Sept. 13, 1932. J. A. SCHELLACK ET AL 1,877,696

PACKING CONSTRUCTION

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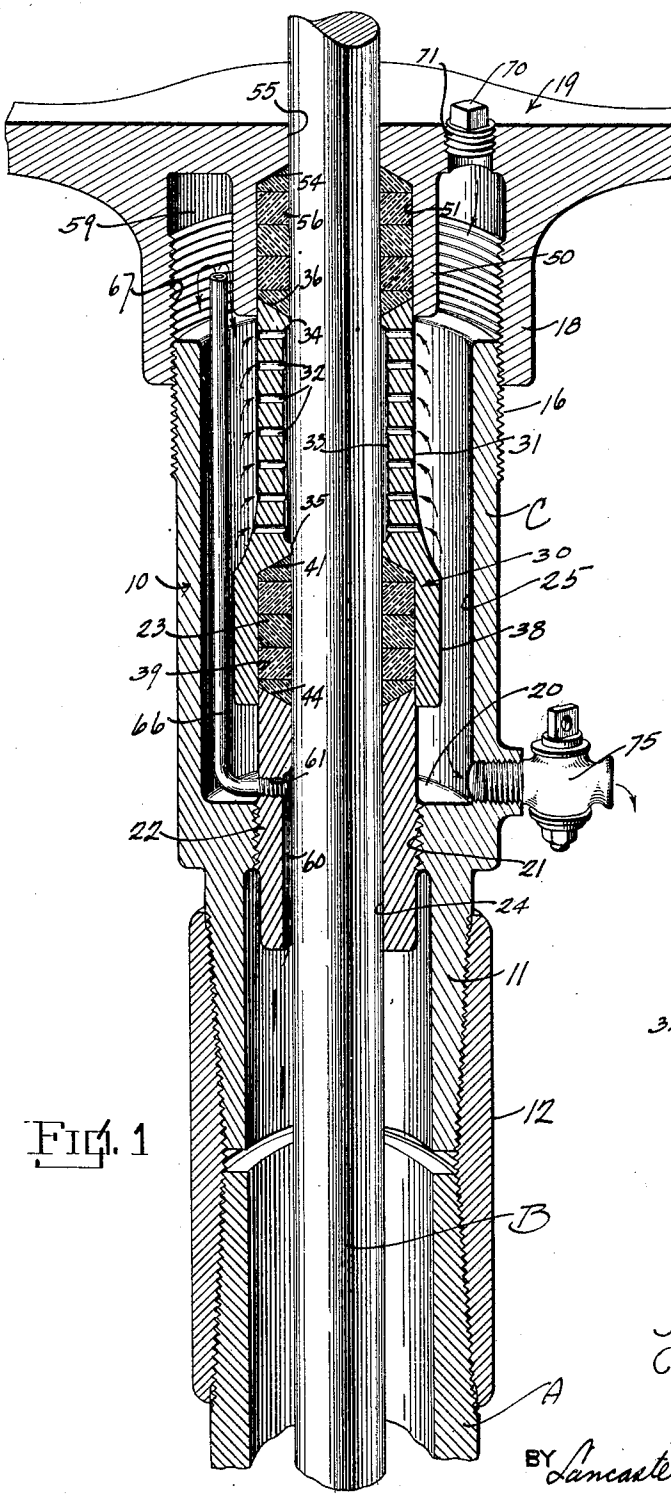


Fig. 1

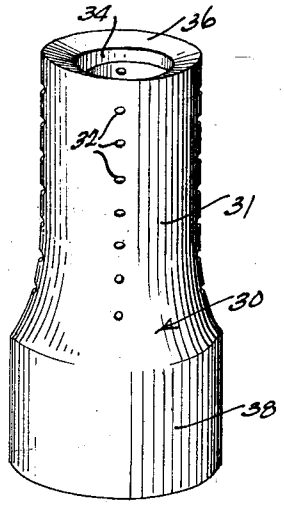


Fig. 2

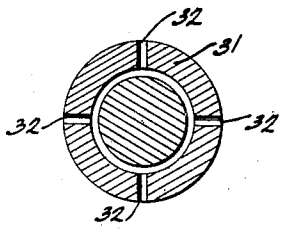


Fig. 3

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PACKING CONSTRUCTION

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This invention relates to improvements in packing constructions or stuffing boxes.

