S. S. SPENCER.

Regulating the Flow of Oil-Wells.

No. 216,064. **Patented June 3, 1879.**

Fig. 1.

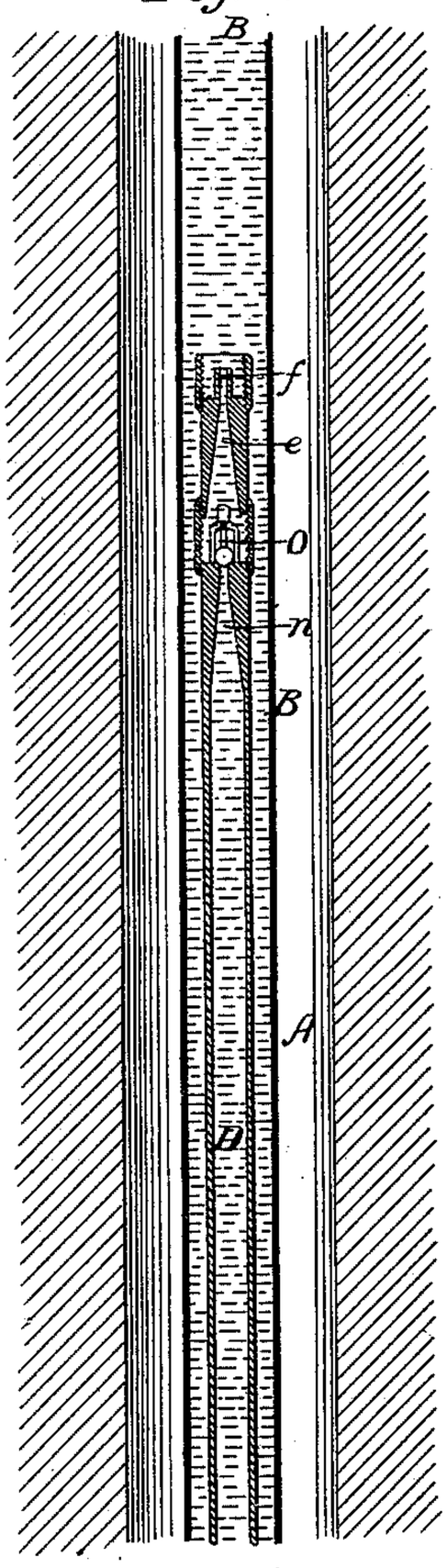
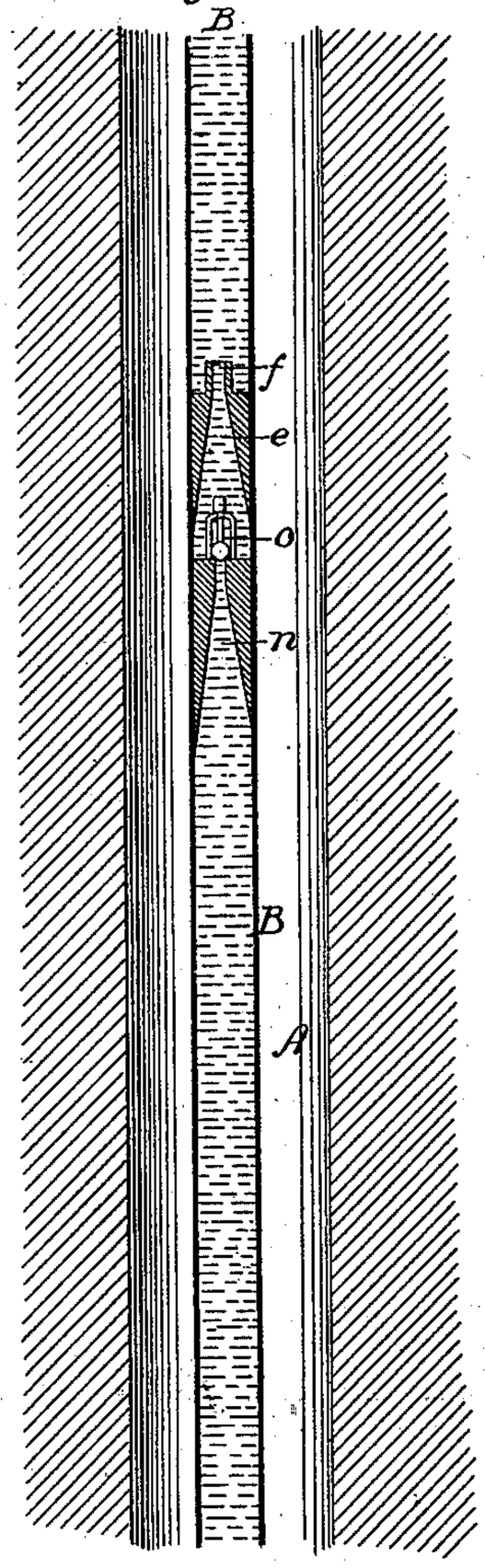


Fig. 2.



