

(No Model.)

R. SHOFF.

DEVICE FOR CLEANING OIL WELLS AND PROMOTING THE FLOW OF OIL.

No. 391,431.

Patented Oct. 23, 1888.

Fig. 1

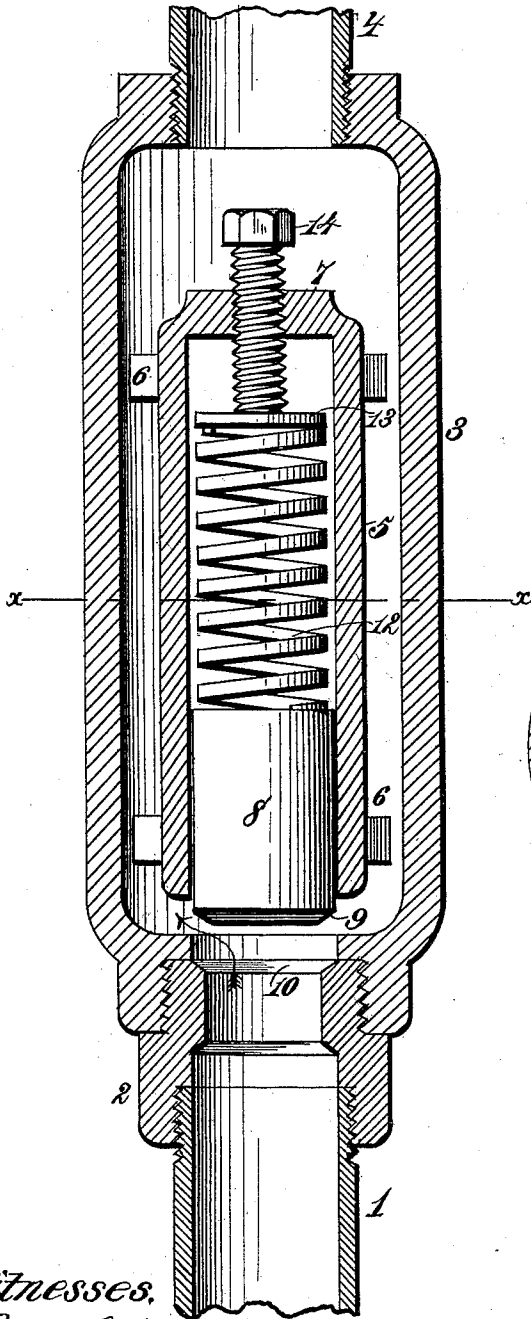
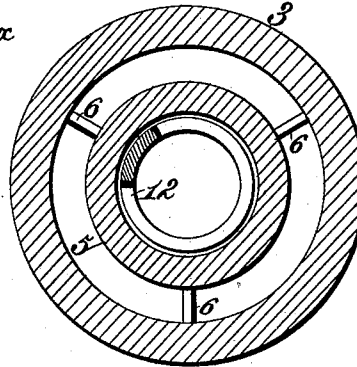


Fig. 2



Witnesses.

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DEVICE FOR CLEANING OIL-VELLS AND PROMOTING THE FLOW OF OIL.

SPECIFICATION forming part of Letters Patent No. 391,431, dated October 23, 1888.

Application filed November 10, 1887. Serial No. 254,820. (No model.)

To all whom it may concern:

Be it known that I, RALPH SHOFF, a citizen of the United States, residing at Bolivar, in the county of Allegany and State of New York, have invented new and useful Improvements in Devices for Cleaning Oil- Wells and Promoting the Flow of Oil, of which the following is a specification.

My invention relates to a simple, convenient, and reliable automatic device for cleaning oil-wells and increasing the flow of oil; and it consists in the combination, with the oil-well tubing, of a casing containing a spring seated valve, and provided with the means for regulating the pressure of the valve to the pressure of the accumulated oil and gas in the tube below said valve until said accumulated oil and gas exert a force sufficient to raise the valve and dislodge the oil above and around the valve-casing, thereby cleaning the well and causing an increased flow of oil.

