(No Model.)

H. D. JONES.

VALVE FOR OIL WELLS.

No. 480,265. Patented Aug. 9, 1892.

Fig. 1

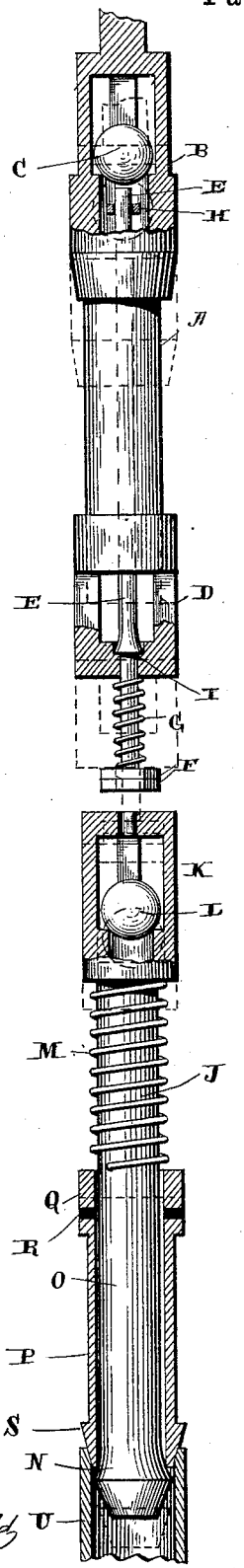
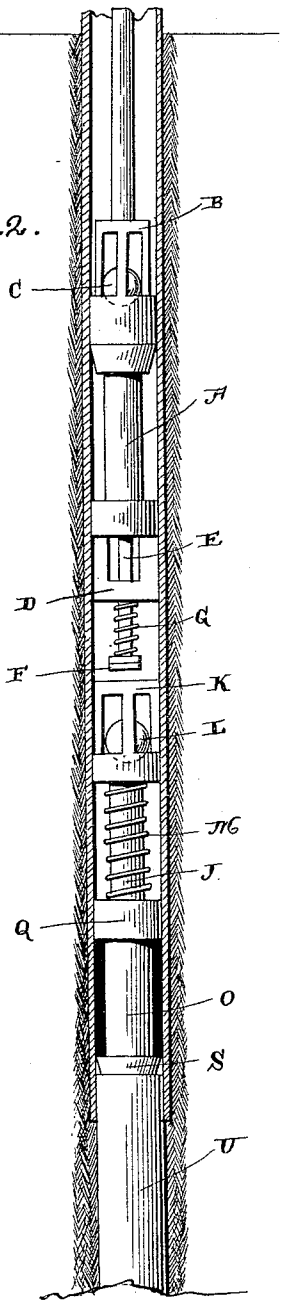


Fig. 2.



WITNESSES_

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VALVE FOR OIL-WELLS.

SPECIFICATION forming part of Letters Patent No. 480,265, dated August 9, 1892.

Application filed October 28, 1891. Serial No. 410,097. (No model.)

To all whom it may concern:

Be it known that I, HORACE D. JONES, of Knapp's Creek, in the county of Cattaraugus and State of New York, have invented certain new and useful Improvements in Valves for Oil-Wells; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in valves for oil-wells; and it consists in the particular construction and arrangement of parts, which will be fully described hereinafter, and particularly referred to in the claims.

The object of my invention is to so construct the working and standing valves of an oil-well that the oil-rock and the tubing may be flooded while the rods and the tubing are in the well, which is alike desirable and profitable, as the flooding of the oil-rock increases the production, and to afford a means for allowing the oil left in the well or tubing after pumping to run back into the well through the said valves, thus preventing the accumulation of paraffine upon the inner side of the tubing, as is the case where the oil is left standing either when the well is not being pumped or while the rods are pulled for any purpose, and, furthermore, to allow the tubing to be cleared by steaming while the rods, tubing, and valves are in place in the well.

Figure 1 of the accompanying drawings is a side elevation of a standing and working valve which embodies my invention, the same being shown partly in section and in their proper relative relation to each other; Fig. 2, a view showing the parts arranged in a well.

The working valve consists of a tube A, having a ball-valve cage B at its upper end, in which cage a ball-valve C is placed. The lower end of this tube A is provided with a yoke D, through which the lower end of a spring-actuated rod E passes, the upper end of the said rod passing through a guiding-bar H, which extends transversely across the upper inner end of the said tube A.

Placed upon the lower end of the rod E are one or more screw-threaded nuts F, and placed between these nuts and the under side of the yoke D is a spiral spring G, which normally holds the said rod E downward. The downward movement of this rod is limited by means of a shoulder I, formed upon the lower end thereof just above the cross portion of the yoke D, as shown, or this may be accomplished by means of a stud or pin, as will be readily understood. This rod E has its upper end normally just below the ball-valve C when it is at rest upon its seat; but when the rod E is forced upward through the tube A, as will be presently described, the ball C is raised from its seat and oil allowed to freely flow through the valve-seat and downward through the tube A.

