Jan. 22, 1935. J. BEGG 1,988,442

OIL WELL CASING HEAD

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Fig. 1.

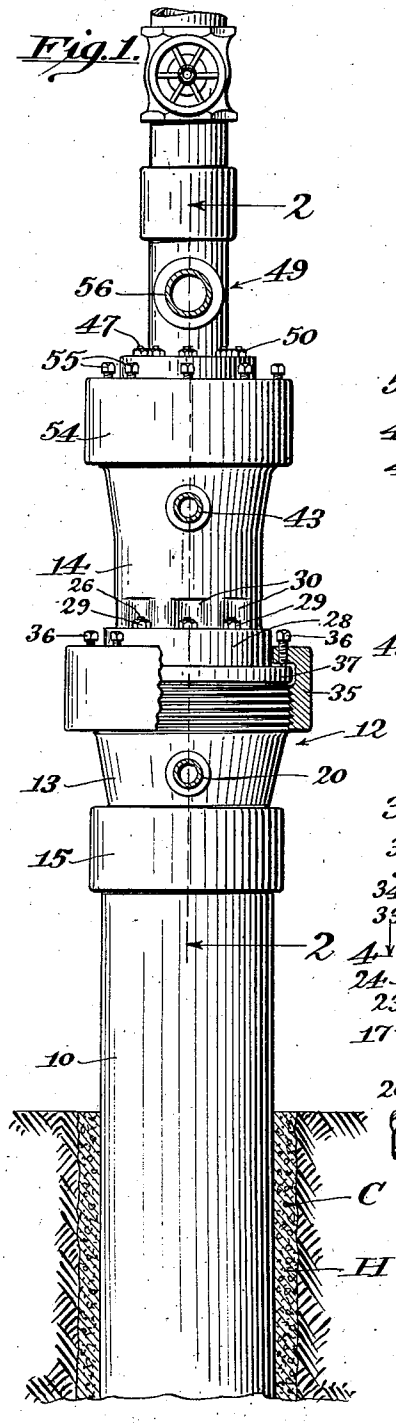
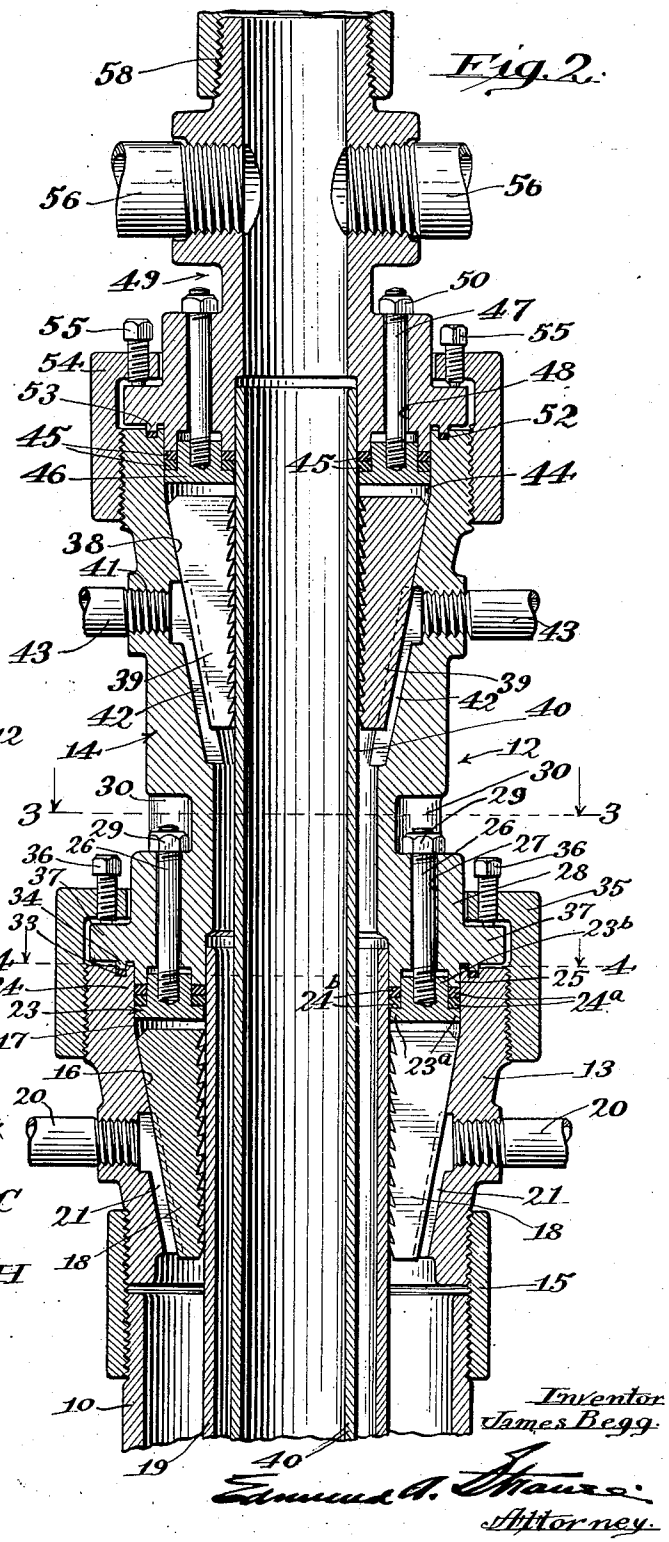


