July 6, 1926.

1,591,226

R. A. MUELLER

PUMP PLUNGER

Filed Jan. 11, 1923

2 Sheets-Sheet 1

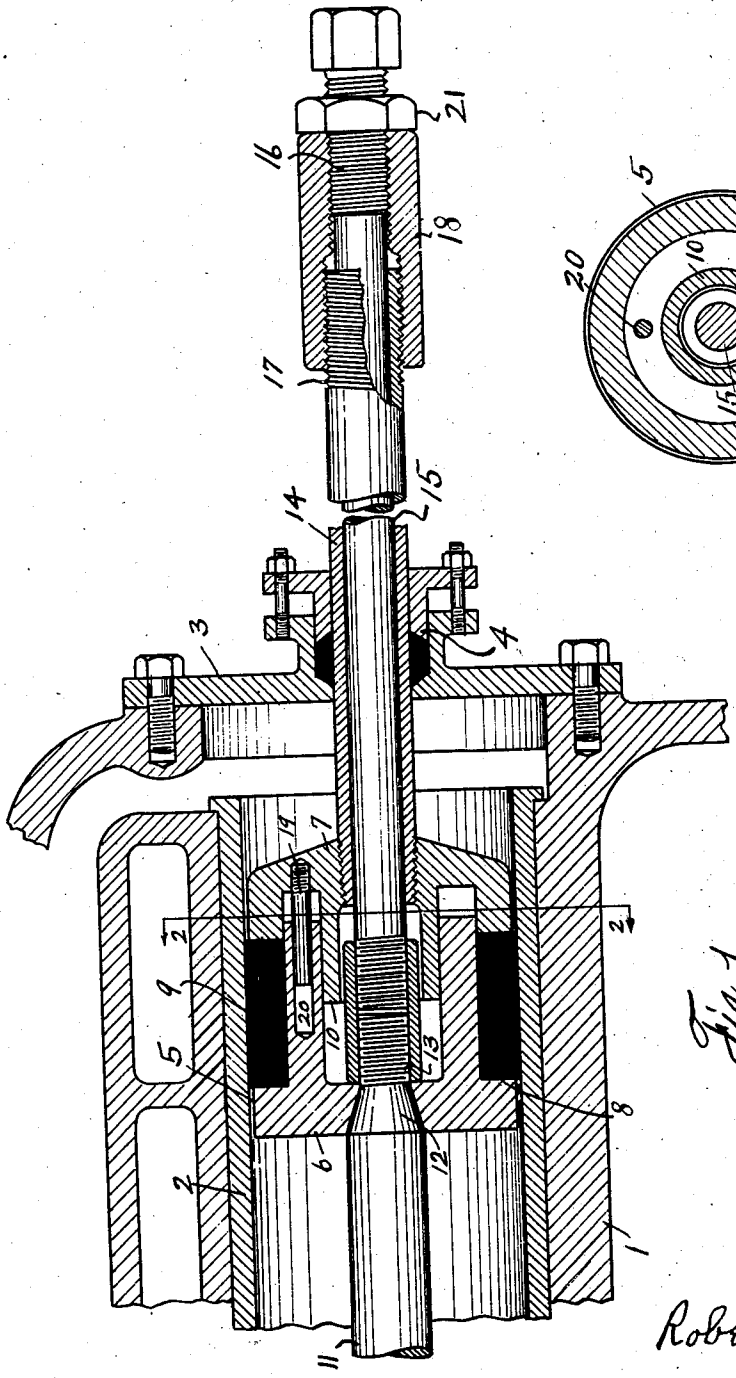


Fig. 1

Fig. 2.

