

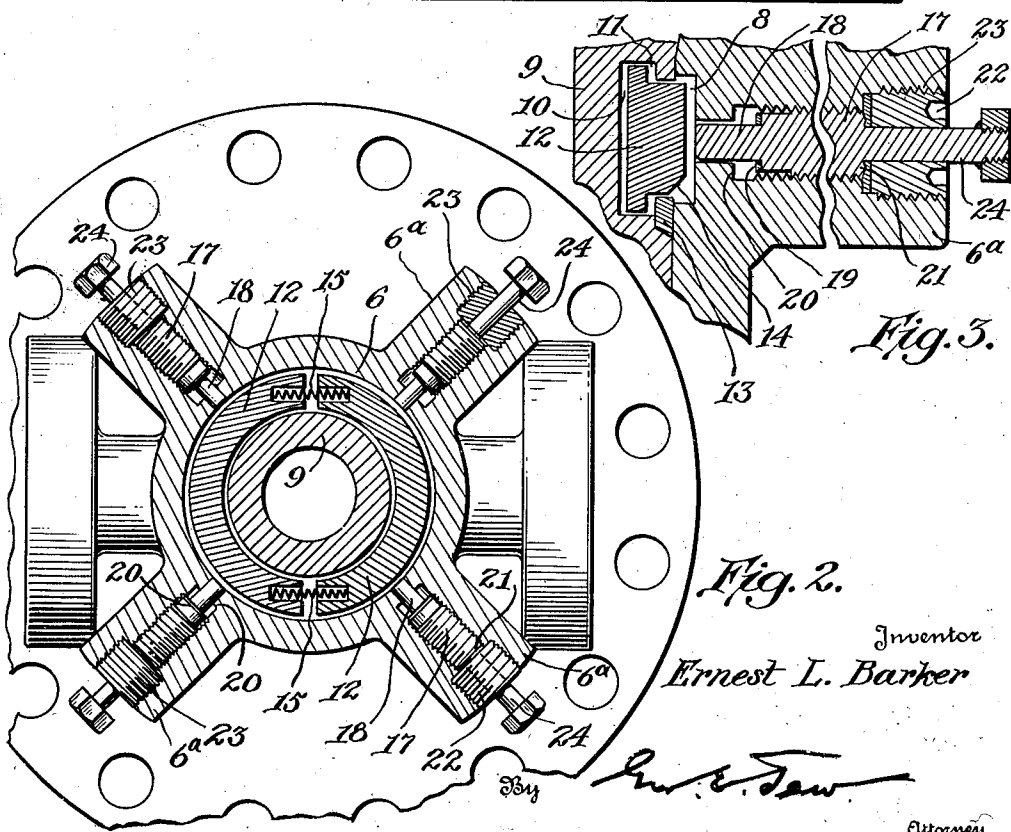
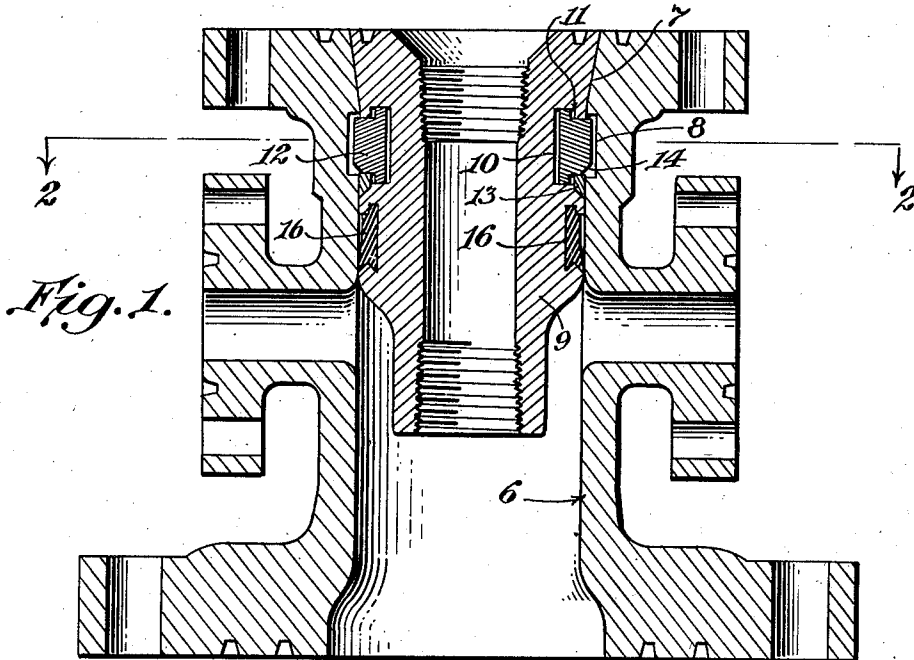
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TUBING HEAD OR HANGER

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## TUBING HEAD OR HANGER

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4 Claims. (Cl. 285-22)

This invention relates to tubing heads or hangers, and has for its object to provide improved means for holding such a head or hanger in locked position so as to prevent the tubing hanger from being blown out by pressure.

