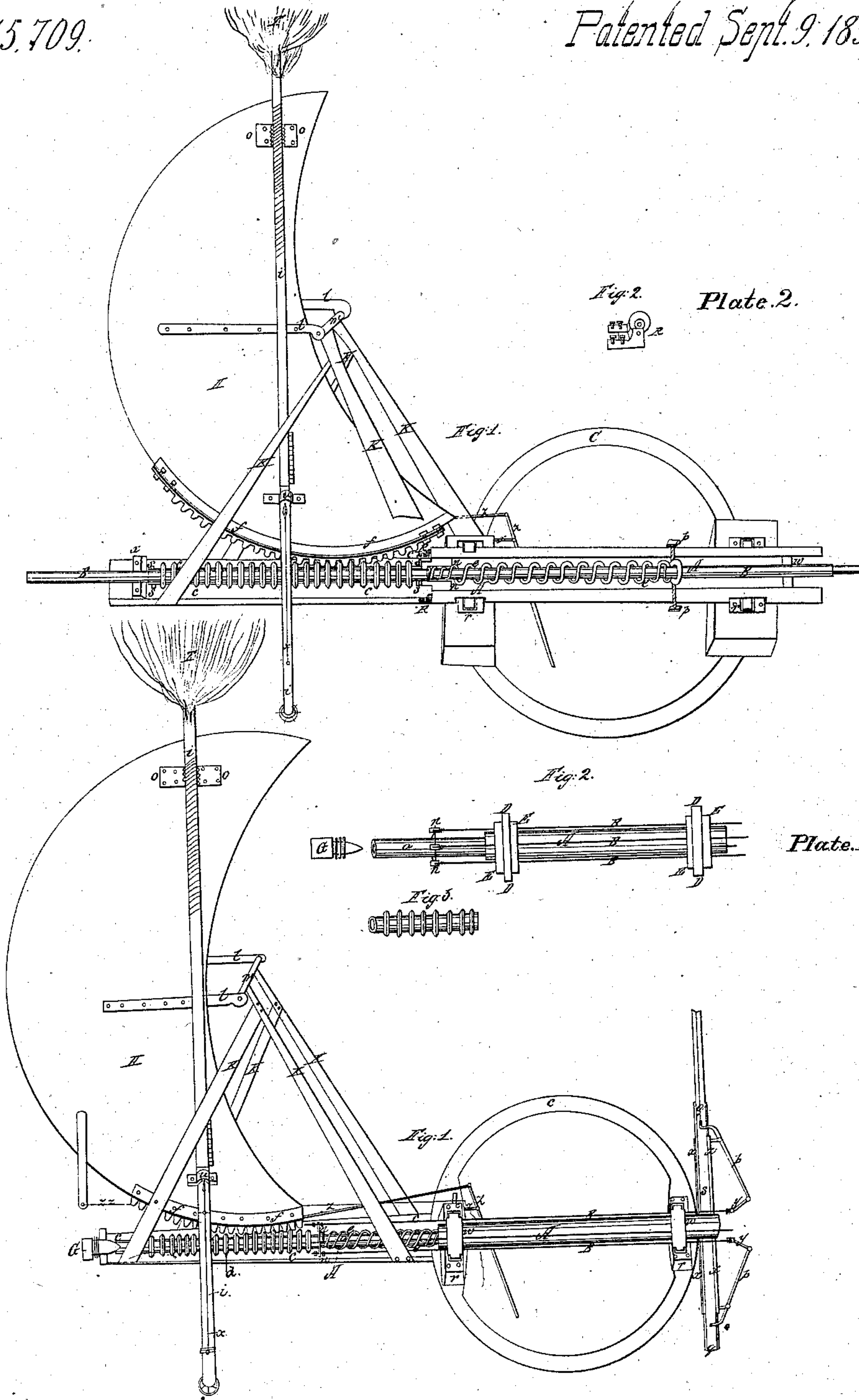


J. R. St. John

Wind Wheel

Nº 15,709.

Patented Sept. 9. 1856.



UNITED STATES PATENT OFFICE.

JOHN R. ST. JOHN, OF LOCKPORT, NEW YORK.

IMPROVED WINDMILL.

Specification forming part of Letters Patent No. **15,709**, dated September 9, 1856.

To all whom it may concern:

Be it known that I, JOHN R. ST. JOHN, of Lockport, Niagara county, and State of New York, have invented a new and useful Improvement on the Windmill, which I have named the "Excelsior Windmill;" and I do hereby declare the following to be a full and exact description thereof, reference being had to the accompanying drawings, (Plates 1 and 2,) and to the figures and letters of reference marked thereon, making a part of this specification.