Fig. 2.



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Fig. 5.

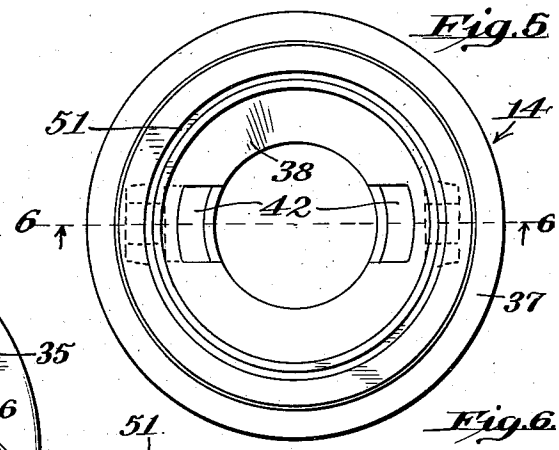


Fig. 3.

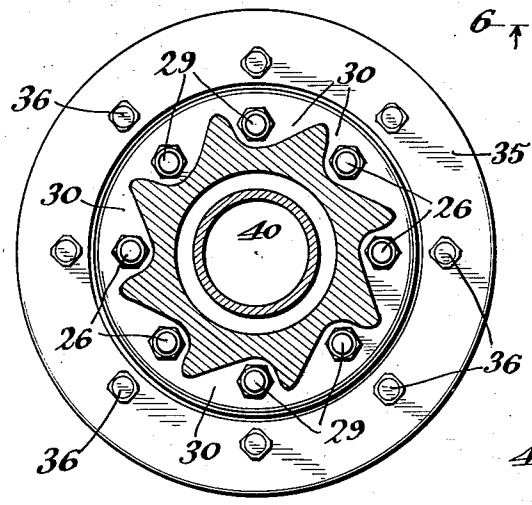


Fig. 6.

