(No Model.)

L. M. HOSKINS.

SHIFTING APPARATUS FOR WINDMILLS.

No. 294,624. Patented Mar. 4, 1884.

Fig. 1.

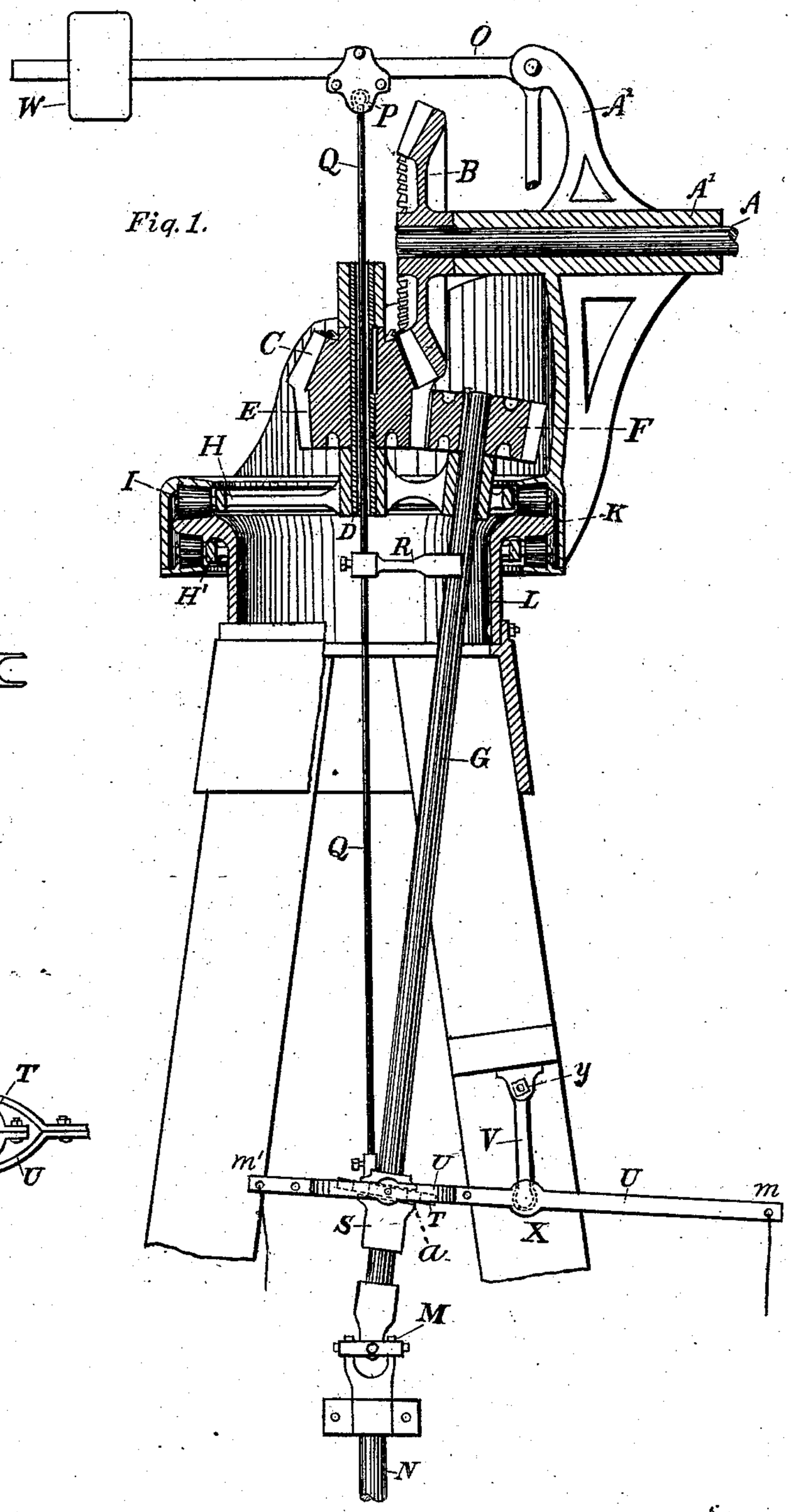


Fig. 2.

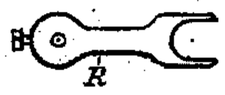
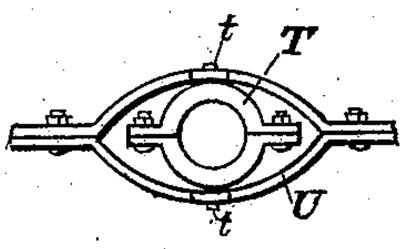


Fig. 3.



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LEANDER M. HOSKINS, OF EVANSVILLE, WISCONSIN.

SHIFTING APPARATUS FOR WINDMILLS.

