(No Model.)

H. G. DURNELL.

TOOL FOR OIL WELLS.

No. 565,442. Patented Aug. 11, 1896.

Fig. 1.

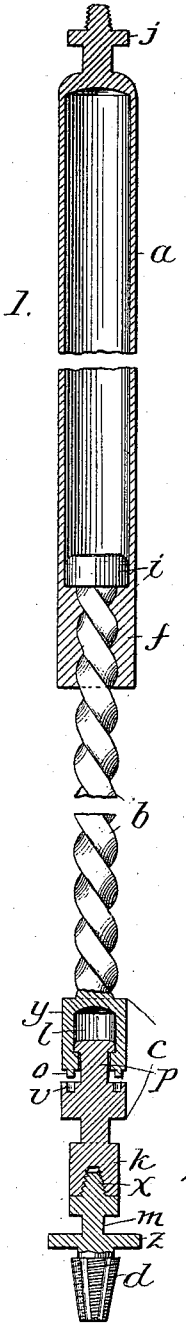


Fig. 2.

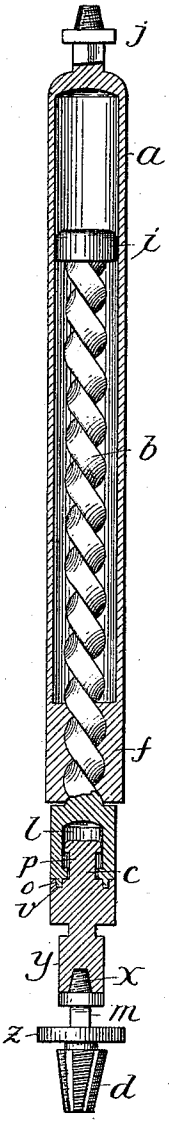
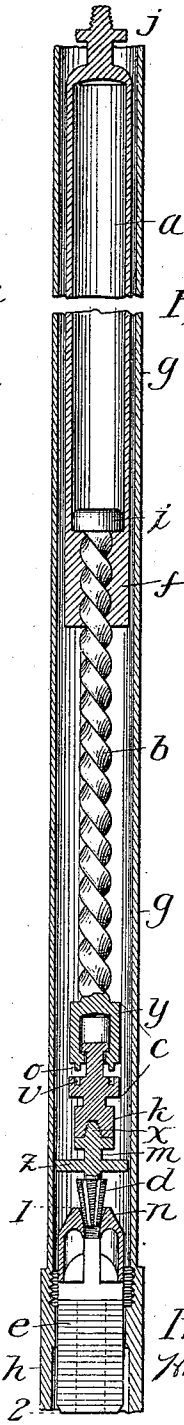


Fig. 3.



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TOOL FOR OIL-WELLS.

SPECIFICATION forming part of Letters Patent No. 565,442, dated August 11, 1896.

Application filed June 5, 1895. Serial No. 551,796. (No model.)

To all whom it may concern:

Be it known that I, HAROLD GIBSON DURNELL, a citizen of the United States, residing at Bolivar, in the county of Allegany and State of New York, have invented an Improved Tool or Apparatus for Removing Valves from Oil-Wells; and the following is a full, clear, and exact description of the invention, such as 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 the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to oil-wells wherein oil is pumped to the surface of the ground through tubing from the bottom of a deep shaft by a reciprocating rod and valves arranged similarly to those in an ordinary pump.

