

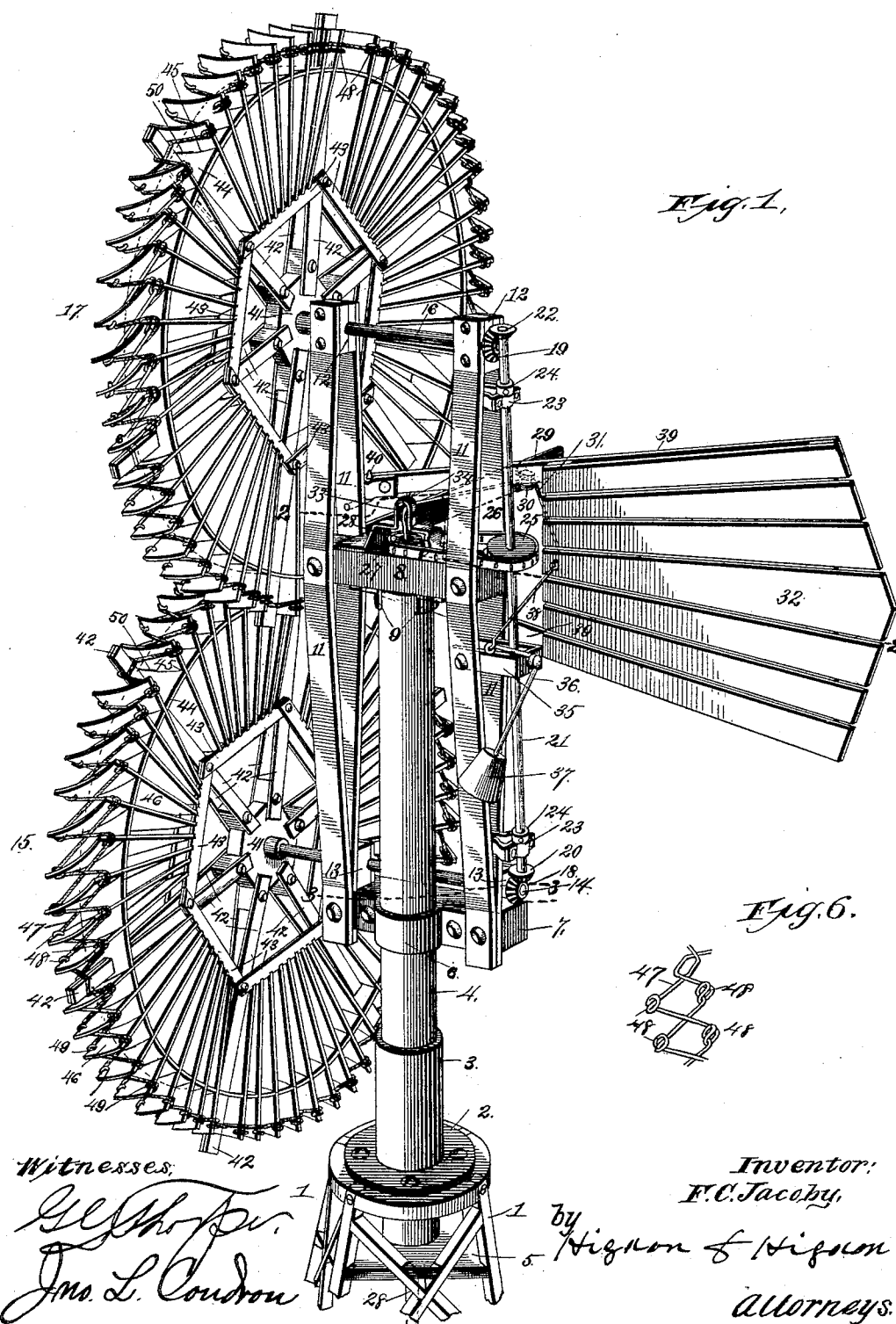
(No Model.)

2 Sheets—Sheet 1.

F. C. JACOBY.
WINDMILL,

No. 467,976.

Patented Feb. 2, 1892.



