

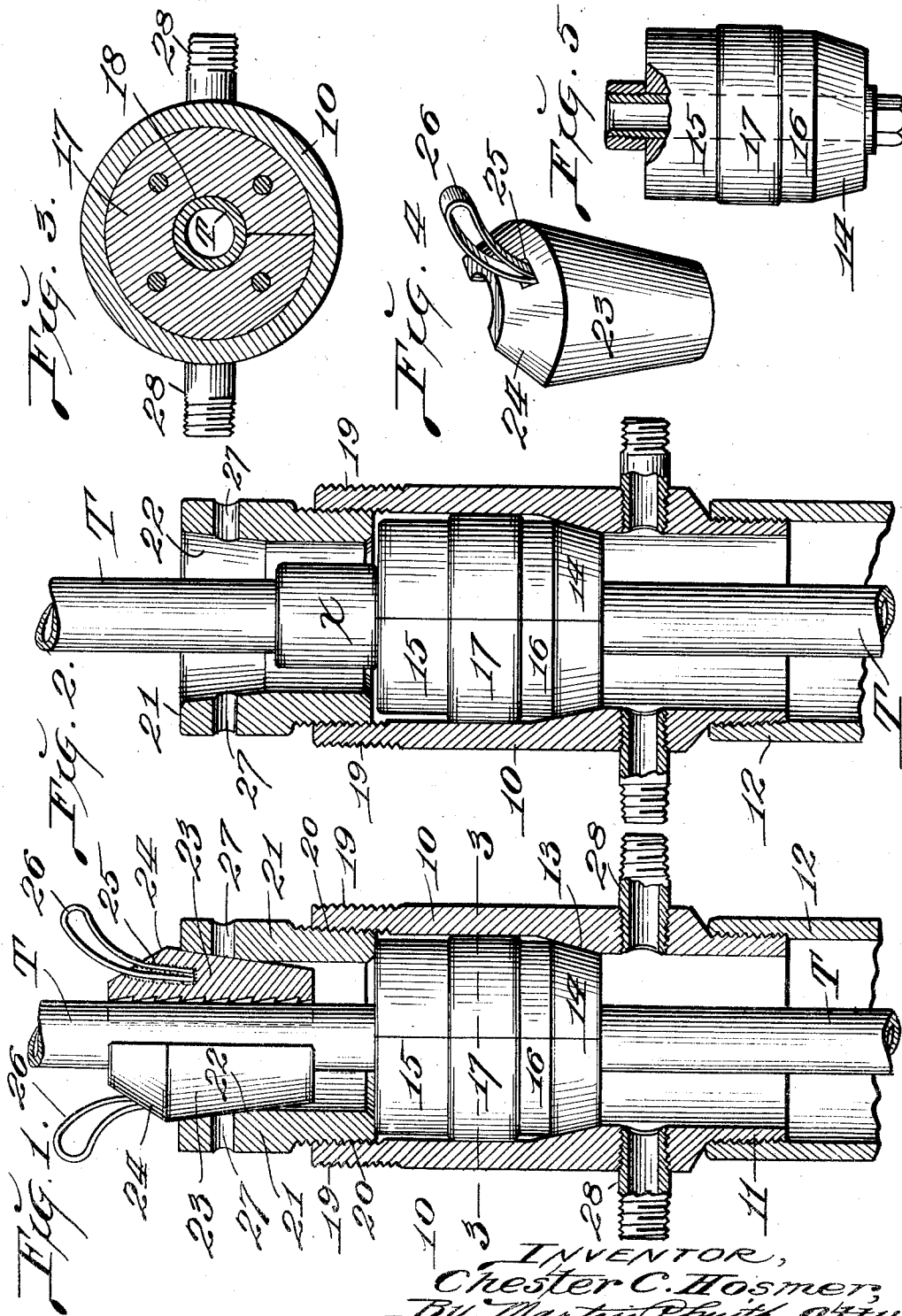
March 29, 1927.

1,623,010

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OIL WELL CASING HEAD

Filed Dec. 13, 1923



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UNITED STATES PATENT OFFICE.

