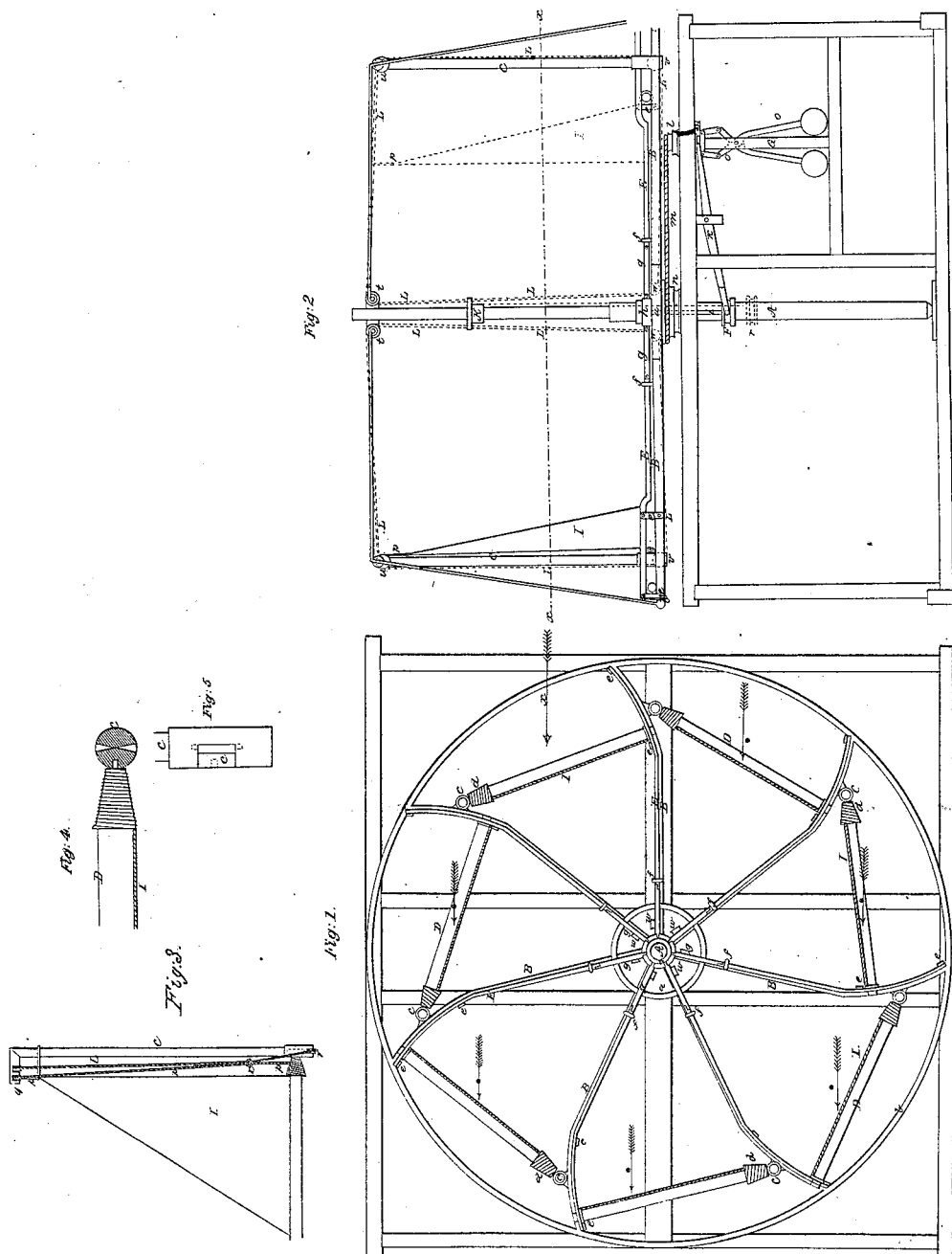


C. B. Hutchinson,

Wind Wheel

N^o 6,498.

