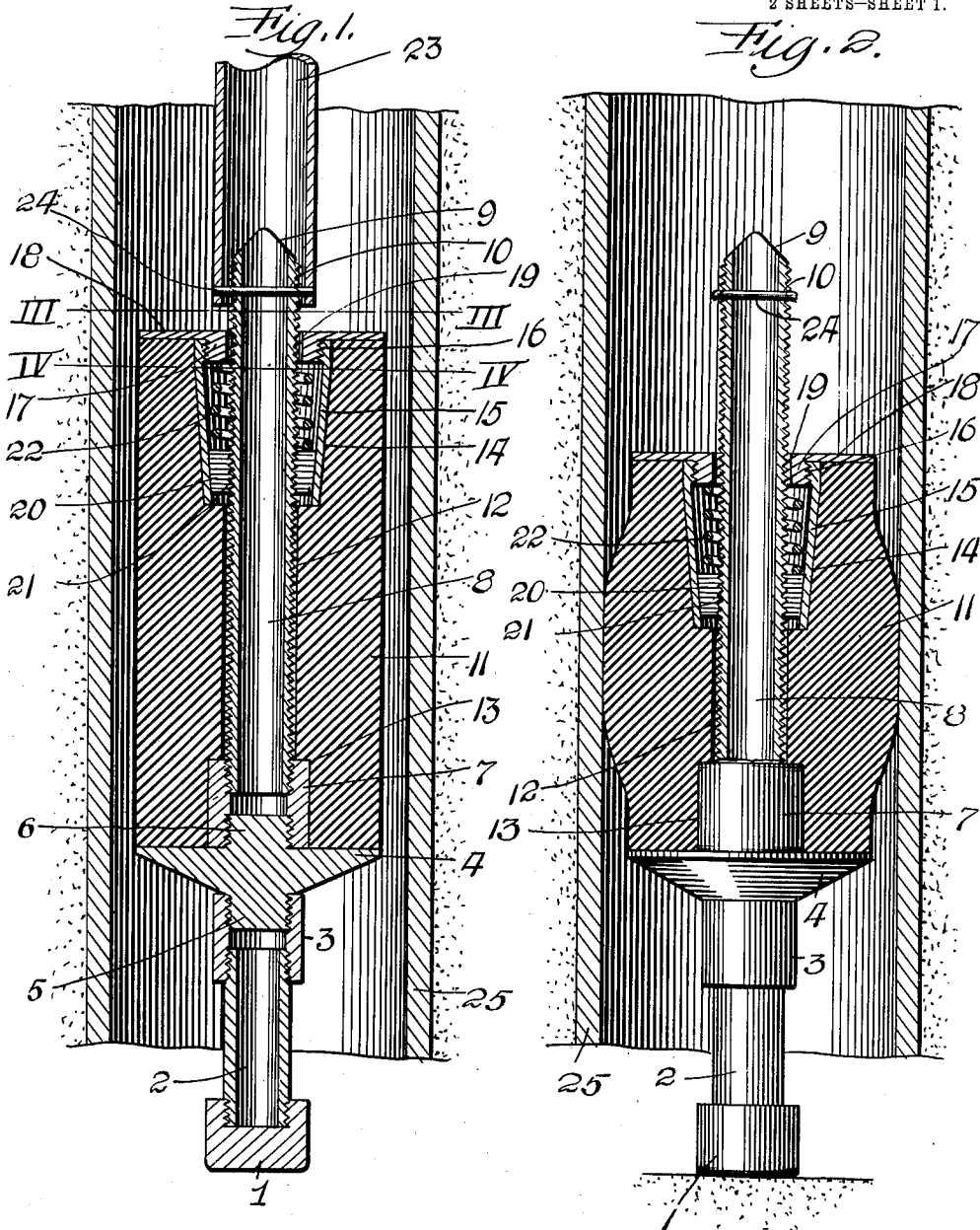


H. L. McLAUGHLIN.
 PLUG FOR OIL AND GAS WELLS.
 APPLICATION FILED AUG. 19, 1912.

1,050,557.

Patented Jan. 14, 1913.

2 SHEETS—SHEET 1.



WITNESSES

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Fig. 3.

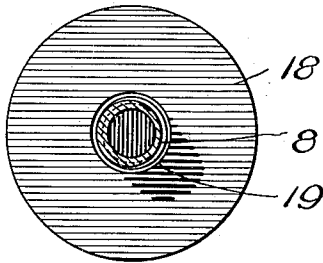


Fig. 6.

