Sept. 6, 1949. A. J. PENICK 2,481,035

WELL HEAD ASSEMBLY

Filed Jan. 19, 1946 2 Sheets-Sheet 1

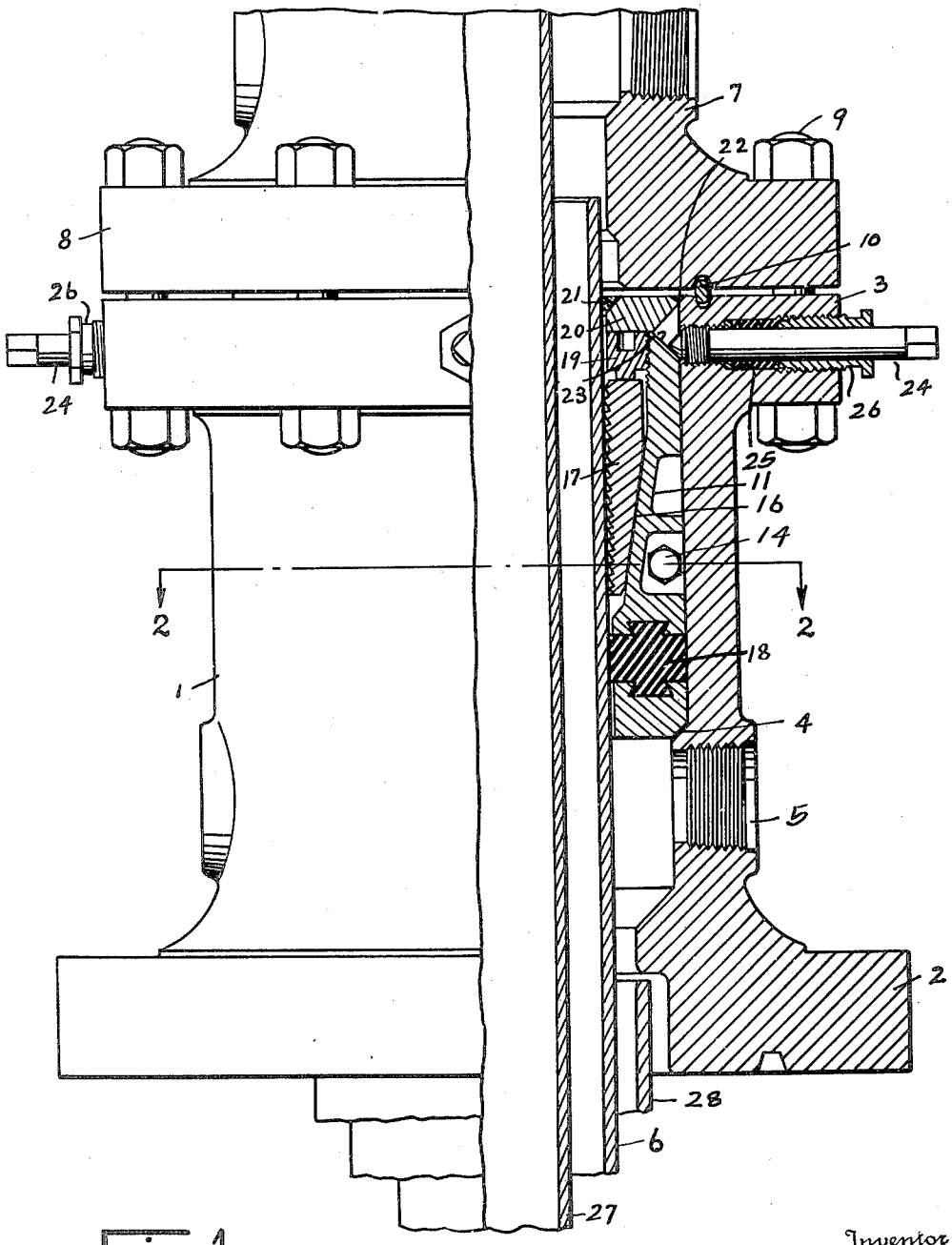


Fig. 1.

