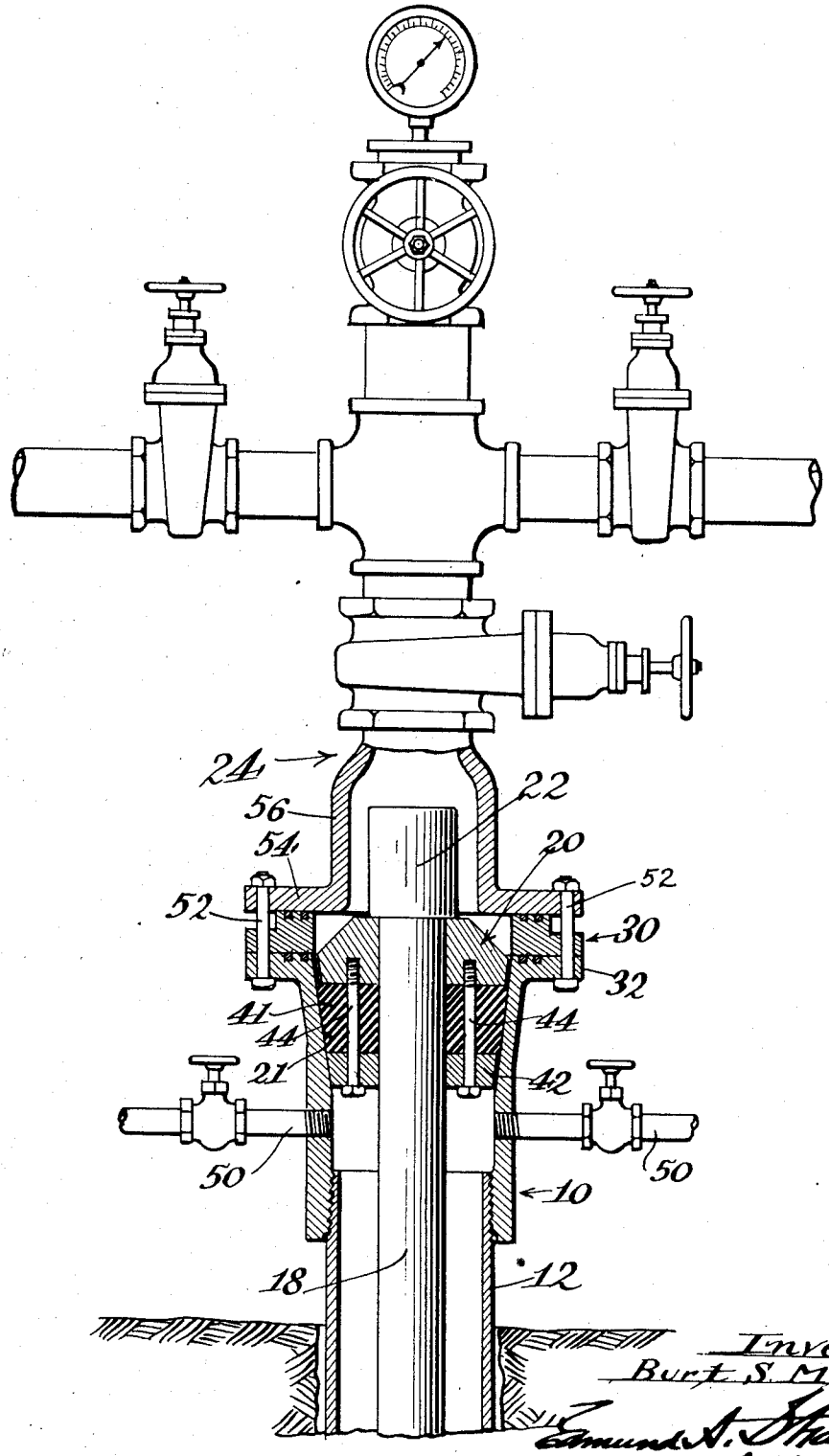
June 30, 1931. B. S. MINOR 1,812,358

OIL WELL PACKING DEVICE

Filed March 8, 1930 2 Sheets-Sheet 1

Fig. 1.



