Sept. 5, 1933. H. R. STANDLEE 1,925,852

OIL SAVER

Filed May 2, 1929 4 Sheets-Sheet 1

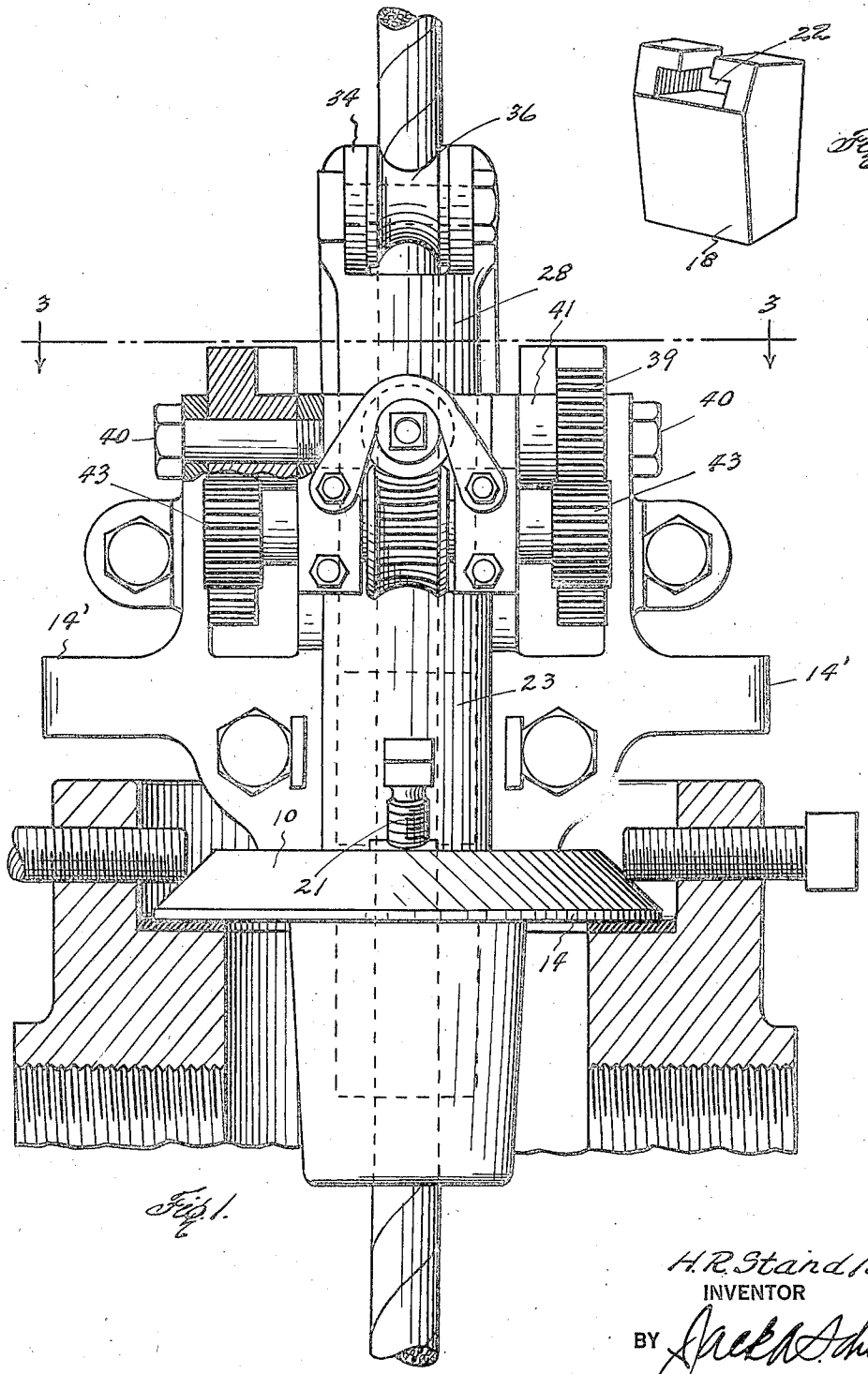


Fig. 1.

Fig. 13.

