

(No Model.)

G. WOODARD.
TOOL FOR OIL WELLS.

No. 505,377.

Patented Sept. 19, 1893.

Fig.1.

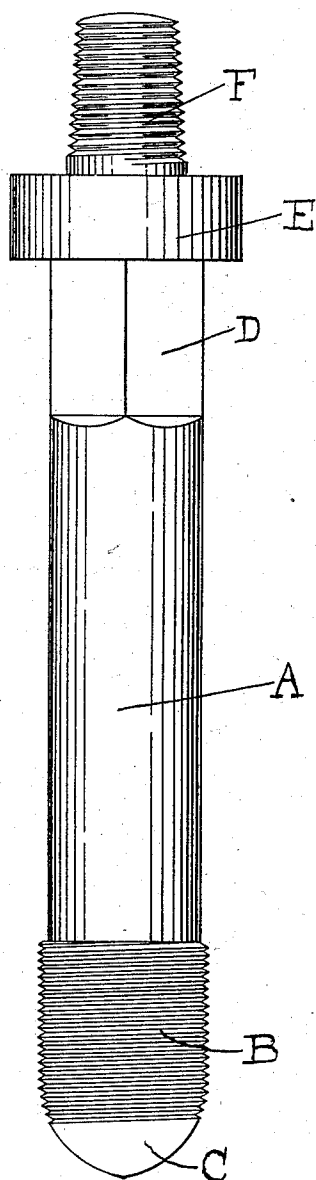


Fig.2.

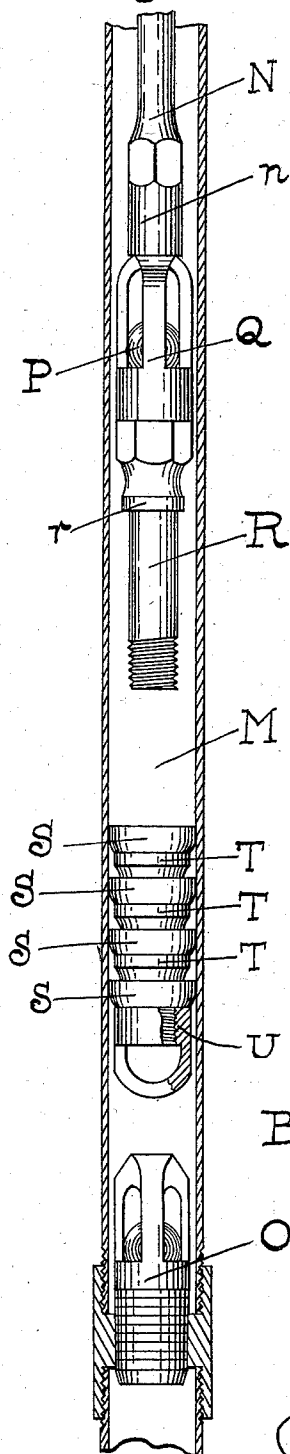
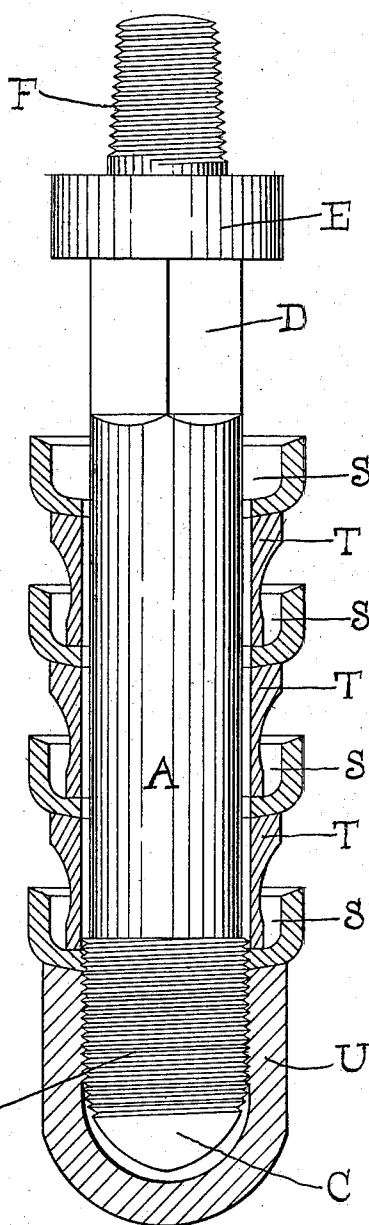


Fig.3.



