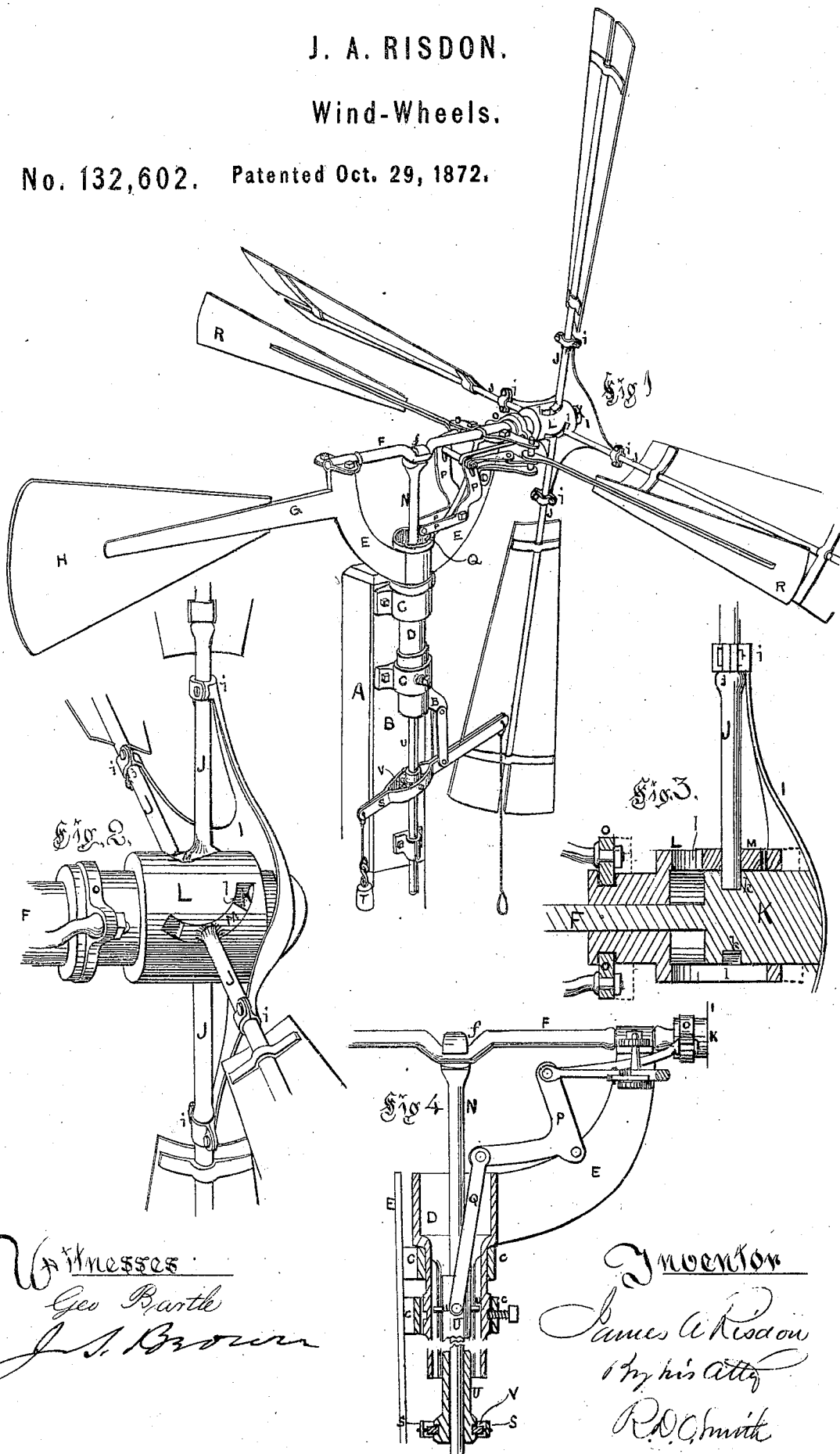


J. A. RISDON.

Wind-Wheels.

No. 132,602. Patented Oct. 29, 1872.



Witnesses  
Geo. Bartle  
J. S. Brown

Inventor  
James A. Risdon  
by his Atty  
R. O. Smith

# UNITED STATES PATENT OFFICE.

JAMES A. RISDON, OF GENOA, ILLINOIS.

## IMPROVEMENT IN WIND-WHEELS.

Specification forming part of Letters Patent No. 132,602, dated October 29, 1872.

*To all whom it may concern:*

Be it known that I, JAMES A. RISDON, of Genoa, in the county of De Kalb and State of Illinois, have invented a new and useful Improvement in Wind-Wheels; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, in which—

Figure 1 is a perspective view of my invention in operation; Fig. 2 is a side elevation of the main-shaft head and connections; Fig. 3 is a central longitudinal section through the parts shown in Fig. 2; and Fig. 4 is a vertical central section through the supporting-shell.

This invention relates to that class of wind-wheels wherein the vanes are mounted at the ends of radial arms, and are made adjustable to compensate the varying velocities of the wind by a partial revolution of said arms; and it consists principally in the devices for automatically controlling said arms and vanes so as to produce uniformity of speed of revolution.

That others may fully understand its construction and mode of operation, I will particularly describe it.

