

F. S. Pease,
Ejecting Pump,
No. 46,931, Patented Mar. 21, 1865.

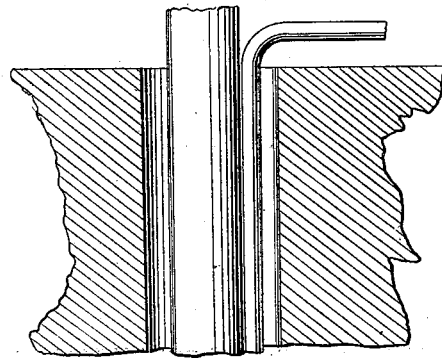


Fig. 1

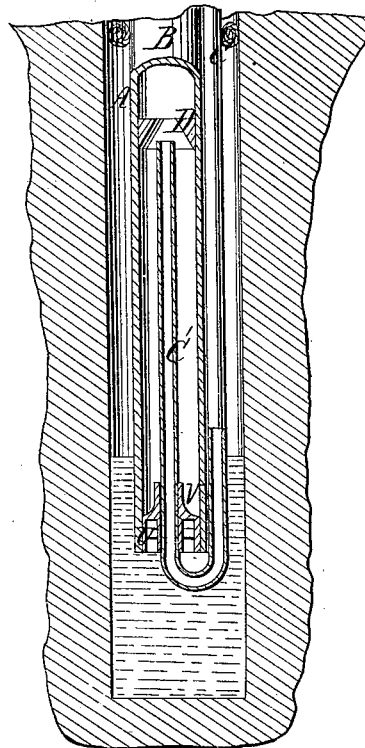
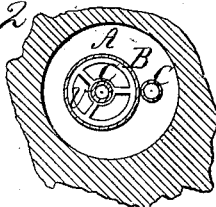


Fig. 2



Witnesses
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UNITED STATES PATENT OFFICE.

F. S. PEASE, OF BUFFALO, NEW YORK.

IMPROVEMENT IN OIL-EJECTORS.

Specification forming part of Letters Patent No. 46,931, dated March 21, 1865.

To all whom it may concern:

Be it known that I, F. S. PEASE, of Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Oil-Ejectors for Wells; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an elevation in vertical section of my apparatus shown applied to a well-tube of an oil-well. Fig. 2 is a cross-section taken through the valve-seat.

Similar letters of reference indicate like parts.

This invention consists in closing the bottom of a well-tube in which an oil-ejector is used, and placing a valve therein below the embouchure of the ejector.

A represents a section of a well, and B a well-tube, the lower part of said tube being also shown in section.

C is a pipe for conducting a current of air, steam, or water down into a well, shown in this illustration as being carried down outside of the well-tube to a point below the tube in which it terminates, open at or within the throat D, which is placed within the tube, at any suitable height above its lower end, for the purpose of diminishing its diameter, and so enabling the stream or fluid which is delivered from the said injecting-pipe to pass into that part of the well-tube above the throat with increased velocity, and so induce or cause an upward movement of the liquids in the well, whether from below the throat or above. Oil-ejectors made and applied in this manner, or by passing the conducting-pipe down inside the well-tube, are defective, because the pressure of air or other currents, being delivered in the well-tube below a long column of air, or a column partly of air and partly of oil or other liquids, reacts upon the contents of the well, and the pressure from this reaction often breaks away the seed-bag packing, and thus disables the well and prevents it being operated any more until the packing is renewed, which is now done by taking out the well-tube, renewing the packing, and then replacing the tube.

The objects of this invention is to do away

with this objection and defect in oil-ejectors of this class and to increase their efficiency, whether they make use of currents of air, of steam, or of water. The pipe C is here shown to be carried, as before explained, to the bottom of the well-tube, around whose lower edge it is turned and carried upward a suitable distance within it, as shown by the part of the pipe marked C'. It terminates at the throat D.

My improvement, as applied to the oil-ejector here shown, consists in placing a diaphragm or annulus, U, around the said pipe, so as completely to fill up the space between it and the inner walls of the well-tube. In those ejectors whose tubes pass down inside the well-tube from above, the lower ends of the tubes should be closed at bottom, and extended downward a little way below the perforations in their sides, through which the currents of steam, air, or water pass, so as to afford room for fixing the diaphragms about them below the perforations, or else a suitable valve should be fixed in the well-tube at a point below the termination of the said pipe. This diaphragm or annulus is perforated, as shown in the drawings, and a valve-seat of annular form is made on its upper face, to which is fitted an annular valve, V, which surrounds the said pipe C', and moves freely up and down within the well-tube. I leave a space between the sides of the valve and the outer surface of the said pipe, and the diameter of the valve is made less than the inner diameter of the well-tube, so that oil or any other liquid is free to pass upward both outside and inside of the ring-valve when it is raised off its seat. The extent of the movement of the valve upward is to be controlled by a guard, (not shown,) which should be placed in the well-tube at a suitable height above the valve-seat; but it is not necessary to describe such a guard, since it is a familiar mechanical device. The effect of this construction will be to prevent the indirect pressure from the said currents, or their direct pressure, from acting on the gaseous or liquid contents of the well, and thereby prevent injury to the packing from that cause, and also to relieve gases and liquids contained in the surrounding rocks from the pressure to which they are subjected in the operation of the ejectors as hitherto used, and permit them to

flow into the well unresisted. Whenever a partial vacuum is formed below the throat D by the rapid motion of the said currents through it, the valve V will yield to the pressure of the contents of the well and be raised, when the oil or other contents of the well will rush upward until an equilibrium of pressure is restored within and without the well-tube, when the valve will fall by its own weight and close the openings in the annular diaphragm. Any additional pressure from within the well-tube above will of course hasten the closing of the valve and tend to make it tight.

By my invention the whole energy of the said currents is used to lift the column of gases and liquids in the well-tube, and none

of it is allowed to act against the packing or against the flow of oil into the well from the surrounding rock.

I do not here claim the use of steam or compressed air for ejecting oil or other liquids from wells.

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

In oil-ejectors, closing the well-tube below the place of delivery of the currents of air or other fluids or liquids by means of a valve, substantially as above described.

F. S. PEASE.

Witnesses:

M. M. LIVINGSTON,

J. P. HALL.