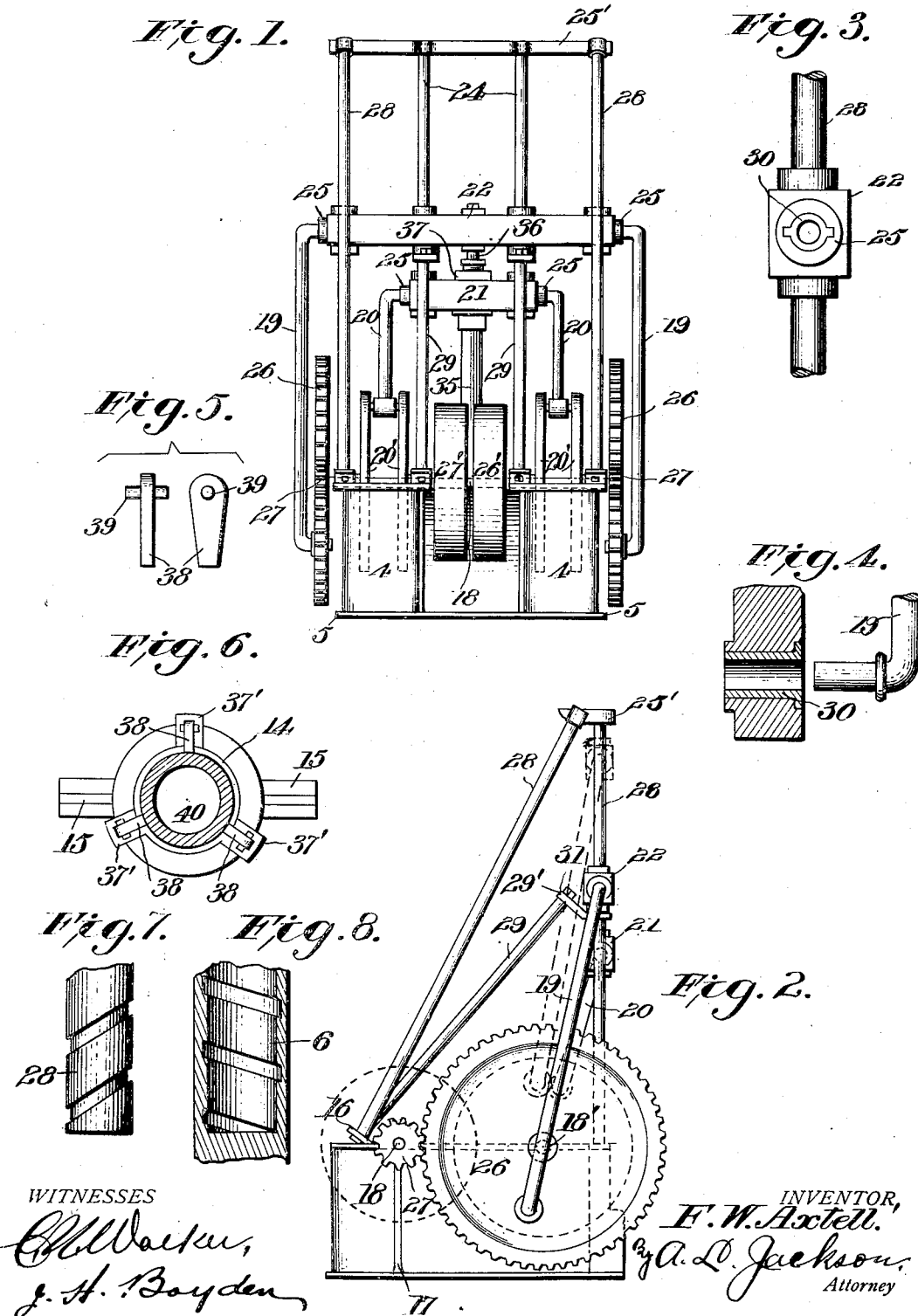


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PUMP JACK FOR DOUBLE ACTING PUMPS.
APPLICATION FILED NOV. 8, 1911.

1,024,921.

Patented Apr. 30, 1912.

2 SHEETS—SHEET 1.



WITNESSES

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2 SHEETS--SHEET 2.

