Oct. 29, 1946. R. B. KINZBACH 2,410,291

STUFFING BOX

Filed Jan. 10, 1944

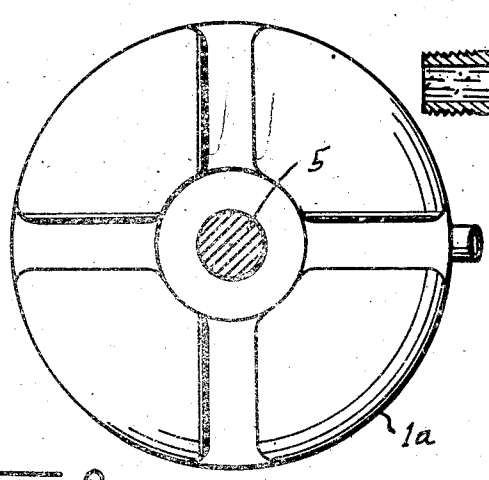


Fig. 2.

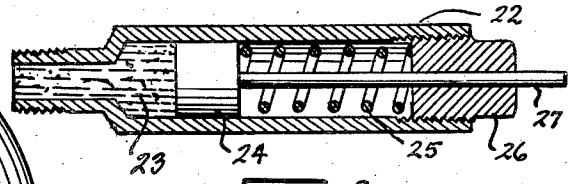


Fig. 6.

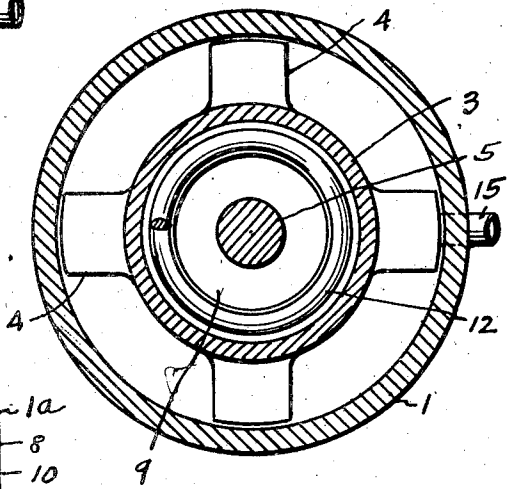


Fig. 3.

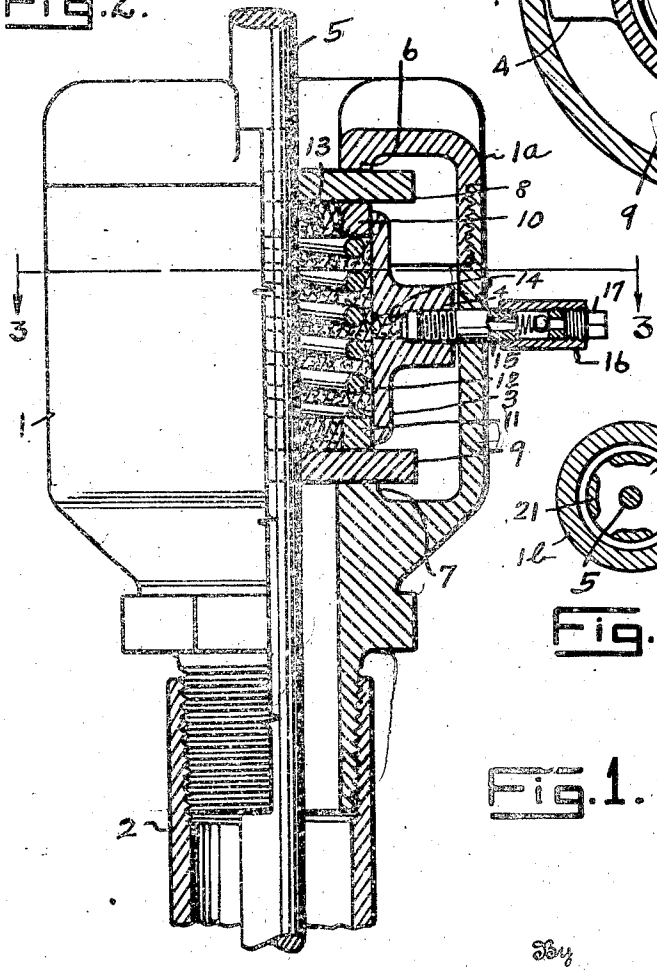


Fig. 1.

Fig. 5.

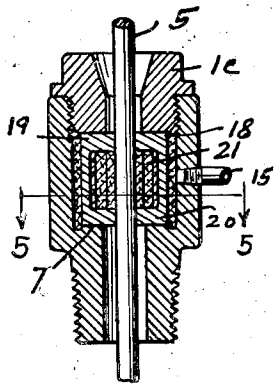


Fig. 4.

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STUFFING BOX

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2 Claims. (Cl. 286—38)

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This invention relates to a stuffing box.

An object of the invention is to provide a stuffing box designed to continuously form a seal about a rod which reciprocates through the stuffing box.

The stuffing box has been particularly designed to form a seal about the polish rod of a pump sucker rod.

The sucker rod of a well pump is usually reciprocated up and down by a walking beam. The end of the beam, to which the rod is connected, describes an arcuate path and consequently the rod has a side swaying, or swinging, movement as it reciprocates. It is one of the principal objects of the present invention to provide a stuffing box of the character described which is so constructed that it will accommodate itself to this side swaying movement of the rod so as to minimize the wear on the rod and at the same time maintain a fluid tight seal about the rod.

