

P. Heald.

Wind Wheel.

N<sup>o</sup> 103,742.

Patented May 3, 1870.

Fig. 1.

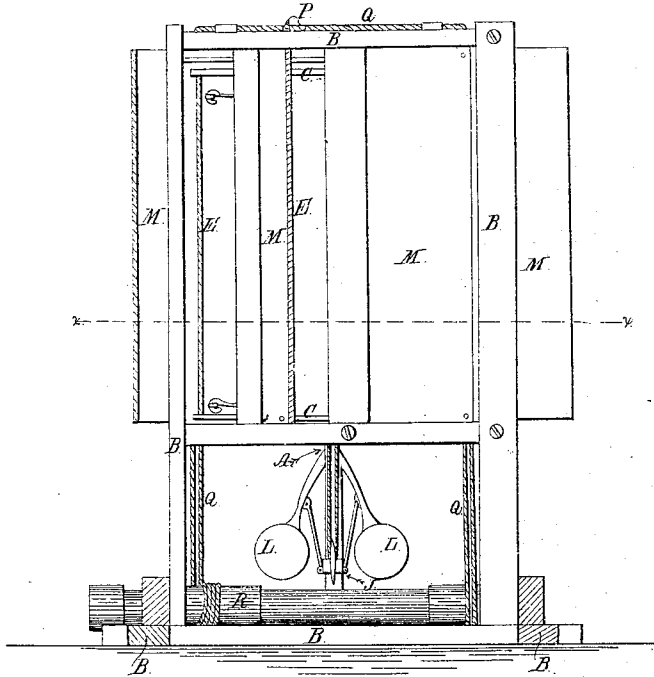
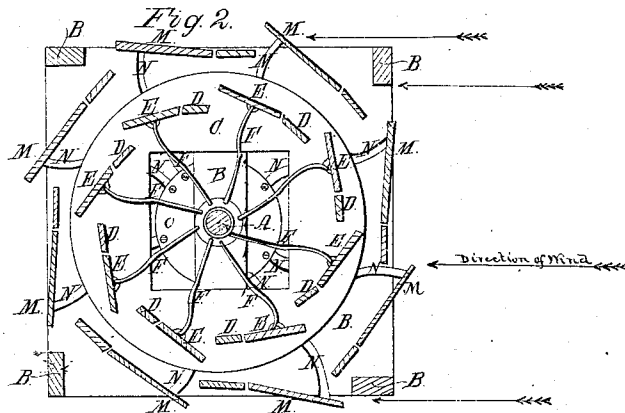


Fig. 2.



Witnesses  
 Chas. T. Larkness.  
 D. J. Brown

Inventor:  
 Peter Heald  
 By his atty.  
 R. D. Apple

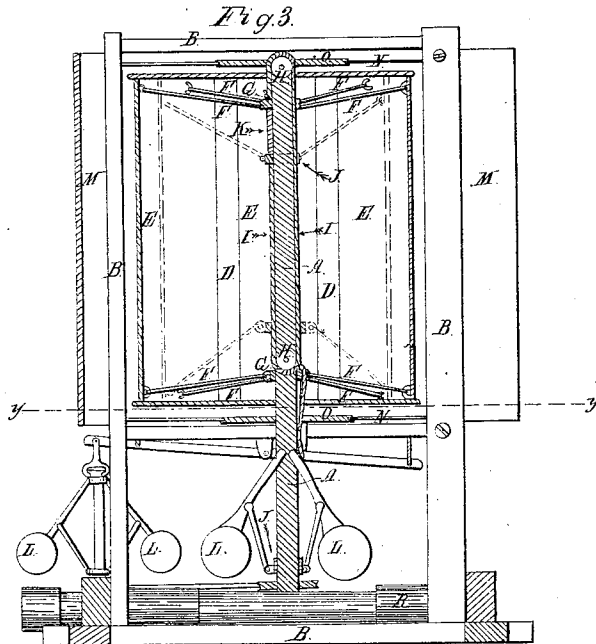
*P. Heald*

*Sheet 2-2, Sheets.*

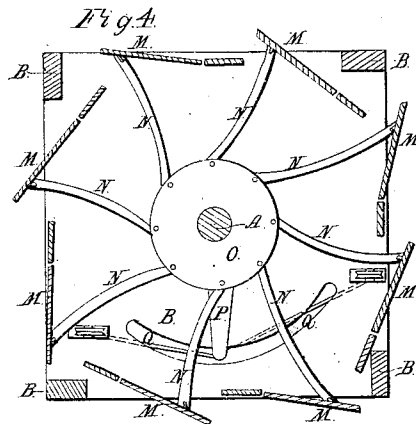
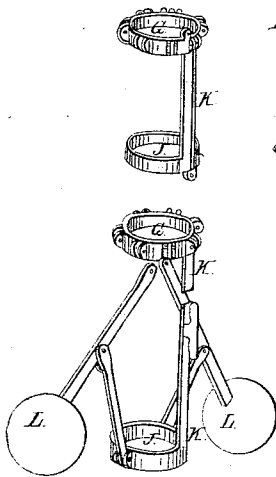
*Wind Wheel*

*N<sup>o</sup> 103,742.*

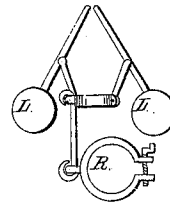
*Patented May 31, 1870.*



*Fig. 5.*



*Fig. 6.*



*Witnesses*

*Chas. T. Harkness.*  
*D. J. Brown*

*Inventor*

*Peter Heald*  
*By his atty*  
*R. D. Gifford*

# United States Patent Office.

PETER HEALD, OF TROY, MAINE.

Letters Patent No. 103,742, dated May 31, 1870.

