

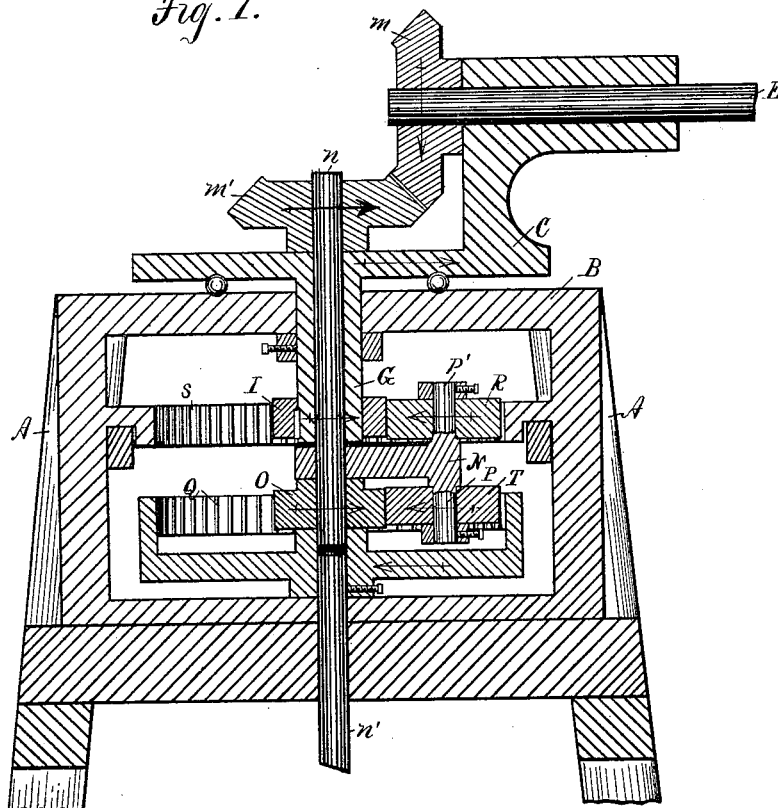
(No Model.)

G. H. PATTISON.  
GEARING FOR WINDMILLS.

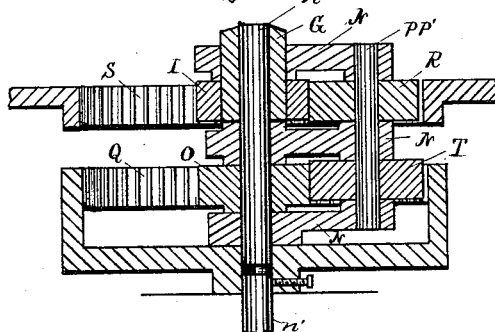
No. 348,411.

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*Fig. 1.*



*Fig. 2.*



WITNESSES:

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# UNITED STATES PATENT OFFICE.

GEORGE H. PATTISON, OF FREEPORT, ILLINOIS.

## GEARING FOR WINDMILLS.

SPECIFICATION forming part of Letters Patent No. 348,411, dated August 31, 1886.

Application filed February 19, 1886. Serial No. 192,491. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE H. PATTISON, a resident of Freeport, in the county of Stephenson and State of Illinois, have invented certain new and useful Improvements in Gearings for Windmills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to improvements in gearings for windmills of the class known as "power-mills," and is fully described and set forth in the following specification, in which—

Figure 1 is a central vertical section of a tower on which is mounted one form of the gearing. Fig. 2 is a similar view of a modified form of the invention.

The arrows on the gears indicate the same directions of rotation as if the gears were shown in elevation.

In Fig. 1, A are the posts of an ordinary windmill-tower, and B is a top plate fastened to the posts. C is a turn-table resting on the usual anti-friction balls, which roll in the groove in the plate B; and E is a horizontal wind-wheel shaft journaled in the turn-table, and having the miter-gear *m* mounted on its inner end. G is a sleeve dependent from the center of the turn-table, and I is a gear rigidly mounted thereon. A preferably hollow shaft, *n*, is journaled in the turn-table, and has on its lower end a rigidly-mounted spur-gear, O, and on its upper end a rigidly-mounted miter-gear, *m'*, which engages with the miter-gear *m* on the wind-wheel shaft. Between the gears I O and journaled on the shaft *n* is an arm, N, having the gudgeons P P', upon which are respectively journaled the loosely mounted planet-gears T R. The gear R engages with the gear I on one side and on the opposite side with a gear, S, stationarily mounted on a tower-support, while the gear T engages with the gear O on one side and on the opposite side with a power-transmitting gear, Q, which is rigidly connected with a shaft, *n'*, adapted to transmit the power of the mill to other mechanism.