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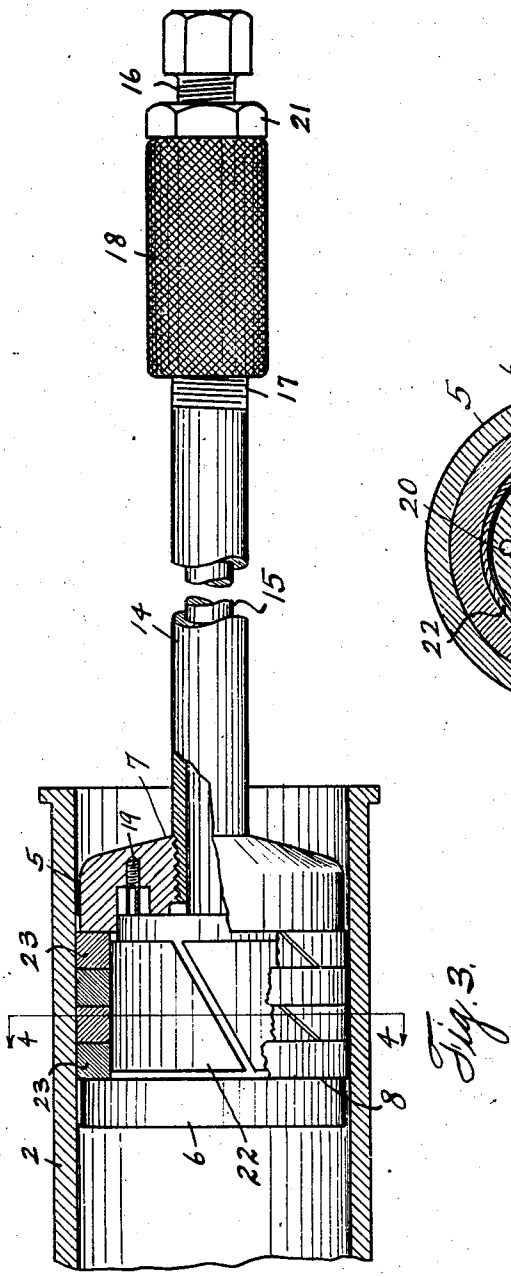


Fig. 3.

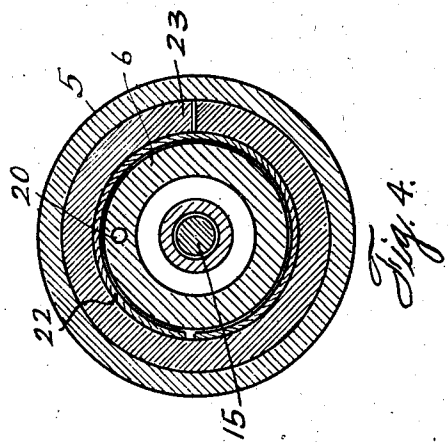


Fig. 4.

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Patented July 6, 1926. 1,591,226

UNITED STATES PATENT OFFICE.

ROBERT A. MUELLER, OF HOUSTON, TEXAS, ASSIGNOR TO GRAY TOOL COMPANY, OF HOUSTON, TEXAS, A COPARTNERSHIP COMPOSED OF WILLIAM K. HUGHES, ED J. DRAKE, ELLSWORTH GRAY, AND SAID MUELLER.

PUMP PLUNGER.

Application filed January 11, 1923. Serial No. 612,009.

This invention relates to pistons or plungers adapted to work in cylinders of pumps and the like, and more particularly to means for rendering such pistons tight against leakage.

One of the objects of this invention is to provide a piston having a packing that can be adjusted to a close fit in the cylinder so as to prevent leakage.

Another object of this invention is to provide means at all times accessible for adjusting the piston.

Another object is to provide adjusting means for the piston which may be manipulated without removing the cylinder head.

Further objects will appear from the detail description taken in connection with the accompanying drawings, in which:

Figure 1 is a longitudinal sectional view of a pump having a piston embodying this invention;

Figure 2 is a section on line 2—2, Figure 1;

Figure 3 is a sectional view showing another embodiment of this invention; and

Figure 4 is a transverse section of Figure 3.