The standing valve consists of a tube J, which is provided at its upper end with a valve-cage K, in which cage K is placed a ball or other suitable valve L. This cage K is larger in diameter, as shown, than the tube J. Below the cage K is a sleeve O, which is placed around the said tube, as shown, and which has an internal diameter that is larger than the external diameter of the said tube. The lower end of the tube J is enlarged and provided with a cone-shaped portion N. Formed upon the lower end of the sleeve O is a cone-shaped flange S, which rests in the upper end of an anchor pipe or tube U, which rests upon the rock. Placed at the upper end of the said sleeve O is an enlargement Q, which is provided with a suitable number of perforations R, which extend into the space between the inner circumference of the said enlargement Q and the external surface of the tube J. Between the enlargement Q and the conical flange S at the lower end of the tube J is formed a space P for leather or other suitable packing. The lower end N of the tube J is normally held in engagement with the lower end of the sleeve O by means of an expanding spring M, which surrounds the tube J and has its opposite ends to engage with respectively the upper end of the

sleeve O and the lower end of the cage K. When, however, the tube J is forced downward, (in a manner to be presently described,) the oil or fluid in the well passes in the upper end of the sleeve O through and the perforations R into the space between the sleeve and the tube J and down through the lower end of the sleeve, which is then above the cone-shaped seat N, into the anchor-tube, as will be readily understood.

The operation of my invention is as follows: When the well is not being worked and it is desired to allow the oil to pass back into the oil-rock, or when it is desired to flood the rock, the working-valve tube is forced down against the upper end of the standing valve until the expansive pressure of the spring M is overcome sufficiently to form an open space around the cone-shaped lower end of the tube J, when the oil or fluid in the well will pass through the said spring M and the perforations R into the space between the sliding sleeve and the tube J into the upper end of the anchor-tube. The valves are held in this position sufficiently long to allow the oil to run back onto the rock, and then the working valve is raised a suitable distance above the standing valve. The advantages of this construction are important and several in number. By this means the tubing can be steamed and cleared by forcing the working-valve tube down, as just described, which affords an uninterrupted opening or course through the valves to the lower end of the well for the steam, and this without removing any parts of the valves or the tubing or the rods. The production of the well is increased by flooding the oil-rock in the manner described. It affords a saving in fluid when pulling tubing by allowing the oil to pass back into the well, and which removes the paraffine by the downward rush of the oil from the tubing and the perforations. It washes mud from the valves and the perforations, keeps the oil from the derrick-floor, and allows flooding through the tubing without letting off the pressure of the gas. Much difficulty is experienced and expense incurred by reason of the tubing being left filled with oil, and to stand thus filled, either when the well is not being pumped or while the rods are pulled for any purpose, inasmuch as the inside of the tubing becomes coated with paraffine and thick oil and necessitates the pulling of the rods and the tubing to steam or clear the tubing. By means of valves constructed as above described all of these difficulties are overcome by allowing the oil to flow back into the tube, as described.

Having thus described my invention, I claim—

1. A standing valve consisting of a tube provided with a valve-seat and valve at one end, the other end of the tube being enlarged to form a valve, a sleeve surrounding the lower end of the said tube and closed by the enlarged end of the tube, a means for holding the enlarged end of the tube against the lower end of the sleeve, and a working valve adapted to force the said tube down, as and for the purpose shown.

2. A standing valve consisting of a tube having a valve-seat and a valve therefor at its upper end, the lower end of the tube being enlarged to form a valve, a sleeve surrounding the lower end of the said tube, the lower end of the valve being shaped to close the upper end of an anchor-tube, and a means for holding the enlarged lower end of the tube against the lower end of the sleeve, combined with a working valve having a means for opening its valve when it is forced downward upon the said standing valve, substantially as set forth.

3. A standing valve having a tube carrying a valve at its upper end and a spring-closed valve below the said valve, combined with a working valve having a tube carrying a valve and a spring-actuated rod which engages its valve when it is forced downward against the standing valve, whereby the working valve is opened and the spring-actuated valve of standing valve also opened, substantially as and for the purpose described.

4. A standing valve having a tube provided with a valve at its upper end, its lower end enlarged and made cone-shaped externally, a sliding sleeve placed around the tube loosely and having its inner surface fitting tightly the said cone-shaped portion of the tube, and a means for normally holding the sleeve down, the lower end of the sleeve having an enlargement of greater diameter than the diameter of the said cone-shaped portion of the lower end of the tube, combined with a working valve carrying a means for opening the same when it is forced upon the upper end of the standing valve, substantially as described.

5. A standing valve having a valve at its upper end, an enlarged cone-shaped lower end, a sliding sleeve fitting loosely the said tube between its ends and fitting tightly the said cone-shaped lower end of the tube, the said sleeve having an enlargement at its ends to form a packing-space between them, the lower enlargement adapted to fit the upper end of an anchor or other pipe, and the upper enlargement having one or more perforations, and a spring for holding the said sleeve down, combined with a working valve-tube carrying a valve, and a means for automatically opening the said valve when it is forced downward upon the upper end of the standing valve, substantially as specified.

6. A standing valve having a tube provided with a valve at its upper end, a cone-shaped external seat at its lower end, a sliding sleeve which fits loosely around the said tube between its ends and its lower end fitting the said seat, a means for holding the sleeve against the seat, and a working valve having

a tube provided with a valve at its upper end, a vertically-moving rod passing through the said tube under the said valve, a yoke at the lower end of the tube, a nut or projection on the lower end of the rod, and a spring between the said yoke and nut, all the parts combined substantially as specified.

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

HORACE D. JONES.

Witnesses:
E. V. CODY,
STELLA NEAL.