Oct. 16, 1962 J. H. WILSON 3,058,207

METHOD OF DISASSEMBLING PUMP PISTON FROM PISTON ROD

Filed Feb. 15, 1956 2 Sheets-Sheet 1

Fig. 1

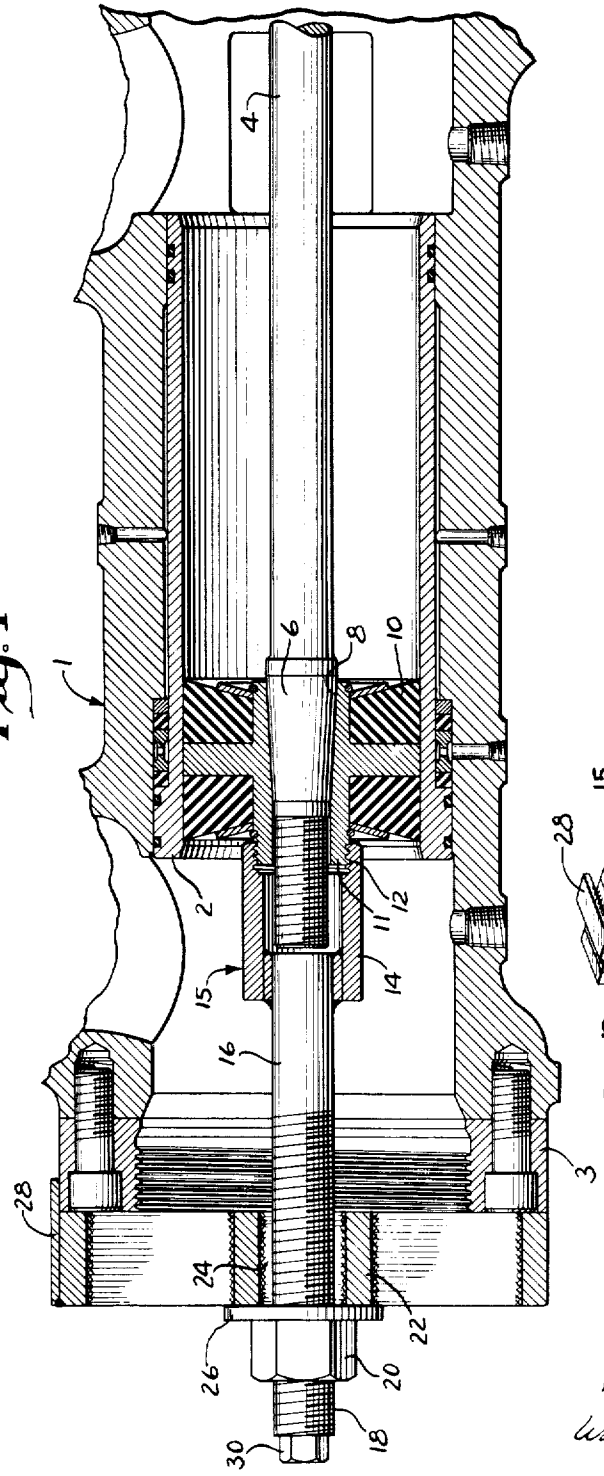
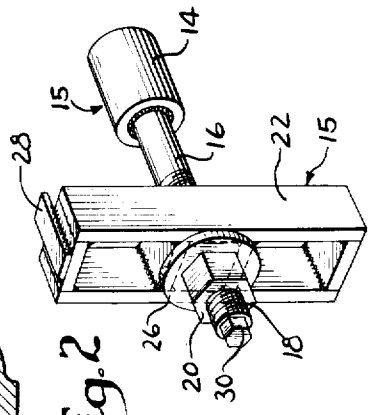


Fig. 2



INVENTOR.
JOHN HART WILSON
BY
Watson, Cole, Grindle & Watson
Attys.

