

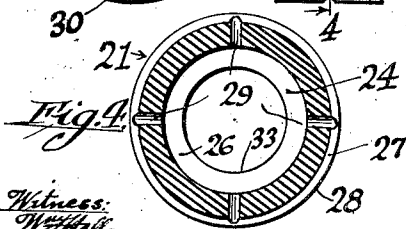
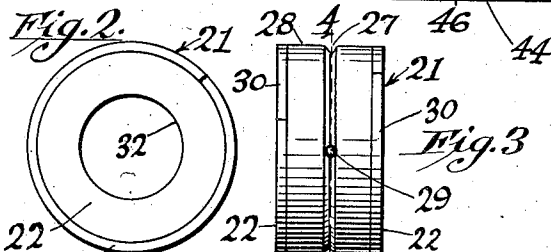
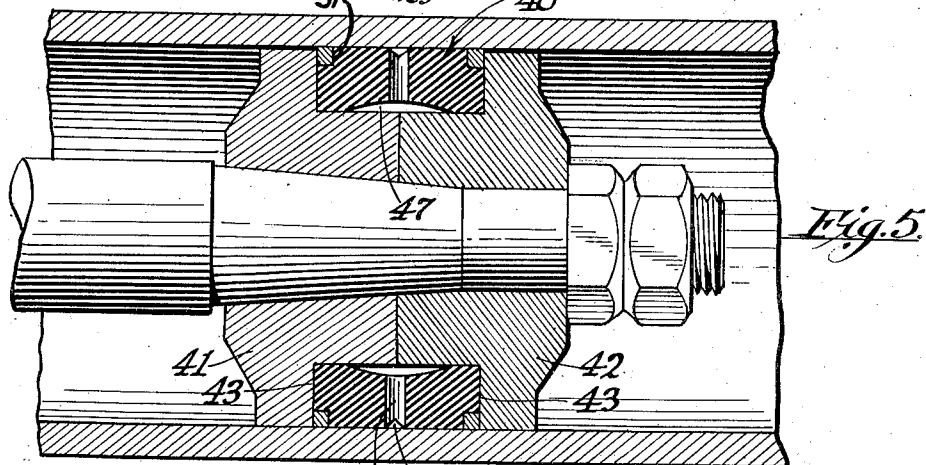
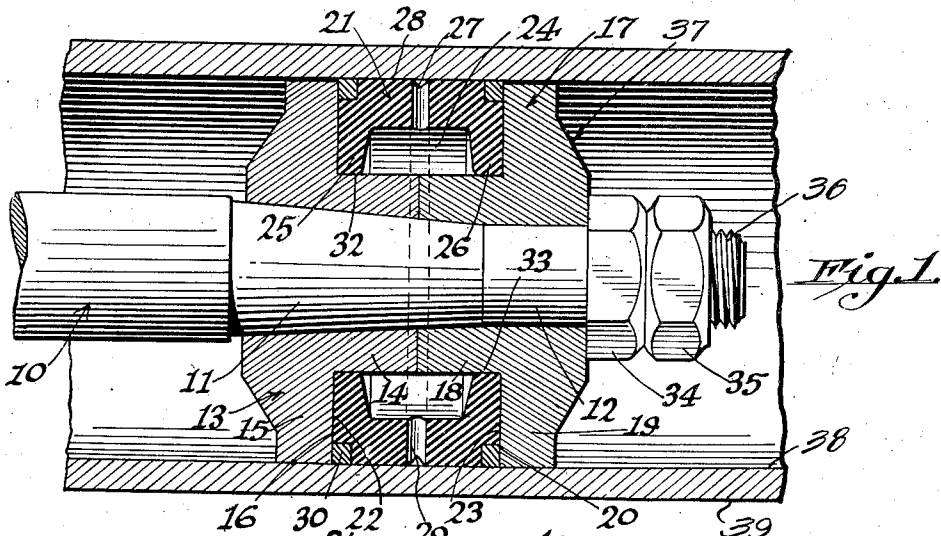
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E. E. MILLER

EXPANSIBLE PACKER FOR HYDRAULIC PLUNGERS

Filed Jan. 6, 1925



Witness:
W. H. Hall

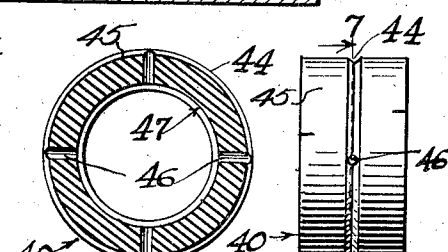


Fig. 7. Fig. 6.

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UNITED STATES PATENT OFFICE.

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EXPANSIBLE PACKER FOR HYDRAULIC PLUNGERS.

