G. W. STAHLEY.

GEARING.

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1,122,654. Patented Dec. 29, 1914.

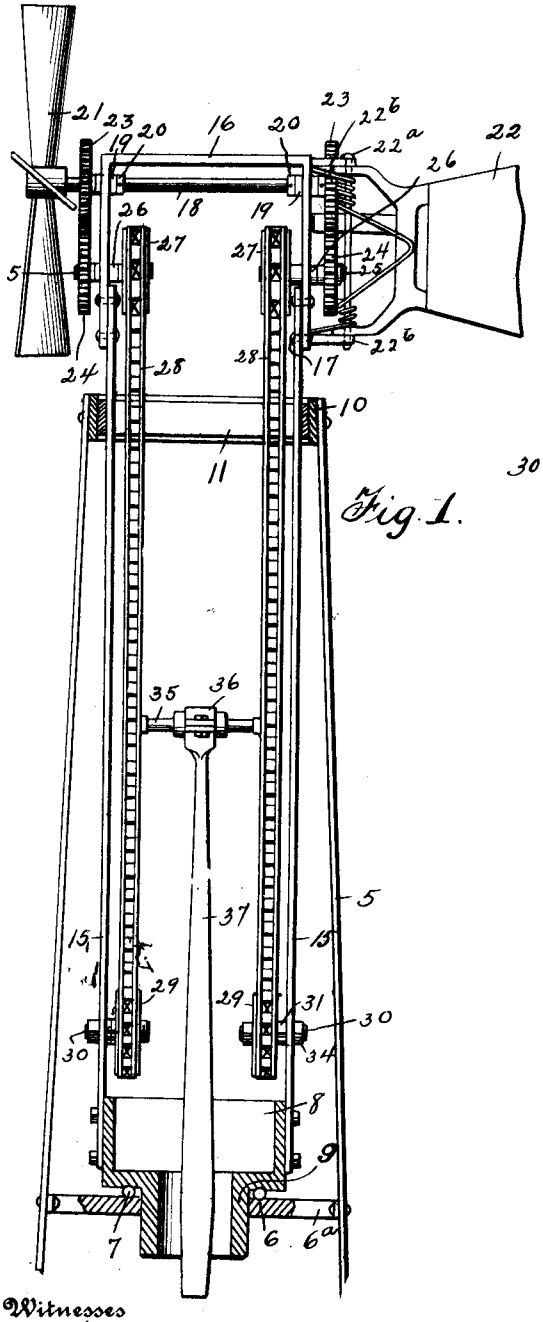


Fig. 1.

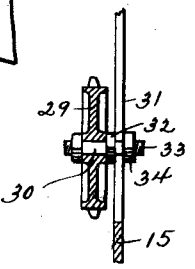


Fig. 2.

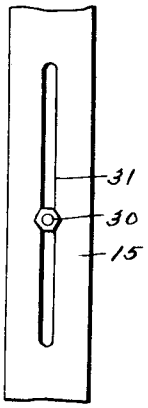


Fig. 3.

Witnesses

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GEARING.

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To all whom it may concern:

Be it known that I, GEORGE W. STAHLEY, a citizen of the United States of America, residing at Marienthal, in the county of Wichita and State of Kansas, have invented certain new and useful Improvements in Gearing, of which the following is a specification.

This invention relates to a gearing and more particularly to a gearing adapted for use in conjunction with wind-mills and arranged to serve as a pumping jack.

Further objects and advantages of the invention will be set forth in the detailed description which now follows.

In the accompanying drawing, Figure 1 is a side elevation of a gearing constructed in accordance with the invention. Fig. 2 is a detail sectional view illustrating the mounting of one of the sprocket wheels, and Fig. 3 is a detail view of a portion of one of the side bars of the super-structure further illustrating the method of mounting one of the lower sprocket wheels for vertical adjustment.

Like numerals designate corresponding parts in all of the figures of the drawing.

Referring to the drawing, the numeral 5 designates a tower, preferably provided with a race-way 6 in a member 6^a thereof, for the reception of balls or like anti-friction members 7. A tubular sleeve 8 has a neck extension 9 which depends into and is guided by the member 6^a.

The top of the tower is provided with a ring-like member 10 which embraces an annular collar 11 carried by the super-structure hereinafter described. This mounting provides a turn table for supporting said super-structure which comprises side bars 15 and a yoke 16, said yoke being of inverted U-shape and being riveted or otherwise secured to the side bars at 17. A transverse shaft 18 is mounted in bearings 19 of the yoke and is held against endwise movement by collars 20.

Any desired type of wind-wheel conventionally illustrated at 21, is mounted upon shaft 18, and it is to be understood that since the invention relates to the gearing and not to the specific type of wind-mill, any desired form of windwheel may be employed to drive the shaft 18. The same is true with relation to the type of vane employed. For the purposes of this application, I have merely conventionally illustrated a vane 22 hinged as is usual at 22^a between ears 22^b, though other ways of mounting the vane and wind-wheel are possible.

The shaft 18 carries spur gear wheels 23 which mesh with spur gear wheels 24, the latter being mounted upon stub shafts 25 journaled in bearings 26 of the yoke. Upon the inner ends of these stub shafts, sprocket wheels 27 are mounted and these sprocket wheels receive sprocket chains 28, the lower portions of which pass over sprocket wheels 29 that are mounted upon stub shafts 30.

