May 19, 1942. K. L. FINLEY 2,283,357

SELF-OILING PUMP JACK

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FIG. 1.

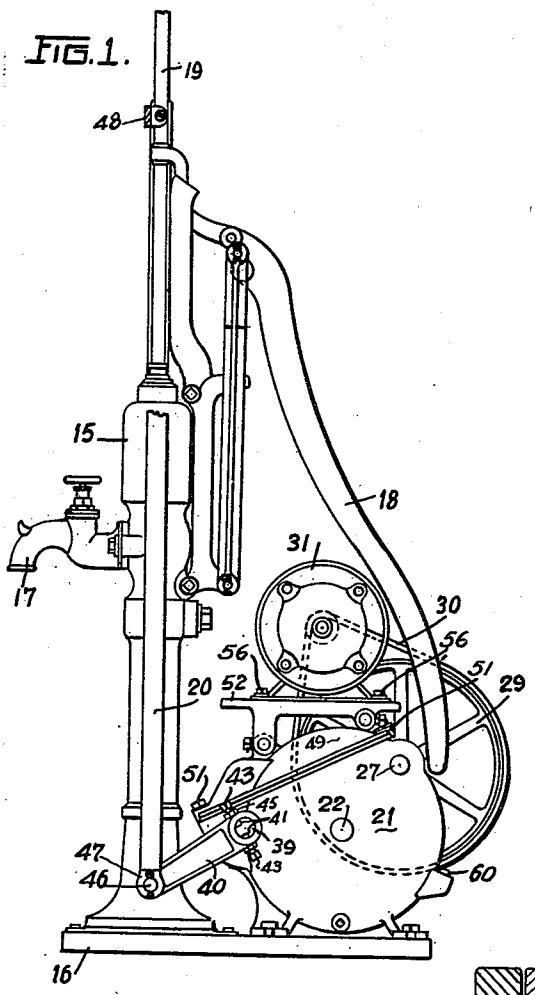

FIG. 10.

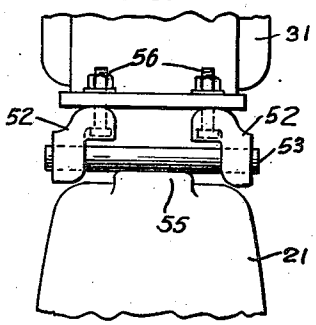

FIG. 9.

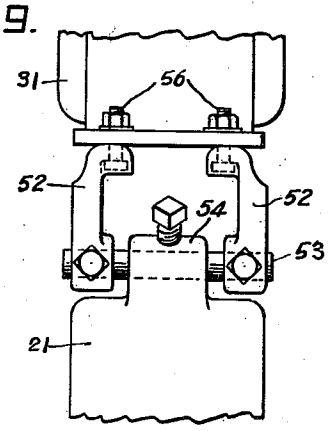

FIG. 4.

