A. WACKER.

PUMP JACK.

APPLICATION FILED AUG. 16, 1917.

1,269,343.

Patented June 11, 1918.

2 SHEETS—SHEET 1.

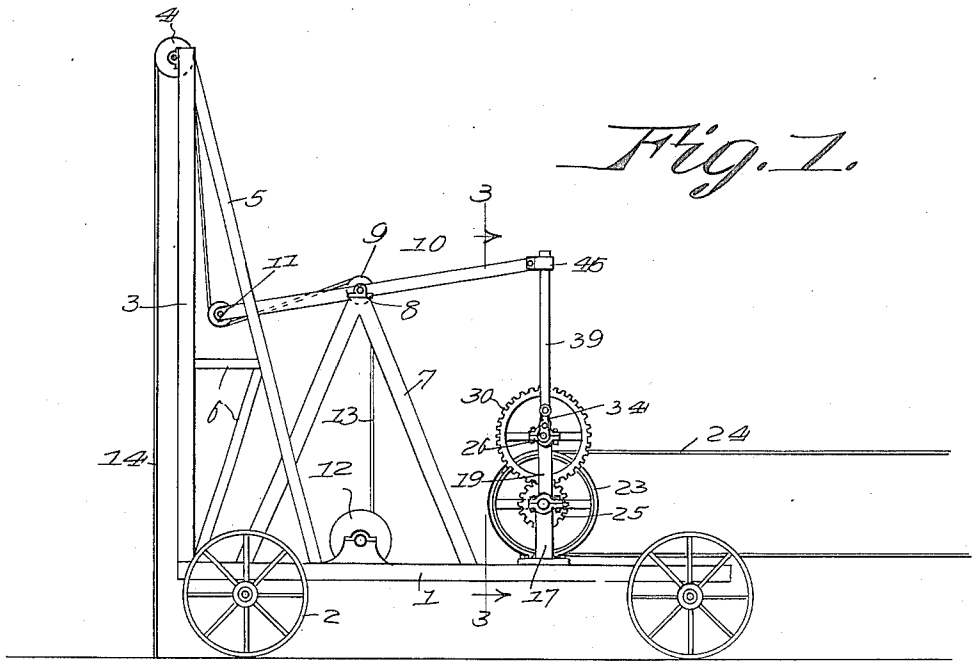


Fig. 1.

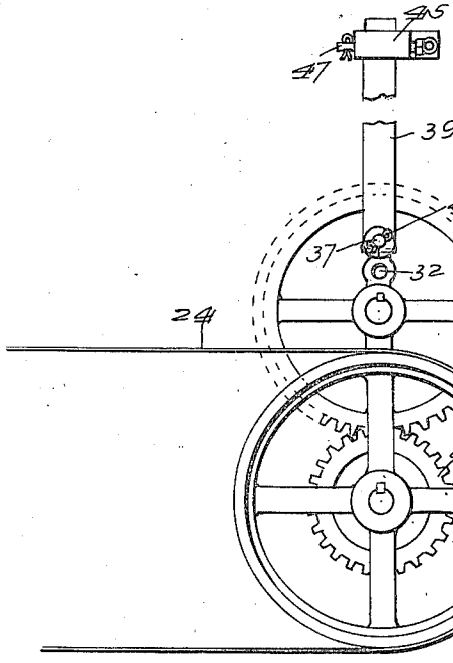


Fig. 2.

Inventor

Aloysius Wacker

By C. Bruce Talbert

Attorneys

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2 SHEETS—SHEET 2.