For the purposes of providing vertical adjustment of these lower sprocket wheels for a purpose hereinafter set forth, the side bars 15 are vertically slotted at 31 and it is through these slots that the shafts 30 pass. These shafts are provided with angular collars 32 and are threaded at 33 for the reception of nuts 34 so that when the nuts 34 are screwed up, the shaft is bound in position by the clamping of the side bar 15 between the collars 32 and said nuts. It is apparent, therefore, that these shafts may be bound in any vertically adjusted position in slots 31. Rotation of the wind-wheel imparts rotation to shaft 18 and through the gearing, imparts movement to the sprocket chains.

Fixedly secured to one of the side flights of each of the sprocket chains is a wrist pin 35 with which is engaged a bearing 36 of a connecting rod 37. As the sprocket chains travel, it is apparent that a vertical reciprocation will be imparted to the connecting rod and that the length of the stroke may be varied by changing the length of the sprocket chains and adjusting the lower sprocket vertically in the slots. In addition to providing for this adjustment of the length of the stroke, it is apparent that many combinations of the other elements of the gearing may be had. For instance, by reducing the size of the gear wheels 23, and increasing the size of the gear wheels 24, less power will be required to operate the device and reciprocation may be imparted to the connecting rod 37 for the purpose of pumping water or for any other purpose, with a very light breeze. Upon the other

hand, where the power is ample, the speed of the connecting rod may be increased by increasing the size of the gear wheels 23 and decreasing the size of the gear wheels 24.

By virtue of the construction herein shown and described, the rotation of the wind-wheel is converted into a very long stroke of the plunger or connecting rod 37. At first glance, it may appear that there would be no particular advantage in employing one long stroke in lieu of a number of shorter strokes, but there is a sound mechanical reason for the statement that the long stroke requires less power in that if it requires a three hundred pound draft to raise the connecting rod, it requires at least one hundred pounds extra to start it. Therefore, comparing a single stroke four inch wind-mill pump of the ordinary type with this gearing, it may be pointed out that in making the equivalent of a three foot stroke, such wheel makes nine revolutions or nine strokes of four inches each. Therefore, the plunger would have to be started from a position of rest nine times, requiring nine hundred pounds starting power and three hundred pounds lifting power, or twelve hundred pounds for the three foot lift. The opening and closing of the valves nine times would cause a loss of one-half inch on each stroke, thereby losing four and one-half inches out of thirty-six inches and leaving an effective stroke of only thirty-one and one-half inches. In the present device, however, assuming that all of the gearing is four inches in diameter, a three foot stroke would be made in six revolutions of the wheel, it being assumed that the distance from sprocket wheels 27 to sprocket wheels 29, is three feet. In this complete stroke, therefore, the valves would only have to close once and therefore only one-half inch of water would be lost, or in other words, thirty-five and one-half inches of water would be raised, and requiring a three-hundred pound draft for the work and one-hundred pounds starting draft, or a total of four-hundred pounds draft for the entire three foot stroke, thereby saving the difference between four hundred pounds and twelve hundred pounds, or eight hundred pounds.

From the foregoing description, it will be seen that simple and efficient means are herein provided for accomplishing the objects of the invention, but while the elements shown and described are well adapted to serve the purposes for which they are intended, it is to be understood that the invention is not limited to the precise construction set forth, but includes within its purview such changes as may be made within the scope of the appended claims.

Having described my invention, what I claim is:

1. In a device of the character described the combination with a supporting tower of an annular bearing member which lies in a horizontal plane at the top of said tower, a transverse support affixed to and supported by said tower at a considerable distance below the top thereof, said transverse support having a central opening formed therethrough, a rotative superstructure comprising a pair of opposed vertically arranged side members, a yoke of inverted U-shape connecting the upper ends of said side members, and a tubular sleeve comprising a cup-like upper portion and a lower neck extension of lesser diameter than the upper portion and which extends through the opening in the transverse support, anti-friction devices disposed between said support and the underside of the upper portion of the tubular sleeve, sprocket wheels journaled upon the inner faces of the side members near the lower end thereof, additional sprocket wheels journaled upon and near the upper portion of the superstructure, a connecting rod operating through said tubular sleeve, sprocket chains passing over said sprocket wheels, a wrist pin extending between and connected to said sprocket chains, and with which the connecting rod is engaged, a power shaft journaled in said yoke means for driving the upper sprocket wheels from said power shaft, and an annular bearing member extending around the upper faces of said side members, and bearing snugly within the first named annular bearing member of the tower.

2. In a device of the character described the combination with a supporting tower of an annular bearing member which lies in a horizontal plane at the top of said tower, a transverse support affixed to and supported by said tower at a considerable distance below the top thereof, said transverse support having a central opening formed therethrough, a rotative superstructure comprising a pair of opposed vertically arranged side members, and a yoke of inverted U shape connecting the upper ends of said side members, and a tubular sleeve comprising a cup-like upper portion and a lower neck extension of lesser diameter than the upper portion which extends through the opening in the transverse support, anti-friction device disposed between said support and the underside of the upper portion of the tubular sleeve, sprocket wheels journaled upon the inner faces of the side members near the lower end thereof, additional sprocket wheels journaled upon and near the upper portion of the superstructure, a connecting rod operating through the tubular sleeve sprocket chains passing over said sprocket wheels, a wrist pin extending between and connected to said sprocket chains, and with which the connecting rod is engaged, a power shaft means for driving the upper

sprocket wheels from said power shaft, and an annular bearing member extending around the upper faces of said side members, and bearing snugly within the first named annular bearing member of the tower, said power shaft being journaled in said yoke.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE W. STAHLEY.

Witnesses:
HUGH REES,
L. E. GORSUCH.