J. D. Makely,

Wind Wheel,

No. 479. Patented Nov. 23, 1837.

Fig. A.

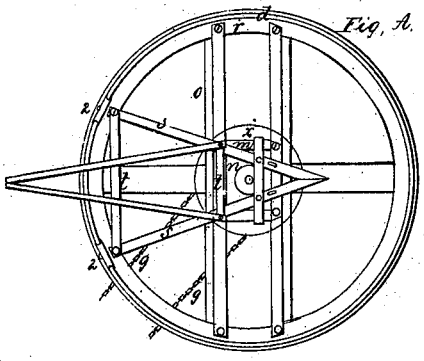


Fig. B.

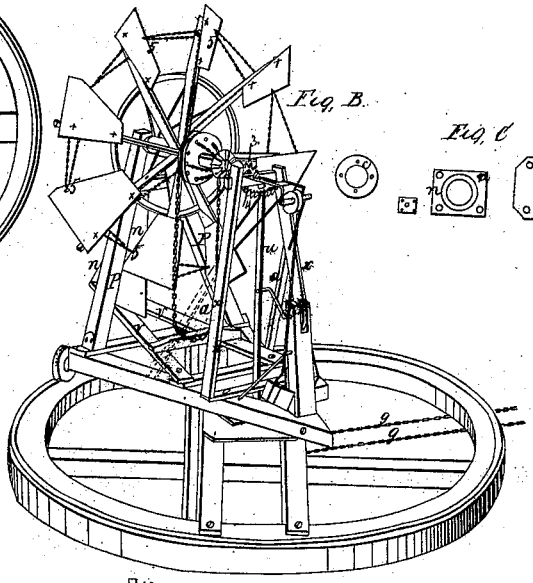


Fig. C

Fig. D enlarged

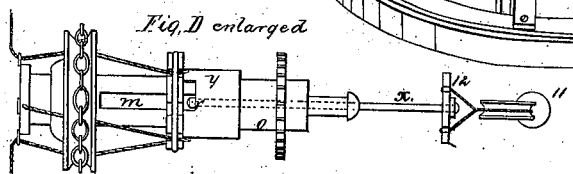


Fig. G.

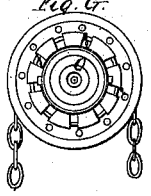


Fig. E.

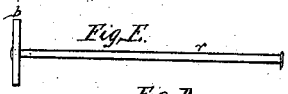


Fig. D

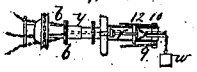
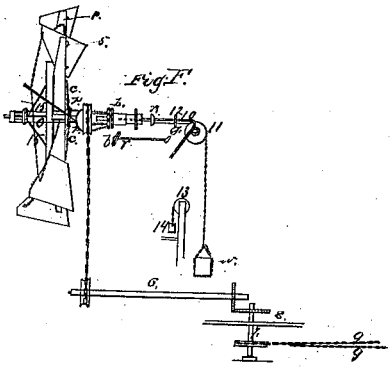


Fig. F.



UNITED STATES PATENT OFFICE.

JACOB D. MAKELY, OF CAIRO, NEW YORK.

IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. **479**, dated November 23, 1837.

To all whom it may concern:

Be it known that I, JACOB D. MAKELY, of Cairo, in the county of Green and State of New York, have invented a new and useful Improvement in Applying the Power of Wind to Mills and Machines, of which the following is a specification.

This improvement consists in placing the wind-wheel separate from the building that contains the machine on which the power of the wind-wheel is to act or operate and convey its power by shafts, chains, or otherwise, and by applying one or more wind-wheels to the same mill or machine, and also by placing the upright wind-wheel in a frame that swings on a swivel and on an endless circular rail around a vertical central shaft.

I do hereby declare that the following is a full and exact description of my invention, with references to drawings hereunto annexed, and to figures and letters marked thereon.

To enable others skilled in the art to make and use the same, I will proceed to describe its construction and operation.