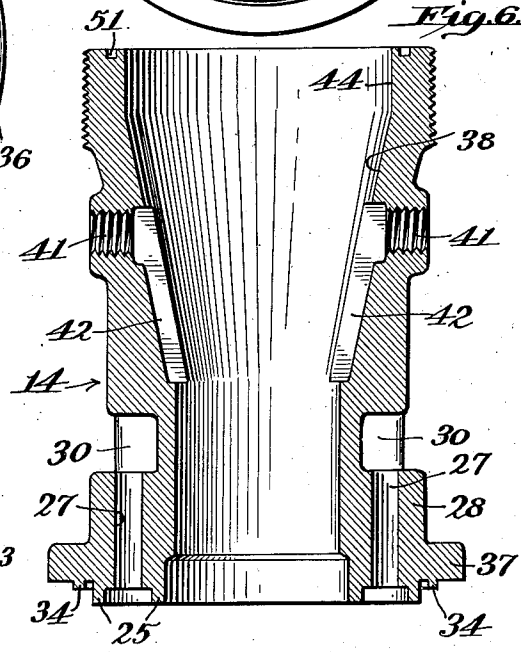


Fig. 4.

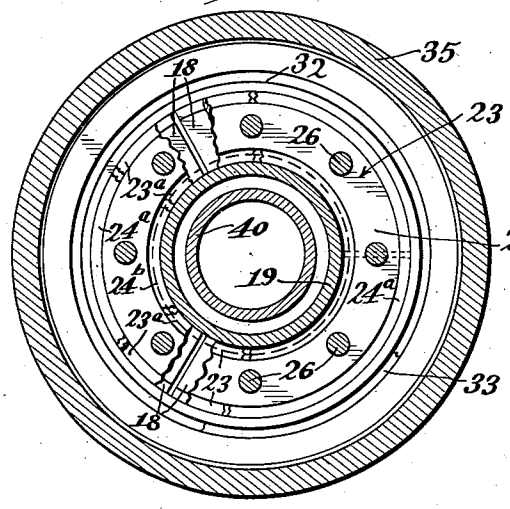
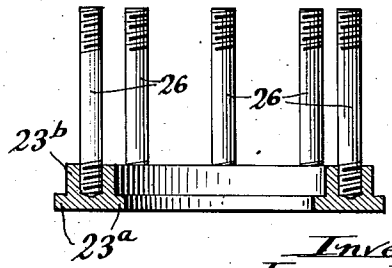


Fig. 7.



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Patented Jan. 22, 1935 1,988,442

UNITED STATES PATENT OFFICE

1,988,442

OIL WELL CASING HEAD

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Application June 26, 1933, Serial No. 677,640

6 Claims. (Cl. 166—14)

This invention relates to oil well equipment and more particularly a casing or control head.

In certain types of casing heads the packing and means for compressing the same to seal or pack off between the several strings of casing is entirely enclosed within the heads when the same are assembled.

Although it is desirable to have the packing enclosed for the reason that it prevents the same from being burnt out in case of fire in an adjoining well or a general conflagration in the field, the packing cannot be reached to adjust the same after the flow lines and "Christmas tree" have been connected to the head.

It is therefore an object of the present invention to provide a casing head construction in which the packing is entirely enclosed within the head (when assembled) yet which may be adjusted externally without dsassembling any part of the head or the flow lines connected thereto.

Another object is to provide a casing head in which the packing for sealing the space between the strings of casing is so arranged that it is compressed by the gas pressure rather than against it.

Other objects and advantages will be apparent from the following description, reference being had to the accompanying drawings, in which:

Fig. 1 is an elevation of the casing head as it appears applied to a casing that has been landed in a well hole.

Fig. 2 is an enlarged vertical section taken on line 2—2 of Fig. 1.

Fig. 3 is a horizontal section taken on line 3—3 of Fig. 2.

Fig. 4 is a horizontal section taken substantially on line 4—4 of Fig. 3.

Fig. 5 is a top plan view of the upper member of the casing head.

Fig. 6 is a verical section taken on line 6—6 of Fig. 5.

Fig. 7 is a section of the packing gland employed in connection with the casing head.

Referring by numerals to the accompanying drawings, 10 designates an outer casing that has been landed in a well hole H and cemented as indicated at C in Fig. 1.

As this outer casing (usually referred to as the water string) is cemented it is not necessary to otherwise support or suspend the same.

