Aug. 12, 1924. 1,504,901

R. W. ROGERS

STUFFING BOX

Filed March 6, 1923

Fig. 1.

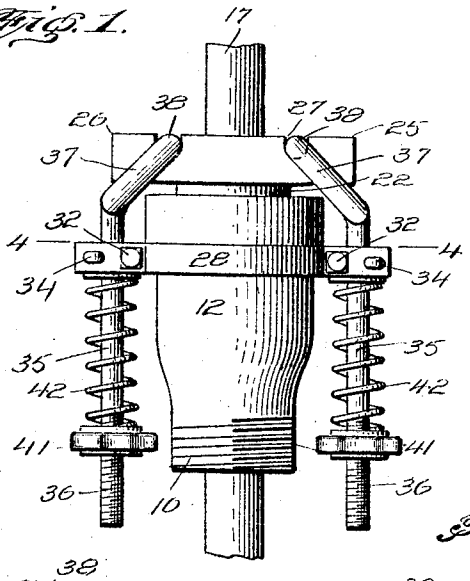


Fig. 2.

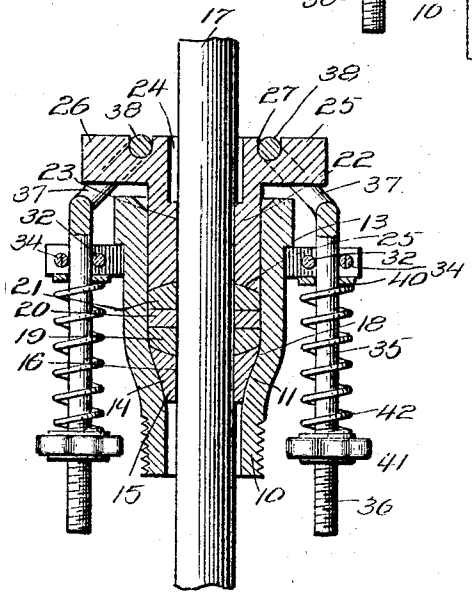


Fig. 3.

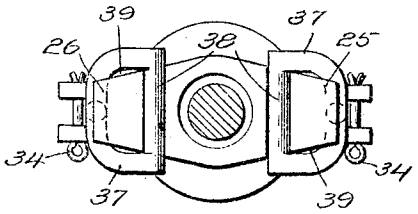
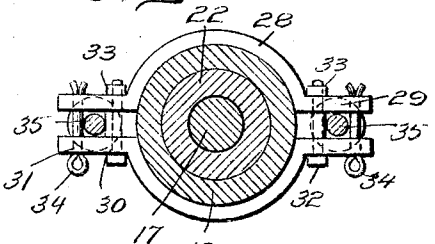


Fig. 4.



INVENTOR.
Roy W. Rogers.

BY
Geo. P. Kimmel.
ATTORNEY.

Patented Aug. 12, 1924. 1,504,901

UNITED STATES PATENT OFFICE.

ROY W. ROGERS, OF MIDIAN, KANSAS.

STUFFING BOX.

Application filed March 6, 1923. Serial No. 623,246.

To all whom it may concern:

Be it known that I, ROY W. ROGERS, a citizen of the United States, residing at Midian, in the county of Butler and State of Kansas, have invented certain new and useful Improvements in Stuffing Boxes, of which the following is a specification.

This invention relates to stuffing boxes designed primarily for use in connection with the packing of the polish rods of pumps in deep well operations, but it is to be understood that a stuffing box in accordance with this invention can be employed for any purpose wherein it is found applicable, and the invention has for its object not only to improve the construction disclosed by Letters Patent 1,400,991, granted December 1, 1921, but further to provide in a manner as hereinafter set forth a stuffing box including means to automatically set up a packing action on the rod to prevent leakage during the operation of the pump, as well as to provide for the convenient insertion, removal or pulling of the polish rod of the pump when occasion so requires and without detaching the body portion or body member of the device.

Further objects of the invention are to provide in a manner as hereinafter set forth a stuffing box for the purposes referred to which is simple in its construction, strong, durable, compact, thoroughly efficient in its use, having the packing elements thereof shifted and held in position automatically with respect to the polish rod to prevent leakage during the operation of the pump, conveniently installed, and comparatively inexpensive to manufacture.