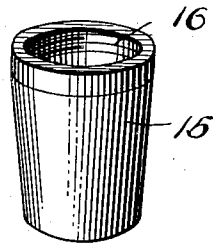


Fig. 4.

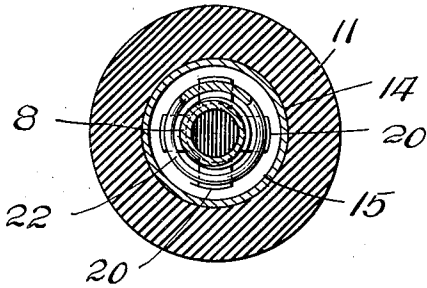


Fig. 7.

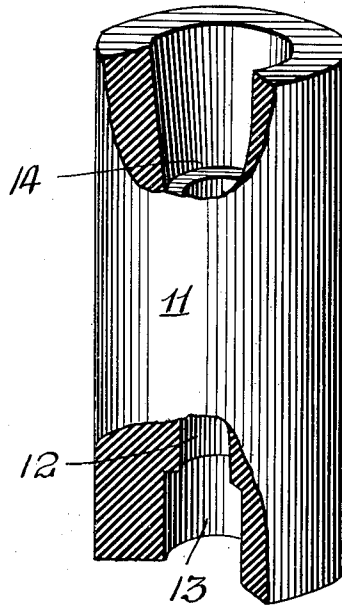
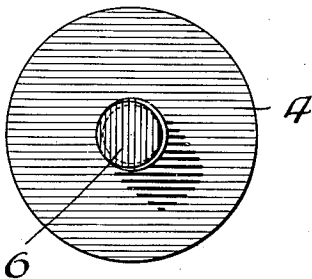


Fig. 5.



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UNITED STATES PATENT OFFICE.

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PLUG FOR OIL AND GAS WELLS.

1,050,557.

Specification of Letters Patent.

Patented Jan. 14, 1913.

Application filed August 19, 1912. Serial No. 715,818.

To all whom it may concern:

Be it known that I, HUGH L. McLAUGHLIN, a citizen of the United States of America, residing at Cleveland, in the county of Pawnee and State of Oklahoma, have invented certain new and useful Improvements in Plugs for Oil and Gas Wells, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to a plug for oil and gas wells, and is used in the oil and gas fields to plug a well casing or tubing, whereby water can be shut off from a formation at the bottom of a well or water shut off from entering by the top of a well. It is furthermore used to shut gas in a well, to plug abandoned wells, and for various purposes that are obvious to a well driller.

The primary object of my invention is the provision of positive and reliable means, as hereinafter set forth, for securing a plug in a well, especially in a manner that permits of its removal.

Another object of this invention is to provide a plug that is constructed somewhat upon the principle of a swab, the plug embodying an expansible member that insures a non-leakable connection between the plug and the well casing, when the member is expanded.

A further object of this invention is to accomplish the above results by a mechanical construction that is simple, inexpensive to manufacture, easy to manipulate, and highly efficient for the purposes for which it is intended.

With the above and other objects in view, the invention resides in a novel construction, combination and arrangement of parts to be hereinafter specifically described and then claimed.

Reference will now be had to the drawings wherein like numerals of reference designate corresponding parts throughout the several views, in which—

Figure 1 is a vertical sectional view of a plug in accordance with this construction, illustrating the same in a retracted position in the casing of a well. Fig. 2 is a similar view showing the plug in an expanded position. Fig. 3 is a horizontal sectional view taken on the lines 111—111 of Fig. 1. Fig. 4 is a similar view taken on the line IV—IV of Fig. 1. Fig. 5 is a plan of a plug sup-

port. Fig. 6 is a perspective view of a slip holder, and Fig. 7 is a perspective view of a plug body, partly broken and partly in section.

The reference 1 denotes a bull plug or anchoring device and attached to said plug is a coupling 2 upon the upper end of which is screwed a coupling sleeve 3.

4 denotes a circular plug support having concentric nipples 5 and 6, the former being detachably mounted in the upper end of the coupling sleeve 3.

7 denotes a heavy collar that is screwed on the nipple 6, and screwed into the upper end of the collar 7 is a tubular exteriorly screw threaded stem 8 that has the end thereof tapered, as at 9 and provided with transversely alining openings 10. Arranged upon the circular support 4 is an expansible plug 11, preferably made of rubber, said plug having a longitudinal bore 12 providing clearance for the stem 8. The bore 12 has the lower end thereof enlarged, as at 13 to provide clearance for the collar 7 and the upper end of the bore 12 is enlarged to provide a conical shaped seat 14.