The improved casing or control head generally designated at 12 includes a base member 13 and an upper member 14. The base member is adapted to be connected to the upper end of the outer casing by a pipe coupling or the like designated at 15.

Formed in base member 13 is a frusto-conical bore 16 that terminates in a cylindrical bore 17, the bore 16 forming a seat for a plurality of usual slips 18 the teeth of which engage and support the second string of casing 19.

Threaded in openings formed in the base member is a pair of vent pipes 20 that enter oppositely disposed recesses 21 formed in bore 16, which recesses serve as ducts to permit escape of gas between the outer and second strings of casing through the pipes.

Mounted in the cylindrical bore 17 of member 13 is a gland or follower 23 that is provided to compress packing generally designated at 24 which serves to pack off or seal the space between the outer and second string of casing.

Packing 24 consists of superimposed concentric rings 24^a and 24^b that respectively engage the bore 17 of member 13 and the face of the second strings of casing.

The lower packing rings rest on lateral flanges 23^a formed on the gland while the upper packing rings engage annular lugs 25 secured to or formed on the bottom face of the upper member 14, each set of rings being centered on the annular body portion 23^b of the gland 23.

Secured to the body portion of the gland 23 is a plurality of usual studs 26 that project through openings 27 formed in base portion 28 of the upper member and threaded on the upper ends of the studs are nuts 29 which serve to compress the packing through the gland.

Formed in side wall of member 14 is a plurality of recesses 30 that accommodate the nuts 29, and application of a wrench for turning the same.

Mounted in a groove 32 formed in upper face of member 13 is a metal packing ring 33 that is engaged by an annular lug 34 formed on the base portion of member 14. This packing ring is provided to prevent escape of any gas that might leak past the packing 24.

Detachably secured to member 13 preferably by screw threads is a bonnet 35 in which is threaded a plurality of set screws 36 that engage a lateral flange 37 formed on the base portion of member 14. The bonnet and set screws provide means for connecting the two members together and compression of the packing ring 33.

The above construction permits an easy assembly and connection of the head members, particularly so in situations (such as in the derrick cellar) where the space is limited for application and turning of a wrench or chain tong. In other

words, the bonnet 35 may be manually turned on the threads formed on the base member.

Formed in the upper portion of member 14 is a tapered seat 38 upon which is mounted a plurality of slips 39 that engage and suspend the inner casing or tubing 40.

Threaded in oppositely disposed openings 41 formed in the member 14 that communicate with recesses 42 formed in seat 38 are vent pipes 43.

Arranged in a cylindrical bore 44 (that forms a continuation of seat 38) is a plurality of concentric packing rings 45 that engage and are compressed by a gland 46 of the same construction as that of gland 23.

Secured to gland 46 is a plurality of stud bolts 47 which extend through openings 48 formed in a fitting 49 that is detachably connected to member 14.

Threaded on the studs are nuts 50 by which the packing rings 45 may be compressed through the gland.

Mounted in a groove 51 formed in the top face of member 14 is a metallic packing ring 52 that is engaged by an annular lug 53 formed on the base of the fitting, said fitting and member being connected together by a collar 54 and set screws 55, the latter serving to compress the packing ring 52.

A plurality of pipes 56 are threaded into the fitting for the discharge of oil, the upper end of said fitting being externally threaded as indicated at 58 for connection with the usual Christmas tree or flow lines.

In actual practice the hole or bore for the second string 19 is drilled, with the base member 13 only applied to the outer casing 10. When conditions indicate that the second string may be landed, it is lowered through the member 13.

The casing 19 is then stretched (if cemented), the slips 18 dropped into the bore 16 to support the same, and the end of the casing cut off at the required length. The packing rings, together with the glands, are next placed in the bore 17, and the upper member 15 applied and connected to the base member by the bonnet 35 and set screws 36, which screws then serve to compress the packing ring 33. The nuts 29 may then be turned on the studs to compress the packing 24.

