July 19, 1932. E. J. BECK 1,867,559

OIL SAVER

Filed March 23, 1931

Fig. 1.

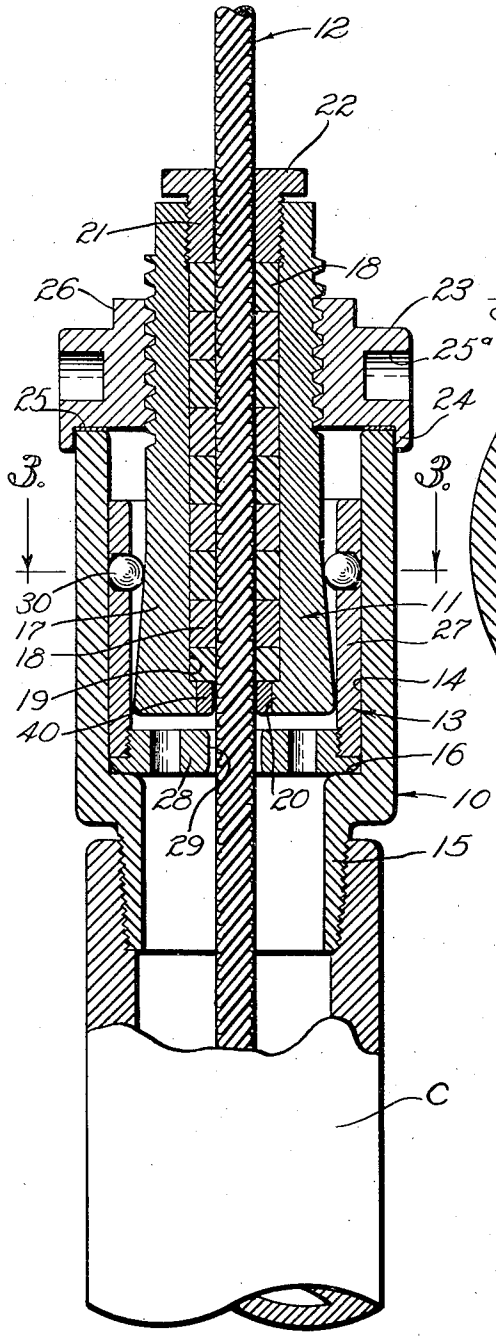


Fig. 2.

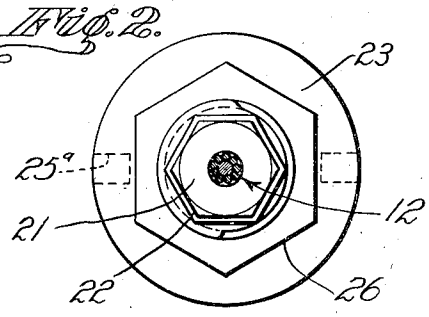
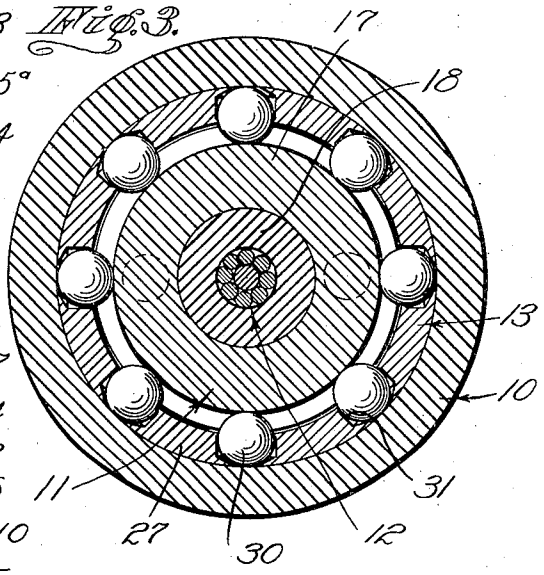


Fig. 3.



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UNITED STATES PATENT OFFICE

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OIL SAVER

Application filed March 23, 1931. Serial No. 524,603.

