

Dec. 16, 1930.

P. H. MACK

1,785,277

OIL WELL PACKER

Filed July 6, 1927

Fig. 1.

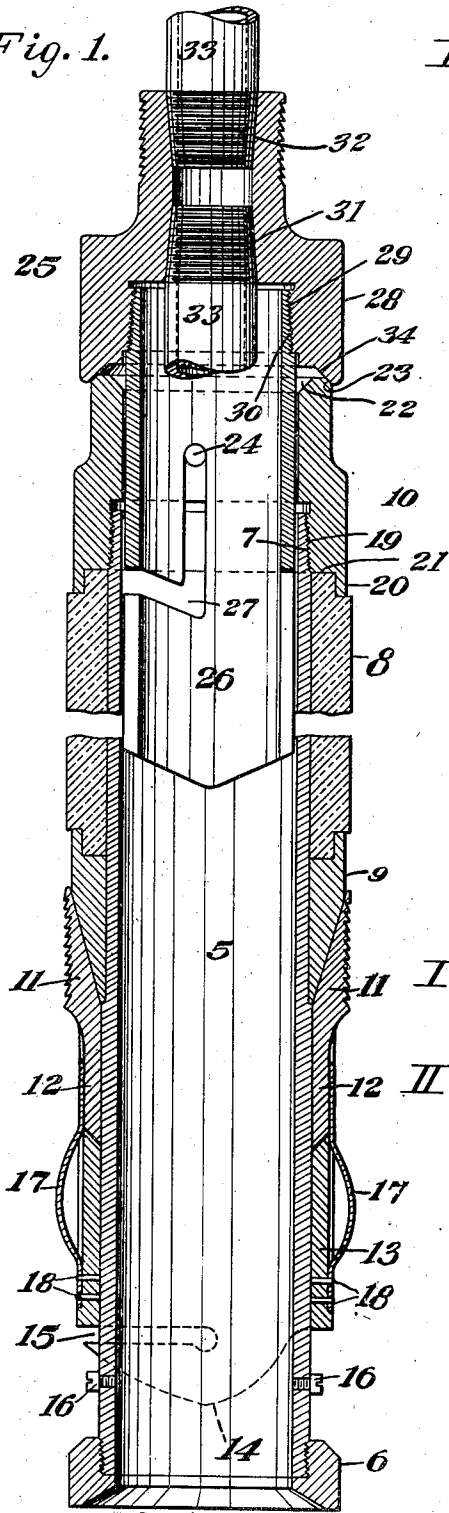


Fig. 2.

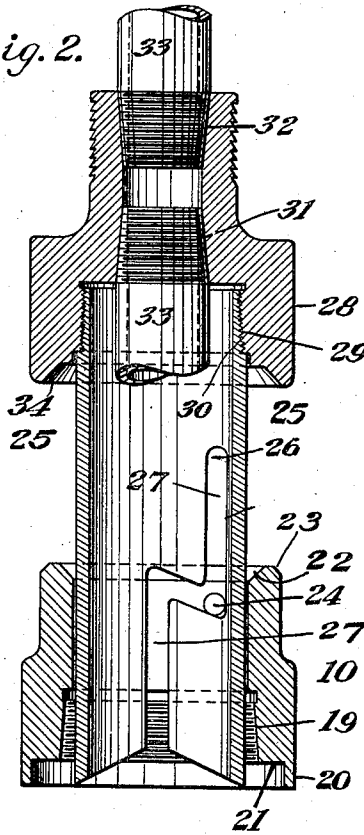
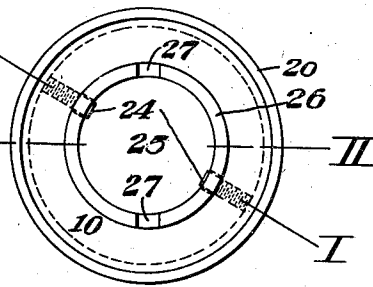


Fig. 3.



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UNITED STATES PATENT OFFICE

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OIL-WELL PACKER

Application filed July 6, 1927. Serial No. 203,805.

This invention relates to packers designed for use in oil and gas wells, and more particularly to a packer of the hook wall type, having a hollow body through which the well tubing may extend.

My invention contemplates a packer structure which may be positioned in a well or the casing thereof by lowering the packer to the desired position by the tubing employed for conveying the gas or oil from the well to the top thereof. It frequently happens that, after the packer is set in the well, it is necessary to pull the tubing and if this can be done without disturbing or removing the set packer, it is very desirable to do so. The present invention is especially designed for accomplishing this end, it being understood that the packer embodies a construction of such a character that the tubing, after being pulled as aforesaid, may be again passed downward through the same without disturbing the set packer.

