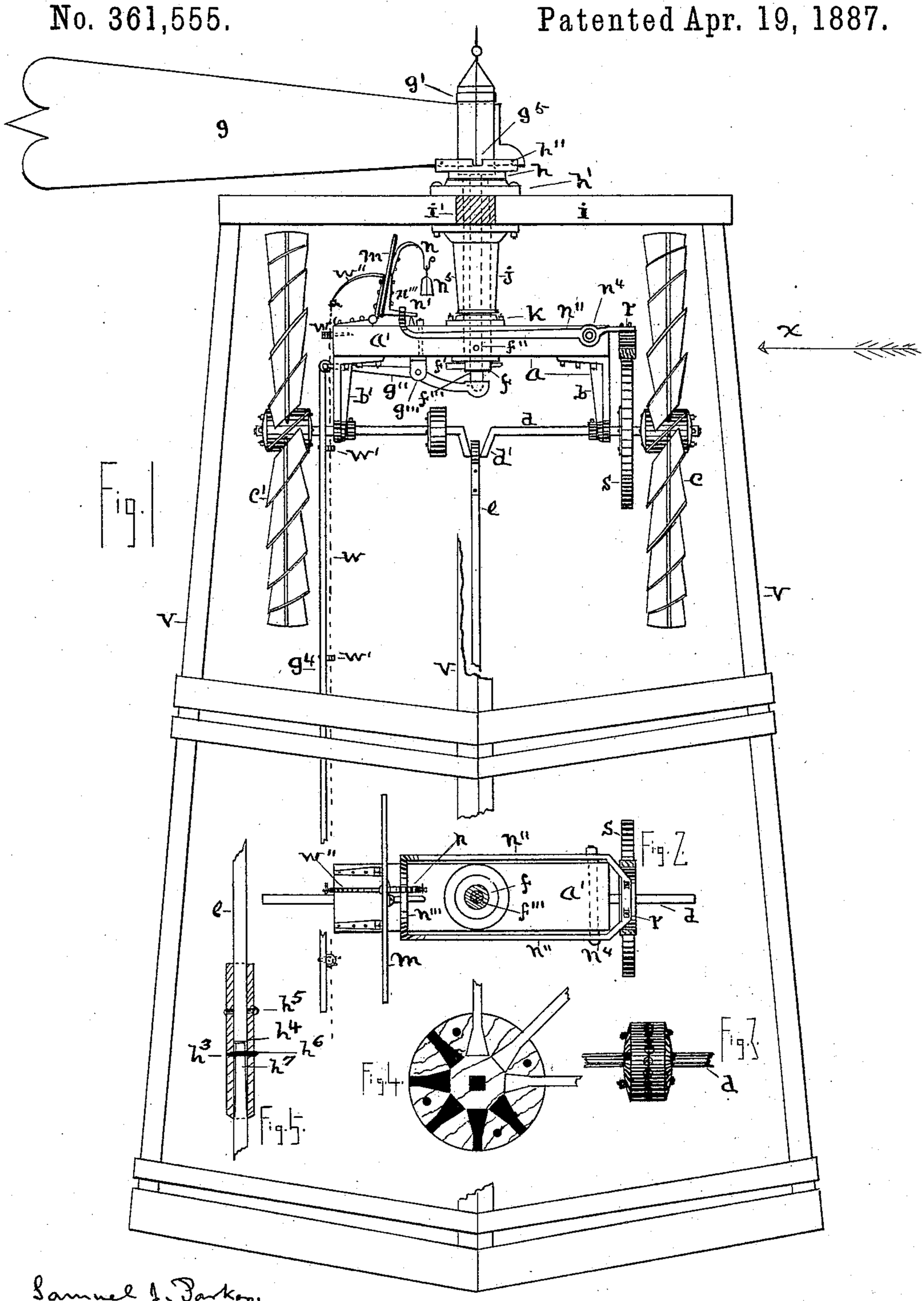
(No Model.)

J. C. C. SMITH.

WINDMILL.

No. 361,555. Patented Apr. 19, 1887.



