

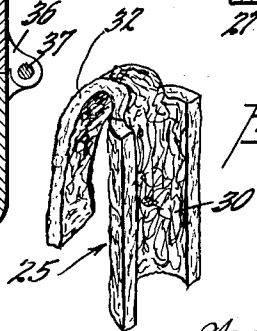
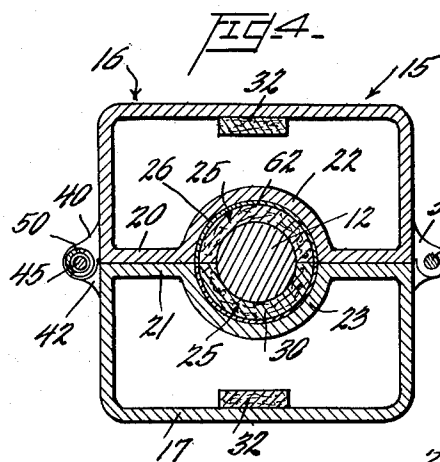
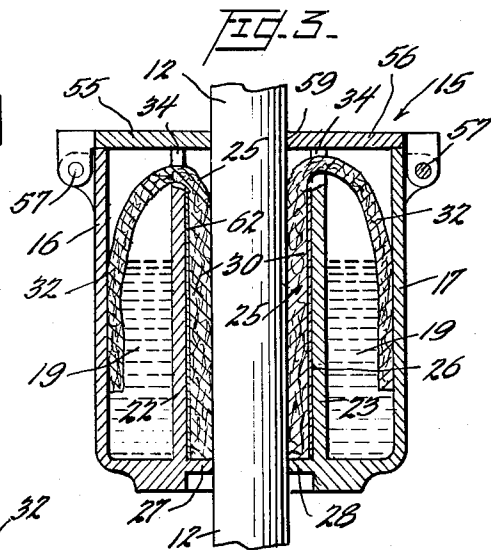
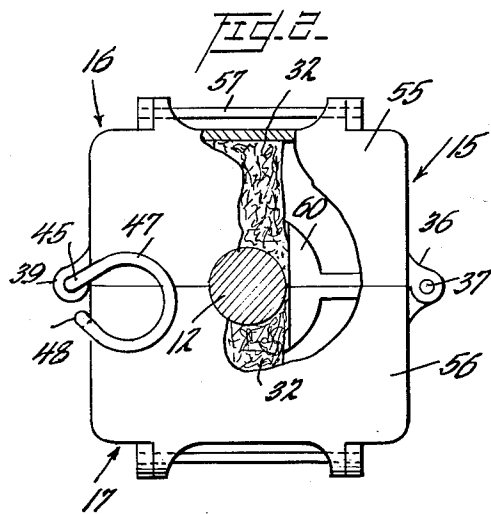
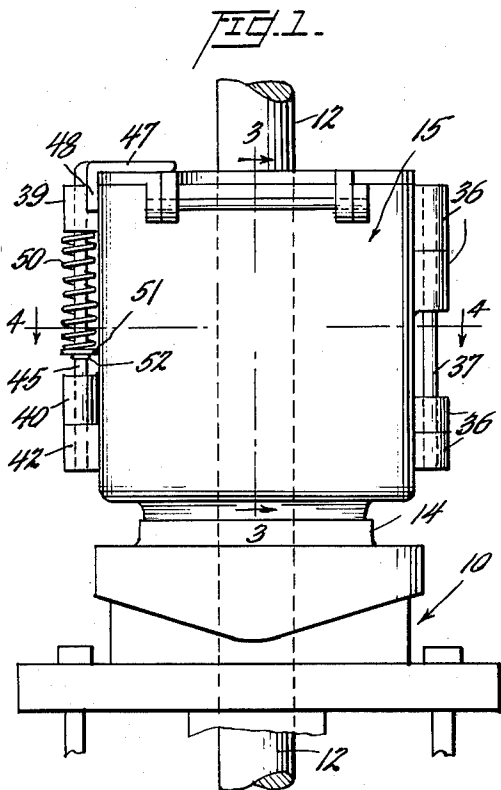
Oct. 3, 1961

G. L. MATSON

3,002,587

POLISH ROD LUBRICATOR

Filed May 12, 1959



INVENTOR

George L. Matson

BY Watson, Cole, Grindle & Watson

ATTORNEYS

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3,002,587

POLISH ROD LUBRICATOR

George L. Matson, 3200 W. Louisiana Ave., Midland, Tex.

