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CASING HEAD

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Fig. 1

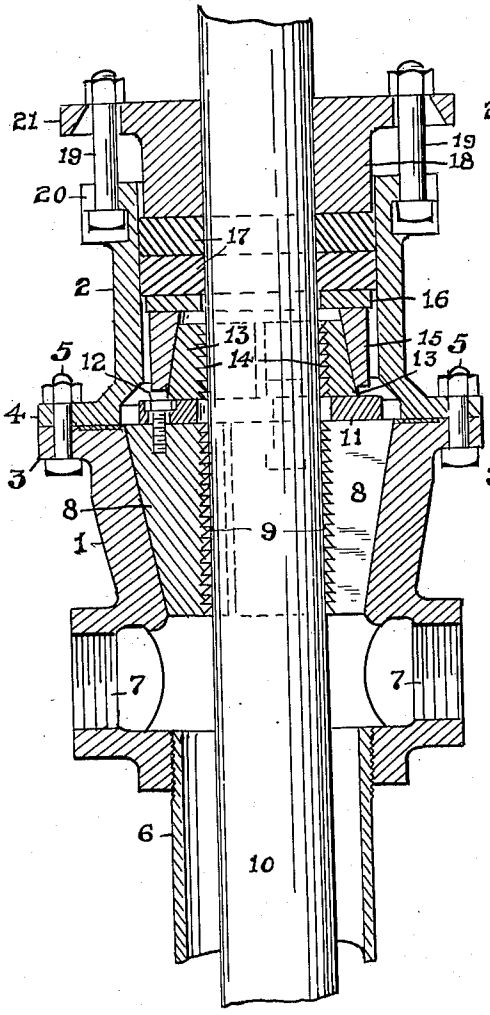


Fig. 2

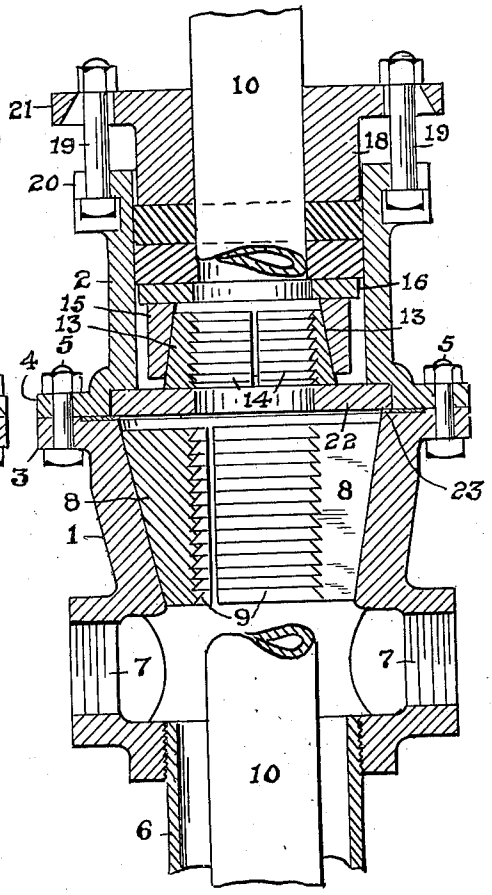
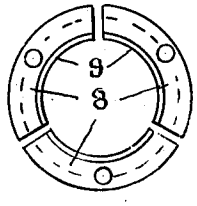