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Fig. 2.

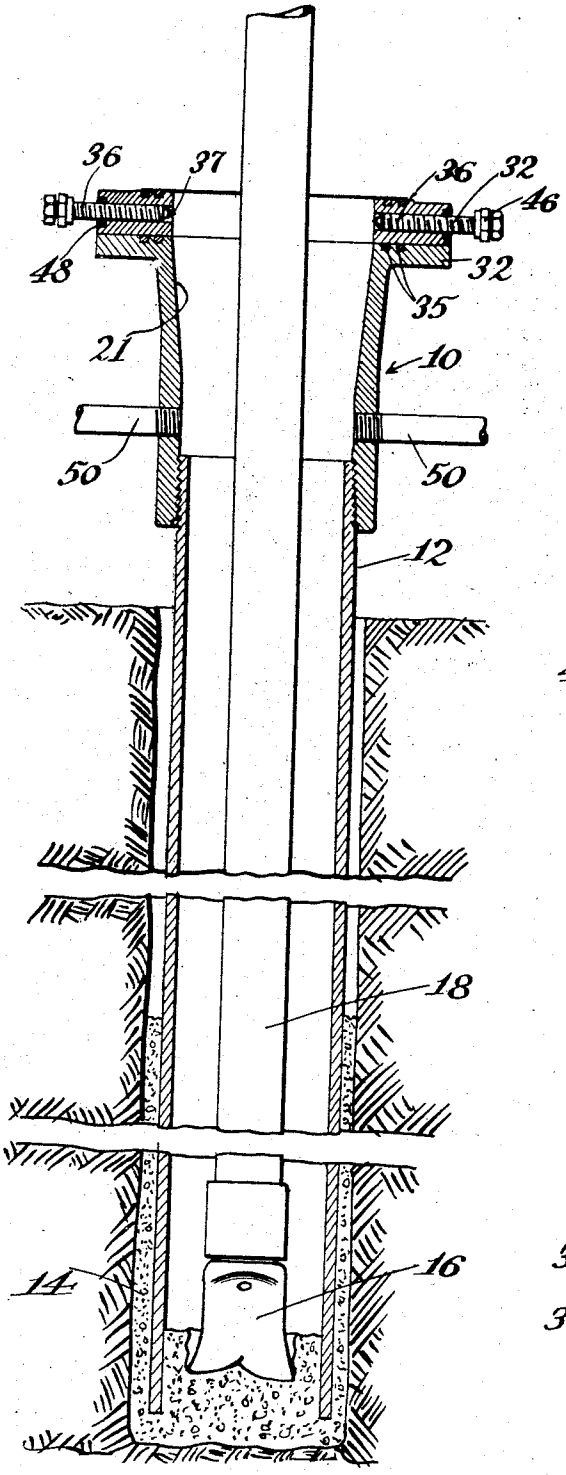


Fig. 3.