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OIL SAVER

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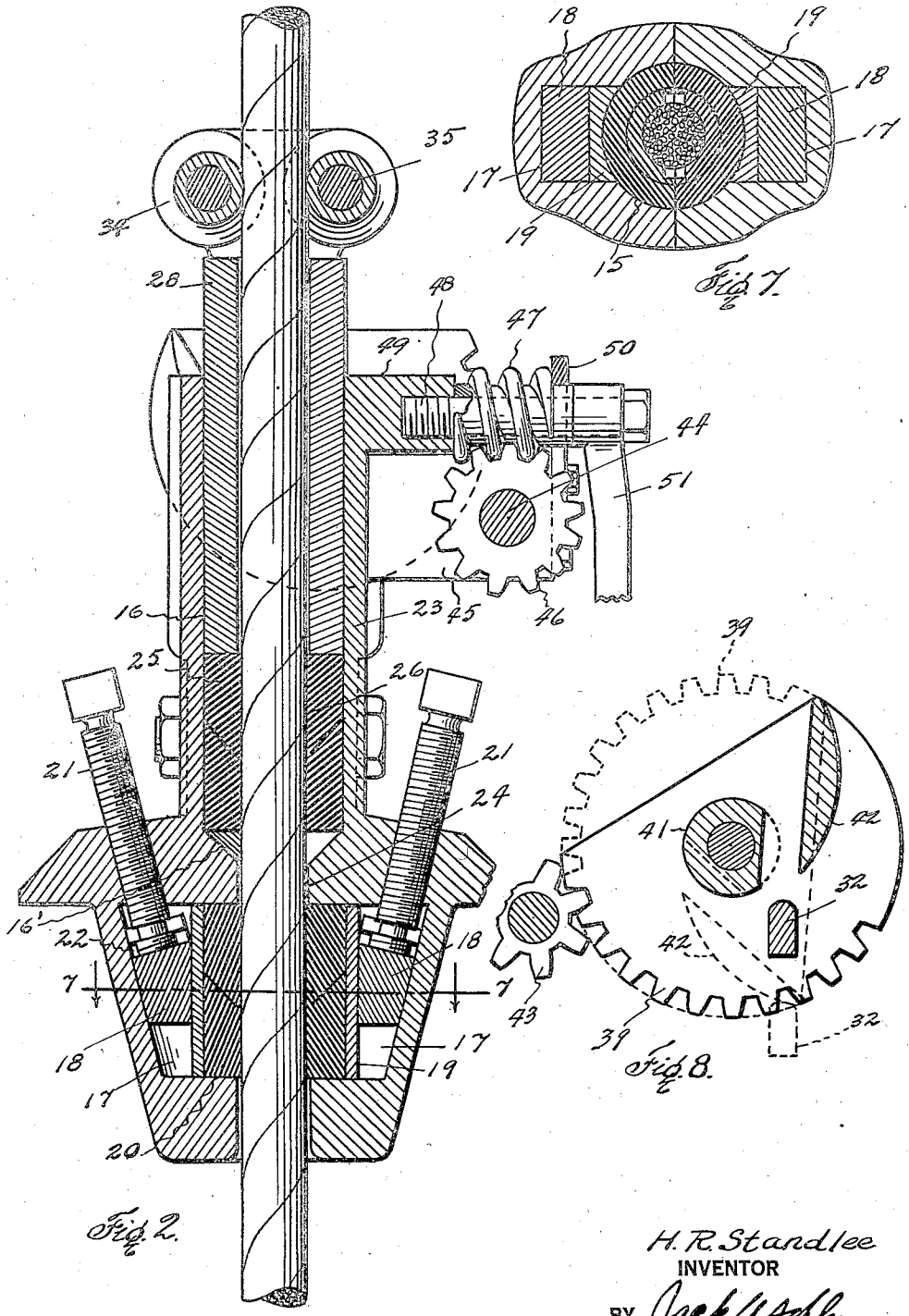


Fig. 2.

Fig. 7.

Fig. 8.