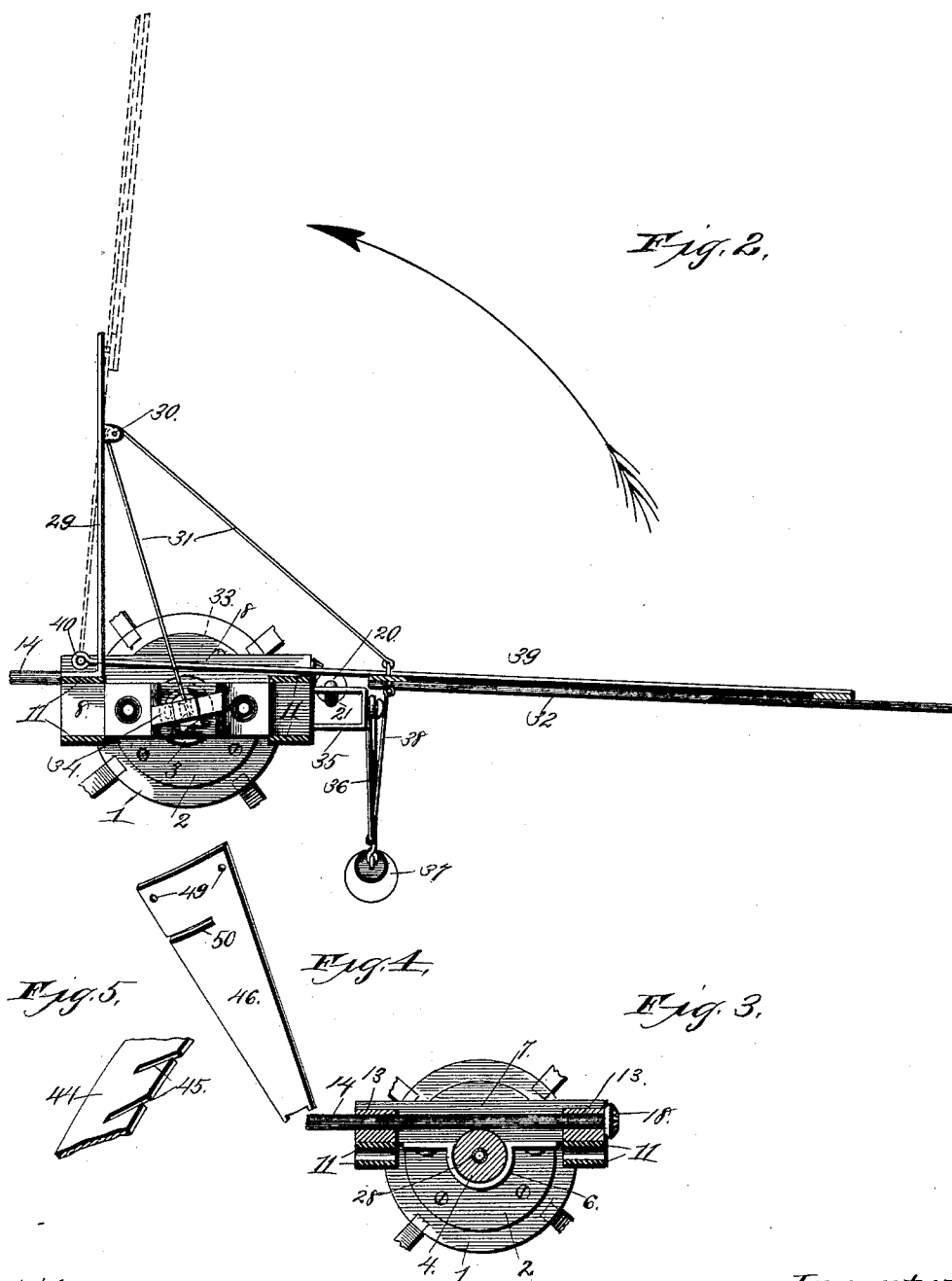
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Witnesses,
G. W. Thorpe
Mr. L. Coudon

Inventor,
F. C. Jacoby
by *Higdon & Higdon*
Attorneys.

UNITED STATES PATENT OFFICE.

FRANK C. JACOBY, OF TULIP, MISSOURI.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 467,976, dated February 2, 1892.

Application filed October 17, 1891. Serial No. 408,974. (No model.)

To all whom it may concern:

Be it known that I, FRANK C. JACOBY, of Tulip, Monroe county, Missouri, have invented certain new and useful Improvements in Windmills, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to machines which are designed to utilize wind-currents for the purpose of generating power for various mechanical purposes; and the objects of my invention are to produce a windmill which shall be simple, durable, and inexpensive in construction, which shall utilize the maximum force of wind-pressure, which shall be self-regulating, so as to operate uniformly under varying conditions of wind velocity, and which shall be capable of being readily thrown into and out of operation by an attendant whenever so desired.

To the above purposes my invention consists in certain peculiar and novel features of construction and arrangement, as hereinafter described and claimed.

In order that my invention may be fully understood, I will proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 is a perspective view of a windmill constructed in accordance with my invention. Fig. 2 is an irregular horizontal cross-section of the same on the line 2 2 of Fig. 1. Fig. 3 is a horizontal cross-section of the same on the line 3 3 of Fig. 1. Figs. 4, 5, and 6 are detached views of certain details of construction hereinafter described.

In the said drawings, 1 designates the upper part of the tower of my improved windmill, the said tower being of the usual or any suitable or preferred type of construction.

2 designates a plate or cap which is bolted or otherwise suitably secured upon the top of the tower 1 and which is preferably of circular marginal contour, as shown.

3 designates a hollow cylindrical casing which is either formed integrally with the cap or plate 2 or suitably secured thereto, and which rises vertically therefrom, preferably about the proportionate distance shown in Fig. 1.

