May 14, 1935. A. M. MATHERNE 2,001,033

PUMP OPERATING MECHANISM

Filed June 10, 1933 2 Sheets-Sheet 1

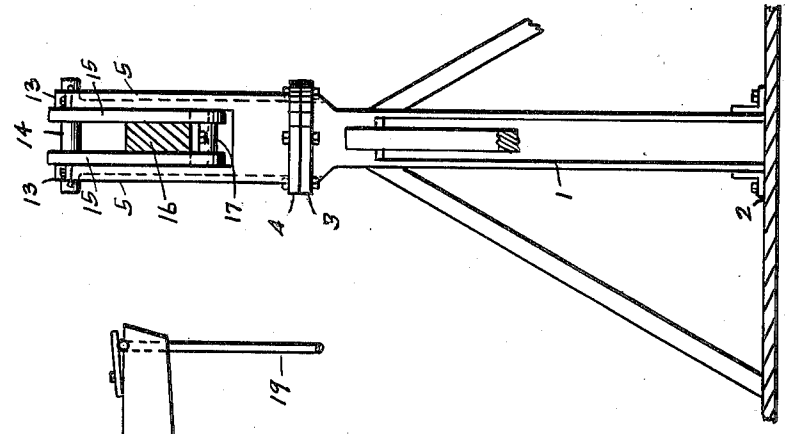


Fig. 2.

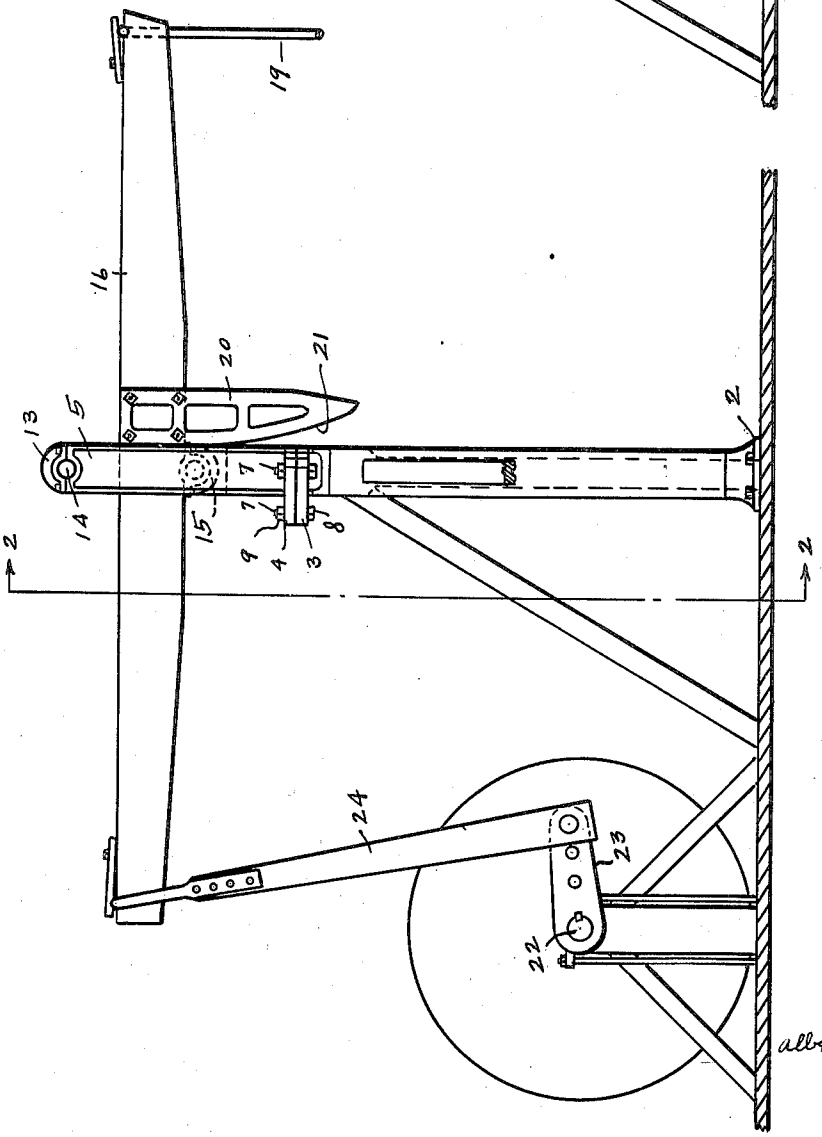


Fig. 1.