Inventor
Arthur J. Penick

By E. V. Hardaway
Attorney

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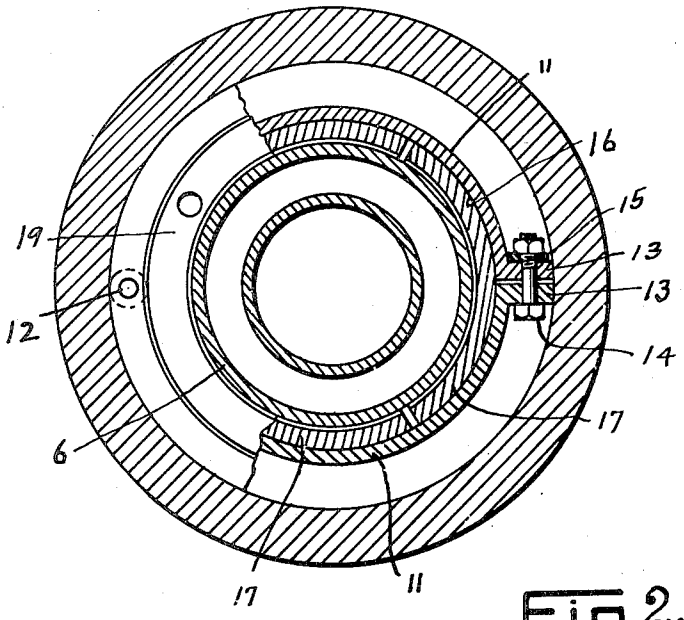


Fig. 2.

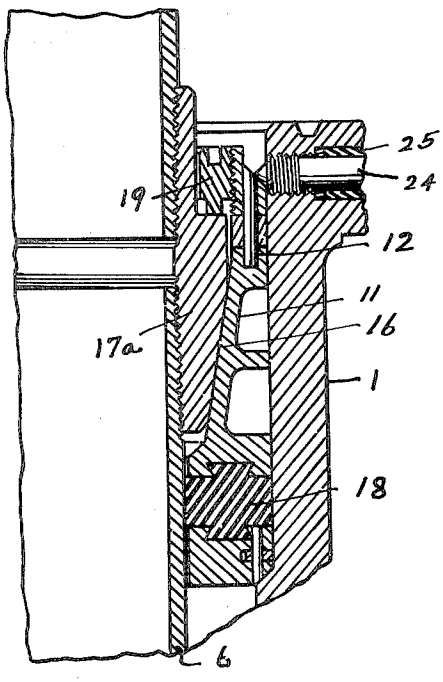


Fig. 3.

Inventor
Arthur J. Penick

By E. V. Hardway
Attorney

Patented Sept. 6, 1949

2,481,035

UNITED STATES PATENT OFFICE

2,481,035

WELL HEAD ASSEMBLY

Arthur J. Penick, Houston, Tex., assignor to Oil Center Tool Company, Houston, Tex., a corporation of Texas

Application January 19, 1946, Serial No. 642,354

6 Claims. (Cl. 285—22)

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This invention relates to a well head assembly.

An object of the invention is to provide, in a well head, novel means for anchoring the upper end of a well pipe in the head.

It is another object of the invention to provide, in a well head, a novel type of bowl, seated in the head and which includes a seal ring, incorporated therein to form a seal with the pipe through the head and with the surrounding head member.

It is a further object of the invention to provide, in a well head, a bowl of the type specified which is formed of sections hinged together with means for securing said sections about a pipe.

A further feature of the invention resides in the assembly with said bowl of means seated therein and in engagement with, and supporting, the pipe and having a ring threaded into the bowl and in engagement with the pipe supporting means to secure the latter against upward movement in the bowl.

