June 6, 1933. L. C. TILBURY 1,912,804

LINER PACKER

Filed July 6, 1931

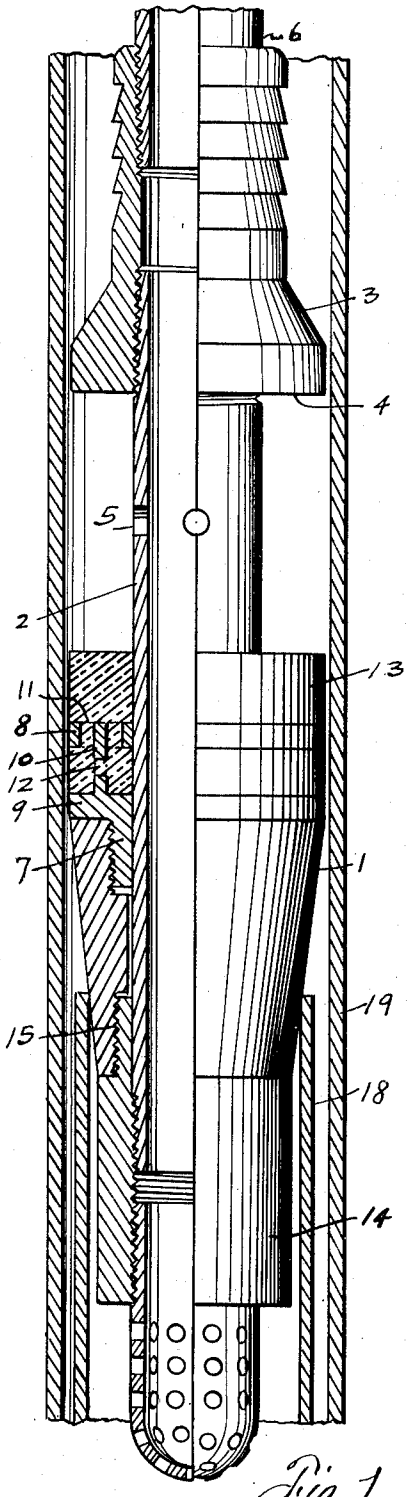


Fig. 1.

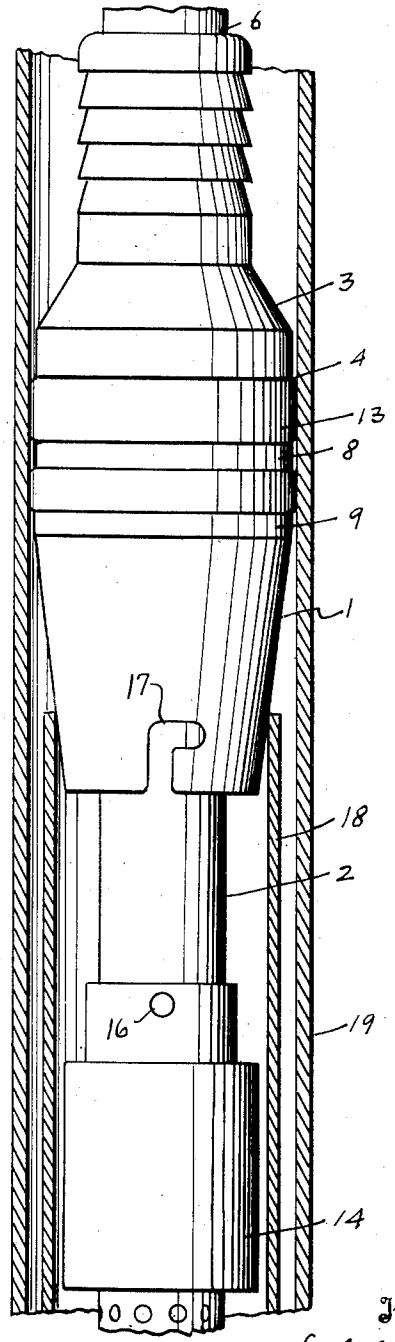


Fig. 2.