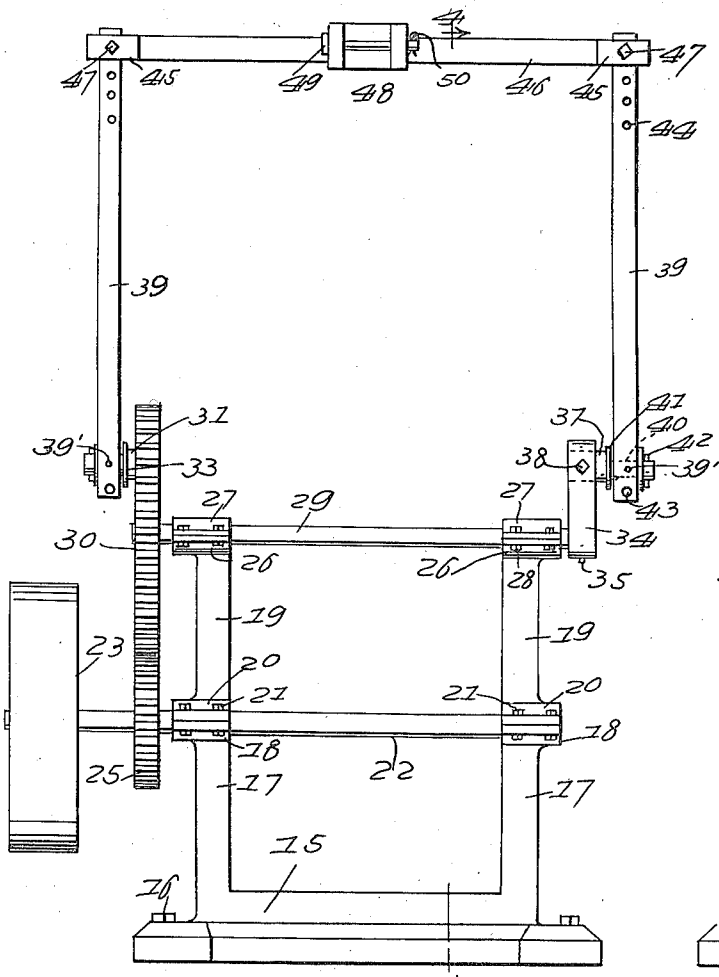


Fig. 3.

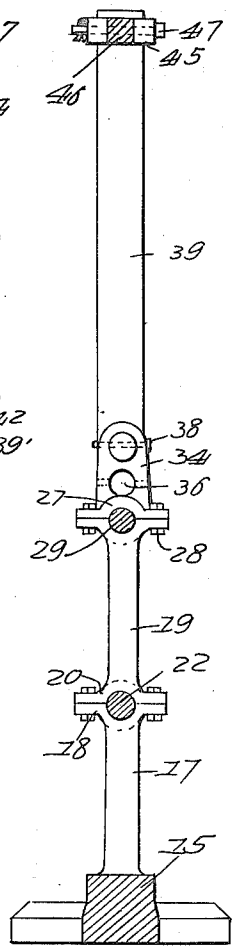


Fig. 4.

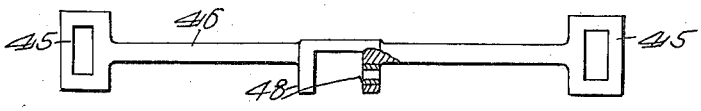


Fig. 5.

Inventor

Aloysius Wacker,

By Thume & Talbert

Attorneys

UNITED STATES PATENT OFFICE.

ALOYSIUS WACKER, OF PIERZ, MINNESOTA.

PUMP-JACK.

1,269,343. Specification of Letters Patent. Patented June 11, 1918.

Application filed August 16, 1917. Serial No. 186,604.

To all whom it may concern:

Be it known that I, ALOYSIUS WACKER, a citizen of the United States of America, residing at Pierz, in the county of Morrison and State of Minnesota, have invented new and useful Improvements in Pump-Jacks, of which the following is a specification.

This invention has reference generally to improvements in that class of inventions known as pumps and more particularly relates to a pump jack.

It is the principal aim and object of this invention to provide a device of the above character designed for operating a vertically swinging walking beam employed in conjunction with a pumping or drilling device and is capable of being readily and quickly adjusted to consequently vary the stroke of the beam.

More particularly this invention embraces the provision of a pump jack wherein the construction permits of the ready adjustment of the crank pins and the lifting bar with respect to the connecting rod therebetween so that the swinging movement of the walking beam may readily be regulated.

As an additional object this invention contemplates the provision of a pump jack wherein the support thereof is of an improved construction so as to be readily assembled and disassembled when occasion requires without occasioning inconvenience.

Among the other aims and objects of this invention may be recited the provision of a device of the character described with a view to compactness, and in which the number of parts are few, the construction simple, the cost of production low and the efficiency high.

Other improvements and novel details in the construction and arrangement of the various parts of the apparatus will be brought out more in detail in the description to follow, which for a clear understanding of the invention should be considered in connection with the accompanying drawings forming a part hereof, and wherein is disclosed for the purpose of illustration a convenient and satisfactory embodiment of the invention. It is to be noted in this connection that minor changes in the construction and arrangement of parts may be made without departing from the principle of operation of the various parts.