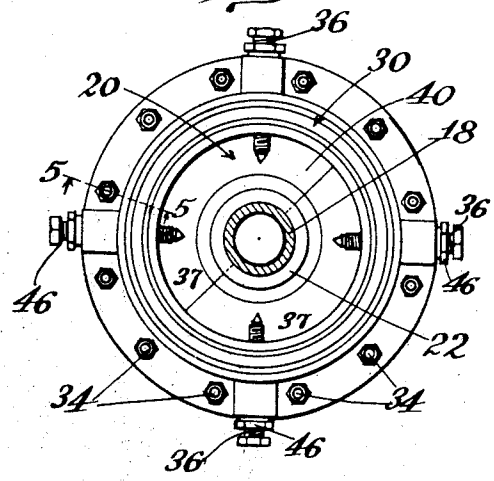


Fig. 4

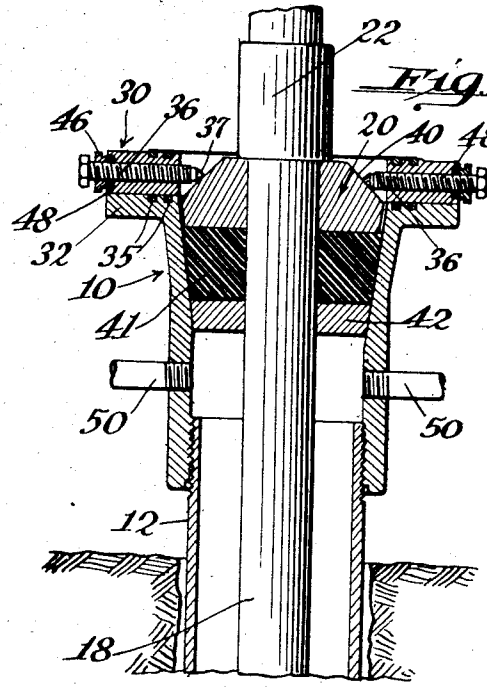
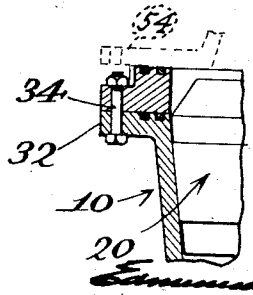


Fig. 5.



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UNITED STATES PATENT OFFICE

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OIL WELL PACKING DEVICE

Application filed March 8, 1930. Serial No. 434,315.

This invention relates more specifically to a device for effecting a rapid and permanent seal-off between two strings of oil well casing when the well is brought in.

In the drilling of oil wells and particularly the "drilling in" of wells after the oil string has been landed and cemented above the producing strata, it has generally been the practice to drill through the cement plug and into the producing sands with a tubing of small diameter which is left in position for the flow of oil therethrough. During this operation when the oil sands are penetrated it is necessary to form a seal between the oil string and tubing in order to keep the well under control until the flow connection can be made.

Heretofore the weight of the drill tubing has been relied upon to hold the packing in the control head prior to connecting the "Christmas tree" thereto. However if any appreciable degree of gas pressure builds up, the drill tubing will be raised and the packers blown out before the "Christmas tree" can be connected thereto.

It is the chief object of this invention to provide a device for holding the usual form of packing assembly in place in the control head against displacement by gas pressure until the "Christmas tree" can be connected to the control head.

A further object is to provide a well packing device that after a "seal-off" is effected in a well it may be advantageously utilized for controlling the well, and rendering it a comparatively simple matter to install a "Christmas tree".

A still further object is to provide a well packing device that will render it possible to effect a "Christmas tree" and flow lines installation in an extremely economical manner, and to further effect a gas seal-off without disturbing the original set up.

Further objects and advantages will appear from the following description, reference being had to the acompanying drawings wherein a single embodiment of the invention is shown by way of example:

Fig. 1 is a side elevation partly in section showing the well packing device as it appears after the well has been "packed off" and the "Christmas tree" attached;

Fig. 2 is a sectional view taken through the well packing device and a well hole showing the packing device as it appears during drilling of a well prior to packing off;

Fig. 3 is a top plan view of the packing device showing the well "packed off" prior to connecting the "Christmas tree";

Fig. 4 is a sectional view taken on line 4—4 of Fig. 3;

Fig. 5 is a fragmentary detail section taken on line 5—5 of Fig. 3.

Referring by numerals to the accompanying drawings, 10 designates a usual control head connected to a well casing or water string 12 which has been cemented above the oil sands as indicated at 14. The oil sands are reached by drilling through the cement plug by a bit 16 connected to a string of tubing 18 which is left in place after the bit has penetrated the oil sands.