The primary object of this invention is the provision of an improved packing construction particularly well adapted for use upon the reciprocatory rods and parts of compressors, engines, pumps, and the like; being particularly well adapted for use about the polish or pumping rods of oil well pumping equipment; and embodying an improved readily accessible assemblage of packing parts, with improved means to insure the automatic lubrication of the packing.

Other objects and advantages of this invention will be apparent during the course of the following detailed description.

In the accompanying drawing, forming a part of this specification, and wherein similar reference characters designate corresponding parts throughout the several views,

Figure 1 is a longitudinal sectional view taken axially along the improved packing construction; showing the parts in perspective.

Figure 2 is a perspective view of an improved packing adjusting and supporting sleeve.

Figure 3 is a sectional view taken transversely through the upper portion of the sleeve of Figure 2.

In the drawing, wherein for the purpose of illustration is shown only a preferred embodiment of the invention, the letter A may generally designate a tubing or casing of any construction, wherein a piston or other slidable rod B is reciprocably mounted; means C including an improved sealed packing construction being associated with the parts A and B to prevent the passage of fluid therebetween.

The improved packing construction includes the supporting casing 10, preferably of cylindrical construction, the lower end 11 of which is reduced and externally screw threaded for connection by means of a collar or sleeve 12 with the upper end of the tubing section A. The upper portion of the cylindrical casing 10 is externally screw threaded at 16 for detachable connection with the internally screw threaded hub 18 of the packing supporting and adjusting cap 19. At the juncture of the attaching shank 11 with the body of the supporting casing 10, there is provided an internal annular flange 20, which is internally threaded at 21 for detachably receiving a rod guiding sleeve 22 and performs the additional function of supporting the lower packing gland 23 which includes a plurality of packing rings of well known construction. The sleeve 22 is provided with a passageway 24 therethrough, which slidably receives the rod B in a guided relation therealong; the upper end of the sleeve extending upwardly into the annular compartment 25 in the body of the casing 10, in spaced relation with the internal walls thereof. It is noted that the sleeve 22 is relatively long and also projects downwardly into the attaching shank 11 of the supporting casing for a distance sufficient to give proper guidance to the polish rod B.

It is to be noted that the annular compartment 25 is relatively deep, and in it is disposed a slidable sleeve or carrier 30, which is annularly spaced from the inner walls of the body of the casing 10, to permit the lubricant which enters the compartment 25 to rise therein.

The sleeve or carrier 30 is of the construction detailed in the figures of the drawing, comprising an annular body portion 31, which is provided with vertical series of radial ducts 32 therethrough; preferably four of these vertical series being provided, although more or less of them may be provided as desired, and the height or length of the body portion 31 may vary. At the ends of the body 31 a passageway through the body portion, designated at 33 is restricted, as by annular flanges 34 and 35 extending into the passageway; said flanges defining passageways through which the polish rod B slidably extends, so that the passageway 33 thru the major length of the body 31 will not contact with the rod B, and in fact provides an annular compartment between the polish rod and the inner surface of the passageway 33, for receiving a supply of lubricant. The upper annular edge of the member 30 is beveled, at 36, that is, downwardly convergent to-

wards the axis of the carrier 30. The lower end of the sleeve 30 is enlarged at 38, having an enlarged compartment 39 therein, opening downwardly, which receives the packing 23 entirely therein. At their juncture the portions 31 and 38 have a downwardly facing bevel seat 41, which slopes convergently from the walls defining the passageway 39 upwardly, and against which the upper ring of the packing 23 engages in a relation which is quite apparent.

