

April 17, 1956

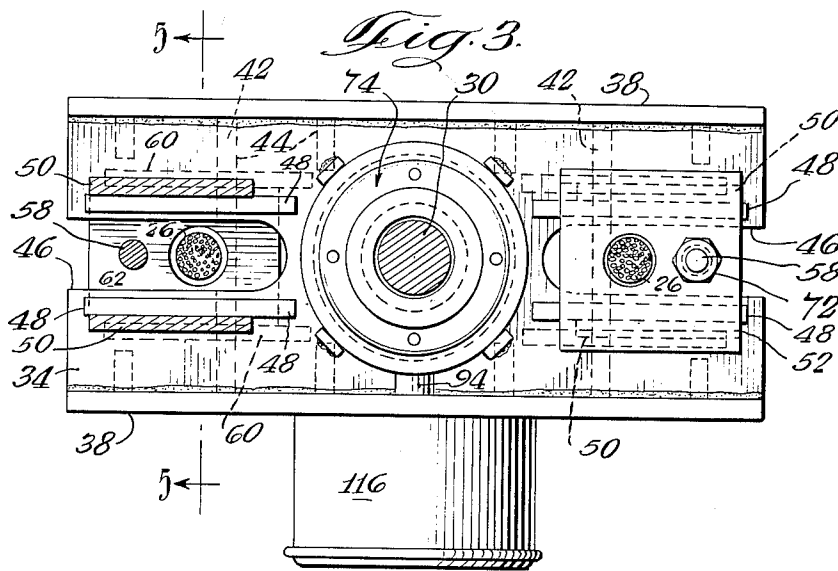
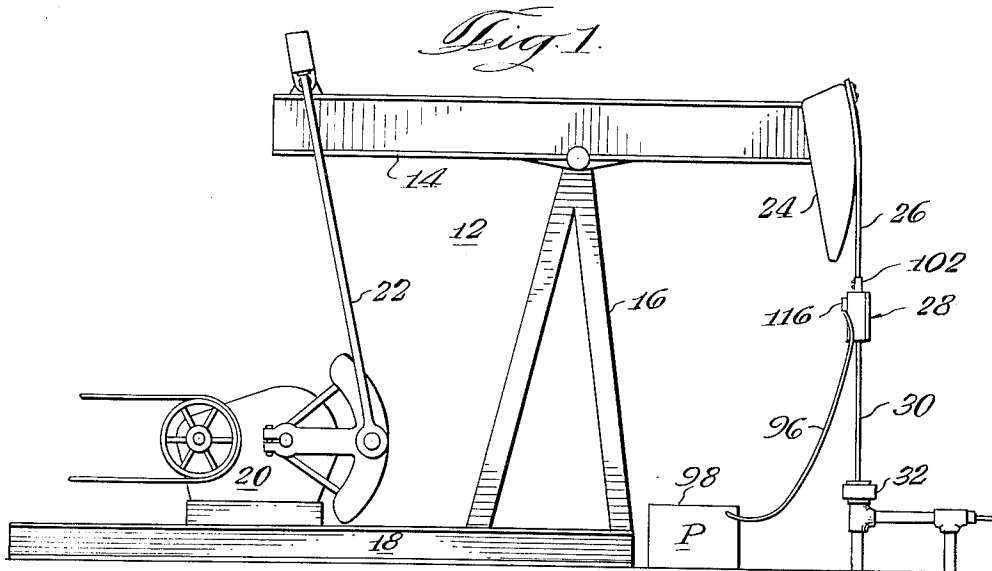
H. J. RENKEN ET AL

2,741,915

APPARATUS FOR PUMPING AND WEIGHING WELLS

Filed Oct. 24, 1952

4 Sheets-Sheet 1



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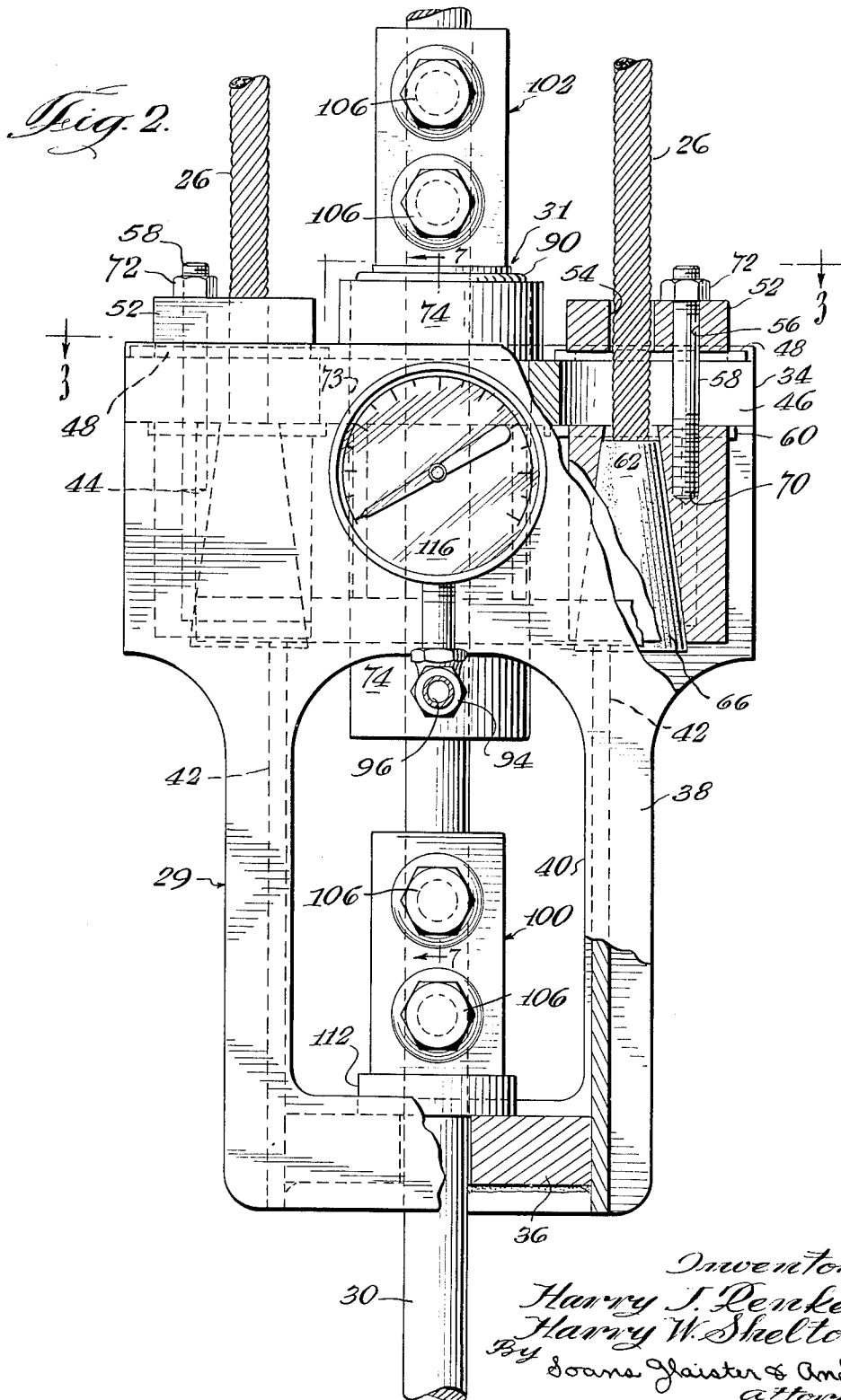
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APPARATUS FOR PUMPING AND WEIGHING WELLS

