Nov. 7, 1939. A. J. PENICK ET AL 2,178,699

WELL HEAD

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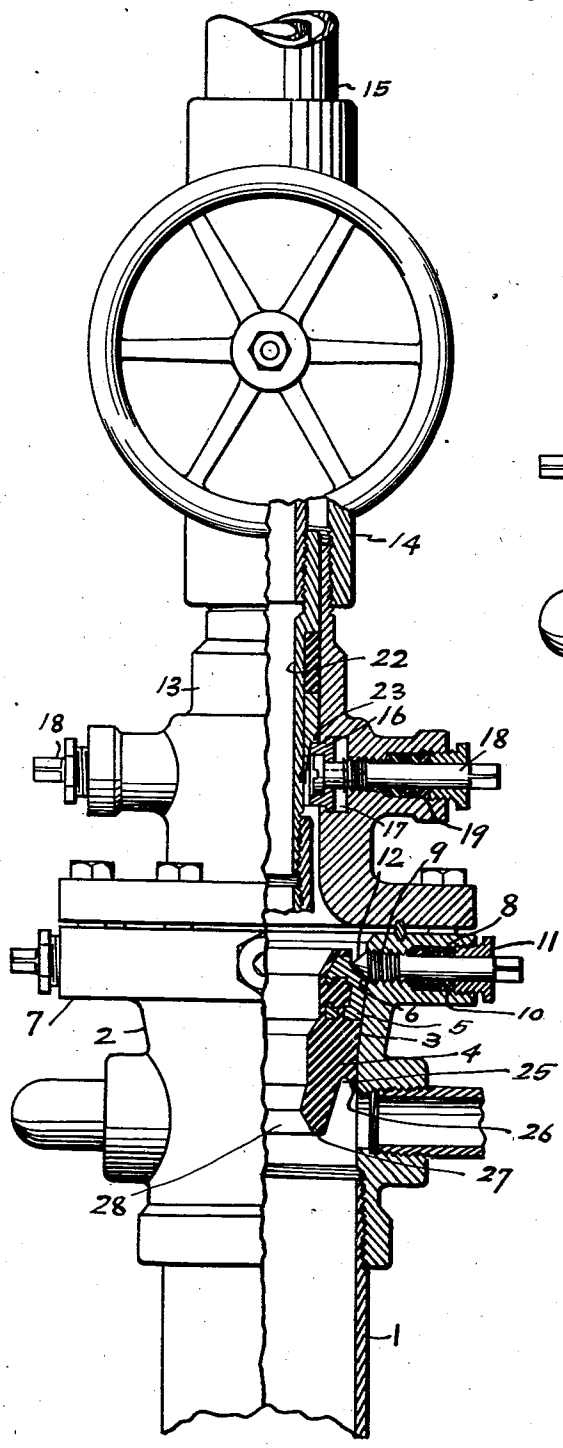


Fig. 1.

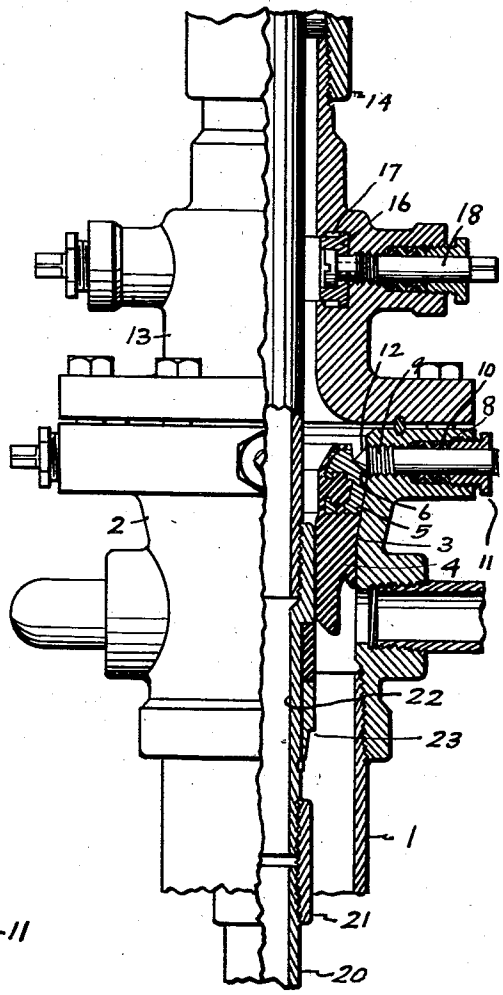


Fig. 2.

Inventors
Arthur J. Penick
Kirby T. Penick

By Edward V. Hardway
Attorney.

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WELL HEAD

Arthur J. Penick and Kirby T. Penick,
Houston, Tex.

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4 Claims. (Cl. 285—22)

This invention relates to a well head and has particular relation to means for releasably securing a pressure head in the casing head.

An object of the invention is to provide in combination a well head adapted to be connected to the top of a casing in a well and having an inside seat with a pressure head on the seat formed of yieldable material such as rubber and shaped to closely surround an inner pipe and whose upper end is preferably molded into, or otherwise attached to, a rigid cage, preferably formed of metal with retractable means for releasably securing the pressure head on its seat.

It is another object of the invention to provide, in the combination above specified, a pressure head whose cage is formed with an external, downwardly tapering face and retractable means having a threaded connection with the well head and having tapering inner ends engageable with the face to hold the pressure head firmly seated on the seat and retractable into released position to release the pressure head, said retractable means having sealing means therearound to prevent the escape of the pressure fluid from the well.

The pressure head herein described is shaped to closely surround an inner tubing and at all times form a fluid tight joint therewith and yet to permit the tubing hanger and tubing couplings to pass therethrough while the well is being tubed up and washed.

