# J. Harrison,

## Pump Lift.

No. 53,974. Patented Apr. 17, 1866

Fig. 1.

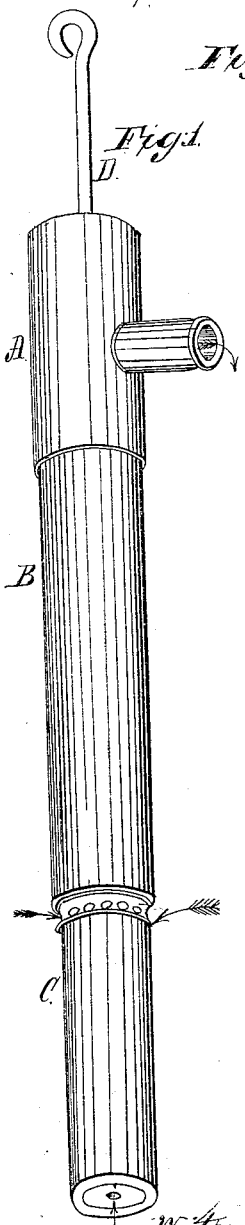



Fig. 2.

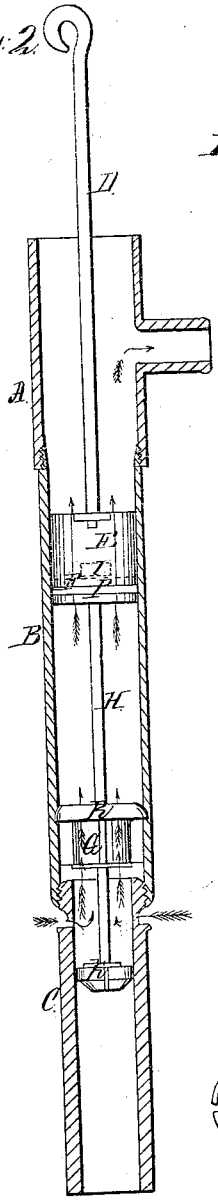
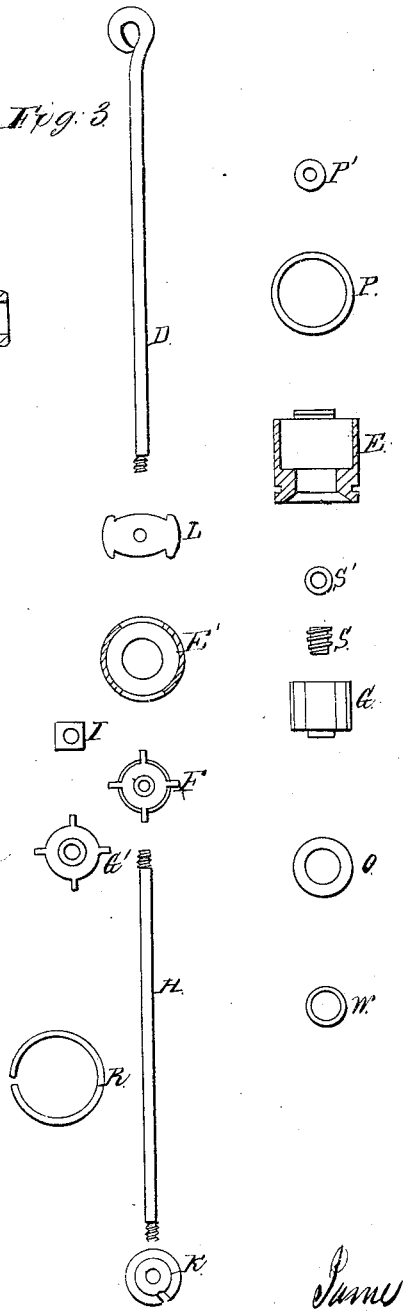



Fig. 3







Witnesses.

John J. Kinney.

Zadock Martin

Inventor.

James Harrison

# UNITED STATES PATENT OFFICE.

JAMES HARRISON, OF JAMESTOWN, NEW YORK.

## IMPROVEMENT IN DEEP-WELL PUMPS.

Specification forming part of Letters Patent No. **53,974**, dated April 17, 1866.

*To all whom it may concern:*

Be it known that I, JAMES HARRISON, of Jamestown, in the county of Chautauqua and State of New York, have invented new and useful Improvements in Pumps for Raising Oil and other Liquids from Deep Wells; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a longitudinal elevation. Fig. 2 is a longitudinal section, and Fig. 3 detached views of the several parts.