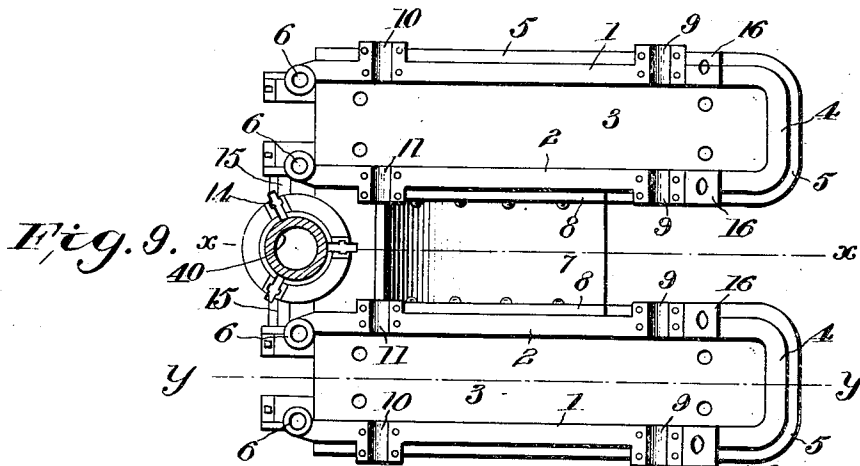


Fig. 9.

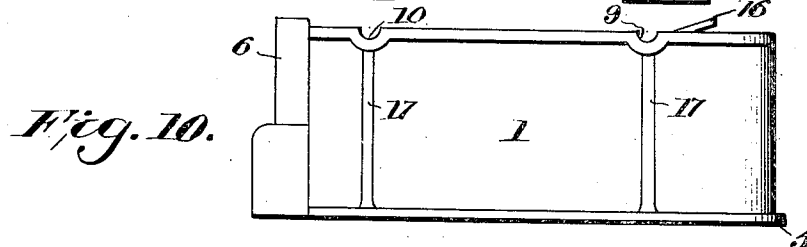


Fig. 10.

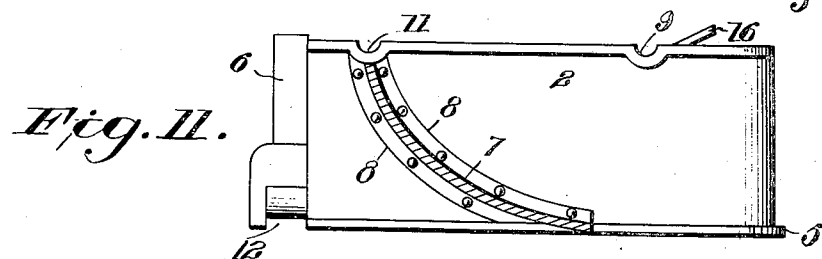


Fig. II.

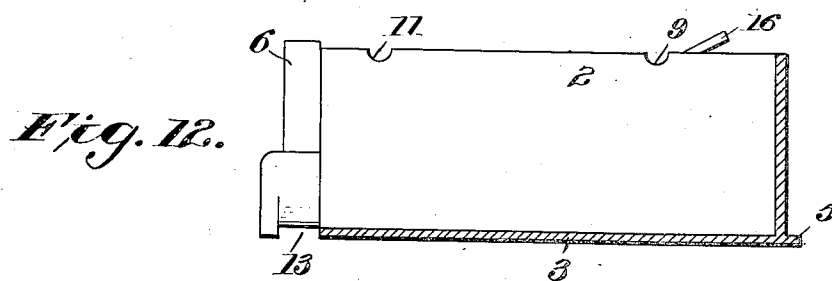


Fig. 12.

WITNESSES

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UNITED STATES PATENT OFFICE.

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PUMP-JACK FOR DOUBLE-ACTING PUMPS.

1,024,921.

Specification of Letters Patent.

Patented Apr. 30, 1912.

Application filed November 8, 1911. Serial No. 659,232.

REISSUED

To all whom it may concern:

Be it known that I, FRED W. AXTELL, a citizen of the United States, residing at Fort Worth, in the county of Tarrant and State of Texas, have invented certain new and useful Improvements in Pump-Jacks for Double-Acting Pumps, of which the following is a specification.

This invention relates to pump jacks for double acting pumps, and the object is to provide a pump jack which is double geared, heavy, and compactly built, requiring very little floor space, and especially adapted for heavy duty.

Another object is to provide the pump with forged steel pitmen with bent and machine turned ends which work in bronze bearings at both ends which are easily removed, inexpensive and interchangeable and in which the center of the bearing is in line with a plane which runs through the vertical center of the gear wheel and pinion for preventing cross strain.

Another object is to provide an improved base for supporting and holding the working parts securely in operative relation and to provide rifled sockets for the upright guide rods in the base.

Another object is to provide bearings for the drive wheel that are off-set relative to the center of the cross heads which drive the piston rods whereby a great advantage is obtained in operating power.

Another advantage is that the piston is attached to the middle of the cross head in such manner as to give a parallel movement of the same, reducing the stuffing box friction to a minimum.

Other objects and advantages will be fully explained in the following description and the invention will be more particularly pointed out in the claims.