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TOOL FOR OIL-WELLS.

SPECIFICATION forming part of Letters Patent No. 505,377, dated September 19, 1893.

Application filed June 8, 1893. Serial No. 476,914. (No model.)

To all whom it may concern:

Be it known that I, GEORGE WOODARD, a citizen of the United States, residing at Bradford, in the county of McKean and State of Pennsylvania, have invented certain new and useful Improvements in Tools for Oil-Wells; and I do 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 appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to oil wells wherein oil is pumped up 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 any ordinary pump. The cylinder or barrel in which the pumping valve or piston works is a section of pipe (of slightly less diameter than the tubing) which is attached at the lower end of the tubing and forms a continuation thereof, being designated the "working barrel." At the bottom of the working barrel is a stationary valve-seat supporting a ball-check-valve called the "standing valve," and above the standing valve within the working barrel reciprocates the pumping piston or "working valve" which is carried by a valve-stem at the lower end of a series of rods, commonly called "sucker rods," which extend up through the tubing to the mouth of the well. By the reciprocation of the sucker-rods, the working-valve carried thereby is reciprocated within the working-barrel and oil is thereby pumped up through the tubing. The working-valve ordinarily includes a series of annular expansion cups of some compressible and elastic material, with alternating metallic rings, which are held in place upon the valve and expanded to fit closely within the working-barrel by a metallic nut or collar screwing onto the hollow stem around which the said expansion cups and metallic rings fit. Now in oil wells where a working-valve of the character indicated is employed, it frequently happens that the "cups and rings" of the working valve become detached during the pumping operation in consequence of the accidental unscrewing of their retaining nut or collar, and when this occurs much difficulty is ex-

perienced in endeavoring to fish out the disconnected parts, especially for the reason that some if not all of the detached cups and rings fall into a tilted position, so that if the stem from which they have slipped is let down upon them it catches in the disarranged cups and rings and cannot be made to pass through them to engage with the detached nut or collar underneath.

It is the object of the present invention to provide a special tool which, when the cups and rings of the working-valve have become detached, can be connected to the sucker-rods and can be readily made to engage with the detached parts and enable them to be lifted out so as to be replaced upon the working-valve.

The drawings illustrate the construction and use of the tool.

Figure 1, is a side elevation of the tool by itself. Fig. 2, is a longitudinal section (on a reduced scale) of a portion of the working-barrel of an oil-well, showing in elevation the standing-valve, the working-valve and a portion of its valve-stem, and the disconnected cups and rings which the improved tool is designed to fish out. Fig. 3, is a view similar to Fig. 1, but showing the tool engaging with the detached parts in position to raise the same.

Referring first to Fig. 2, M is the working-barrel, N is the valve-stem carried by the sucker-rods and carrying the working-valve, and O is the usual stationary valve-seat and ball-check-valve at the bottom of the working-barrel. The working-valve carried by valve-stem N, comprises the ball-check-valve P; its cage Q screwing into the threaded socket *n* at the lower end of the valve-stem; the tube or hollow stem R screwing into the cage Q, forming at its upper end the seat for ball-valve P, and having near its upper end a flange or shoulder *r*; the annular expansion cups S, and alternating rings T, fitting upon the hollow stem R in the normal condition of the valve (but shown detached therefrom in the drawings); and the metallic nut or collar U, which screws onto the lower threaded end of the hollow stem R to retain the cups and rings S T upon the stem. When the working-valve is in its normal operative condition the cups and rings S T are held and compressed

between the nut or collar U and the shoulder *r* of stem R. This form and arrangement of valves shown in Fig. 2, are common and well-known in oil wells.