## IMPROVEMENT IN WIND-WHEELS.

The Schedule referred to in these Letters Patent and making part of the same.

### To all whom it may concern:

Be it known that I, PETER HEALD, of Troy, in the county of Waldo and State of Maine, 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 an elevation of my apparatus.

Figure 2 is a sectional plan on line *x-x*.

Figure 3 is a vertical section of the apparatus.

Figure 4 is a horizontal section on line *y-y*.

Figure 5 represents, in perspective, the rings G G and J J, with their attachments detached.

Figure 6 represents a method of applying a governor to the windlass R.

My invention relates to that class of wind-wheels which revolves on a vertical axis, and which is actuated by an excess of force upon one side of said axis, resulting from the positions of the buckets or vanes; and

It consists in the arrangement of such a wheel within an inclosing case, by means of which the moving currents of air may be deflected upon the vanes of the wheel in a uniform direction upon one side, and deflected away from the wheel upon the other side.

It also consists in providing said inclosing case with adjustable shutters, by means of which said case may be entirely closed, and access of wind to the wheel prevented.

It also consists in the construction and arrangement of devices by means of which the various adjustments of the wheel and its inclosing case may be effected.

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

The shaft A forms the axis of the wind-wheel. Said shaft has its bearings at top and bottom of a frame formed by the timbers B B, or an equivalent structure, and its motion is transmitted to the mechanism to be actuated by any of the well-known arrangements of gearing commonly used in similar connections.

The wind-wheel is formed of two heads C C, which are secured to the shaft A, and these heads are connected by stiles D D arranged around the periphery.

The spaces between the stiles are closed by the shutters or vanes E E, which may be hinged to said stiles or hung upon pintles stepped in sockets made in the heads C C.

When the shutters E E are closed the wheel would present an equally angular surface to the wind on all sides; but, if the shutters E E are opened outward, as shown in fig. 2, then a moving current of air would be permitted to enter the wheel on one side, but would be deflected from the other side, and, as is well known under these circumstances, the wheel would be caused to revolve with velocity proportionate to the force of

the wind. A uniform speed is essential to the successful operation of any machinery, and it is therefore desirable to attach a governing device, by means of which the shutters shall be automatically closed as the speed is increased, and opened as it decreases, and thus maintain, within narrow limits, a uniform speed.

I am aware that wind-wheels having the above-described construction, and provided with governing devices, have been made heretofore, and, therefore, do not claim so much of my device as is described above, but the devices hereinafter described I believe to be new.

The shutters or vanes E E are severally connected by the wire links F to the rings G, which surround and move upon the shaft A. Said links and rings are located at top and bottom of said wheel, so that the upper and lower ends of the vanes will be simultaneously moved. When the vanes are closed the rings G G move toward each other, and when the vanes are opened they move away from each other, as is shown in fig. 3.

These simultaneous movements of the vanes and rings G in opposite directions are accomplished in the manner as follows:

Pulley-sheaves H H are inserted in the shaft A, as shown in fig. 3, at points opposite the extreme positions of the rings G, or thereabout. Two cords I I are used, one secured to the upper part and the other to the lower part of the upper ring G. The first passes over the upper sheave and the other passes under the lower sheave, and they are both secured to the lower ring by means of a cleat, or other convenient contrivance. It is apparent then that, when the lower ring moves upward, the upper ring will be correspondingly drawn downward, because the lower cord I will receive tension, and *vice versa*.

In order to prevent any possibility of cramping of the rings G against the shaft A, I attach guide-rings J J, by inflexible arms or connections K, so that irregularity of movement or position is obviated.

The governor L is attached to the lower guide-ring J, and operates to raise or depress said ring and its connections as the speed of the wheel is increased or diminished, and, consequently governs and controls the degree of opening presented by the shutters or vanes to the wind.

The frame B is also provided with shutters M M, which open and close similarly to those of the wheel. When the shutters M are closed, then the wheel is entirely shut in and protected from the wind, and from rain, snow, &c.

The shutters M are controlled by link-pieces N, similar to the links F. They are arranged at top and bottom of the shutters, and are respectively connected to rings O, which are located at top and bottom of the frame B, outside of the wheel, and surrounding the

shaft A. As the ring O is rotated about the shaft A the several shutters M are simultaneously opened or closed, and this motion is effected by means of arm P and cords Q Q, which pass over pulleys set in the frame B, and thence descend to a windlass, R, or other regulating contrivance.

In figs. 3 and 6 I have shown how an independent governor may be applied to regulate the positions of the outside shutters M, and it will appear evident that the governor may be employed with the outer shutters alone, if so desired.

From the foregoing description it will appear that, by my device, the wheel is not only protected from the deleterious effects of exposure to rain, snow, &c., but it possesses a double means of regulation; that is, the movable vanes E and the outer shutters M, by either of which the propelling-force of the wind may be regulated and controlled.

In addition to the above, there is great advantage in inclosing the wheel in the manner described, for it is thereby relieved from the resistance of the moving currents of air against the outer or advancing side, and

the propelling currents are introduced and act with more uniformity of direction.

Having described my invention,

What I claim as new is—

1. The combination of a vertical wind-wheel, having adjustable vanes E, with an inclosing stationary case, B, provided with adjustable shutters M, as and for the purpose set forth.

2. The arrangement of the rings G G, (with the link-wires F,) cords I I, and pulleys H H, as and for the purpose set forth.

3. The combination and arrangement of the vanes E, links F, rings G, and governor L, as and for the purpose set forth.

4. The arrangement of the shutters M, links N, rings O, arm P, cords Q, and windlass R, for the purpose set forth.

PETER HEALD.

Witnesses:

E. W. BENNETT,  
MINERVA BENNETT.