Reference is had to the accompanying drawings which form a part of this application.

Figure 1 is a rear elevation of the pump jack complete; Fig. 2 is a side elevation of the pump jack, the drive pulley being shown only in dotted outline; Fig. 3 is an end view of a bronze bearing for a cross head; Fig. 4 is a section of a similar bearing in the drive wheel; Fig. 5 are detail viewss, being an edge and a side view of the dog used in the universal pipe centering device; Fig. 6 is a plan view of a universal pipe centerer; Fig. 7 is a view of the lower end of one of

the guide rods; Fig. 8 is a section of one of the sockets for the guide rods; Fig. 9 is a plan view of the entire base with all working parts omitted; Fig. 10 is a side elevation of the same; Fig. 11 is a vertical section of the base taken on the line $x-x$ of Fig. 9, omitting the pipe centerer; and, Fig. 12 is a vertical section taken on the line $y-y$ of Fig. 9 looking toward the center.

Similar characters of reference are used to indicate the same parts throughout the several views.

The jack is provided with a base which is composed of two trough like castings and each casting is composed of outer walls 1 and inner walls 2 and end walls 4 and with a bottom 3 which is integral with the side and end walls. The walls 1—1 and 2—2 constitute the bearing walls for the driving gear and also the bearing walls for the piston driving gear.

The castings are provided with flanges 5 and on the front ends of the castings are formed vertical sockets 6. The two castings are rigidly connected together by a curved flange casting 7 which has flanges 8, riveted to the inner walls 2 of the bearing castings. The bearing walls 1—1 are provided with bearings 10 and the bearing walls 2—2 are provided with bearings 11 for the shafts of the piston driving wheels and for the crank disks. These bearing walls are also provided with bearings 9 for the main driving shaft. The inner walls 2 have cut outs 12 and 13 for the arms 15 which are integral with the pipe centerer 14. The arms 15 of this pipe centerer are placed under the ends of the castings so that when the castings are bolted down to the base timbers the pipe centerer will be held rigidly in place. The shaft 18 which is the main driving shaft is journaled in the bearings 9. The bearing walls have ears 16 cast integral therewith to receive the ends of the braces 28 and 29. The braces 28 are inserted in the ears 16 of the outer walls 1 and in sockets formed in the tie bar 25'. The braces 29 are inserted at the lower ends in the ears 16 of the inner walls 2 and in clips 29' which are secured to the central uprights 24 at points which are not reached by either cross head 21 or 22. The cross head 21 drives an outer piston rod 35 and the cross head 22 drives the inner piston rod 36. The cross head 21 is guided in its vertical movement by the guide rods 24 which

are rifled in the sockets 6 and secured in sockets in the tie bar 25'. The cross head 22 is guided in its vertical movement by the guide rods 28 and 24 which are rifled in the sockets 6 and secured in sockets in the tie bar 25'. A stuffing box 37 is mounted on the cross head 21 for the piston 36.

Pinions 27 are mounted rigidly on shaft 18 and drive the gear wheels 26 which are mounted on shafts 18'. The shaft 18 is provided with a loose pulley 27' and a fast pulley 26' which is the power pulley. The drive wheels 26 move the cross head 22 by means of pitman rods 19 which are bent at the ends to engage bearings 25 in the cross head 22 and also bent at the lower ends to engage the drive wheels 26. Bronze bushings 30 are provided with lugs to prevent the bearings from turning in the cross head and the bushings 30 are inserted in the bearings 25 with the lugs also embedded in the bearings 25. The center of the bearings 25 is in line with the plane which runs vertically through the center of the gear wheel 26 and pinion 27 so that there will be no cross strain of the pitman rod 19. The cross head 21 is driven by pitman rods 20 which are similar to pitman rods 19 and the pitman rods 20 are pivotally connected to crank disks 20'. These disks are rigid with shafts 18' and consequently the disks are driven by the power from the gear wheels 26 which power is transmitted by means of the shafts 18'.

The bearings 11 of the bearing walls 2 and the bearings 10 of the bearing walls 1 are off-set relative to the centers of the vertical guide rods 24 and 28 and consequently the vertical centers of the cross heads for the purpose of securing greater power from the drive wheels. By reason of this arrangement of the off-set bearings approximately 17% more time is required to make the up stroke of the piston rods than the down stroke, thus reducing the strain on the lifting parts in the same ratio as the strain is less on this plan than if the time were divided equally between the down stroke and the up stroke as is common in other pump jacks. This means the time of one revolution of the driving gear. There is a further advantage of getting a quick return of the down stroke in permitting the valves to close quicker. It also permits the valves to start slower increasing in speed after they are in motion by which the best possible result is obtained and which is not possible when the time of the stroke is evenly divided between the up and down stroke.