Filed May 12, 1959, Ser. No. 812,644

4 Claims. (Cl. 184—25)

This invention relates to pumping oil well equipment and more particularly to the polish rod and stuffing box installations at the upper ends of the well casing and the tubing.

Surmounting the casing head, the upwardly projecting tubing is equipped with a lateral outlet, usually in the form of a T-fitting, and above that is provided a stuffing box through which the polish rod extends, this polish rod being connected at its lower end within the well tubing to the sucker rod string, and at its upper end to the pump jack.

It has been found that the wear on the polish rod and the stuffing box rubbers may be substantially reduced, and the working life of these members prolonged, by providing lubricating means for said rod adjacent the point where it enters the stuffing box, and it is therefore the principal object of the invention to provide a novel and improved polish rod lubricator for such an installation.

In its preferred embodiment, the invention contemplates the provision of a polish rod lubricator comprising a box-like container adapted to hold a supply of liquid lubricant and to support a wick member, a portion of which dips into the lubricant supply and another part of which fits snugly a portion of the circumference of the polish rod.

The box preferably is split in half on a vertical plane extending diametrically through the polish rod, and each half is in the form of a separate bowl or receptacle for containing the supply of lubricant. The halves are hinged together at one side of the rod and provided upon the opposite side with novel latching means for holding the halves firmly together embracing the rod between them.

Mating, outwardly hinged, cover-halves are provided at the top of the box, the inwardly extending portions of the lids or covers being provided with semi-circular cut-out portions to accommodate the polish rod.

Novel hold-down means are provided, in conjunction with the latching means for the box halves, to retain the covers in securely closed position.

An important feature of the invention is the particular construction and arrangements of the wicks which feed the lubricant to the rod by capillary attraction. There are preferably a pair of these wicks, each wick comprising a flat and rather wide portion adapted to extend substantially from top to bottom of the box, and to be curved to conform to the shape of the inner wall of a semi-cylindrical cavity provided between the box halves and surrounding the polish rod. An elongated, preferably narrower, portion of each wick extends over the upper edge of the inner wall of each box half and thence downwardly into the supply of lubricant.

When the box halves are closed onto the polish rod, the semi-circular larger portions of the wicks complement each other to form a continuous cylindrical wrapping for the rod within the lubricator attachment.

Among the advantages of the present invention may be mentioned the ease of installation and removal, the relatively greater reservoir capacity, its adaptability to all

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makes of pump installations, the ease of filling the bowls with lubricant, and the capability and readily mixing inhibitors with the lubricant when desired.

Other objects and features of novelty will be apparent from the following specification when read in connection with the accompanying drawings in which one embodiment of the invention is illustrated by way of example.

In the drawings:

FIGURE 1 is a view in side elevation of a polish rod lubricator embodying the principles of the invention;

FIGURE 2 is a top plan view with portions of the cover plates of the lubricator broken away;

FIGURE 3 is a vertical sectional view taken on line 3—3 of FIGURE 1;

FIGURE 4 is a horizontal sectional view taken on line 4—4 of FIGURE 1; and

FIGURE 5 is a view in perspective of one of the wick elements.

In FIGURE 1 of the drawings, a fragmentary portion of the upper end of a typical stuffing box installation is rather diagrammatically shown at 10, and the polish rod indicated at 12 extends downwardly through the stuffing box and thence into the well tubing as in typical installations.

Surmounting the upper portion 14 of the stuffing box arrangement 10 and adapted to rest thereupon, is the novel polish rod lubricator indicated generally by the reference numeral 15.

As best shown in FIGURES 2 and 4 of the drawings, the lubricator comprises a box-like approximately cubical hollow structure comprising two half portions 16 and 17 each affording a cup-like or bowl-like receptacle structure as suggested in FIGURE 3, and adapted to contain supplies of liquid lubricant 19.