The invention is clearly illustrated in the accompanying drawings, in which:—

Figure 1 is a side elevation of the pump jack in use;

Fig. 2 is an elevational detail looking toward the opposite side of the pump jack;

Fig. 3 is a front elevation of the pump jack;

Fig. 4 is a section taken on line 4—4, Fig. 3, in the direction in which the arrows point, and

Fig. 5 is a detail plan of the lifting cross bar.

Similar characters of reference are employed in all the above described views, to indicate corresponding parts.

Referring now, more particularly, to the accompanying drawings, there is provided a supporting platform 1 preferably supported in spaced relation to the ground through the instrumentality of supporting wheels 2. A derrick 3 extends perpendicularly from the platform adjacent one end thereof while a head wheel 4 is rotatably mounted upon the upper end of the derrick. Suitable braces 5 and 6 are employed for assuring of the maintenance of the derrick in a substantially rigid position with respect to the platform. A support commonly known as an A-frame 7 is mounted on the platform. A shaft 8 is journaled transversely at the upper end of the A-frame while a pulley wheel 9 is mounted on the shaft. A walking beam 10 is pivotally mounted at points approximately intermediate the spring upon the shaft 9 while the outer end is bifurcated so as to rotatably support another pulley wheel 11. A cable drum 12 of conventional construction is rotatably mounted on the opposed upper surface of the platform transversely thereof and beneath the A-frame 7 while a pulley 13 has one end connected to the drum and is extended upwardly and trained about the pulley wheel 9, extended outwardly and trained about the pulley wheel 11 of the beam and thence extended upwardly and trained about the head wheel, the outer portion 14 depending from the head wheel and is adapted to receive a drilling or pumping device, not shown.

With a view toward operating the vertical swinging walking beam an improved pump jack is provided and in the present instance

perferably consists of a base 15 arranged transversely of the platform adjacent the opposite end being secured thereto through the medium of suitable fastening devices 16. Lower standards 17 extend upwardly from the base in spaced parallel relation to each other and terminate in bearing brackets 18. Upper standards 19 are positioned directly above the standards 17 and terminate at their lower ends in bearing brackets 20 which rest upon and are secured to the bearing brackets 18 through the medium of suitable fastening devices 21. A lower shaft 22 is journaled between the bearing brackets 18 and 20 while one end projects beyond one set of bearing brackets to receive a pulley wheel 23 over which is a power transmitting belt 24 for transmitting rotary motion to the shaft 22. A gear 25 is carried by the projecting end of the shaft for a purpose that will hereinafter become apparent. Bearing brackets 26 are formed on the upper ends of the upper standards 18 and have secured thereto other bearing brackets 27 through the instrumentality of fastening devices 28. An upper shaft 29 is journaled in the bearing brackets 26 and 27 and is disposed above the shaft 22 and has its respective ends projecting beyond the bearing brackets. A relatively large gear 30 is mounted on the projecting end of the shaft 29 and is arranged in mesh with the gear 25 so that rotary motion transmitted to the shaft 22 will, through the instrumentality of the meshing gears 25 and 30, be transmitted to the upper shaft 29.

A crank pin 31 is removably fitted in any one of the eccentrically positioned openings 32 in the gear 30 while the outer end of the pin is reduced to form a shoulder 33 having a purpose that will hereinafter become apparent. An arm 34 is provided with an opening in its inner end for disposition about the opposite projecting end of the shaft 29 and is removably held in substantially rigid position with respect to the shaft 29 through the instrumentality of a set-screw 35. This arm is further provided with a plurality of longitudinally arranged openings 36 in which is fitted a crank pin 37 similar in construction to the crank pin 31. The crank pin 37 is held in substantially rigid position in the arm through the instrumentality of a transversely arranged fastening device 38 engaged through the arm and the crank pin.

Connecting or pitman rods 39 are now employed and have their inner ends provided with openings 40 for loose arrangement about the reduced ends of the crank pins 31 and 37. Washers 41 are arranged about the crank and the reduced end of the pin on opposite sides of the rods while suitable cotter pins 42 are removably extended transversely through the reduced ends for removably retaining the rods 39 on the crank pins. If desired, these rods may be formed of wood and in such case reinforcing pins 43 are extended transversely therethrough to prevent splitting thereof. The outer portions of the rods 39 are provided with a longitudinal series of openings 44 while disposed about the outer portions of these rods are the looped ends 45 of a lifting cross bar 46 suitable fastening devices 47 being passed through the looped ends of the bar for adjustably connecting the bar on the rods. Spaced ears 48 are formed intermediate the ends of the cross bar and between these ears is positioned the inner end of the walking beam 10 which is preferably pivotally connected to the ears through the instrumentality of a bolt 49 removably held in position by a suitable cotter pin 50 or the like.

