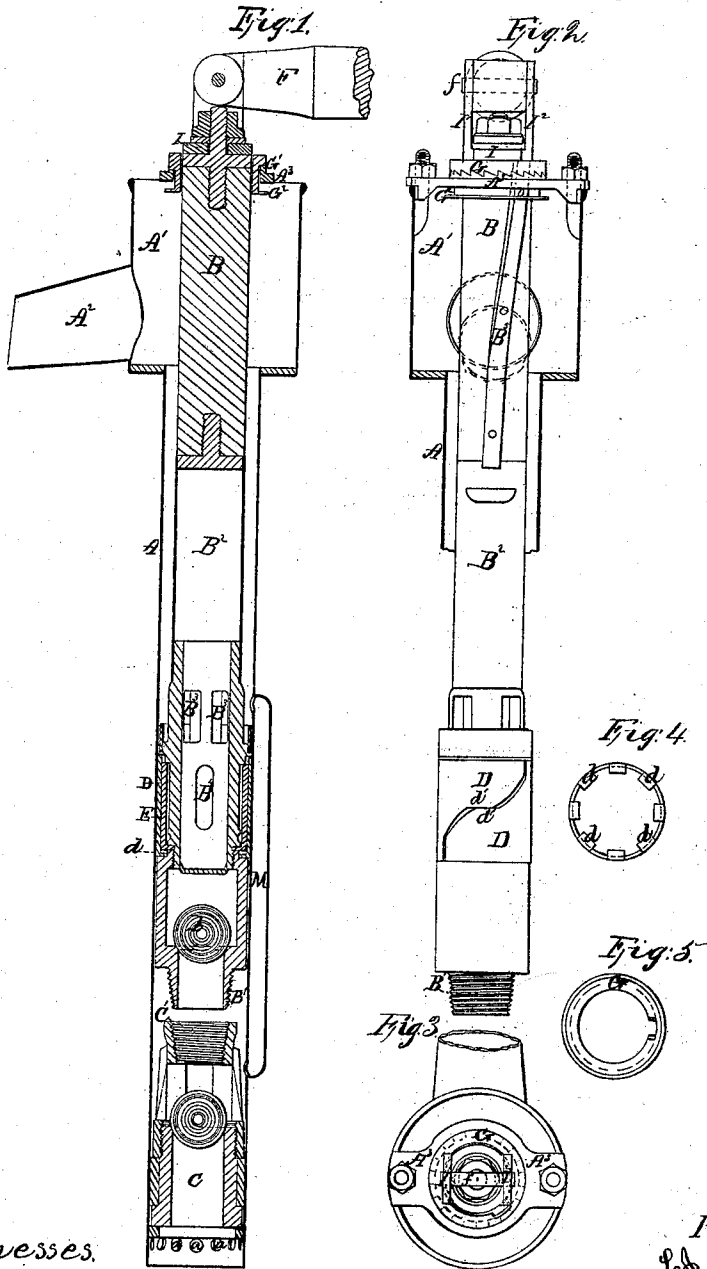


L. Jennings.

Oil Pump.

Nº 80,631.

Patented Aug. 4, 1868.



Witnesses.

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LEWIS JENNINGS, OF BROOKLYN, NEW YORK.

Letters Patent No. 80,631, dated August 4, 1868; antedated July 23, 1868.

IMPROVEMENT IN ARTESIAN 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, LEWIS JENNINGS, of Brooklyn, in the county of Kings, and State of New York, have invented a certain new and improved pump, which I term the Artesian-Well Pump; and I do hereby declare that the following is a full and exact description thereof.

My pump is a lifting-pump; but, for the sake of convenience, I shall, in the following description, call the reciprocating part the plunger.

I will first describe what I consider the best means of carrying out my invention, and will afterwards designate the points which I believe to be new therein.

The accompanying drawings form a part of this specification.

Figure 1 is a central vertical section through the entire pump, it being understood that its length may be increased at pleasure, by increasing the length of the tube and connections.

