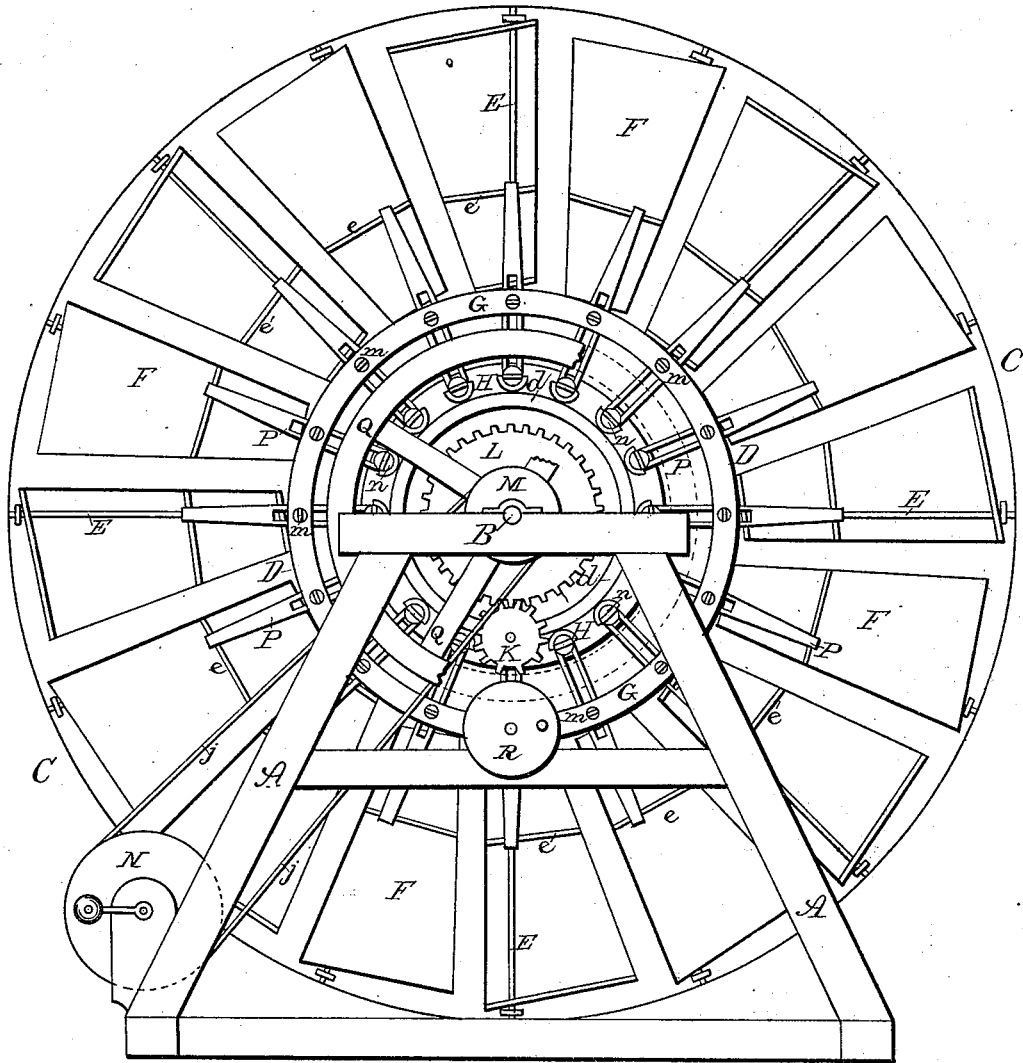


J. DESJARDINS.
Windmill.

No. 215,892.

Patented May 27, 1879.

Fig. 1.



Witnesses:

J. W. Garner
H. S. D. Haines

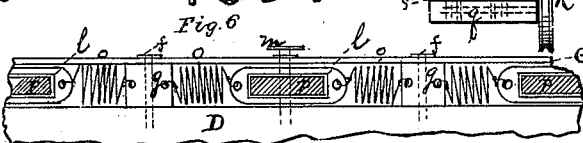
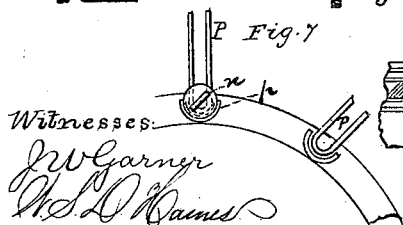
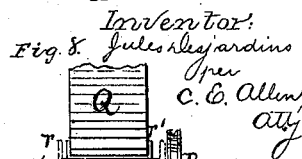
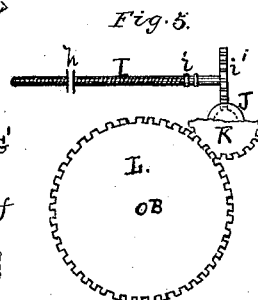
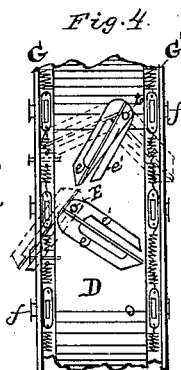
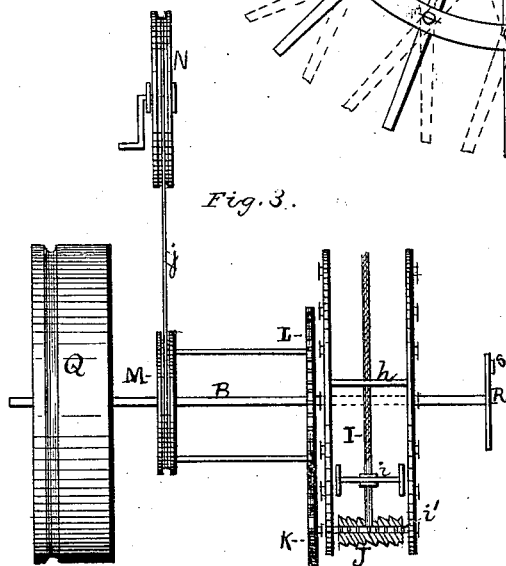
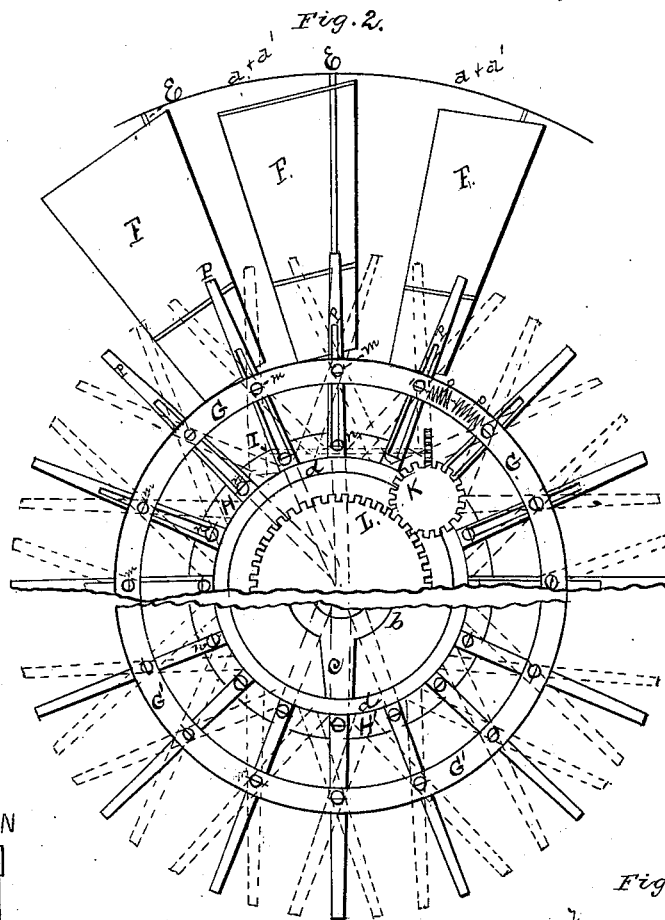
Inventor:

Jules Desjardins
per
C. E. Allen, atty

J. DESJARDINS.
Windmill.

No. 215,892.

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Witnesses:

J. W. Garner
Chas. D. Haines

UNITED STATES PATENT OFFICE.

JULES DESJARDINS, OF BURLINGTON, VERMONT.

IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. **215,892**, dated May 27, 1879; application filed March 11, 1879.

To all whom it may concern:

Be it known that I, JULES DESJARDINS, of the city of Burlington, in the county of Chittenden and State of Vermont, have invented certain new and useful Improvements in Portable Windmills; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The invention relates to improvements in wind-wheels, the various devices which enter into the construction of which being so arranged and combined that a simple and effective wheel of a portable character is produced, at all times reliable in operation and readily controlled. As it does not claim to be self-adjusting it is necessarily free from many devices, which, however ingenious and successful they may be, are always more or less complicated and expensive in their construction, and therefore more liable to injury in their operation.