The cylinder or barrel in which the piston works is a section of pipe whose inside diameter is one and one-half inches smaller than the tubing and is a continuation of the tubing, being designated the "working barrel." At the lower end of this working barrel is a stationary valve-seat supporting a ball check-valve, called the "standing valve." This standing valve has an opening extending through the length of the valve. On the outside are leather rings, which allow it to be made to fit perfectly the working barrel. This standing valve also consists of an upper section, called the "cage," in which is a brass ball, which rests on a seat, this seat being exact in its proportions with the ball at every point. The oil is drawn up through the standing valve by the rising and falling of a working valve in the working barrel, when, as the strokes are made, the ball catches and holds the oil drawn up through the standing valve until another stroke is made. It very frequently occurs that the ball becomes worn or the seat becomes nicked, and in such a case the valve has to be removed from the well and the difficulty, whatever it may be, must be remedied to prevent leakage. The working valve is carried by a valve-stem at the lower end of a series of rods, commonly called the "sucker-rods," which extend up through the tubing to the mouth of the well. To obtain this standing valve, the method now in use is a tap, similar to *d*, attached to the sucker-rods and lowered to the standing valve. The rods are then turned at the top of the well, which causes the tap to be screwed into a thread which is in the cage of all valves. This method cannot be used to any advantage in places where the wells are of great depth.

It is the object of the invention in question to provide a special tool or machine in which, when the tap *d* touches the thread *n* in the standing valve, the weight of the sucker-rods will force the machine or tool into the position Figure 3 and screw the tap *d* into the thread *n*.

The drawings illustrate the construction of the tool and also the use thereof.

Fig. 1 is a side view of the tool by itself as in position for lowering to the standing valve. Fig. 2 is a side view of the tool contracted as it appears when in contact with the valve. Fig. 3 is a longitudinal section of the working barrel of an oil-well and my improved fishing-tool in place within such barrel.

Referring first to Fig. 3, *a* is the body of the tool, and is a hollow tube, with a pin *j* at the upper end, for attachment to the sucker-rods. In the lower end of this tube *a* is a section *f*, which is threaded to fit the spiral *b*. At the upper end of this spiral is a head *i* or enlarged portion of the spiral *b*. At the lower end of this spiral is a swivel *c*, and on the lower end of this swivel is a box *k*, threaded on the inside to fit the pin *x*, and this pin and box shall be of the same dimensions as *j*, and also as those which connect the sucker-rods. The section marked *m* is a square, to allow a wrench to be placed on it in order to fasten the tap *d* to the tool or machine. The tap really consists of *x*, *m*, *z*, and *d*, and I do not claim it as my invention.

x is a pin for attachment to my machine or tool.

m is a square portion on which to place a wrench to screw *x* into *h*.

z is a guide, which insures the tap *d* touching the valve at the thread *n*.

The working barrel is designated by the letter *g*.

h is the joint or collar, in which is the seat on which the standing valve rests. The standing valve is designated by *e*, and extends from 1 to 2.

The object of my invention is obtained by attaching the above-described tool or machine to the sucker-rods, and then lowering the same down through the tubing, by adding rod after rod, until the tap *d* rests on the thread *n*, when the gravity pressure forces the spiral *b* through its auxiliary thread *f*, causing the spiral to turn until the tenons *o* fall into their mortises *v*, which immediately causes the tap *d* to be screwed into the standing valve. The machine or tool then appears as in Fig. 3. Pulling strain or traction is then applied to the rods from above, which withdraws the tenons from their mortises *o*, leaving the swivel as it appears in Figs. 1 and 3, and allows the spiral to rotate to its original position without unscrewing the tap *d* from the valve. The tap *d* is now engaged to the valve and the valve can be readily drawn. In this manner the drawing of the standing valve is rendered easier and surer than by the method now used, and my tool or machine thus overcomes much of the trouble and annoyance which has heretofore accompanied the drawing of a standing valve.

What I do claim as my invention is—

1. An improved tool for removing the valve of an oil-well, which consists of a body or holder having a coarse internal thread at its lower end, a spiral or coarsely-threaded bar that runs free and is self-rotatable in such body, the same being provided at its upper end with an enlarged head, and a swivel, or rotatable part, connected with such spiral and carrying a tap for engaging a valve, both swivel and spiral having portions that automatically engage when the spiral rotates and descends as soon as the tap rests on the valve, substantially as shown and described.

2. The combination, with the tap, adapted to screw into the valve to be removed, of the swivel connected with said tap, the spiral having an enlarged head and portions that engage the swivel, and the body having the internal thread in which the spiral runs and rotates by its own gravity, as shown and described.

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Witnesses:
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