SPECIFICATION forming part of Letters Patent No. 294,624, dated March 4, 1884.

Application filed August 6, 1883. (No model.)

To all whom it may concern:

Be it known that I, LEANDER M. HOSKINS, of Evansville, in the county of Rock and State of Wisconsin, have invented a new and useful Improvement in Shifting Apparatus for Windmills; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The invention involved in the subject-matter of this application relates to an improvement in windmills, the object whereof is to provide shifting devices for windmills in which the power is transmitted in the manner described and illustrated in Letters Patent No. 274,329, granted to me March 20, 1883, and to which this invention is particularly applicable. The purpose of these shifting devices is to shift the wind-wheel in and out of the wind without interfering with the different motions of the main and compensating turn-tables, and it is therefore necessary that the portions of the shifting apparatus attached to these two elements should be so connected as to admit of revolution independently of each other.

The invention therein consists in the employment of three sets of devices, of which one connects and revolves concurrently with the main turn-table, another with the compensating turn-table, and the third is secured to the tower in such a manner that it will not revolve as the turn-tables revolve, the different sets being swiveled so as to act independently of each other.

The invention further consists in the construction and arrangement of these several devices, and in the combination of the same with their respective parts, all as more fully hereinafter described and claimed.

For a better comprehension of the invention, and to enable those skilled in its relative art to know how to construct and use the same, a detailed description will now be given with reference to the accompanying drawings, in which—

Figure 1 illustrates a part perspective and section of a windmill embracing the principal features of my invention, and Figs. 2 and 3 views in detail of certain portions of the shifting devices.

Like letters of reference denote corresponding parts in the several views.

In order that a better understanding may be had of the operation of the shifting devices, in conjunction with the gearing with which these devices are designed to be employed, I will first proceed to describe such gearing and its arrangement, omitting general details of construction.

In the drawings, A represents the wind-wheel shaft, having bearings in a suitable box or casing, A′, which is rigidly mounted upon the main turn-table K, so that whenever the position of shaft A is varied by a change in the direction of the wind, the main turn-table K is compelled to revolve. Upon the outer end of shaft A a suitable wind-wheel (not shown) is mounted, and to the inner end of said shaft a bevel-gear wheel, B, is keyed. In its revolution the gear-wheel B meshes with a similar wheel, C, keyed, as shown, to a hollow vertical shaft, D, which is mounted on the compensating turn-table H, and is concentric with the turn-table K.

Secured to the shaft D is a second gear-wheel, E, which in its revolution meshes with a gear-wheel, F, keyed to the upper end of a shaft, G. The shaft G has bearings in the compensating turn-table H, and passes obliquely downward to the center line of the tower, where it is coupled by means of a universal joint, M, to a vertical shaft, N, said shaft N connecting in any appropriate manner with the machinery to be driven. The main turn-table K consists of a cylinder provided, as shown, with inwardly-projecting flanges, and is of such a diameter that it will encircle the upper end of the tower-casting L, and revolve about the same. This tower-casting L has at its upper end an outwardly-projecting flange located between the two flanges of the turn-table K. This flange forms suitable paths for the friction wheels or rollers I, of which there are two sets or series. Those of the upper set are carried upon journals fixed to the compensating turn-table H, and those of the lower set are carried in like manner upon journals of a ring, H′, made for the purpose. These rollers enable the turn-table K to swivel easily upon the tower-casting. As illustrated, the main turn-table K rests upon the upper set of

friction-wheels, and is of such a depth that its lower flange will press against the lower set of such wheels.

The compensating turn-table H is, as shown, smaller than the main turn-table K, and revolves within said turn-table. The parts being constructed and arranged as thus far described makes manifest the fact that upon the revolution of turn-table K the frictional contact between said turn-table and rollers I will cause the compensating turn-table H to revolve with exactly half the angular velocity of turn-table K.

The arrangement of the gearing being as above described, I will now proceed to describe in detail the construction and arrangement of the component parts of the shifting devices.

A^2 denotes an arm rigidly secured upon the top of the main turn-table K and revolving concurrently therewith. To this arm A^2 is hinged a lever, O, by the movement of which (by means of suitable connections not illustrated) the wind-wheel is shifted in and out of the wind. A rod, Q, is attached to the lever O by means of a ball-and-socket joint, P, and, passing downward through the center of the hollow vertical shaft D, is attached at its lower end to a sleeve, S, by means of a socket and set-screw, or by some other suitable means. This sleeve is loosely adjusted upon the oblique shaft G, and is provided with an annular groove, *a*, in which is loosely fitted a second sleeve or ring, T. A lever, U, is attached by a ball-and-socket joint, *x*, to a link, V, which in turn is attached to the tower by a hinged joint, *y*. The lever U is preferably made of two strips of metal of a corresponding shape and size, in order that near its inner end it may be separated or expanded to form a loop of a size sufficient to embrace the oblique shaft G and the two sleeves S and T. The sleeve T is provided with studs *t t*, which enter holes made in the lever U, and thus fulcrum or pivotally connect these two parts. The construction of lever U and the manner of connecting it with sleeve T are clearly illustrated in Fig. 3.

