Nov. 5, 1935. F. H. BARNEY ET AL 2,019,838

TUBING HEAD

Filed Oct. 29, 1934 2 Sheets-Sheet 1

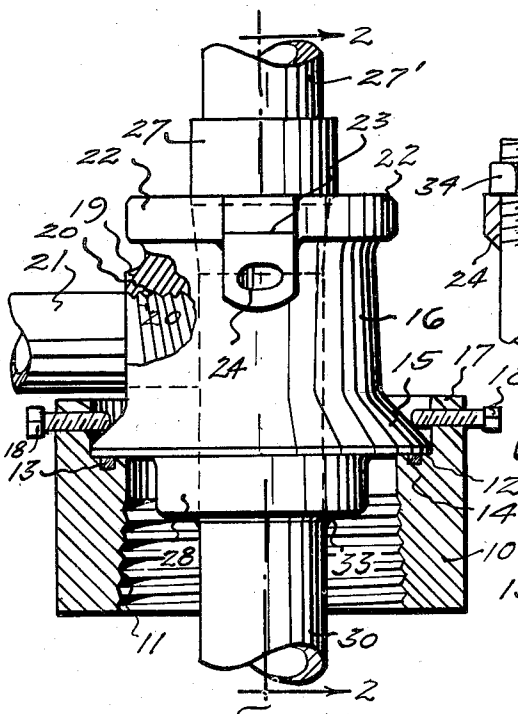


Fig. 1

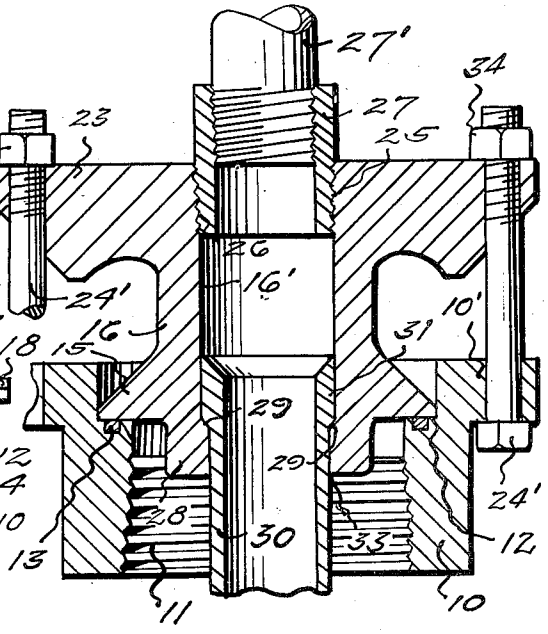


Fig. 2

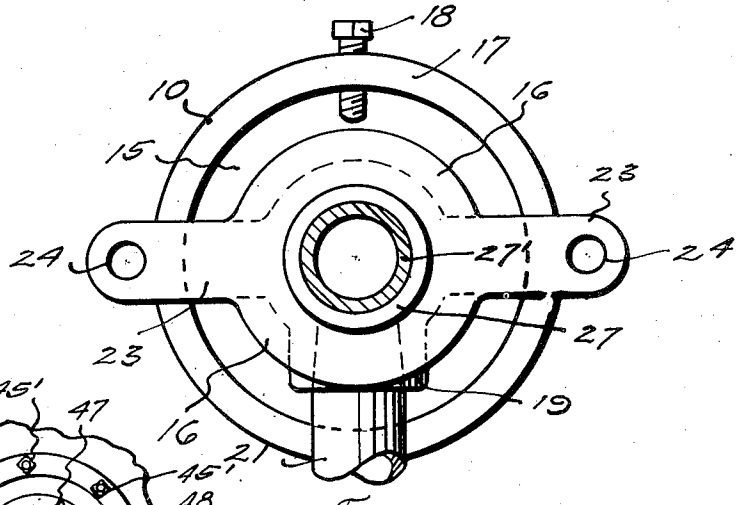


Fig. 3

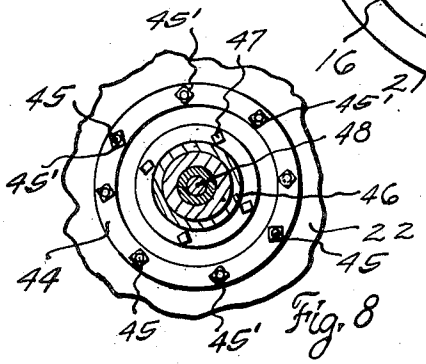


Fig. 8

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TUBING HEAD

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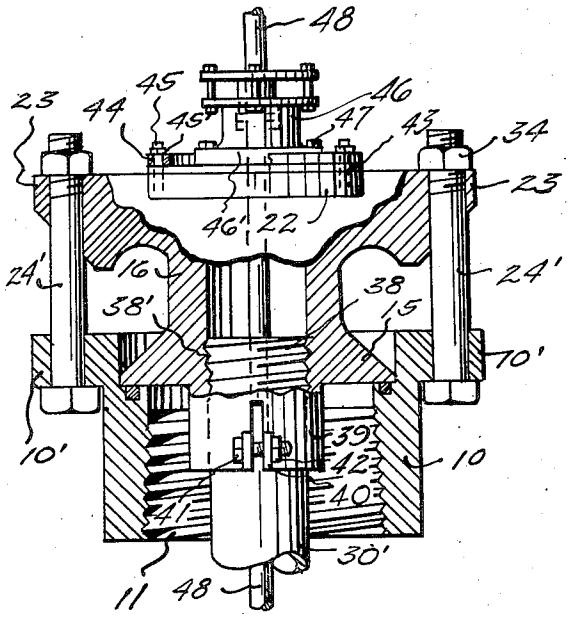


Fig. 4

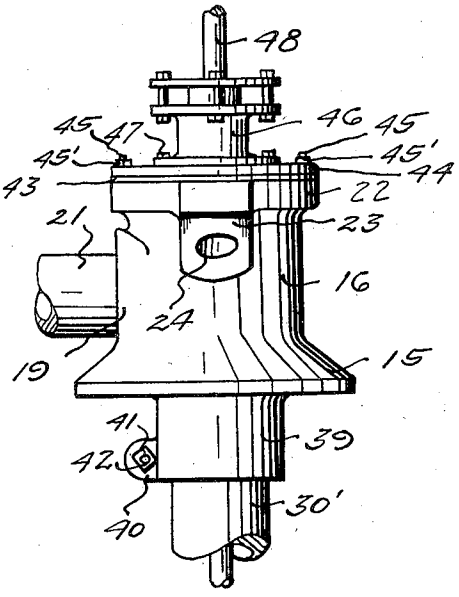


Fig. 5

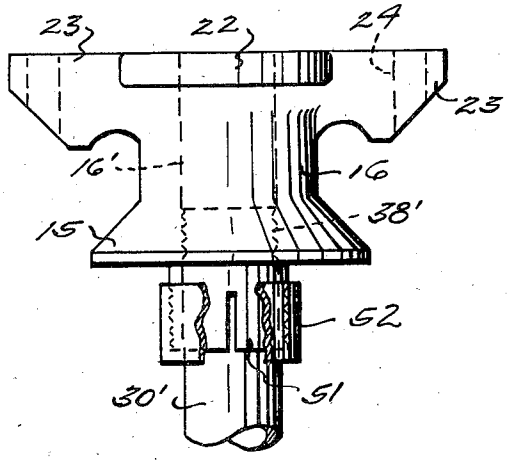


Fig. 6

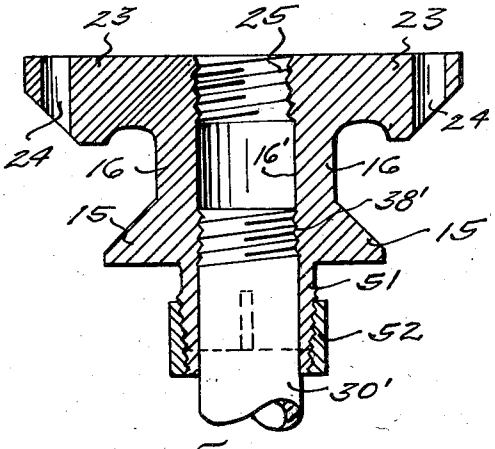


Fig. 7

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UNITED STATES PATENT OFFICE

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TUBING HEAD

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Application October 29, 1934, Serial No. 750,510

10 Claims. (Cl. 285—22)

This invention relates to new and useful improvements in tubing heads.

One object of the invention is to provide an improved tubing head of the safety type having a tubing nipple securely fastened in its bottom below the lead line which extends from the side of the head.

Another object of the invention is to provide means at the bottom of the tubing head for securely fastening the nipple therein against upward and downward movement.

A further object of the invention is to provide a tubing head having elevator ears and hold-down bolts, whereby it may be securely fastened to the usual casing head.

Another object of the invention is to provide a tubing head which will lend itself to various stuffing box mountings, to the end that the box may be built into the upper end of the bore of the head or it may be mounted on a flexible support to provide a floating box.

