This invention relates to packing glands, and more particularly, but not by way of limitation, to a double packed stuffing box adapted for use around the polished rod of a producing oil well.

As is well known in the oil industry, the majority of producing oil wells are pumped by use of a rod type pump. The pumping unit is installed near the bottom of the oil well and is actuated by a string of rods from the surface. The uppermost rod, which projects from the well head, is commonly called the polished rod. A packing gland or stuffing box is ordinarily secured to the well head around the polished rod to prevent a leakage of the pumped oil around the polished rod. The majority of stuffing boxes in common use are provided with a single set of packing rings, therefore, the pumping unit must be stopped to replace the packing rings in order to prevent leakage of well fluid upward through the stuffing box.

An important object of this invention is to permit replacement of the main set of packing rings in an oil well stuffing box without the necessity of stopping the oil well pumping unit.

Another object of this invention is to provide a novel double packed oil well stuffing box utilizing two sets of packing rings. The box is constructed in such a manner that the upper set of packing rings may be replaced while the well pumping unit is in operation. In addition, it is also contemplated to provide a secondary packing gland containing an oil reservoir and assuring a constant lubrication of the polished rod and increase the service life of the packing rings, particularly the upper set.

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that the bolts 54 determine the vertical position of the gland 50 with respect to the body section 32 to control the upward applied pressure on the packing rings 46. The packing rings 46 are also compressed by a second gland member 56. The gland 56 is also tubular in shape and is of a size to be inserted in the gland 50 loosely around the polished rod 85 for contacting the uppermost packing ring 46 adjacent the inner periphery thereof. The upper portion 58 of the upper gland 56 is enlarged and provided with a pair of outwardly extending and diametrically opposed lugs 60. Bolts 62 extend through the lugs 60 and downwardly into connection with mating lugs 64 formed on the upper end of the body section 32. Referring to Fig. 2, it will be observed that the lugs 60 and 64 are disposed at substantially right angles to the previously described lugs 52. The bolts 62 provide for a tightening of the gland 56 and compression of the packing rings 46 in proximity with the polished rod 8 and the angular disposition of the flanges 60 with respect to the flanges 52 facilitates independent adjustment of the glands 50 and 56. It will also be noted in Fig. 2 that the compression bolts 38 are arranged between the lugs 52 and 60 to facilitate access thereto. Another conical shaped packing ring 66 is disposed in the upper end of the gland 56 around the polished rod 8 and rests on a circumferential shoulder 68 formed in the inner periphery of the enlarged portion 58 of the gland 56. An aperture cap member 70 is loosely disposed around the polished rod 8 above the upper gland 56. The cap 70 is provided with a downwardly extending circumferential flange 72 of a size to envelop the upper end of the gland 56 in the manner shown in Fig. 1. A circumferential shoulder 74 is formed on the outer surface of the cap 70 to contact the packing ring 66 and maintain the ring in sealing contact with the polished rod 8 and the inner periphery of the gland 56. Diagonally opposed cup shaped flanges 76 are formed on opposite sides of the cap 70 and are connected by bolts 78 to mating flanges (not shown) on the upper end of the gland 56. Thus, the cap gland 70 may be tightened on the gland 56 to control the pressure exerted by the shoulder 74 on the packing ring 66. As readily seen in Fig. 1, the tubular gland 56 forms a chamber 80 around the polished rod 8 between the upper packing ring 46 and the packing ring 66. The chamber 85 is provided to receive a suitable lubricant and the lubricant is supplied to the chamber 80 through a suitable grease fitting 82 threaded securely in the wall of the gland 56.

**Operation**

The stuffing box 2 is assembled as shown in Fig. 1 and the lower end 6 thereof is threadedly engaged with the well head around the polished rod 8. Preferably prior to operation of the polished rod 8, the chamber 80 is charged with a suitable lubricant through the fitting 82. Thus, when the polished rod 8 begins to reciprocate, the packing rings 46 and 12 will be supplied with lubricant to increase the service life thereof. The polished rod 8 reciprocates vertically through the stuffing box 2 in the usual manner, and ordinarily well fluid flows upwardly through the lower end 6 of the body 4 into contact with the sealing rings 12. If desired, the sealing rings 12 may be loosened by slightly unthreading the compression bolts 38 and permit the well pressure to push the lower body section 4 into contact with the packing rings 46. This will reduce the wear of the packing rings 12 and materially increase the service life thereof. As previously stated, the packing rings 12 and 46 may be adjusted independently.

When it is desired to replace one or more of the packing rings, the bolts 54 and 62 are removed to permit an upward movement of the glands 50 and 56. Access may then be gained to the packing rings 46. During this replacement of the packing rings 46, the polished rod 8 may continue to reciprocate and provide a continuous operation of the well pump (not shown). The packing rings 12 will effectively seal off the well head pressure and if they have been loosened prior to the time for changing the packing rings 46, the compression bolts 38 may be tightened to provide the desired compression of the packing rings 12. Upon replacement of the packing rings 46, the glands 50 and 56 are moved downwardly along the polished rod 8 to the position shown in Fig. 1 and reconnected to the body section 32 by the bolts 54 and 62. Furthermore, the chamber 80 may be recharged with lubricant by use of the fitting 82 during reciprocation of the polished rod 8.