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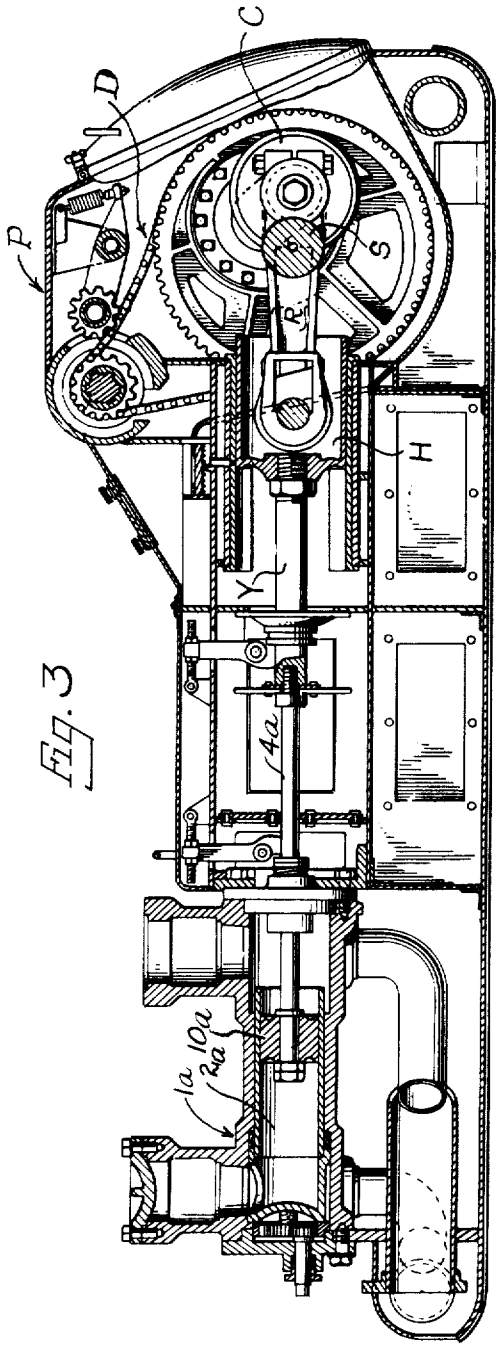


Fig. 3

John Hart Wilson
INVENTOR

BY Watson, Cole, Grindle & Watson
ATTORNEYS

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3,058,207

METHOD OF DISASSEMBLING PUMP PISTON FROM PISTON ROD

John Hart Wilson, % Wilson Manufacturing Co., P.O. Box 1031, Wichita Falls, Tex.

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1 Claim. (Cl. 29—427)

This invention relates to improvements in pump piston pullers for reciprocating pumps and more particularly to pump piston pullers wherein the pump piston is removed from the piston rod by the power of the pump acting on the piston rod thereof when the piston puller is connected to the piston. The patent to John Hart Wilson, No. 2,249,802, Slush Pumps, issued July 22, 1941, discloses a power driven pump having a reciprocating piston rod and piston, the structure of which lends itself for use with the present tool.

Various piston pullers have been proposed heretofore, but these, for the most part, require a screw jack, hydraulic jack or other power means to operate the pump piston puller.

The present device is so constructed that pump pistons may be readily removed from the piston rod of the pump by the action of the piston rod of the pump on the pump piston, when the pump piston puller is attached to the pump piston, so sufficient power is transmitted from the piston rod to the pump piston to speedily and positively remove the pump piston therefrom, without manual effort and in a minimum of time.

An object of this invention is to provide a pump piston puller which may be readily attached to a pump piston, while the pump piston is within the liner within the pump, in such manner that the piston rod of the pump will be moved by the power of the pump to withdraw the piston rod therefrom, which rod is usually tightly fitted within the pump piston.

With this object in mind, and others which will become manifest as the description proceeds, reference is to be had to the accompanying drawings, in which like reference characters designate like parts in the several views thereof, in which:

FIG. 1 is a longitudinal, sectional view through a pump cylinder, cylinder liner, and pump piston assembly, with the pump piston remover shown connected to the pump piston, and with portions thereof shown in section, and other parts shown in elevation, to illustrate the details of construction;

FIG. 2 is a perspective view of the pump piston puller apart from the pump piston and showing the top, end and side elevation thereof; and

FIG. 3 is a longitudinal sectional view through a reciprocating pump showing the reciprocating piston rod and piston therein.