Figure 2 represents the plunger or reciprocating part, with the upper portion of the work in which it is mounted.

Figure 3 is a plan view.

Figure 4 is a view of the packing, seen from below.

Figure 5 is a top view of the fleeting-cap detached from the other parts.

Similar letters of reference indicate corresponding parts in all the figures where they occur.

A is the fixed tube, which is driven down or otherwise introduced in the well, which receives the fluid either through the open bottom, or through the holes *a*, represented near the lower end.

A¹ is an enlarged head or top, in which the fluid is received, and A² is a side spout, through which it is delivered.

B will be understood to indicate the whole of the plunger or the reciprocating part, the several details of which are indicated by their marks. The lower portion is threaded, as indicated by B¹, adapted to take hold of the corresponding part C¹ of the lower box C of the pump, so as to remove the lower box at will, in a manner which will be obvious.

The valve of the upper box B is indicated by *b*.

The packing is indicated by D and E, and will be further described below.

In the interior of the plunger B, above the valve and packing, is a long cavity, B², which serves as an air-chamber, contained within the pump and within the rod. In this the air is pressed by the force of the superincumbent fluid, and the volume of the air in the chamber B² becomes alternately reduced and increased, to facilitate the variations in the force impressed, performing the same functions, in this respect, as in the ordinary air-chambers of pumps, excepting that ordinary air-chambers are outside of the bearings of the pump, while this air-chamber is within the bearing.

B³ are passages, through which the water flows freely.

The packing presents a metallic surface to the interior of the pipe A, while there is a packing of leather, which makes the metallic packing tight. The metallic exterior is cylindrical in its general form, and may be described as a cut tube, the form of the cut being indicated very distinctly in the side elevation, fig. 2. The lower edge of this metallic portion is dentated and turned inward, as indicated by *d*, and the whole is enclosed between collars in the fixed plunger B, as indicated in fig. 1.

Within this metallic packing D *d* is a cup-leather, E, the lower edge of which is confined firmly between collars in the fixed plunger B, as represented. The pressure of the water holds this leather outward against the metallic portion, D, and prevents the leakage of the fluid, while the metallic enclosure protects the leather from wear. The cup-leather E and the enclosing metallic portion, D, are held outward with a force depending on the height of the column of water which is being pumped, the water being allowed access to the interior of the cup-leather E through the holes B⁴.

I provide a very cheap mode of disposing of the gas, which is frequently troublesome in working artesian wells. M is a small pipe, fitted closely against the side of the main pipe A, and extending from a point below the lowest descent of the plunger B to a point which is above the packing, when the part B is in its highest

position. It bends inwards, and communicates, through holes in the pipe A, at each extremity. When the plunger is in its highest or middle position, the pipe M is of no effect, but at the moment when the plunger B is in its very lowest position, there is a free communication, through the pipe M, between the space below and the space above it. Through this passage the water, oil, or other fluid will, for a brief period, descend freely, displacing the gas, and causing it to rise past the valve *b*, and to escape freely. The form and arrangement of the parts cause the gas to rise up and supply the air-chamber B², thus keeping it always stocked with air or gas.

I turn the plunger B so as to induce it and the tube A to wear perfectly round. I effect the revolution by a mechanism introduced at the top of the apparatus.

F is a lever, operated by hand or by any convenient power, which gives the proper reciprocating motion to the plunger B, through the aid of the side-pieces I¹ I², which are fixed by a swivel-piece, I, and cross-pin *f*.

B³ is a spiral feather or projection, which extends up and down the surface of the plunger B, and is fixed thereon. Its length somewhat exceeds the stroke of the part B.