The upper edge 44 of the guide sleeve 22 is beveled in a downwardly convergent relation, and receives the lower end of the packing 23 therein; the external diameter of the upper portion of the sleeve 22 being such that it just slidably fits into the lower open end of the packing compartment 39 of the enlarged lower end of the sleeve 30, as shown in Figure 1. Thus, upon downward pressure upon the sleeve 30, the packing 23 will be compressed between the beveled surfaces 41 and 44, to compress the same against the polish rod for obvious purposes.

The cap 19 disposed within and annularly spaced from the hub 18 is provided with a depending gland cylinder or casing 50, having a packing receiving compartment 51 therein opening downwardly and of a size to permit the upper end of the body 31 of the sleeve 30 to slidably fit snugly therein. The packing gland casing 50 has its upper end converging upward at 54 to an opening 55 which just slidably receives the polish or pump rod B therethrough. The upper packing 56, comprising compressible packing rings, is fitted in the compartment 51 to compress against the polish rod B between the relative sloping surfaces 36 and 54 above mentioned, as is shown in Figure 1 of the drawing.

With the cap 19 assembled on the upper portion of the housing 10, the compartment 25 is enclosed, and extends above the top of the housing 10 into the space 59 between the hub 18 and the gland casing 50.

Assuming the improved packing construction to be used upon well pumping equipment, to which it is to be distinctly understood that the invention is not to be limited, the lubricant under pressure is of course forced upwardly through the tubing and through a longitudinal duct 60 within the sleeve 22 through a screw threaded passageway 61 which opens laterally into the lower part of the compartment 25 just above the annular flange 20. In the screw threaded passageway 21 is a right angled pipe or conduit 66, the lower end of which is screw threaded in the passageway 61, and which conduit 66 is annularly turned and extended upwardly through the compartment 25, opening at its upper end 67 into the space 59. The lubricant or liquid being pumped is forced upwardly through the conduit 66 and enters the compartment 25, filling the same. It passes laterally through the ports 32 into the annular space within the portion 31 of the sleeve 30 between the inner passageway 33 and the polish rod B; lubricating the latter. The glands 23 and 56 of course prevent leak of the fluid along the polish rod B.

The cap 19 may have a filler plug 70 in a top screw threaded opening 71 thereof, which is removable to permit the filling of the compartment 25 with a lubricant to initially start the self lubricating action. This filler plug may be located any place in the housing structure surrounding the compartment 25, depending upon the use to which the improved packing structure is put.

If desired, the stand pipe 66 may be omitted, and the lubrication may be laterally supplied in the compartment 25 by any approved means. This would especially be necessary in event the invention is put to a use upon a reciprocatory rod B which is horizontally slidable.

A suitable pet cock 75 may be supported by the casing or housing 10 in communication with the lower end of the compartment 25, both for draining purposes, and in the invention as illustrated as an aid in determining whether the pumping is in progress.

It will be particularly noted from the assemblage of structure that the parts of the packing structure are readily accessible. Thus, the upper and lower packing rings or glands are carried respectively by the cap 19 and the packing supporting sleeve 30; both of which are readily removable upon the detachment of the cap 19. The packing rings may be quickly and easily withdrawn or replaced without injury or destruction thereto.

If desired, the lower end of the casing 10 may be flanged and suitably bolted to whatever supporting structure it is to be connected with in lieu of attachment to the tubing A.

If desired, in lieu of the stand pipe 66, a check valve may be placed in the opening 61. Of course, it will be recognized that with the use of the stand pipe 66 the oil will always be maintained in the lubricating compartment 25, at a level above the top 67 of said pipe. This will insure a constant supply for all of the ducts 32.

Various changes in the shape, size, and arrangement of parts may be made to the form of invention herein shown and described, without departing from the spirit of the invention or the scope of the claims.