This invention relates to a device for use in well drilling operations, and relates more particularly to an oil saver. It is a general object of the invention to provide a simple, practical, and effective oil saver for packing or sealing about a reciprocating cable, or the like.

An object of the invention is to provide an oil saver that is adapted to be mounted on the upper end of a well casing and which includes a packing gland or packing assembly for packing about a cable, or the like, extending into the well.

It is another object of this invention to provide a packing or sealing device of the character mentioned that embodies a novel and improved means for releasably locking or latching the packing gland in the body. It is a feature of the present invention that the reciprocation of the cable about which the packing is arranged tends to more tightly lock or set the packing gland against movement and cannot possibly cause its loosening or displacement.

A further object of the invention is to provide an oil saver of the character mentioned that is simple and sturdy in construction and that is inexpensive of manufacture.

Other objects and features of the invention will be best and more fully understood from the following detailed description of a typical form and application of the invention, throughout which description reference will be had to the accompanying drawing, in which:

Fig. 1 is a longitudinal detailed sectional view of the device, showing it mounted on the upper end of a well casing and packing about a cable extending into the well. Fig. 2 is a reduced top or plan view of the device. Fig. 3 is an enlarged transverse detailed sectional view, taken as indicated by line 3—3 on Fig. 1.

The device provided by the present invention includes, generally, a tubular body 10 adapted to be mounted on the upper end of a well casing C, a packing means or packing gland 11 in the body for packing about a cable 12 extending into the casing C, and means 13 for releasably locking the packing means 11 in the body.

The body 10 is adapted to be mounted on the upper end of the well casing C and is provided to carry the packing means 11. The body 10 is tubular, having a central longitudinal or vertical opening 14. The upper or major portion of the opening 14 is of round cross section and is of uniform diameter. The lower end portion 15 of the body is of reduced diameter to provide an annular upwardly facing shoulder 16 in the opening 14. The lower reduced portion 15 of the body is externally screw-threaded to thread into the upper end of the well casing C or into a coupling, or the like, on the casing.

The packing means or gland 11 is provided to pack about and wipe liquid from the reciprocating cable 12. In the particular form of the invention illustrated in the drawing, the packing means 11 includes an elongated packing carrier 17 carrying the packing 18 for sealing about the cable 12. The carrier 17 is tubular, having a central longitudinal opening 19 for containing the packing 18. Any suitable form of packing 18 may be arranged in the opening 19 to pack about and wipe the cable 12. An inwardly projecting annular flange 20 is provided at the lower end of the packing carrier 17 to support the packing in the opening 19. A bronze bushing 40 is provided in an opening in the flange 20 to pass the cable 12. In accordance with the preferred form of the invention, the packing carrier 17 projects a considerable distance above the upper end of the body 10. A tubular compression gland or nut 21 is screw-threaded into the upper end of the housing 19 to compress the packing 18. The nut 21 is formed of bronze, or the like, and is provided at its upper end with a polygonal head 22 to receive a wrench, or the like.

The means 13 is provided to hold the packing carrier 17 against displacement from the body opening 14. The means 13 releasably locks or latches the packing carrier 17 against longitudinal movement relative to the body 10 and includes a nut 23 threaded on the projecting upper end part of the packing carrier 17. The nut 23 is prefer-

ably connected with the carrier by comparatively heavy or coarse threads, as illustrated in Fig. 1 of the drawing. A polygonal portion may be provided at the extreme outer end of the carrier 17 to facilitate its engagement by a wrench, or the like. The nut 23 completely covers the upper end of the body 10 and is provided at its lower end with a downwardly projecting annular flange 24. The flange 24 overhangs or surrounds the upper end part of the body 10 to center the nut 23 and the carrier 17 relative to the body. A suitable gasket 25 may be provided between the nut 23 and the upper end of the body 10. Means may be provided whereby the nut 23 may be readily engaged by a wrench or spanner. Spaced openings or sockets 25^a are provided in the nut 23 and a reduced polygonal upper end 26 is provided on the nut.