Plate 1, Figure 1: A is the forward part of the main shaft. A *a* is the hinder part of the main shaft, reduced in diameter to receive the circular cogged tube *d*, which operates as a sliding rack and may revolve at the same time, together with the collar *n n* and the spiral spring. B B (red lines) are metal rods attached to the collar *n n*, which pass through holes in the shoulders of the journals parallel and close to the shaft and also through holes in the arm flange or hub *x*. *c c c c* is a traverse table formed of a circle and tail-piece, which may be cut in one piece or more or constructed of wood. This traverse table moves round on wheels in the usual way. *d* is the circular cogged tube-rack, which slides and may also revolve on the hinder reduced part of the main shaft while pressing forward the collar *n n*. *e e* is a spiral spring of any required power around the reduced portion of the main shaft A. *f f* is a segment-pinion fastened to the lower limb of the rudder-vane H, and its teeth mesh into those of the tube-rack *d*. G is a screw pin or pivot screwed through the hinder end of the tail-piece of *c c c* and enters a box in the reduced end of the main shaft. H is a rudder-vane of any required size and material moving by the force of the wind the traverse table horizontally in a circle, bringing the sails or fans to the wind and also moving vertically upon its axis *m* under the pressure of the wind upon the governor vane or globe T, thereby moving forward the rack *d* and reversely when the wind slackens by the power of the spiral spring *e e*, acting through the collar *n n* upon the rack *d*. *i i* is a rod attached perpendicularly to the rudder-vane H by the clamps *u* and *o o*, having the governor vane or globe T upon its upper end. K K K K are braces from

the tail-piece *c c c c*, uniting to support the axle *m* of the rudder-vane H. *l l* are straps fastened to the sides of the rudder-vane H, the eyes in the outer end of which receive the arbors of the axle *m*. *m* is the axle of the rudder-vane H referred to. *n n* is a collar moving upon the reduced portion of the main shaft between *d* and *e e* under the pressure of either the rack *d* or spiral spring *e e*, and to which the inner ends of the rods B B B B are attached, its movement carrying the rods B B B B out and in. O O is a female-threaded clamp holding the rod *i i*, through which by its screw-thread that rod is moved up or down by turning it. P P are levers of any desired shape working on the studs connected to the rods along the forearms or any other device for increasing or diminishing the propelling-surface presented to the wind. *r r* are the journal-boxes of the main shaft A. They are lined entirely with rollers between the inside face of the boxes and the revolving face E E E E of the journals, and the boxes are made wider than the faces of the journals, from which they are held sidewise by the screw-pivot G in the end of the reduced part of the main shaft A. *s* is one of any number of arms it may be expedient to employ and of any desirable material or construction. T is the governor vane or globe referred to. It is mounted upon the rod *i i*, and is raised or dropped with it to increase or diminish the leverage thereof upon the rudder-vane H. *t* is a small rod with a tapering key upon its upper end to fit the rod *i i* in position and keep it from turning. *u* is a clamp to sustain the lower portion of the rod *i i* in place. W W are the shoulders of the main shaft, through which the rods B B B B move; *x x x x*, a section of a flange or hub on the outer end of the main shaft. *y y* are flat links attached by flat joints to shoulders screwed on the ends of the rods B B B B and fastened to the ends of the levers *p p*. *z z* is a common lever fastened to the forward lower point of the rudder-vane, or a cord fastened to the back limb of the rudder-vane may be either used leading down through the traverse-table circle into the mill for the purpose of opening the fans at pleasure and stopping the mill.

Plate 1, Fig. 2: A is a perspective view of the larger portion of main shaft; B B B B, red

lines, are the rods passing through the shoulders of the journals D D D D. D D D D are the perpendicular rubbing-faces of the journals. E E E E are the shoulders of the main shaft, through which the rods B B B B pass. G is the same as described in Fig. 1. A a is the reduced portion of the main shaft, on which move the rack *d*, collar *n n*, and spiral spring *e e*. *n n* is the collar referred to between the rack *d* and the spiral spring *e e*.

Plate 1, Fig. 3, is the circular cogged tube *d*.

The foregoing is a description of one arrangement of my improvement. Another arrangement by a change of some of the parts and operations, producing, however, the same results, is shown in Plate 2, Figs. 1 and 2. In this arrangement the same traverse table is used as in Plate 1, and the letters T, *i i*, *o o*, *w*, *t*, *k k k*, *r r*, and *z z* represent the same parts operating in the same way and with the same effect as described in the explanation of Plate 1, Fig. 1.