The mode of operation of the present invention may be reviewed as follows:—

Assuming that the parts have been assembled in the manner described, upon operation of the belt through the instrumentality of a suitable source of power, not shown, rotary motion is transmitted to the shaft 22 and by reason of the provision of meshing gears 25 and 30 rotary motion will in turn be imparted to the upper shaft 29. During rotation of the shaft 29 the connecting rods 39 owing to their connection with the gear 30 and the crank arm 34 will reciprocate vertically and inasmuch as the walking beam has one end connected to the lifting beam the said beam will be rocked about the shaft. The outer portion 14 of the cable of course will be reciprocated owing to the action of the beam on the intermediate portion of the cable thus actuating the pump or drilling device not shown which is adapted to be connected to the extreme lower end of the outer portion 14. The stroke of the walking beam may be varied by varying the adjustable connection of the loops 45 of the upper ends of the rods 39 and by adjusting the crank pins respectively in the openings 36 in the arm 34 and in the opening 33 in the gear 30. This adjustment also varies the speed of the reciprocatory motion of the rods.

It is believed that in view of the foregoing description a further detailed description of the operation of the invention is entirely unnecessary. Likewise it is believed that the advantages of the invention will be readily apparent.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limited sense. It is also to be

understood that the language used in the following claims is intended to cover all the generic and specific features of the invention which is here described and all statements of the scope of the invention which as a matter of language might be said to fall therebetween.

Having thus clearly described the invention, what is claimed as new and desired to be secured by Letters Patent is:—

1. As a means for operating a vertically swinging walking beam, a rotatably mounted shaft, means for transmitting movement to the shaft, a gear carried by the shaft, another rotatably mounted shaft positioned above the first shaft, a gear carried by the second shaft and meshing with the first gear for transmitting motion to the second shaft and also provided with a series of radial openings, a crank arm carried by the other end of the second shaft and provided with a series of openings, crank pins fitted in any one of the openings in the gear and in the arms, connecting rods having their lower ends operably arranged about the crank pins, a lifting cross bar adjustably connected to the upper ends of the connecting rods, and means for pivotally connecting one end of the beam to the cross bar.

2. As a means for operating and varying the stroke of a vertically swinging walking beam, a rotatably mounted shaft, means for transmitting rotary motion thereto, a gear carried by one projecting end of the shaft, another shaft rotatably mounted above the first shaft, a gear carried by the projecting end of the shaft and meshing with the first gear and provided with a series of radial openings, a crank arm provided at the opposite end of the shaft and provided with a series of openings, crank pins adjustably fitted within the openings in the gear and the crank arm, crank arms each having an opening in its lower end for engagement with the adjacent crank pin, the upper ends of the rods being provided with a series of openings, a lifting cross bar having its looped ends disposed about the upper ends of the connecting rods, means removably engageable with the looped ends of the bar in any one of the openings in the upper portions of the rods for adjustably connecting the bar thereto, and means for pivotally connecting the bar to one end of the beam.

3. A pump jack including a base, standards formed thereon, a shaft journaled in the upper ends of the standards and having one end projecting beyond one of the standards, a gear carried by the projecting end of the shaft, another standard detachably connected to the first standards and having its respective ends projecting beyond the standards, a gear carried by one projecting end of the upper shaft and meshing with the gear on the first shaft and provided with a series of radially arranged openings, an arm removably and rigidly secured to the other projecting end of the shaft and provided with a series of openings, crank pins removably fitted in any one of the openings in the gear and arm, connecting rods provided with openings in their lower ends for detachable and operable engagement with the crank pins, the upper ends of the rods being provided with a series of openings, a lifting cross bar having its looped ends adjustably arranged about the upper ends of the connecting rods, means removably engageable with the looped ends and with any one of the openings in the connecting rods for adjustably connecting the lifting bar thereto, and an attaching bracket formed intermediate the ends of the lifting bar, substantially as described.

In testimony whereof I affix my signature.

ALOYSIUS WACKER.