Patented June 5, 1849.



UNITED STATES PATENT OFFICE.

CHARLES B. HUTCHINSON, OF WATERLOO, NEW YORK.

IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. 6,498, dated June 5, 1849.

To all whom it may concern:

Be it known that I, CHARLES B. HUTCHINSON, of Waterloo, in the county of Seneca and State of New York, have invented new and useful Improvements in the Construction of Wind-Wheels for Propelling Machinery and for other Purposes, which is described as follows, reference being had to the annexed drawings of the same, making part of this specification.

Figure 1 is a horizontal section of the wind-wheel through the line *xx* of Fig. 2. Fig. 2 is a vertical longitudinal section of the same. Fig. 3 is a section showing the form of the sails and the manner of folding the same. Fig. 4 is a horizontal section through one of the upright shafts. Fig. 5 is a side elevation of the lower part of one of the same.

Similar letters in the several figures refer to corresponding parts.

The nature of my invention and improvements consists in securing to a vertical shaft arranged within a suitable frame and resting on a step at the lower part of the same a series of radial arms curved near their outer extremities, where they are secured to a ring or rim and having vertical shafts fastened to their curved parts, provided with pulleys above and below, around which pass bands or cords extending over similar pulleys attached to the main revolving shaft and fastened at each end to a rising and falling button or ring connected by a rod to a similar ring or button near the lower part of the shaft within reach of the operator, said cords or bands being also attached to other bands or cords passing over pulleys at the upper ends of the rods and secured to the upper end of triangular sails at one end and wound round a series of vibrating rollers at the other, and also in providing the wheel with a governor, the whole being constructed, arranged, and operated in such a manner as to cause the wind to act on all the sails, more or less, at one and the same time, and to regulate the speed of the wheel without the assistance of the operator and to enable him to lower the sails from below, and thus stop the motion of the wheel when desired.

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

A is the upright shaft, turning in a step at the lower part of the frame and in suitable boxes at the upper part of the same.

B are a series of radial arms curved at their outer extremities in the form of a segment of a circle described from the centers of the upright shafts C and secured to a hub or flanged plate *a* at their inner ends and to a circular rod or rim *b* at their curved ends.

C are upright shafts bent at right angles at their upper ends and secured firmly to the curved part of the radial arms at their lower ends, where they are enlarged and perforated or mortised so as to receive semicircular boxes or blocks *c*, as represented in Fig. 4, which are suspended on pivots in said spaces or mortises.

D are horizontal vibrating shafts provided with journals at one of their ends, which enter corresponding openings in the semicircular boxes or blocks, and larger journals at their opposite ends which rest and vibrate on the curved part of the radial arms, having shoulders near their vibrating ends to hold them in their proper places, and screws or worms *d* of the form of a frustum of a cone at their opposite ends.

E are hinged bars arranged immediately above the radial arms, curved at their outer extremities to correspond with the form of the same, and connected to the outer ends and bends of said arms by links or hinged plates or bars *e*, between which the vibrating ends of the rollers traverse. The inner ends of these bars pass through an eyelet or ring-bolt *f*, secured on the upper surface of the radial arms and are connected by pins to the ends of connecting-bars *g*, attached at their opposite ends in like manner to ears formed on a rising and falling hub or ring *h*, surrounding the main shaft.

F is another ring or hub connected to the last-mentioned one by a vertical rod *i* passing through a corresponding groove in the vertical shaft and having a circular groove or channel formed on its periphery for the reception of small pins projecting from the forked end of a lever *k*, moving on a fulcrum at its center and forked in like manner at its opposite end.

G is a vertical shaft turning on a step secured on a horizontal timber of the frame

and in a suitable box in the upper horizontal timber of the same, and having three or more pulleys *l* of unequal sizes at its upper end, around one of which is passed a band or cord *m*, also passing around one of three or more other pulleys *n* of larger diameter on the main vertical shaft.