Another object of the invention is to provide a stuffing box that may be packed, or repacked, without disassembling and while the rod is in motion.

A further object of the invention is to provide a stuffing box of the character described that is of very simple construction and may be cheaply produced and readily assembled or dismantled.

With the above and other objects in view the invention has particular relation to certain novel features of construction, operation and arrangement of parts an example of which is given in this specification and illustrated in the accompanying drawing wherein:

Figure 1 shows a side elevation of a stuffing box installed and shown partly in section.

Figure 2 shows a plan view showing the polish rod in section.

Figure 3 shows a cross sectional view taken on the line 3—3 of Figure 1.

Figure 4 shows a vertical, sectional view of another embodiment of the invention.

Figure 5 shows a cross sectional view taken on the line 5—5 of Figure 4, and

Figure 6 shows a side view, partly in section of a reserve supply packing cylinder.

Referring now more particularly to the drawing wherein like numerals of reference designate the same parts in each of the figures the numeral 1 designates the housing whose lower end is reduced and outwardly threaded to be screwed into the upper end of the well tubing 2. This housing has a top 1*a* connected to the body 1 of the housing by suitable threads.

Within the housing there is a cylindrical retainer ring 3 for retaining the packing. The ring has the radial external spacers 4 to hold it approximately centered in the housing.

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As is clearly shown in Figure 1 the housing is of a general tubular form so as to admit the polish rod 5 which reciprocates vertically therethrough. The minimum inside diameter of the rod passageway through the housing is considerably greater than the maximum transverse diameter of the rod so as to allow the required range of lateral movement of the rod relative to the housing, as the rod reciprocates.

The housing has the inside annular depending upper boss 6 and the inside annular upstanding lower boss 7 therein. There are the upper and lower floating plates 8 and 9 fitted against these respective bosses and having central bearings through which the rod 5 fits snugly. These plates move laterally with the rod as it sways during its up and down movements.

Fitted snugly within the ring 3 are the upper and lower retaining rings 10 and 11. Interposed between the rings 10 and 11 there is a coil spring 12 which holds the rings 10 and 11 against the respective plates 8 and 9. The rings 10 and 11 are fitted snugly within, and have a ground fit with, the ring 3 and the plates 8 and 9 also have ground fits with the bosses 6 and 7 as well as with the rings 10 and 11.

As is obvious there is a closed packing chamber within the ring 3 which is closed by the plates 8 and 9 and the rings 10 and 11. This chamber is completely fitted with a plastic packing 13 which forms a seal with the rod.

In order to fill the chamber with packing there is an inlet passageway 14, through one of the bosses of the ring 3 and a tubular nipple 15 extends through a radial opening in the housing and is equipped with a back pressure valve 16, normally closed by the plug 17. This plug may be removed and packing forced into the packing chamber by a suitable gun, provided for the purpose and additional packing may be supplied from time to time should the stuffing box develop a leak.

In the form shown in Figure 4 the housing 1*b* is substantially similar to the housing shown in Figure 1. However within the housing and supported on the lower boss 7 there is an open work cage 18 consisting of the upper and lower plates 19 and 20, connected by the vertical bars 21 which are spaced apart. The plates 19 and 20 have the central bearings through which the rod 5 works.

Screwed into the upper end of the cage 1*b* there is a cap 1*c* having an enlarged central passage-

way to receive the rod and this cap 1c is externally threaded to be screwed into and close the upper end of the housing. It may be screwed down tightly against the cage to hold the cage centered and against lateral movement or it may be relaxed to permit lateral movement of the cage.

The cage is of an external transverse diameter somewhat less than the maximum internal diameter of the housing as shown.

The plastic packing material may be forced into the housing 1b as above explained until it fills the housing both around and within the cage so as to form a seal about the rod 5.

It may be found desirable to provide means for constantly supplying additional packing to the chamber to replace the loss from wear. For this reason a cylinder 22 has been provided which may be substituted for the nipple 15. This cylinder contains the chamber 23 for a reserve supply of packing and a plunger 24, in the cylinder is held against the packing by a strong coil spring 25. A plug 26 is screwed into the outer end of the cylinder against said spring to place the spring under the required compression. A stem 27 is attached to the plunger and extends out through an axial bearing in the plug 26.

As the packing is displaced from the packing chamber, additional packing will be constantly forced into the chamber from the cylinder 22. The outer end of the rod 27 serves as a gauge to indicate when the reserve supply is low. When

necessary the plug 26 and plunger 24 may be removed and an additional reserve supply of packing placed in the cylinder and the plunger and plug then replaced as shown in Figure 6.

What I claim is:

1. A stuffing box comprising, a housing having a rod passageway and an internal chamber, a rod sealing assembly in the chamber including an internal rigid cage having upper and lower rod-bearings and also having an internal chamber, sealing means filling both chambers and forming a seal around the rod through the stuffing box, the ends of the cage sealing said rod passageway, around the rod, at the top and bottom of the housing chamber, said assembly being laterally movable, with the rod in the housing.

2. A stuffing box comprising, a housing having a rod passageway and an internal chamber, a rod sealing assembly in the chamber including a rigid cage having upper and lower rod-bearings and also having an internal chamber, sealing means filling both chambers and forming a seal around the rod through the stuffing box, the ends of the cage sealing said rod passageway, around the rod, at the top and bottom of the housing chamber, said assembly being laterally movable, with the rod in the housing and a clamp nut at one end of the housing forming means for clamping the assembly against movement relative to the housing.

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