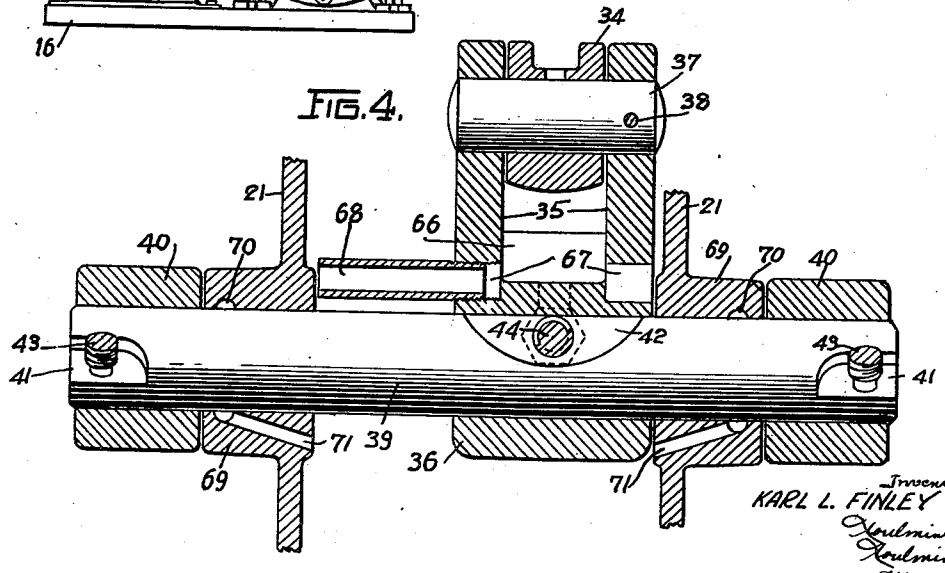

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FIG. 2.

