls of the barrel, either by expanding the lining, and and forcing them into it, or by crozing in a pair of grooves for their reception, the outward spring of the metal tending to keep it in contact with the barrel, following it when it expands, and giving way to it in its contraction, the lips being employed to simply hold the laps together.

C is a piston, attached to the reciprocating piston-rod C′, operated in the ordinary manner.

c is a cup-leather or packing, secured around the top of the wooden piston, which is chamfered at its edge, to form an annular water-chamber between it and the cup-leather, reaching nearly down to the base of the latter, wedging the leather outward in the upward strike of the piston.

The lower half of the valve is diminished in diameter, as shown, and, from this part, a row of openings, *d*, enter the piston, and are carried up through its top, as shown in fig. 1.

In the ordinary method of constructing such pistons the openings for the passage of the water are bored directly through them, weakening them to such an extent that they readily split; in the present form the liability to split is avoided by carrying the lower solid part of the piston-well below the entrance of the openings, thus insuring great strength therein.

D is a disk, of stiff leather, forming a valve, or series of valves, secured by a shoulder in the rod to the center of the piston. It is radially and concentrically grooved, as shown at *e*, fig. 2, the parts between the grooves forming valves, which, in the downward stroke, are enabled to rise, by reason of the flexibility of the grooved parts of the disk.

E is a plug, perforated with suitable openings, *f*, for the admission of water.

D′ is a disk, forming the foot-valve, constructed as above described, and centrally secured to the plug by an eye-bolt, *g*, by means of which the plug may be withdrawn from the pump-barrel, when desired.

The plug E differs in construction from those in ordinary use in this, that its top is concaved or cup-shaped to about the shape that the valves would, from use, assume, so that, where there is not the weight of a high column of water imposed on the valve, it will readily close down on the upper surface of the plug. Where a pump-barrel and tube are of the same diameter throughout, the lining may be carried down to the bottom of the barrel, and, in place by the upper end of the tube expanding it outward against the walls of the barrel.

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

1. The flexible sheet-metal lining C, provided with flanges *d* and lips *b*, constructed, arranged, and operating substantially as and for the purpose set forth.

2. The piston C, provided with the curved openings *d*, and with the cup-leather *c* and valve D, which is provided with the grooves *e*, when each of said parts is constructed as described, shown, and set forth, and arranged to operate as and for the purposes above named.

3. In combination with the piston C, provided as above described with the curved openings *d*, the cup-leather *c* and valve D, with its grooves *e*, the plug E, with concave upper face openings *f*, cup-leather D′, with its grooves *e′*, all constructed and arranged to operate as and for the purposes set forth.

4. The combination and arrangement of the pump-barrel A, flexible lining B, piston C, plug E, and valves D D′, when constructed, arranged, and operating substantially as described, and for the purpose specified.

ROBERT M. LAFFERTY.

Witnesses:

H. F. EBERTS,

H. S. SPRAGUE.