A sleeve 27 is provided in the opening 14 to surround the inner end part of the packing carrier 17. The sleeve 27 is freely slidable and rotatable in the opening 14 and freely passes the carrier 17 with suitable clearance. A bronze cap 28 is screw-threaded into the lower end of the sleeve 27 to receive the lower end of the packing carrier 17. The cap 28 engages the shoulder 16 to support the sleeve 27 in the opening 14. A central opening 29 is provided in the cap 28 to freely pass the cable 12. A plurality of spaced balls 30 are carried by the sleeve 27. The balls 30 are arranged in a row of symmetrically spaced openings 31 in the sleeve. The row of openings 31 is preferably spaced a short distance below the upper end of the sleeve 27. The balls 30 are rotatably or swivelly supported in the openings 31 and are adapted to engage the walls of the opening 14 and the exterior of the packing carrier 17. In accordance with the preferred embodiment of the invention, the balls 30 are retained against displacement from the openings 31. The outer ends of the openings 31 are of reduced diameter, while the inner edges of the openings are peaned over to retain the balls.

The lower end portion of the packing carrier 17 is shaped to cause the balls 30 to tightly bind or wedge between the carrier and the walls of the opening 14. The lower end part of the packing carrier 17 is flared, having a downwardly and outwardly inclined exterior. The slope or inclination of the exterior of the lower part of the carrier 17 is preferably gradual. The nut 23 may be threaded downward on the carrier 17 to clamp against the upper end of the body 10 to hold the carrier in a position where the balls 30 are tightly wedged between the tapered part of the carrier and the walls of the opening 14 to effectively hold the packing carrier against longitudinal movement in the body. It will be apparent that any tendency for the carrier 17 to move upwardly, due to reciprocation of the cable 12, causes the balls 30 to more tightly set the carrier against movement.

It is believed that the operation of the oil saver provided by the present invention will be readily apparent from the foregoing detailed description. The packing carrier 17 may be initially set in the desired position by threading the nut 23 downward to clamp against the upper end of the body 10. Pressure of the nut 23 against the upper end of the body 10 causes the carrier 17 to assume a position where its flared lower end wedges against the spaced balls 30 to tightly clamp the balls between the carrier and the walls of the body. It will be apparent that the packing carrier 17 cannot become loosened or displaced by reciprocation of the cable 12, as any outward movement of the carrier 17 caused by movement of the cable causes the tapered exterior of the carrier to co-operate with the spaced balls 30 to more tightly lock the carrier against movement. The packing carrier 17 of the sleeve 27 may be easily and quickly removed from the body 10 by first removing the body from the casing C inverting the oil saver, loosening the nut 23 and then shifting the packing carrier 17 upward to release the balls 30. After the balls 30 are released the carrier 11 and sleeve 27 may be easily lowered out of the body opening. In practice, the carrier 17 may be removed by first loosening the nut 23 and then bringing the swab or other tool on the cable 12 into lifting engagement with the cap 28. This causes the balls 30 to release so that the tool may lift the sleeve and carrier from the body.

It is to be noted that the present invention provides an oil saver that is particularly effective in packing about and wiping a cable, or the like, and that will operate over a long period of time without becoming loosened or displaced by reciprocation of the cable. The packing carrier 17 may be clamped as tightly as desired in the body by threading the nut 23 downward against the body. The packing holding or latching means embodied in the present invention is particularly dependable and effective, as it does not embody threaded parts, or the like, liable to loosening or releasing by movement of the cable. The packing carrier 17 may be easily and quickly removed for the purpose of replacing the packing, etc.

Having described only a typical, preferred form of my invention, I do not wish to limit myself to the specific details set forth, but wish to reserve unto myself any changes or variations that may appear to those skilled in the art, or fall within the scope of the following claims:

Having described my invention, I claim:

1. An oil saver of the character described including, a tubular body adapted to be mounted on the upper end of a well casing, a packing gland for packing about an ob-

ject extending through the body, and means for releasably retaining the packing gland in the body, said means including a sleeve in the body surrounding the packing gland, and balls carried by the sleeve to wedge between the gland and body.