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WINDMILL.

SPECIFICATION forming part of Letters Patent No. 361,555, dated April 19, 1887.

Application filed November 3, 1886. Serial No. 217,882. (No model.)

To all whom it may concern:

Be it known that I, JOSHUA CASHUN COVERT SMITH, a citizen of the United States, residing at Covert, Seneca county, New York, have invented an Improved Windmill, of which the following is a specification, reference being had to the accompanying drawings.

My object is to make a compact and efficient windmill; and my invention relates to the special parts, that will be apparent as I describe my invention.

Figure 1 is a side elevation of my windmill. Fig. 2 is a view from above of my wind-plate, which operates a retarding-brake. Fig. 3 is a side view of one of the hubs of the wind-wheels. Fig. 4 is a view of one half of a hub, showing the method of inserting the spokes into the hub; and Fig. 5 is a view of my pitman-swivel.

In the figures, *a* is a letter designating a hanging frame suspended by the spindle *f*, composed of the wood block *a'* and of the iron hangers *b b'*. This block or bed-piece is the main member of the frame, and the hangers have attached to them the shaft *d* of the two wind-wheels *c c'*.

The whole of my windmill may be made of either wood or iron; but I have represented it as partly wood and partly iron.

The shaft *d* has a crank, *d'*, in its middle, on which is the pitman *e*, for pumping water. It may have a cog or band wheel to communicate the power of the wheels for useful purposes. The bed-piece *a'* is fast to the spindle *f*, the frame and the spindle turning together. On the top of the spindle is a vane, *g*, also fast to the spindle *f*, and turning the frame and the wind-wheels. The encircling iron plate *h*, fast to the spindle just below the vane, turns on the plate *h'*, just below it. The plate *h'* is fast to the cross suspending-beam *i*, and by these two plates *h h'* the frame *a* and wheels *c c'* are sustained; and since the bed-piece of the hanging frame is some distance below the beam *i*, I use a steadying taper case-plate, *j*, which reaches down to near the bed-piece *a'*, where there is a turning joint between it and the plate *k*, which is fast to the bed-piece *a'*. A key-pin, *f'*, or a pin, *f''*, through the spindle and bed-piece, answers the same purpose. Thus I make a secure joint, easily turned by the vane.

The only noticeable features of the wind-wheels is that the one *c* to the right hand faces the wind and receives its full force, and that experience has shown that the one *c'*, though receiving less of the force of the wind, yet is a powerful aid in the propulsion of the wheels, pitman, band-wheel, or other appliance.

It will be noticed that *m* indicates a perpendicular wind-plate hinged at right angles to the direction of the wind, as indicated by the arrow *x*, to the bed-piece *a'*, with a weight-lever, *n*, and weight n^5, and an angled lever, *n'*, that connects with one or two levers, *n''*. In Fig. 2 these levers are shown to be made of one piece of iron and hinged on each side of the bed-piece with a loop, *n'''*, connecting them over the angled lever. Whether one or two levers are used, the hinge is at n^4, near the rubber *r*, and the rubber wheel *s*, which is fast to the shaft *d*.

The parts just named are effective when the plate *m* is acted on by the wind; for if the wind is light the weight n^5 causes the plate to fall to the windward, and thus by the levers the rubber *r* is lifted off of the wheel *s*, releasing it; but if the wind is blowing hard, revolving the wheels too rapidly, the wind-plate raises the levers *n''* and brings the rubber in contact with the wheel *s* with a force in proportion to the strength of the wind, and thus the rapidity of the revolutions is controlled.

So energetic is the plate, levers, rubber, and the wheel that a cord or rod, *w*, (indicated by a dotted line,) is used to prevent all rotation of the wheels, its lower end being secured with a tension on the plate.

The hubs of the wheels are made of wood or iron, but are represented as made of wood. Fig. 3 shows the round apertures made to receive the round spokes which hold the fans of the wheels, one half of the round cavity being in each half of the hubs, or all the spokes being in one side when the other half of the hub acts as a cap over them, and Fig. 4 shows that the ends of the spokes are made with dovetailed enlargements fitting into dovetailed mortises in the inner portions of the hubs. The hubs are held together by bolts; hence if

a spoke is broken the hub is easily opened and the spoke replaced.