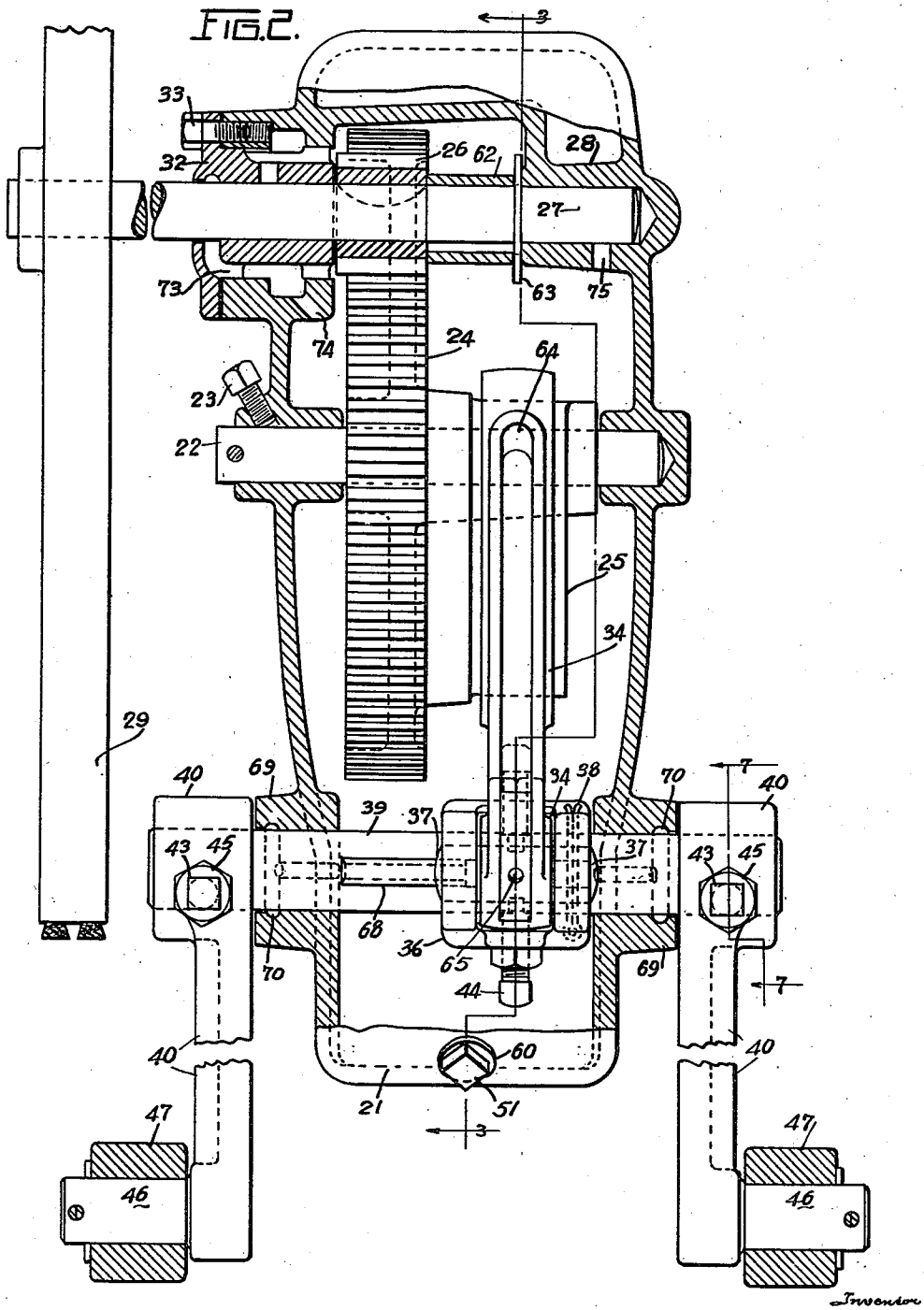

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FIG. 7.

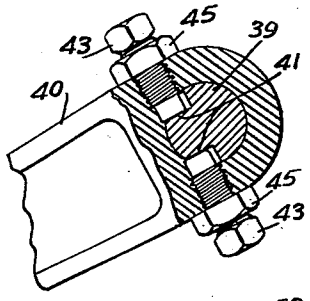


FIG. 8.

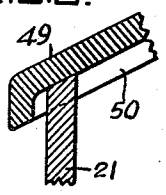


FIG. 3.

FIG. 5.

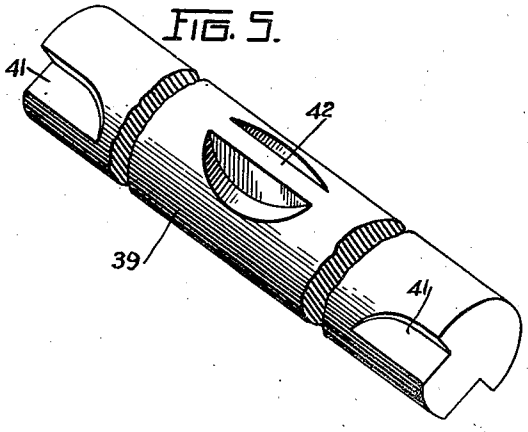
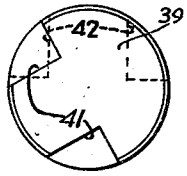


FIG. 6.



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Patented May 19, 1942 2,283,357

UNITED STATES PATENT OFFICE

2,283,357

SELF-OILING PUMP JACK

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Application November 20, 1939, Serial No. 305,268

6 Claims. (Cl. 184—4)

This invention relates to power heads for operating the piston rods of pumps and more particularly an improved self-lubricating pumping jack.

It is an object of this invention to provide an improved pumping jack which is self-oiling and is adapted to be driven by an electric motor, internal combustion engine or fluid operable prime mover.

Another object of this invention is to provide in a device of this character an assembly wherein the driving motor or engine may be mounted either on top or behind the pump jack.

Another object is to provide an improved pumping jack construction having the prime mover or engine mounted on adjustable rails which are attached to the cover or lid enclosing the gear casing of the device.

Another object is to provide a pumping jack mechanism wherein the rotation of the prime mover or engine is in the same direction as the driven member so that the prime mover need not be offset in mounting the same.

Another object is to provide an improved power head for operating piston rods of pumps, such as used for drawing liquid from wells or storage containers which comprises a fluid tight casing adapted to be self-lubricated which contains the driven mechanism for operating the pump.

Another object is to provide a pumping jack wherein the length of the stroke may be varied by employing outer oscillating arms of different sizes and arranged in such a manner that the speed of the stroke during all positions of the oscillator arm is substantially the same.

Another object is to provide a device of this nature having all working parts readily accessible by merely removing the lid or cover on which is mounted the driving motor or engine.

Still another object is to construct a lubricating pumping jack so that the oil may be removed and replaced or replenished without taking off the cover or lid of the casing containing the operating mechanism for actuating the oscillator arms of the jack.