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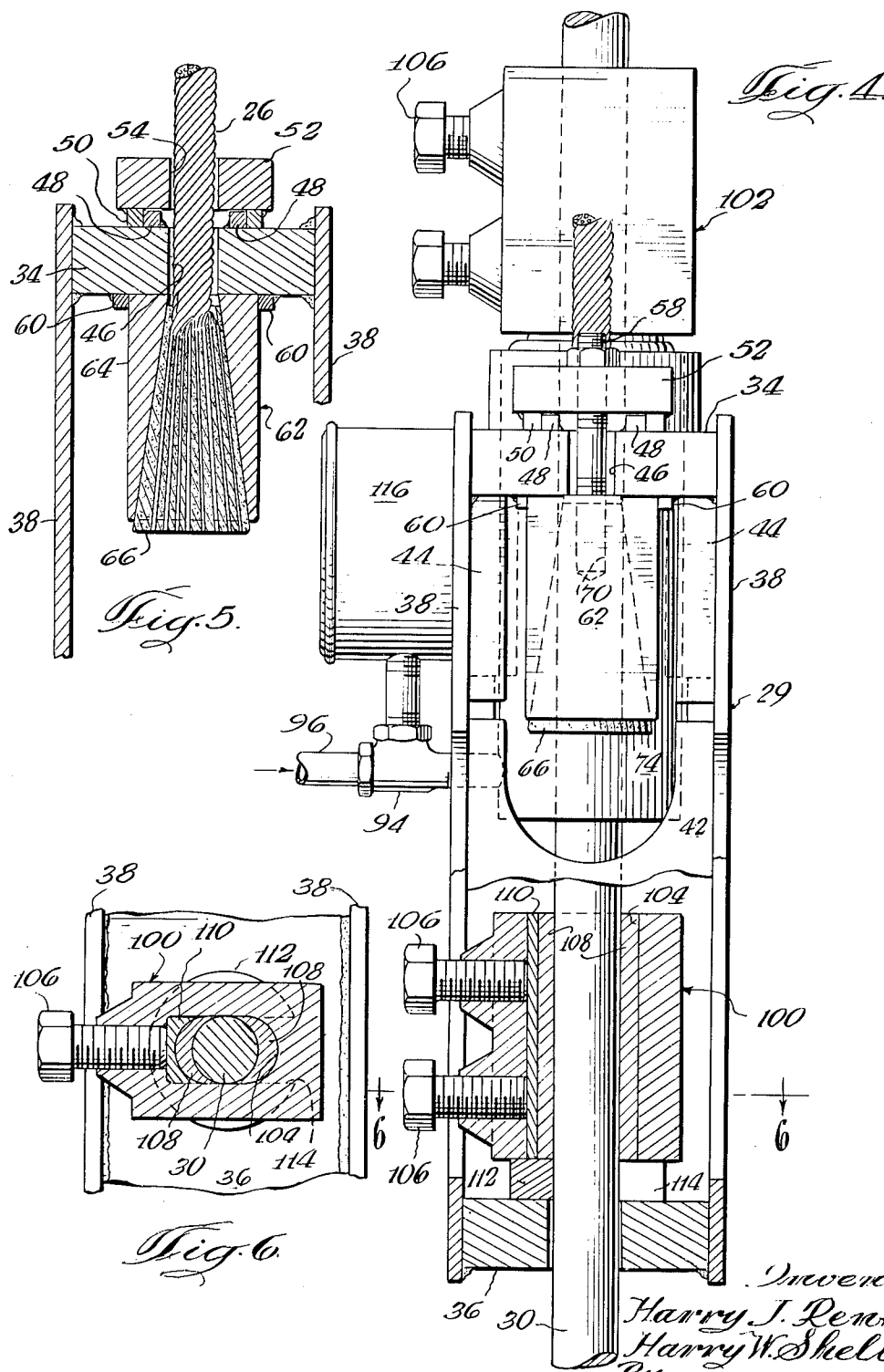
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APPARATUS FOR PUMPING AND WEIGHING WELLS

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4 Sheets-Sheet 3



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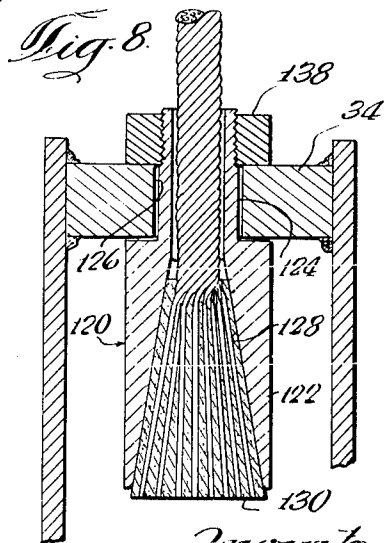
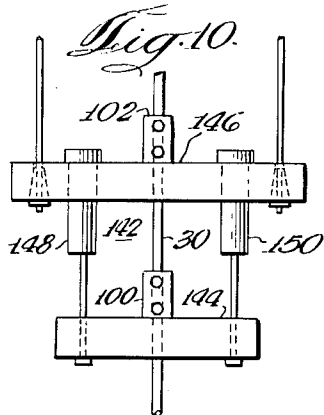
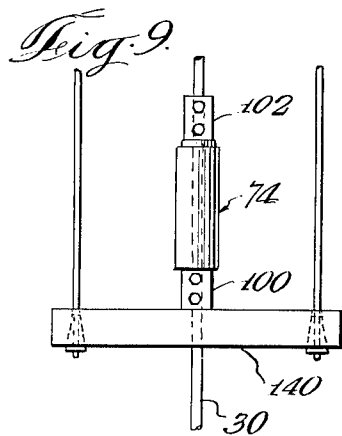
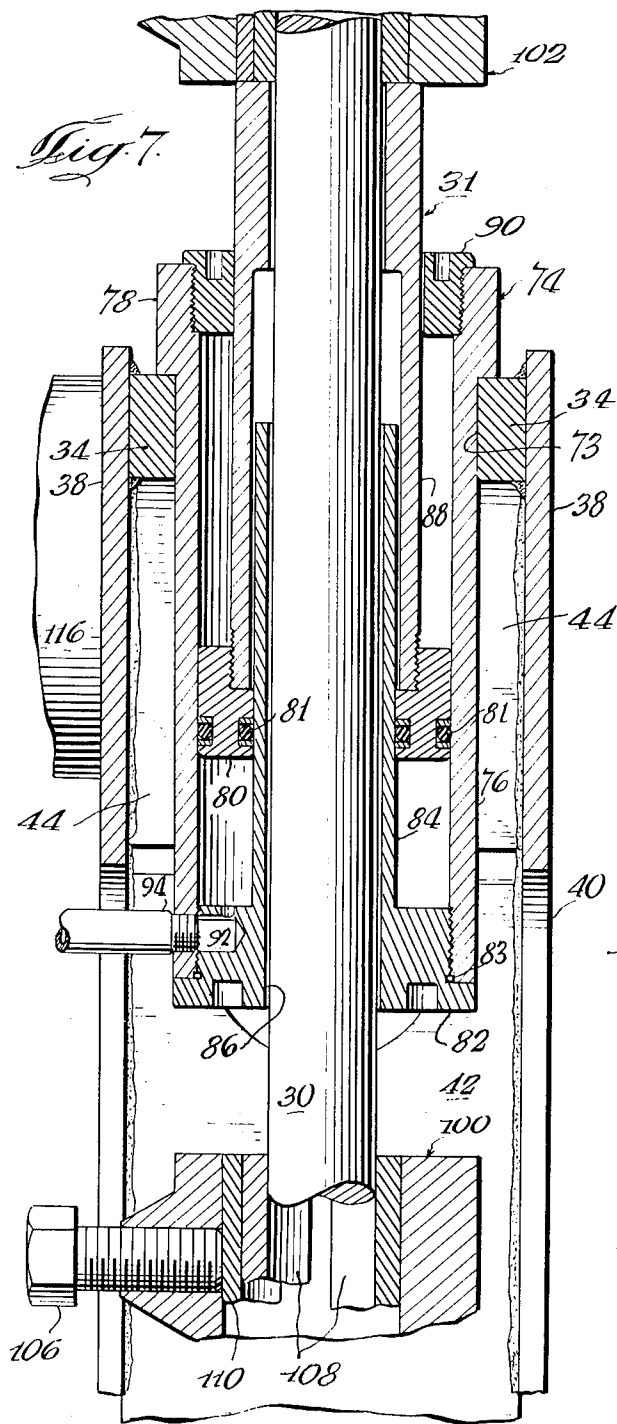
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APPARATUS FOR PUMPING AND WEIGHING WELLS