By the use of the two wheels, as shown, the diameter of each wheel is comparatively small, yet the surface exposed to the wind is large, and their united power large, and this enables me to place my windmill in a comparatively low supporting-frame. I use, preferably, four posts, *v*, held together at their tops by the cross-beams *i i'*, and either with their lower ends inserted into the ground or held by sills, the supporting-frame being slatted and the posts braced.

It has been stated that when the cord *w* is drawn upon and held taut the wind-wheels are stopped; but a more permanent means of disuse of the wheels is desirable, and one with less strain on the wheels. Such a one is represented in Fig. 1, where the spindle *f* is made of tubing, with a shaft, *f'''*, inside of the tube. The vane *g* and its head-block *g'* are made fast to the top of this shaft, and a lever, *g''*, is hinged to a fulcrum, *g'''*, fast to the bed-piece *a'*, its longer end, which extends to a rod, g^4, outside (to the left) of the hanging frame *a*, where it hangs down between that frame and the wheel *c'*, the weight end of the lever having a cup-shaped cavity, in which the lower end of the shaft rests. When the rod is drawn upon, it lifts the vane and its head out of the notches g^5 in the disk *h''*, and the wind turns the hanging frame *a* and the wheels to right angles with the arrow *x*, or the direction of the wind. When releasing the rod, the lower edges of the vane enter the notches of the disk, securing the vane and the wheels in the inoperative position, there being four notches in the disk—two for the operative and two for the inoperative positions of the wind-wheels.

The vane if made of iron needs nothing to aid it in catching into the notches. If of wood, it is plated with iron where it enters the notches. The rod g^4 has loops W, for the cord *w* to pass through. Thus both rod and cord hang clear of the wheel *c'*. Tying the cord to the rod secures the stoppage of the wheels by draft on the wind-plate, since the lever *g''* cannot be elevated thereby. The cord and rod both reach down to where the curator of the windmill stands, and they revolve with the frame *a*. The pitman *e* has a long inflexible swivel-joint in its length, composed, as is seen in Fig. 5, of the metallic tube h^3 about the pitman, which is divided at h^4. The upper part is fastened to the tube by the bolt h^5. The lower part fits tightly, but allows the turning in the tube *h* of a key, h^6, fitting in a groove about the upper end of the lower half, h^7, of the pitman, which key holds the lower end secure in the tube. This is an arrangement which enables the wheels to change position without any strain on the pitman or pump.

The use of two wind-wheels on the same shaft and a suspending-spindle and a bed-piece with hangers for the shaft of a wheel are devices in common use; hence I do not claim these; but

What I claim as my invention in the described windmill is—

1. The combination of a supporting beam or frame, *i*, vane *g* above the frame, wheels *c c'*, suspended beneath the frame and connected with the vane by the bed-piece *a* and spindle *f*, transverse hinged wind-brake plate *m*, provided with the weight-arm *n*, weight n^5, cord-arm *w''*, and lever-arm *n'*, with levers *n''*, rubber *r*, and friction-wheel *s*, the said parts being constructed and used substantially as set forth.

2. The wind-wheels *c c'* on the shaft *d*, beneath the supporting-frame *i*, suspended to the frame *i* by the spindle *f* and bed-piece *a*, in combination with the wind-brake plate *m*, directly in front of the supplementary wheel *c'*, as shown and described.

3. The wind-wheels *c c'* on the shaft *d*, beneath the supporting-frame *i*, suspended by the spindle *f* and bed-piece *a* to the frame *i*, in combination with the brake-plate *m*, levers *n''*, rubber *r*, and friction-wheel *s*.

4. The vane *g*, provided with and fast to the spindle *f'''*, inside of the spindle *f*, and adjustable in the notches *h''* of the plate *h*, and cord-lever *g''*, whereby the wheels *c c'* are adjusted either to their working or non-working positions, as set forth.

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Witnesses:
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