Referring to the drawings:

Figure 1 is a side elevation view of a pump head and my improved self-lubricating pumping jack, showing the manner of connecting the same to a pump;

Figure 2 is a sectional view of the pumping jack built according to this invention and taken on the line 2—2 of Figure 3;

Figure 3 is a similar sectional view thereof taken along the line 3—3 of Figure 2;

Figure 4 is a detail sectional view of the oscillator shaft and connecting parts taken on the line 4—4 of Figure 3;

Figure 5 is a perspective view of the oscillator shaft;

Figure 6 is an end elevation view thereof;

Figure 7 is a fragmentary detail sectional view of a part of the device taken on the line 7—7 of Figure 2;

Figure 8 is a detail sectional view showing the drip mold construction of the casing lid;

Figure 9 and 10 are detail views illustrating the front and rear motor mountings for supporting the pump jack motor on the casing cover.

Referring to the drawings in detail, the character reference 15 designates a pump head of the conventional type, such as is adapted to be mounted upon a pump platform 16, having a spout 17 and a handle 18 for operating the piston rod 19.

A pair of pitmans is used, one on each side of the pump, which are connected to the pumping rod for operating the pump when the handle is disconnected therefrom. These several features are common in a pump head of this character and are in general use. My invention here is concerned with a self-oiling pump jack mechanism designed for actuating the piston rod and pitman so as to operate the pump.

Pump jack construction

The pump jack mechanism comprises a gear case 21, preferably made of cast iron and forming within it a chamber for holding a suitable amount of lubricant and the mechanism for oscillating the pitman of the pump, which mechanism dips into the lubricant as illustrated in Figure 3. These parts consist of the stationary shaft 22 positioned centrally of the gear case and having the ends resting in the side walls of the casing 21. Rotation of the shaft 22 is prevented by the set screw 23.

On the shaft 22 is rotatably mounted the gear wheel 24 and eccentric 25 which are preferably cast integral. The gear 24 is rotated by the pinion 26 keyed to the pinion shaft 27. This pinion shaft is mounted in the bearing 28 which preferably is integral with the gear case at the rear end of the shaft and a pulley wheel 29 is keyed to the opposite end of the pinion shaft and is adapted to be driven by belt, chain or other suitable means 30 by a prime mover 31, such as a motor or engine. The pulley wheel

end of the shaft 27 is mounted in a self-cleaning removable bearing 32 which is removable by backing off of the tap bolts 33. In this manner the pinion shaft and pinion may be removed from the casing. The particular construction of the bearing is similar to that disclosed in Patent 1,368,449 to P. A. Myers.

Connecting link 34 actuated by the eccentric 25 is connected to the inner oscillator crank arm members 35 of the crank 36, positioned at the front of the jack, by means of the wrist pin 37. The wrist pin is held stationary in the fork of the inner oscillator crank by means of the cotter pin 38 which extends through one arm of the crank and end of the wrist pin. Oscillator crank 36 is secured to the main oscillator shaft 39 as shown in Figure 4.

For fastening the inner oscillator crank 36 and outer oscillator arms 40 to the oscillator shaft 39, pairs of cuts are made in the shaft at the outer ends of the shaft and between the ends so as to form the ear portions 41 at the opposite ends of the shaft and a central ear portion 42 as illustrated in Figures 4, 5 and 6. The ear portions 41 are parallel to each other and in line whereas the central ear portion 42 is revolved approximately 120 degrees about the shaft from the center of the end ear portions, as illustrated in Figures 5 and 6. Oscillator arms 40 are bored to fit snugly on the ends of the shaft 39 and diametric tappings are made in the ends thereof for accommodating the set screws 43. These screws are offset from the center of the shaft 39, as shown in Figure 7. Similarly the inner oscillator member 36 is secured to the ear portion 42 by the set screws 44. After the screws are tightened down in place they are locked by the check nuts 45.

The object of this construction is to draw down the pairs of opposed screws from opposite sides of the castings so that the flat ends of the screws are parallel to the flat surfaces of the ear portions cut in the oscillator shaft. Since the screws are eccentric to the shaft they are placed under compression during use rather than shear which provides a more durable mechanism. Further any wear on the parts may be taken up merely by adjusting the screws. Moreover this construction permits ready interchangeability of parts.