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4 Sheets-Sheet 4



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1

2,741,915

APPARATUS FOR PUMPING AND WEIGHING WELLS

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14 Claims. (Cl. 73—141)

The present invention relates generally to apparatus for pumping oil wells and the like, and is particularly directed to carriers for rod strings used in connection with oil wells and the like.

For pumping oil wells of considerable depth, the usual practice is to employ a series of interconnected rods for connecting an actuating device at the surface with a pump at the bottom of the well. This series of rods, generally referred to as the rod string or sucker rods, has the uppermost rod extending up through the well casing head for connection with an actuating device, such as a pump jack of the walking beam type, through a coupling device generally referred to as the rod hanger and carrier. The well casing head includes a suitable stuffing box for permitting sliding action of the uppermost rod which is generally referred to as the "polished rod."

In setting up the well for operation, or when changing the length of stroke, it is essential that the travel of the plunger stroke be properly located with respect to the standing valve at the bottom of the well. This is accomplished by moving the polished rod up or down as may be required relative to the carrier. Further, in order to rate the structural parts of the pumping unit for selecting the proper gear reducer and the like, the well should be "weighed." By the use of a dynamometer or other device, the total weight of the sucker rods and the column of fluid in the well tubing is determined at various portions of the pumping cycle and this procedure is generally referred to as weighing the well. To achieve this, of course, the weight of the rods and fluid must be transferred from the actuating device to a weighing device which may be connected with an instrument for recording the variations in the load throughout the cycle.

In the course of pumping the well, it frequently becomes necessary to "bump" the valve at the bottom of the well to clear it of mud, paraffin, sand, and the like which tend to clog the valve. This is accomplished by lowering the rod string sufficiently with respect to the carrier, in order for the working barrel to strike the lower valve during an interval of rig operation with the rod operating reciprocally. When the valve is cleared, the rod is again raised to its normal pumping position with respect to the carrier, and pumping resumed normally. Then too, in the course of operation it often becomes necessary to recondition a well by replacing broken rods and resetting the sucker rod string relative to the stationary portion of the valve. In putting the well back in operation, it generally takes a considerable period of time for the bottom of the rod string to attain a position of equilibrium. During this period the rod string must be repositioned intermittently relative to its actuating device, to permit satisfactory functioning of the well.

From the foregoing it is seen that, apart from the normal pumping action, the rod string must be frequently raised and lowered to properly adjust the various parts of the well or to correct unsatisfactory conditions of the well. It is the principal object of the present invention to provide a novel and improved rod string carrying mechanism which is designed to facilitate and expedite the set-

2

ting of sucker rod type pumps or the like. A further object is to provide a carrying mechanism which affords vertical adjustment of the rod string for the aforementioned purposes without the hazards involved in removing the load from the actuating device. It is also an object of the invention to provide a carrying mechanism which is capable of "spacing" or "weighing the well" without transferring the load to the well stuffing box.

A further object is to provide a means of making fine adjustments of the well spacing while the beam is in operation and indicating the results of such adjustments. A further object is to provide a means of spacing beyond the ordinary travel range of the ram, without removing the load from and reapplying the load to the beam. Another object of this invention is to provide a rod string carrying mechanism which is adapted for use with and can be readily installed on existing types of well pumping equipment.

Other objects and advantages will become readily apparent when reference is had to the accompanying description and drawings, the latter being illustrative of a preferred embodiment, wherein:

Figure 1 is a schematic illustration of a well pumping rig;

Figure 2 is an enlarged side elevation of the carrier mechanism of the rig, with portions broken away and in section to more clearly illustrate the structure;

Figure 3 is a plan view of the carrier mechanism taken along line 3—3 in Figure 2;

Figure 4 is a side view of the structure in Figure 2, with portions broken away and in section in the interest of clarity;

Figure 5 is a fragmentary, sectional view taken along line 5—5 in Figure 3;

Figure 6 is a fragmentary, sectional view taken along line 6—6 in Figure 4;

Figure 7 is an enlarged sectional view taken along line 7—7 in Figure 2, showing the ram of the carrying mechanism partially extended;

Figure 8 is a view similar to Figure 5, showing a modified form of connecting means for securing the reins thereto;

Figure 9 is a schematic illustration of a modified form of the invention; and

Figure 10 is a schematic illustration of still another modified form of the invention.

Referring particularly to Figure 1, it is seen that the preferred embodiment of the present invention is shown in connection with a beam hanger pumping unit 12 of the type employed for pumping oil and the like from very deep wells. The pumping unit 12 comprises generally a walking beam 14 fulcrumed on a Sampson post 16 which is suitably anchored as to a platform 18. A suitable source of power 20 is connected through a pitman rod 22 with one end of the walking beam 14 for effecting reciprocating movement of the beam about the fulcrum provided by the Sampson post 16. The other end of the beam 14 has fixed thereto a hanger 24 of the well known "arc" or "horsehead" type, which has removably attached thereto a looped wire 26 with the free ends of the wire depending along the outer face of the hanger.

