P. H. MACK.

WELL PACKER.

APPLICATION FILED AUG. 2, 1918.

1,371,503. Patented Mar. 15, 1921.

FIG. 4.

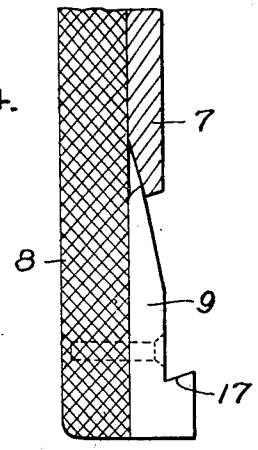


FIG. 3.

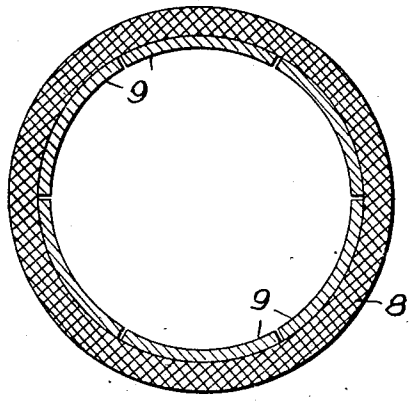


FIG. 1.

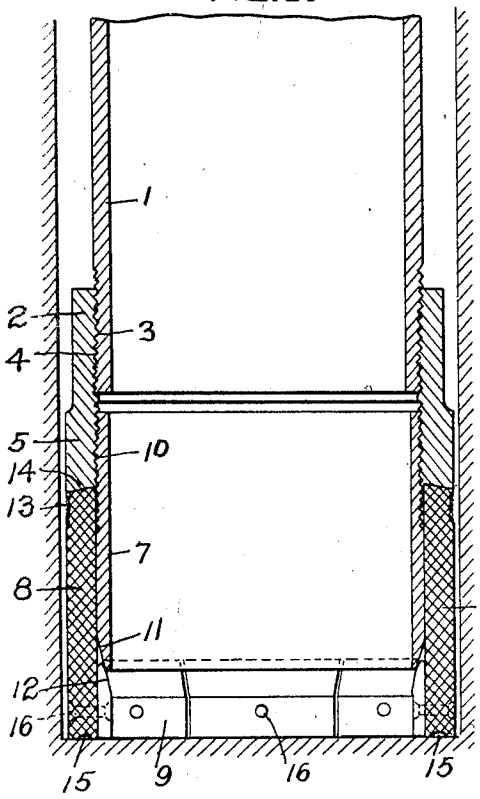
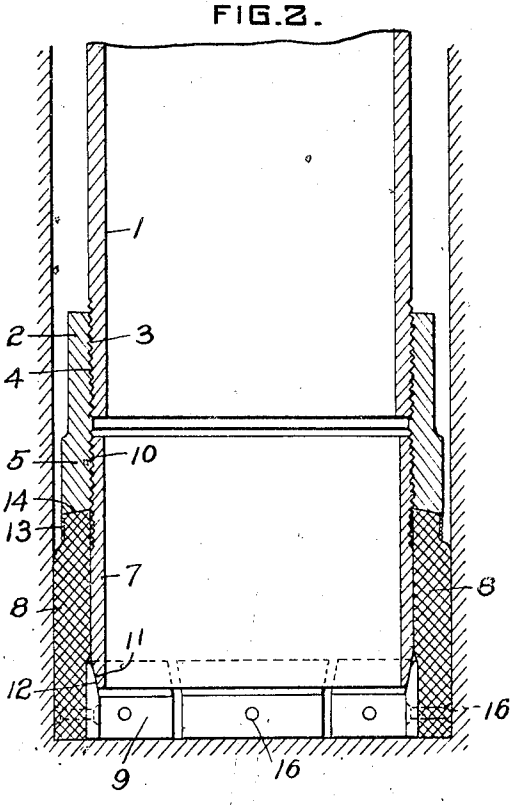


FIG. 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

PATRICK H. MACK, OF BRADFORD, PENNSYLVANIA, ASSIGNOR TO OIL WELL SUPPLY COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

WELL-PACKER.

1,371,503. Specification of Letters Patent. Patented Mar. 15, 1921.

Application filed August 2, 1918. Serial No. 248,027.

To all whom it may concern:

Be it known that I, PATRICK H. MACK, a citizen of the United States, residing at Bradford, in the county of McKean and State of Pennsylvania, have invented certain new and useful Improvements in Well-Packers, of which the following is a specification.

