Nov. 25, 1930. B. P. HOFFMAN ET AL 1,782,851

OIL SAVER

Filed Dec. 18, 1926 2 Sheets-Sheet 1

Fig. 1.

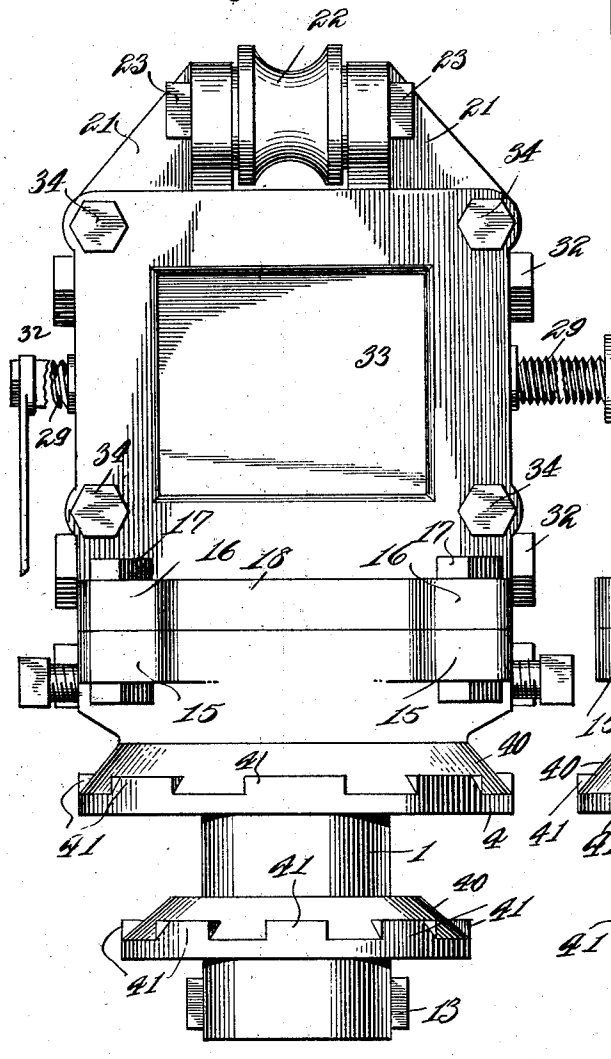
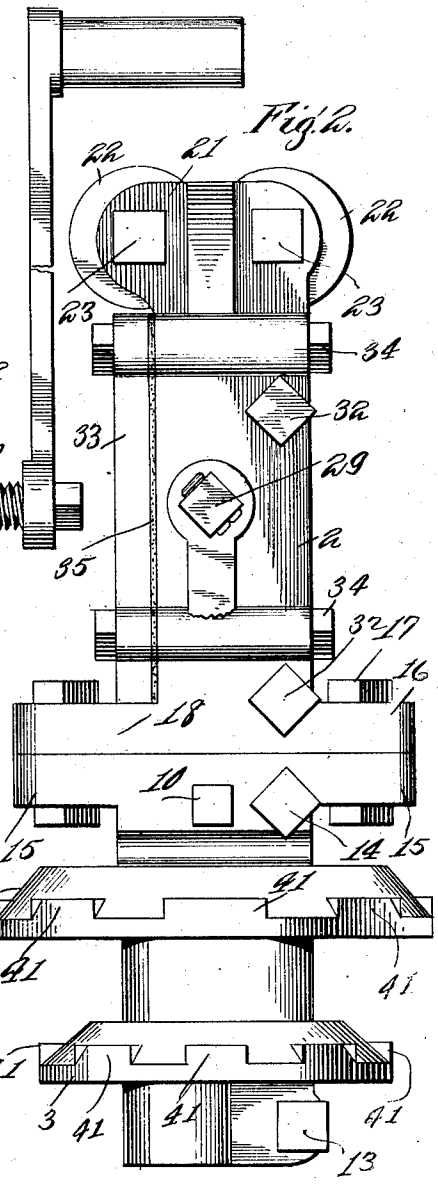


Fig. 2.