The invention comprises or embodies the use of a locking ring made in sections backed by springs so that when the tubing hanger is put in place the ring sections will snap outwardly into a groove in the casing head. Associated with this is a screw device for releasing the locking ring when the parts are to be separated, as more fully described hereinafter.

The invention is illustrated in the accompanying drawing in which:—

Fig. 1 is a vertical section of the parts.

Fig. 2 is a section on the line 2—2 of Fig. 1, and

Fig. 3 is a detail in section of the releasing screw.

Referring particularly to the drawing, 6 indicates a casing head which may be of any suitable or desired construction. It has a tapered seat 7 at the upper end of its bore, and below this is an annular groove 8 extending around the bore. The tubing head or hanger is indicated at 9 and it is tapered at the top to fit the seat 7. In the form shown, the top of the hanger is flush with the top of the casing head, which permits the use of a seal ring such as shown in my pending application, Serial No. 100,409 which matured into Patent No. 2,087,179. However, this is a mere matter of choice.

Below the tapered part of the head the hanger has a circumferential groove 10 which is undercut as indicated at 11 to receive and retain the locking ring 12, which in the form shown, is made in two sections or segments. A retainer ring 13 is provided, which may be welded in place, to permit the insertion of the locking ring sections, and to retain the same after welding. The locking ring sections are beveled at their outer lower corners, as indicated at 14, to assist the compression of the rings as the tubing hanger is lowered into the casing head. The locking ring sections are normally expanded by springs 15 between the ends of the sections, which tend to snap the locking ring outwardly into engagement in the groove 8, as will be understood.

Below the locking ring the hanger 9 is preferably provided with rubber packing 16 seated in a groove around the hanger and expansible by pressure admitted into the groove from below to prevent any fluid or gas under pressure from escaping through the joint between the casing head and the hanger.

Obviously when the hanger is let down into the casing head the ring segments 12 will contract until they reach the groove 8 when they will snap out by the pressure of the springs to lock-

ing engagement with the casing head. This will effectively prevent the tubing hanger from being blown out by pressure.

For releasing the locking ring, to permit the withdrawal of the hanger, I provide screw devices as shown in Figs. 2 and 3, of which four are shown, two for each segment. Each of these screws is tapped through a boss 6a on the outside of the casing head 6, the screws 17 each having an extension 18 at its inner end which by advancing the screws will force the ring section 12 inwardly against the tension of the springs 15, until its outer edge is disengaged from the groove 8. In this position the shoulder 19 on the screw will stop against the shoulder 20 in the bore, so that the screw cannot be set in too far. When the locking ring is to be engaged the screw is backed out until its shoulder 21 seats against a plug 22 screwed into a counterbore 23 and around the stem 24 of the screw.

It will be seen that by setting in the screws in the manner described the locking ring sections 12 will contract sufficiently to unlock the hanger from the casing head.

The locking ring is of the floating type. That is, it is free to move in and out and is not subject to inoperativeness due to sand packing in the groove and around the ring, a defect to which some other locking devices are subject.

Various modifications may be made within the scope of the following claims.

I claim:

1. The combination with a casing head having an internal annular groove, and a tubing hanger having an external annular groove, of a locking ring mounted in the groove in the hanger and comprising a plurality of segments and springs between the ends of the segments tending to expand the same into locking engagement with the groove in the casing head.

2. The combination stated in claim 1, the groove in the hanger being undercut and the inner part of the segments being retained by engagement with the undercut.

3. The combination with a casing head having an internal annular groove, and a tubing hanger having a tapered seat in the casing and an external annular groove below said seat, of a locking ring mounted in the groove in the hanger and comprising a plurality of segments and springs tending to expand the same outwardly to locking engagement with the groove in the casing head.

4. The combination stated in claim 3, and screws tapped radially through the wall of the casing head and into the groove therein, and adapted to force the segments inwardly out of locking engagement with the head.

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