

May 21, 1935.

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2,002,012

STUFFING BOX FOR POLISH RODS

Filed May 26, 1931

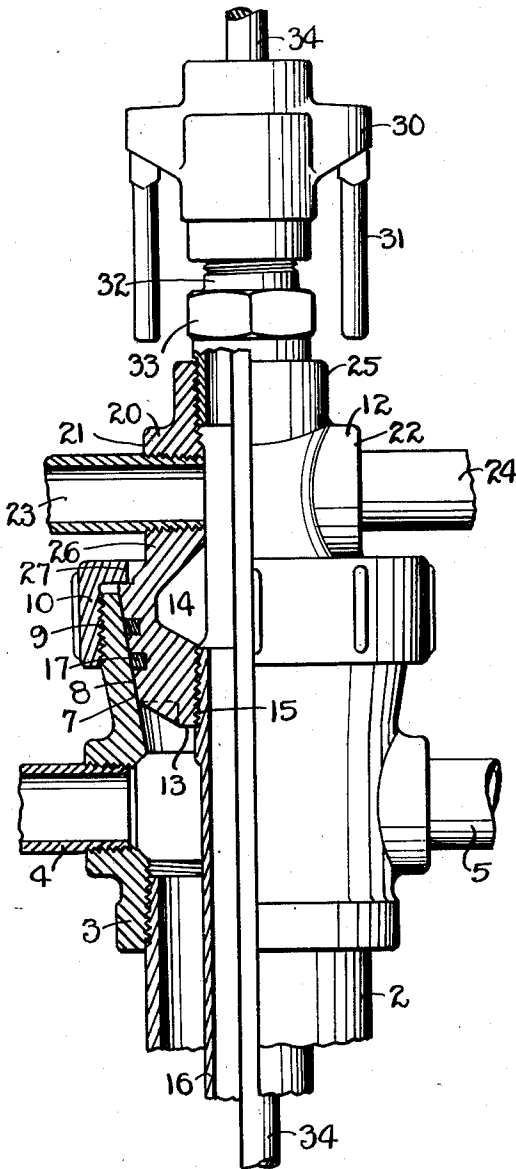


Fig. 1.

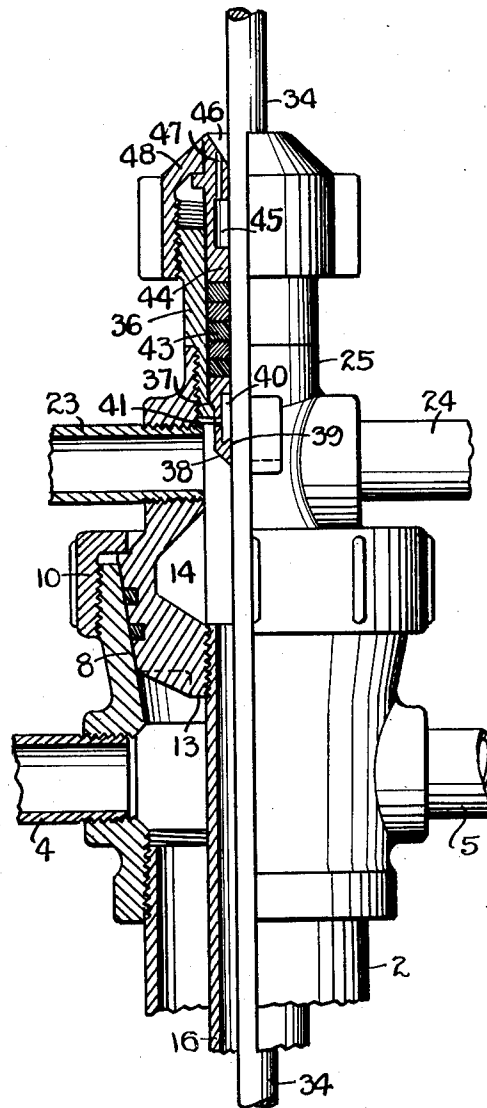


Fig. 2.

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2,002,012

STUFFING BOX FOR POLISH RODS

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Application May 26, 1931, Serial No. 540,093

3 Claims. (Cl. 286—17)

The invention relates to an improvement in polish rod stuffing boxes for wells.

An object of the invention is to provide a stuffing box for polish rods having a lubricant chamber beneath the packing.

Another object of the invention is to provide a lubricant reservoir beneath the packing and having openings into which a portion of the oil being pumped will be deposited so that the polish rod will be lubricated during periods of dry operation.

A still further object of the invention is to provide a combination hanger head, cross and stuffing box so that when it is desired to pump the well a stuffing box will be available to maintain a seal about the polish rod.

A still further object of the invention is to provide in combination with a hanger head a stuffing box constructed wherein lubricant reservoirs are provided so that the polish rod will be lubricated in event the well is pumping dry.

A still further object of the invention is to provide a compact combination casing head and tubing head so that the flow lines therefrom will be in compact relationship and the entire assembly will occupy a minimum of space.

Other and further objects of the invention will be readily apparent to those skilled in the art when the following description is considered in connection with the accompanying drawing wherein

Fig. 1 is a side elevation with certain of the parts shown in section to illustrate the internal construction thereof.

Fig. 2 is a showing of a modified form of the invention wherein a stuffing box is provided on the hanger head in order to accommodate a polish rod.

By having reference to Fig. 1, the casing head 1 which extends into the well bore is indicated at 2, and is arranged to support the casing head body 3. This casing head is provided with the outlets 4 and 5, which serve to discharge fluid from inside of the casing 2. During the drilling operation the flow of flushing fluid may discharge through these outlets and after the mechanism is assembled casing head gas or an accumulation of fluid in the casing head may be permitted to escape through these outlets. Above the outlets the body 3 is arranged in the form of a bowl 7, which is constructed with a tapered seat 8. This bowl is threaded externally at 9 with a tapered thread and arranged to receive the cap 10.

