Feb. 25, 1936. E. D. McFADDEN 2,031,613

OIL WELL PACKER

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Fig. 1.

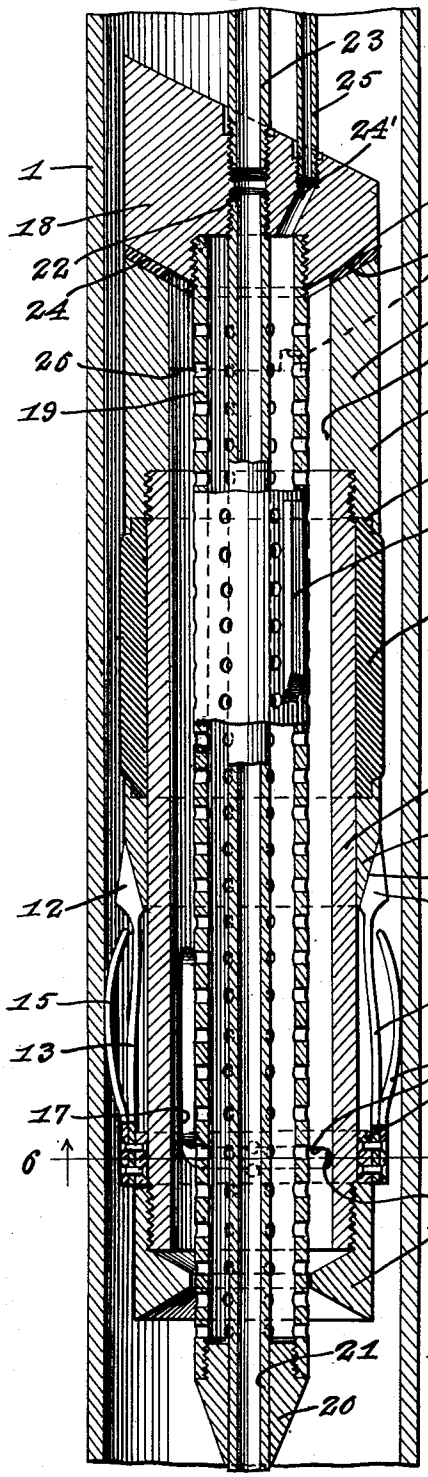
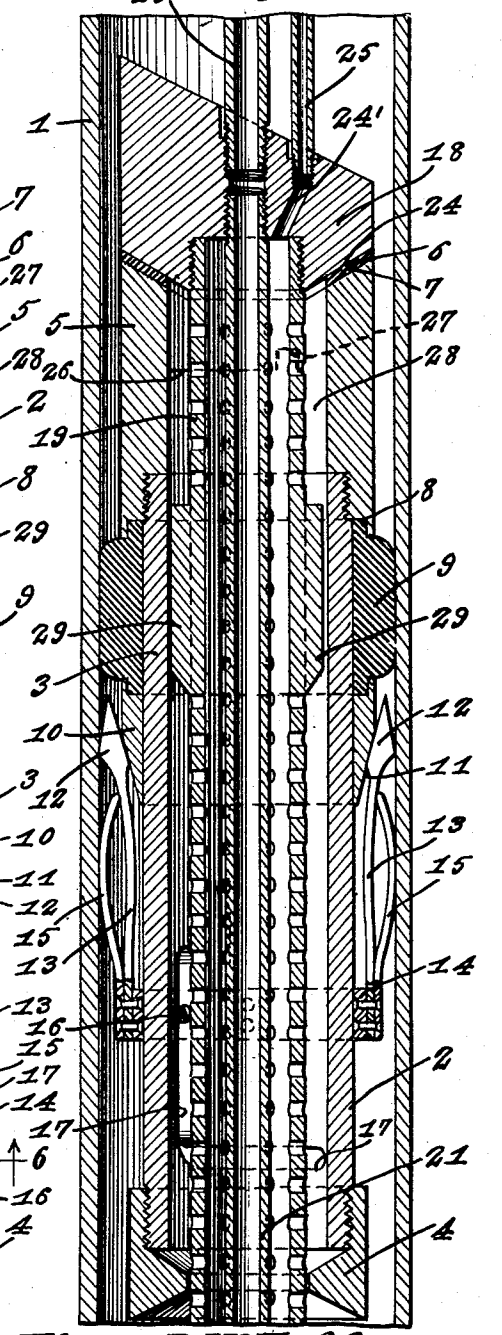


Fig. 2.