Fig. 5



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Fig. 3

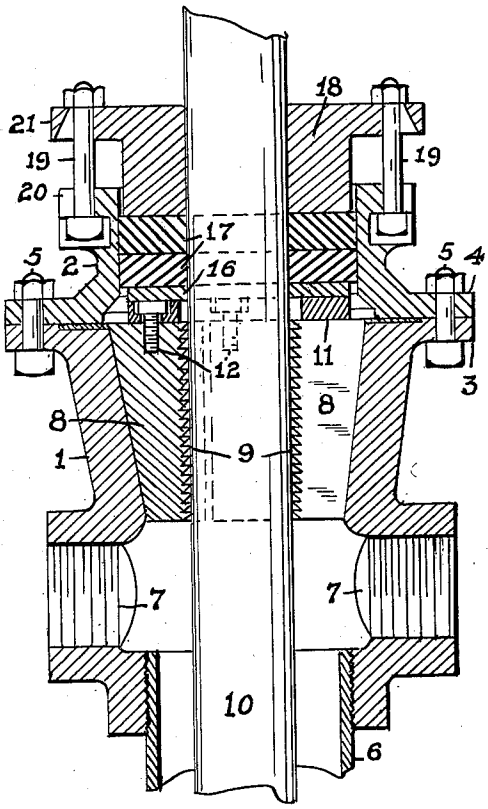
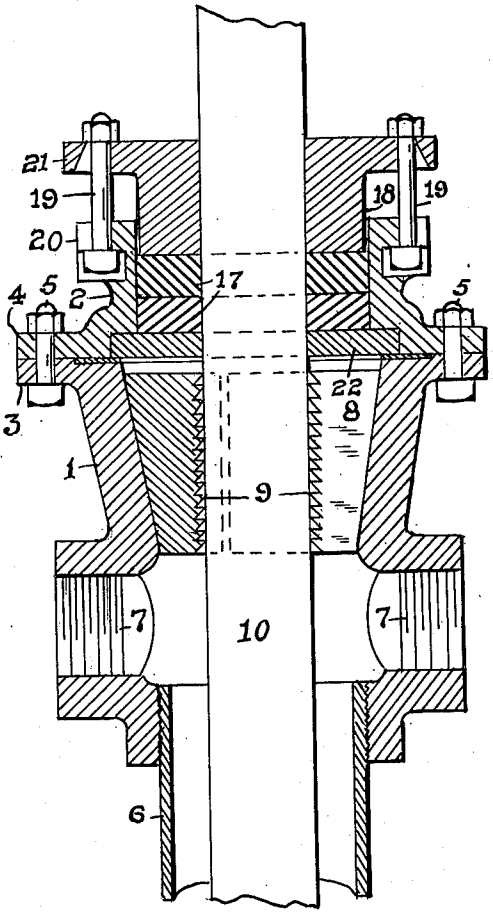


Fig. 4



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UNITED STATES PATENT OFFICE

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CASING HEAD

Application filed September 29, 1928. Serial No. 309,280.

Our invention relates to casing heads of the slip type for wells.

One object of this invention is to provide a casing head structure in which certain slips therein can function as a pipe or tubing support independently of the stuffing box superimposed thereon.

Another object is to provide a casing head structure with a set of slips for supporting a well tubing, a set of anchor slips for preventing an upward movement of the tubing, and a packing, the parts being so arranged and constructed that the adjustment of the packing gland for the purpose of compressing the packing will with certainty cause the anchor slips to increase their grip on the tubing as well as to cause the packing to be compressed. Other objects appear hereinafter.

Referring to the accompanying drawings, Fig. 1 is a central vertical section of a casing head embodying our invention, a part of a string of tubing being shown in side elevation therein; Fig. 2, a view of like character as Fig. 1, but showing a modification; Fig. 3, a similar view of a second modification in which the anchor slips of Figs. 1 and 2 are not employed, and Fig. 4, a view of like character as Fig. 3, but showing a modification thereof. Fig. 5 is a plan view of a set of pipe-supporting slips.

On Fig. 1, the casing head body is composed of two vertical hollow members 1 and 2, the latter being superimposed on the former. The member 1 has at its top the horizontal flange 3 on which is seated the horizontal flange 4 on the bottom of the member 2, bolts 5 being employed to secure the flanges together.

Into the lower end of the member 1 the upper end of the casing 6 is screwed. The member 1 has between its ends the usual threaded openings 7 into which the usual pipes, not shown, may be connected for the discharge of oil or gas from the casing head. The upper portion of the member 1 has its interior surface or wall above the openings 7 tapered downwardly to receive the annular series of slips 8 having their outer faces tapered downwardly to fit and slide upon the said tapered surface in the member 1. The slips have upwardly inclined teeth 9 to bite into the exterior wall of the tubing 10 and support the same at any adjusted position thereof. The upper ends of the slips are loosely connected together by the ring 11 attached to the slips by the screws 12 which are smaller than the holes which they occupy in the ring.

The annular series of anchor slips 13 have their lower ends seated on the ring 11, their outer faces being tapered upwardly and their inner vertical faces being provided with downwardly inclined teeth 14 for engagement with the outer surface of the tubing 10. 15 is a ring slidable vertically in the member 2 and having its inner face tapered upwardly to fit the taper on the slips 13. The ring 15 telescopes over the slips 13 and prevents their radial outward movement and by its downward movement causes the slips 13 to move inwardly or toward the tubing 10 or the axial center of the body. The upper end of the ring 15 supports the ring 16 which forms the base or bottom of a stuffing-box containing the packing rings 17 slidable in the member 2. The gland 18 rests on the top of the packing rings and is adjusted by the bolts 19 connected in a well known manner to the flange 20 on the member 2 and to the flange 21 on the gland.

