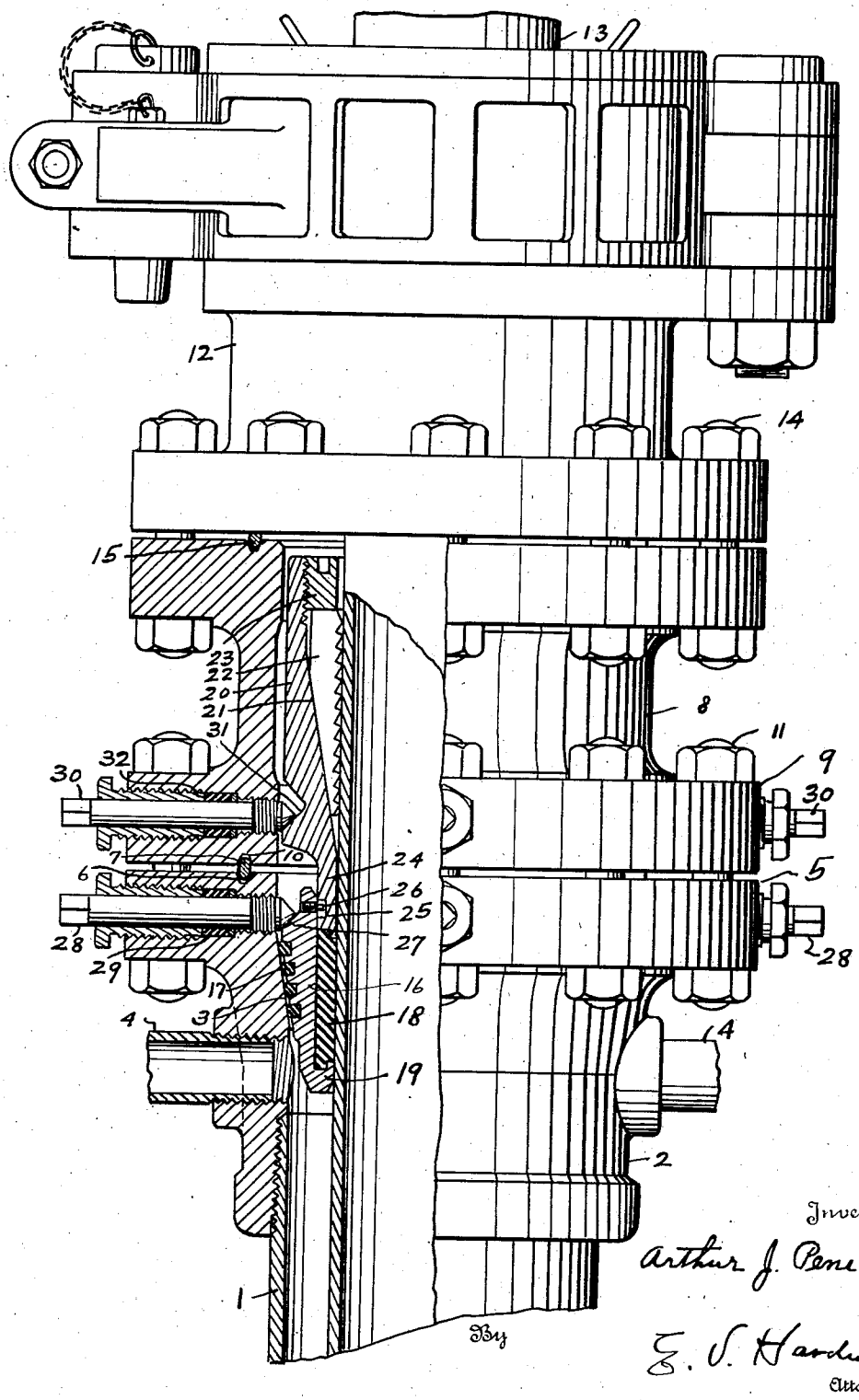
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CASING HEAD

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CASING HEAD

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4 Claims. (Cl. 285—22)

This invention relates to a casing head and has particular relation to a packing assembly for forming a seal with the casing head and with the inner pipe which extends through the casing head into the well.

A further object is to provide a sealing assembly of the character described which may be mounted on the inner tubing and lowered into the well through the blowout preventer and secured in the casing head before the blowout preventer is removed.

Therefore, while lowering the tubing the blowout preventer may be maintained installed and in readiness for use, in case of a threatened blowout, until the inner pipe is securely sealed with the casing head and secured in place.

Another object of the invention is to provide, in a casing head seal, suitable slips for mounting the sealing assembly on the inner pipe or tubing preparatory to lowering the same, with the tubing through the blowout preventer and into the casing head.

With the above and other objects in view the invention has particular relation to certain novel features of construction, arrangement of parts and use, an example of which is given in this specification and illustrated in the accompanying drawing wherein:

The figure shows a side view of the complete assembly shown partly in section.

Referring more particularly to the drawing the numeral 1 designates the well casing on which the casing head 2 is mounted.

This casing head has an inside downwardly converging seat 3 and beneath the seat has one or more outflow lines as 4.

The upper end of the casing head has an external annular flange 5 provided with an upwardly facing annular groove 6 to receive the annular seal ring 7.

On the casing head there is the tubing head 8 having the external annular flange 9 at its lower end and provided with the annular groove 10 to receive the ring 7 to form a fluid tight seal.

The flanges 5 and 9 may be clamped together by suitable clamping bolts 11.