We claim:

1. In a stuffing box structure of the class described the combination of a housing having a chamber therein and having a reduced annular sleeve-like extension projecting into the chamber at one end of the latter, an adjustable cap upon said housing at the opposite end of the chamber from said annular extension, said extension and cap having pas-

sageways therethrough for slidably receiving a rod, a packing gland cylinder, provided with packing, and carried within said cap, a packing adjusting sleeve surrounding said rod and mounted in said chamber, with an end slidably received within said cylinder and with the opposite end enlarged and providing an annular passageway about the rod and slidably receiving said annular extension therein, and packing in said annular passageway compressible therein against said annular extension upon adjustment of said cap.

2. In a stuffing box structure of the class described the combination of a housing having a chamber therein and having a reduced annular sleeve-like extension projecting into the chamber at one end of the latter, an adjustable cap upon said housing at the opposite end of the chamber from said annular extension, said extension and cap having passageways therethrough for slidably receiving a rod, a packing gland, including packing, carried by said cap, a packing adjusting sleeve surrounding said rod and mounted in said chamber, having an end opposite the first mentioned packing enlarged and providing an annular passageway about the rod, and slidably receiving said annular extension therein, packing in said annular passageway compressible therein against said annular extension upon adjustment of said cap, said adjusting sleeve being laterally perforated, and means for feeding lubricant into said chamber for flow through said perforations onto the rod between said packings, including a conduit wholly within the housing having an outlet above said sleeve.

3. In a stuffing box the combination of a housing having a chamber therein, a detachable sleeve connected to the housing and having an end thereof annularly extending upwardly into the chamber of the housing in spaced relation with the inner walls of said chamber, and the other end extending downwardly into the chamber of the housing, said last mentioned end having a longitudinal groove extending from its extremity to short of its upper portion, and having a transverse duct communicating with said groove and with the exterior of said sleeve a rod slidably guided through the extent of said sleeve and providing in cooperation with said groove a duct along said rod, a detachable cap for enclosing the chamber of said housing, said cap having the rod slidably extending therethrough, means supporting packing within the cap, a rigid follower sleeve in the chamber of the housing compressibly engaging against the packing mentioned, said follower sleeve having packing at an end thereof spaced from the first mentioned packing including a compartment slidably receiving the annular extension of the first mentioned sleeve therein against the packing thereof.

4. In a stuffing box the combination of a housing having a chamber therein, a sleeve connected to the housing and having an end thereof annularly extending into the chamber of the housing in spaced relation with the inner walls of said chamber and provided with a passageway therethrough, a rod slidably guided through said passageway packing, a rigid follower sleeve in the chamber of the housing compressibly engaging against the packing and having transverse ducts therethrough to the rod, means for admitting lubricant to said chamber including a duct paralleling and communicating with said passageway and opening into said chamber of the housing.

5. In combination an elongated housing having a chamber therein, provided with an open end, a detachable cap at said open end of the chamber for closing off the chamber, an elongated detachable guide sleeve carried at the opposite end of the chamber by said housing and annularly projecting into said chamber in spaced relation with the walls thereof, a reciprocating rod slidably guided in said sleeve and slidably extending through said cap, an annular extension carried by the cap projecting in spaced relation towards the chamber of said housing and defining an annular chamber therein, packing in said annular chamber, an annular sleeve-like follower surrounding said rod and mounted in said chamber in spaced relation with the walls therein, one end of said follower being slidably extended into the packing chamber of the cap extension into compressing engagement with the packing therein, said sleeve-like follower at its opposite end having an annular chamber therein surrounding said rod, packing in the last mentioned annular chamber, said annular chamber being open at its lower end and slidably receiving therein the annular extension of the first mentioned sleeve in packing compressing relation therein, said follower being transversely perforated and having an annular chamber therein surrounding said rod in which said perforations open, said first mentioned sleeve having a lubricant receiving duct extending therealong opening externally of and into the lower end of said housing chamber, and a stand pipe connected in said duct and extending upwardly along the chamber to adjacent said cap for transmittal of lubricating fluid into the chamber to a predetermined level above said perforations.

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