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OIL SAVER

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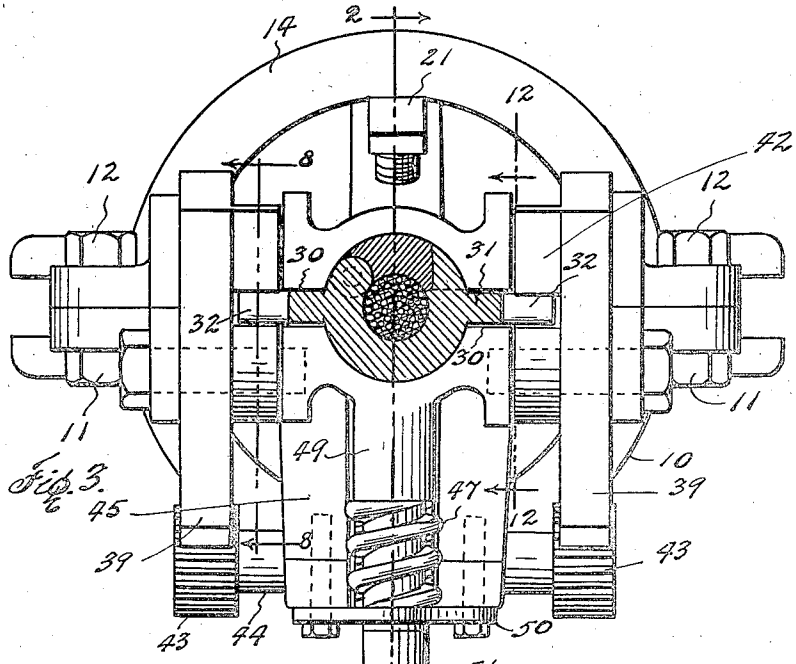


Fig. 3.

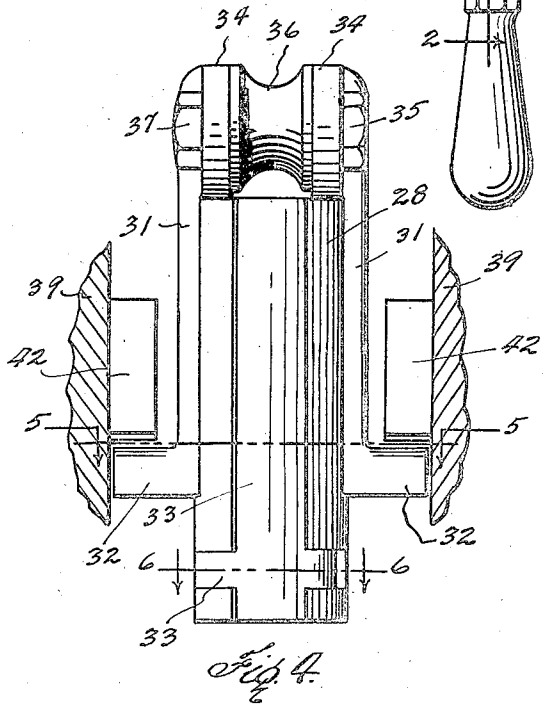


Fig. 4.

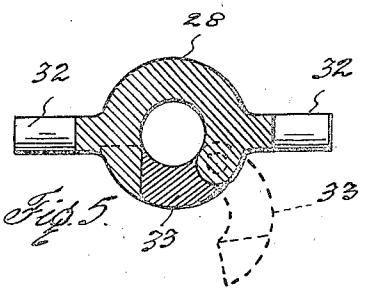


Fig. 5.

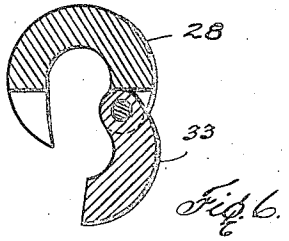


Fig. 6.