In the annexed drawings, illustrating the invention, Figure 1 is a vertical longitudinal section of my improved device for promoting the flow of oil in wells, and Fig. 2 is a horizontal section of the same on the line *x x* of Fig. 1.

The numeral 1 designates two-inch tubing leading from the lower part of an oil-well, and having secured to its upper end a coupling, 2, which projects inward above the tube 1, and has an internal diameter of, say, one inch and a half.

To the coupling 2 is secured an enlarged tube, 3, having an internal diameter of four inches, except at its ends, where the diameter is reduced for convenience of attachment to the coupling 2 and to the upper well-tube, 4, the latter having an internal diameter of two inches.

In the end of the enlarged tube 3 is supported longitudinally a vertical valve-casing, 5, by means of radial arms 6, disposed at such intervals as to offer no obstruction to the flow of the oil in the annular space between the tube 3 and inclosed valve-casing. The valve-casing 5 is cylindrical or tubular in form, with a closed top, 7, and a lower open end. This casing contains a solid cylindrical valve, 8, having a diameter of about two inches, or approxi-

mately the same as that of the casing to which it is fitted. The lower end of the cylindrical valve 8 has a beveled edge, 9, to correspond with a beveled valve-seat, 10, formed on the upper end of the coupling 2.

Above the valve 8 is a spiral spring, 12, and above this a follower-plate, 13, both inclosed in the valve-casing. An adjusting-screw, 14, is passed through the top 7 of the valve-casing and bears on the follower 13, whereby the pressure or tension of the spring 12 can be regulated so as to cause the valve 8 to bear down in its valve-seat 10 with any desired force. When the oil and gas in the lower tubing, 1, have accumulated in sufficient quantities to overcome the downward pressure of the spring 12, which has been set, say, for twenty-five or fifty pounds, as occasion may require, the valve 8 will be raised and the pressure of the oil and gas beneath the valve will throw out all oil that is standing in the tubes 3 and 4 around and above the valve-casing. It may be observed that this effect will be accomplished without requiring the oil in the lower tube to lift the column of oil above while raising the valve, because the valve is seated solely by its spring, and as the upper end of the valve-casing is closed there can be no downward pressure of oil on the valve; neither will any obstruction to the rise of the valve be offered by the small quantity of oil surrounding its lower end when closed. As soon as the valve is raised the confined oil and gas will rush through the reduced spaces in the coupling 2 and tube 3 toward the tube 4, where they will find room to expand, and thus all accumulations of oil in the tubes 3 and 4 will be forcibly ejected and an increased impetus given to the flow of oil from the well.

Ordinarily, the gas is continually escaping in such small quantities that it simply "sprays" the oil without dislodging it and does not clean the well; but by means of my invention the pressure of the spring-seated valve can be so adjusted as to produce any desired pressure of accumulated gas and oil in the well, so that when released the well-tubing will be effectually cleaned and an increased flow of oil obtained.

What I claim as my invention is—

1. The combination, with the oil-well tubing,

of a cylindrical valve-casing located in said tubing and having a closed upper end and an open lower end, a spring-seated valve located in the lower end of said casing to engage a
5 valve-seat in the tubing, and a screw to adjust the pressure of the valve in its seat, substantially as described.

2. The combination, with the oil-well tubing 1 and 4 and an intermediate enlarged tube, 3,
10 of a coupling, 2, having a reduced internal diameter and provided with a valve-seat, 10, at the lower end of the enlarged tube, a cylin-

drical valve-casing, 5, located centrally in said enlarged tube, the valve 8 and spring 12, placed in said casing, and the screw 14, passed through
15 the top of the valve-casing to adjust the valve-spring, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

RALPH SHOFF.

Witnesses:

CHAS. H. BROWN,
C. W. FULLER.