I first construct a hollow frame, upon which I build a platform, whereon I fasten a swivel with a central hole, (see Figure A, *x* representing the platform, and *m* and *n* the swivel-plates,) through which hole the vertical central shaft runs that conveys the power of the wind-wheel to a wheel in the hollow frame under the platform attached to the vertical central shaft, and then to the required place by chain or otherwise, as shown by *g g*, Fig. A. From the swivel as a common center I take a sweep with a radius proportionably to the intended bigness or circumference of the endless circular rail, as *r*, Fig. A, which I build of timber sufficiently circular as to form thereupon a true circle of iron or other material, as *d*, Fig. A, for friction-rollers or small wheels with flanges to their outside rims, as those used on common railroads to run upon. The endless circular rail is raised and leveled, or nearly so, with the center platform and requires no greater height from the ground than what is necessary to convey the power from the wheel in the hollow frame under the platform to its required place.

Numbers 2 2, Fig. A, are the friction rollers or wheels, placed on the rail *d* and fastened to the ends of the sills *s s* with iron arms or spindles, which sills are the bottom timbers of the wind-wheel frame and rest with one of their ends on the friction-rollers and with the other ends on the swivel-plate *n*, Fig. A, and fastened to the plate with screw-bolts, as shown by the dots on the sills in Fig. A. The swivel and its construction are shown in Fig. C. First, *m* is a cast-iron plate with a hole in its center sufficiently large to admit the vertical central shaft, as *u*, Fig. B. From the edge of the central hole *m*, Fig. C, is a rim formed like a tube, and projects upward from the surface of the plate at least four inches and sufficiently thick to admit holes for screw-bolts to fasten cap *c* upon, Fig. C. After the plates *m* and *n* are fitted together the central hole of cap *c* must correspond with the central hole in plate *m*, and its circular surface must be large enough to project horizontally on plate *n* to keep it down in its place when the plates are put together, as on the platform *x*, Fig. A. Plate *n*, Fig. C, has also a central hole large enough to just encircle the tube or flange of plate *m*, and has also a rim or flange projecting from its under surface far enough that when it rests on plate *m* it raises the upper surface even with the flange of plate *m*. The cap *c*, being put on the swivel, is then completed. The plates may be halved, as shown by the dotted lines on them. This swivel being firmly fastened on the platform *x*, Fig. A, and the sills *s s* or bottom timber of the wind-wheel frame placed and fastened, as represented in Fig. A, it is evident that the least force will swing the frame bedded on the sills to any point of the compass and carry the wind-shaft fully in the direction of the wind, the shaft being placed on the frame, as shown in Fig. B. Hence it is calculated that the force of the wind on the vanes is sufficient to give this requisite and self-directing motion or swinging; but to facilitate the same a large wooden vane or weather-cock must be applied and fastened to prop *n*, Fig. B, in the same direction or line of the wind-shaft. By the foregoing it will be a self-directing wind-wheel, and the sails or vanes will at all times be in a proper position.

t t are transverse sticks framed in the sills *s s*.

A stick, as *o*, Fig. A, if thought necessary, may be applied and cross the sills *s s* at any re-

quired point and the ends extended unto the circular rail *d*, where friction-rollers may be applied. This stick serves for the more effectual propping of the wind-wheel frame. However, the greater sway of the wind-wheel frame is in the direction of the wind-shaft, in which direction the frame ought to be well propped. The posts that support the wind-shaft have their bottom ends fastened to the sills *s s* with strap-bolts and stand inclined with their tops as to meet, meaning the outside ones P P, Fig. B. At or near their tops is a brass box or some other suitable substance, placed for the gudgeon of the wind-shaft to run in.

x x, Fig. B, are two other posts raised and fastened with strap-bolts to support the other and perforated end of the wind-shaft with a rim or flange to the gudgeon, as shown in Fig. D, which is put down in brass or some suitable substance in manner that the shaft cannot raise nor move endwise.

u, Fig. B, represents the vertical central shaft, the pressure of which is borne by timbers under the platform, where a socket is placed upon and directly under the central hole of the swivel or platform to receive the lower pivot of the shaft. The upper end of the shaft is supported by a transverse stick framed in the posts *x x* or otherwise. It may be convenient to couple this shaft just above the platform or swivel.

n, Fig. B, represents a prop raised from the angler point of the sticks *v v* and meets the posts P P near or under the gudgeon of the wind-shaft.

a a, Fig. B, are props that prop the posts *x x*.

