C. H. SHEASLEY.

PACKER FOR WELLS.

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1,273,548.

Patented July 23, 1918.

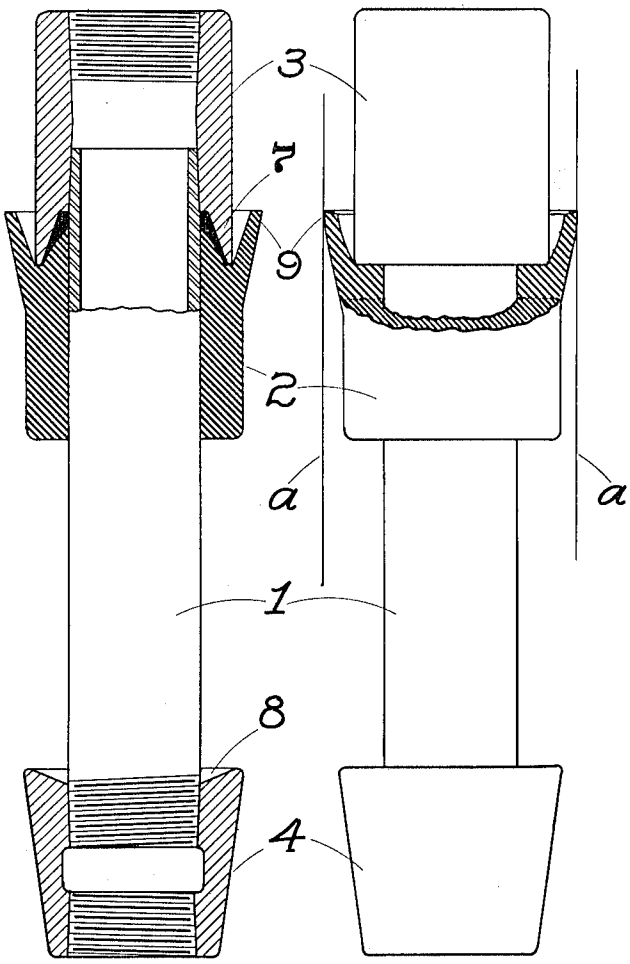


FIG. 1.

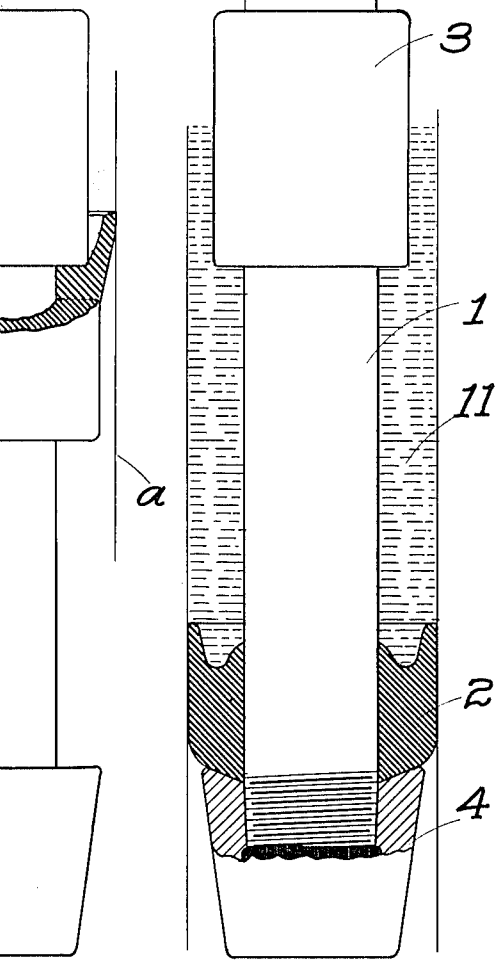


FIG. 2.

FIG. 3.

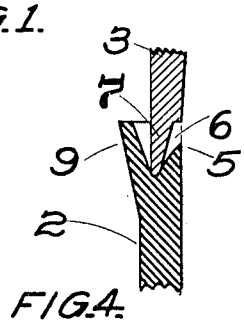


FIG. 4.

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CHARLES H. SHEASLEY, OF FRANKLIN, PENNSYLVANIA, ASSIGNOR TO PRODUCERS SUPPLY CO., OF FRANKLIN, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

PACKER FOR WELLS.

1,273,548. Specification of Letters Patent. Patented July 23, 1918.

Application filed April 14, 1917. Serial No. 162,176.

To all whom it may concern:

Be it known that I, CHARLES H. SHEASLEY, citizen of the United States, residing at Franklin, in the county of Venango and State of Pennsylvania, have invented certain new and useful Improvements in Packers for Wells, of which the following is a specification.

The objects, construction and utility of this invention are herein set forth with sufficient clearness to enable those skilled in the arts of packer construction and oil well equipment, to make and use the same.

The objects of this invention are, to supply a packer for oil wells which shall be of simple construction, inexpensive, efficient, and constructed with special reference to facilitating its removal from the well.

With these objects in view I have devised the packer shown in the accompanying drawings, the respective figures of which are as follows:

Figure 1 is a view partly in elevation and partly in longitudinal section, of my improved packer, showing the flexible packing member in the position in which it is arranged upon its carrying member preparatory to inserting the packer in the well.

Fig. 2 is an elevation of the packer, with the upper portion of the packer member in vertical section, to show the position which said upper portion,—which I term the automatic seal—assumes when being inserted in the well.