From the foregoing, it is apparent that the present invention provides a novel double packed oil well stuffing box wherein the main packing rings may be replaced without stopping operation of the oil well pumping unit. A constant lubrication is provided for the stuffing box to materially increase the service life of the main packing rings. Furthermore, the auxiliary packing rings utilized during replacement of the main packing rings may be independently adjusted and substantially placed out of operation during the normal operation of the stuffing box.

Changes may be made in the combination and arrangement of parts as heretofore set forth in the specification and shown in the drawings, it being understood that any modification in the precise embodiment of the invention may be made within the scope of the following claims without departing from the spirit of the invention.

I claim:

1. A stuffing box for an oil well polished rod, comprising a tubular body loosely surrounding the polished rod, a main set of super-imposed conical shaped packing rings in the body around the polished rod, a tubular gland extending into the upper end of the body into contact with the uppermost main packing ring adjacent the outer periphery thereof, a second tubular gland disposed in the first mentioned gland in contact with the uppermost main packing ring adjacent the inner periphery thereof, connecting means on the body for independently adjusting said first and second tubular glands, an auxiliary set of super-imposed conical shaped packing rings in the body around the polished rod arranged below the main packing rings, a compression ring in the body loosely disposed around the polished rod in contact with the uppermost auxiliary packing ring, an inwardly projecting shoulder provided in the body to retain the compression ring in position adjacent the auxiliary packing rings, and means to support the lowermost main packing ring, and means adjustably secured in the body for contacting the compression ring and controlling the compression of said auxiliary packing rings.

2. A stuffing box for an oil well polished rod, comprising a tubular body loosely surrounding the polished rod, a main set of super-imposed conical shaped packing rings in the body around the polished rod, a tubular gland extending into the upper end of the body into contact with the uppermost main packing ring adjacent the outer periphery thereof, a second tubular gland disposed in the first mentioned gland in contact with the uppermost main packing ring adjacent the inner periphery thereof, connecting means on the body for independently adjusting said first and second tubular glands, an oil reservoir in said second gland around the polished rod, an auxiliary set of super-imposed conical shaped packing rings in the body around the polished rod arranged below the main packing rings, a compression ring in the body loosely disposed around the polished rod in contact with the uppermost auxiliary packing ring, an inwardly projecting shoulder provided in the body to retain the compression ring in position adjacent the auxiliary packing rings, and means to support the lowermost main packing ring, and means adjustably secured in the body for contacting the com-
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pression ring and controlling the compression of said auxiliary packing rings.

3. A stuffing box for an oil well polished rod, comprising a tubular body loosely surrounding the polished rod, a main set of super-imposed conical shaped packing rings in the body around the polished rod, a tubular gland extending into the upper end of the body into contact with the uppermost main packing ring adjacent the outer periphery thereof, a second tubular gland loosely disposed on the polished rod within the first mentioned gland in contact with the uppermost main packing ring adjacent the inner periphery thereof, connecting means on the body for independently adjusting the first and second tubular glands and controlling the compression of the main packing rings, a conical shaped packing ring in the second gland spaced upwardly from the main packing rings, said second gland forming an oil reservoir between the last mentioned packing ring and the main packing rings, a cap gland adjustable secured on the upper end of the second gland in contact with the last mentioned packing ring, an auxiliary set of super-imposed conical shaped packing rings in the body around the polished rod arranged below the main packing rings, a compression ring loosely disposed on the polished rod in contact with the uppermost auxiliary packing ring, and means adjustable secured in the body for contacting the compression ring and controlling the compression of the auxiliary packing rings into contact with the polished rod and the inner periphery of the body and means integral with the body for supporting the lowermost main packing ring and retaining the compression ring in position adjacent the auxiliary packing rings.

4. A stuffing box for an oil well polished rod comprising a tubular body having a reduced lower end to provide a shoulder, a set of lower conical shaped packing rings supported by the shoulder, a compression ring disposed above the lower packing rings, adjusting means for urging the compression ring against the lower packing rings to control the pressure thereof against the polished rod, an inwardly projecting shoulder within the body to retain the compression ring in position, a set of main conical shaped packing rings supported by the inwardly projecting shoulder, a tubular gland member extending downwardly within the tubular body into contact with the uppermost main packing ring adjacent the outer periphery thereof, a second tubular gland disposed in the first tubular gland extending into contact with the uppermost main packing ring adjacent the inner periphery thereof, connecting means on the body for independently adjusting the two gland members, an upper conical shaped packing ring cooperating with the second gland member to provide a sealed oil reservoir therein for supplying lubrication to the polished rod, and cap gland means adjustable secured on the second tubular gland and in contact with the upper packing ring for controlling the compression thereof against the polished rod.

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