J. H. HOLMGREEN
FULL ROD PUMP JACK
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Fig. 1

Fig. 2

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[Signature]
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JULIUS H. HOLMGREEN, OF SAN ANTONIO, TEXAS.

PULL-ROD PUMP JACK.

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To all whom it may concern:

Be it known that I, JULIUS H. HOLMGREEN, a citizen of the United States, residing at San Antonio, in the county of Bexar and State of Texas, have invented certain new and useful Improvements in Pull-Rod Pump Jacks, of which the following is a specification.

My said invention relates to pull rod pump jacks as are used in connection with oil wells, and it is an object of the same to provide a simple and relatively inexpensive mechanism for giving a straight line movement to the pump rod, the mechanism being such as will not be likely to get out of order and cause delay in operations.

Referring to the accompanying drawings which are made a part hereof and on which similar reference characters indicate similar parts—

Figure 1 is a side elevation of my device, Figure 2, an elevation looking toward the right in Figure 1,
Figure 3, an enlarged detail of the pulley and its mounting shown in Figure 1,
Figure 4, a plan of parts shown in Figure 3,
Figure 5, a plan of a yoke shown in Figure 1,
Figure 6, a vertical section on line 6—6 in Figure 5,
Figure 7, a detail of the block for attaching the cable to the pump rod viewed from the front as in Figure 2,
Figure 8, a side view of said block and parts connected thereto; and
Figure 9 a detail of a yoke-saddle shown in Figure 1.

In the drawings reference character 10 indicates the base of the frame which may be supported on beams 11 or in any other conventional or desirable manner. The base constitutes one member of a frame including upright posts 12 and 13 arranged in pairs at the front and rear ends of the frame respectively. The posts are connected at their upper ends by cross bars and preferably this part of the frame comprises two inwardly directed channel bars 14 as indicated in Figure 2. Each of the front posts may also consist of a pair of channel bars resting at their lower ends on channel bars 15 forming parts of the base 10. For further reinforcing the frame cross bars 16 and 17 are provided extending obliquely from corner to corner of the frame, these cross bars being of structural iron. The front and rear pairs of posts 13 are also connected by braces 18 as shown in Figure 2.

A vertical beam 19 is mounted on a pivot extending crosswise of the frame and supported on a bearing 21 secured to members 15 of the base. The beam 19 may consist of an I-beam or any other convenient form and as here shown is provided with blocks 22 filling the space between the flanges of the I-beam and bearing against the adjacent bars 14 or against other guides fastened to such bars or fixed to the frame in some other desirable manner. At the upper end of the beam a yoke block 23 is secured to the flanges of the beam by bolts or rivets 23. Another yoke block 24 is bolted to the beam between its ends and the beam is provided as indicated at 24' with a series of holes whereby the yoke block may be adjusted lengthwise of the frame to vary the stroke of the pump rod for a given length of stroke of the pull rod.

A yoke 25 engages the yoke block 24 at one end and at the other end receives a hook on the pull rod 26. A yoke 27 engages the yoke block 23, this yoke being shown in detail in Figures 5 and 6 and comprising an opening indicated at 28 loosely embracing the beam 19 and an arcuate front part having an arcuate groove at 29 to receive a cable 30. The rear end of the yoke is curved at 31 to provide a rocking engagement with the groove in the yoke block.

The cable 30 comprises two parallel portions connected at their ends to a pump rod 31', and forming a bight lying in the groove 29. The parallel parts of the cable pass over a pulley 32 and lie respectively in grooves 33 and 34, said pulley also having a groove 35 in which the pump rod may rest as it moves up and down past the pulley 32.

The pulley 32 projects normally from the upper front corner of the frame and said pulley is mounted for rotation on a shaft 36 to which it is preferably fixed. The shaft is journaled in bearings 37 having oil cavities at their upper ends closed by covers 38.
The bearings are slidably mounted on channel bars 14 and channel bars 39 secured parallel thereto but facing outwardly, the upper flanges of the adjacent pairs of channel bars 14 and 39 forming tracks for the bearing boxes.

Gusset plates 40 are located between the channel bars 14 and 39 and the pairs of oppositely facing channel bars forming the respective posts 12, 12 said gusset bars having upward extensions 41 and rearward extensions 42 (Figures 1 and 3). Channel bar 43 are secured to opposite sides of the upward extension 41 and reach forward beyond the shaft 36. Removable plates 44 are located at the front side of the bearing boxes 37 between a pair of angle irons 45 at the top and channel bars 14 and 39 at the bottom end and said plates are secured in place by bolts 49.

A space is left between parts 41 and 44 in which the bearing boxes 37 are movable to provide for moving the pulley 32 out of the way of the permit free access to the wheel as when casing sections or pipe are to be placed in a well or removed therefrom or when tools of various kinds are to be put in or taken out of the well by means of a block and tackle or other similar means.

For normally holding the bearings and the pulley in the position shown in solid lines in Figure 3 I have provided keys 46 with inclined rear edges bearing at one end on fillers 47 between the angle irons 43 and at the other end against an edge of a hole cut in the gusset 40, the front edges of the keys resting against boxes 37.

For attaching the cable 30 to the pump rod 31 I have provided a pair of blocks 48 embracing the pump rod by means of grooves on their inner faces and fastened together by bolts 49. The cables are joined at the ends to form eyes 50 embracing blocks 51 at opposite sides of the respective blocks.