The two ends of the wire 26 are fixed to a carrying mechanism 28 which supports the uppermost rod 30 of a series of sucker rods extending down into the well. The well is of the "sucker rod" type of conventional structure and is therefore not completely shown in the drawings. Generally, it includes a tubing which receives the sucker rod string, a pump at the bottom of the well including a stationary portion and a reciprocable portion attached to the end of the lowermost sucker rod, and a well casing head 32 at the surface which supports the tubing with a stuffing box for slidably receiving the uppermost rod 30. The rod 30 is usually machined and polished to provide a

smooth surface for sliding in the stuffing box and is therefore generally referred to as the "polished rod."

The arcuate design of the hanger is for the purpose of providing for straight line, vertical movement of the sucker rod string as the walking beam is reciprocated. In the course of the pumping operation, it may be necessary that the stroke of the pump be controlled to achieve efficient operation of the well. It also requires regular checking of the pumping unit inasmuch as conditions in the well are frequently changing due to the presence of gas in variable amounts, clogging of the valve, formation of paraffin on the inner wall of the tubing, changes in the well "load," i. e., the weight of the sucker rod string plus the weight of the column of fluid being pumped, failure of a part of the well, and the like.

It will be apparent that many of the difficulties which arise to interfere with the normal operation of the well are overcome, at least in part, by an adjustment of the rod string relative to the supporting wire or "reins" 26 of the hanger 24. Further, the initial setting up of the well for operation necessitates an accurate setting of the vertical position of the rod string relative to the pumping unit to achieve the desired stroke. Therefore, it becomes essential that a means be provided for simply and speedily adjusting the vertical position of the polished rod 30 relative to the carrying mechanism 28.

The present means for affording the aforementioned adjustment of the polished rod generally require that the entire load of the sucker rod string be transferred to the stuffing box cap during the adjustment. Since this load may be 30,000 lbs. or more in the type of well pumped by this equipment, there is obviously a serious danger to the crew involved in transferring the load from the carrier to the stuffing box cap and then back again to the carrying mechanism. Also, the imposition of such a load on the stuffing box cap even when applied gradually, necessarily creates stresses in the structure which will ultimately lead to a failure of one or more parts. Then too, it is seen that the aforementioned load transfer requires clamping to the polished rod at a point therealong which is to slide within the stuffing box during normal operation. Frequent clampings at such point will mar the smooth finish on the polished rod and ultimately cause serious damage to the packing material in the stuffing box. The rod string carrying mechanism 28 embodying the present invention eliminates the necessity for thus transferring the rod string load and, consequently, avoids the dangers and ill effects of such transfer.

With reference particularly to Figures 2 and 4, it is seen that the improved rod string carrying mechanism 28 comprises a carrier frame 29; means on the frame for connecting the frame 29 to the wires 26 of the pumping unit 12; a pair of spaced-apart clamps 100 and 102, one of which is clamped on the polished rod 30 and supported by the carrier frame 29 when the carrying mechanism is supporting the sucker rod string; and means 31 supported by the carrier frame 29 for adjusting the relative position of the clamps 100 and 102.

The carrier frame 29 comprises a welded plate structure having an upper horizontal plate 34 and a lower horizontal plate 36 which are fixedly joined in vertically spaced, parallel relation by a pair of side plate members 38 to form the upper and lower decks of what may be termed a two-deck carrier. The lower portion of each of the side plate members 38 has a rather large opening 40 therethrough to provide access to the interior of the carrier frame 29. To complete the carrier frame structure there is provided a pair of end plates 42, which extend from the lower horizontal plate 36 to a point just beyond the upper end of the openings 40, and a series of vertical webs 44 at the upper end of the frame for assisting in supporting the upper horizontal plate member 34.

The upper plate member 34 includes a slot or recess 46 at each end thereof for adjustably receiving the two ends of the wire 26 which may vary somewhat in their

lateral spacing on different pumping rigs. Astride each of the slots 46 is a pair of guides or tracks 48 which cooperate with a pair of similar guides 50 on the underside of a plate 52 to position the latter on the upper carrier plate 34. Each of the plates 52 includes a bore 54 therethrough for receiving one end of the wire 26 and a second bore 56 for receiving a bolt 58, or the like, to secure the plate 52 to the carrier frame in a manner to be seen.

The underside of the upper carrier deck or plate 34 includes, at each end thereof, another set of spaced-apart guides 60 for positioning a wire receiving socket member 62 in alignment with the slot 46 and the bore 54 just described. The socket member 62 comprises a metal block 64 having a vertically disposed frusto-conical opening therethrough and a complementary frusto-conical element 66 of Babbitt metal or the like extending vertically therethrough. The metal blocks 64 each include at their upper end a threaded bore 70 for receiving one end of the bolt 58.

In connecting the wire 26 to the carrier frame 29, the plates 52 and the underlying blocks 64 with wire ends babbitted therein are placed in their respective guides on the upper deck 34 of the carrier and held loosely in place by means of the bolts 58 which extend from each of the blocks 64, through the slot 46, and the bore 56 in the overlying plate 52. A nut 72 is placed on the projecting upper end of each bolt 58. The loose plates 52 are then moved, with the underlying socket members attached thereto, to the desired spaced-apart relation. After the proper lateral spacing of the wire ends, the nut 72 may be tightened to lock the assembly in position.

As noted, particularly in Figure 7, the upper horizontal plate 34 of the carrier frame 29 has an enlarged central opening 73 therethrough to accommodate the means 31 for adjusting the relative position of the clamps 100 and 102. In the illustrated structure, this means consists of a hydraulic jack or ram 74. The ram 74 includes a cylinder 76 having an enlarged shoulder portion 78 at its upper end for supporting the ram on the plate 34 in downwardly extending relation through the opening 73, and a plunger 80 disposed within the cylinder. The lower end of the cylinder 76 is internally threaded and connected to a threaded cylindrical plug 82. A resilient O-ring or gasket 83 provides a fluid tight seal between the cylinder 76 and the plug 82. The plug 82 includes an upwardly extending tube portion 84 which provides, together with the cylindrical plug 82, a bore 86 which extends along the length of the ram 74. O-rings 81 seat within recesses in the plunger 80 and engage the walls of the cylinder 76 and tube portion 84 for preventing the passage of fluid around the plunger 80. The plunger 80 connects with a tubular element 88 which telescopically engages the outer side of the tube 84 and extends upwardly through a seal or plug 90 which is threaded into the upper end of the cylinder 76.

The lower end of the cylinder 76 and plug 82 includes a threaded bore 92 for receiving a suitable coupling 94 for a flexible hose 96 extending from a source of hydraulic pressure such as the pump 98 (Figure 1). It is seen, therefore, that the hydraulic ram 74 is a one-way ram, with the introduction of fluid pressure through the hose 96 forcing the plunger 80 and the attached tube portion 88 upwardly within the cylinder 76, and the release of such pressure permitting the downward return of the plunger 80 due to the weight imposed thereon.

As noted particularly in Figures 2 and 4, the opening 86 through the center of the ram 74 is disposed in aligned relation to a similar sized opening in the lower horizontal plate 36 to thereby accommodate the extension therethrough of the polished rod 30.