A is the base or supporting post or standard to which is securely bolted a plate, B, which bears the rings C C to receive the hollow cylindrical shell D, so that said shell is securely held, but free to revolve easily therein. At the upper end of the shell D there are two arms, E, which project outward and upward, and support at their upper ends bearings or journal-boxes for the main shaft F. A horizontally-projecting arm, G, is attached to one of the arms E to receive and support the fish-tail vane H, by which the driving-vanes are kept properly headed to the wind. A spider, I, having a central hub, K, projecting from its concave side, is mounted at the front end of the shaft F. At the ends of the arms of the spider I there are bearing-boxes *i* for the vane-arms J, and in the hub of the spider there are cells *k* to serve as steps to receive the ends of said vane-arms. Collars *j* prevent any lengthwise movement of said arms in their bearings. The spider-hub K is turned off true upon its outer surface, and a sleeve, L, is fitted to move freely but snugly thereon. Curved slots *l*, corresponding in number to the number of arms J, are made in the sleeve L, and said arms pass

through said slots when in position. A short cross-piece, M, curved to fit the slot *l*, is securely attached to each of the vane-arms, so that, as the sleeve L is moved back and forth on the hub K in the direction of its axis, the cross-pieces M will slide in the slots *l* and the vane-arms will thereby be caused to rotate in their bearings and the inclination of the vanes to their plane of rotation will be correspondingly changed. Motion is transmitted from the revolving shaft F to the mechanism to be actuated, by means of the crank or eccentric *f* located on said shaft on a point in line with the axis of the cylindrical shell D and the connecting-rod or pitman N, which passes downward through the center of said shell, drives such mechanism as may be properly connected to its lower end. The sleeve L is constructed with a neck and lateral flange at the end thereof to form a seat for a clutch-ring, O, by which said sleeve may be moved back and forth on the hub K while revolving to adjust the vanes to the wind, as may be required by the force with which it may be blowing or the power desired. To effect the desired adjustment, the clutch-ring O is linked to a bell-crank lever, P, and this may be controlled by a rod, Q, which passes downward through the shell D to some place convenient of access to the person in attendance.

The vanes are placed upon the arms J, so that about the same extent of surface is displayed on either side thereof, and they will therefore be balanced as to the pressure of the wind. It may, however, be advantageous to give a slight preponderance of surface on one side of the arm J, so that in case of disarrangement of the controlling mechanism the vanes will automatically adjust themselves edgewise to the wind, and then come to rest. This may best be accomplished by setting one of the vanes so as to present sufficient excess of surface on one side of its arm to act as a controller for the other vanes when liberated from control of the clutch-ring O. The advantage will be in the fact that the excess of wear consequent upon an excess of pressure on one side of the arm will affect only one of said vanes. The employment of a wind-wheel for the driving of machinery generally requires the use of an automatic governor.

The governor which I prefer to use consists of a pair of small wings, R R, one on either side, jointed to the arm E by suitable means, and acting upon the bell-crank lever P. The rod Q is connected to the lever S, which is pivoted to the plate B below the shell D. This lever S acts like a scale-beam, a weight T being attached to it to represent the maximum velocity desired. So long as the velocity or pressure of the wind does not exceed this maximum the wings R will not yield and the vanes will be fully displayed at the angle of greatest efficiency. But when the force of the wind is sufficient to overcome the gravity of the weight T the wings will yield, the rod Q, bell-crank P, sleeve L will all be moved and the adjustment of the vanes will be changed correspondingly, so that the speed of revolution will be practically uniform after the maximum velocity has been reached. The lever S is fixed to move only in a single plane, and it is therefore necessary to insert between it and the rod Q a swivel whereby the one latter may revolve while the former is stationary. This swivel I prefer to construct in the form of a sleeve, U, incasing the crank-rod or pitman N and extending up within the shell D. I am then enabled without inconvenience to attach the rods Q by a simple joint to each side of said swivel-sleeve at its upper end, and at the lower end I make an annular groove for the reception of a gimbal-ring, V, having its bearings in a yoke formed in the lever S, as shown. To prevent any change of relative position between the sleeve U and the shell D, except in the line of the motion of the former, I make two longitudinal grooves within said shell and place upon the sleeve U two studs, *u*, to slide therein, so that in all movements of rotation the shell D and sleeve will coincide. The

weight T may be made to slide back and forth upon the lever S like the weight of a scale-beam, notches or a clamp being provided to prevent motion from the point of adjustment.

When it is desired to stop the wheel the lever S is raised up and the vanes immediately brought edge to the wind and the wings R are folded back by the same movement.

To protect the mechanism from snow and ice a housing may be constructed similar in form to the spider and attached to the same, but covering the sleeve L, and a stationary housing may be placed above the main shaft and secured to the arms E at each end, so that the entire working portion of the mechanism may be covered and protected.

The vanes R R are made adjustable back and forth upon their arms to adjust their leverage in correspondence with the surface of the vanes exposed to the wind.

Having described my invention, what I claim as new is—

1. The combination of a crank shaft, F, mounted upon the revolving frame D E, with a spider, I, constructed with radial arms, and hub K to form bearings for the radial vane-arms J and the slotted sleeve L, as set forth.
2. In combination with the vane-arms J and sleeve L, the curved slots *l*, and the curved arms M, substantially for the purpose set forth.
3. In combination with the slotted sleeve L and the adjustable vane-arms J, the fan R and weighted lever S, with their connections, to form an automatic governor, substantially as set forth.

JAMES A. RISDON.

Witnesses:

ORIN LEONARD,  
WM. H. DURHAM.