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OIL SAVER

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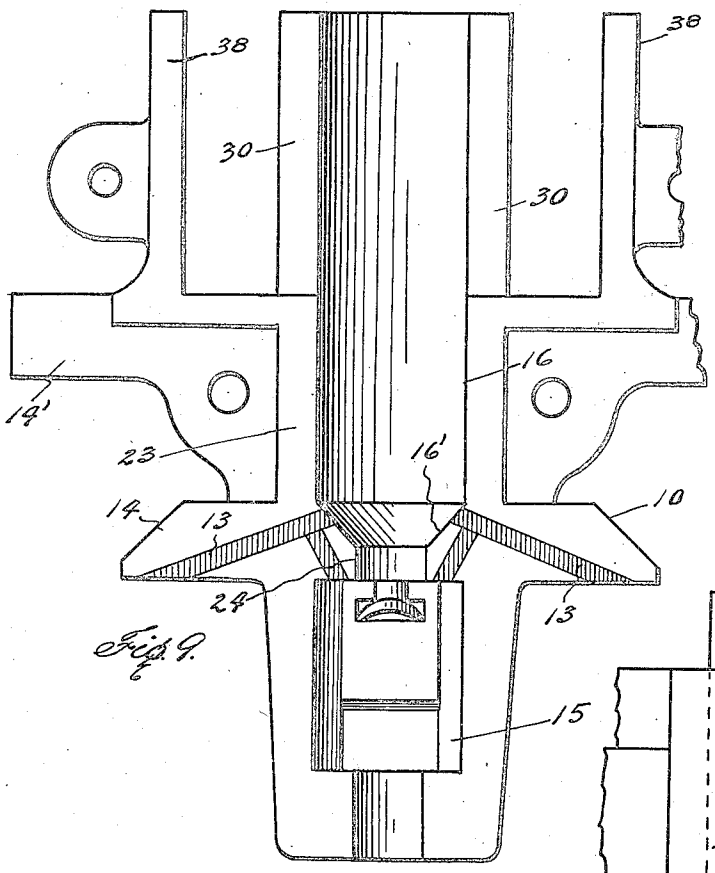


Fig. 9.

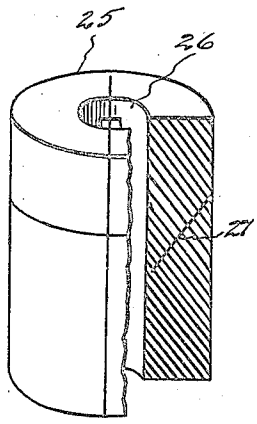


Fig. 10.

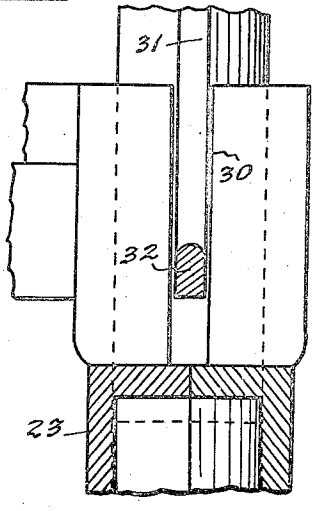


Fig. 12.

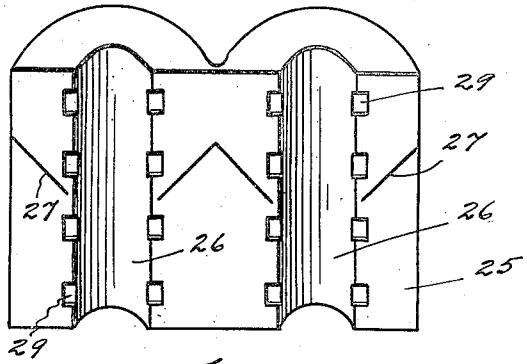


Fig. 11.

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Patented Sept. 5, 1933 1,925,852

UNITED STATES PATENT OFFICE

1,925,852

OIL SAVER

Harvey E. Standlee, Tulsa, Okla., assignor to The Guiberson Corporation, Dallas, Tex., a corporation of Delaware

Application May 2, 1929. Serial No. 359,385

11 Claims. (Cl. 286—16)

This invention relates to new and useful improvements in oil savers.

One object of the invention is to provide an oil saver for use on drill cable, rod, tube, and the like in connection with oil and gas wells, whereby certain advantageous results are obtained.

A particular object of the invention is to provide simple and positive packing means for embracing a cable or other cylindrical member together with packing compressing means including elements working with sufficient leverage to exert ample pressure to quickly compress the packing against varying head pressures.

A further object of the invention is to provide a follower sleeve and guide arranged for ready application to and removal from the cable or other vertically moving member, and involving simple and easily worked parts.

Another object of the invention is to provide an oil saver having its seal packing below its supporting flange, whereby the length of the device is shortened which permits the temper screw to be run farther down before reclamping a cable.

Still another object of the invention is to provide an oil saver in which the working packing may be quickly and conveniently replaced.

An important object of the invention is to provide a packing member of peculiar construction arranged to equally grip a cylindrical member throughout the length of said packing member and to automatically feed itself to the said member as it wears.

