

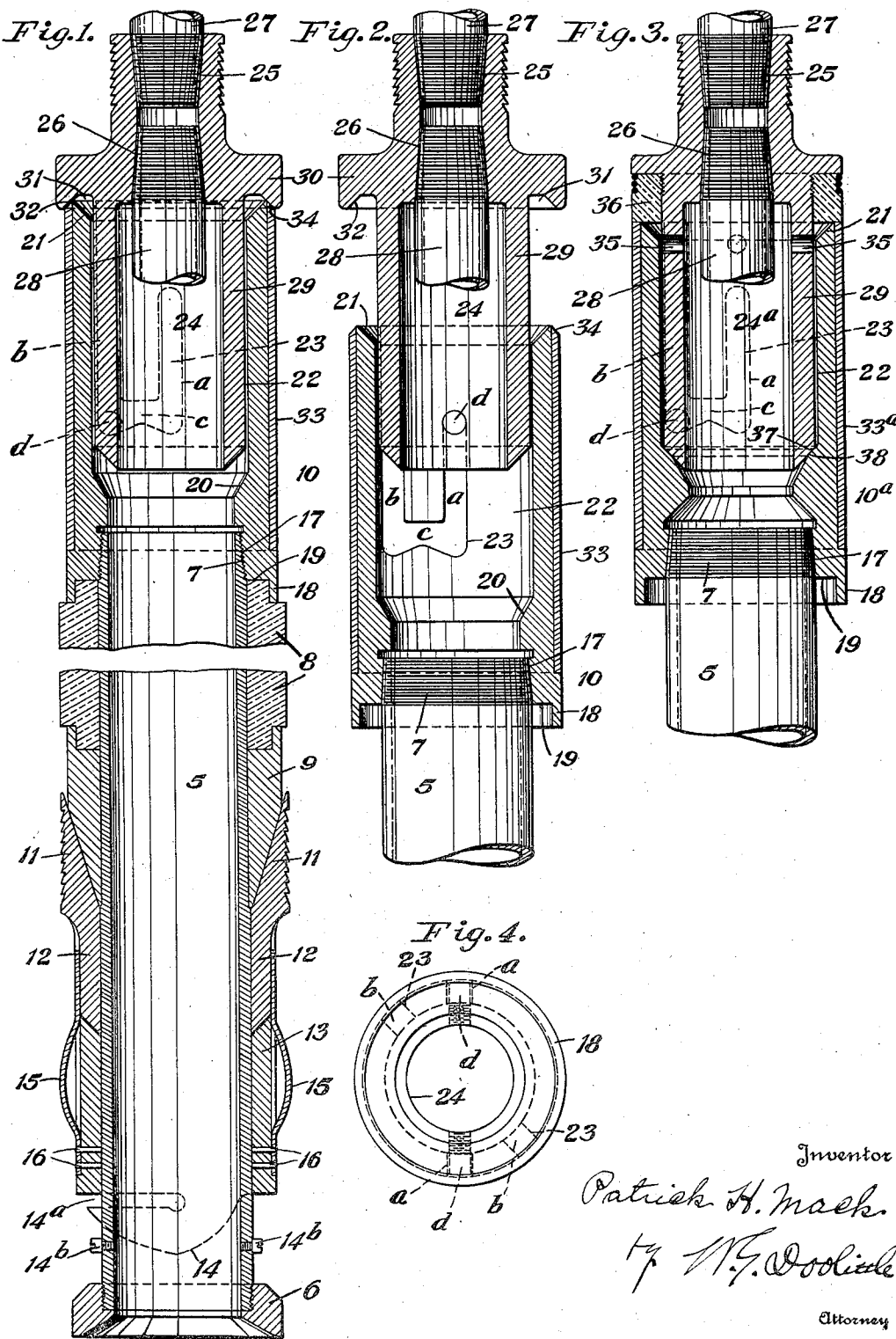
Dec. 16, 1930.

P. H. MACK

1,785,276

OIL WELL PACKER

Filed July 6, 1927



Inventor
Patrick H. Mack.
By W. S. Doolittle
Attorney

UNITED STATES PATENT OFFICE

PATRICK H. MACK, OF BRADFORD, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO OIL WELL SUPPLY COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF NEW JERSEY

OIL-WELL PACKER

Application filed July 6, 1927. Serial No. 203,804.

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 wall 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 cooperating means for connecting and disconnecting said members; to provide a new and improved packer head including an elongated body portion having an outer sleeve encircling the body; to provide a new tubing coupling member having an elongated body portion adapted to be entered in and withdrawn from the elongated body of the head, said members having cooperating seating faces for preventing the escape of oil and gas; and to provide a packer embodying said features in combination with means for allowing for the escape of fluids upwardly through the packer while it is being lowered into the desired position in a well.

