

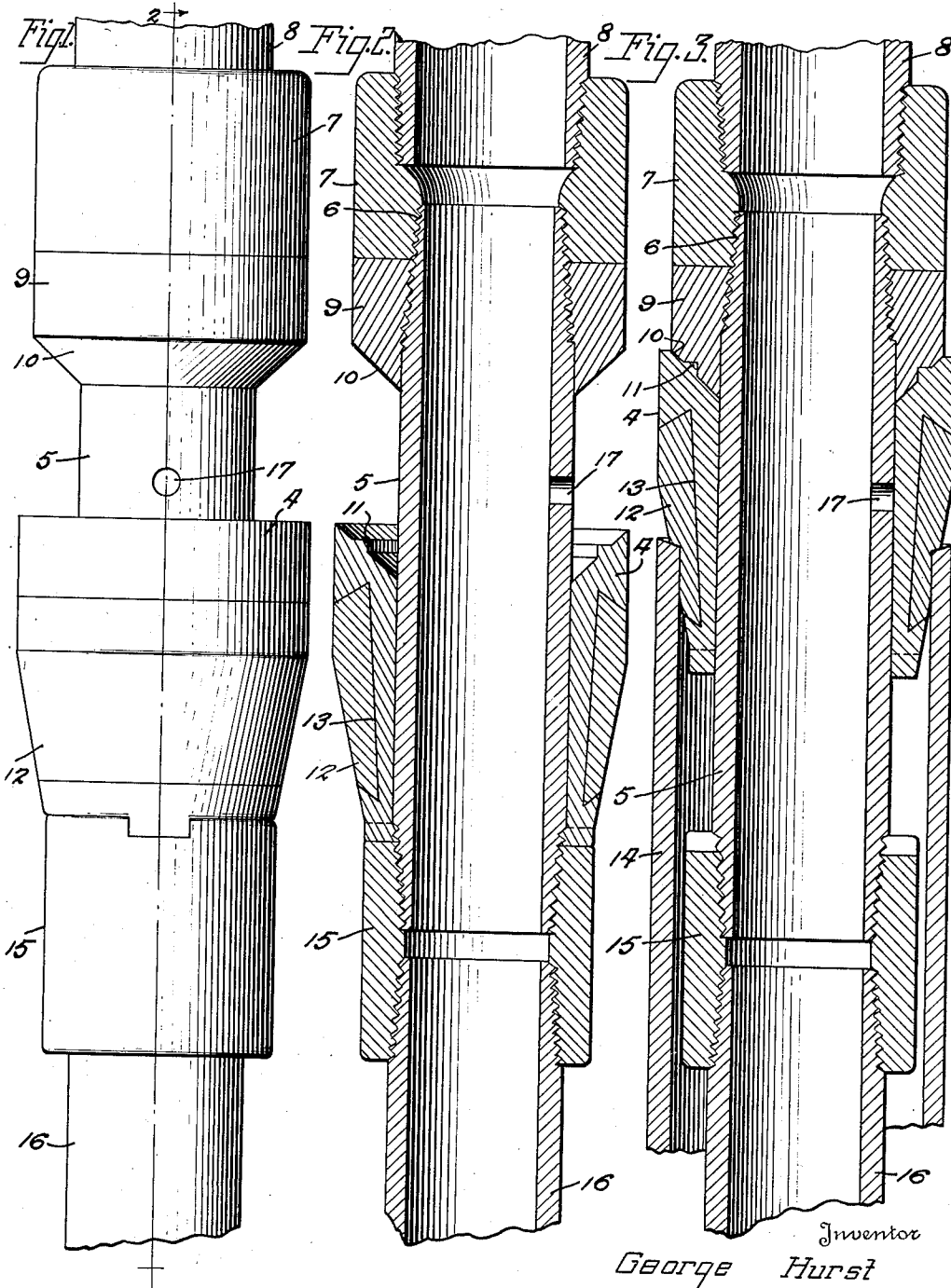
July 26, 1938.

G. HURST

2,125,231

PACKER FOR OIL WELLS.

Filed Dec. 17, 1937



Inventor
George Hurst

By *Mason Fenwick Lawrence*
Attorneys

UNITED STATES PATENT OFFICE

2,125,231

PACKER FOR OIL WELLS

George Hurst, Houston, Tex.

Application December 17, 1937, Serial No. 180,435

3 Claims. (Cl. 166—10)

The invention forming the subject matter of this application relates generally to improvements in liner-packers for pumping systems, and more particularly for such systems as are commonly used in oil wells.

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

Another object of the invention is to provide a packer of the character described which does not expand against the casing, thereby facilitating release in the weight of fluid around the packer and to provide for ready removal of the packer from its seat on the upper end of the liner.

