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C. M. HEETER.
ANCHOR PACKER.

APPLICATION FILED JAN. 25, 1907.

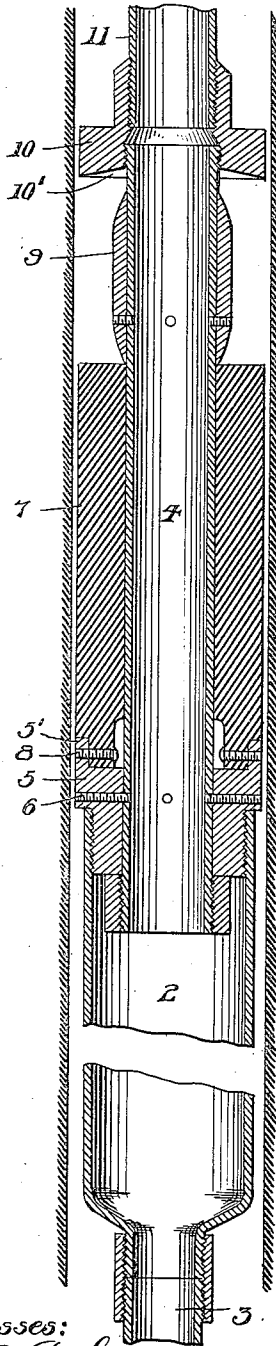


Fig. 1.

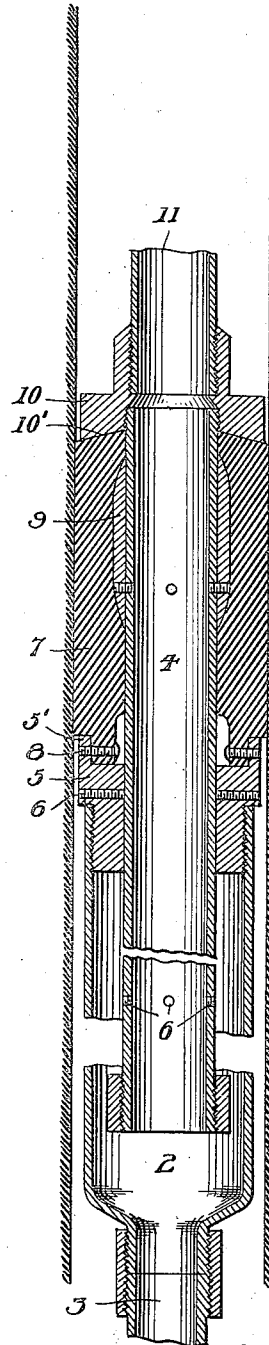


Fig. 2.

Witnesses:

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UNITED STATES PATENT OFFICE.

CHARLES M. HEETER, OF BUTLER, PENNSYLVANIA.

ANCHOR-PACKER.

No. 859,060.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES M. HEETER, a resident of Butler, in the county of Butler and State of Pennsylvania, have invented certain new and useful Improvements in Anchor-Packers, of which the following is a specification.

The object of this invention is to provide improved means for expanding or enlarging the rubber annulus, causing it to tightly engage the well wall without detracting from the compressing efficiency of the packer-cap or collar.

A further object is to provide improved means for securing the lower end of the annulus, preventing it from curling upward or being displaced by gas pressure from below.

In the accompanying drawings, Figure 1 is a vertical sectional view of a packer constructed in accordance with the invention, the same being shown in unset position or adjustment, as when being lowered into a well. Fig. 2 is a similar view showing the packer set.

Referring to the drawings, 2 designates the sleeve of the packer structure from which depends anchor 3, the latter extending from the bottom of the wall and sustaining the packer while being set. The tubular portion 4 of the packer structure extends through and tightly fits collar 5, secured to the upper end of sleeve 2. Normally, and until the packer is collapsed for setting, collar 5 and body 4 are united by frangible rivets 6.

Body 4 is surrounded in the usual manner by rubber annulus 7, the lower end of which is slightly reduced on its outer periphery to enter within the annular upwardly extending flange 5' of collar 5, to which the rubber is secured by rivets 8. By thus securing the lower end of the rubber, it is permanently united with the lower portion of the packer structure and prevented from curling or compressing upwardly under strong gas pressure from the well.

Carried by body 4 is the annular enlargement 9, here shown in the form of a sleeve riveted to the body, and having its extremities tapered or coned, as shown. It is characteristic of this body enlargement that it is located wholly beneath the upper cap or collar 10, secured to the upper end of body 4, and which when setting the packer forms the upper compressing abutment for the rubber annulus. Tubing 11 extends upward from cap 10 in the usual manner. Enlargement 9 is preferably located just above the upper end of the rubber annulus when the packer is in expanded or unset position, with its lower coned end ready to enter and expand the annulus as soon as the collapsing or telescoping movement begins. The enlargement is effective in spreading the rubber laterally, and causing it to tightly bind the well wall. As the enlargement tapers off at its upper end and stops short

of cap 10, the full lower face of the latter provides an upper abutment or pressure-head upon the rubber when the packer has collapsed sufficiently for it to reach the same. Thus I secure the beneficial effect of the body enlargement without detracting from the efficiency of the cap as a compressor. It has been proposed heretofore to enlarge the packer body, but such enlargement has been extended upwardly to the upper cap, and to that extent has reduced the pressure imparting efficiency of the latter, an objection which is overcome by the present improvement. To still further increase the efficiency of cap 10 as a compressor, the under or rubber engaging face thereof is coned upwardly or dished, as indicated at 10', which obviously gives it a more secure hold on the rubber than would a face projecting at right angles to body 4.

When lowering the packer, the structure remains rigid and cannot collapse or telescope until the anchor reaches the bottom of the hole and provides a resistance, holding sleeve 2 stationary. The weight of tubing 11 then causes the body 4 to shear frangible rivets 6, permitting the structure to collapse, and the compression of the rubber and the full setting of the packer results.

I claim:—

1. A packer consisting of telescoping inner and outer portions, a rubber annulus embracing the inner portion and at one end bearing against the outer portion, an abutment for the opposite end of the annulus carried by the inner portion, and a rubber-expanding enlargement on the inner portion and spaced from said abutment.

2. A packer consisting of telescoping inner and outer portions, a rubber annulus embracing the inner portion and at one end bearing against the outer portion, an abutment for the opposite end of the annulus carried by the inner portion, and a rubber expanding enlargement on the inner portion spaced from said abutment and tapered at its opposite ends.

3. A packer consisting of telescoping inner and outer portions, a rubber engaging abutment on each of the portions, a rubber annulus between and adapted to be compressed by the abutments, and a rubber-expander on one of the portions and spaced from the abutment on the latter.

4. A packer consisting of telescoping inner and outer portions, a rubber annulus secured to the outer portion and embracing the inner portion, a compressing cap for the rubber carried by the inner portion, and a rubber-expanding enlargement on the inner portion arranged wholly beneath the said cap.

5. A packer consisting of telescoping inner and outer portions, a rubber annulus embracing the inner portion and at its lower end bearing against the upper end of the outer portion, a rubber compressing cap secured to the upper end of the inner portion, and a rubber-expanding sleeve secured to the inner portion and located wholly beneath the said cap.

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

CHARLES M. HEETER.

Witnesses:

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