For securing the polished rod 30 to the carrier frame 29, there is provided a pair of clamps 100 and 102 which are disposed, respectively, atop the lower and upper horizontal plate members 36 and 34. Each of these clamps comprises a generally rectangular block having an oblong

5

opening 104 (Figure 6) therethrough, and a pair of set screws 106 projecting from one side of the block and adapted for extension into the opening 104. To firmly position the clamps relative to the polished rod 30, the opening 104 in each of the clamps is provided with suitable shims, comprising a pair of arcuate segments 108 of Babbitt metal or the like arranged on opposite sides of the rod 30, and a shim 110 which is complementary to one of the segments 108 and presents a flat surface for engagement by the set screws 106. Thus it is seen that axial movement of the set screws 106 effects a variation in the pressure exerted by the clamping segments 108 on the polished rod 30 to fix or release the clamps relative to the rod, as desired.

The upper clamp 102 is positioned above the upper deck of the carrier frame 29 in position for support by the tube extension 88 of the ram plunger 80, and the lower clamp 100 is positioned atop the lower deck of the carrier frame 29. For purposes which will become apparent later on in the disclosure, it may be desirable to place a spacer element 112, having a slot 114 for receiving the polished rod 30, between either one or both of the clamps and the supporting decks of the carrier.

Also, in the illustrated embodiment, there is attached to the hose coupling 94 for the hydraulic ram 74 a pressure recording device 116 for registering the force applied to the ram in suitable terms and increments.

Operation

During the normal operation of the illustrated well pumping unit, the rod string carrying mechanism 28 is disposed as shown in Figure 2. The lower clamp 100 is secured to the polished rod 30 and the entire sucker rod string is supported, through the spacer 112, on the lower deck 36 of the carrier frame 29. The hydraulic ram 74 is in fully retracted position with zero pressure in the cylinder, and the upper clamp 102 rests freely on the upper end of the ram without being clamped to the polished rod 30.

Should it be desired that the load be supported on the hydraulic ram 74, to secure a temporary reading on the gauge or indicating device 116, this can be achieved with little or no stopping of the operation of the well. The upper clamp 102 is first secured to the polished rod 30 and then the ram 74 is extended sufficiently to place the entire well load, i. e., sucker rod string load and the weight of the fluid in the tubing, on the ram plunger 80 through the clamp 102. The lower clamp 100 is now raised with respect to the lower carrier deck 36, and consequently, carries no load. By leaving this clamp in position on the rod, the latter may be accurately returned to its original position at any time by releasing the pressure in the ram. Of course, while the ram 74 is supporting the well load through the upper clamp 102, the readings on the gauge 116 will reflect the amount of the well load throughout the pumping cycle. Obviously in the above operation, if the upper clamp 102 had been left engaged to the rod but not engaged to the ram 74, it would be unnecessary to shut down the pumping operation to secure pressure readings.

Generally, however, if it is desired to run the well for any length of time with the rod string "elastically" suspended on the ram 74, the sucker rod string should be adjusted for proper "spacing" or locating of the travel of the pumping stroke relative to the stationary portion of the pump at the bottom of the well, since the rod string was originally "spaced" with the load on the lower deck 36 and the extension of the ram plunger 80 to assume the load has obviously changed the position of the polished rod 30 relative to the carrier 28. This readjustment of the well for operation with the load on the plunger 80 of the ram requires a lowering of the polished rod 30 relative to the carrier an amount sufficient to compensate for the raising of the plunger from the original "spaced" position. Under such a condition, a spacer 112 or supplemental spacer thereto of suitable thickness could have been used

6

for the normally correct "spaced" condition. With the upper clamp 102 engaged to the rod a slight distance above the top of the retracted ram, the ram could be raised to support the load and permit removal of the spacer and then lowered slightly to support the load at the original "spaced" position.

With the use of the spacer 112 below the lower clamp 100, the lowering of the polished rod 30 relative to the carrier is quite easily accomplished. The upper clamp 102 is secured to the rod above the top of the retracted ram a distance slightly greater than the thickness of the spacer 112 and pressure fluid is pumped into the ram to raise the plunger 80 into contact with the upper clamp 102. The spacer 112 is then removed and the plunger 80 may be lowered to any point within the range afforded by the spacer to achieve proper spacing. Since the lower clamp 100 has not been moved on the rod 30, the original spacing with the load supported on the lower deck 36 may obviously be resumed whenever desired. Further, it will be readily apparent that the foregoing adjustment can be achieved without the use of the spacer by merely shifting the clamped position of the lower clamp 100 on the rod 30 once the ram plunger has taken the well load through the upper clamp. In such instance, however, the original setting of the lower clamp is lost unless properly marked and, if the original condition is to be resumed, a new setting must be made of the polished rod 30 with respect to the carrier frame 29.

Frequently, the standing valve at the bottom of the well becomes clogged with sand, paraffin or the like, and it becomes necessary to clear the valve by "pounding" or tapping the working plunger against the standing valve. This can be readily achieved with the illustrated structure by lowering the rod string with respect to the carrier sufficiently to cause the valve to be nipped by the bottom end of the rod string each time the rod string is lowered by the beam during the operation of the rig. Here again the use of the spacer 112 between the lower clamp 100 and the lower carrier deck 36 facilitates the return of the rod string to its normal operating position once the standing valve has been cleared of obstructing material. The upper clamp is fixed to the polished rod 30 above the top of the ram 74 a distance equal to or slightly greater than the thickness of the spacer 112 and, upon establishing contact between the extended plunger 80 and the clamp 102, the spacer is removed and the rod raised and lowered within the space thereby afforded between the lower clamp 100 and the lower carrier deck 36, to pound the valve.

In initially setting the well for operation, that is, "spacing" the rod string with respect to the walking beam hanger or the like to properly locate the travel of the plunger stroke with respect to the standing valve at the bottom of the well, the following procedure is used. The rod string is fixed to the upper clamp 102 and pressure is exerted through the hydraulic ram 74 to raise the rod string relative to the carrier 28. The well is then put into operation and the results observed while the plunger 80 is moved up and down seeking the point of most efficient operation, i. e., properly "spacing" the rod string. When the best "spacing" has been found, the lower clamp 100 is fixed to the polished rod 30, preferably with a spacer between the clamp and the lower deck 36 for the reasons mentioned above, in position to transfer the load to the lower deck of the carrier. The pressure in the ram can then be released to transfer the well load from the upper clamp to the lower clamp.

Obviously, it is possible to space beyond the range of stroke of the ram, without "clamping off" the load on top of the stuffing box. For example, if the rod has been raised with respect to the carrier, to the limit of the ram stroke, the lower clamp 100 may be tightened above the lower deck 36. The ram should be retracted to its bottom position, thereby placing the load on the lower clamp 100 and deck 36. The upper clamp 102 will now be released and positioned above the lowered ram, then

tightened at which time it can be again raised to the full length of its stroke. This process may be repeated. The reverse procedure may be used to space downwardly any distance beyond the travel range of the ram.

It will be apparent from the foregoing that other manipulations of the rod string can be achieved with the present invention without ever having to remove the well load from the carrier. Further, it will be apparent that spacers of varying thickness, similar to the illustrated spacer 112, may be used in connection with either of the two clamps or both.