It is a still further feature of the invention to provide, in a well head assembly, a bowl of the character described, pipe supporting means therein, a ring threaded into the bowl to secure the pipe supporting means in the bowl and a seal ring on the assembly welded to the pipe, through the bowl, all the way around and also welded to the outside head member, all the way around, to thus form a seal, both on the lower end and upper end of said assembly to prevent the passage of well fluid therethrough.

With the above and other objects in view the invention has particularly 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 drawings, wherein:

Figure 1 is a side elevation of the assembly shown partly in section.

Figure 2 is a cross sectional view taken on the line 2—2 of Figure 1, and

Figure 3 is a fragmentary vertical sectional view of another embodiment.

Referring now more particularly to the drawings, wherein like numerals of reference designate the same parts in each of the figures, the numeral 1 designates a casing head which, in the present illustration, has an external lower end flange 2 to seat on a braden head beneath.

As shown the casing head has an external upper end flange 3 and is provided with an inside downwardly converging seat 4 with an outlet opening 5 beneath the seat for the connection of a flow line thereto.

The upper end of the pipe 6 is anchored in the

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casing head and thereafter the tubing head 7 will be mounted on the casing head.

As illustrated the tubing head has an external lower end flange 8 which is bolted to the upper end flange 3 by the bolts 9 and these flanges have registering grooves to receive a seal ring 10.

The numerals 11, 11 designate similar sections of a bowl which is substantially cylindrical in external contour and which is fitted downwardly into the casing head and rests on the seat 4. The sections of the bowl are hinged together, at one side, by the hinge 12.

To reduce their weight they are externally cored, as illustrated in Figure 1 and at their free margins are formed with the mating flanges 13, 13 through which the bolt 14 is fitted. This bolt has a head on one end and a nut screwed onto the other end with a washer 15 between the nut and the corresponding flange which is formed of resilient material to reduce the liability of the threads being stripped in case the bowl is subjected to excessive strain.

The bowl has an inside inwardly tapering seat 16. Within the bowl are the slips 17 whose outer sides are tapered to conform to the taper of the seat 16 and whose inner sides are toothed to engage the pipe 6.

Incorporated into the lower end of the bowl there is a seal ring 18 formed of rubber or similar resilient material and which is molded into dove tailed grooves above and beneath, as shown in Figure 1. This seal ring forms a seal around the pipe 6 as well as with the inner wall of the casing head 1 and will be maintained expanded to maintain said seals by the load thereon.

Screwed into the upper end of the bowl there is a ring 19 which abuts the upper ends of the slips 17 and maintains the same seated closely in the seat 16.

When the bowl, slips 17 and ring 19 are assembled about the upper end of the pipe 6 during the final lowering operation incident to lowering said pipe in the well, said assembly may be lowered through the blow out preventer, which will be at that time, installed on the casing head, and when the landing operation has been completed the blow out preventer can be removed and if desired a sealing ring 20 may be located on the hold down ring 19 and may be welded around the pipe by the weld 21 and around the casing head by the weld 22 thus sealing the head against the escape of well fluid.

The upper end of the bowl is formed with an upwardly and inwardly tapering seat 23 and threaded radially through the flange 5 there are

the hold down bolts 24 and whose inner ends are tapered and bear against the face 23.

If for any reason additional pressure should be applied to the seal ring 18 to expand the same to prevent leakage the bolts 24 may be screwed inwardly to apply such pressure.

The bolts 24 are surrounded by seals 25 which are maintained under pressure by the glands 26 which are screwed into the flange 3.

After the assembly has been installed, as hereinabove explained, the tubing head 7 may then be mounted and secured in place.

Another embodiment of the invention is illustrated in Figure 3 wherein the coupling 17a is substituted for the slips 17. This coupling connects adjacent sections of the pipe 6 and it is tapered downwardly, externally, and is seated in the seat 16 of the bowl, with the hold down ring 19 in engagement therewith and holding the pipe 6 against upward movement.