Pins 46 at the end of the outer oscillator arms 40 are preferably cast and machined as an integral part of the arms. They fit into cast iron bearings 47 attached to the ends of the rods 20 which in turn are suitably fastened by means of a crossbar 48 to the piston rod 19 of the pump. This provides a connection between the pumping piston rod and the pumping jack.

A lid or cover member 49 closing the top of the gear case 21 is constructed with an overhanging drip mold portion 50 around the outside edges which extends down over the side of the gear case opening as shown in Figure 8. The upper surfaces of the gear case forming the opening are ground approximately flat and the lid is secured thereon by means of the tap bolts 51. This produces a water and dust-proof housing for oil and working parts of the pump jack.

Where an electric motor is employed for driving the pump jack the motor may be mounted on rail members 52, which are adjustably positioned on the bars 53, which in turn are adjustably attached to the lid at the front thereof by the boss 54 and rest on rib 55 at the back of the lid as illustrated in Figures 9 and 10. The rail members are suitably fastened to the base of the motor by means of bolts 56. The pump motor support is similar to that shown in the patent to P. A. Myers 1,784,245.

Self-lubricating action

The gear case 21 is filled with lubricating oil to the bottom of the oil filler plug 60 as illustrated in Figure 3. Rotation of the gear 24 carries oil up to the pinion 26 where it is squeezed out from between the pinion and the gear teeth. Oil flows along the shaft 27 over the oil ring spacer member 62 and is deflected by the washer 63 suspended on the pinion shaft, into the oil trough 64 formed on top of the connecting link 34 as the link moves under the pinion shaft during its course of rotation.

Oil in the trough 64 flows forward as the eccentric end of the link raises during its movement gravitating the oil downward through the passageway 65 in the forward bottom portion of the trough 64 directly over the wrist pin 37. Lubricating oil collects in the pocket 66 and flows along the oscillator shaft through drilled holes 67 and pipe nipple 68 to bearing 69 in the casing 21 which supports the oscillator shaft.

Lubricating oil works out from the bearing along the shaft to grooves 70 at the outer end of the bearings and returns to the main oil chamber in the bottom of the gear casing through passageways 71. In a similar manner lubricating oil flows out along the pinion shaft 27 to the removable self-cleaning bearing 32 and collects in the groove 73 at the outer end of the bearing and is returned to the oil stored in the bottom of the casing through suitably drilled holes 74 in the boss which supports the removable bearing member 32 in the gear case 21. Lubricant is also carried along the pinion shaft 27 over and through the ring spacer and deflector to the bearing 28 which is integral with the case and is returned to the interior chamber of the gear case through the oil hole 75 in the bearing. In this manner all moving parts of the pumping jack are automatically lubricated.

In the operation of the pumping jack mechanism of this invention, it will be observed that when the gear 24 is rotated by means of the motor driven pulley wheel 29 and pinion 26, the eccentric 25, during its course of rotation, will oscillate the crank 36, which in turn oscillates the shaft 39 and attached outer arm members 40. Reciprocation of the arms 40 moves the pitmans 20 and piston rod 19 of the pump up and down actuating the pump.

By reason of the novel arrangement and particular design of the device of this invention, lubricating oil contained in the gear casing is automatically supplied, during operation of the mechanism, to the bearing surfaces, providing a self-oiling pumping jack.

It will be understood that this invention is not limited to the particular details of construction as illustrated, but may be varied to suit the particular purpose desired without departing from the spirit of the invention.

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

1. In an improved power head, the combination with a substantially oil-tight casing having a driven gear power transmitting mechanism mounted therein, of an oscillating shaft supported by the casing and extending therethrough with bearing means for said shaft in said casing, a reciprocating crank drivingly connected to said

gear and said oscillating shaft within said casing, and oil distributing means for self-oiling the working parts of said mechanism including a rotating part, a channel on said crank and passageways to said casing bearing means, said rotating part including a driving shaft having means for permitting passage of lubricant lengthwise of said shaft and a member on said shaft for receiving oil carried there-along and for dropping said oil by gravity to said channel.