In one method of assembling the parts, the tubing is lowered in the member 2 to the desired position whereupon the supporting or landing slips 8 are driven tightly into the tapered opening in the member 1. The member 2 may then be secured to the member 1 and the slips 13 and the ring 15 dropped into their places. The ring 16, the packing rings 17 and the gland 18 are assembled into the position shown. Then the bolts 19 are connected to both the flanges 20 and 21 and the nuts thereon are tightened. The downward movement of the gland causes the packing to be compressed so as to seal the annular space between the member 2 and the tubing 10, to force the ring 15 downwardly and cause the anchor slips to grip the tubing tightly, and to prevent the slips 8 from rising or becoming loose. Obviously the order given above for assembling the parts may be somewhat

varied. By making the casing head body into separate detachable members, the assembly of the internal parts and their removal and replacement are very much facilitated.

In Fig. 2, the ring 11 is omitted and the anchor slips 13 rest on the ring 22 supported on a shoulder 23 which may be the inner portion of the top of the member 1, as shown. Otherwise the parts of Figs. 1 and 2 are the same. Obviously the ring 11 could be retained in Fig. 2, if desired.

In Fig. 3, the ring 15 and the anchor slips 13 have been omitted, the ring 16 resting directly on the ring 11. This construction may be used where the gas pressure encountered in the well is relatively low and there is no danger of the tubing being blown from the well.

In Fig. 4, the structure is the same as in Fig. 2 except that the rings 15 and 16, and the slips 13 are omitted, the packing rings resting directly upon the ring 22.

Other modifications of our invention may be made without departing from the spirit of the invention as defined in the appended claims.

We claim:—

1. In a casing head, a vertical hollow body member having a downwardly tapering interior wall, an annular series of slips having their outer surfaces correspondingly tapered and slidably supported on the wall and adapted to engage and support a vertical pipe in the body member, and packing seated in the body member and above the series of slips and adapted to surround the pipe, means for compressing the packing to seal the space between the pipe and the body member, in combination with a series of inverted slips within the casing head and between the first series of slips and the packing and means for forcing the inverted slips toward the pipe.

2. In a casing head, a vertical hollow body member having a downwardly tapering interior wall, an annular series of slips having their outer surfaces correspondingly tapered and slidably supported on the wall and adapted to engage and support a vertical pipe in the body member, and packing seated in the body member and above the series of slips and adapted to surround the pipe, and means for compressing the packing to seal the space between the pipe and the body member, in combination with a series of inverted slips within the casing head and between the first series of slips and a ring having a downwardly tapered inner wall for engagement with the outer face of the inverted slips and adapted to be forced downwardly by the packing when subjected to the said compressing means.

3. In a casing head, a vertical hollow body adapted to receive a vertical pipe, a set of slips in the body to support the pipe, a series of slips in the body and above the first slips to engage the pipe and prevent its upward travel in the body, an annular wedge seated in the body and movable downwardly to force the second series of slips toward the pipe, a packing seated in the body and above the wedge and operatively related to the wedge to move it downwardly, and a gland to compress the packing and cause it to operate the wedge downwardly.

4. In a casing head, a vertical hollow body adapted to receive a vertical pipe, a set of slips in the body to support the pipe, a series of slips in the body and above the first slips to engage the pipe and prevent its upward travel in the body, an annular wedge seated in the body and movable downwardly to force the second series of slips toward the pipe, a packing seated in the body and above the wedge and operatively related to the wedge to move it downwardly, a gland to compress the packing and cause it to operate the wedge downwardly, and a ring in the body between the two series of slips, for supporting the second series of slips.

5. In a casing head, a vertical hollow body adapted to receive a vertical pipe, a set of slips in the body to support the pipe, a series of slips in the body and above the first slips to engage the pipe and prevent its upward travel in the body, an annular wedge seated in the body and movable downwardly to force the second series of slips toward the pipe, a packing seated in the body and above the wedge and operatively related to the wedge to move it downwardly, a gland to compress the packing and cause it to operate the wedge downwardly, and a ring supported by the body and within the same between the two series of slips, for supporting the second series of slips.

6. In a casing head, a vertical hollow body adapted to receive a vertical pipe, a set of slips in the body to support the pipe, a series of slips in the body and above the first slips to engage the pipe and prevent its upward travel in the body, an annular wedge seated in the body and movable downwardly to force the second series of slips toward the pipe, a packing seated in the body and above the wedge and operatively related to the wedge to move it downwardly, and a gland to compress the packing and cause it to operate the wedge downwardly, the second series of slips preventing the first series of slips from rising in the body.

In testimony whereof we hereunto affix our signatures.

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