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COMBINATION WELLHEAD AND CHRISTMAS TREE

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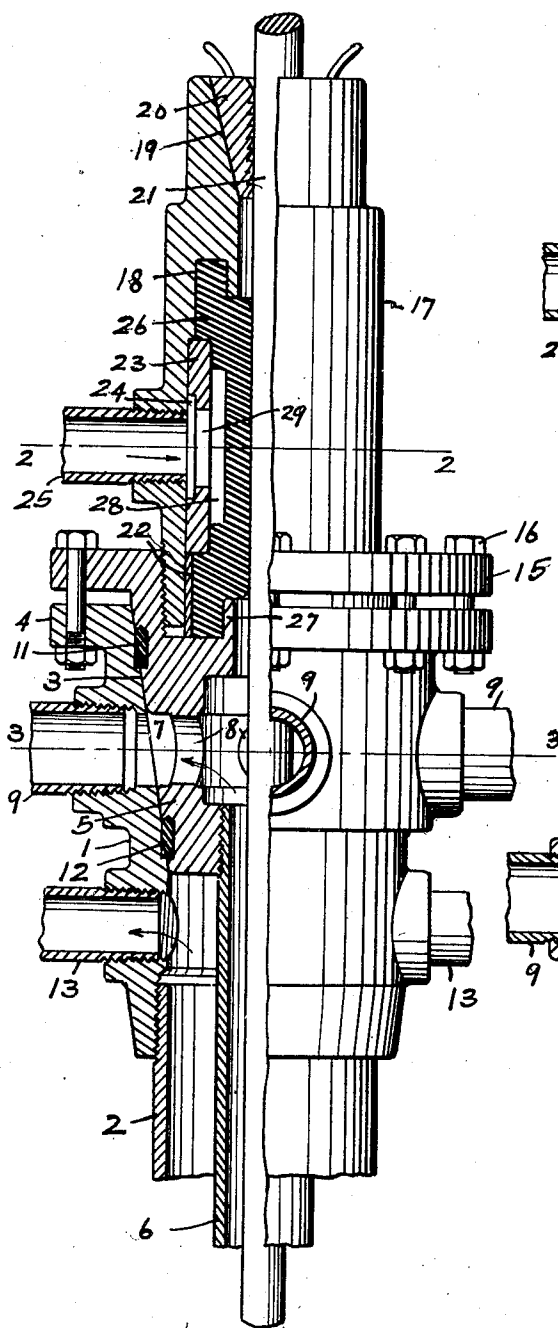


Fig. 1.

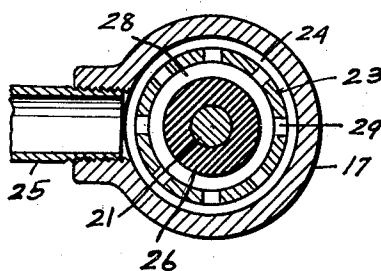


Fig. 2.

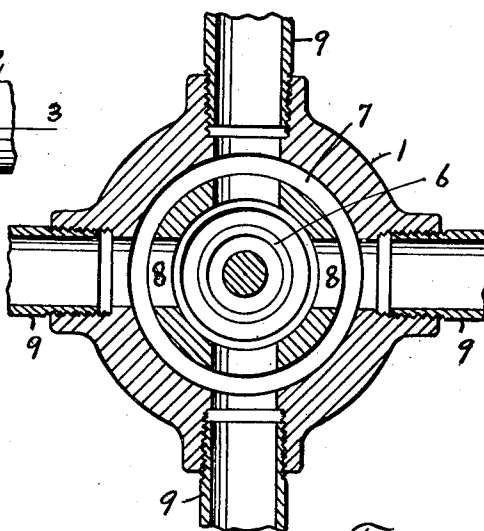


Fig. 3.

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COMBINATION WELLHEAD AND CHRISTMAS TREE

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2 Claims. (Cl. 285-22)

This invention relates to a combination well head and Christmas tree.

An object of the invention is to provide the combination with a casing head, of a tubing hanger therein, and means for taking off the liquid flowing, or being pumped, through the tubing suspended from the hanger, as well as means for taking off the liquid or gas flowing upwardly between the tubing and the casing. The invention is so designed that the head, as well as the piping for handling the well fluid, may be located beneath the derrick floor when the apparatus is being used as a well head and Christmas tree only.