Referring to the accompanying drawings, and more particularly to Figures 1 and 2, 1 designates the pump casing having the cylindrical liner 2 therein. The numeral 3 designates the head of the pump which is formed with a stuffing box 4. The numeral 5 designates the plunger as a whole. This plunger is formed of the body 6 and the cap 7 which telescopes thereover. The body is reduced forming an annular shoulder 8 and interposed between the cap 7 and this shoulder there is an annular packing ring 9, preferably of rubber or similar material. The body 6 is hollow or cup shaped in form and the cap 7 has an annular guide flange 10 which fits within the body, thus forming a telescoping structure. The plunger is connected to the plunger rod 11. At its other end the plunger has a tapering fit as at 12 in the plunger body and is reduced and outwardly threaded within said body and held clamped thereto by means of an elongated sleeve 13 which is threaded thereon. Working through the stuffing box 4 there is a sleeve 14 whose inner end is threaded into the plunger cap 7 and within this sleeve there is an adjusting rod 15 whose inner end is threaded into the sleeve 13. The outer end of the rod 15 projects out beyond the outer end of the sleeve 14 and has the right hand threads 16, and the outer end of the sleeve 14 has the external left hand threads 17. There is an adjusting sleeve 18, one end of which is internally threaded and in mesh with the threads 17 and the other end of which is reduced and internally threaded and in mesh with the threads 16 on the rod 15. The cap 7 has an inwardly extending key 19 which works in a keyway 20 of the plunger body to hold the cap against turning relatively to said body.

When the packing 9 becomes worn so as to permit leakage past it, the sleeve 18 may be turned to the right and this will operate on the principle of the ordinary turn buckle to force the sleeve 14 inwardly on the rod 15 and will clamp the packing more tightly between the cap 7 and shoulder 8 and expand said packing against the cylinder walls. This operation will carry the outer end of the sleeve 18 away from the lock nut 21 which is threaded onto the rod 15. This lock nut may then be screwed up tightly against the outer end of said sleeve to hold the parts in position. In case the packing should fit too tightly in the cylinder the lock nut 21 may be loosened and the sleeve 18 turned to the left until a proper adjustment is obtained.

The structure shown in Figures 3 and 4 is similar to that shown in Figures 1 and 3, excepting the packing element. In Figures 3 and 4 there is a self expansible resilient metallic band 22 surrounding the plunger body 6 and around this are the packing rings 23 formed of suitable fabric or other packing material. In this embodiment of the invention the plunger is assembled with the band 22 and packing rings 23 clamped between the cap 7 and the shoulder 8 on the plunger in contracted position. When the packing 23 wears to permit leakage the sleeve 18 is turned to the left to release said packing elements and to permit them to expand against the liner wall. The expansible band 22 will cause this expansion. The sleeve 18 is then turned to the right to clamp said packing element against further expansion. The plunger is then again operated until the packing rings 23 are worn to permit leakage and the cap 7 is then again

loosened as before to permit the further expansion of said packing elements and then again tightened and this operation may be repeated until the band 22 has fully expanded.

The type of plunger hereinafter described is very economical in the use of packing inasmuch as the packing elements of either type shown may be used until they are practically worn out and a tight fit of the plunger within the cylinder will always be maintained, and the plunger may be adjusted to maintain this fit without removing the plunger or the cylinder head or in any way dismembering the pump.

It is obvious that various changes may be made in details of construction without departing from the spirit of this invention; it is, therefore, to be understood that this invention is not to be limited to the specific details shown and described.

What I claim is:—

1. The combination with a pump cylinder having a stuffing box in the head thereof, of a plunger operable in said cylinder, said plunger being formed of two sections, a self expansible packing surrounding the plunger and arranged to be clamped between said sections, and differentially threaded means working through said stuffing box through which the plunger sections may be adjusted toward and from each other to vary the clamping tension thereof on said packing element.

2. The combination with a pump cylinder having a stuffing box in the head thereof, of a plunger operable in said cylinder and formed in two sections, an expansible packing surrounding the plunger and arranged to be clamped between said sections, means working through said stuffing box and extending to the outside of the cylinder adapted for adjustment to vary the clamping tension of said section on said packing, and a differentially threaded adjusting member engaging said means for adjusting the same.

3. The combination with a pump cylinder having a stuffing box in the head thereof, of a plunger operable in said cylinder and formed in two sections, an expansible packing surrounding the plunger and arranged to be clamped between said sections, concentric adjusting members working through said stuffing box and extending to the outside of the cylinder adapted for adjustment to vary the clamping tension of said sections on said packing, and an oppositely threaded manipulating sleeve engaging said members for adjusting the same.

In testimony whereof I have signed my name to this specification.

ROBERT A. MUELLER.