A construction designed to carry out the invention will be hereinafter described, together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings, in which an example of the invention is shown, and wherein:

Figure 1 is an elevation of a tubing head constructed in accordance with the invention and mounted on a casing head, which is shown in section,

Figure 2 is a vertical sectional view of the head taken on the line 2—2 of Fig. 1,

Figure 3 is a plan view,

Figure 4 is a view partly in elevation and partly in section, showing the tubing head equipped with a floating stuffing box,

Figure 5 is an elevation of the same, taken at right angles to Figure 4,

Figure 6 is an elevation of another form of tubing head,

Figure 7 is a transverse, vertical sectional view of the same, and

Figure 8 is a horizontal cross-sectional view, taken through the packing of the stuffing box on Figure 4.

In the drawings the numeral 10 designates a casing head of any suitable type. The casing head is provided with the usual tapered, internally screw-threaded socket 11 at its lower end for receiving the upper end of the casing of the well. The upper end of the casing head is formed with the regular internal annular shoulder 12. An annular packing ring 13 is mounted in a groove 14 in the top of the shoulder 12. The flaring base 15 of a tubing head 16, which will be described later, is mounted on the shoulder and is packed-off by the ring 13. An upstanding annular flange 17 surrounds the outer edge of the shoulder and is made integral with the casing head. Set screws 18 are threaded through the flange to engage over the flaring base 15 of the tubing head for holding the same on the shoulder 12 of the casing head against upward displacement. It is pointed out that the set screws tightly hold the tubing head on the shoulder and the packing ring 13, so that a fluid-tight seal is formed therebetween and leakage from the casing is prevented.

The tubing head 16 is provided with an axial bore 16' extending therethrough. The body of the tubing head is provided with a boss 19 which is formed with an internally screw-threaded port 20. A pipe 21 constituting the lead off line is screwed into the port which communicates with the bore 16'. An annular top flange 22 is formed at the upper portion of the body of the tubing head. A pair of the usual elevator arms 23 are made integral with the top flange and are positioned diametrically opposite each other. These arms are for the links of an elevator to engage under for lifting the tubing head and is assembly. The upper end of the bore 16' (Fig. 1) is provided with an internally screw-threaded socket 25 for receiving the screw-threaded end 26 of a nipple 27 into which the pipe 27' of the superstructure may be screwed.

The lower end of the tubing head is formed with a depending collar 28 (Figs. 1 and 2). The diameter of the bore of the collar is less than the diameter of the bore 16' of the tubing head; thus, an annular beveled shoulder 29 may be formed therebetween.

A tubing nipple 30 having an upset head 31 is mounted in the bore 16' and the collar. The head is undercut complementary to the shoulder 29 so as to rest thereon and form a fluid-tight, metal to metal seal. The upper end of the head 30 is beveled inwardly so as to form a guide for directing tools, valves and the like into said nipple. The nipple fits snugly in the reduced bore of the collar and extends below the same.

For securing the nipple 30 in the collar, a weld 33 may be formed therebetween. By thus welding the nipple in the tubing head, said nipple is held against vertical displacement, while the load is carried on the shoulder 29. The nipple may be fastened in the tubing head in various ways.

As an additional means for holding the tubing head in position within the casing head, the arms 23 are provided with vertical bolt holes 24 and the casing head 10 is formed with diametrically opposite ears 10'. Hold-down bolts 24' have their heads engaging under the ears and extend upwardly through said ears and through the holes 24. Nuts 34 screwed on the upper ends of the bolts serve to draw up the bolts and thus fasten the tubing head 16 in the casing head. This fastening takes the place of the set screws 18.

Instead of the nipple 27 an ordinary stuffing box may be screwed into the socket 26 at the upper end of the bore 16' for receiving a sucker rod or other reciprocating element.

In Figures 4 and 5 another form of mounting the stuffing box and of fastening the nipple in the tubing head has been shown. The nipple 30' has screw threads 38 at its upper end in place of the upset head 31. A split collar 39, integral with the tubing head 16 depends from the bottom thereof concentrically of the bore 16'. A screw threaded socket 38' is formed in the lower end of the bore 16' immediately above the collar. The bore of the collar is sufficiently larger than the socket to permit the screw-threaded end of the nipple 30' to be passed therethrough to engage in the socket 38'. The collar is provided at its lower end with a pair of outwardly directed, radially extending ears 40. These ears are mounted one on each side of the split in the collar 39. A bolt 41 passes through the ears and is provided with a nut 42 for drawing the ears close together, thereby tightening the collar around the nipple for supporting the same in addition to its support in the socket.