To the lever U, at *m* and *m'*, are attached wires, by means of which the shifting apparatus can be actuated from the ground.

It will be seen that by the use of two wires attached to the lever U on opposite sides of its fulcrum the sleeve S and its rod Q may be operated either upward or downward at pleasure, and the wind-wheel may thus be held securely, either in or out of the wind, or at any intermediate position, as desired.

It will be observed that the mode of attachment of the lever U to the tower is such as to allow of the changes in the position of the sleeves S and T caused by the changes in the position of the oblique shaft.

Fig. 2 illustrates an arm, R, which, by means of a set-screw or other suitable means, is adapted to be adjustably secured upon the rod Q. This arm is, as shown, forked at one end to embrace the oblique shaft G, and by this means of connection between rod Q and shaft G the former is caused to revolve as the position of the latter is changed by the revolution of compensating turn-table H; hence the rod Q and sleeve S (which connects with said rod) are caused to revolve concurrently with compensating turn-table H.

It will be seen that the different rates of revolution of the lever O and the rod Q (which revolve, respectively, with the main and compensating turn-table) are permitted by the ball-and-socket joint P, while the revolution of rod Q with reference to the lever U (which is attached to the tower) is permitted by the swiveled sleeves S and T.

From the foregoing description it will be apparent that the shifting apparatus consists of three sets of devices having independent action—viz., first, the lever O and other connections attached to and revolving in unison with the main turn-table; second, the rod Q, arm R, and sleeve S, attached to and revolving in unison with the compensating turn-table; and, third, the sleeve T, lever U, and other connections fixed to the tower, so as to avoid revolution with the turn-tables. Although these three sets of devices are essential, yet it will be evident that the construction may be varied, as may also the manner of swiveling them.

It may also be well to state that, so far as the essential parts of this device are concerned, it is immaterial what kind of wheel is employed, as the shifting apparatus is designed for use with the arrangement of gearing shown, and may be used with any windmill employing such gearing, whether its wheel be a solid or a feathering blade wheel.

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

1. In a windmill employing a secondary or compensating turn-table, revolving at a different rate of speed from that of the main turn-table, an apparatus for shifting the wind-wheel in and out of the wind, consisting of three sets of devices, of which one connects and revolves concurrently with the main turn-table, another with the secondary or compensating turn-table, and the third is so secured to the tower as to avoid revolution with the turn-tables, the three sets being swiveled so as to act independently of each other, for the purpose set forth.

2. In a windmill employing a secondary or compensating turn-table, and an oblique shaft arranged as described, a sleeve loosely adjusted upon said shaft, and connecting with the compensating turn-table by means compelling it to revolve concurrently therewith, for the purpose set forth.

3. In a windmill employing a secondary or compensating turn-table, and an oblique shaft arranged as described, the combination, with

a sleeve loosely adjusted upon said shaft, and revolving concurrently with the compensating turn-table, of a rod connecting said sleeve with the shifting devices attached to the main turn-table, and swiveled to allow of the different rates of revolution of said turn-tables, for the purpose set forth.

4. In a windmill employing a secondary or compensating turn-table, and an oblique shaft arranged as described, the combination, with a sleeve loosely adjusted upon said shaft, and revolving concurrently with the compensating turn-table, of a second sleeve or ring swiveled upon the first-mentioned sleeve and connecting with the shifting devices attached to the tower by means preventing said sleeve or ring from revolving by the revolution of the turn-tables, for the purpose set forth.

5. In a windmill employing a secondary or compensating turn-table, and an oblique shaft arranged as described, the combination, with a sleeve loosely adjusted upon said shaft, and a second sleeve or ring swiveled upon it, of a lever attached to said sleeve or ring and to the tower by means preventing the revolution of said sleeve or ring, and allowing both sleeves to change position according as the position of the oblique shaft varies, for the purpose set forth.

6. In the windmill described, the combination, with the sleeves S and T, the former revolving concurrently with the secondary or compensating turn-table, of the lever U, provided on both sides of its fulcrum with means adapting the sleeves to be actuated either upward or downward from the base of the tower, for the purpose set forth.

7. In the windmill described, the arm R, rigidly attached to the rod Q, and loosely embracing the oblique shaft G, for the purpose set forth.

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

LEANDER M. HOSKINS.

Witnesses:
A. S. BAKER,
J. H. HOSKINS.