A construction designed to carry out the invention will be hereinafter described together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings in which an example of the invention is shown, and wherein:

Fig. 1 is an elevation of an oil saver constructed in accordance with the invention and illustrated as mounted on a casing head (in section) and applied to a cable,

Fig. 2 is a vertical sectional view of the saver at right angles to Fig. 1,

Fig. 3 is a plan view of the saver except the follower sleeve which is in section,

Fig. 4 is an elevation of the follower sleeve,

Figs. 5 and 6 are cross-sectional views taken on the lines 5—5 and 6—6 respectively, of Fig. 4,

Fig. 7 is a horizontal cross-sectional view taken on the line 7—7 of Fig. 2,

Fig. 8 is a vertical sectional view taken on the line 8—8 of Fig. 2,

Fig. 9 is an elevation of the inner side of one of the housing members,

Fig. 10 is an isometrical view of the working packing,

Fig. 11 is a similar view showing said packing spread open,

Fig. 12 is a vertical sectional view taken on the line 12—12 of Fig. 3, and

Fig. 13 is a perspective view of one of the wedge blocks.

In the drawings the numeral 10 designates a vertically split housing comprising complementary members. The housing members are secured together by bolts 11 and nuts 12. By employing four bolts the housing may be readily and easily assembled or disassembled. Suitable packing strips 13 are interposed between the housing members.

The housing includes a horizontal annular flange 14 below which is located a lower packing chamber 15 and above which extends an upper packing chamber 16. The flange is suitable for supporting the device in a casing head as is shown in Fig. 1. The lower packing chamber 15 will be below the top of the casing head and thus the projection of the device above said head will be reduced.

The lower packing chamber has diametrically opposite guides 17 (Figs. 2 and 7) which receive sliding wedge blocks 18 resting against upright shoes 19. The shoes have their rear faces flat to receive the blocks and their front faces concaved to embrace opposite sides of a cylindrical packing member or sleeve 20 fitting in the lower chamber.

Adjusting screws 21 are threaded through the flange at the same angles as the outer walls of the guides 17. Each wedge block 18 has a key slot 22 (Figs. 2 and 13) for receiving the lower end of one of the screws, whereby the blocks are suspended in the guides. By rotating the screws the blocks are slid downwardly and inwardly, thus displacing the shoes 19 inwardly and compressing the packing sleeve about the cable, rod, tube or other element which passes through the device. Hold-down jaws 14' are located on each side of the housing for securing it against upward displacement.

The housing is formed with a vertical shank 23 extending upwardly from the flange 14 and in which the upper packing chamber 16 is formed. The flange has a reduced opening 24 through which the cable passes and thus said flange forms a top for the lower packing chamber, whereby the sleeve 20 is retained.

The upper packing chamber 16 has an inclined annular bottom 16' and receives a cylindrical packing sleeve 25, which will more closely embrace the cable or other element which it surrounds, when forced down said inclined bottom. The packing sleeve 25 is formed of rubber or any material suitable for the purpose and while various types of cylindrical packing members could be used I prefer to use the sleeve herein set forth. The sleeve is split vertically one side to its bore 26 (Figs. 11 and 12), while on the opposite side it is split nearly to its outer wall to form a vertical hinge, whereby the sleeve may be opened as is shown in Fig. 11 for engaging it around a cable, rod or tube as the case may be.

A particular feature of the packing sleeve is an annular incision 27 inclined downwardly from its outer wall, but terminating short of its bore 26 so as not to sever the sleeve. A follower sleeve 28 slidable vertically in the chamber 16 rests upon the packing and when forced downwardly compresses said packing about the cable as well as forcing it down the inclined bottom.

It is obvious that the downward pressure on the packing sleeve will cause the upper portion to ride down the inclined surface of the lower portion provided by the inclined incision 27. The thin wall uniting the upper and lower portions of the packing will soon be worn through by the cable. This arrangement will compensate the wear of the packing sleeve and with the inclined bottom 24, will bring about an equal gripping of the cable or rod throughout the length of the bore 26. Grease pockets 29 may be provided in the bore 26. The same kind of packing may be used for the sleeve 20 thus avoiding the making of two styles of packing sleeves.

The shank 23 of the housing has vertical diametrical slots 30 above the packing sleeve 25. The follower sleeve is provided with diametrically opposite ribs 31 engaging said slots. These ribs terminate short of the bottom of the sleeve and have outwardly directed lugs 32 at their bottoms (Fig. 4).