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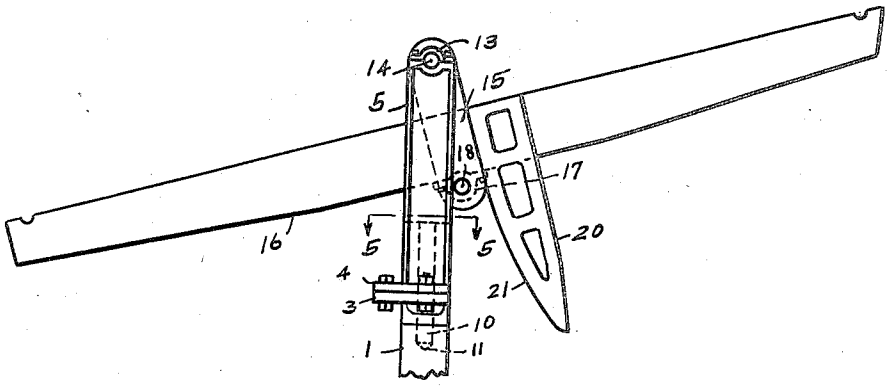


Fig. 3.

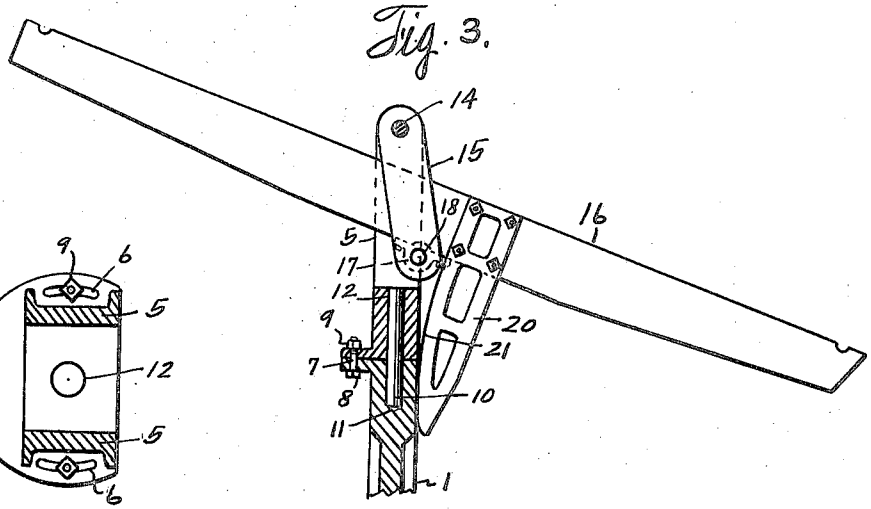


Fig. 4.

Fig. 5.

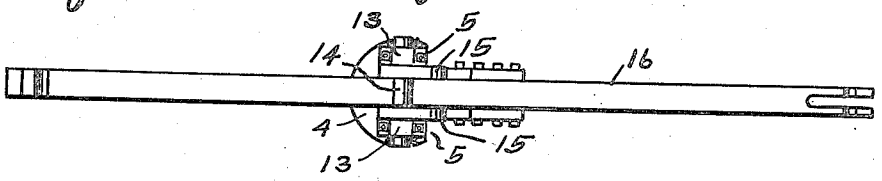


Fig. 6.

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UNITED STATES PATENT OFFICE

2,001,033

PUMP OPERATING MECHANISM

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Application June 10, 1933, Serial No. 675,264

3 Claims. (Cl. 74—103)

This invention relates to pump operating mechanism, and has particular relation to means for operating deep well pumps.

An object of the invention is to provide means for operating a pump whereby the pump sucker rod will be reciprocated up and down on an approximately vertical line.

Operating mechanism of this character now commonly used consists of a walking beam directly pivoted on the supporting post and one end of which is connected to the pitman rod and the other end to the pump sucker rod. Accordingly as the walking beam is reciprocated or rocked, the end connected to the sucker rod describes an arc causing the upper end of the sucker rod to sway laterally and this in turn causing the stuffing box at the upper end of the pump tubing, through which the sucker rod works, as well as the sucker rod itself, to become worn. It is the prime object of this invention to so mount the walking beam on the post that the beam may move longitudinally to maintain the sucker rods in a true vertical position at all times parallel to the post and to thus reduce the wear on the sucker rod and pump stuffing box.

Another object is to provide a novel type of post on which the walking beam may be turned partly around, when not in use, so as to be out of the way while carrying on other operations about the well.

With the above and other objects in view, the invention has particular relation to certain novel features of construction, operation and arrangement of parts, an example of which is given in this specification and illustrated in the accompanying drawings, wherein:—

Figure 1 shows a side view of the apparatus partly broken away.

