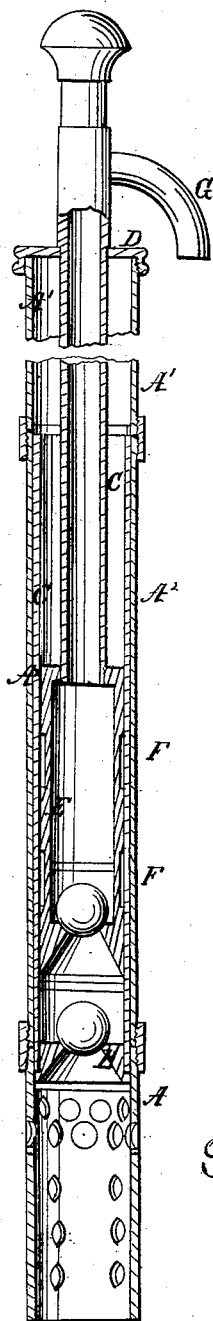


*S. E. Hewes,*

*Oil Pump.*

*N<sup>o</sup> 50,932.*

*Patented Nov. 14, 1865.*



*Witnesses:*

*Nausantwood*

*Gustave Dietrich*

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# UNITED STATES PATENT OFFICE.

S. EMILIUS HEWES, OF ALBANY, NEW YORK.

## IMPROVEMENT IN DEEP-WELL PUMPS.

Specification forming part of Letters Patent No. 50,932, dated November 14, 1865.

*To all whom it may concern:*

Be it known that I, S. EMILIUS HEWES, of Albany, in the county of Albany and State of New York, have invented a new and useful Improvement in Pumps for Oil and other Deep Wells; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same reference being had to the accompanying drawing, forming part of this specification.

The drawing, consisting of only one figure, represents, partly in section, a pump made according to my invention.

Similar letters of reference indicate corresponding parts.

The object of this invention is to produce a pump for operating deep wells, such, for instance, as oil-wells; and it consists, among other things, in securing the cylinder of the pump within and near the lower end of the ordinary well-tube, which is usually carried down to, or nearly to, the bottom of the well.

It also consists in extending the well-tube, or that portion thereof into which the bottom of the pump-cylinder is secured, some distance below the pump, the extended part being perforated with numerous holes to admit oil or other liquid, as well as gas, to the valve in the bottom of the pump. The piston and piston-rod are hollow, the piston being made of considerable length, and its diameter being reduced at two or more places intermediate of its extremities, to allow any liquid which finds its way between it and the sides of the cylinder to be collected in the annular spaces left at such reduced places, and so prevent any injurious effect upon the working of the piston. The piston is used without packing, being made, with the exception of the reduced places above mentioned, of a diameter sufficient to occupy the cylinder of the pump and at the same time be capable of being moved freely up and down in it. The lower end of the piston is brought to a sharp edge by beveling its bottom on the inside, thereby making its bottom in its interior of a conical or funnel shape, the narrowest part forming the seat of the piston-valve.

C is the pump-cylinder. It carries at its lower end a ball-valve working in a cage. The valve is confined in place by a ring, B, on whose upper end is formed the seat of the

valve. This ring fits within the lower edge of the cylinder and is confined and held in place by means of a section, A, of the well-tube which screws over it onto the outside of the cylinder, so as to inclose the ring between a shoulder in the section and the end of the cylinder. This section extends below the cylinder three or more feet down to the bottom of the well, and is perforated with numerous holes to admit fluids and liquids to the pump. The upper end of the cylinder is closed by a cap, through which the piston-rod works as usual, but such a cap is not seen in this example of my invention.

To the upper end of the cylinder is secured, by a screw-joint coupling or in any other proper way, the upper section, A', of the well-tube, which section is carried up through the oil-pipe to the top of the well, or as high as is desired, where it is covered by a cap, D, through which the piston-rod passes. The cylinder C is, moreover, to be inclosed by a cylinder, A<sup>2</sup>, which is a section of well-tubing, and is to be screwed or joined by couplings or otherwise onto sections A A' of the well-tube.

E designates the piston of the pump. Its sides are not packed, as in ordinary pumps, but it is made of considerable length and fills the cylinder as nearly as may be and yet allow it to move freely up and down within it. Its diameter is reduced at two or more places intermediate of its ends, as at F F, in this example (to form annular spaces for receiving any oil or other liquid) or any sand or foreign matter which may get between the piston and the cylinder. In this way the cylinder as well as the piston will be preserved from being worn away or injured by such sand or other foreign substance and the binding of the piston prevented. The piston is hollow and carries a ball-valve in a cage near its lower end, the piston below the valve-seat being beveled off toward its circumference so as to produce a sharp edge at its bottom. This edge will serve to keep the sides of the cylinder free from paraffine, from sand, and other possible sources of injury and obstruction, and will force such matters down to the bottom of the cylinder. The piston-rod is hollow and is carried to the top of the well, where it has a spout, G, and its upper end is to be formed so that it can be connected to the walking-beam or other

means for operating it. The upper section, A', of the well-tube is carried up through the soil-tube.

The piston should be made of bronze and the cylinder of the pump of brass.

It will be observed that there is no packing over the piston of this pump. The boxes of the valves are to be made strong, so as to be durable and capable of resisting the strain of the pump and the weight of the column of liquid in the piston and piston-rod. The head of the piston is not subjected to the weight of the liquid, but the column of liquid, being confined in the piston-rod, rests directly on the piston-valve, and its pressure acts against the inner sides of the piston and so prevents any possibility of their being collapsed or forced inward. When gas rushes into a well which has my pump the valves will not obstruct its escape, and it will have a free and straight course through the pump from bottom to top.

It will be observed that the water or oil is lifted on the upward motion of the piston and hollow piston-rod, but does not at that time flow from the spout G, but on the downward movement of the said piston and piston-rod, by means of the lowering of the point of discharge, the contents flow out at G, as they are prevented by the valve B from flowing out below. The lifting of the water, oil, &c.,

is accomplished by the upward motion and the discharge by the downward, these motions and operations being distinct and alternate.

I claim as new and desire to secure by Letters Patent—

1. In pumps for deep wells, securing the pump-cylinder at top and bottom to the well-tube, substantially as above described.

2. Extending the lower section of the well-tube below the pump-cylinder to the bottom of the well and perforating its sides occasionally throughout its length, to admit gas and liquids to the pump, substantially as shown and described.

3. Bringing the lower part of the piston below the seat of its valve to a sharp edge, substantially as and for the purpose above described.

4. The arrangement of the hollow piston-rod, piston valves, and cylinder, constructed and operated as described, so that the upward and lifting and downward and discharging actions and operations are alternate and distinct.

The above specification of my invention signed by me this 19th day of September, 1865.

S. EMILIUS HEWES.

Witnesses:

M. M. LIVINGSTON,  
J. VAN SANTVOORD.