Fig. 3 is an elevation of the packer in its service or operative position within the well, the packer sleeve being shown in vertical section.

The construction here illustrated is substantially as follows:

The main element of this packer, which carries all the other coöperating members, is termed the pipe section, and is indicated by the numeral 1. Upon said pipe section is mounted a flexible packing sleeve 2 which is composed preferably of rubber, and is adapted to have longitudinal movement upon said pipe section; to the upper end of said pipe section is secured a coupling 3, which is preferably formed at its lower end to engage the upper, adjacent end of said sleeve in such manner as to reinforce the same when the packer is being lowered into the well; to the lower end of said pipe section is attached a coupling 4, which is of a frusto-conical shape, with the periphery thereof converging downwardly to adapt it to act as a drift or pilot to correct and straighten out any irregularities which may have been produced in the well casing when said casing was being inserted in the well.

The upper end of said packer member 2, immediately adjacent or abutting and surrounding said pipe section 1, is formed into an upwardly-extending nipple 5; within the lower end of said coupling 3 is provided an annular recess 6,—see Fig. 4—which is formed by a downwardly-extending annular lip 7; when the packer is being inserted in the well, these features, 5, 6 and 7, occupy the relative positions shown in Figs. 1 and 4, thus serving to reinforce and protect the upper end of said sleeve 2, and to prevent said coupling 3 from being forced into or expanding said sleeve 2, when the packer is being lowered into the well: This arrangement is also of service when the sleeve 2 is being loosened by percussion, as hereinafter set forth, preparatotry to removing the packer from the well.

The upper face of the lower, or pilot coupling 4 is dished somewhat, as indicated at 8, for the purpose of tending to compress the lower end of said sleeve 2 inwardly, thus causing it to bear more firmly against the periphery of said pipe section 1, and this increased inward pressure not only serves to form a more effective fluid-tight joint when the packer is in service, but it also prevents said coupling from being forced into and expanding the lower end of the packer sleeve.

The upper end of said sleeve 2 is formed into an upwardly-diverging peripheral, annular lip 9 which I term an automatic seal; the perimeter of the upper portion of this lip is somewhat larger in circumference than the bore of the well, so that when said packer is lowered into the well, said lip or seal is caused to assume the position shown in Fig. 2, that is to say, it is compressed inwardly somewhat, so as to automatically form an initial fluid-tight joint between its perimeter and the wall of the well: This seal, while preventing a downward flow of fluid past the same, does not, owing to its upwardly-diverging position, prevent the packer from being inserted within the well and its submergence in the fluid in the well, since said seal 9 can easily be compressed somewhat

more than is shown in said Fig. 2, thereby permitting the downward movement of the packer into the well.

The packer is lowered into the well by means of the tubing 10, and after said packer has reached the position in which it is to remain, the tubing is anchored at the top of the well in any suitable manner. The pumping operation of the well is then started, and this causes a lowering of the fluid in the well beneath the packer, and because of the automatic sealing action of said seal 9, the weight of the superposed fluid above said sleeve 2 first causes it to move downwardly until it rests upon the abutment 4, whereupon the weight of said fluid, indicated by the numeral 11, compresses said sleeve longitudinally and expands it circumferentially, thus causing said sleeve to occupy substantially the position shown in Fig. 3 and to effectually prevent any downward flow of fluid past the same.

Necessity arises occasionally, and for various reasons, for the removal of the packer from the well, and in case the packer has been in position for a considerable length of time said sleeve 2 may have lost its elasticity, become hard, and adhered to the wall of the well: In this event the tubing is disconnected from its anchorage at the top of the well, then, by lowering and raising said tubing by quick, forcible movements, the couplings 3 and 4 are caused to strike the respective upper and lower faces of said sleeve 2 with sufficient force to loosen it and permit its ready withdrawal from the well.

A further object of providing said relative longitudinal movement between said pipe section and said flexible sleeve is, to permit a certain amount of longitudinal or upward and downward movement of the tubing, when the same is being placed in the well, without causing a corresponding movement of said sleeve: The reason for this provision is due to the fact that, when the tubing is being placed in the well, it is necessary to raise it slightly as each joint is inserted for the purpose of removing the elevator, or device by which the pipe is seized, and said relative longitudinal movement is sufficient to permit said sleeve to remain stationary when said tubing or pipe is thus raised and said sleeve is thus saved from a certain amount of wear and tear which might be injurious thereto.

My improved pilot-coupling here shown is especially well adapted to be used in connection with certain forms of my packer shown and described in my co-pending application for a patent for packers for oil wells, Serial No. 195,452, filed October 8, 1917, especially those forms shown in Figs. 1, 2, 3, 4 and 7 of said application.

I claim the following:

In a packer for wells, the combination comprising the following elements; a pipe section, a flexible sleeve carried by said pipe section and adapted to move longitudinally thereon, said flexible sleeve having as features arranged at the upper end thereof a centrally-disposed, upwardly-projecting nipple positioned adjacent said pipe sections also a seal consisting of an upwardly-projecting, outwardly-extending peripheral, annular lip, a collar or coupling element connected to the upper end of said pipe section and having as a feature thereof an annular recess adapted for the reception of said nipple, and a pilot-coupling attached to the lower end of said pipe section consisting of a downwardly-converging, frusto-conical collar adapted for the attachment of tubing thereto.

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

CHARLES H. SHEASLEY.

Witnesses:
WM. B. GRIFFEN,
C. W. YEANING.