Modifications

Although the foregoing description has been directed to the embodiment shown in Figures 1-7, certain modifications of the structure may be made without deviating from the principles of the invention.

For example, Figure 8 illustrates another form of clamping means for securing the wire 26 to the carrier frame 29 in a manner which affords a means of untwisting the wire when needed relative to the carrier frame 29. In this instance, there is provided a socket member 120 comprising a block 122 having a hollow cylindrical portion 124 extending up through an enlarged slot 126 in the upper horizontal plate 34 of the carrier. The lower portion of the block includes a downwardly diverging, frusto-conical bore 128 adapted to receive a complementary frusto-conical Babbitt element 130 in wedged relation thereto for securing the wire 26, which passes downwardly through the center bore in the block portion 124 and into the Babbitt element 130, in axially fixed relation to the carrier. The assembly is fixed in position on the carrier by a threaded collar 138 which fits the upper threaded portion of the socket 120.

Figure 9 illustrates a modified form of the invention as applied to a single carrier deck 140 suspended from the two ends of the wire 26. The polished rod 30 extends upwardly through a central opening in the carrier deck 140 and has detachably fixed thereto in coaxial relation a pair of clamps and a hollow-center hydraulic ram. The clamps are disposed above and below the ram on the rod; the ram and clamps may be similar to the elements 74, 100, and 102 described above. In this instance, the load is normally carried by the lower clamp 100 which rests on the carrier deck 140 but may be transferred to and from the upper clamp 102 by extension and retraction of the hydraulic ram plunger, in the manner of the preferred embodiment, to "space" the rod string, "bump" the standing valve, "weigh" the well, and the like.

Figure 10 illustrates the application of the present invention to a two-deck structure 142 wherein the lower deck 144 is suspended from the upper deck 146 by means of a pair of hydraulic rams 148 and 150. The polished rod 30 extends upwardly through a pair of vertically aligned openings in the two decks 144 and 146, and a pair of the clamps 100 and 102 are positioned on the rod with one of the clamps above each of the decks. The relative positions of the two decks 144 and 146 are, of course, regulated through extension and retraction of the hydraulic rams 148 and 150. Accordingly, the polished rod 30 can be adjusted vertically by transferring the load from one clamp to the other and raising or lowering the lower deck 144, as desired.

Although described with respect to particular apparatus, it will be readily apparent that the present invention may be readily applied to other types of structure. For example, a pump actuating device other than a walking beam may be used, and a geared jack or the like may be used in place of the hydraulic ram for effecting adjustment of the rod string on the hanger without deviating from the principles of the invention. And, as pointed out above, various arrangements may be made to transfer the rod string load from one portion of the carrier to another portion thereof, without releasing the load from the carrier and thereby incurring all of the resulting dangers and ill effects known heretofore in well pumping equipment.

We claim:

1. In apparatus for pumping fluid from wells, the combination of a carrier frame, means on said carrier frame connecting the frame to a generally vertically reciprocable, power driven element, said carrier frame having at least one horizontal bearing surface, said carrier frame being provided with a vertical passageway which extends centrally through each said bearing surface, a polished rod slidably extending through said passageway in said carrier frame, a pair of spaced-apart, vertically aligned clamps on said polished rod, each of said clamps being positioned above at least one bearing surface of said carrier frame and adapted when in clamping engagement with said polished rod for supporting said polished rod and positioning said polished rod relative to said carrier frame, at least one of said clamps being in clamping engagement with said polished rod so as to prevent said polished rod from becoming disengaged from said carrier frame, and means supported by said carrier frame for varying the relative spacing of said clamps, said polished rod being movable vertically relative to said carrier frame by alternately placing first one and then the other of said clamps in clamping engagement with said polished rod and co-ordinating said alternating clamping engagement with suitable operation of said spacing means.

2. In apparatus for pumping fluid from wells, the combination of a carrier frame, means on said carrier frame connecting the frame to a generally vertically reciprocable, power driven element, said carrier frame having at least one horizontal bearing surface, said carrier frame being provided with a vertical passageway which extends centrally through each said bearing surface, a polished rod slidably extending through said passageway in said carrier frame, a pair of spaced-apart, vertically aligned clamps on said polished rod, each of said clamps being positioned above at least one bearing surface of said carrier frame and adapted when in clamping engagement with said polished rod for supporting said polished rod and positioning said polished rod relative to said carrier frame, at least one of said clamps being in clamping engagement with said polished rod so as to prevent said polished rod from becoming disengaged from said carrier frame, a removable spacer element which slidably accommodates said polished rod positioned about said polished rod and between one of said clamps and a bearing surface of said carrier frame for fixing the vertical position of said polished rod relative to said carrier frame, and means supported by said carrier frame for varying the relative spacing of said clamps, said polished rod being movable vertically relative to said carrier frame by alternately placing first one and then the other of said clamps in clamping engagement with said polished rod and co-ordinating said alternating clamping engagement with suitable operation of said spacing means.

3. In apparatus for pumping fluid from wells, the combination of a carrier frame, means on said carrier frame connecting the frame to a generally vertically reciprocable, power driven element, said connecting means being adjustable laterally on said carrier frame, said carrier frame having at least one horizontal bearing surface, said frame being provided with a vertical passageway which extends centrally through each said bearing surface, a polished rod slidably extending through said passageway in said carrier frame, a pair of spaced-apart, vertically aligned clamps on said polished rod, each of said clamps being positioned above at least one bearing surface of said carrier frame and adapted when in clamping engagement with said polished rod for supporting said polished rod and positioning said polished rod relative to said carrier frame, at least one of said clamps being in clamping engagement with said polished rod so as to prevent said polished rod from becoming disengaged from said carrier frame, and means supported by said carrier frame for varying the relative spacing of said clamps, said polished rod being movable vertically relative to said carrier frame by alter-

9

nately placing first one and then the other of said clamps in clamping engagement with said polished rod and co-ordinating said alternating clamping engagement with suitable operation of said spacing means.

4. In apparatus for pumping fluid from wells, the combination of a carrier frame, means on said carrier frame connecting the frame to a generally vertically reciprocable, power driven element, said carrier frame having at least one horizontal bearing surface, said carrier frame being provided with a vertical passageway which extends centrally through each said bearing surface, a polished rod slidably extending through said passageway in said carrier frame, a pair of spaced-apart, vertically aligned clamps on said polished rod, each of said clamps being positioned above at least one bearing surface of said carrier frame and adapted when in clamping engagement with said polished rod for supporting said polished rod and positioning said polished rod relative to said carrier frame, at least one of said clamps being in clamping engagement with said polished rod so as to prevent said polished rod from becoming disengaged from said carrier frame, a removable spacer having a horizontally extending groove therein for slidably accommodating said polished rod positioned about said polished rod and between one of said clamps and a bearing surface of said carrier frame for fixing the vertical position of said polished rod relative to said carrier frame, hydraulic means supported by said carrier frame for varying the relative spacing of said clamps, and a hydraulic pressure gauge attached to said hydraulic means for indicating the load carried by said hydraulic means, said polished rod being movable vertically relative to said carrier frame by alternately placing first one and then the other of said clamps in clamping engagement with said polished rod and co-ordinating said alternating clamping engagement with suitable operation of said spacing means.