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Fig. 7.

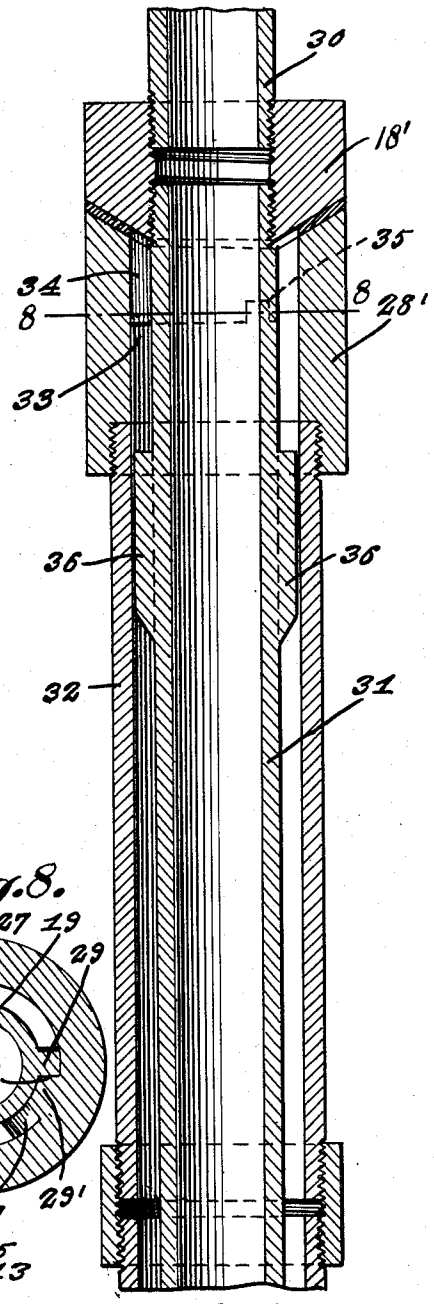


Fig. 3.

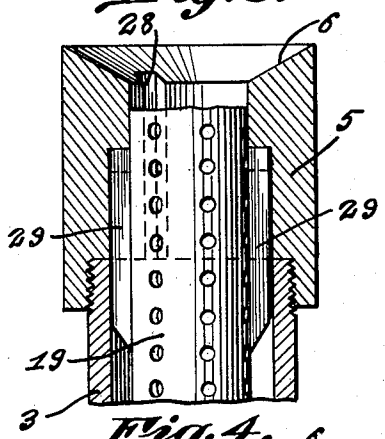


Fig. 4.

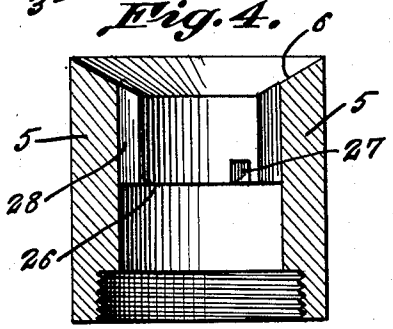


Fig. 5.

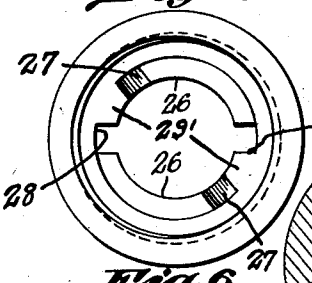


Fig. 8.

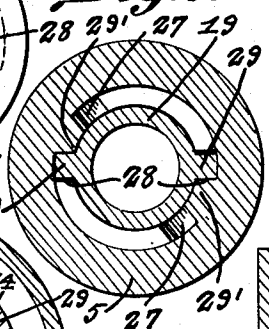
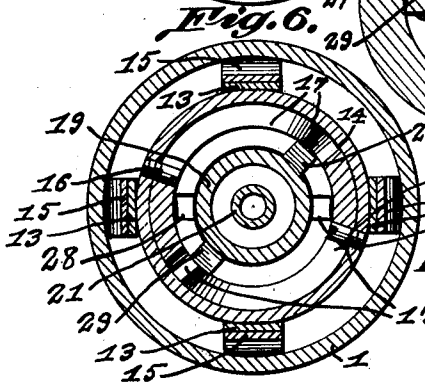


Fig. 6.