The object of my invention is to provide a stationary wheel of such design that I am enabled either to present to the wind as great a surface as can be effectively used, the force of the wind being always expended upon those portions which are specially adapted to sustain it, or to so arrange the sails or fans that when unemployed they shall offer no resistance to the slightest current of air.

The invention consists in the arrangement of the sails or fans upon the exterior rim or face of the wheel in connection with movable stops, which are located upon either side of the rim of the wheel, and are controlled by an intermediate gearing mechanism.

It also consists in the particular construction and arrangement of the stops and gearing mechanism; and, finally, in the construction of a hand-brake, by which the motion of the wheel can be controlled through the power-pulley.

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 is a front elevation of my wheel; and Figs. 2, 3, 4, 5, 6, 7, and 8 are detail views of the same.

A is a frame, of any suitable construction, and consists of two pairs of stout uprights converging at the top. These are suitably braced, and rest upon a substantial underlying frame. The main shaft B of the wheel extends horizontally from the cross-timbers of one pair of uprights to the other, being journaled in bearings upon each.

The entire frame which sustains the mechanism, hereinafter described, I intend to have portable, so that it can be located upon a tower, building, or any convenient position, which shall be sufficiently elevated to permit the free movement of the parts named, and thus adapted to the purpose for which the power is to be used.

C is the wheel, which is secured to the main shaft B. It is constructed of wood or metal of proper strength. To its hub *b* radial arms or spokes *c* are rigidly secured to sustain the rim or felly D. These arms are thoroughly braced by an intermediate circle, *d*, which passes around midway between the hub *b* and the rim D. This rim is of sufficient strength and width to hold the stationary arms or standards E, upon which the sails or fans F are intended to swing. They are screwed perpendicularly into the surface, and near the outer edge of the rim D, being located on either side of the rim alternately.

The sails F are made of wood or sheet metal. They are of the greatest width at the top, and each is so hung upon its respective standard E that, while it may swing freely in any direction, the line of its axis being parallel with and nearer to one side of the wheel, its tendency, when open, is to always present the greatest surface desired to the action of the wind. Each sail is stiffened by braces across the top and bottom, which form the upper and lower bearings of the standard E, and also across the center on each side. These last, *e e'*, are more especially intended for fenders, and may, therefore, if preferred, be attached to the sail only at one end to give them additional elasticity.

Wire braces *a a'*, connecting the tops of all the standards on either side of the rim, encircle the entire wheel, and being united together by stiff cross-braces at each standard they serve to bind the whole together in the most compact manner.

A short distance from and on either side of the rim D are fixed metallic circles G G'. They are securely attached to the edge of the rim of the wheel. For convenience I prefer to have them attached to the rim by set-screws *f*, which pass through a block or gage *g*, so that the width of the intervening space can be more easily varied.

Between the fixed circles G G' and the hub *b* are the rotary circles H H', which are connected with and located opposite each other and resting on shoulders in each side of the central brace *d*. They are rotated by means of an endless screw, I, which turns in one of their connecting-braces *h*. This screw I passes through the stationary bar *i*, by which it is held in position, and terminates in a cog-wheel, *i'*, which is turned by the worm J. Motion is transmitted to this worm through the gearing K and L, the latter wheel being revolved upon the shaft B by the pulley M on the same shaft, to which pulley motion is transmitted from the crank-pulley N through the endless belt *j*.

P P are removable stops of the sails F, being made to swing backward and forward on the axis formed by the collar *l*, which is held in position by the set-screw *m*. They extend from the circles H H', to which they are attached by the set-screws *m*, to a point above the rim D of the wheel C sufficiently high to meet the fenders *e e'* passing through the movable slotted collars *l*, which are located between the circles G G' and the edges of the rim D. The movement of these slotted collars is controlled by set-screws *m*. The office of these stops is to regulate the extent of surface which the sails shall present to the wind-current, the mechanism by which they are moved backward and forward being so arranged that the surface of the sails can be exposed to the wind at any desired angle.

Coiled springs *o* connect the stationary blocks *g* and the movable slotted collars *l*, for the purpose of relieving, if desired, by their elasticity, the force of the pressure of the sails against the stops P.

The movement of the collars *l* is controlled by the set-screws *m*, by tightening which the stops P, which pass through the collars, can be set according to the angle which it is desired to have the sail F present to the wind.