- 5 Figs. 1 and 3, illustrate the improved tool constituting the present invention, which is adapted to be attached at the lower end of the sucker-rods for the purpose of fishing out the parts S T U when they have become disconnected from the working-valve. The form of the tool and the manner in which it engages with the detached parts are clearly shown in the drawings. The tool may be of iron, and comprises a central cylindrical shank or body 10 portion A; a threaded portion B, and beveled point C, at one end of said shank A; and at the other end of said shank a squared portion D, a projecting cylindrical collar E, and a threaded pin F. The threaded pin F at the 20 upper end of the tool has the proper diameter and pitch to enable it to be screwed into the threaded socket *n* of valve-stem N, while the threaded portion B at the lower end of the tool has the proper diameter and pitch to enable it to be screwed into the threaded bottom 25 nut U of the working-valve. Preferably the screw-threads at B are continued down to cover a portion of the beveled point C, which facilitates the engagement of the tool with the threaded socket of the detached nut U. The 30 shank A of the tool is of a length sufficient to enable the tool to be passed through all of the cups and rings S T and screwed into nut U. The cylindrical collar E is of greater diameter than shank A and is just large enough to fit and slide freely within the working-barrel M. The purpose of the beveled point C is to cause the tool to pass through the cups and rings S T when they are so tilted that 40 their central openings are not in line with each other. The squared portion D of the tool is provided to enable a wrench to be applied when necessary for the purpose of unscrewing the tool from the valve-stem. For 45 screwing the tool on the use of a wrench is not ordinarily required, and the collar E facilitates the screwing on of the tool by hand since it enables the operator to more firmly grasp the tool. The main purpose and function of the collar E, however, is to guide the 50 tool in its descent through the tubing and keep it in the center of the working barrel so that its point will properly engage with the disconnected parts.
- 55 The manner of using the tool will be un-

derstood to be as follows:—When the cups and rings S T and their retaining nut U become detached from the stem R of the working-valve and drop to the bottom of the working-barrel, the sucker-rods are drawn out of 60 the well, the remaining portions P Q R of the working valve are removed from the valve-stem, and the tool is screwed into the socket *n* of the valve-stem. Then the rods are lowered into the well tubing, and the 65 tool, guided by collar E, descends centrally within the working-barrel M, and by reason of its beveled point C slips easily down through the central apertures of the cups and rings S T (most or all of which will have 70 fallen into a tilted position), straightening out the cups and rings by its passage there-through and entering the bottom nut U. Then by turning the sucker-rods at the mouth of the well the threaded portion B of the tool 75 is made to engage with the internal screw-threads of the nut U, so that by then raising the rods the detached parts S T U will be drawn up within reach of the operator who can then secure them again to the working- 80 valve and replace the valve upon its valve-stem. In this manner the fishing out of the detached parts is rendered quite a simple matter, and the use of my improved tool thus overcomes much of the trouble and annoy- 85 ance which has heretofore been occasioned by the accidental detaching of the cups and rings of the working-valve.

I claim as my invention—

1. An oil-well tool for fishing out the de- 90 tached cups and rings of the working-valve, said tool being adapted at one end to be secured to the sucker-rods and at the other end to engage with the detached parts, and said tool having a beveled point C, a shank A of 95 such diameter and length that it will pass through all of the detached cups and rings, and a guiding collar E above said shank A, substantially as set forth.

2. The described fishing out tool for oil- 100 wells adapted to be secured to the sucker-rods and having guiding collar E, squared portion D, shank A, threaded portion B, and beveled point C, substantially as set forth.

In testimony whereof I affix my signature in 105 presence of two witnesses.

GEORGE WOODARD.

Witnesses:

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J. A. McKELLEN.