With more detailed reference to the drawing, FIG. 3 shows a longitudinal sectional view through a conventional slush pump or mud pump P, which has a crank C on the crank shaft S, which crank shaft is journaled in the housing of pump P. The crank shaft S is driven by a sprocket and chain drive, generally designated at D. A connecting rod R is pivotally connected to cross-head H, which cross-head has a pony rod Y extending outward therefrom, to which the piston rod **4***a* is connected. The piston rod **4***a* has a piston **10***a* mounted thereon near the outer end thereof, which piston **10***a* is fitted within liner **2***a* which is fitted in cylinder **1***a*. Upon the turning of the crank shaft S, by sprocket and chain drive D, the connecting rod **4***a* moves back and forth within liner **2***a*, in a manner well known in the art of reciprocating pumps, and as disclosed in the above-mentioned Patent No. 2,249,802. While the pump shown in FIG. 3 shows the piston **10***a* to have a straight bore therein to receive

piston rod **4***a*, this is indicative of the manner in which pistons are used in pumps, such as disclosed in Patent No. 2,249,802. The piston rod and piston are replaceable by piston rod **4** and piston **10**, as shown in FIG. 1, as any pump of this character which is equipped with the piston rod **4** and piston **10** will enable use of the pump piston puller of the present invention. Numeral **1** designates generally a pump cylinder in which a liner **2** is fitted. A piston rod **4** is shown extending into the liner **2**, which piston rod has a tapered end portion **6** to complementarily engage a tapered bore **8** within piston **10**. The body of the piston **10** has a neck **11**, which neck **11** extends out and is threaded, as indicated at **12**, to enable an interiorly threaded sleeve **14**, of the pump piston puller designated generally at **15**, to be screw threaded thereonto in the manner as shown in FIG. 1. The sleeve **14** is secured to a rod **16**, which rod is threaded at its outer end, as designated at **18**, to threadably receive a nut **20** thereon.

A cross bar assembly **22** is fabricated to have an opening **24** medially thereof, through which cross bar assembly the rod **16** is telescoped. A thrust washer or bearing **26** is interposed between the nut **20** and the cross bar assembly **22**, so as to form proper bearing support for the nut **20**.

A lug **28** is welded, or otherwise secured, to an end of the cross bar assembly **22** so the lug will engage the upper side of cylinder **1**, when the cross bar assembly is fitted in place and to support the outer end of the rod **16** of the pump piston puller before the final tightening of nut **20** on threaded portion **18** or rod **16**.

The rod **16** is hexed or squared, at its outer end as indicated at **30**, so as to enable ready turning of the rod **16** to enable the screwing of the threaded sleeve **14** onto threads **12** of the piston body **10**, and the unscrewing of the sleeve therefrom.

Operation

To remove the pump piston **10** from the connecting rod **4**, after having removed the cylinder head of the pump, the sleeve **14** is threadably engaged with the threaded portion **12** of piston **10**. Whereupon, the pump piston rod **16** is rotated by fitting a wrench on hexed head **30** thereof, so as to turn the rod **16** and sleeve **14** to threadably engage the threaded portion **12** of piston **10**. Then cross bar assembly **22** is telescoped over elongated rod **16** until the inner face of the cross bar assembly **22** is in abutting relation with the outer face of the pump cylinder head ring **3**, and with the lug **28** resting on top of the cylinder head ring **2**, the cross bar assembly **22** is supported in this position until thrust bearing or washer **26** and nut **20** are fitted onto the threaded rod to securely hold elongated rod **16** against inward longitudinal movement.

With the pump piston puller **15** in the position, as described above, and with the pump piston rod **4** at the extreme end of the outer stroke, the pump is started, whereupon the rod **4** is drawn inward and the pump piston **10** is retained against inward movement by a pump piston puller, designated generally at **15**, which is attached to the threaded portion **12** of the pump piston body by sleeve **11**.

With the driving power of the pump applied to the piston rod **4**, a great pull can be exerted thereon to disengage the tapered portion **6** of the piston rod from the tapered bore **8** of the piston. After the piston rod **4** has been moved a sufficient distance away from the piston, the pump may be stopped and the piston readily removed therefrom manually, but if the piston resists being pulled from the liner **2** manually, the nut **20** may be screwed on rod **16** so as to pull the piston outward until it loosens sufficiently to be readily removed.

Having thus clearly shown and described the inven-

tion what is claimed as new and desired to secure by Letters Patent is:

In a method of removing a piston from a piston rod of a reciprocating pump on which it is frictionally engaged; the said piston being in place in said pump and reciprocatable longitudinally therein; comprising the steps of attachably securing to said piston a static element; of seating an end of said static element against the outer end of the pump in which said piston and piston rod are mounted; of operating the pump by power to reciprocate said piston rod in the direction to move said piston rod inward with respect to said piston while holding said piston statically so as to cause said piston rod to be automatically pulled from its friction fit on said piston rod; and of disengaging said piston from said static element.

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