Application filed January 6, 1925. Serial No. 936.

This invention relates to expansible packers for hydraulic plungers.

An object of this invention is to provide a packer for pump plungers expansible by internal fluid pressure.

Another object of this invention is to provide a packer that is particularly adapted for pumps used in rotary drilling where there is considerable grit in the fluid.

With the foregoing and other objects in view which will be made manifest in the following detailed description and pointed out in the appended claims, reference is had to the accompanying drawings for an illustrative embodiment of the invention, wherein:

Figure 1 is a section through a pump cylinder and plunger with an expansible packer;

Fig. 2 is an end elevation of the packer shown in Fig. 1;

Fig. 3 is a side elevation of the packer shown in Fig. 1;

Fig. 4 is a section taken on the line 4—4 of Fig. 3;

Fig. 5 is a section through a pump cylinder and plunger showing a modified form of the expansible packer;

Fig. 6 is a side elevation of the packer shown in Fig. 5; and

Fig. 7 is a section taken on the line 7—7 of Fig. 6.

Referring to Figs. 1 to 4 inclusive, 10 designates a rod having a tapered portion 11 terminating in a cylindrical portion 12. A head 13 is mounted on the tapered portion of the rod 10 and has a hub 14 depending from an annular portion 15 having a flat face 16. A head 17 similar to the head 13 is also mounted on the rod 10 and has a hub 18 depending from an annular portion 19 having a flat face 20.

A packer, generally designated at 21, is carried by the heads 13 and 17. The packer has a flat face 22 engaging the flat face 16 of the head 13 and an oppositely disposed flat face 23 engaging the flat face 20 of the head 17. An annular recess 24 is formed in the packer 21 between flanges 25 and 26. A peripheral groove 27 is formed in the annular face 28, and a plurality of apertures 29 form passages between the groove 27 and the annular recess 24. The packer 21 is formed of resilient material, such as rubber, and split metallic protecting rings 30 are mounted in annular depressions 31 in the

faces 22 and 23. The hub 15 extends through an opening 32 in the flange 25 and the hub 18 extends through an opening 33 in the flange 26. The heads 13 and 17 are urged into engagement by a nut 34 and retained by a lock nut 35 on a threaded portion 36 of the rod 10, and with the packer forms a plunger 37 adapted to reciprocate in the bore 38 of the pump cylinder 39.

Referring to Figs. 5, 6 and 7, a modified form of packer designated at 40 is carried by heads 41 and 42. The packer is made of resilient material, such as rubber, and has flat side faces 43, a peripheral groove 44 formed in an annular face 45, and a plurality of apertures 46 forming passages between the groove 44 and an internal recess 47.

The operation of the plunger with its expansible packer is as follows: Referring to Figs. 1 to 4 inclusive, the annular face 28 of the packer 21 engages the bore 38 of the cylinder 39 and forms a tight joint. The fluid under pressure in the pump cylinder, however, will pass between the annular face of the packer and the cylinder wall and fill the recess 24 through the apertures 29 during the first few strokes of the plunger. As the plunger 38 continues to reciprocate, the pressure of the fluid in the recess 24 and pump cylinder 39 will be equalized, and no more fluid can enter the recess until the packer wears. The packer will be expanded, as it wears, by additional fluid under pressure entering and exerting an outward pressure against the inner face of the recess 24.

From the construction it will be seen that the packer is of unitary construction and is very effective in performing its intended functions.

It will be understood that various changes may be made in the detail of construction without departing from the spirit or scope of the invention as defined by the appended claims.

I claim:

1. An expansible packer for pump plungers in the form of a solid annular body of flexible material having an internal annular recess, a peripheral groove, and a plurality of apertures forming passages between the peripheral groove and annular recess.

2. An expansible packer for pump plungers in the form of a solid annular body of soft rubber having flat end faces, a straight annular face, an endless groove in the straight

annular face, an annular internal recess, and a plurality of apertures forming passages between the endless groove and the annular internal recess.

3. An expansible packer for pump plungers comprising a cylindrical body of flexible material having internal flanges, a peripheral groove, radial apertures entering said peripheral groove, and a split ring of metal set in the outer edges of the cylindrical body.

4. A pump plunger comprising a rod, a pair of heads having abutting hubs carried by said rod, an expansible packer having

an internal annular recess between openings engaging the hubs of said heads, a peripheral groove, a plurality of radial apertures forming passages between the peripheral groove and the internal annular recess, split rings of metal set in the outer edges of said expansible packer and nuts carried by said rod adapted to hold said heads together, the hubs of said heads being of sufficient length to prevent said expansible packer being compressed when said nuts are tightened.

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

ERWIN E. MILLER.