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Filed Dec. 18, 1926 2 Sheets-Sheet 2

Fig. 3.

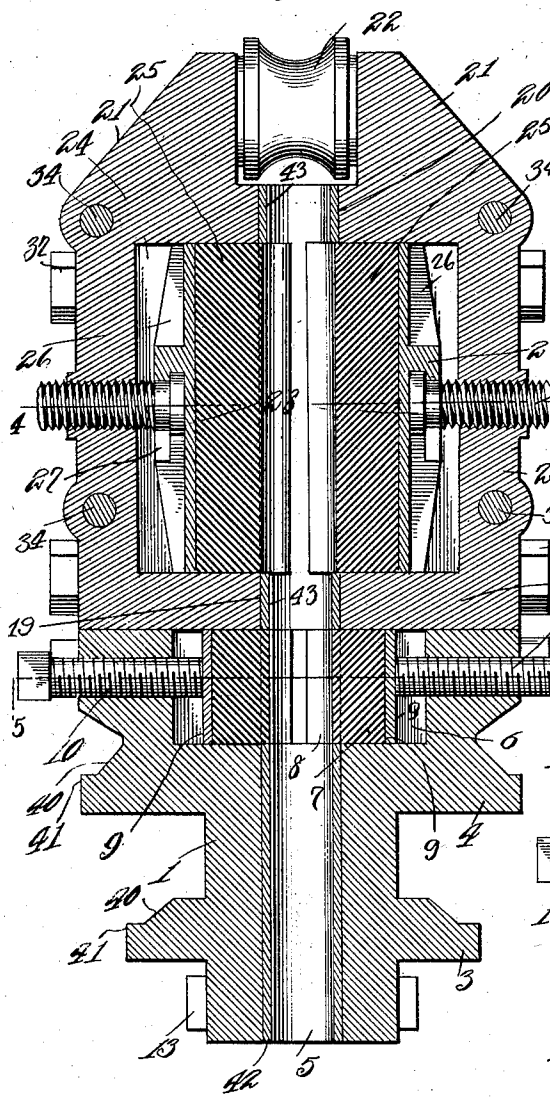


Fig. 4.

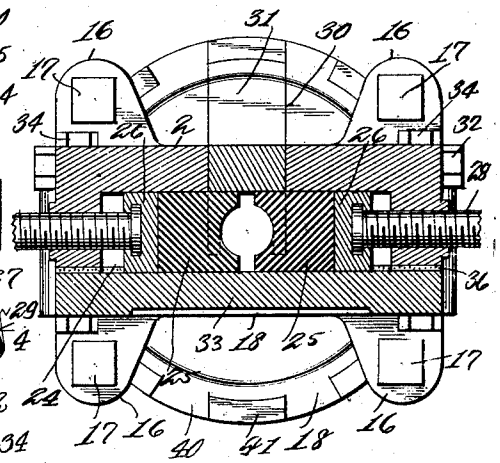
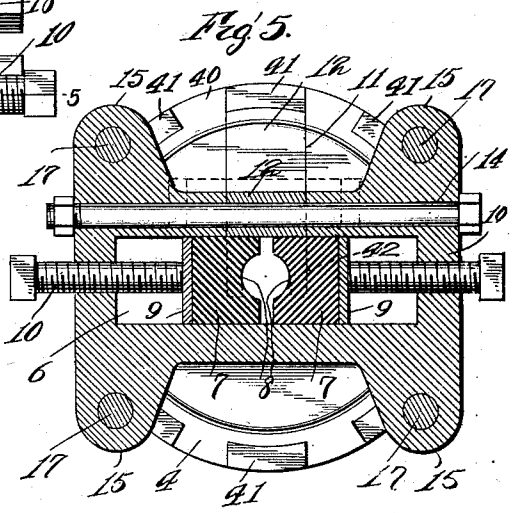


Fig. 5.



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UNITED STATES PATENT OFFICE

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OIL SAVER

Application filed December 18, 1926. Serial No. 155,673.