The posts *x x* may have their bottom ends extended beyond the sills *s s* on a transverse stick bedded on the sills, or they may be placed on stick *o*, Fig. A—that is, if the distance or limits of the sills is not sufficient.

o, Fig. F, represents the wind-shaft, which is perforated, as shown in Fig. D, till it meets a long mortise through its center lengthwise, as shown by *m*, Figs. F and D. The length of the mortise must be proportioned by the swing of the vanes.

b, Figs. D and F, represents a bar that moves in the long mortise, and must be somewhat longer than the shaft is thick, and has a hole in the center to receive the sliding rod *r*, which is fastened by a key. *y* is a sliding belt that is put around the wind-shaft back of the bar *b*, as shown in Fig. D, and is to move or slide easy on the shaft. The bar *b* in the long mortise having the sliding rod *r* with the weight *w* attached, as shown in Fig. D, will draw the sliding belt *y*. Back cords or light chains are fastened through the holes in the projecting rim of the sliding belt *y* and carried along the shaft, as shown in Fig. D.

c represents the cords.

P P P P are pulleys fastened, as placed in the figure, on or through which the cords run that draw the surfaces of the vanes in the wind. Hence as the weight *w* descends it draws back the sliding belt and the cords attached to it and to the vanes, and thereby draws their surfaces in the wind. Hence it is evident that the wind on the vanes and the weight to the sliding rod act alternately and mutually upon each other.

The vanes may be made of thin boards sufficiently strengthened by cross-bars, the number of vanes not to be less than eight, and may be increased. They are to be fastened to the arms of the wind-shaft with hinges or otherwise, that they may swing as a door upon its hinges. I fasten the vanes at about one-third their width to the arms. The remaining two-thirds of their surface will be sufficient to turn them edgewise in the wind. When at liberty, the vanes are to be coupled together by pairs or move on the edge of the two-thirds surface, the cords or chains that are fastened to the vanes at the place where they are coupled, then carried to the next arm, (the back of the next vane,) where they are carried over a pulley, (see Fig. B, number 5,) then down to the shaft, where they run over other pulleys, and then along the shaft, to where they are fastened to the rim of the sliding belt.

Number 3, Fig. B, is a cog-wheel, which transmits the power of the wind-shaft to number 4, a cog-wheel attached to the vertical central shaft, which has a wheel attached to it in the hollow frame under the platform that conveys the power by chain *g g*, Fig. B, to the building. The power may be otherwise conveyed from the wind-shaft by chain to a horizontal shaft that lies near the platform, as shown by number 6, Fig. F, then to the short vertical central shaft number 7, and then from under the platform number 8 by chain or otherwise to the required place.

Numbers 9 and 10 in Figs. F and D represent round rods or bars of iron projecting horizontally on a level with the center of the wind-shaft, fastened on each side of the sliding rod *r*, with their outer ends propped, a bar, as shown by number 12, with a hole at each end to admit the outside rods, and a hole in the center, through which the sliding rod *r* runs.

Number 11 represents a pulley that the cord or chain runs over, to which the weight *w* is attached, and must be in a true line or direction with the sliding rod *r*, the weight being fastened to the bar number 12, as shown in Figs. D and F.

The numbers 15 15, Fig. F, are props that are extended from the wind-shaft to its arms. The shaft may be cast-iron and the arms fastened to a cast-iron wheel with sockets or otherwise.

Number 13 is a windlass to raise the weight, and may answer the compound purpose of windlass and pulley, it being evident that as one of the weights descends the other rises. If weight number 14, Fig. F, is wound up, weight *w* will descend and draw the surfaces of the vanes in the wind. Weight *w* may be

a tub or box where weights are put in and taken out, according to the power required. Weight number 14 may be kept in its elevated position by a catch and set at liberty by a cord or wire attached to the same, which is left for the machinist to construct, as it seems proper.

I do not claim the principle of placing a wind-wheel and its frame upon a circular railway, nor of drawing the surfaces of the vanes in the wind by cords and pulleys and regulating the same by weight; but

What I do claim is—

The method of constructing the wind-wheel with its frame and swivel placed on a circular railway on the ground and detached from the building containing the machine or mill to be propelled, the whole combined substantially as herein described, also the long mortise in the shaft and the sliding belt, bar, and rod combined, with the other parts for regulating the vanes, as before described.

JACOB D. MAKELY.

Witnesses:

DANIEL GUNN,

SEDGWICK PRESTON.