The sleeve 28 has a vertical door 33 hinged thereto (Figs. 4, 5 and 6) which when opened exposes the bore and permits the sleeve to be placed on a cable or other cylindrical element. Ears 34 are provided at the top of the sleeve on each side of the ribs. These ears support bolts 35 on which grooved guide pulleys 36 are journaled on each side of the bore of the sleeve. The bolts are secured by nuts 37. By removing the bolt 35 above the door 33 the pulley 36 thereabove may be removed and the sleeve easily placed on the cable. The guide pulleys act to center the cable or other element in the sleeve.

One of the features of the invention is means for depressing the follower sleeve 28 to compress the packing sleeve 25. Some mechanism involving the element of leverage, whereby quick as well as gradual and forceful action is most desirable. The housing is provided on each side of the shank 23 with upright standards 38 spaced therefrom and opposite the slots 30.

Segmental gears 39 are journaled on studs 40 extending from the standards to the shank. Each gear has a hug 41 bearing against the shank for spacing said gear therefrom and also has a cam 42 adapted to engage one of the lugs 32 to depress the follower sleeve. When the cams 42 are in their upright position their flat sides are substantially parallel with the slots 30 and thus the lugs 32 are free to pass vertically when the follower sleeve 28 is lifted from the shank 23.

For actuating the cams the segmental gears 39 are employed and these gears are swung by pinions 43 fastened on the end of a countershaft 44 journaled in brackets 45 extending from the shank 23. A worm gear 46 is fastened on the shaft 44 between the brackets 45. A worm screw (Fig. 2) 47 meshes with and drives the gear 46 and is journaled on a stud 48 screwed into a boss 49 extending from the top of the shank. A hold-down keeper 50 secured to the brackets 45 bridges over the hub of the worm screw 47 and a crank handle 51 is made integral with the screw for revolving the same on the stud 48.

The segmental gears each have their teeth so regulated that when the pinions 46 engage in the last tooth, the parts will be locked against further movement except in a reverse direction. When this occurs the cams 42 will be in the position where their flat sides are substantially parallel with the slots 30, whereby the parts are automatically positioned for inserting and removing the follower sleeve 28. It is obvious that by revolving the crank handle 51 the countershaft 44 is rotated and the segmental gears 39 are likewise rotated. The gears may be quickly rotated or swung and as they are swung the cams 42 have their curved sides brought into engagement with the lugs 32.

The upper edges of the lugs 32 are rounded so as to induce the cams to ride thereon. As the cams move downward the lugs 32 are carried downward, thus depressing 28, whereby the packing 26 is compressed. When the pinions arrive at the lowermost teeth on the segments, the packing will have been completely worn out and further downward movement of the sleeve 28 will be prevented. The operator will thus know that the packing must be replaced.

When it becomes necessary to replace the upper packing 26 it is merely necessary to run down the screws 21 to displace the blocks 18 and compress the lower packing 20. This will prevent the upward escape of fluid while the upper packing is being replaced. In replacing the upper packing the parts are manipulated to bring the cams 42 to the position shown in full lines in Fig. 8.

The sleeve 28 is then elevated and the split packing 26 is placed around the cable and dropped into the shank 23. After this is done the sleeve 28 is again lowered and the crank handle 51 operated to actuate the gears 39 and compress the packing 26. After the packing 26 has been compressed the screws 21 are backed up to release the packing 20, the use of which is no longer required.

It will be seen that by reason of the worm gearing and comparatively large segments considerable leverage is had and, therefore, the cams 42 will depress the sleeve 28 with ample force. The device may be easily and quickly operated and as it is only necessary to handle five bolts, including the bolt 37, the saver may be quickly mounted or dismounted.

The term "cable" has been used generically herein because the device could be used on rods or tubing as well as upon a cable.

Various changes in the size and shape of the different parts, as well as modifications and alterations, may be made within the scope of the appended claims.

What I claim, is:

1. In an oil saver, a housing having a vertical passage therethrough and also having upper and

lower packing chambers therein and through which said passage extends, a packing member located in the upper housing chamber, means for compressing the upper packing to engage an element extending through the passage of the housing, a lower packing member located in the lower packing chamber of the housing, means separate from the upper packing and spaced therefrom for compressing the lower packing member for engaging an element passing through said housing, a supporting flange carrying the housing and below which the lower packing member is located, the means for compressing the lower packing extending above the flange for operation at that point.