While any fitting or stuffing box may be mounted at the top of the head, in Figures 4 and 5 a flexible ring 43 is mounted on the upper surface of the top flange 22. A narrow retaining ring 44 is secured on the marginal portion of the flexible ring, by stud bolts 45 extending up through both rings and provided with nuts 45' for securing said rings in place. The base flange 46 of a stuffing box 46' is fastened to the flexible ring by bolts 47 having their heads embedded in the under side of said ring 43. The tubing head may be held on the casing head in any suitable manner. It is pointed out that a floating mounting for the stuffing box is thus provided. The stuffing box may wobble and move laterally with the rod or line 48 passing through said box, thereby preventing bending of the rod and excessive wear.

In Figures 6 and 7, we have shown another form of the invention. The nipple 30' is screwed into the socket 38', the same as in Figures 4 and 5. A split collar 51, similar to the collar 39, but free of ears, is made integral with the tubing head 16 and depends from the bottom thereof concentrically of the bore 16'. The collar 51 is externally screw-threaded and slightly tapered, so that a circular nut 52 may be screwed thereon. It will be seen that by screwing the nut on the collar 51, the latter will be tightened around the nipple below the screw-threads on the upper end of said pipple and, thereby additionally supporting the nipple as well as preventing it from unscrewing from the socket.

In all forms, the tubing nipple is fastened against both upward and downward displacement. It is also adequately supported by the head. The collars 28, 39 and 51 act as braces to prevent the nipples breaking off at the base of the tubing head. They also tend to defeat the nipple 30' from stripping its threads and pulling out of the socket 38'.

What we claim and desire to secure by Letters Patent is:

1. A tubing head comprising, a body having an axial bore therethrough and provided with means for mounting it on a casing head, a collar depending from the bottom of said head concentrically of the bore of the body, a tubing nipple extending through the collar and fastened in said head, and exterior means for fastening the collar to the nipple.

2. A tubing head comprising, a body having an axial bore therethrough and having means for mounting it on a casing head, a shoulder in the lower portion of the bore of the body, a collar depending from the bottom of the body concentric to the bore thereof, a tubing nipple extending into the bore of the body and having an upset head resting on the shoulder, and means for holding the nipple against upward displacement.

3. A tubing head comprising, a body having an axial bore therethrough and having means for mounting it on a casing head, a shoulder in the lower portion of the bore of the body, a collar depending from the bottom of the body concentric to the bore thereof and extending below the shoulder, a tubing nipple having an upset head resting on the shoulder and the upper edge of the head being beveled inwardly, whereby a guide for the insertion of tools is formed, and means for holding the nipple against upward displacement.

4. A tubing head comprising, a body having an axial bore therethrough and provided with means for mounting it on a casing head, a shoulder in the lower portion of the bore of the body, a collar depending from the bottom of the body concentric to the bore thereof, a tubing nipple extending into the bore of the body and having an upset head resting on the shoulder, and a weld for holding the nipple against upward displacement.

5. A tubing head comprising, a body having an axial bore therethrough and provided with means for mounting it on a casing head, a collar depending from the bottom of said head concentrically of the bore of the body, a tubing nipple extending through the collar and held in the core of the body, and a weld for fastening the collar to the nipple.

6. A tubing head comprising, a body having an axial bore therethrough and provided with means for mounting it on a casing head, a tubing nipple extending downwardly and communicating with the bore of the body, means at the lower end of the bore of the body for holding the nipple against upward or downward displacement, and means depending from the bottom of the body for additionally supporting the nipple.

7. A tubing head comprising, a body having an axial bore therethrough and provided with means for mounting it on a casing head, a tubing nipple extending downwardly and concentrically with the bore of the body, a screw-threaded socket at the lower end of the bore of the body for holding the nipple against upward and downward displacement, and means depending from the bottom of the body for additionally supporting the nipple.

8. A tubing head comprising, a body having an axial bore therethrough and provided with means for mounting it on a casing head, a tubing nipple extending downwardly and concentrically with the bore of the body, a screw-threaded socket at

the lower end of the bore of the body for holding the nipple against upward and downward displacement, and a split clamping collar depending from the bottom of the body for additionally supporting the nipple.

9. A tubing head comprising, a body having an axial bore therethrough and provided with means for mounting it on a casing head, a tubing nipple extending downwardly and communicating with the bore of the body, means at the lower end of the bore of the body for holding the nipple against upward or downward displacement, a split collar depending from the bottom of the body concentric to the bore of the body and surrounding the nipple, and means for tightening the collar around the nipple.

10. A tubing head including, a body having an axial bore therethrough and provided with means for mounting it on a casing head, a bracing support depending from the bottom of the head and having a bore extending coaxially with the bore of the head, a tubing nipple extending upwardly through the bracing support and held in the bore of the head, and means for fastening the support and the nipple together to hold it against vertical displacement, the bracing means extending below the section of the tubing which is held in the bore of the head, whereby the tubing is braced against lateral movement and breaking off at the head.

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