Figure 2 shows a vertical sectional view taken on the line 2—2 of Figure 1.

Figure 3 shows a fragmentary side elevation showing the walking beam in position at the end of the upstroke.

Figure 4 shows a fragmentary side view, partly in section, showing a walking beam at the end of the downstroke.

Figure 5 shows an enlarged cross sectional view taken on the line 5—5 of Figure 3, and

Figure 6 shows a plan view of the beam and post whereon the beam is mounted.

In the drawings the numeral 1 designates an upstanding post which is mounted on a suitable support as 2. This post is composed of two sections having coinciding semi-circular flanges 3, 4, and the upper section of the post is forked providing the spaced upstanding side arms 5, 5. The upper flange 4 has the arcuate slots 6 and bolts 7 are fitted upwardly through the flange 3 and through said slots 6 and are provided with the heads 8 on their lower end and the nuts 9 on their upper ends whereby said flanges may be clamped securely together. A pin 10 has its lower end seated in the socket 11 in the upper end of the lower section of the post and the upper end of this pin is received in the vertical bearing 12 in the upper section of the post.

The upper ends of the arms 5 are equipped with aligned bearings 13, 13 in which the cross pin 14 is mounted and swung from the pin 14 between the arms 5 are the spaced links 15, 15.

Between these links the walking beam 16 is mounted to rock. Approximately midway between the ends of the walking beam and fastened to the underside thereof there is a bearing 17 and a cross pin 18 is anchored at its ends to the lower ends of the links 15 and works in said bearing 17. One end of the walking beam is suitably connected to the upper end of the pump sucker rod 19, and attached to said walking beam adjacent the side of the post, facing the sucker rod, there is a depending bearing member 20 having the arcuate bearing face 21 arranged to work against the adjacent side of said post as more accurately shown in Figure 4.

On the other side of the post there is a transverse power shaft 22, which is rotated by any suitable power device and fixed to one end of which there is a crank arm 23. A pitman rod 24 is pivoted, at one end, to the crank arm 23 and has its other end connected to the corresponding end of the walking beam 16 whereby said walking beam may be reciprocated or rocked up and down as the shaft 22 rotates.

Upon downward movement of the sucker rod 19, the corresponding end of the walking beam will move downwardly also but the arcuate bearing face 21 will bear against the adjacent side of the post 1, as shown in Figure 4, causing a corresponding longitudinal movement of the walking beam 16 so that the end of said beam connected to the sucker rod will not follow an arcuate course but will move vertically so that there will be no side swinging movement imparted to the upper end of the sucker rod. Upon upward movement of the end of the walking beam to which the sucker rod is connected the walking beam 16 will move longitudinally in the opposite direction until the beam has reached a horizontal position and upon further upward movement the longitudinal movement of the beam will be reversed and said beam will move longi-

tudinally outwardly toward the sucker rod causing the walking beam to assume the position shown in Figure 3 at the end of its upward or power stroke. As the end of the walking beam to which the sucker rod is connected moves back downwardly, said walking beam will again move longitudinally in a direction toward the power until said walking beam again assumes a horizontal position and during the remainder of the down stroke it will gradually reverse its longitudinal movement and assume the position shown in Figure 4 at the end of its down stroke, all to the end that the sucker rod will be reciprocated up and down in approximately a vertical direction

If it be desired to work on the well, the nuts 9 may be loosened and the sucker rod 19 and pitman 24 disconnected from the walking beam and the walking beam and upper section of the post turned around to carry the walking beam from over the well so that it will not be in position to interfere with the operations being carried on in or about the well.

The drawings and description disclose what is now considered to be a preferred form of the invention by way of illustration only, while the broad principle of the invention will be defined by the appended claims.

What I claim is:

1. In apparatus for operating a pump in a well, an upstanding support, a swinging connecting member on the support, a walking beam mounted to rock on said connecting member, and a depending bearing member on said beam operable against the side of the support and effective to impart a longitudinal movement to the beam upon a rocking movement of the beam in one direction.

2. In apparatus for operating a pump in a well, an upstanding support, a walking beam mounted to rock and to move longitudinally on the support, a bearing member depending from the beam between the support and one end of the beam, said support having a bearing face against which said bearing member works to impart a longitudinal movement to the beam upon the downward movement of said end.

3. Apparatus for operating a pump in a well comprising an upstanding support, a swing link whose upper end is pivoted to said support, a walking beam pivoted to said link beneath the upper end of the link, a bearing member fixed to and depending from the walking beam on one side of said support and having an arcuate bearing face adapted to bear against one side of the support, to effect longitudinal movement of the walking beam as the beam rocks on its pivotal mounting.

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