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SAMUEL S. SPENCER, OF OIL CITY, PENNSYLVANIA.

IMPROVEMENT IN REGULATING THE FLOW OF OIL-WELLS.

Specification forming part of Letters Patent No. **216,064**, dated June 3, 1879; application filed November 7, 1878.

To all whom it may concern:

Be it known that I, SAMUEL SMITH SPENCER, of Oil City, in the county of Venango and State of Pennsylvania, have invented certain new and useful Improvements in Regulating the Flow of Oil from Oil-Wells; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention consists in so arranging tubes in an oil-well, in combination with a standing valve and funnel, that a constant, or nearly constant, flow of oil is produced, while the great body of oil in the tubing is held as dead-oil and prevented from falling back to the bottom of the well, as will be hereinafter more fully set forth.

The common method of tubing an oil-well is (after boring till the oil-producing rock has been pierced to a proper depth) to insert two-inch tubing the entire depth of the well, having perforations near the bottom of the tubing for the oil and gas to enter this tube, and placing a packer around it above the oil-producing rock, so as not only to force all gas and oil through this tubing, but to prevent the water from above falling and drowning out the well, and where very large amounts of oil and gas are found this method serves a good purpose; but new wells starting to flow in this manner soon exhaust the gas, so they will only flow by "heads," as it is termed, or when the gas has so accumulated as to be powerful enough to raise this large column of oil, and when it ceases the whole body of oil is pressing back on the rock, and after a short time ceases to flow at all without artificial agitation, which is expensive, and at last have to be pumped entirely. Another great objection to this large body of oil pressing back on the oil-producing rock is that it soon becomes thickened or "paraffined," as it is termed, and has to be cleaned out, which is attended with large expense and risk.

To entirely overcome these difficulties and utilize all the gas, causing a more uniform flow of oil, I insert a smaller pipe inside the before-described casing or tubing, usually using three-fourth inch, and securely fasten its lower end into a seat or "working-barrel," where one is already in the well, a short distance above the oil-producing rock or above the perforations in the large tube, which small pipe extends upward some two hundred feet, and has near its top a standing valve of the common make, and just above it a funnel having a small opening or a small short pipe, through which the oil is ejected into the large tube or casing of the well, as will be more perfectly understood by the accompanying drawings, in which—

A is the well; B, tubing; C, packing; D, small inside tube; G, seat; O, standing valve; *e*, funnel above valve; *f*, small pipe or opening for funnel; *n*, funnel below standing valve; R, oil-producing rock; *r*, perforations in tubing.

The practical operation is this: Where there is gas in an oil-well (even in quite small quantities) the gas will force the oil through this small pipe D and standing valve O and through the small end of the funnel *e* into the casing or tubing B with much greater velocity than through a large orifice or tube, and this not only utilizes all the gas, but keeps up a constant agitation and thus liberates more gas, while the great body of oil is held up by the tubing, as will be readily understood by the drawings, and not allowed to press back on the oil-producing rock. This entirely prevents the oil from thickening at the bottom of the well, and saves all expense and risk of cleaning that has heretofore usually been necessary.

The standing valve O holds all the oil and gas that pass it from falling back into the well, and all sediment that passes the funnel at *f* is prevented from falling back onto the bottom of the well. Some wells are cased with one and one-fourth inch tubing, and, as the tube is too small for inserting the standing valve O and funnel *e* inside, I insert them directly into the casing with proper connections, as will be readily understood by Fig. 2. This is found to answer a good purpose, though not equal to that shown in Fig. 1.

I do not wish to confine myself to the exact

length and size of pipe mentioned, but give these sizes as I have found them practical, while different wells will require different size and length, according to the amount of gas and depth of well.

I am aware that smaller tubes of uniform size running from near the bottom of the well to the top have been used to give a more steady flow to oil-wells; but this I do not use.

I claim—

In combination with oil-well tubing, the standing valve O and the contracting funnel *e* above it, all combined to operate in the manner and for the purpose set forth.

In testimony that I claim the foregoing as my own invention I affix my signature in presence of two witnesses.

SAMUEL SMITH SPENCER.

Witnesses:

H. L. FAIRBANK,

J. L. WHITE.