My invention relates to oil well packers, and more particularly to what are commercially known as bottom hole packers.

The prime objects of the present invention are to provide a simple and efficient packer of the class specified that may be readily set and readily withdrawn from the hole when desired.

In the accompanying drawing which illustrates an application of my invention,

Figure 1 is a vertical sectional view of a packer embodying my invention, the packer being shown positioned in a well and in connection with a section of a string of piping or tubing, the parts being shown in the position they occupy prior to compression and expansion of the packing element;

Fig. 2, a similar view showing the packing element compressed and expanded;

Fig. 3, a horizontal sectional view particularly showing the packing element and the packing expanding means; and

Fig. 4, an enlarged detail view showing a modified form of expanding means.

Referring to the drawing, 1 designates a section of a string of piping or tubing designed to carry the packer, and 2 a coupling member of the packer structure adapted to couple the packer to the lower end of the section 1. Coupling member 2 is internally threaded as shown at 3, and is adapted to receive the lower threaded end 4 of section 1. Said coupling member is also formed with an enlargement 5 having an inwardly and upwardly beveled face 14.

The packing structure, in addition to the coupling member 2, includes an inner tubular member 7, a compressible packing 8, and packing expanding means 9 formed of metal or other hard substantially non-compressible material. The upper end of member 7 is entered in the lower portion of the coupling member 2 with the threads 10 of the former adapted to engage the threaded portion of member 2.

The outside lower end of member 7 is beveled downwardly as indicated at 11, said beveled portion 11 being adapted to cooperate with the oppositely beveled faces of the expanding means 9. As illustrated and as preferred, the expanding means 9 include a plurality of wedge-like ring sections each having a beveled face 12 designed to contact with the beveled portion 11 of member 7. This construction provides for a wedging action between member 7 and the means 9, when the weight of the tubing or piping is applied to the coupling member 2 for the purpose of compressing the packing element 8.

The packing member 8 embraces the inner member 7 and is held thereon by means of strands of wire or other suitable material 13 wound around the upper end of the packing and opposing a part of the threaded portion 10. The upper end of the packing 8 is beveled to make contact with the beveled face 14 of the coupling member 2, and the lower end is preferably provided with an annular groove 15. The purpose of the annular groove 15 is to permit the bottom of the rubber packing to spread out fan-shape when pressure is exerted thereon.

Fig. 1 shows the relative positions of the parts of the packing structure prior to having the weight of the tubing applied thereto, and Fig. 2 the relative positions of the parts after the packing has been compressed and expanded at the bottom of the hole.

The independent wedging ring sections constituting the expanding means are secured to the lower end of the packing by means of rivets 16. By providing the individual wedging sections, each section will act individually depending upon the contour of the formation upon which it rests, thereby expanding the packing in such a manner as to cause it to effectively pack the hole.

In the form of Fig. 4 each ring section is provided with a shoulder 17 against which the lower end of member 7 is designed to make contact when the packing is compressed.

Should it be desired to remove the packer, this may be readily accomplished by drawing the string of pipe upwardly, the result being that the compression on the packing

element 8 is released and the inner member 7 will be drawn from the position shown by Fig. 2 into the position shown by Fig. 1.

What I claim is:—

1. In a well packer, an internally threaded coupling member, a depending externally threaded inner member carried by engaging the threads of the coupling member, a compressible packing embracing the inner member, and a non-compressible packing expanding means at the bottom of the packer adapted to coöperate with the inner member.

2. In a well packer, a coupling member, a depending inner member carried by the coupling member, a compressible packing embracing the inner member, and packing expanding means at the bottom of the packer adapted to coöperate with the inner member, said expanding means including a plurality of wedge ring sections of non-compressible material.

3. In a well packer, a coupling member, a depending inner member carried by the coupling member, a compressible packing embracing the inner member, packing expanding means at the bottom of the packer adapted to coöperate with the inner member, said expanding means including a plurality of metal wedge ring sections, and means for securing the ring sections to the packing member.

4. A well packer comprising a coupling member, a depending inner member carried by the coupling member, said depending inner member having an inwardly beveled lower edge, a compressible packing embracing the inner member and having its lower end extending below the lower end of said inner member, and expanding means for said packing comprising a plurality of non-compressible wedge shaped ring sections secured to the lower end of the packing and engaging the beveled lower edge of said inner member.

In testimony whereof I affix my signature in presence of two witnesses.

PATRICK H. MACK.

Witnesses:
W. E. BURDICK,
E. B. SAGE.