Another object is to provide a novel combination of hanger and head.

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 described in this specification and illustrated in the accompanying drawing, wherein:

Fig. 1 shows a side view of the head, partly in section, showing also the polish rod wiper.

Fig. 2 shows a cross-sectional view taken on the line 2-2 of Fig. 1, and

Fig. 3 shows a cross-sectional view taken on the line 3-3 of Fig. 1.

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 head formed to be connected to the upper end of the well casing 2. The casing head has the downwardly converging seat 3 and the outwardly extending flange 4 at its upper end. Within the head 1, as shown in Fig. 1, there is a tubing hanger 5 which is shaped to conform to the shape of and to fit closely within the head 1. This hanger is tubular in shape and the upper end of the well tubing 6 is screwed into the lower end of it. This tubing hanger has an annular external groove 7 therearound and the openings 8 lead from the interior of the hanger into said groove and leading out from the head 1 opposite said groove are the flow lines 9 which may be controlled by conventional valves.

Above and beneath said flow lines are the upper and lower annular packers 11, 12, which surround the tubing hanger and are seated in grooves therein and whose lower margins also seat in coinciding inside grooves in the head 1, thus effectively breaking the joint between the head and the hanger.

Beneath the packing 12 the flow lines 13 lead

out from the casing head and through which the gas or oil may flow from the casing. These lines 13 are controlled by conventional valves. The upper end of the hanger has an external annular flange 15 and bolts 16 connect the flanges 4 and 15, thereby securing the hanger in the head. Under normal flowing conditions, or when the well is being pumped, the oil will flow up through the tubing 6 into the groove 7 and thence out through the flow lines 9.

As shown in Fig. 1, provision is made for pumping the well in case the same does not flow voluntarily. Screwed into the upper end of the hanger, there is a tubular housing 17 whose upper end is inwardly thickened, forming a downwardly facing inside shoulder provided with an annular groove 18. The housing has the downwardly converging seat 19 at its upper end to receive the wedge-shaped pipe-engaging slips 20 of conventional construction which may be used for supporting the pump rod 21, when the pump is not in operation, or which may be used to support a pipe suspended in the well. Within the lower end of the housing 17 there is a metal ring 22 which fits closely in the housing and whose lower end rests on the upper end of the hanger. Resting on this ring and fitted closely within the housing, there is a metal sleeve 23. This sleeve has an external annular groove 24 and opposite this groove, there is a pressure line 25 which enters the housing. Within the metal sleeve 23 there is a resilient wiper sleeve 26 whose upper end is fitted in the groove 18 and whose lower end rests on the upper end of the hanger 5 and is clamped between the ring 22 and the upwardly extended tubular extension 27 of the hanger. The sleeve 26 has an annular external groove 28 therearound, and the grooves 24, 28, are connected by perforations 29 through the sleeve 23. The wiper sleeve 26 is shaped to closely surround the polish rod 21 of the pump, or other pipe extending through the head. Pressure may be applied through the line 25 to cause the wiper sleeve 26 to closely grip the pump rod and wipe the liquid therefrom during pumping operations.

In some instances, a fire extinguishing agent may be introduced under pressure through one of the lines 9 and out through another line 9 leading to the oil tank or other oil reservoir for extinguishing a fire should the oil become ignited.

At times the hanger 5 and the appendants thereof may be removed and drilling operations carried on in the well, and as the drill stem is withdrawn for changing the drill or for other

purposes, a washing fluid may be forced under pressure through one of the lines 9 to wash the drill stem as it is being withdrawn.

What I claim is:

- 5 1. A well head comprising a casing head adapted to be attached to a well casing and having an inside seat and a flow line, a tubing hanger fitting on the seat, said assembly having an annular groove arranged to register with the
10 flow line, said hanger having a port affording communication from the tubing, suspended from the hanger, to the groove, and packing breaking the joint between the hanger and head above and beneath the groove.

2. A well head comprising a casing head adapted to be attached to a well casing and having an inside downwardly and inwardly tapering seat and a flow line, a tubing hanger shaped to fit on the seat and having an external, annular 5 groove therein arranged to register with the flow line, said hanger having a port affording communication from the tubing, suspended from the hanger, to the groove, packing between the hanger and head above and beneath the groove 10 and a flow line leading out from the casing head beneath the hanger.

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