

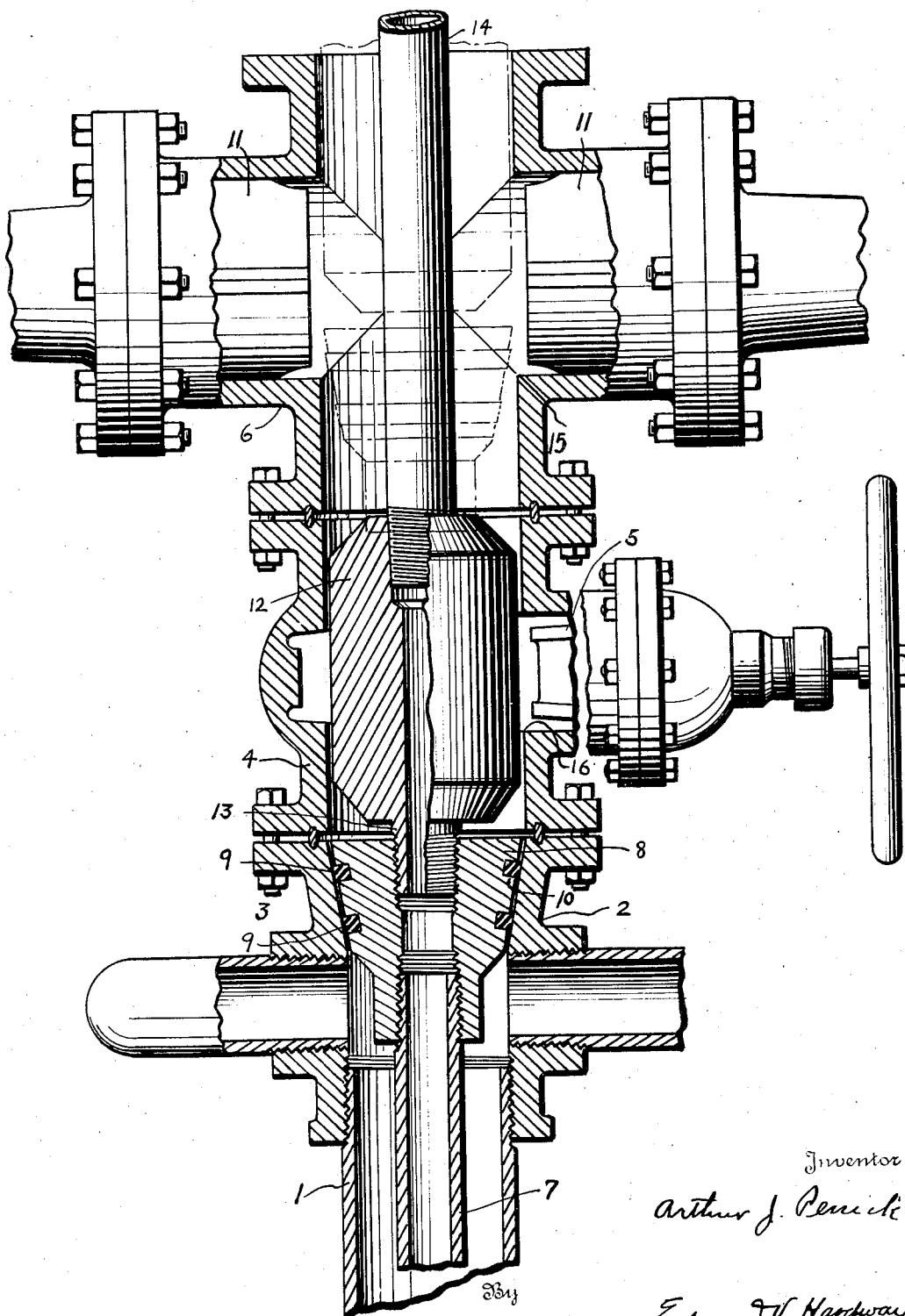
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SEATING TOOL

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SEATING TOOL

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1 Claim. (Cl. 166—15)

This invention relates to a seating tool.

An object of the invention is to provide means for seating the hanger, supporting a well tubing, in the supporting seat for said hanger.