With the above and other objects in view the invention has particular relation to certain novel features of construction, operation and arrangement of parts, an example of which is given in this specification and illustrated in the accompanying drawing, wherein:

Figure 1 shows a side elevation of the head, partly in section, showing the well tubing hung in suspended position, and

Figure 2 shows a side view of the head, partly in section, showing the tubing hanger in lowered position beneath the hanger support.

Referring now more particularly to the drawing wherein like numerals of reference designate similar parts in each of the figures, the numeral 1 designates the casing of the well, to the upper end of which the casing head 2 is attached, said casing head having the inside seat 3.

On the seat 3 there is a tubular pressure head which is formed of yieldable material such as rubber and whose upper end is formed with a rigid cage 5 preferably formed of metal and into which the upper end of the rubber is molded. The cage, however, may be attached to the rubber in any preferred manner. This cage is of such construction as to have the external, annular, downwardly and outwardly tapering face 6 extended therearound.

As shown the upper end of the casing head has an external, annular flange 7 having the radial bores 8 whose inner ends are reduced and internally threaded to receive the externally threaded inner ends of the lockdown screws 9 which extend radially through said bores. The lockdown screws are surrounded by packing 10 which is located in the bores and retained therein by the glands 11 which are screwed into said bores to form fluid tight joints.

The inner ends 12 of the lockdown screws are tapered and bear against the face 6 when said screws are in their active positions whereby the pressure head will be secured firmly in place. If it be desired to remove the pressure head the holddown screws may be retracted or screwed outwardly to clear the tapering face 6 and the pressure head may then be lifted off of its seat.

In the present illustration there is shown an adapter 13 whose lower end is outwardly flanged and secured to the flange 7. On the adapter there is shown the conventional gate valve 14 which in turn supports the Christmas tree or other flow connection as 15, only the lower end of the Christmas tree being shown in the present illustration. However, the pressure head and the means for securing the same in place forming the subject matter of the present invention are capable of use in other hook-ups than that shown. In the present illustration there is shown a retractable support 16 which is movable inwardly into active position or outwardly to inactive position in the inside recess 17 of the adapter. This support has a swiveling connection with the inner end of the actuating screw 18 which in turn has a threaded connection with the adapter and is surrounded by conventional stuffing box 19.

The tubing 20 is made up of sections in the usual way connected by couplings 21 and the upper end of the tubing has the hanger 22 attached thereto of any selected form and it is formed with an external shoulder 23 to seat on the support 16 when the latter is in active position. The coupling 21 and the hanger 22 are of approximately the same outside diameter and will readily pass through the support when it is in inactive position.

The lower end of the pressure head 4 has the annular groove 25 therearound forming the external, annular lip 26 which fits closely against the seat 3 and the inwardly converging annular

lip 27 of an inside diameter to fit closely about the tubing 20. Above the lip 27 the pressure head is of an inside diameter to permit the passage of the tubing couplings and tubing hanger and the lip 27 will yield outwardly, as shown in Figure 2, to also permit the passage of the couplings and hanger to the end that the pressure head will at all times maintain a close seal about the tubing, couplings, and hanger during the manipulation of the tubing.

The lower end of the pressure head is beveled downwardly and outwardly to permit the ready movement of the hanger and tubing couplings upwardly therethrough during the process of washing the well and when it is desired to elevate and hang the tubing in its final position as indicated in Figure 1.

The tubing may thus be made up and lowered into the well through the pressure head and manipulated during the process of washing the well and thereafter elevated and hung in final position, meanwhile maintaining a fluid tight seal between the tubing and the casing head.

The drawing and description disclose what is now considered to be a preferred form of the invention by way of illustration only, while the broad principle of the invention will be defined by the appended claims.

What we claim is:

1. In combination a casing head having an inside seat, an adapter on and detachably secured to the casing head, an inside retractable support in the adapter, a hanger adapted to be coupled to a tubing and of an outside diameter to fit snugly in the adapter, means for moving the support radially inwardly into position to engage and support the hanger, sealing means between the supported hanger and the adapter, a pressure head on said seat embodying yieldable material and of an inside diameter to form a fluid tight seal about the tubing, tubing couplings or hanger, retractable means for locking the pressure head on the seat and means for forming a seal around the retractable means.

2. In combination a tubular head, a tubular adapter thereon, a tubing hanger, a tubing coupled to the hanger, sealing means in the head shaped to form a fluid tight seal about the tubing, tubing couplings and hanger upon manipulation of the tubing through the head and means in the adapter above the sealing means movable into active position into engagement with the hanger whereby to support the tubing suspended in the well.

3. In combination a tubular head, a tubular adapter thereon, a tubing hanger, a tubing coupled to the hanger, sealing means in the head shaped to form a fluid tight seal about the tubing, tubing couplings and hanger upon manipulation of the tubing through the head and means in the adapter above the sealing means movable into active position into engagement with the hanger whereby to support the tubing suspended in the well and means forming a fluid tight seal between the hanger and the adapter.

4. In combination a casing head having an inside seat, an adapter on and detachably secured to the casing head, an inside retractable support in the adapter, a hanger adapted to be coupled to a tubing and of an outside diameter to fit snugly in the adapter, means having a sealed engagement with the adapter for moving the support radially inwardly into position to engage and support the hanger, sealing means between the supported hanger and the adapter, a pressure head on said seat embodying yieldable material and of an inside diameter to form a fluid tight seal about the tubing, tubing couplings and hanger as they are manipulated through the casing head, retractable means for locking the pressure head on the seat and means for forming a seal around the retractable means.

ARTHUR J. PENICK.
KIRBY T. PENICK.