This invention is a device for saving oil so that when oil has been reached in a deep well and begins to flow the rising of the oil along and past the polish rod or drilling cable may be arrested and turned into the pipe line running from the casing head, waste of the oil being thereby prevented. The invention has for its object the provision of a structure in which the packing rubbers may be easily reached when renewal or repairs are necessary and replacement of other parts may be easily effected. The invention is illustrated in the accompanying drawings and will be hereinafter fully set forth.

In the drawings:

Figure 1 is a side elevation of a device embodying the invention;

Fig. 2 is an edge elevation of the same;

Fig. 3 is a central vertical transverse section;

Fig. 4 is a horizontal section on the line 4—4 of Fig. 3, and

Fig. 5 is a horizontal section on the line 5—5 of Fig. 3.

The device includes a lower member which is substantially a sleeve or cylinder 1 adapted to be secured on the upper side of the casing or well head, and an upper member which is substantially a box 2 secured on the upper end of the lower member. The lower member is provided at a point intermediate its ends with an annular flange 3 whereby it may be secured upon a relatively smaller casing or well head and above the said collar or flange 3 is equipped with a larger collar or flange 4 whereby it may be secured upon the upper side or top of a relatively large casing, the lower collar or flange 3 in such event passing into the casing in a well known manner. We also construct these collars 3, 4, so that the device may be secured upon heads known as "set screw" heads as well as upon heads known as "ratchet" heads. It will be noted that the upper surfaces of the collars are beveled, as at 40. At the peripheral margins of the beveled surfaces are lugs 41 which are spaced circumferentially and are adapted to interengage with the ratchet formation on a "ratchet" head while the spaces between the lugs provide surfaces for engagement by the set screws of the "set screw" head. The body portion of the lower member 1 is constructed with a cylindrical bore 5 through which the polish rod or drilling cable passes and in the top of the said member is an enlarged chamber 6 disposed concentric with the said bore 5 and through the bottom of which the bore opens. Within the chamber 6 at opposite sides of the center thereof are located rubber packers 7 having semi-circular grooves 8 in their opposed faces whereby they may fit around the polish rod or drilling cable, metallic followers 9 being disposed within the chamber at the backs of the blocks 7 whereby to support the blocks and permit them to be adjusted close to the cable or rod in order to take up wear without being subjected to penetration from the pressure screws 10 which are mounted in the sides of the member 1 at the ends of the chamber 6 and bear against the outer faces of the followers 9, as shown and as will be understood. These adjusting screws may be engaged at their outer ends with any convenient form of turning tool, and it will be understood that by slightly turning these screws the packers 7 may be adjusted from time to time so as to maintain the desired contact with the drilling cable or polish rod. By reason of such contact, oil which may be rising through the bore 5 will be checked and will be held in the casing instead of flowing up along the cable so that loss of the oil will be prevented. One side of the lower member 1 of the device, which side, for convenience, will be termed the front, is of an integral formation so that it is free of joints through which the oil might leak, but in order to permit access to the packing chamber 6, the back of the device is split or slotted, as indicated at 11, and a closing or filler bar 12 is fitted tightly in the split or slot in break-joint relation to the packers so as to bridge the space between the opposed inner faces of the packers and thereby avoid leakage of the oil as well as to facilitate access to the packers when necessary. This bar 12 extends the full length of the lower member of the device and is hingedly secured therein at its lower end by

a hinge bolt, indicated at 13. The bar conforms to the contour of the member 1 and at its upper end is locked in place by a bolt 14 inserted through openings provided therefor in the end of the bar and in the side portions of the member 1. This bolt is clearly shown in Fig. 5. Below the chamber 6, the bar 12 is formed with offsets 42 which extend under the packing rubbers and prevent the ends of the rubbers spreading into the bore 5 and thereby hastening disintegration.