5. In apparatus for pumping fluid from wells, the combination of a carrier frame, means on said carrier frame connecting the frame to a generally vertically reciprocable, power driven element, said connecting means being adjustable laterally on said carrier frame, said carrier frame having at least one horizontal bearing surface, said carrier frame being provided with a vertical passageway which extends centrally through each said bearing surface, a polished rod slidably extending through said passageway in said carrier frame, a pair of spaced-apart, vertically aligned clamps on said polished rod, each of said clamps being positioned above at least one bearing surface of said carrier frame and adapted when in clamping engagement with said polished rod for supporting said polished rod and positioning said polished rod relative to said carrier frame, at least one of said clamps being in clamping engagement with said polished rod so as to prevent said polished rod from becoming disengaged from said carrier frame, a removable spacer having a horizontally extending groove therein for slidably accommodating said polished rod positioned about said polished rod and between one of said clamps and a bearing surface of said carrier frame for fixing the vertical position of said polished rod relative to said carrier frame, hydraulic means supported by said carrier frame for varying the relative spacing of said clamps, and a hydraulic pressure gauge attached to said hydraulic means for indicating the load carried by said hydraulic means, said polished rod being movable vertically relative to said carrier frame by alternately placing first one and then the other of said clamps in clamping engagement with said polished rod and co-ordinating said alternating clamping engagement with suitable operation of said spacing means.

6. In apparatus for pumping fluid from wells, the combination of a carrier frame, means on said carrier frame connecting the frame to a generally vertically reciprocable power driven element, said carrier frame having a pair of spaced-apart, generally vertically aligned, interconnected, horizontal bearing surfaces, said carrier frame

10

being provided with a vertical passageway which extends centrally through said pair of bearing surfaces, a polished rod slidably extending through said passageway in said carrier frame, a pair of spaced-apart, vertically aligned clamps on said polished rod, one of said clamps being positioned between said horizontal bearing surfaces of said carrier frame and the other of said clamps being positioned above the upper horizontal bearing surface of said carrier frame, said clamps being adapted when in clamping engagement with said polished rod for supporting said polished rod and positioning said polished rod relative to said carrier frame, at least one of said clamps being in clamping engagement with said polished rod so as to prevent said polished rod from becoming disengaged from said carrier frame, and means supported by said carrier frame for varying the relative spacing of said clamps, said polished rod being movable vertically relative to said carrier frame by alternately placing first one and then the other of said clamps in clamping engagement with said polished rod and co-ordinating said alternating clamping engagement with suitable operation of said spacing means.

7. In apparatus for pumping fluid from wells, the combination of a carrier frame, means on said carrier frame connecting the frame to a generally vertically reciprocable power driven element, said carrier frame having a pair of spaced-apart, generally vertically aligned, interconnected, horizontal bearing surfaces, said carrier frame being provided with a vertical passageway which extends centrally through said pair of bearing surfaces, a polished rod slidably extending through said passageway in said carrier frame, a pair of spaced-apart, vertically aligned clamps on said polished rod, one of said clamps being positioned between said horizontal bearing surfaces of said carrier frame and the other of said clamps being positioned above the upper horizontal bearing surface of said carrier frame, said clamps being adapted when in clamping engagement with said polished rod for supporting said polished rod and positioning said polished rod relative to said carrier frame, at least one of said clamps being in clamping engagement with said polished rod so as to prevent said polished rod from becoming disengaged from said carrier frame, a removable spacer having a horizontally extending groove therein for slidably accommodating said polished rod positioned about said polished rod and between one of said horizontal bearing surfaces of said carrier frame and the adjacent overlying clamp, and means supported by said carrier frame for varying the relative spacing of said clamps, said polished rod being movable vertically relative to said carrier frame by alternately placing first one and then the other of said clamps in clamping engagement with said polished rod and co-ordinating said alternating clamping engagement with suitable operation of said spacing means.

8. In apparatus for pumping fluid from wells, the combination of a carrier frame, means on said carrier frame connecting the frame to a generally vertically reciprocable power driven element, said connecting means being adjustable laterally on said carrier frame, said carrier frame having a pair of spaced-apart, generally vertically aligned, interconnected, horizontal bearing surfaces, said carrier frame being provided with a vertical passageway which extends centrally through said pair of bearing surfaces, a polished rod slidably extending through said passageway in said carrier frame, a pair of spaced-apart, vertically aligned clamps on said polished rod, one of said clamps being positioned between said horizontal bearing surfaces of said carrier frame and the other of said clamps being positioned above the upper horizontal bearing surface of said carrier frame, said clamps being adapted when in clamping engagement with said polished rod for supporting said polished rod and positioning said polished rod relative to said carrier frame, at least one of said clamps being in clamping engagement with said polished rod so as to prevent said polished rod from becoming disengaged from said carrier frame, and means supported by said

11

carrier frame for varying the relative spacing of said clamps, said polished rod being movable vertically relative to said carrier frame by alternately placing first one and then the other of said clamps in clamping engagement with said polished rod and co-ordinating said alternating clamping engagement with suitable operation of said spacing means.

9. In apparatus for pumping fluid from wells, the combination of a carrier frame, means on said carrier frame connecting the frame to a generally vertically reciprocable power driven element, said carrier frame having a pair of spaced-apart, generally vertically aligned, interconnected, horizontal bearing surfaces, said carrier frame being provided with a vertical passageway which extends centrally through said pair of bearing surfaces, a polished rod slidably extending through said passageway in said carrier frame, a pair of spaced-apart, vertically aligned clamps on said polished rod, one of said clamps being positioned between said horizontal bearing surfaces of said carrier frame and the other of said clamps being positioned above the upper horizontal bearing surface of said carrier frame, said clamps being adapted when in clamping engagement with said polished rod for supporting said polished rod and positioning said polished rod relative to said carrier frame, at least one of said clamps being in clamping engagement with said polished rod so as to prevent said polished rod from becoming disengaged from said carrier frame, a vertically disposed hydraulic ram comprising a cylinder shouldered on one of said horizontal bearing surfaces of said carrier frame and a piston having a center bore therethrough which is aligned with said vertical passageway in said carrier frame, said center bore being of suitable diameter so as to accommodate said polished rod, one of said clamps being supported by said piston, and hydraulic means for raising and lowering said piston to adjust the relative position of said piston supported clamp relative to said carrier frame, said polished rod being movable vertically relative to said carrier frame by alternately placing first one and then the other of said clamps in clamping engagement with said polished rod and co-ordinating said alternating clamping engagement with suitable operation of said hydraulic ram.