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OIL-WELL CASING HEAD.

Application filed December 13, 1923. Serial No. 680,376.

My invention relates generally to oil well appliances, and more particularly to a bowl or cylindrical head that is adapted to be applied to the upper end of a well tube or casing, which head is adapted to receive casing head packings of the general type disclosed in my co-pending applications filed September 15, 1922, Serial No. 588,391, and August 30, 1923, Serial No. 660,145.

The principal objects of my present invention are to generally improve upon and simplify the construction of the casing heads or bowls now in general use and to provide a bowl or cylindrical head that is practically universal in its use, inasmuch as it may be used to serve a number of purposes, for instance as a receptacle for the unitary packing members disclosed in my aforesaid co-pending patent applications; as a receptacle for a spider that may be manipulated so as to bear on top of the packing element and thereby produce a tightly packed joint between the tube and the casing head or bowl without utilizing the weight of the tubing; for the purpose of permitting a circulation of mud or water under pressure and likewise to permit the cementing of a well through the tubing, which latter may be moved vertically for the length of a full joint or section so as to prevent "setting" in the cement.

With the foregoing and other objects in view, my invention consists in the features of construction and combination and arrangement of parts hereinafter more fully described and claimed, reference being had to the accompanying drawings, in which

Figure 1 is a vertical section taken through a casing head of my improved construction showing the packing structure positioned therein and retained in packing position by a spider that is inserted in the top of the head;

Figure 2 is a vertical section taken through the center of the head and showing the packing structure retained in packing position therein by the weight of the drill tube;

Figure 3 is a horizontal section taken on the line 3—3 of Figure 1;

Figure 4 is a perspective view of a tube engaging slip that is used in connection with my improved casing head;

Figure 5 is a side elevational view of the packing structure used in my improved head, which structure has its centrally-arranged

tube receiving opening closed by a blind nipple, thereby enabling said packing structure to be used as a plug in the upper portion of the casing head while cement is being pumped through openings in the lower portion of said head.

Referring by numerals to the accompanying drawings which illustrate a practical embodiment of my invention, 10 designates the body of the head or bowl, which body is in the form of a short tube having its lower portion 11 reduced slightly in external diameter, said reduced portion being externally threaded in order to receive the upper end of a section 12 of well casing or a nipple or collar used as a connection between said casing and the bowl or head.

The internal diameter of the upper portion of the bowl or head 10 is slightly greater than the internal diameter of the lower portion of said bowl or head, and formed between the portions of different diameters is an internally arranged inclined shoulder 13 which serves as a bearing or seat for the correspondingly tapered lower portion 14 of the packing unit. This packing unit is preferably of a type disclosed in my above mentioned copending applications, and it includes upper and lower split metal rings 15 and 16 between which is arranged an elastic ring 17, preferably of rubber. Formed axially through this packing unit is an opening 18 which receives the drill tube T.

The upper portion of the wall of head or bowl 10 is provided with an external thread 19 and with an internal thread 20, the latter being adapted to receive a corresponding thread that is formed externally on the lower portion of a spider 21, the external thread on a cap or a further pipe connection for the casing head. This spider, which is in the form of a short tube, is provided in its upper portion with an internally-arranged inclined seat or shoulder 22 for a pair of drill tube engaging slips 23. The bodies of these slips are of the usual form, but their upper ends are provided with beveled faces 24, and extending into the bodies of said slips inwardly and downwardly from these inclined faces 24 are apertures 25 which receive the ends of looped straps 26 which serve as handles for lifting and manipulating the slips. The portions of these loops that are inserted in the apertures 25 are secured therein by means of Babbitt metal or the like, and by this arrangement of the

looped handles they will not be broken off in the event that an elevator or other extraneous object moves downward into position so as to rest on top of the slips.

Formed through the upper portion of the wall of the spider 21 are apertures 27 that are adapted to receive a spanner wrench for the end of a bar that may be utilized for screwing said spider into the upper end of the casing head or bowl or out of the same. Formed through the lower portion of the wall of the head or bowl 10 and below shoulder 13 are threaded apertures in which may be seated short tubular members or nipples 28, thus enabling mud or water to be circulated through the head and the casing to which it is applied and likewise to permit cement to be pumped into the casing.