Other objects of the invention will become apparent as the detailed description thereof proceeds:

In the drawing:

Figure 1 is an elevation of the packer forming the subject matter of this invention;

Figure 2 is a section taken on the line 2—2 of Figure 1; and

Figure 3 is a section taken on the line 2—2 of Figure 1, but with the parts of the packer in liner sealing position.

Referring now particularly to the drawing, the numeral 4 designates a downwardly tapering tubular support which slides freely on a tube 5. The upper end of the tube 5 is externally screw threaded to receive the internal screw threads 6 at one end of a coupling 7, the other end of the said coupling being internally screw threaded to receive the lower end of a setting string 8. A collar 9 of comparatively soft metal, such as Babbitt metal, is also screw threaded onto the upper end of the tube 5 and in contact with the coupling 7. This collar 9 is shaped at its lower end to form a frusto-conical surface 10 adapted to seat in the correspondingly shaped upper end of the support 4.

The tapered upper end of the support 4 is provided with an annular serration 11 adapted to bite into the comparatively soft metal of the conical surface 10, (see Figure 3) to form a fluid-tight seal between the upper end of the support and the aforesaid collar 9.

The support 4 is cylindrical at its upper part; and the remaining part is tapered downwardly to form a frustum of a cone. This downwardly tapering part of the support includes a frusto-conical sealing insert 12 formed of Babbitt metal and molded in a recess 13 formed in the support 4 to make an effective seal with a sharp inner

edge of the upper end of liner 14, (see Figure 3).

The lower end of the tube 5 is connected by the coupling 15 to the pump barrel 16, and is provided with the inside drain ports 17.

This liner packer and seal is designed for use only where there is a casing. The sealing effect does not depend upon the expansion of any elements into contact with the casing. As will be noted in Figure 3 of the drawing, the comparatively soft metal insert 12 forms an effective seal with the upper end of the liner 5 and the soft metal collar 10 forms an effective seal with the upper end of the slidable support 4. By the elimination of any frictional contact between the sealing elements of the casing of the well, the packer can be very readily removed since nothing more is required than a direct lift of the elements from the two seats.

In use, the packer may be assembled as shown in Figures 1 and 2. As thus assembled, it may be let down into the well until the comparatively soft insert 12 lands on the sharp upper edge of the liner 14. Since the support 4 slides freely on the tube 5, the tube slides downwardly through the support until the tapered surface of the soft metal collar seats on the correspondingly tapered upper end of the support 4 and spreads over the annular serration 11 to complete the seal. The entire operation is continuous; and when the parts are arranged in sealing position, the pressure within the casing is effectively excluded from the liner and the tubing arranged within the same. Since the packer does not make sealing contact with the casing, it is obvious that the packer may be withdrawn by direct, upward pull on the setting string 8. Just as soon as the drain ports 17 clear the upper end of the support 4, the fluid in the casing above the support may drain through the ports back into the well as the packer is being pulled out.

The invention is not to be considered as limited to the particular form disclosed herein, nor in any other manner except as indicated by the scope of the claims appended hereto.

What I claim is:

1. A liner-packer including a tube, a pipe coupling at one end of said tube, a collar of comparatively soft metal secured to the other end of said tube, a support slidable on said tube between said collar and coupling and having an insert of comparatively soft metal shaped to form a downwardly tapering surface adapted to seat in and form a seal with the upper end of a liner in a well bore, said support being less in length than the distance between said collar and coupling and

said tube having drain ports closed when the support contacts the said coupling and open when the support contacts the said coupling.

5 2. A liner-packer including a downwardly tapering tubular support adapted to seat within and form a seal with the upper end of a liner in a well bore, a tube slidable through said support, a coupling connected to one end of said tube and forming a stop for said support, and a sealing
10 collar fixed to the other end of said tube, said coupling and collar being spaced apart at a distance greater than the length of said support, said tube having drain ports closed when the support contacts with said head and open when the
15 support contacts with said coupling, the downwardly tapering part of said tubular support being formed by an insert of comparatively soft metal adapted to be indented by contact with the upper end of said liner.

20 3. A liner-packer including a downwardly ta-

pering tubular support adapted to seat within and form a seal with the upper end of a liner in a well bore, a tube slidable through said support, a coupling connected to one end of said tube and forming a stop for said support, and a sealing
5 collar fixed to the other end of said tube, said coupling and collar being spaced apart at a distance greater than the length of said support, said tube having drain ports closed when the support contacts with said head and open when
10 the support contacts with said coupling, the downwardly tapering part of said tubular support being formed by an insert of comparatively soft metal adapted to be indented by contact with
15 the upper end of said liner, said collar being formed of comparatively soft metal adapted to make sealing contact with the upper end of said tubular support.

GEORGE HURST. 20