2. In an oil saver, a housing having a passage therethrough, an upper packing member located in the housing for engaging an element passing through said housing, a packing chamber at the lower end of the housing surrounding the passage thereof, a compressible packing member located in the lower chamber of the housing, wedge blocks in the lower chamber having sliding engagement with the packing member, a supporting flange carrying the housing and screws extending down through the flange and engaging the blocks for sliding the same downwardly for compressing said lower packing member.

3. In an oil saver, a housing having a support near its lower end and also having a vertical passage therethrough, an upper packing member surrounding said passage, a follower sleeve in the top of the housing resting upon said packing member, lugs projecting from each side of the sleeve, and cam means directly engaging said lugs and mounted on said housing for depressing the sleeve to compress said packing member.

4. In an oil saver, a housing having an upright shank provided with vertical slots on opposite sides, a packing member located in the housing at the lower end of the shank, a follower sleeve slidable vertically in the shank and having lugs extending through the slots thereof, and means for engaging the lugs for depressing the sleeve to compress the packing, said compressing means being arranged to be moved out of the path of said lugs, whereby the sleeve may be removed from the shank of the housing.

5. In an oil saver, a housing having a vertical packing chamber, a compressible packing member located in the housing chamber and having a vertical bore for receiving a movable element to be packed, a follower sleeve mounted in the housing for engaging the packing member, lugs extending from the sleeve, cams engaging said lugs, and means for actuating said cams for depressing the sleeve to compress the packing member.

6. In an oil saver, a housing having a vertical packing chamber, a compressible packing member located in the housing chamber and having a vertical bore for receiving a movable element to be packed, a follower sleeve mounted in the housing for engaging the packing member, lugs extending from the sleeve, cams engaging said lugs, gear members mounted on opposite sides of the housing and carrying said cams, and means for actuating said gear member to swing said cams.

7. In an oil saver, a housing having a vertical packing chamber, a compressible packing member located in the housing chamber and having a vertical bore for receiving a movable element to be packed, a follower sleeve mounted in the housing for engaging the packing member, lugs extending from the sleeve, cams engaging said lugs, gear members mounted on opposite sides of the housing and carrying said cams, a countershaft mounted on the housing, pinions on the countershaft engaging the gear members, a worm gearing for rotating the countershaft, and a crank handle for acting the worm gearing.

8. As a sub-combination in an oil saver, a packing comprising a cylindrical body of compressible material having a longitudinal bore, said body being longitudinally and diametrically split whereby it is hinged so as to be opened on both sides of the bore, said body also having an annular inclined incision intermediate its ends, whereby one portion may be telescoped into the other portion when the body is longitudinally compressed.

9. In an oil saver, a housing having an annular flange for supporting it in position, a shank on the housing having slots and provided with a packing chamber having an inclined bottom, a compressible packing member located in the packing chamber of the housing, a follower sleeve in the shank resting upon said packing member and having upright guides engaged in the slots of the shank, and means for depressing the sleeve to compress the packing member and force it downwardly in the inclined bottom of the packing chamber, whereby an element passing through the housing and said packing member is gripped by the latter.

10. In an oil saver for oil wells, a vertically elongated housing having a vertical packing chamber therein, a support extending laterally from the housing near its lower end, a vertically elongated compressible packing member located in the housing chamber and having a vertical bore for receiving a vertically movable element to be packed, a separable follower sleeve vertically movable in the upper end of the housing and having means for fastening it together loosely about an element vertically movable through the housing and the packing member, guides in the housing for the sleeve to prevent rotation of the sleeve, and means entirely mounted on the housing above the lateral support and including a leverage element for quickly depressing the follower means for compressing the packing member.

11. In an oil saver for oil wells, a vertically elongated housing having a vertical packing chamber therein, a support extending laterally from the housing near its lower end, a vertically elongated compressible packing member located in the housing chamber and having a vertical bore for receiving a vertically movable element to be packed, follower means vertically movable in the upper end of the housing for downwardly compressing the packing member, cams journaled on the housing and engaging the follower means which is unattached to the said cams, said cams acting to force the follower means downwardly to compress said packing member, and means for quickly actuating said cams.

HARVEY R. STANDLEE.