15 denotes a conical shaped slip holder in the form of a shell that is mounted upon the seat 14. The upper inner walls of the holder are screw threaded, as at 16 and screwed into said holder is the depending exteriorly screw threaded collar 17 of a cap 18 that is mounted upon the upper end of the holder and the plug 11. The collar 17 has an opening 19 providing clearance for the tubular stem 8.

20 denotes a plurality of slips that are equally spaced within the conical shaped holder 15, said slips having the inner faces thereof toothed or threaded, as at 21 to engage the threaded surface of the tubular stem 8. Surrounding the tubular stem 8, between the slips 20 and the collar 17 is a coiled compression spring 22 that retains the slips normally in a lowered position in the holder 15 and said slips in engagement with the periphery of the tubular stem 8.

23 denotes a letting in nipple that is connected to the upper end of the stem 8 by a small metal rivet 24 that is arranged transversely in the nipple 23, said rivet extending through the opening 10 of the stem 8. This rivet is preferably made of copper and is adapted to be sheared or broken, as will hereinafter appear.

In operation, the plug is lowered into the casing 25 of an oil well in the position shown in Fig. 1, that is, with the plug 11 retracted and the stem 8 connected to the nipple 23 by the soft metal rivet 24. Immediately upon the bull plug 1 resting upon the bottom of the well hole, the weight of the nipple 23 and its connections is sufficient to shear the soft metal rivet 24, whereby the end of the nipple 23 will rest upon the cap 18. The weight of the nipple 23 and its connection is sufficient to longitudinally compress the plug 11 and thereby expand the plug as illustrated in Fig. 2, whereby the periphery of the plug will engage the inner walls of the casing or tubing 25. With the walls of the plug 11 in engagement with the walls of the casing or tubing 25 a non leakable connection is established and it is impossible for a liquid or gas to pass between the plug 11 and the walls of the casing or tubing 25, consequently the lower end of the casing or tubing is sealed. As the plug 11 is longitudinally compressed and laterally expanded the slip holder 15 is lowered, consequently the slips 20 are allowed to expand through the medium of the inclined walls of the holder 15 and the compression spring 22, said slips obtain a fresh purchase upon the periphery of the tubular stem 8 and thereby lock the plug 11 against contraction. These slips 20 serve functionally as locking members as best shown in Fig. 2 and the plug is firmly held against accidental displacement.

To remove the plug 11 from the casing 25, a suitable tool (not shown) is lowered into the casing or tubing 25 and the tubular stem 8 jarred or unscrewed from the collar. When the stem 8 is released from the collar 7 the plug 11 immediately contracts and can be removed. Suitable fishing tools can then be employed for removing the elements 1 to 7 inclusive.

It is thought that the operation and utility of the plug will be apparent without further description and while in the drawing there is illustrated a preferred embodiment of my invention, it is to be understood that the structural elements are susceptible to

such variations and modifications as fall within the scope of the appended claims.

What I claim is:—

1. A plug of the type described comprising an anchoring device, a plug support connected thereto, a stem connected to said support, an expansible plug surrounding said stem, a slip holder arranged in the upper end of said plug and surrounding said stem, spring pressed slips arranged in said holder and retained normally in engagement with the periphery of said stem, and a nipple connected to the upper end of said stem and adapted to be detached to expand said plug.

2. A plug of the type described, comprising a support, a stem connected thereto, an expansible plug surrounding said stem and resting upon said support, slips arranged in the upper end of said plug and normally engaging the periphery of said stem, and a nipple connected to the upper end of said stem and adapted to be detached to expand said plug.

3. A plug of the type described comprising a support, a stem carried thereby, an expansible plug surrounding said stem and resting upon said support, a nipple detachably connected to the upper end of said stem, means located in the upper end of said plug to lock said plug in an expanded position.

4. A plug of the type described comprising a support, a stem detachably connected to said support, an expansible plug surrounding said stem and resting upon said support, a slip holder arranged in the upper end of said plug, slips arranged in said holder and adapted to engage the periphery of said stem, and a nipple connected to the upper end of said stem and adapted to be detached to engage the upper end of said plug and expand the same.

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

HUGH L. McLAUGHLIN.

Witnesses:

JOHN A. LASH,
LEWIS H. KELLY.