In the arrangement of Plate 2, Figs. 1 and 2, A A is a hollow main shaft revolving in the journal-boxes *r r*. B B (red lines) is a rod moving through the hollow of the main shaft and long enough to reach from the outside of the flange or arm-hub back along the tail-piece, its forward end being supported by the collar *w*, which is inserted into the main shaft's hollow, its center supported by the collar *n n*, and its hinder end passing through and supported by the box *x*. *d* is a circular cogged tube, as described in Plate 1; but instead of sliding on the reduced portion of the main shaft it is fastened to the rod B B by screw-pins *s s*, the forward pins passing also through the collar *n n* and fastening them both to the rod B B, with which they revolve, or the cogs, the collar *n n*, and the rod B B may all be one piece. *p p* are screw-pins through the hollow shaft into the edge of the collar *q*, holding that collar firmly to sustain the spiral spring *e e* in its contractions and expansions. R R are rollers fixed in frames with slots for adjustment, held to the tail-frame *c c* by screw-bolts and tight against the hind end of the main shaft, holding it forward and relieving the horizontal pressure of the journals upon their boxes.

Plate 2, Fig. 2: R is a roller fixed in a frame fastened to the tail-frame, so as to be moved forward to press as required against the hinder end of the main shaft to relieve the horizontal pressure of the journals upon the sides of the boxes.

Having thus described the several parts and their arrangement in the two ways, I will explain the operations and advantages of my improvements.

First. As shown in Plate 1, by passing the rods B B B B through the shoulders of the main-shaft journals, I am enabled to apply the power simply and effectually for increasing or diminishing the surface of the sails, fans, or slats presented to the wind.

Second. I obtain the power necessary for doing this from the wind independent of the fans or sails without detracting it from the working-power by means of the governor vane or globe T, which, being raised or dropped by the rod *i i*, may have any lever-power required to move the rudder-vane vertically, and as the governor T is pressed backward the rudder-vane H moves vertically on its axis *m*; by which its segment-pinion *f f* carries forward the collar *n n* and the rods B B B B, contracting the spiral spring *e e*. At the same time the levers *p p* are operated by the rods B B B B and move the rods or other means for opening and shutting the sails, fans, or slats. When the wind relaxes its force upon the governor vane or globe T, the spiral spring expands, reversing the motion and restoring the parts to their former positions, thus operating under each increase and diminution of the force of the wind upon the governor T. With these facilities of adjustment and regulation by a mark on the rod *i i* and marks on the rudder-vane H a scale may be erected from experiment upon each mill, which will serve for running any desired number of revolutions per minute, adapted to the load or work the power of the wind at the time may admit of.

Third. By this arrangement of the tail-frame *c c c c*, I not only obtain a bed for working the governing apparatus, but by the screw-pivot G through the end of that tail-frame the horizontal pressure of the journals upon the boxes of the main shaft is relieved, this pivot G holding the shaft forward and preventing contact of the sides of the journals and sides of the boxes, and to relieve the perpendicular friction of the journal-faces in their revolutions I surround them with rollers in their boxes. By means of the rope or lever Z Z the mill is stopped at pleasure from within.

As arranged in Plate 2, Fig. 1, the difference between this and the arrangement of Plate 1 is that, instead of the rods B B B B passing through the journal-shoulders outside of the main shaft as transmitters of the governor's power, a rod B B (red lines) may be used, which works through a hollow main shaft. The rack *d*, instead of sliding on a mandrel or reduced portion of the main shaft, is here fastened to the rod B B, together with the collar *n n*, by the pins *s s s s*, and the spiral spring *e e*, instead of being sustained by the shoulder of the main shaft, is here sustained by the collar *n n*, through which B B moves, which collar is held in place by screw-pins *p p* through the shell of the tube, forming the main shaft.

Plate 2, Fig. 2: R is used to relieve the pressure of the journals upon their boxes of the main shaft in lieu of the screw-pivot G.

Having thus described fully my improvement upon the windmill in its different arrangements and operations, I do not claim

separately and simply by themselves any of the parts, as they have all been used before; but

What I do claim, and wish to secure by Letters Patent, is—

1. The arrangement and combination of the parts as described and referred to by figures and letters in the drawings or Plates One and Two (1 and 2) or their merely equivalents.

2. The traverse table and tail-piece for carrying the reduced part of the main shaft and for sustaining the main shaft horizontally on the screw-pivot G, with the arrangement thereon of the rudder-vane for its perpendicular movement.

3. The main shaft with its hinder portion reduced, with the circular cogged-rock *d*, the collar *n n*, and the spiral spring *e e*, working therewith.

4. The rudder-vane H, as performing the two offices of reefing the sails to the wind by moving the traverse table horizontally, also as carrying the rod *i i* and the governor vane or globe T for giving a vertical movement.

JOHN R. ST. JOHN.

Attest:

ALPHEUS CLARK,
A. H. CLULINE.