The inner abutting walls 20 and 21 of the halves 16 and 17 are provided centrally with substantially semi-circular recessed portions 22 and 23 which are adapted to surround the polish rod 12 but being spaced therefrom to provide an annular cylindrical cavity for reception of the wick elements 25 which will be presently described in detail.

The inner walls 22 and 23 of the half portions of the lubricator are provided with inwardly directed semi-circular flanges 27 and 28 to form a bottom of the wick cavity. Each of the wick members 25 comprises a rather wide rod embracing portion 30 which is adapted to be warped to a semi-cylindrical configuration to fit within the halves of the wick cavity 26, and a strap-like tail portion 32 extends from the upper end of each of the portions 30 of the wick, this portion 32 when installed adapted to pass through notches 34 formed in the central portions of the upper ends of the walls 20 and 21, and thence downwardly into the reservoirs 19, dipping beneath the surface of the liquid lubricant therein. Thus, it will be seen that the relatively narrow strap-like wick portion is of a capacity sufficient to attract the proper amount of lubricant from the reservoir, and the wider semi-cylindrical wick leg spreads this lubricant around the entire half of the rod. Also, the inner wall portions 20, 21, 22 and 23, except for the wick notches 34, extend all the way to the top wall or lid portions of the receptacle and thus serve to prevent splashing of the lubricant or the introduction of extraneous matter into the reservoirs.

The halves 16 and 17 of lubricator 15 are provided

with hinge projections or lugs 36 through which a pintle 37 extends, and upon the opposite side of the installation the half portion designated 16 is provided with two bored ears or projections 39 and 40. The half designated 17 is provided with a single perforated ear 42. A latching pin 45 extends downwardly through the registering openings in the ears 39 and 40 and the lower end is adapted to be received within the bore of the ear 42. The upper end of the latching pin 45 is bent to a substantially circular configuration as at 47 and the extreme end is directed downwardly as at 48. Surrounding the greater portion of the locking pin 45 is a coil spring 50 which is compressed between the upper ear 39 and a washer 51 carried by the locking pin 45 and held in place as by means of the cotter 52.

It will thus be readily seen that when the locking pin 45 is in the engaged position shown in FIGURE 1 of the drawings, the lower end of the pin is urged downwardly into the opening of the ear 42 and thus prevents the swinging of the halves of the lubricator to open position.

The upper end of the lubricator is provided with lids or covers 55 and 56 which are hinged to the remote walls of the respective halves 16 and 17 as by means of the pintles 57. The adjacent inward edges of the lids 55 and 56 are provided with semi-circular openings 59 to accommodate the polish rod 12.

Since the curved upper or handle portion of the locking pin 45 overlaps both of the lids 55 and 56, as clearly shown in FIGURE 2 of the drawings, it serves also as a latching device for these covers. Whenever it is desired to raise the covers for replenishment of lubricant, adjustment of the wicks, or for any other purpose, the upper portion 47 of the latching pintle may be swung in a clockwise direction as seen in FIGURE 2 and thus will clear the lids and permit them to be opened. The spring 50 urges the upper end 47 of the pin 45 downwardly upon the lids, and when in locked position the projection 48 acts as a stop for limiting the swinging movement of the overhanging curved portion 47 of the pin. To aid in maintaining the rounded portions 30 of the wicks 25 within the pockets 26, the segmental lips 60 are provided. These lips or ledges 60 are divided along the line of cleavage between the box halves 16 and 17 as clearly shown in FIGURE 2.

It will be readily understood how upon opening the lids or covers 55 and 56 the lubricant can be replenished, and whenever it is desired to remove the lubricator as a whole from its embracing position upon the polish rod 12, the latch pin 45 can be retracted, the halves 16 and 17 swung apart and the device opened out. In open position, of course, the wicks 25 may be easily removed for renewal or cleaning. If desired, a backing sheet 62 of a fairly stiff sheet material such as a hard impervious paper or fiber or a strip of plastic, may be inserted behind the portions 30 of the wicks and within the semi-circular alcoves provided in the inner walls of the bowls 16 and 17, if there is any tendency for the wick to stick to the metal walls of the container, although it will be found that this expedient may not be necessary in many installations.