With the foregoing and other objects in view, the invention consists of the novel construction, combination and arrangement of parts as hereinafter more specifically described, and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which fall within the scope of the claim hereunto appended.

In the drawings wherein like reference characters denote corresponding parts throughout the several views:—

Figure 1 is an elevation of a stuffing box in accordance with this invention.

Figure 2 is a vertical sectional view thereof.

Figure 3 is a top plan view.

Figure 4 is a section on line 4—4, Figure 1.

Referring to the drawings, a stuffing box in accordance with this invention comprises a body member, a clamping element, a series of packing elements, a gland element, and a pair of pressure applying elements. The packing elements are supported in the body member and engaged by the gland element which is automatically shifted through the medium of the pressure applying elements and these latter are connected with the gland element and retained in position by the clamping element which is carried by the body member. The body is so set up that the packing elements can shift lengthwise and they are compressed to snugly engage the polish rod to prevent leakage.

The body member is hollow from end to end, is constructed from metallic material of substantial thickness, is cylindrical in cross section and includes a peripherally threaded lower portion 10, an upwardly flaring intermediate portion 11, and an upper portion 12 which is of greater diameter than the lower portion 10. The top of the upper portion 12 is offset and somewhat enlarged to provide at a point removed from the top edge of the upper portion 12 an annular shoulder 13. The flaring intermediate portion 11 provides what may be termed a seat 14 of inverted frustoconical shape.

Arranged within the body member and positioned against the seat 14, is a follower ring 15, of the same contour as the shape of the seat 14 and which is substantially of the same height as the height of the seat 14 and wedgingly engages the seat 14 and owing to the manner of setting up the ring 15 with respect to the seat 14, the ring 15 can shift towards the lower portion 10 so that it will always be in snug engagement on the inner face of the body member. The ring 15 is formed with an opening 16, for the passage of the polish rod 17 of the pump, and said ring 15 has its top formed with a concave recess 18.

The packing elements, which as shown are three in number, although this number can be increased if desired, are interposed between the ring 15 and a gland element to be presently referred to, and the said packing elements are indicated at 19, 20 and 21. The packing elements are in the form of

perforated disks and constructed of any suitable compressible material preferably leather or rubber. The lower face of the packing element 19 conforms in curvature to the concave recess 18 so as to snugly engage therein and the upper face of the packing element 21 is of convexed curvature for a purpose to be presently referred to. Both faces of the ring 20 are flat.

The packing elements are of a diameter to snugly engage the inner face of the body member and are provided with openings for the passage of the polish rod 17, and the diameter of the openings is such as to provide a snug engagement between the walls thereof and the polish rod 17.

The gland element consists of a hollow cylindrical body portion 22 of an outer diameter to snugly engage the inner face of the body member and said body portion 22 has its openings of two different diameters, the smaller indicated at 23 and the larger at 24. The wall of that portion of smaller diameter as indicated at 23, snugly engages with the polish rod 17. The wall of that portion 24, of greater diameter, is spaced from the polish rod 17. The gland element has its lower edge formed with a convex recess 25 into which extends, as well as snugly fits, the convexed upper face of the packing element 21. The gland element is extended into the upper portion of the body member and is of a length as to permanently extend upwardly therefrom and the body portion 22, of said gland element, is formed with a pair of oppositely extending and outwardly disposed flanges 25, 26 which extend at right angles with respect to the axis of the gland element and are arranged in lengthwise alinement with respect to each other. Each of the flanges 25, 26, is of a length to project beyond the body member and each of said flanges is formed with a transverse groove 27 of a length equal to the width of the flange. The grooves 27 are provided in the upper face of the flanges and at a point between the transverse center of each flange and the inner end thereof. The grooves 27 are adapted to receive the pressure applying elements, to be presently referred to, and which elements coact with the gland element for the purpose of compressing the packing elements so that they will snugly engage with the polish rod to prevent leakage during the operation of the pump, and the action of such pressure applying elements is automatic as will be hereinafter understood.