2. In an improved power head, the combination with a substantially oil-tight casing housing a gear and pinion, of an eccentric driven oscillating crank in driving connection with said gear, said eccentric driving crank being adapted to automatically collect and distribute oil to the working parts of an oscillating member to lubricate the same, said pinion having a shaft and an unobstructed passageway for lubricant thereon, a collar spaced from said gear located above said crank, whereby oil picked up by said gear is transferred to said pinion and passes along said shaft to said collar and drops by gravity to said crank therefrom.

3. In a self-lubricating pumping jack mechanism comprising a substantially oil-tight casing and oscillator mechanism mounted therein, said oscillator comprising a shaft extending transversely through said casing, said shaft having bearing journals in the walls of said casing, means for retaining oil in the bottom of said casing for lubricating said pumping jack, oscillating mechanism and associated parts in the casing comprising an oil collecting basin and gravity feed means for distributing oil from the bottom of said casing to the bearing parts of said oscillating mechanism, said oil gravity feed means including a gear and driving pinion therefor, a shaft mounting said pinion having conveying means for the oil picked up by said pinion, said oscillating mechanism including a crank connected to and driven by said gear, said crank having a passageway extending adjacent to said oscillating shaft and in one of its positions directly beneath said pinion shaft, and means for conveying oil from said oscillating shaft to said bearing journals in the walls of said casing, whereby oil picked up from said basin is transferred by said gear to said pinion and to said conveying means.

4. In a power head mechanism for actuating reciprocating rods, the combination of an eccentric gear driven crank mechanism, said entire mechanism being enclosed in a substantially oil-tight casing, means comprising a chamber for retaining lubricating oil in the bottom of said casing and contacted by said gear, means carried by said crank for gathering and gravity-supplying lubricating oil to the bearings of said oscillating mechanism during the normal operation of the power head, said last-named means including a passageway extending substantially the length of said crank, a pinion for driving said eccentric gear driven crank, a shaft mounting said pinion located directly above a portion of said crank when the same is in one position whereby oil collecting on said shaft will drop on to the crank passageway, an oscillating shaft located at the opposite end of said crank and driven thereby, and means connected therewith for conveying oil from said crank to said oscillating shaft and its bearings.

5. An improved power head mechanism comprising a substantially oil-tight gear case, a chamber in the bottom for holding a suitable amount of lubricant, a shaft journal, a shaft thereon, a gear on said shaft, an oscillating crank and an oscillating shaft driven by said gear, said gear being adapted to dip into the lubricant, a pinion gear shaft journaled in said casing for driving said gear, crank and oscillating shaft, means carried by said pinion shaft and freely rotatable means thereon including a spacing collar having a passageway for distributing lubricating oil along said gear shaft to said journal and adjacent moving parts of said mechanism, said mechanism comprising an oil retaining trough on said crank which is adapted to receive oil from said gear shaft and feed the oil by gravity to the movable parts of said machine.

6. In an improved power head, the combination with a substantially oil-tight casing having an oil chamber and a driven gear therein, a pinion gear and shaft therefor for driving said driven gear, a gravity oil distributing means for self-lubricating the working parts of said power head mechanism including an eccentric driven by said driven gear, a link on said eccentric having a lubricant passageway, a wrist pin and oscillator shaft, a crank connecting said last two named parts, bearings in said casing for said oscillator shaft, said oil distributing means and mechanism further including a rotating member mounted on said pinion gear shaft spaced from said pinion gear, whereby lubricant picked up by said driven gear and transferred to said pinion gear is fed along said pinion gear shaft to said rotating member and falls by gravity to said lubricant passageway to lubricate said wrist pin, oscillator shaft and said oscillator shaft bearings.

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