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Patented Feb. 25, 1936 2,031,613

UNITED STATES PATENT OFFICE

2,031,613

OIL WELL PACKER

Elmer David McFadden, Harrisville, Pa., assignor of one-eighth to Horrise L. McFadden, Harrisville, Pa., and one-eighth to Perry R. McFadden, Grove City, Pa.

Application January 15, 1934, Serial No. 706,782

1 Claim. (Cl. 166—12)

This invention relates to well packers and has for the primary object the provision of a device of the above stated character which may be readily positioned at any desired place in a well and expanded to tightly engage with the walls of the well to stop the flow of the well except through the means provided by the packer.

Another object of this invention is the provision of a coupling for the device which besides permitting the application of the packer to the walls of the well, permits the removal of the pump tubing from the well and the packer without disturbing the latter from its position within the well.

With these and other objects in view this invention consists in certain novel features of construction, combination and arrangement of parts to be hereinafter more fully described and claimed.

For a complete understanding of my invention, reference is to be had to the following description and accompanying drawings, in which

Figure 1 is a vertical sectional view illustrating a packing positioned within the casing of a well.

Figure 2 is a similar view showing the packer adjusted to the walls of the well casing.

Figure 3 is a fragmentary vertical sectional view showing coupling means adapted for the adjustment of the packer to the well casing and capable of permitting the packer to remain in the well casing during the removal of the pump tubing.

Figure 4 is a vertical sectional view illustrating a combined coupling element and seat of the coupler.

Figure 5 is an end view illustrating the coupler.

Figure 6 is a sectional view taken on the line 6—6 of Figure 1.

Figure 7 is a vertical sectional view illustrating a coupler employed for connecting and disconnecting well tubing for a well.

Figure 8 is a sectional view taken on the line 8—8 of Figure 7.

Referring in detail to the drawings, the numeral 1 indicates a fragmentary portion of a well casing. Positioned in said casing is a packer 2 forming the subject matter of the present invention. It consists of a tubular housing 3 externally screw threaded at each end and has threaded to its lower end a stop collar 4. Threaded to the upper end of the housing 3 is a coupler element 5 in the form of a tubular sleeve having its upper end beveled to form a seat 6 engaged by a gasket 7. The lower end of the coupler element 5 overhangs the housing 3 to form a flanged shoulder or seat 8 engaged by one end of a tubular packing element 9 constructed of rubber or any other material suitable for the purpose and capable of expanding when subjected to a force. The lower end of the packing element 9 engages the flanged end of a collar 10 slidable on the housing 3 and provided at its lower end with a conical-shaped outer face 11 engaged by the gripping ends 12 of fingers 13 mounted on a collar 14 which is slidably mounted on the housing 3 and limited in an endwise movement downwardly with respect to said housing by the stop collar 4. Spring members 15 are carried by the collar 14 to bear against the walls of the well casing 1 for the purpose of placing a drag on the housing 3 to retard the rotation thereof when the device is operated within the well casing. The normal position of the fingers 13 is as shown in Figure 1 and when in said position the packing element 9 is free from any force. The collar 14 carries pins 16 operating in bayonet slots 17 formed in the housing 3 and when the collar 14 is in its lowermost position, as shown in Figure 1, the pins lie in the horizontal branches of the bayonet slots and move into the vertical branches of the bayonet slots when the packer is adjusted to the well casing.

A head or coupling element 18 operates in conjunction with the coupling element 5 and has secured thereto a perforated sleeve 19, the lower end of which has threaded thereto a gland 20 which engages one section of a well tubing indicated by the character 21. The section 21 extends upwardly through the perforated sleeve 19 and is threaded into a passageway 22 formed in the head 18. This passageway also has threaded thereinto another section of the well tubing indicated by the character 23. It is to be understood that any number of well tube sections may be connected to the sections 21 and 23. The head 18 has a conical seat 24 to cooperate with the conical seat 6 in establishing a leak-proof connection between the head and the coupling element 5. The upper face of the head 18 is disposed on an incline to facilitate the guiding of the section 23 of the well tubing into the passageway 22. The head 18 is also provided with a passageway 24' communicative at one end with the interior of the perforated sleeve 19 while the opposite end is in com-

munication with a gas vent tube 25. It is to be understood that the perforated tube 19 moves with the head 18 as well as the section 21 and the other sections that may be connected thereto.