G is a fleeting-cap, recessed at one point, to match the feather B³, enclosing the upper portion of the part B, as represented. It is mounted in a fixed framing in the head A³ of the fixed portion, A, of the pump, so that it is free to rise and sink a little distance. It is prevented from sinking too low by the top flange G¹, and is prevented from rising too high by the bottom flange G². The side of the upper flange G¹ is toothed, as indicated, and the upper surface of the top piece A³ is correspondingly toothed. Now, when the part B is elevated, the friction is sufficient to lift the fleeting-cap G G¹ G² to its fullest extent, which lifts the teeth of the fleeting-cap out of the teeth of the top piece A³, and leaves the fleeting-cap free to revolve, which it does by the action of a spiral feather, B³, before described. This feather, sliding through the corresponding notch in the fleeting-cap, turns the cap so that it performs some fraction of a revolution at each ascent. So soon as the plunger B and its connections commence to descend, the motion brings the fleeting-cap down, so that its teeth lock with the teeth of the top piece A³, and it is now prevented from turning, while the action of the spiral feather B³, being unable to effect the turning of the fleeting-cap, is compelled to turn the entire plunger B. A swivel-joint is provided at the top, so that the plunger B may turn independently of the side pieces; a construction which will be readily understood by mechanics.

My air-chamber, arranged within the plunger B, near the bottom of the well, is close to the point where the pumping is effected, and may be made as capacious as desired by extending its vertical dimensions.

My arrangement of the parts and passages for catching the gas in the air-chamber provides against the well-known difficulties accruing in the gradual absorption of air or gas by water or other liquids under pressure.

My packing is more desirable than ordinary packing, is tight, and is pressed outward with more force, when it is required to be tightened, during the lifting-action, because pressure on its interior is increased by the inertia of the column of water to be lifted.

My fleeting-cap G and its connections, by turning the entire plunger at every stroke, insure a very uniform wear and a tight fit of the parts, with little friction; and my vent, M, is a very cheap and efficient mode of providing for the descent of water or other liquids, passing to either box, to displace the gas. I am aware that expensive and complicated constructions have been proposed with this view, and I attach importance mainly to the facility and economy with which my own can be constructed and applied.

I esteem it important to form the hard portion, D, of my packing with one or more horizontal steps or offsets, *d'*, as shown, so that the edges will fit tightly at those points at all times, however the packing may open and close at other points.

By making the internal flange *d*, at the base of the packing D, in separate teats or teeth, as represented, I insure an efficient hold on the body of the box, to prevent the packing from becoming displaced vertically, while the lateral stiffness of the packing is not materially increased.

Without the hard exterior D, my packing would not serve, because ordinary soft packing would be cut in pieces in passing across the hole where the top of the pipe M connects, and without the several features of the details, or some equivalent, the combination of hard and soft packing, as arranged, would involve many difficulties.

It will be observed that my fleeting-cap G G¹ G², and the spirally-ribbed plunger B B³, operating as described, with the toothed cap or fleeting-cap A³, have the effect to turn the plunger-rod, at each reciprocation, in the direction required to keep the sections of the plunger tightly screwed together, as well as to continually change the position of the joints, &c., and thus induce a uniform wear of the pump.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent, in pumps adapted for deep wells, is as follows:

1. I claim the within-described construction and arrangement of the packing D *d'* E, the same being composed of the soft and water-retaining cup-leather E, and the hard and expansible exterior, D, the latter being in the form of a ring or hollow cylinder, open on one side, with one or more offsets, *d'*, at the joint, all these several parts being constructed and arranged, relatively to each other and to the box B and barrel A, substantially as and for the purpose herein set forth.

2. I claim the partial spiral or incline B³, and corresponding ratchet-ring G¹ G², arranged as represented, the ring G¹ G² being allowed to traverse axially within the yoke or enclosing-ring A³, and to lock itself in new relations thereon as the bucket B descends, substantially as and for the purpose herein set forth.

In testimony whereof, I have hereunto set my hand, in the presence of two subscribing witnesses.

LEWIS JENNINGS.

Witnesses:

RICH'D S. DEMILT,
JAMES E. DEMILT.