J. E. LEONARD.

Lift-Pump.

No. 206,587. Patented July 30, 1878.

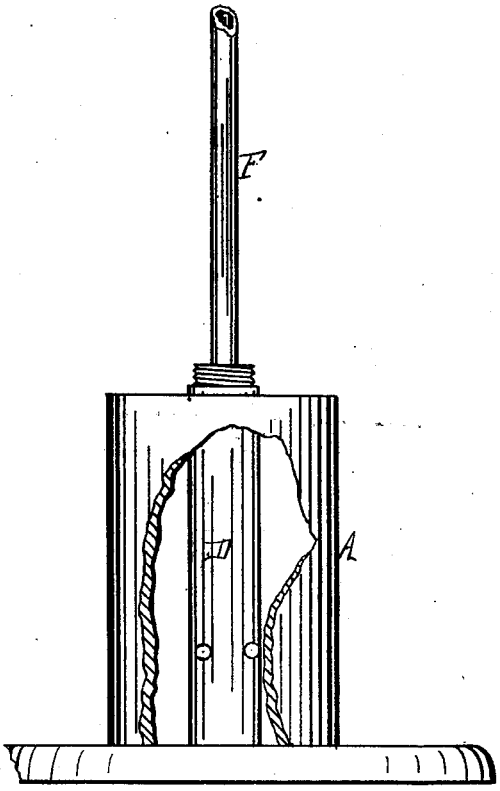

Fig. 1.

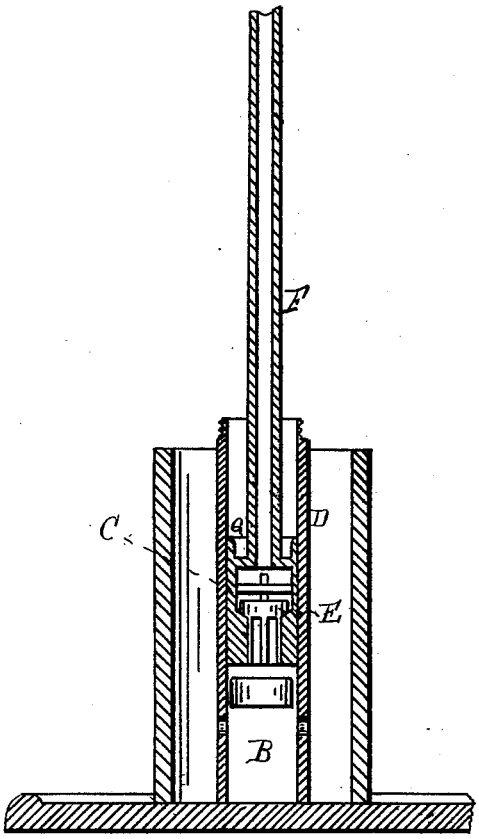

Fig. 2.

Witnesses:
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UNITED STATES PATENT OFFICE.

JOHN E. LEONARD, OF BAY CITY, MICHIGAN.

IMPROVEMENT IN LIFT-PUMPS.

Specification forming part of Letters Patent No. **206,587**, dated July 30, 1878; application filed March 22, 1878.

To all whom it may concern:

Be it known that I, JOHN E. LEONARD, of Bay City, in the county of Bay and State of Michigan, have invented an Improvement in Lift-Pumps, of which the following is a specification:

The nature of my invention relates to new and useful improvements in the construction of pumps designed for use at the bottom of Artesian wells; and the invention consists in the construction and arrangement of the various parts, as more fully hereinafter set forth.

Figure 1 is an elevation, partially in section, of my improved pump. Fig. 2 is a vertical section of the same through the center thereof.

In the drawing, A represents the bore of the well at the bottom, into which the water passes, and into the chamber B, below the bottom of the hollow plunger C, which works in the pump-case D, so placed at the bottom of the bore as to allow the water therein to pass freely in through the ordinary check-valve (not shown) into the hollow piston or plunger C.

The interior of the hollow piston is fitted with a downwardly-seating wing-valve, E. Tapped into the top of the hollow plunger is the hollow rod, F, and surrounding the base of said rod, and above the top of the plunger, is a sand or dirt chamber or cup, G. The rod F should be continued in the usual manner of joining pipes together. To the top of the bore, and above ground, suitable mechanism for giving it a vertically-reciprocating motion should be attached.

It will be noticed that in the operation of this pump, the water entering the chamber B is, by the depression of the rod and plunger, compelled to lift the valve E, opening a passage to the top of the plunger and the rod. Elevating or raising the rod allows the pressure of water below the check-valve to open said valve and pass upward into the chamber B. The depression of the rod forces the water to close said check-valve and open the wing-valve and pass to the chamber above it. The cup G upon the top of the hollow plunger forms a receptacle for sand and dirt, and prevents the same from working between the plunger and its case, to the injury of both.

By the use of this construction of pumps to be used in Artesian wells of great depth, the column of water to be lifted is limited to the size of the bore of the hollow piston-rod F, thereby requiring a much less power than is required by pumps of the ordinary construction, where the column of water to be raised is the full size of the bore of the tubing of the well, and a great saving is effected in the cost of said tubing by its being relieved from the pressure of the large column of water.

Whenever the sand-receptacle becomes filled, the plunger may be withdrawn, said chamber emptied, and the plunger returned, thereby saving the necessity of the use of a sand-pump for the purpose of removing the sediment which accumulates in the ordinary pump.

What I claim as my invention is—

In a pump for Artesian wells, the combination, with the case D, of the hollow plunger C, provided with valve E and with sand-cup G, and the tubular plunger-rod F, connected water-tight to the said plunger, so that the water which enters the tubular plunger-rod is forced from below the plunger up through the same on its downward stroke, constructed and arranged substantially as described and shown.

JOHN E. LEONARD.

Witnesses:
H. S. SPRAGUE,
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