In the operation of my device the pull rod is actuated as usual and the yoke block 24 having been set in accordance with the desired length of stroke of the pump rod the beam 19 will oscillate in a vertical plane at right angles to the shaft 36 causing the pulley to rotate and moving the pump rod up and down in a vertical line as will be obvious from consideration of Figure 1 of the drawings. Extreme positions of the beam 19 are indicated in dotted lines in Figure 1 but it will be understood that these positions will vary according to the stroke of the pull rod and the position of the yoke block 24. The only movable parts of the pump jack are the beam 19, the parts directly connected thereto, and the pulley 32.

It will be obvious to those skilled in the art that my device may be modified in various ways without departing from the spirit of the invention and therefore I do not limit myself to what is shown in the drawings and described in the specification but only as indicated in the appended claims.

Having thus fully described my said invention, what I claim as new and desire to secure by Letters Patent is:

1. In a pull-rod pump-jack, a base, an upstanding beam pivoted at its lower end on the base, a fixed frame on the base providing lateral guides for the beam, a yoke on the beam for attachment of a pull-rod, a cable connected to the upper end of the beam, and a pulley on the frame over which said cable passes to the pump-rod, substantially as set forth.

2. In a pull-rod pump-jack, a base, a fixed frame thereon, an upstanding beam pivoted at its lower end on the base, a yoke on the beam for attachment of a pull-rod, a cable connected to the upper end of the beam, a pulley on the frame over which said cable passes to the pump-rod, and means adjacent to the upper end of the frame to guide the beam in its oscillatory movement, substantially as set forth.

3. In a pull-rod pump-jack, a base, a fixed frame thereon, an upstanding beam pivoted at its lower end on the base, a yoke on the beam for attachment of a pull-rod, a cable connected to the upper end of the beam, a pulley on the frame over which said cable passes to the pump-rod, and supporting means for said pulley mounted for adjustment toward and from the path of the pump-rod to provide space for giving access to the well with block and tackle or the like, substantially as set forth.

4. In a pull-rod pump-jack, a base, a fixed frame thereon, an upstanding beam pivoted at its lower end on the base, a yoke on the beam for attachment of a pull-rod, a cable connected to the upper end of the beam, a pulley on the frame over which said cable passes to the pump-rod, bearings on the frame, registering slots in said frame above and below said bearings, and keys fitting in said slots, substantially as set forth.

5. In a pull-rod pump-jack, a base, a fixed frame thereon, an upstanding beam pivoted at its lower end on the base, a yoke on the beam for attachment of a pull-rod, a cable connected to the upper end of the beam, a pulley on the frame over which said cable passes to the pump-rod, bearings for the shaft of the pulley slideable forward and backward on the frame, registering slots in said frame above and below the bearings, and keys fitting in said slots the rear faces of said slots being inclined to force the bearings forward as the keys move downward, substantially as set forth.

6. In a pull-rod pump-jack, a base, a fixed frame thereon, an upstanding beam pivoted at its lower end on the base, means for attaching a pull-rod to the beam, a yoke em-
bracing the upper end of the beam said yoke having an arcuate groove at its forward end, and a cable connected at its ends to the pump-rod said cable having a bight between its ends lying in said groove, substantially as set forth.

7. In a pull-rod pump-jack, a fixed frame, an oscillatory beam pivoted at its lower end, a cable attached at an intermediate part to the upper end of the beam and at its ends to the pump-rod; and a pulley on the frame having spaced grooves to receive the limbs of the cable between the pump-rod and the beam said pulley having a third groove between said first-named grooves for the pump-rod, substantially as set forth.

8. In a pump-jack, a fixed frame, a cable for attachment to the pump-rod, a pulley over which the cable passes, and bearings for the pulley slidably mounted on the frame said bearings normally projecting forward from the frame and adapted to be moved backward to facilitate access to the well, substantially as set forth.

9. In a pump-jack, a fixed frame, a cable for attachment to the pump-rod, a pulley over which the cable passes, bearings for the pulley slidably mounted on the frame said bearings normally projecting forward from the frame and adapted to be moved backward to facilitate access to the well, and means for guiding the bearings including a gusset-plate extending downward therefrom between parts of the fixed frame, substantially as set forth.

10. In a pull-rod pump-jack, a base, a fixed frame thereon, an upstanding beam pivoted at its lower end on the base, a yoke block at the front side of the beam, a yoke supported on the yoke block for attachment of a pull-rod at the rear side of the beam, a cable connected to the upper end of the beam, a pulley on the frame over which said cable passes to the pump-rod, and means for securing the pull-rod yoke to the beam at various points along the length of the beam, substantially as set forth.

11. In a pull-rod pump-jack, a vertical beam pivoted at its lower end, means for attachment of a pull-rod including a yoke-saddle adjustable along the beam for varying the stroke of the pump-rod relatively to the stroke of the pull-rod, and means for connecting the upper end of the beam to the pump-rod for moving the same in a straight line including a pulley on the fixed frame and a flexible connection passing over it, substantially as set forth.

In witness whereof I have hereunto set my hand and seal at Washington, District of Columbia, this 22nd day of September, A. D. nineteen hundred and twenty-four.

JULIUS H. HOLMGREEN. [L. S.]