Mounted on the tubing head there is a blowout preventer 12 of any conventional construction for forming a seal about the inner pipe or tubing 13 as the same is lowered into the well. This blowout preventer is provided to guard against blowouts in case high pressure develops in the well. It is secured on the tubing head by bolts 14 and sealed therewith by the seal ring 15 similar to the ring 7.

For the purpose of forming a fluid tight seal with the casing head and with the tubing 13 a retainer 16 has been provided. This retainer is tapered downwardly externally to conform to the taper of the seat 3 and the retainer 16 has the surrounding packing rings 17 countersunk therein which form a secure seal between the retainer and the seat 3.

Within said retainer there is sleeve like packing 18 which closely surrounds the inner pipe or tubing 13. The lower end of the retainer has an inside, annular shoulder 19, in which the lower end of the packing 18 is dovetailed. The shoulder 19 colsely surrounds the inner pipe 13.

Above the retainer 16 there is a slip bowl whose inner side converges downwardly forming a slip seat 21 whereon is mounted a plurality of wedge shaped slips 22, whose inner surfaces are toothed to engage the inner pipe 13.

A ring nut 23 is screwed into the upper end of the slip bowl against the slips to hold them in secure engagement with the inner pipe.

The lower end of the slip bowl is reduced and fitted within the upper end of the packing retainer 16 from a gland 24 whose lower end engages the upper end of the packing sleeve 18. This gland has external longitudinal keyways as 25 and threaded through the upper end of the retainer 16 there are keys 26 whose inner ends project into said keyways so as to allow vertical movement of the slip bowl relative to the packing retainer but to prevent their complete separation.

The upper end packing retainer 16 has an external downwardly and outwardly tapering face 27 and extending radially through the flange 5 and having threaded connection therewith are the lock drawn bolts 28 whose inner ends are tapered to bear against the face 27.

Suitable sealing means as 29 are mounted in the flange 5 to form seals about the bolts 28. These bolts may be screwed inwardly to force the retainer 16 downwardly so as to apply a compressive force to the seal rings 17 and to thus form a fluid tight joint between the retainer 16 and the casing head.

Similar bolts 30 extend radially through the flange 9 and have a threaded connection therewith. Their inner ends are tapered to bear against the external downwardly and outwardly tapering face 31 of the slip bowl. Suitable seals 32 are mounted in the flange 9 around the lock down bolts 30.

The inner tubing 13 is made up and lowered into the well through the blowout preventer and casing head and as a final step of completing

the installation of the inner tubing the sealing assembly, including the retainer 16 with the packing 18 therein and the slip bowl and slips, is placed on the tubing above the blowout preventer and is lowered with the tubing through the blowout preventer and lands on the seat 3 of the casing head. The bolts 28 may then be screwed inwardly to force the retainer downwardly to compress the packing rings 17 and form a tight seal with the seat 3. The weight of the tubing on the slips and slip bowl will usually be sufficient to compress the packing sleeve 18 so as to form a fluid tight seal around the tubing 13. However, the lower end of the tubing 13 is usually cemented and the heat in the well sometimes causes expansion and upward movement of the tubing 13 so as to relieve the compression on the packing 18 permitting leakage. In such case the bolts 30 may be screwed inwardly against the face 31 which will force the slip bowl 20 and gland 24 downwardly to apply a compressive force to the packing sleeve 18 thus causing its expansion so that it will maintain a tight seal around the tubing 13.

When the tubing has been landed in position and the sealing assembly installed the blowout preventer 12 may be removed with safety and the Christmas tree or other flow connections then installed.

What I claim is:

1. In well head construction having an inside seat; a retainer formed externally to fit onto, and form a seal with, said seat and having inwardly projecting keys, an annular seal ring within the retainer to form a seal with an inner pipe through the head, a slip bowl having external vertical keyways to receive the keys and movable against said seal ring and slips in the bowl engageable with said inner pipe.

2. In well head construction having an inside annular seat; a retainer formed externally to fit into, and to form a seal with, said seat and having an inside projection, an annular seal ring formed of resilient material within the retainer to form a seal about an inner pipe through the head, a slip bowl having an external vertical keyway to receive said projection whereby the bowl is loosely connected to the upper end of the retainer but movable against said seal ring to compress the same, slips in the bowl engageable with the inner pipe and a ring nut threaded into the bowl against the upper ends of the slips.

3. In well head construction having an inside downwardly converging annular seat; a retainer formed externally to fit into said seat, an external annular packing ring countersunk into the retainer and forming a seal between the retainer and seat, a sleeve like seal ring within the retainer to form a seal with an inner pipe through the head, a slip bowl whose lower end is fitted into, and has a slip joint connection with, the upper end of the retainer and abuts the upper end of said seal ring, said bowl having an inside downwardly converging seat, gripping means in the bowl on said seat engageable with said inside pipe, a ring nut threaded into the bowl and abutting the upper end of the gripping means.

4. In well head construction having an inside downwardly converging annular seat; a retainer formed externally to fit into said seat, an external annular packing ring countersunk into the retainer and forming a seal between the retainer and seat, a sleeve like seal ring within the retainer to form a seal with an inner pipe through the head, a slip bowl whose lower end is telescoped into, and slackly connected with the upper end of the retainer and abutting the upper end of said seal ring, said bowl having an inside downwardly converging seat, gripping means in the bowl on said seat engageable with said inside pipe whereby the weight of the pipe will be supported, through said bowl, on the seal ring, a ring nut threaded into the bowl and abutting the upper end of the gripping means, and means on the head accessible to an operator and engaging with the retainer and the slip bowl, respectively, and effective to force the same downwardly to apply a compressive force to said seal rings.

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