In the preferred construction, the lubricator container is made of aluminum and is thus quite light in weight. However, if it is necessary, in order to prevent the lubricator from riding upwardly away from the stuffing box assembly 10 upon an upward stroke of the polish rod, the lubricator 15 may be held down by any suitable means, for example, by being wired to a portion of the stuffing box.

It will be understood that various changes and modifications may be made in the embodiments illustrated and described herein without departing from the scope of the invention as defined by the following claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A lubricator for a substantially vertically disposed axially reciprocating rod, said lubricator comprising a stationary box-like container adapted to embrace said rod and to accommodate relative movement of the latter; said container comprising two complementary receptacles hinged together at one side of the rod and provided with manually operable latching means at the opposite side thereof, each receptacle having top walls, and mutually facing inner walls when closed to embrace the rod; said mutually facing inner walls of said receptacles being provided with semi-cylindrical recesses therein each of a radius greater than that of the contained rod, whereby when the container is closed about the rod there is provided an inner annular chamber surrounding said rod, the surface of the rod adapted to constitute at least in part the inner wall of said annular chamber; each of said receptacles comprising also an outer chamber adjoining the inner chamber and separated by the vertical recessed inner walls of the receptacle; each of said outer chambers adapted to contain a supply of liquid lubricant; a pair of inverted U-shaped wicks within said container, each having a wide first leg confined within said annular inner chamber and of a width equal to one-half of the circumference of the annular inner chamber and the wicks being curved to fit into said chamber to complement each other in providing complete peripheral surface contact with said rod, each wick having a second narrower strap-like leg surmounting the recessed portion of said inner walls and dipping down into the lubricant supply in the adjacent outer chamber, the said inner walls of the receptacles extending generally to the full height of said receptacles except that the semi-cylindrically recessed portions of said inner walls are notched at their upper ends to provide a space between said upper ends and said top wall only sufficient to accommodate the passage of said legs of the wicks there-through.

2. The lubricator as set forth in claim 1 in which inwardly directed semi-annular flanges are provided at the bottoms of the inner walls of each of the hinged receptacles to provide a bottom wall for the inner chamber and underlying the first named legs of the wicks, and said top walls of the receptacles comprising a pair of closure plates hinged to oppositely disposed outer edges of the receptacles, and provided with semi-circular cut-outs to accommodate the rod when they are in closed position, the manually operable latching means for retaining said container in rod embracing position being provided with means to also retain the closure plates in closed position.

3. The lubricator as set forth in claim 1 in which inwardly directed semi-annular flanges are provided at the bottoms of the inner walls of each of the hinged receptacles to provide a bottom wall for the inner chamber and underlying the first named legs of the wicks, and said top walls of the receptacles comprising a pair of closure plates hinged to oppositely disposed outer edges of the receptacles, and provided with semi-circular cut-outs to accommodate the rod when they are in closed position, and in which said latching means comprises perforated lugs on the respective receptacles adjacent their abutting edges, the lugs having openings therein which are in vertical registry when the container is closed about the rod, a latch pintle movable through said openings to retain the receptacle in closed position, spring means urging said pintle vertically downwardly toward latching position, and a lateral extension at the upper end of said pintle adapted to be swung to overlie said cover plates and hold them in closed position as urged downwardly by said spring means.

4. A lubricator for a substantially vertically disposed working rod, said lubricator comprising a stationary box-like container adapted to embrace said rod and to ac-

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commodate relative movement of the latter, said container comprising two complementary receptacles hinged together at one side of the rod and provided with manually operable latching means at the opposite side thereof, said latching means comprising perforated lugs on the respective receptacles adjacent their abutting edges, the lugs having openings therein which are in vertical registry when the container is closed about the rod, a latch pintle movable through said openings to retain the receptacle in closed position, spring means urging said pintle vertically downwardly toward latching position, a pair of cover plates hinged respectively to outer margins of the tops of said receptacles, and a lateral extension

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at the upper end of said pintle adapted to be swung to overlie said cover plates and hold them in closed position as urged downwardly by said spring means.

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