Other objects of the present invention will be apparent from a consideration of the fol-

lowing description taken in connection with the accompanying drawings.

In the drawings, which illustrate applications of my invention:

Fig. 1 is a longitudinal sectional view of a packer of the hook wall type embodying my invention;

Fig. 2, a longitudinal sectional view, particularly showing the detachable packer head and the co-operating tubing coupling member embodied in my invention, showing a portion of the hollow body member of the packer in elevation;

Fig. 3, a view similar to Fig. 2, showing a modified form of head and coupling member; and

Fig. 4, 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 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 14a adapted to co-operate with a pin 14b 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 15, said leaf springs being fixedly secured to the cage at their lower ends by means of rivets 16, 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, designed to be mounted on

the upper end of the body 5 of the packer, is interiorly threaded as shown at 17, and at its lower end is formed with an annular flange 18 and an annular shoulder or ledge 19, 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 interior of the head near its lower end is formed with an annular inclined shoulder 20 and is also formed at its upper end with a beveled portion 21. This shoulder and the said beveled portion are designed to aid in guiding the tubing into and through the head. Attention is called to the fact that the head or member 10 comprises a relatively long or elongated hollow body portion 22 and, as shown, the body is formed with an irregular slot 23 including vertically extending portions *a* and *b* and a transverse portion *c*, the latter connecting the vertical portions.

24 designates a tubing coupling member associated with the head. Said coupling member is interiorly threaded at 25 and 26 to engage the respective sections 27 and 28 of a string of tubing, and includes an elongated body portion 29 adapted to be entered in and withdrawn from the elongated body of the head. *d* designates a pin carried by the body and designed to engage the slot of the head. In addition to the elongated body portion 29, the coupling member has a cap portion 30, the latter having an annular groove 31 and an inclined seating face 32 formed adjacent to the groove.

Surrounding the elongated body of the head 10 is a sleeve 33. The purpose of this sleeve is to prevent the escape of fluid through the irregular slot 23 formed in the elongated body portion of the head. Said sleeve 33 is formed at its upper end with an inclined seat 34 adapted, when the coupling member is lowered into the position as shown by Fig. 1, to engage the inclined face 32 of the cap portion of said coupling member to form a seal therebetween to prevent the escape of fluids from the interior of the packer.

In the form of Fig. 3, in addition to the parts mentioned the elongated body portion of the coupling member 24*a* is provided with openings 35 to permit the passage of fluid up through the packer and out of the head thereof when the packer is being lowered into position in the well. This form also shows a packing 36 carried by the coupling member, said packing being interposed between the coupling member and the upper end of the head 10*a* and its sleeve 33*a* when the coupling member is lowered into the head. In this latter form, I provide an inclined lower seating face 37 on the coupling member, this face being designed to seat upon an inclined seat 38 of the head. It will be noted that the form just described provides two sealing points between the head and the coupling member.

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 *d* of the coupling member resting in the upper vertical portion *a* of the slot in the head. After the packer has reached the desired position for being set, the tubing 27 is given a quarter turn to the left. This rotative movement disengages pins 14*b* from the members or hook portions 14 of cage 13, and allows slips 11 to engage the wall or casing. The tubing, together with the coupling member, is then again lowered, setting the packer and carrying pin *d* to the lower end of vertical portion *a* of the slot, after which the tubing and coupling member are again given a left quarter turn. This last turning movement will bring the pin *d* into the other vertically extending portion *b* of the slot 23 of the head or into the position shown by dotted lines in Fig. 1.

When the parts are assembled in the position shown by Fig. 1, it will be apparent that the tubing, together with the coupling member, may be raised free of the head 10 and thus permit the tubing to be withdrawn from the well without disturbing the set packer. It will also be evident that the tubing may be passed downwardly through the packing without disturbing the said packer.

I claim:

1. A device of the class described comprising a head including a body portion formed with a slot, a sleeve embracing the body portion of the head, a member associated with the head and having a pin connection with the slot of the head.

2. The combination in a hollow well packer, a head therefor, said head having a slot extending through its wall and being substantially of U-shape with one leg opening at the top of the head, a sleeve surrounding the head and laterally closing said slot, a sleeve adapted to be carried by tubing extending into the head and having a pin operable in said slot, said first sleeve having laterally extending means above the head and adapted to rest on the upper end of said first sleeve and have sealing engagement therewith.

In testimony whereof I affix my signature.
PATRICK H. MACK.