The operation of the gearing is as follows: If the turn-table, with its sleeve G and gear I, be held stationary, then, as the gear S is always stationary and the gear R engages with

the gears I and S, the gear R will also remain stationary, and will hold the arm N and gudgeon P stationary. Now, if the wind-wheel shaft E and gear *m* be rotated in the direction indicated by the arrow on the gear, the hollow shaft *n*, with its gears *m'* O, turns in the direction indicated by the arrow on either of said gears and rotates the planet-gear T about the stationary gudgeon P, and thus rotates the gear Q (adapted to transmit power to other machinery, and with which the gear T also engages) in a direction opposite to the direction of rotation of the gear O, as indicated by the arrow thereon. The gear Q being rigidly fastened to the shaft *n'*, the shaft consequently turns with the gear and transmits the motion of the mill to any mechanism to be operated. On the other hand, if the power-transmitting shaft *n'* be held stationary and the turn-table be rotated in the direction indicated by the arrow thereon, the sleeve G and gear I turn in the same direction, and, as the gear S is always stationary, this rotation of the gear I rolls the gear R about the gear S, and hence the gudgeon P', arm N, and gudgeon P are rotated about the center of the stationary gear S, and the gear T, being loosely mounted on the gudgeon P, is therefore rolled about the now stationary gear Q, and thus rotates the gear O, which engages with it on the opposite side in the same direction as that in which the gear I and turn-table C are rotated. This rotation of the gear O is communicated to the shaft *n* and gear *m'*, which are thus made to rotate in the same direction as the turn-table.

The relative sizes of the gears are such as to give the shaft *n* and the turn-table the same speed of rotation, and thus the rotation of the turn-table when the shaft *n'* and gear Q are at rest turns the shaft *n* at a speed uniform with that of the turn-table itself, thereby preventing any rotation of the shaft E in its bearing—that is, the rotation of the turn-table neither rotates the shaft E nor the shaft *n'*. Therefore the side draft of the mill is obviated and the gearing is perfectly balanced.

The difference between Fig. 2 and Fig. 1 is simply in the location of the arm N. In Fig. 2 different locations of the arm N are shown, and either one or any two may be omitted. Duplicates of the arm N and planet-gears may

be used, and miter-gears may also be used instead of the spur and internal gears, if desired.

Having now described my invention, I desire to secure by Letters Patent the following 5 claims:

1. The combination, with the turn-table of a windmill and a vertical shaft journaled therein, of a power-transmitting shaft, gears rigidly mounted on the turn-table and said shafts, respectively, a stationary gear fastened to the 10 tower of the mill, and gearing connecting said gears and forming therewith a balanced train, substantially as and for the purpose set forth.

2. The combination, with a turn-table free to rotate about the vertical axis of the mill, a 15 vertical shaft journaled in the turn-table, and two gears, one rigidly mounted on the turn-table and the other on said vertical shaft, of a gear rigidly attached to the tower, a power-transmitting shaft and a gear rigidly mounted 20 thereon, and two planet-gears, one interposed between the turn-table gear and the gear attached to the tower and the other between the gears mounted on said shafts.

3. The combination, with a turn-table free to rotate about the vertical axis of a windmill, a vertical shaft journaled in the turn-table, and gears rigidly mounted on the turn-table and the vertical shaft, respectively, of a 30 stationary gear attached to the tower, a power-transmitting shaft and a gear rigidly mounted thereon, two gudgeons rotating about the same vertical axis, and two planet-wheels loosely mounted on said gudgeons, respectively, and 35 interposed one between the turn-table gear and the stationary gear and the other between the gears mounted on said shafts.

4. The combination, with a turn-table free to rotate about the vertical axis of a windmill and a gear rigidly mounted thereon, of a 40 stationary gear fastened to the tower, a vertical shaft journaled in the turn-table, and a second vertical power-transmitting shaft, an external gear rigidly mounted on one of said 45 vertical shafts and an internal gear rigidly mounted on the other, and two planet-gears, one connecting the turn-table gear and the stationary gear and the other connecting said internal gear and said external gear.

5. The combination, with a turn-table free 50 to rotate about the vertical axis of a windmill and a vertical shaft journaled therein, of a stationary internal gear fastened to the tower of the mill, a spur-gear rigidly fastened to the turn-table, a vertical power-transmitting 55 shaft, gears rigidly mounted on said vertical shafts, respectively, and two planet-gears, one connecting the gears on the two vertical shafts and the other connecting the turn-table gear and the stationary gear. 60

6. The combination, with a rotating turn-table, a vertical shaft journaled in the turn-table and coincident with the axis thereof, and a second vertical shaft in line with the first, 65 of a stationary gear fastened to the tower of the mill, gears rigidly mounted, respectively, on the turn-table and said vertical shafts, a planet-gear revolving about said vertical shafts and connecting the turn-table gear and the 70 stationary gear, a second planet-gear revolving about said shafts and connecting the gears on said vertical shafts, and means for securing simultaneous revolution of said planet-gears about said shafts.

7. The combination, with the turn-table C, 75 the shaft *n*, journaled therein, and the power-transmitting shaft *n'*, of a stationary gear, gears rigidly mounted on the turn-table, and the shafts *n* *n'*, respectively, an arm loosely mounted on one of said shafts and free to rotate about it, 80 two gudgeons formed on said arm, and two planet-gears loosely mounted on said gudgeons and connecting, respectively, the turn-table gear with the stationary gear and the gear on the shaft *n* with that on the shaft *n'*. 85

8. In a windmill of the class described, the combination of the wind-wheel shaft E, turn-table C, shaft *n*, and gear I, and the gearing 90 *m*, *m'*, O, T, Q, R, and S, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

GEORGE H. PATTISON.

Witnesses:

CHAS. GILBERT,  
JAMES H. STEARNS.