The lower extremities of the stops P being secured to the circles H H' by the set-screws *n*, the stops are moved backward or forward on their axes at *m* by rotating the circles H H', thus limiting the rotary motion of the sails, it being impossible for them to swing farther than the point of their impact with the stops. The speed of the wind-wheel can therefore always be easily regulated by the operator.

When the wheel is not in use the stops can be dropped in the direction of the dotted lines until their upper extremities are below the bottom of the sail. By this means the sail, being allowed to swing without obstruction, offers no fixed surface to the wind, and there-

fore ceases to revolve the wheel. That I may more conveniently control the vertical movement of the stops, I prefer to slot them, as indicated in Fig. 1, passing the set-screw *n* through the slot, which should therefore be extended sufficiently far to allow the upper end of the stop to drop to the face D of the wheel.

When the stop is raised into position its lower extremity rests upon a shoulder, *p*, attached to the rotary circles, which is somewhat thicker than the stop, and so shaped that it prevents any lateral movement of the stop when resting upon it. By loosening the set-screw *n* the stop is lowered between the shoulder *p* and the exterior washer of the set-screw *n*.

If preferred, the wheel C can be made without the circle G G' and H H', and all the mechanism above described which is required to operate them. In that event the stops P should be slotted from a point below where they are attached to the under side of the rim D to a point as near their upper extremities as is required to allow them to be dropped, so as to clear the bottom of the sails. They are then secured to the edge of the rim D by set-screws. Notches are then placed in the outside edge of the brace *d*, into which their lower extremities can be sprung, according to the angle at which it is desired to have the stops P placed. To drop the stops, loosen the set-screws which pass through their slots, and hold them to the rim C sufficiently to allow them to fall as far as their slots will permit.

Power is transmitted to the machinery through the pulley Q on the shaft B. A connecting-rod secured to the top of the pitman or pump-rod may also be attached to an eccentric at the extremity of the main shaft B for raising water from a well or stream.

To control more readily the pulley Q, and therefore the movement of the wheel C, I have attached to the frame A immediately below the pulley Q a brake, consisting of a block, in which is placed a right and left screw, *q*, actuated by the same crank-wheel R. The screw passes through the lower part of the brakes *r r'*, which run in the grooved plate *s'*. By turning the wheel R the brakes *r r'* are made to mutually gripe the pulley Q, thus preventing its revolution and that of the wheel. Revolving the wheel R in the opposite direction, the brakes *r r'* mutually recede from the pulley, thus relieving it from all pressure.

The operation of the device is as follows: The stops P are first adjusted according to the angle which it is desired to have the face of the sail present to the wind. If the current is not too great, the stops can be firmly secured in position by turning up the set-screws *m*. Should it be necessary to alter the angle of the sails, by reason of a change in the wind or otherwise, by revolving the pulley M the gear-wheels L and K are turned and the circles H H' are readily moved, thus carrying the bottom of the stops in either direction desired.

As the sails are so hung that their tendency is to present their edges to the wind after they have been acted upon by it, they offer no obstruction to the passage of the air from the moment they leave the wind until they again arrive at a point in the revolution of the wheel where they should receive the full force of the current necessary to revolve the wheel.

The brake-wheel R enables the operator to control the whole mechanism at a moment's notice.

To more readily operate the crank-wheels N and R, belting may connect them with corresponding pulleys convenient to the operator.

If the wheel is to stand for any length of time without use, the stops P should be dropped, so that the sails may offer no obstruction to the current of air.

The whole device should be erected upon a frame convenient for transportation, so that it can be easily moved to any point desired.

Having thus described my invention, I claim—

1. The combination of the standards E and sails F, the standards being secured to the rim D alternately on one edge and then the other, substantially as shown.

2. The sails F, having the fenders *e e'*, in combination with the rods P, substantially as set forth.

3. The combination of the rods P, springs *o*, and sails F, substantially as specified.

4. The combination of the rim D, circles G G', rods P, springs *o*, rotary circles H H', and sails F, substantially as shown.

5. The combination of the pulleys M N, wheels L K, worm J, screw I, and rotary circles H H', for operating the rods P, substantially as described.

6. The rods P, collar *l*, set-screw *m*, circles G G', sails F, and rim D, substantially as set forth.

7. The combination of the pulley Q, brakes *r r'*, and right and left screw *q*, substantially as specified.

In testimony that I claim the foregoing as my own I do affix my signature in presence of two witnesses.

JULES DESJARDINS.

Witnesses:

F. L. PERKINS,
CHARLES E. ALLEN.