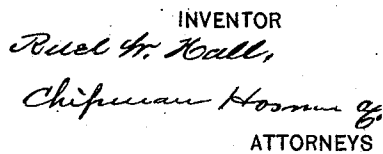


Patented July 4, 1876.



UNITED STATES PATENT OFFICE.

RUEL W. HALL, OF TITUSVILLE, PENNSYLVANIA.

IMPROVEMENT IN EJECTORS FOR OIL-WELLS.

Specification forming part of Letters Patent No. 179,552, dated July 4, 1876; application filed October 17, 1874.

To all whom it may concern:

Be it known that I, RUEL W. HALL, of Titusville, in the county of Crawford and State of Pennsylvania, have invented a new and valuable Improvement in Ejectors for Oil-Wells; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawing is a representation of a plan view of my device. Fig. 2 is a sectional view of the same.

This invention relates to means for raising oil from wells, wherein the principle of the "Giffard injector" is employed in combination with air, or air and gas under pressure, as will be hereinafter more fully set forth and claimed.

In the annexed drawings, A designates the pipe through which oil is forced out of the well. B designates the pipe through which air and gas are forced down into and through a foot-piece, C, at the bottom of the pipe A; and D designates a long tubular casing, which extends down into the well and surrounds the two pipes A B, and which is suitably packed at *a*. At the top of the well the casing D communicates with a head, D', from which gas, rising from the well, is drawn by means of a pipe, *b*, provided with a stop-cock, *b'*. The pipe *b* communicates with a pipe, *c*, leading from a reservoir, E, into which air is forced by means of a suitable engine. At the point of junction of the two pipes *b* and *c* I apply an ejecting-tube, *d*, which tapers downward, and by means of which gas from the head D' is compelled to descend with the air from the reservoir E into the pipe B, which communicates with the foot-piece C, as before stated. I thus utilize the gas which rises from the well for the purpose of aiding in raising the oil.

The foot-piece C consists of a portion having a rectangular passage, *e*, through it, one end of which passage communicates with the pipe B, and the other end with an ejecting-nozzle, G, which rises vertically through an inlet chamber, *g*, and enters a tapered tube, G', at the lower end of the oil-pipe A, as shown in Fig. 2. The tubes G G' taper upward, and their centers coincide with each other, and also with the center of pipe A. The inlet-passage *g* surrounds the base of the tube G, and at the lower end of this passage a perforated plug or strainer, *h*, is applied, having a seat, *i*, for a spherical valve, J, above which is a check-bridge, *f*.

When the force of gas rising from the well is sufficiently great to raise the oil in pipe A, the air from tank E need not be used; but when the gas-pressure is not strong enough, the air will be used.

The combined pressures of air and gas may be employed by my improved arrangement.

I claim—

1. The means herein described for using the pressure of gas in the well to raise the oil therefrom, consisting in the packer-casing D, hollow head D', pipes *b* and B, and a foot-ejector, C, in combination with the discharge-pipe A, substantially as described.

2. The air-reservoir E and its pipe *c*, communicating with the pipe B by means of an ejecting-tube, *d*, in combination with the gas-pipe *b*, hollow head D', casing D, ejector C, and pipes A B, substantially as described.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

RUEL WATSON HALL.

Witnesses:

A. P. ODELL,
A. M. PORTERFIELD.