The inner string 34 is then lowered through member 14 to the required depth and slips 33 placed in the seat 32 to suspend the same. The fitting 39 and packing may then be applied as above described.

From the foregoing it will be apparent that the packing 24 and 38 is entirely enclosed after the head is assembled, yet may be compressed from time to time as required without disassembling any part of the head or the aforesaid pipe lines connected thereto.

It will also be noted that the fluid pressure between the strings of casing will tend to compress the packing 24 and 38 and thereby relieve strain on the studs and nuts.

In other words, the pressure exerted on the packing glands will automatically keep the packing compressed or expanded.

What I claim is:

1. A casing head including a pair of casing head members secured together, one of said members being secured to the upper end of a well casing, each of the casing head members including gripping means to support concentrically disposed casings, packing glands mounted within said casing head member above the gripping means, packing engaging the upper faces of said glands, and adjusting means secured to and operable externally of the casing head members for adjusting said packing glands for compressing said packing to pack the said concentric casings against the casing head members, whereby gas pressure developed within said casing head members will be exerted upon the lower faces of the packing glands and coact with said adjusting means for compressing said packing, there being vents formed in the casing head members communicating with spaces formed between the concentric casings.

2. A casing head including a pair of similar casing head members detachably connected together and one of said casing head members being secured to the upper end of a casing, each casing head member including slips mounted on tapered seats formed within said casing head members to support concentrically disposed casings, packing glands mounted within said casing head members above the slips, packing rings disposed above said packing glands, and means on said casing head members for externally adjusting said packing glands to compress the packing rings against the said concentric casings within the casing head members.

3. A casing head construction for oil wells comprising a base member adapted to be connected to an outer casing that has been landed in a well hole and having a tapered seat formed therein, slips mounted on the seat formed in said base member for supporting a second string of casing, a packing gland slidably mounted in said base member above the slips, packing disposed above and engaging said packing gland, an upper member detachably secured to said base member and engaging said packing, and means secured to said packing gland and operable externally of said upper member for compressing said packing whereby the space between said outer and second strings of casing may be packed off after said base and upper member have been assembled.

4. A casing head construction for oil wells comprising a base member adapted to be connected to an outer casing that has been landed in a well hole and having a tapered seat formed therein, slips mounted on the seat formed in said base member for supporting a second string of casing, a packing gland slidably mounted in said base member above the slips, packing disposed above and engaging said packing gland, an upper member detachably secured to said base member and engaging said packing, studs secured to said packing gland and extending through openings formed in said upper member, and nuts threaded on the upper ends of said studs for adjusting said packing gland to compress said packing.

5. A casing head construction comprising a base member adapted to be secured to the upper end of a casing, said base member having formed therein a frusto-conical bore terminating in a cylindrical bore and vent openings communicating with a recess formed in the frusto-conical bore, slips mounted in the frusto-conical bore for supporting a second casing, a packing gland slidably mounted in the cylindrical bore of the base member above the slips, concentric packings carried by said packing gland and engaging the face of the second casing and the cylindrical bore in said base member respectively, an upper member detachably connected to said base member and having lugs formed on its bottom face engaging said packing rings, and means interconnected with said packing gland and operable externally

of said upper member for adjusting said packing gland to compress said packing rings.

6. A casing head construction for oil wells comprising a base member adapted to be connected to an outer casing that has been landed in a well hole and having a tapered seat formed therein, slips mounted on the seat formed in said base member for supporting a second string of casing, a packing gland slidably mounted in said base member above the slips, packing disposed above and engaging said packing gland, an upper member mounted on said base member and having a portion engaging said packing, a packing ring engaging the face of the base member, a bonnet screw threadedly connected to said base member, set screws threaded in said bonnet and engaging said upper member for compressing said packing ring and holding said base and upper member in assembled relation, and means secured to said packing gland and operable externally of said upper member for compressing said packing whereby the space between said outer and second strings of casing may be packed off after said base and upper member have been assembled.

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