H is a ring or hub having a groove on its periphery in which is inserted small pins formed on the outer forked end of the lever, and ears on its outer periphery, to which are attached the upper ends of the toggle-joint levers of an ordinary governor *o*.

I are triangular or jib-shaped sails secured at their lower edges to the rollers D and at their upper pointed ends to the ends of bands or cords *p*, passing over pulleys *q*, turning in boxes in the right-angled or horizontal arms of the upright shafts C, and secured to the conical worms or screws *d* on the ends of the vibrating rollers.

K is a ring or hub surrounding the main vertical shaft near its upper end and connected to another ring or hub *r* near the lower end of the shaft by means of a rod *s* passing through a groove in said shaft.

L are bands or cords attached at one end to the upper ring or hub and passing upwardly parallel to the shaft A to the upper end of the same, where they pass over pulleys *t*, turning in boxes in a hub secured to the shaft, from whence they pass outwardly and extend over pulleys *u*, turning in boxes in the horizontal arms of the upright shafts, thence downwardly and under pulleys *v*, turning in boxes in the lower ends of the shafts, thence toward the center of the shaft or wheel and under pulleys *w*, turning in ears secured on the upper surface of the hub or plate or on the sides of the radial bars, and thence upwardly to the ring or hub K, to which they are again attached, being also lashed or otherwise fastened in their course to the cords at the points *x*.

Operation: When it is desired to put the wheel in motion, the operator lowers the ring or hub K, to which the bands or cords L are attached, by drawing on the lower hub or button *r*, attached to the same by a rod *s*, as represented by dotted lines in Fig. 2, which causes the several bands or cords to move over their respective pulleys *t u v w*, and carry with them the bands or cords *p*, (to which they are attached at the point *x*, Fig. 3,) passing over the pulleys *q* on the horizontal arm of the upright shafts C and to the peaks of the sails I and conical worm or screw pulleys *d* on the horizontal rollers D, and the sails to be raised to the required height. The wind

will then strike the sails and cause the vibrating ends of the rollers to move between the radial arms B and curved bars E and assume such positions in relation to the line upon which the wind is blowing as will bring the sails more or less into action at all times during their revolutions, except when they present a feather-edge to the wind and during their movements over the curved radial arms, which happen twice in one of their revolutions, and when the sails arrive at the position represented in Fig. 1, in relation to the line of wind indicated by the arrow marked \times , all will be acting more or less toward the propulsion of the wheel, as will be observed by reference to the arrows marked \otimes , represented in Fig. 1, to indicate the line of the wind and the angle it strikes the surfaces of the sails. The upright shaft G, to which the governor *o* is attached, being geared to the main shaft by the band *m*, will revolve with said main shaft and regulate the speed of the same by throwing the centrifugal balls of the governor outward when the speed becomes too great, which will depress the outer end of the lever *k* with forked ends and raise the inner end of the same, which being geared to the ring or hub F, attached to the ring or hub *h* above, to which the connecting-rods *g* are attached, will also cause that ring or hub *h* to raise and draw the curved bars E toward the main shaft, and thus clamp the vibrating ends of the rollers D, to which the sails are secured, and hold them in one position until the usual speed is restored, when the gravity of the centrifugal balls of the governor will bring the rings or hubs, curved bars, &c., to their original positions.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the curved bars E, connected to the radial arms B by hinged plates or bars *e*, connecting-bars *g*, hubs *h r*, connected together by a rod *s*, forked lever *k*, and governor *o* for regulating the speed of the wheel, in the manner herein described.

2. The mode of raising and lowering the sails, when desired, by means of the bands or cords L, attached to the hub K, connected to the hub *r* below by the rod *s*, passing over the pulleys *t u v w*, and attached in their course at the point *x*, Fig. 3, to the cords *p*, passing over the pulleys *q* and secured to the peaks of the sails, and the worm or screw pulleys *d* on the rollers D, as herein set forth.

CHARLES B. HUTCHINSON.

Witnesses:

STERLING G. HADLEY,
ISAAC MOSHER.