10. In apparatus for pumping fluid from wells, the combination of a carrier frame, means on said carrier frame connecting the frame to a generally vertically reciprocable power driven element, said carrier frame having a pair of spaced-apart, generally vertically aligned, interconnected, horizontal bearing surfaces, said carrier frame being provided with a vertical passageway which extends centrally through said pair of bearing surfaces, a polished rod slidably extending through said passageway in said carrier frame, a pair of spaced-apart, vertically aligned clamps on said polished rod, one of said clamps being positioned between said horizontal bearing surfaces of said carrier frame and the other of said clamps being positioned above the upper horizontal bearing surface of said carrier frame, said clamps being adapted when in clamping engagement with said polished rod for supporting said polished rod and positioning said polished rod relative to said carrier frame, at least one of said clamps being in clamping engagement with said polished rod so as to prevent said polished rod from becoming disengaged from said carrier frame, a vertically disposed hydraulic ram comprising a cylinder shoulder on one of said horizontal bearing surfaces of said carrier frame and a piston having a center bore therethrough which is aligned with said vertical passageway in said carrier frame, said center bore being of suitable diameter so as to accommodate said polished rod, one of said clamps being supported by said piston, and hydraulic means for raising and lowering said piston to adjust the relative position of said piston supported clamp relative to said carrier frame, and a pressure gauge connected to said hydraulic means for indicating the load

12

carried by said piston, said polished rod being movable vertically relative to said carrier frame by alternately placing first one and then the other of said clamps in clamping engagement with said polished rod and co-ordinating said alternating clamping engagement with suitable operation of said hydraulic ram.

11. In apparatus for pumping fluid from wells, the combination of a carrier frame, means on said carrier frame connecting the frame to a generally vertically reciprocable power driven element, said carrier frame having a pair of spaced-apart, generally vertically aligned, interconnected, horizontal bearing surfaces, said carrier frame being provided with a vertical passageway which extends centrally through said pair of bearing surfaces, a polished rod slidably extending through said passageway in said carrier frame, a pair of spaced-apart, vertically aligned clamps on said polished rod, one of said clamps being positioned between said horizontal bearing surfaces of said carrier frame and the other of said clamps being positioned above the upper horizontal bearing surface of said carrier frame, said clamps being adapted when in clamping engagement with said polished rod for supporting said polished rod and positioning said polished rod relative to said carrier frame, at least one of said clamps being in clamping engagement with said polished rod so as to prevent said polished rod from becoming disengaged from said carrier frame, a removable spacer having a horizontally extending groove therein for slidably accommodating said polished rod positioned about said polished rod and between one of said horizontal bearing surfaces of said carrier frame and the adjacent overlying clamp, a vertically disposed hydraulic ram comprising a cylinder shouldered on one of said horizontal bearing surfaces of said carrier frame and a piston having a center bore therethrough which is aligned with said vertical passageway in said carrier frame, said center bore being of suitable diameter so as to accommodate said polished rod, one of said clamps being supported by said piston, and hydraulic means for raising and lowering said piston to adjust the relative position of said piston supported clamp relative to said carrier frame, and a pressure gauge connected to said hydraulic means for indicating the load carried by said piston, said polished rod being movable vertically relative to said carrier frame by alternately placing first one and then the other of said clamps in clamping engagement with said polished rod and co-ordinating said alternating clamping engagement with suitable operation of said hydraulic ram.

12. In apparatus for pumping fluid from wells, the combination of a carrier frame, means on said carrier frame connecting the frame to a generally vertical reciprocable power driven element, said connecting means being adjustable laterally on said frame, said carrier frame having a pair of spaced-apart, generally vertically aligned, interconnected, horizontal bearing surfaces, said carrier frame being provided with a vertical passageway which extends centrally through said pair of bearing surfaces, a polished rod slidably extending through said passageway in said carrier frame, a pair of spaced-apart, vertically aligned clamps on said polished rod, one of said clamps being positioned between said horizontal bearing surfaces of said carrier frame and the other of said clamps being positioned above the upper horizontal bearing surface of said carrier frame, said clamps being adapted when in clamping engagement with said polished rod for supporting said polished rod and positioning said polished rod relative to said carrier frame, at least one of said clamps being in clamping engagement with said polished rod so as to prevent said polished rod from becoming disengaged from said carrier frame, a removable spacer having a horizontally extending groove therein for slidably accommodating said polished rod positioned about said polished rod and between one of said horizontal bearing surfaces of said carrier frame and the adjacent overlying clamp, a vertically disposed hydraulic ram com-

13

prising a cylinder shouldered on one of said horizontal bearing surfaces of said carrier frame and a piston having a center bore therethrough which is aligned with said vertical passageway in said carrier frame, said center bore being of suitable diameter so as to accommodate said polished rod, one of said clamps being supported by said piston, and hydraulic means for raising and lowering said piston to adjust the relative position of said piston supported clamp relative to said carrier frame, and a pressure gauge connected to said hydraulic means for indicating the load carried by said piston, said polished rod being movable vertically relative to said carrier frame by alternately placing first one and then the other of said clamps in clamping engagement with said polished rod and co-ordinating said alternating clamping engagement with suitable operation of said hydraulic ram.

13. In apparatus for pumping fluid from wells, the combination of a carrier frame, means on said carrier frame connecting the frame to a generally vertically reciprocable, power driven element, said carrier frame having a pair of spaced-apart, generally vertically aligned bearing surfaces which are interconnected to form a two-deck carrier, said carrier frame being provided with a vertical passageway which extends centrally through said pair of horizontal bearing surfaces, a vertically disposed hydraulic ram comprising a cylinder shouldered on one of the horizontal bearing surfaces of said carrier and a hollow piston axially aligned with said vertical passageway, a polished rod slidably extending through said passageway in said carrier frame and through the bore of said hollow piston, a pair of spaced-apart, vertically aligned clamps on said polished rod, one of said clamps being positioned between the horizontal bearing surfaces of said carrier frame and the other of said clamps being positioned above the upper horizontal bearing surface of said carrier frame in position for engagement by the upper end of said hollow piston, said clamps being adapted when in clamping engagement with said polished rod for supporting said polished rod and positioning said polished rod relative to said carrier frame, at least one of said clamps being in clamping engagement with said polished rod so as to prevent said polished rod from be-

14

coming disengaged from said carrier frame, and hydraulic means for raising and lowering said piston to adjust the relative position of said piston supported clamp relative to said carrier frame, said polished rod being movable vertically relative to said carrier frame by alternately placing first one and then the other of said clamps in clamping engagement with said polished rod and co-ordinating said alternating engagement of said clamps with suitable operation of said hydraulic ram.

14. In apparatus for pumping fluid from wells: a carrier frame for connecting a rod string to a generally vertically reciprocable power driven element comprising means forming a pair of spaced-apart, generally vertically aligned horizontal bearing surfaces which are interconnected to form a two-deck carrier, said frame being provided with a vertical passageway having an axis which extends centrally through said pair of bearing surfaces; a vertically disposed hydraulic ram comprising a cylinder supported at its upper end on one of said horizontal bearing surfaces of said carrier frame, and a hollow piston axially aligned with said vertical passageway in said carrier frame and projectable upwardly from the upper end of said cylinder, said vertical passageway and hollow piston being suitably dimensioned for slidably receiving a rod member therein, each of said horizontal bearing surfaces of said carrier frame being adapted for supporting a clamp which may be in clamping engagement with said rod member, one clamp being positionable between the horizontal bearing surfaces of said carrier frame and another clamp being positionable above the upper bearing surface of said carrier frame in position for engagement by the upper end of said hollow piston; and means on said carrier frame which is adapted for receiving a member which connects to said power driven element.

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