At its upper extremity, the lower member 1 of the saver is provided with lateral lugs 15 mating with corresponding lugs 16 on the lower end of the upper member or box 2 and receiving bolts 17 whereby the upper member may be rigidly secured upon the lower member. The lugs 16 are formed at the lower end of the upper box-like member 2 which lower end, as shown at 18, conforms to the outline of the top of the lower member 1 and rests flat on said member, as shown in Figs. 1, 2 and 3. The upper member or box 2 is provided with central openings 19 and 20 in its bottom and top, respectively, which aline with the bore 5 of the lower member so that a continuous passage for the polish rod or drilling cable is provided, and the top of the box is constructed with upwardly extending lugs or brackets 21 providing bearings for guide rollers 22 between which the cable or rod plays. These guide rollers are carried on bolts or spindles 23 removably fitted through the bearing brackets or lugs and the brackets are not seated in deep recesses but are readily accessible so that, if the rollers should wear excessively or choke through an accumulation of sand or other matter, they may be removed and the proper repairs or cleaning effected without removing the saver from the cable or rod. The main portion of the box is hollow whereby to provide a packer chamber 24 within which are fitted the rubber blocks or packers 25 which are of the same form as the packers 7 previously described but have a greater vertical extent. The followers 26 are metallic plates provided on their outer sides with overhanging forks or yokes 27 whereby they may be removably engaged with the heads 28 of the adjusting screws or bolts 29. By properly turning the bolts, the followers may be adjusted so as to maintain the desired engagement of the packers with the cable or polish rod. The back of the box 2 is slotted or split, as indicated at 30, in the same manner as the lower member of the device is split and a filler bar 31 is fitted in the split or slot and secured therein by long bolts 32 which are inserted through the rear wall of the box adjacent the upper and lower ends thereof and through the corresponding portions of the bar 31, as will be understood. This bar 31 is in break-joint relation to the packers and thereby bridges the space between the opposed faces of the packers 25, as shown in Fig. 4, so that leakage of the oil will be avoided, and it is provided along both edge portions with offsets 43 corresponding to the offsets 42 previously mentioned. These offsets support the upper packers at both ends and it will be noted, upon reference to Fig. 3, that the lower offsets 43 cooperate with the offsets 42 in preventing deformation of the lower packers 7. The front 33 of the box is removable as an entirety so that it constitutes a door and is normally held in place by bolts 34 inserted through its corners and through the side walls of the box. By withdrawing these bolts 34, the entire door may be removed and access thereby had to the packer chamber 24 so that the packer blocks may be renewed or repaired and the followers 26 also renewed if necessary, and a packing strip, indicated at 35, is interposed between the rear side of the door and the front side of the several walls of the box so as to avoid leakage in an obvious manner.

From the foregoing description, taken in connection with the accompanying drawings, it will be seen that we have provided an exceedingly simple, compact and efficient device whereby waste of oil will be avoided. Repairs or renewals may be very easily made without removing the device from the casing or from the drilling cable or polish rod. If, for any reason, it should be necessary to remove either the upper or the lower member of the saver from the cable, the bar 12 or 31, as the case may be, is withdrawn and the bolts 17 removed, whereupon either the upper or the lower member may be removed from the cable without requiring disengagement of the other member from the cable and, of course, the removed part may be reengaged around the cable by a reverse series of steps or a new member placed in position without disturbing the member which was not removed. The packers are all very completely and effectually housed and supported so that they will be subjected to wear only through their engagement with the polish rod or drilling cable and frequent renewal of the packers will, therefore, not be necessary.

Having thus described the invention, we claim:

1. An oil saver comprising a box-like body, packer blocks fitted in the body at opposite sides of the center thereof, means for adpusting the packers to compensate for wear, the body being slotted vertically in one side with the packer blocks extending partially across the slot from opposite sides thereof, and a closing bar removably secured in the slot in break-joint relation to the packers, and bridging the space between the inner ends of the packer blocks.

2. An oil saver comprising a box-like body, packer blocks fitted in the body at opposite sides of the center thereof, means in the ends

of the body for adjusting the packer blocks to compensate for wear, the body being slotted vertically in one side with the sides of the slot in break-joint relation to the inner ends of the packer blocks, and a closing bar removably secured in the slot and bridging the space between the inner ends of the packer blocks, said bar having offsets at its end portions projecting across the top and bottom of the packer blocks at the ends thereof to prevent deformation.

In testimony whereof we affix our signatures.

BENJAMIN P. HOFFMAN. [L. S.]
AYERS M. HOFFMAN. [L. S.]