In Figure 1 the packing unit comprising the parts 15, 16 and 17, is shown as being maintained in packing position by the spider 21 and to produce a leak-proof joint between the flexible packing element 17 and the casing head or bowl and the tube T spider 21 is screwed into the upper end of the casing head 12, its lower end engages the upper face of split ring 15 and forces the parts of the packing element together, which action necessarily compresses member 17 and forces its inner and outer faces into intimate contact with tube T and the wall of head or bowl 10. Where this method of packing is carried out the tube T is supported by means of the slips 23 which are positioned in the upper portion of spider 21.

Where the packing action is accomplished by utilizing the weight of the tubing, as illustrated in Figure 2, the slips 23 are removed from the tube and the latter is lowered until one of the collars or nipples, such as X, rests directly on top of the upper metal ring of the packing element. Thus the weight of the supported tubing acts through the upper ring of the packing element to compress the intermediate ring and force its inner and outer faces into immediate contact with the adjacent faces of the drill tube and casing head.

When the packing element is used as a plug in the upper portion of the casing head or bowl a short tube or blind nipple is inserted through the axial opening in the packing element, as illustrated in Figure 5, and said packing element is retained in packing position within the casing head or bowl by pressure produced as a result of screwing down the nipple 21. With the casing head thus plugged, cement may be pumped into the casing through the short tubes or nipples 28.

In so far as I am aware, I am the first to produce a casing head or bowl, that is constructed so that it may, in combination with a packing member and spider, be used for packing off the head end of the casing, either

by utilizing the weight of the string of tubing or by screwing the spider down onto the packing member within the bowl.

A casing head or bowl of my improved construction is comparatively simple, may be easily and cheaply produced, and is very effective in performing its intended functions.

It will be understood that minor changes in the size, form and construction of my improved casing head or bowl may be made without departing from the spirit of my invention, the scope of which is set forth in the appended claims.

I claim as my invention:

1. The combination with a well casing, of a head comprising a substantially straight cylindrical body, the lower portion of the wall thereof being externally threaded in order to be screwed into the upper end of the well casing, the upper portion of the straight cylindrical wall of said head being internally and externally threaded, a tapered seat formed on the interior of said head intermediate its ends, and said head being provided with openings in its wall below said tapered seat, a packing element adapted to rest on said tapered seat and a spider adapted to be screwed into the upper end of said head and to bear on the upper end of the packing element within said head.

2. An oil well casing head comprising a tubular body, the upper portion of the wall thereof being internally threaded, a tapered seat formed within said tubular body intermediate its ends, which seat is adapted to receive the tapered lower portion of a packing element and a spider adapted to be screwed into the internally threaded upper end of said tubular body to bear on the upper end of the packing element positioned within the head.

3. An oil well casing head comprising a tubular body, the upper portion of the wall thereof being internally threaded, a tapered seat formed within said tubular body intermediate its ends, which seat is adapted to receive the tapered lower portion of a packing element, a spider adapted to be screwed into the internally threaded upper end of said tubular body to bear on the upper end of the packing element positioned within the head and the upper portion of said spider being provided with an internally arranged tapered seat for the reception of tube supporting slips.

4. An oil well casing head comprising a tubular body, the upper portion of the wall thereof being internally threaded, a tapered seat formed within said tubular body intermediate its ends, which seat is adapted to receive the tapered lower portion of a packing element, a spider adapted to be screwed into the internally threaded upper end of said tubular body to bear on the upper end

of the packing element positioned within the head and there being openings formed through the wall of the tubular member below the tapered seat therein.

- 5 5. An oil well casing head comprising a tubular body, the chamber within which is adapted to receive and support a packing element, the upper portion of said tubular

body being internally threaded and a spider having its lower portion screw seated in the 10 internally threaded upper portion of the tubular body and adapted to engage the upper end of the packing element positioned therein.

In testimony whereof I affix my signature.
CHESTER C. HOSMER.