In this embodiment the welded ring 20 has been omitted but may be used if desired.

In either of the embodiments the inner pipe 27 may be anchored in the tubing head 7 above and the outer pipe 28 may be anchored in the braden head beneath in the manner shown in either Figure 1 or 3 for anchoring the pipe 6 in the casing head 1.

The drawings and description are illustrative merely while the broad principle of the invention will be defined by the appended claims.

What I claim is:

1. In a well head assembly having a tubular head member provided with an internal seat and a well pipe extending through the head, a bowl unit adapted to seat within the head member and comprising, a bowl proper, pipe supporting means within the bowl, a single sealing element secured to the lower end of the bowl for sealing between the bore of the head member and the well pipe when the unit is seated within the head, and an abutment ring below and attached to the sealing element and engaging the internal seat within the tubular head member, said pipe supporting means having engagement with the well pipe extending through the head member, whereby the weight of said pipe may be imposed through the pipe supporting means and through the bowl upon the sealing element to distort the same into sealing position with the pipe and head member.

2. In a well head assembly a bowl unit as set forth in claim 1, together with a retaining means mounted in the bowl and co-acting with the pipe supporting means for retaining said means within the bowl.

3. In a well head assembly, a bowl unit as set forth in claim 1, with a retaining ring screwed into the upper end of the bowl and engaging the pipe supporting means within the bowl, and a metallic sealing ring above said retaining ring welded to the well pipe and to the head member to permanently restrain the bowl unit against upward displacement.

4. A pipe hanger assembly for supporting a well pipe which extends axially through a well casing head having an internal seat and including, a bowl formed of pivoted sections whereby said bowl may be engaged about the pipe while said pipe extends through said head, a single annular sectional sealing element secured to the lower portion of the bowl and arranged to seal around the pipe, an abutment ring disposed below and secured to the sealing element, the outer diameter of the sealing element and of the bowl being of a size to engage within the bore of the casing head whereby when said bowl and element are within the head the sealing element also seals with the bore of said head, a seat within the bore of the bowl above the sealing element, and pipe supporting means mounted within said bowl for engaging the well pipe to suspend said pipe from the bowl, the weight of the supported pipe being imposed through the pipe supporting means and through the bowl upon the sealing element to distort the same into positive sealing engagement with the pipe and casing head.

5. A pipe hanger assembly as set forth in claim 4, together with means adapted to be mounted in the bowl and co-acting with the pipe supporting means for retaining said pipe supporting means within the bowl, whereby said bowl, pipe-supporting means and sealing element may be engaged about the well pipe and lowered as a unit around the well pipe and into the casing head without disconnecting said pipe from its point of support above the casing head.

6. In a well head assembly consisting of a tubular well head having a seat, control equipment mounted on the head, and a well pipe extending through the control equipment and head and supported by means above said control equipment, the improvement residing in, a pipe hanger unit including, an annular bowl formed of hinged sections having an internal seat, pipe supporting means mounted in the seat of the bowl, a single annular sealing element formed in sections and secured to the lower portion of the bowl, an annular abutment also formed in sections below the sealing element and secured thereto and engageable with the seat within the well head, whereby the bowl, pipe supporting means, sealing element and abutment may be engaged about the well pipe while said pipe is supported at a point above the control equipment and may be lowered as a unitary assembly through the control equipment and into the well head with the abutment engaging the well head seat, said sealing element being adapted to engage both the pipe and the bore of the well head, and said pipe supporting means engaging the well pipe when the hanger unit is within the casing head, whereby at least a portion of the pipe weight is transferred through the pipe supporting means and bowl sections to the sealing element to distort the sealing element into positive engagement with a pipe and well head.

ARTHUR J. PENICK.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,918,810	Hinderliter	July 18, 1933
1,928,259	McCabe	Sept. 26, 1933
2,312,487	Roach	Mar. 2, 1943
2,387,610	Roach	Oct. 23, 1945