Inside of this casing head is the tubing head

or hanger head 12, which is of special construction and includes the base 13 which may be provided with the cavity 14 to reduce the weight thereof. This base is threaded at 15 and serves as a hanger or support for the string of tubing 16, which extends downwardly into the well inside of the casing 2. In order that this hanger 12 will form a seal with the bowl 7 a plurality of rings of hydraulic packing 17 may be provided.

Above the base 13 this hanger head is formed with a cross construction 20 in which the lateral flanges 21 and 22 are arranged to receive the flow lines 23 and 24, respectively. The upper outlet of the cross is shown at 25 and the downward extension includes the neck 26, which connects with the base 13 and is part of the hanger head 12. The body 12 is provided with a shoulder 27, which is adapted to be engaged by the cap 10, so that it may be firmly anchored in position. Thus the tubing will be supported in the well on the hanger and the hanger will be anchored in position. It is to be understood that the casing head 3 may be located on the well during the drilling operation and when the drilling is completed and it is desired to set tubing the head 12 may be connected to the uppermost section of the tubing string 16 and lowered into place. The cap 10 will be positioned and the flow lines 23 and 24 connected with the head. The cap and these flow lines may, however, be connected with the head directly proceeding its placement in the casing head.

Above the flow lines 23 and 24 the upper outlet 25 is arranged to receive a stuffing box 30, which may be of any desired construction and is provided with handles 31 so that the stuffing box may be screwed in position as an independent unit. As illustrated in Fig. 1, the stuffing box is connected to a nipple 32, which is in turn carried by an adapter 33. This stuffing box 30 is arranged to form a seal about the polish rod 34 which may be used when it is desired to pump the well. If the well is flowing it is to be understood that a flow line may be connected to the nipple 32 or this outlet of the cross may be closed with a bull plug or gate valve. When, however, it becomes necessary to pump the well, the stuffing box may be positioned on the cross after the string of sucker rods has been run into the well, and the stuffing box will form a seal about the polish rod.

The construction of Fig. 2 is identical with the construction shown in Fig. 1 except the upper outlet 25 of the cross is provided with a special type of stuffing box which is desirable due to the fact that it provides for lubrication of the polish rod

regardless of whether any oil is being pumped in the well. In pumping wells, so long as there is a flow of oil from the well through the lines, such as 23 and 24, the polish rod 34 will be lubricated due to its engagement with the oil being pumped. However, in many instances, when an air or gas pocket is encountered or for some other reason the flow of oil ceases, the pump may continue its operation for a considerable length of time without any oil being pumped. Under these conditions the polish rod very quickly runs dry and burns out the packing in the stuffing box. With the idea in mind of providing lubrication for this stuffing box the arrangement in Fig. 2 includes a stuffing box housing 36, which is connected directly into the upper cross outlet 25. This body 36 is provided with a tapered seat 37, which is arranged to receive the combination gland and reservoir 38. This structure includes a body 39 which includes a reservoir or cavity 40, which is open to contact with the polish rod 34. One or more outlets 41 may be provided in this body 39 leading from the reservoir 40 to the interior of the cross. In this manner when there is a flow of oil from the well there will be an inlet provided to the cavity 40 and it will be at least partially filled with oil. When, however, there is no flow of oil from the well for a number of strokes, the oil which has accumulated in the cavity 40 will be available to lubricate the polish rod. When the flow of oil is resumed from the well another charge of oil will obviously flow through these openings 41 and provide another supply of lubricant for the polish rod.

This arrangement is believed to be of material advantage because it eliminates the removal of the stuffing box periodically to lubricate the polish rod below the packing, which is carried by the stuffing box.

Above this combination gland and oil reservoir 38 are the packing rings 43. Any desired number of rings may be provided and they are retained in position by the upper gland 44, which fits inside of the stuffing box 36. This upper gland is held in position by a locking cap 45, which is threaded to the stuffing box body. The gland

44 is of special construction and contains the cavity 45 for the storage of a supply of lubricant. The upper end of the gland is tapered at 46 so that any excess of lubricant carried upwardly by the polish rod will accumulate in this tapered portion and when a sufficient supply thus accumulates it may flow downwardly into the cavity 45 by means of the passages 47. It is also intended that these passages 47 may be used to fill the cavity 45 with lubricant.

With the structure such as described in connection with this stuffing box it seems apparent that lubricant both above and below the packing rings will be provided at all times and it will only be necessary to provide lubricant to the upper gland at quite lengthy intervals, it being intended that the lower gland will be lubricated at all times by the flow of oil from the well. This Fig. 2 construction is adapted for a flowing head the same as described in connection with the Fig. 1 modification as the upper outlet 25 of the cross may be fitted with a tubing or closure member as desired.

Having described my invention, what I claim is:

1. In a tubing hanger and flow line cross, a polish rod stuffing box including a housing, a lower oil gland therein, means in said gland whereby the pumped oil will fill said gland, packing above said gland, and an upper oil gland with means therein to retain a supply of lubricant.

2. In a tubing hanger, a stuffing box for the polish rod, said stuffing box including upper and lower gland members and a lubricant reservoir in each gland.

3. In a stuffing box for polish rods on oil wells, an upper gland adapted to store lubricant, a lower recessed gland, packing between said glands, means on said stuffing box to compress said upper gland, a shoulder in said stuffing box to support said lower gland, an opening in said lower gland through which fluid may enter said recess when said well is pumping fluid, said recess retaining fluid to lubricate the lower end of said packing when the well is not pumping fluid.

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