My invention has for its object a remedy for the difficulties which are caused by the presence of gas in pumping oil-wells, and it consists mainly in constructing, locating, and using an anchor-chamber below the foot-valve and below the ingress-openings of the pump-barrel, the anchor being connected with the upper valve by a rod, which passes through the lower or foot valve, so that the anchor working in this chamber will act upon and assist in operating both valves.

It is not my object to separate the gas from the oil or other liquids in the well, but to provide means by which it may be easily and successfully pumped with the other liquids or fluids without materially hindering or retarding the normal action of the pump.

Letters of like name and kind indicate like parts in each of the figures.

A represents ordinary well-tubing. B represents the pump-barrel, and C the anchor-chamber. The tubing and the pump-barrel are of ordinary construction, and the anchor-chamber has a screw-connection to the lower end of the pump-barrel.

D is the valve-piston rod. E and F represent the valve-piston, which is of common construction.

G represents the lower or foot valve, which is shown open. When closed it rests upon the seat $g'$, which seat is formed on the upper end of the anchor-chamber.

K is, by way of distinction, called an "anchor," although it works like a piston in the chamber C. It is connected by means of the rod H to the upper valve, which rod passes through the lower valve. It also passes through the upper valve and is made fast thereto by means of the nut I, so that the anchor and the upper valve must have simultaneous and equal movements. The lower or foot valve is made of considerable depth, as will be noticed by the drawings, in order to give it a supporting-bearing upon the rod H, and there is a packing within it, which may be tightened or loosened at pleasure, it being my object to allow the rod H to work water-tight through this valve and give it sufficient friction on the rod to support its own weight or more.

An open bevel-ring, R, made of spring-metal, is fitted into an appropriate seat in the pump-barrel, as shown at $r'$, in order to limit the upward movement of the valve G. When the valve strikes this ring its upward movement is stopped, but the rod H will continue its movement through it as far as the valve-piston moves. It will be noticed that this ring occupies a position between the lower valve and the valve-piston, and that it limits the upward movement of the lower valve. Now, if at any time it becomes necessary or desirable to remove the whole working apparatus from the well, the anchor may be made to act as a "jar" upon this ring, so as to release or force it from its seat, so that the valve-piston, ring, lower valve, and anchor may all be drawn out of the well together, and then they may all be put in together, the upper end of the pump-barrel B being beveled from within outwardly to correspond with the bevel of the ring, so that the downward pressure of the valve-piston will force the ring into its seat again.

L is a cross-bar or bail for connecting the piston-rod to the valve-piston.

S is a hollow screw fitting into the interior of the lower valve to support the packing around the rod H, and $s'$ is a tranverse section thereof.

P is a packing-ring, which is placed in the groove $p^2$ of the valve-piston; and P′ is also a packing-ring for the lower valve, G, placed around the rod H.

O is a metallic disk with slightly-convex surface, attached to the lower end of the lower valve, and forms the valve-face. It is susceptible of a slight lateral play on the rod, so that it really acts like a ball-valve, and insures a quick and perfect closing of the valve upon its seat; and W is a washer, which may or may not be used.

There is a vertical orifice made in the anchor,

as shown at K′. The object of this orifice is to diminish the power of the anchor, and it will do so in proportion to its size by admitting a slight passage of the fluid through it. This may or may not be used.

At $c'$ is represented a small orifice through the bottom of the anchor-chamber, to admit the passage of fluid through it as the anchor moves up or down.

At B′ are shown ingress-openings into the pump-barrel to allow the fluids of the well to pass in. Y represents the discharge-nozzle of the pump.

In the practical operation of this pump the anchor K, with its rod H, has the effect to insure the closing of the lower valve at the proper time, notwithstanding any pressure of gas behind it; and it also has the effect to insure the opening and closing of the upper valve at the proper time, notwithstanding a heavy pressure of gas in the pump-barrel below it, and thereby the pump is made effective at all times, and the gas is pumped out with the oil or other liquids.

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

1. The anchor-chamber C, including the anchor K and rod H, for the purpose and substantially as described.

2. The anchor-chamber, including its anchor and connecting-rod, in combination with the upper and lower valves, substantially as described.

3. The combination and arrangement of the check-ring R (fitted into an appropriate seat, $r'$, in the pump-barrel) with the valve G and anchor K, the ring forming a check to the movements of the valve, and, with the anchor, acting as a jar, for the purposes and substantially as described.

JAMES HARRISON.

Witnesses:

JOHN J. KINNEY,

S. T. ALLEN.