5 In equipping a well for production a flow tubing is lowered into the well and is suspended therein by a hanger. The hanger is equipped with surrounding packing which forms a fluid tight seal between the hanger and the casing head seat when the hanger is landed in home position on the seat. When the tubing is made up and lowered into the well as a final step the hanger is attached to the upper end of the tubing and landed on said seat and it is usually necessary to lower the hanger through equipment, such as a blowout preventer on a gate valve in landing on the seat. This equipment through which the hanger passes usually has inside projections, or shoulders, and if the derrick is out of plumb, or if the well casing is not exactly vertical, the hanger will be swung to one side of the blowout preventer, valve casing, or other equipment through which it may pass so that the hanger packing will come into contact with one of said shoulders and the packing will become mutilated thereby to such an extent that it will not form a perfect seal when the hanger is landed thus permitting, to some extent at least, the escape past the hanger of the well fluid, under pressure, and this escape of fluid, under pressure, which usually carried gritty substances, will cut out and enlarge the escape passageway thus destroying the adjacent parts and the leak will gradually increase.

35 It is an object of the present invention to provide a seating tool which forms a guide as it passes through the equipment, above, in landing the hanger and which will ride against the inner wall of said equipment hold the packing away from projecting shoulders or angles in the equipment through which the hanger is lowered and the hanger packing will be preserved in its original state until it is landed and a perfect seal will thus be formed between the hanger and the casing head seat.

40 It is another object of the invention to provide the combination with a hanger for tubing of a guide for guiding the hanger through the equipment, through which it is lowered, and which may be readily detached and removed when its work has been performed.

45 With the above and other objects in view, the invention has particular relation to certain novel features of construction and use, an example of

which is given in this specification and illustrated in the accompanying drawing, wherein:

The figure shows a vertical, sectional view of the well head, showing a gate valve and blowout preventer and showing the seating tool 5 therein connected to the tubing hanger as in use.

Referring more particularly to the drawing, the numeral 1 designates a well casing having a casing head 2 thereon provided with an inside, downwardly converging seat 3. 10

In the present illustration a gate valve casing 4, having a gate valve 5 therein, is mounted on the casing head and on the gate valve casing there is shown mounted a ram type blowout preventer 6 of any conventional construction. 15

The casing head, gate valve and blowout preventer constitute a well head, but the seating tool is adaptable for use for lowering the hanger through any type of similar equipment or other type of well head. 20

When the well is completed and ready to be brought into production, a well tubing 7 is lowered into the well and a tubing hanger 8 is connected to the upper end of the tubing and seated on the seat 3 to support the tubing. As shown, this hanger has the external surrounding packing forming a seal between the hanger and the seat 3. In the present instance this packing is shown as composed of packing rings 9 seated in external, annular grooves 10 around the hanger and whose outer surfaces extend outwardly beyond the hanger. 25 30

The valve 5 is shown in open position and the rams 11, 11 of the blowout preventer 6 are shown retracted. The tubing 7 may thus be lowered into the well in the usual way. The hanger 8 is shown to be tubular to permit the flow of the well fluid upwardly therethrough when the equipment is finally assembled. The hanger is screwed to the upper end of the upper section of the tubing and the upper end of the passageway through it is internally threaded. When the hanger is ready to be landed on the seat 3 the sealing tool 12 is attached to the hanger. The tool 12 also has an axial passageway through it, as shown, and in the illustration shown the tool 12 has a depending nipple 13 around said passageway which is externally threaded to be screwed into the hanger. A letting in string 14 may then be attached, by means of threads, to the upper end of the tool 12 and the assembly lowered until the hanger lands in place. The tool 2 is of a general cylindrical form having its upper and lower ends beveled as shown so that it will not hang on any projections 35 40 45 50 55

encountered during the lowering operation. The inside diameter of the blowout preventer casing and the valve casing are substantially the same and the tool 12 is of an outside diameter to pass, rather snugly through said casings.

It is to be noted that the seating face of the hanger tapers downwardly and the diameter of the upper end of the hanger is substantially the same as the diameter of the seating tool. As the assembly is lowered through said casings if the casings are not standing vertically or if the derrick is not plumb the assembly will swing slightly to one side of the axial line of said casings and the seating tool 12 will ride against the casing wall, as indicated in dotted lines in the figure, so that the packing will be held clear of any inside projections or angles such as the shoulders 15 and 16 and will thus be protected against mutilation.

When the hanger is landed in home position the letting in string may be turned in a direction to unscrew the threads connecting the tool to

the hanger and the tool and letting in string removed.

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 claim.

What I claim is:

A seating tool for lowering a tubing hanger, having packing on its external face, into a tubular well head having an internal projection, said tool comprising a tubular guide of a length, axially, greater than that of the hanger and having a cylindrical, external surface and formed with beveled ends, means for attaching the guide to the hanger, means for lowering the assembled guide and hanger into the head, the cylindrical surface of the guide being shaped to ride against the inside wall of the head and to hold the packing spaced inwardly from said projection.

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