2. An oil saver of the character described including, a tubular body adapted to be mounted on the upper end of a well casing, a packing gland for packing about an object extending through the body, and means for releasably retaining the packing gland in the body, said means including a tapered portion on the gland, a sleeve in the body surrounding the gland, and balls carried by the sleeve to wedge between the tapered portion of the gland and the body.

3. An oil saver of the character described including, a tubular body adapted to be mounted on the upper end of a well casing, a packing gland for packing about an object extending through the body, and means for releasably retaining the packing gland in the body, said means including a tapered portion on the gland, a sleeve in the body surrounding the gland, balls carried by the sleeve to wedge between the tapered portion and the body, and means for holding the gland in a position where the balls are wedged between said tapered portion and the body.

4. An oil saver of the character described including, a tubular body adapted to be mounted on the upper end of a well casing, a packing gland for packing about an object extending through the body, and means for releasably retaining the packing gland in the body, said means including a tapered portion on the gland, a sleeve in the body surrounding the gland, balls carried by the sleeve to wedge between the tapered portion and the body, a nut threaded on the gland for holding the gland in a position where the balls are wedged between the tapered portion and the body.

5. An oil saver of the character described including, a tubular body adapted to be mounted on the upper end of a well casing, a packing gland for packing about an object extending through the body, and means for releasably retaining the packing gland in the body, said means including a tapered portion on the gland, and a ball between the tapered portion and the body.

6. An oil saver of the character described including, a tubular body adapted to be mounted on the upper end of a well casing, a packing gland for packing about an object extending through the body, and means for releasably retaining the packing gland in the body, said means including a tapered portion on the gland, a ball between the tapered portion and the body, and a nut threaded on the gland to wedge the ball between the tapered portion and the body.

7. An oil saver of the character described including two elements, one a tubular body adapted to be mounted on the upper end of a well casing, the other a packing carrier in the body for passing an object extending through the body, packing in the carrier to pack about the object, and means for retaining the carrier in the body including a tapered portion on one of the elements, and a ball between the tapered portion and the other element.

8. An oil saver of the character described including two elements, one a tubular body adapted to be mounted on the upper end of a well casing, the other a packing carrier in the body for passing an object extending through the body, packing in the carrier to pack about the object, and means for retaining the carrier in the body including a tapered portion on one of the elements, a sleeve, and a plurality of balls carried by the sleeve to wedge between the tapered portion and the said other element.

9. An oil saver of the character described including, a tubular body adapted to be mounted on a well casing, a packing carrier in the body adapted to pass an object extending through the body, packing in the carrier to pack about the object, and means for retaining the carrier in the body including a flared portion on the carrier having a downwardly and outwardly inclined exterior, and a plurality of balls between the flared portion of the carrier and the interior of the body.

10. An oil saver of the character described including, a tubular body adapted to be mounted on a well casing, a packing carrier in the body adapted to pass an object extending through the body, packing in the carrier to pack about the object, and means for retaining the carrier in the body including a flared portion on the carrier having a downwardly and outwardly inclined exterior, a plurality of spaced balls between the flared portion of the carrier and the interior of the body, and means urging the carrier upwardly to wedge the balls between the flared portion and the body.

11. An oil saver of the character described including, a tubular body adapted to be mounted on a well casing, a packing carrier in the body adapted to pass an object extending through the body, packing in the carrier to pack about the object, and means for retaining the carrier in the body including a flared portion on the carrier having a downwardly and outwardly inclined exterior, a sleeve in the body surrounding the carrier, balls carried by the sleeve to be wedged between the flared portion of the carrier and the interior of the body, and a nut threaded on the carrier to act against the body and move the carrier upwardly to wedge the balls between the flared portion of the carrier and the body.

12. An oil saver of the character described

including, a tubular body adapted to be mounted on a well casing, a packing carrier in the body adapted to pass an object extending through the body, packing in the carrier to pack about the object, means for compressing the packing in the carrier, and means for retaining the carrier in the body including a flared portion on the carrier having a downwardly and outwardly inclined exterior, and a plurality of balls between the flared portion of the carrier and the interior of the body.

In witness that I claim the foregoing I have hereunto subscribed my name this 16th day of March, 1931.

ERNEST J. BECK.