The coupling element 5 has an internal shoulder 26 located intermediate the ends of the coupling element. Said shoulder is provided with notches 27 and grooves 28. The grooves 28 extend longitudinally of the coupling element and open outwardly through the shoulder 26 and are of such depth that their bottom walls lie in the cylindrical surface of the inner wall of said coupling elements. The notches 27 are of a similar depth as the grooves 28. Ribs 29 are carried by the perforated sleeve 19, the upper ends of which ribs are adapted to abut the shoulder 26 to prevent separation of the head 18 from the coupling element 5 and the other elements connected thereto. However, the head carrying the perforated sleeve may be turned relative to the coupling element 5 to align the ribs 29 with the grooves 28 so that said ribs 29 may pass through the grooves and permit the head to be separated from the coupling element 5 and the section 21 of the well tubing drawn from the well and the packer, of course, it being understood that the packer has first been adjusted to the well casing, as shown in Figure 2. To remove the packer from the well, the ribs 29 are so positioned as to fit within the notches 27 and by an upward pull on the head 18 the entire packer and associated parts may be pulled from the well.

Shoulders or stops 29' are provided to limit the rotation of the coupling head 18 relative to the coupling element 5 in either direction by the ribs 29 coming in contact therewith and also when the ribs 29 are in engagement with the stops 29', said ribs are in alignment with the grooves 28 so that said ribs may readily enter said grooves.

The entire unit, as shown in Figure 1, is lowered to a desired place within a well or the casing of the latter and the head 18 is then rotated in a desired direction by force applied to the section 23 of the well tubing, causing the pin 16 to move out of the horizontal branch of the bayonet slot 17 into the vertical branch thereof, the casing 3 being held against rotation due to the resilient fingers 13 bearing tightly against the walls of the well casing. When the lowermost section of the well tubing rests upon the bottom of the well, the weight of the upper sections of the well tubing acts to move the housing 3 downwardly carrying with the same the collar 10 and the beveled or conical face 11 of said collar forces the gripping ends of the elements 13 tightly against the walls of the well casing so that on further movement of the housing 3 in a downward direction the packing element 9 will be expanded tightly against the well casing, as shown in Figure 2. Thus the flow of the well can only be through the well tubings and the gas may escape from the well by way of the perforated casing 19 and vent tube 25.

The described connection between the head 18 and the coupling element 5 may be also employed for making pipe or tube connections, as shown in Figures 7 and 8, the character 28' indicating the coupling element engaged by the head 18' to which an upper pipe section 30 is threaded. The head 18' also has threaded thereto a sleeve 31 extending downwardly through the coupling element and within tube or pipe sections 32, the upper pipe section 32 being threaded to the coupling element 28' and the latter has the internal shoulder 33, grooves 34 and notches 35. Ribs 36 are carried by the sleeve 31. To disconnect the pipe sections 32 from the head 18', the latter is turned to align the ribs 36 with the grooves 34 so that said ribs may pass through the grooves and bring about separation of the head 18' from the coupling element 28'. To lift the pipe section 32 by the head 18', the latter is positioned so that the ribs 36 fit within the notches 35.

Having described the invention, I claim:

A well packer comprising a housing, an expandible packing element mounted on the housing, means for expanding the packing element against a well casing, a tubular coupling element connected to the housing, a shoulder in the coupling element provided with downwardly opening notches having spaced from the notches grooves extending throughout its entire length, a second coupling element adapted to engage the first coupling element, a sleeve located in the housing and secured to the second coupling element, ribs on the exterior of said sleeve and adapted to engage in the notches in the shoulder for locking the coupling elements in seated engagement with each other and adapted to pass through the grooves for separating the coupling elements.

ELMER DAVID McFADDEN.