The clamping element, which cooperates with the pressure applying elements for the purpose of connecting them with the body member and also for the provision to cause the application of the pressure from said elements on the gland element, consists of two complementary sections which are oppositely disposed with respect to each other and each of which is formed of a semicircular intermediate portion 28 and a pair of end portions 29 which are disposed at right angles with respect to the intermediate portion 28. The end portions 29 extend in opposite directions with respect to each other and are arranged in lengthwise alinement. The intermediate portion 28 is positioned against the periphery of the body member and against the shoulder 13. When the sections of the clamping element are positioned against the periphery of the body member, the end portions 29 of one section opposes the end portions 29 of the other section, but are spaced therefrom to provide for the passage of the pressure applying elements, to be presently referred to. Each end portion 29 is formed with a pair of openings 30, 31 and the openings of the end members 29, of one section of the clamping element, are arranged in alinement with respect to the openings formed in the end portions 29, of the other section of the clamping element. Extending through the alining openings 30, are headed bolts 32, carrying nuts 33, and said bolts 32, in connection with the nuts 33, provides means for detachably securing the clamping element to the body member, in the manner as shown in Figures 1 and 2 of the drawings. Extending through the alining openings 31, of the end portions 29, are cotter pins 34 which provide means for detachably connecting the pressure applying elements to the clamping element.

The pressure applying elements are detachably connected with the gland element and with the coupling element, and two pressure applying elements are employed, and each of which consists of a substantially elongated rod 35 having its lower portion peripherally threaded as at 36. The upper end of the rod 35 terminates in an integral angularly disposed skeleton head formed of a U-shaped body 37 carrying a connecting bar 38. The opening 39 formed by the skeleton head is of such size as to permit of the head being positioned over a flange 25 or 26, so that the connecting bar 38 can seat in a groove 37 whereby a pressure applying element is connected with the gland element. The skeleton head at the upper end of the rod 35 extends inwardly and at an upward inclination with respect to the rod 35 and when the two pressure applying elements are set up with respect to the gland element, the skeleton heads extend in opposite directions with respect to each other as shown in Figure 2.

Mounted on the rod 35, at the upper portion thereof is a disk 40, and carried by the threaded portion 36 of the rod 35 is an adjusting nut 41. Mounted on the rod 35 between the disk 40 and nut 41 is a coiled expansion spring 42, the function of which is

to shift the rod 35 downwardly thereby carrying the gland element therewith and automatically exerting pressure on the packing elements within the body member. The nut 41 provides means for adjusting the tension of the spring 42.

When the pressure applying elements are set up, the rods 35 extend upwardly between the end portions 29 of the sections of the clamping element, and with each rod 35 arranged between a bolt 32 and a cotter pin 34 as clearly shown in Figure 4 of the drawings. When it is desired to pull the rod 17, the cotter pins 34 are moved, and the pressure applying element swung outwardly which releases the pressure on the packing elements and the polish rods 17 can then be removed.

From the foregoing description taken in connection with the accompanying drawings, a stuffing box is set up having means for automatically applying pressure to packing elements to prevent leakage during the operation of the polish rod and further a stuffing box is set up which enables the convenient removal of the polish rod when occasion so requires, and although the provided embodiment of the construction is as shown and described, yet changes in the details of construction can be had which will fall within the light of the invention as claimed.

What I claim is:

A stuffing box comprising a hollow body member, a packing means arranged therein and supported thereby, a gland extending into said member and having its upper end formed with oppositely disposed laterally extending transversely grooved flanges, a pair of vertically extending spring controlled pressure applying elements each formed at its upper end with an inwardly extending skeleton head seated in a groove of and further opposing the sides of a flange, and a clamping element carried by said body in proximity to its upper end and provided with laterally disposed end portions providing means for detachably connecting said pressure applying elements with said body and further constituting abutments for the springs of said pressure applying elements, and said end portions including transversely extending removable means to permit of the swinging outwardly of the pressure applying elements on said flanges to release the gland to relieve compression on the packing means.

In testimony wherof, I affix my signature hereto.

ROY W. ROGERS.