March 15, 1932. G. R. LIVERGOOD 1,849,101

CONNECTION FOR PUMP PLUNGERS AND THE LIKE

Filed Aug. 2, 1926

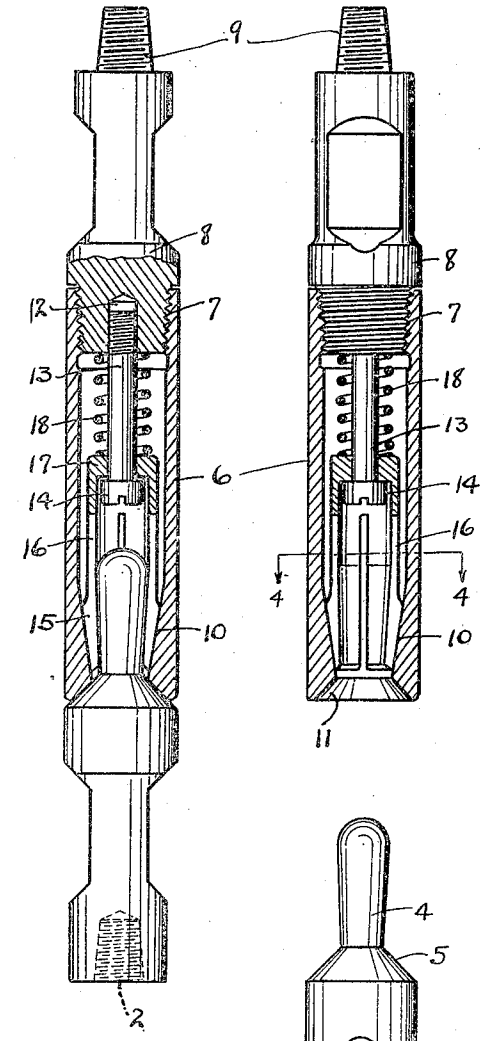


Fig. 1.

Fig. 2.

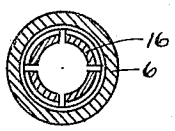


Fig. 4.

Fig. 3.

Gerald R. Livergood Inventor

By Jesse R. Stone

Attorney

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UNITED STATES PATENT OFFICE

GERALD R. LIVERGOOD, OF HOUSTON, TEXAS

CONNECTION FOR PUMP PLUNGERS AND THE LIKE

Application filed August 2, 1926. Serial No. 126,463.

My invention relates to a means for connecting the pump rod to the pump plunger in deep well pumping. It is, in fact, an automatic connection between rods or pipes employed in oil well operations and is not confined entirely to the use herein set forth.

It is an object of the invention to provide an automatic coupling means between the sucker rod and the pump plunger which is convenient to operate and accurately adjustable upon the pump plunger without a material amount of manipulation. It is a further object to provide clamping jaws to engage the plunger which are connected together integrally and which have means to align the jaws axially in the housing.

Referring to the drawings herewith, Fig. 1 illustrates a side view partly in elevation and partly in central vertical section of a gripping device embodying the invention and showing it attached to the plunger. Fig. 2 is a similar view of the gripping socket detached. Fig. 3 is a side elevation of the pump plunger shank; and Fig. 4 is a transverse section on the plane 4—4 of Fig. 2. Like numerals of reference are employed to designate like parts in all the views.

The pump plunger ordinarily employed in packed pumps fits within the packing of the barrel and it is desirable to place the plunger in position in the pump barrel before the barrel is introduced into the well. This avoids the necessity of forcing the pump plunger downwardly through the tubing from the surface and thus tending to scratch and mutilate the surface of the plunger while it is going down.

When this is done, however, it becomes necessary to have an automatic coupling at the lower end of the sucker rod to engage the upper end of the plunger and the plunger must be formed with a shank to be gripped by the coupling.

In Fig. 1 I have illustrated a coupling 1 which is understood as having a threaded socket indicated at 2 to be screwed on the upper end of the pump plunger. Said coupling has its sides flattened at 3 for engagement by a wrench. The upper end of the coupling has a shank 4 of reduced diameter, said shank being gradually increased in diameter toward the upper end so that it may be more securely held by the gripping means. Below the shank there is a downwardly flaring surface 5 to engage with the lower end of the gripping device.

The gripping device comprises a barrel 6 of suitable length, the upper end of which is threaded at 7 for engagement with a solid coupling member 8, which has an upper threaded shank 9 to form a connection with the next adjacent rod section.

The lower end of the coupling member is reduced in internal diameter at 10 to provide a downwardly tapered seat for the gripping jaws. The lower end of the barrel is formed with a flaring mouth 11 to contact with the upper beveled face 5 of the plunger attachment.

The lower end of the coupling 8 has a threaded recess 12 to receive a bolt or pin 13 which is adjustable therein. Said pin extends downwardly along the axis of the barrel 6 and has a head 14 at its lower end.

The tapered jaws or slips 15 which fit within the seat 10 are formed on arms 16 extending downwardly from an upper collar 17. Said collar 17 has a central opening to receive the pin 13 and a spring 18 around said pin bears at its upper end against the coupling 8 and its lower end against the collar 17 of the jaws.

When this device is operated the plunger having the coupling member 1 thereon is placed in the pump barrel before the barrel is set into the well. The sucker rod having the gripping device thereon is then lowered into the tubing until its lower bell-shaped mouth 11 telescopes over the shank 4 of the plunger attachment. The jaws 15 will be thereby pushed upwardly in the barrel 6 until the jaws can receive the said shank and then the spring 18 will force the jaws downwardly over the shank 4, and into the tapered seat 10. The downwardly tapered form of the shank adapts it to be firmly gripped by the said jaws. The pump plunger may thereafter be operated until the plunger has to be later withdrawn for repairs.

When the plunger is at the surface, it may

be disengaged from the plunger gripping device by first unscrewing the coupling 8 from the barrel 6. This allows the jaws 15 to be drawn away from the shank 4 of the plunger attachment.

By making the jaws all integral with the collar 17 they are kept in assembled condition and by mounting them to be guided axially of the barrel by the pin 13, I am not only enabled to keep them accurately seated, but am enabled to easily withdraw them when necessary without unnecessary handling. The formation of the slips and their means of mounting are both valuable features of the invention.

What I claim as new and desire to protect by Letters Patent is:

In a connection of the character described including an attachment having an upwardly extending shank, the combination of a gripping device comprising a barrel having an inner downwardly tapered seat, a pin axially of said barrel, a collar on said pin, jaws on said collar adapted to fit said seat, resilient means to hold said collar and jaws downwardly, and a head on said pin limiting the downward movement of said collar thereon.

In testimony whereof I hereunto affix my signature this 28th day of July, A. D. 1926.

GERALD R. LIVERGOOD.