After the bit has encountered the oil bearing strata, it is necessary to effect a seal or pack off as quickly as possible between the tubing and water string. The usual procedure is to place packing slips generally designated at 20 in the tapered bore 21 of the control head and continue drilling until one of the tubing couplings 22 will engage or rest on the upper face of the packing slips as shown in Figs. 1 and 4, the weight of the tubing then being relied upon to hold the slips in place until the "Christmas tree" 24 (see Fig. 1) may be connected.

The above operation may be carried out successfully. However, the gas pressure often builds up so rapidly that the tubing will be forced upwardly and the packing slips blown out of the control head before the "Christmas tree" can be connected, it being understood that the weight of the tubing is insufficient to hold the packers in place after the gas pressure has developed to any appreciable degree.

This invention resides in means for holding the packing slips in position in the control head against displacement by gas pressure in the casing in order that drilling may be

continued (if necessary) and the "Christmas tree" attached to the control head without any danger from the gas pressure developed in the casing, and consists of a ring or annular member 30 mounted on and secured to the top flange 32 of the control head by a plurality of bolts 34, the flange having a pair of packing rings 35 engaged by the bottom face of the ring.

A plurality of radially disposed set screws 35 are mounted in the ring and are provided with tapered points 37 adapted to engage the bevelled face 40 of the upper plate of the packing slips. The packing slips consist of two segments or sections, each of which are composed of a section formed of resilient material designated at 41 interposed between the upper plate 40 and a lower plate 42 which are held in assembled relation by screws 44 extending through openings in the lower plate and expansible section and threaded into the upper plate.

When conditions indicate that the bit has penetrated the oil sands, the packing slips are placed in the bore of the control head, and the set screws adjusted so that their tapered points engage the bevelled face of the upper plates of the packing slips as shown in Figs. 3 and 4. Drilling may then be continued without any danger of displacement of the packing slips until one of the couplings 22 of the drill tube engages the upper face of the packing slips as shown in Figs. 4 and 5. After adjusting the set screws any leakage of fluid between the screw threads is prevented by nuts 46 mounted on the screws adapted to compress packing rings 48 mounted in suitable recesses 45 formed in the ring.

From the foregoing it will be seen that after adjusting the set screws the packing slips are permanently held in place in the control head, thereby controlling the well until the "Christmas tree" can be attached to the control head as shown in Fig. 4. Before attaching the "Christmas tree" the length of tubing extending above the coupling resting on the packing slips, is unscrewed and removed. The "Christmas tree" is attached to the ring by removing the bolts 34 one at a time and replacing them with bolts 52 of sufficient length to extend through the openings in the casing flange 32, ring 30, and openings in the flange 54 of the "Christmas tree" coupling 56.

I claim:

1. An oil well packing device comprising in combination with a control head, a member secured thereto by a plurality of bolts and nuts, the bolts passing through openings in the control head flange and said member, a plurality of screws mounted in said member adapted to engage packing slips placed in the control head, the bolts holding said member on said control head adapted to be removed and replaced by other bolts one at a time for connecting a "Christmas tree" to said member.

2. An oil well packing device comprising a control head and an annular member secured thereto, said annular member having a plurality of screws adapted to engage packing slips placed in the control head to form a seal between the drill tubing and the well casing, said annular member secured to the control head by a plurality of bolts and nuts adapted to be removed and replaced by longer bolts for connecting a "Christmas tree" thereto.

3. An oil well packing device comprising a casing having a control head secured to its upper end, a packing device mounted in said control head and forming a seal between the tubing and said head, means adapted to be bolted to said control head for holding the packing device in engagement therewith, said member having an outer annular recess, whereby when the member is bolted to the control head the securing bolts can be removed and replaced by longer bolts one at a time when it is desired to attach a flow controlling means thereto.

In testimony whereof I affix my signature.

BURT S. MINOR.