The universal pipe centerer consists of a cylindrical casting 14 with arms 15 which have ribs integral therewith and which project up to the top of the castings. Sockets 37' are formed in the casting 14 and in these

sockets are pivoted dogs 38 which have lugs 39 projecting into vertical grooves in the walls of the sockets 37'. The dogs 38 will thus swing inwardly at the free ends and engage the pipe 40 by which the pipe can be accurately centered. The dogs 38 are pivotally mounted by reason of the lugs 39 which project into the grooves in the walls of the sockets 37'.

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

1. A pump-jack for double acting pumps comprising a base consisting of two bearing members each having two bearing walls formed of an integral structure and a curved flanged binding member bolted to each of said members and making said members rigid with each other, the front ends of said bearing members having four sockets formed therein in alinement with each other, four vertical guide rods rifled in said sockets, an interior piston cross-head adapted to move vertically on all of said guide rods, an exterior piston cross-head adapted to move vertically on the two central guide rods, gear wheels for driving said interior piston cross-head having shafts journaled in the exterior walls of said bearing members and pitmen operatively connecting said cross-head with said gear wheels, crank disks for driving said exterior piston cross-head operated by said gear wheels, and pitmen operatively connecting said cross-head and said disks, and means for driving said gear wheels.

2. A pump-jack having a rigid base consisting of two pairs of walls, each pair having an integral connection at the ends and throughout the bottoms thereof, constituting bearing walls and means for making said bearing walls rigid with each other, sockets for guide rods being formed in said walls, vertical guide rods rigid in said sockets, cross-heads adapted to move on said guide rods, gearing and pitman rods operatively connected with said gearing and with said cross-heads, shafts for said gearing, and bearings for said shafts offset in said bearing walls relative to the centers of said guide rods and cross-heads.

3. A pump-jack having a base consisting of two bearing members rigid with each other and each having two bearing walls, the front ends of said walls having sockets formed therein, four parallel vertical guide rods rifled in said sockets, an interior piston cross-head adapted to move on all of said guide rods, an exterior piston cross-head adapted to move on the two central guide rods, gear wheels and pitmen for driving said interior piston cross-head, shafts for driving the said gear wheels journaled in the exterior walls of said bearing members, crank disks and pitmen for driving said

exterior piston cross-head, a pair of disks being connected to each pitman, the exterior disk for each pitman being rigid with the shaft of the adjacent gear wheel, a shaft for the interior disks journaled in the interior walls of said bearing members, a shaft journaled in all of said walls, and gearing on said shaft for driving said gear wheels, and means for driving said shaft.

10 4. A pump-jack having a base consisting of four rigid parallel bearing walls having sockets formed in the front ends thereof, four parallel guide rods rifled in said sockets and a tie-bar connected to the upper ends
15 of the guide rods, an interior piston cross-head adapted to move on all of said rods, an exterior piston cross-head adapted to move on the two central guide rods, pitmen and gearing operatively connected with said
20 cross-heads and with said bearing walls for moving said cross-heads, braces for the two exterior guide rods rigidly connected to said tie-bar and to the rear ends of the exterior bearing walls, and braces for the two
25 interior guide rods rigidly connected thereto at points between the travel of said cross-heads and to the rear ends of the interior bearing walls.

30 5. A pump-jack having a rigid base consisting of bearing walls and means for making said walls rigid with each other, sockets for guide rods formed in said bearing walls, vertical guide rods rigid in said sockets, cross-heads adapted to move on said guide

rods, gearing and pitman rods operatively 35 connected with said gearing and said cross-heads, shafts for said gearing journaled in said bearing walls, means for driving said gearing, and a pipe centerer at the front end of the pump-jack consisting of a vertical 40 cylinder having laterally extending arms projected under the two adjacent bearing walls, said bearing walls having cutouts thereunder to receive said arms, and dogs pivotally mounted in said cylinder for en- 45 gaging the pipe.

6. A pump jack consisting of bearing walls and means for making said walls rigid with each other, sockets for guide rods being formed in said bearing walls, vertical 50 guide rods rigid in said sockets, a cross-head adapted to move on said guide rods, bearings in said cross-head, gear wheels and bearings in said gear wheels, removable bronze bushings in said bearings, and pit- 55 man rods having bent ground journals engaging said bearings for driving said cross-head, the centers of the bearings in said cross-head being in a vertical plane passing through the centers of said gear wheels. 60

In testimony whereof, I set my hand in the presence of two witnesses, this 19th day of October, 1911.

FRED W. AXTELL.

Witnesses:

A. JOHNSTON,
A. L. JACKSON.