My invention further contemplates the employment of a detachable packer head that may be attached to the body of a hollow packer and a tubing coupling member associated and operable in conjunction therewith for setting the packer and enabling the well tubing to be passed through the packer after it is set.

Among the objects of the present invention are, to provide a new and improved packer including a packer head and a tubing coupling member having co-operating means for connecting and disconnecting said members; to provide a new and improved packer head including a relatively short body portion; and, to provide a new and improved tubing coupling member having an elongated body portion adapted to be entered in and withdrawn from the body of the head, said members having co-operating seating faces for preventing the escape of oil and gas from the interior of the packer when the packer is set.

Other objects of the present invention will be apparent from a consideration of the following description taken in connection with the accompanying drawings.

In the drawings, which illustrate an application of my invention:

Fig. 1 is a longitudinal sectional view of a packer of the hook wall type embodying my invention, the section being indicated on line I—I of Fig. 3;

Fig. 2, a longitudinal sectional view, particularly showing the detachable packer head and the co-operating tubing coupling member embodying my invention, the section being indicated on Fig. 3; and

Fig. 3, a detail bottom plan view, showing the head and the coupling member.

Referring to the drawings, 5 designates the hollow body of a well packer, 6 the lower connecting member, and 7 a slightly reduced threaded upper end of the body. Surrounding the body is a packing element of rubber or other suitable material 8, said packing 8 being positioned on the body between an annular sliding wedge member 9 and the detachable head, indicated generally by the numeral 10. Slidable wedge member 9 is adapted to be forced downwardly between the upper end of a series of slips 11 and the body for the purpose of expanding the slips and causing them to engage the interior of a pipe or casing or open hole in which the packer is to be set.

The slips are each formed with a shank portion 12 and are designed to be carried on a cage 13. Cage 13 has a downwardly projecting part 14, having a slot 15 adapted to co-operate with a pin 16 on the body for maintaining the slips and the other parts in the desired position during the act of letting the packer down into the well. Cage 13 also carries a series of leaf springs 17, said leaf springs being fixedly secured to the cage at their lower ends by means of rivets 18, and bearing upon the shank portions of the slips at their upper ends. The parts above described, with the exception of the head 10, are of the usual and well known construction, and form no part of the present invention.

The head 10 as illustrated and as preferred comprises a relatively short body portion and is designed to be mounted on the upper end of the body 5 of the packer. This head is interiorly threaded, as shown at 19, and at its lower end is formed with an annular flange

20 and an annular shoulder or ledge 21, said shoulder and flange being adapted to bear against the packing element 8 when the head is positioned on the body of the packer. The head 10 at its upper end is formed with a beveled portion 22, an inclined seating face 23, and is provided with a pin 24.

Associated with the head and designed to cooperate therewith is a tubing coupling member 25. Said member as shown includes an elongated body 26 formed with an irregularly shaped slot or slots 27 designated to receive the pin or pins 24 of the head. Coupling member 25, in addition to the body, comprises a cap member 28. This member is detachably connected with the elongated body 26, and for this purpose, I thread the interior of said cap, as shown at 29, and form the upper end of the body with a threaded portion 30. The cap member is also formed with threaded portions 31 and 32 designed to engage the threaded ends of tubing sections 33, and with an annular inclined valve face 34 adapted to make sealing contact with the inclined face or seat 23 of the head 10, thus forming, at the juncture of said cap and head, a seal to prevent the escape of fluids from the interior of the packer when the packer is set or when the parts are in the position shown by Fig. 1.

When the packer is being lowered into the desired position in a well, the coupling member and the head will be positioned as shown by Fig. 2, with the pin 24 of the head resting in an inclined portion of the slot 27. After the packer has reached the desired position for being set, the tubing 33 is given a quarter turn to the left. This movement disengages members or hooks 14 on cage 13, and allows the slips 11 to engage the hole or casing. The tubing and the coupling member are then lowered relatively to the head until the upper end of a vertically extending portion of the slot 27 comes into contact with the pin 24, thus seating the packer. When it is desired to raise the tubing and the coupling member, it is merely necessary to raise the coupling member into the position shown by Fig. 2, and then impart a quarter turn to the said coupling member, thus bringing the pin 24 into the other vertical portion of the said slot 27. In this position, it will be evident that the coupling member may be freed from the head and the tubing withdrawn through the packer without disturbing it.

I claim:

The combination with a tubular body of a packer, a relatively short head on said body having its bore of substantially the same diameter as the adjacent portion of the body, a cap surmounting the head and having sealing engagement therewith, a depending tubular portion carried by the cap and substantially snugly fitting the bore of the head and the body, said tubular member having an ir-

regular slot opening through the lower end thereof, and a pin carried by the head and disposed in said slot.

In testimony whereof I affix my signature.

PATRICK H. MACK.

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