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Patented June 6, 1933 1,912,804

UNITED STATES PATENT OFFICE

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LINER PACKER

Application filed July 6, 1931. Serial No. 548,854.

This invention relates to a liner packer.

An object of the invention is to provide a packer of the character described whereby a fluid tight joint, or seal may be formed between a liner or pipe in a well bore and the surrounding casing, or wall, of the bore.

Another object is to provide a packing device of the character described wherein the packing element may be maintained in collapsed condition while the device is being elevated or lowered, and whereby said packing element may be readily expanded against said casing, or wall, when the packer is landed on the upper end of the liner.

Another object of the invention is to provide a device of the character described wherein provision is made for draining the fluid in the well, above the packing element, back into the well beneath upon the withdrawal of the device from the well.

With the above and other objects in view this invention has particular relation to certain novel features of construction, operation, and arrangement of parts, an example of which is given in this specification and illustrated in the accompanying drawing, wherein:

Figure 1 shows a side view of the device, partly in section, as landed on a liner in a well, with the packing element ready to be expanded, and

Figure 2 shows a side view of a slightly modified form showing the packing element expanded.

Referring now more particularly to the drawing the numeral 1 designates a downwardly tapering, tubular, support and the numeral 2 designates a tube fitted through and slidable in said support. On the upper end of said tube there is a substantially conical head 3 having the flat under face 4 and spaced beneath said head there are the drain ports 5. A setting string 6 is attached to the head 3 by means of which the packer may be lowered and set or raised.

On the support 1 there is an annular, metal cage having a depending nipple 7 which may be screwed into the upper end of said support. This cage is formed with the upper and lower annular plates 8, 9 connected by the annular web 10, and the upper plate 8 and web 10 have the respective perforations as 11 and 12. A packing element, as 13 is moulded onto this cage and fills the space between said plates and extends above the upper plate 8 and has a smooth, flat, upper surface.

There is a coupling 14 attached to the tube, and as shown in Figure 1, the upper end of this coupling is reduced and connected into the lower end of the support 1 by means of right hand threads 15 whereby the head 3 is held elevated above the packing element 13. As shown in Figure 2 the reduced upper end of the coupling 14 has an outwardly extended pin 16 which is engageable in an inverted J-slot 17 in the lower end of the support 1 to hold the head 3 elevated as above explained.

In use the packer may be assembled as shown in either figure and let down into the well until the packer support lands on the upper end of the liner, or pipe 18. The string 6 may then be turned to the right to unscrew the threads 15, if the form shown in Figure 1 is used, or to unseat the pin 16 from the laterally turned end of the J-slot 17 if the form shown in Figure 2 is used, and the coupling 14 thus disengaged from the support 1, and the friction of the support with the upper end of the liner 18 will prevent said support from turning during this operation. The setting string may then be lowered until the head 3 lands on the packer element 13 and the weight of the string will expand said element out against the inside wall of the casing 19 and a fluid tight joint will thus be formed. The resilient material 13 of the packer element will be moulded through the openings 11, 12 so that the pressure applied to the top of said element will be transmitted through said openings and said element will be expanded uniformly throughout.

In case it be desired to withdraw the packer the string may be elevated and the pressure on the element 13 relieved and said element will contract and release the walls of the casing 19 and when the openings 5 clear the upper end of the body 1 the fluid

in the casing above may drain through said openings 5 and through the tube 2 back into the well beneath as the packer is pulled out of the well.

What I claim is:

A packer including a downwardly tapering support shaped to seat within the upper end of a liner in a well bore, an expansible packing element on said support, a coupling releasably engaged to the lower end of said support, a tube extending downwardly through said packing element and support whose lower end is attached to said coupling, a head carried by the upper end of said tube, said tube having a liquid, outlet beneath said head, said head and outlet being located above said expansible element when the coupling is attached to the support, said tube and head being movable downwardly upon the release of said coupling from said support to allow the head to land on and expand said packing element and whereby said outlet is closed.

In testimony whereof I have signed my name to this specification.

LYLE C. TILBURY.