4 designates a hollow cylindrical standard

or support which extends vertically through the casing 3, and the lower end of which rests, preferably, upon a horizontal partition or support 5, suitably secured in the upper part of the tower 1. The lower part of this support or standard 4 is embraced by a metal band or strap 6, which is bolted or otherwise firmly secured to the adjacent side of a short horizontal bar or beam 7, the said bar or beam thus occupying a position beside the support or standard 4 and a short distance above the upper end of the casing 3.

8 designates a second short horizontal bar or beam which rests upon the upper end of the standard or support 4, and to the under side of which are preferably bolted or otherwise suitably secured two pendent segmental flanges 9, which partially embrace the upper end of the standard 4 and thus retain the beam or bar 8 in position upon the upper end of said standard, while permitting said beam or bar to rotate horizontally upon said standard, for a purpose to be hereinafter described.

11 designates four upright connecting-bars, which are arranged in two pairs, the lower ends of said pairs of bars being bolted or otherwise firmly secured to the lower horizontal bar or beam 7 at one side thereof and at its extremities. Each pair of these bars 11 diverge upwardly from each other to a point about midway of their length and then converge upwardly, the upper extremities of each pair of bars being bolted or otherwise secured to two divided bearing-blocks 12, which are thus interposed between the upper extremities of the bars 11. The upper short horizontal bar or beam 8 is interposed between the two pairs of bars 11 midway of their length, said bars lying against and being bolted or otherwise suitably secured to opposite sides of the bar or beam 8 at the ends thereof, as shown. Upon the upper side of the horizontal beam or bar 7, at the opposite ends thereof, are bolted or otherwise firmly secured two bearings 13, through which extends the horizontal shaft 14 of the lower wind-wheel 15, to be hereinafter fully described.

16 designates the shaft of the upper wind-wheel 17, which will also be hereinafter fully described, and this shaft extends horizontally through the divided bearings 12, the

wheel 17 being mounted upon the front end of the shaft 16. At its rear end the lower shaft 14 carries a beveled gear-pinion 18, and at its rear end the upper shaft 16 carries a similar beveled gear-pinion 19. The gear-pinion 18 of the lower shaft meshes with a beveled gear-pinion 20 on the lower end of a vertical shaft 21, and the gear-pinion 19 of the upper shaft meshes with a beveled gear-pinion 22 on the upper end of said vertical shaft 21. This vertical shaft 21 is journaled in two bearings 23, which are suitably secured to the lower and upper parts of the rear pair of vertical bars 11, and said shaft carries two collars 24, which rest upon the upper sides of the bearings 23 and thus retain the shaft 21 in its proper operative position. About midway of its length the vertical shaft 21 carries a sprocket-pulley 25, around which passes a sprocket-belt or drive-chain 26; and this belt or chain also passes around a second sprocket-pulley 27, which is mounted upon the upper end of the main vertical tubular shaft 28 of the windmill. It will thus be seen that as the windmill operates, as hereinafter more fully explained, the main shaft 28 is caused to rotate axially in a horizontal plane, and it is to be understood that the lower end or part of the shaft 28 is to be connected by any suitable or preferred gearing with the pump or other machine or machinery which is to be driven by the windmill.

29 designates a horizontal arm, the inner end of which is bent at right angles and bolted or otherwise suitably secured to one side of one of the front vertical bars 11. Near its outer end and at its rear side this arm 29 carries a pulley 30, around which passes a cord or rope or other flexible connection 31. One end of this flexible connection is secured to the tail-vane 32, and said flexible connection passes from the pulley 30 downward over a pulley 33, which is journaled in a bracket 34, secured to the upper side of the beam or bar 8, and thence downward through the tubular shaft 28 to within convenient reach of an attendant upon the ground. To the rear pair of the vertical bars 11, just below the beam or bar, is secured a horizontal rearwardly-extending U-shaped bracket 35, to the outer side of the bend of which is pivoted an arm 36, which is of approximately V form. The lower end of this arm 36 carries a counter-weight 37, while the upper end of said arm is connected by a link-rod 38 with the tail-vane 32 at the opposite side of said vane from that to which the flexible connection 31 is attached. It will thus be seen that when the wind strikes against the side of the tail-vane 32, to which the link-bar 38 is attached, the entire supporting frame-work of the wind-wheels 15 and 17 will be rotated horizontally upon the standard or support 4, so as to face the wheels to the wind, and also that the counter-weight will be raised by the tail-vane when a very strong gust of wind strikes the tail-vane, so that the wind-wheels will be

feathered or thrown edge to the wind and thus prevented from racing. The tail-vane 32 is composed of a number of parallel horizontal forwardly-projecting bars or arms 39, which are hinged, as at 40, upon one of the front vertical bars 11. It will be further observed that the arm 29 above described serves to limit the lateral movement of the tail-vane under strong gusts of wind, as indicated by the dotted lines and the arrow in Fig. 2. The wind-wheels 15 and 17 are of precisely similar construction, so that a description of one will suffice for both.

A hub 41 is mounted upon the front end of the shaft 14 or 16, and from this hub radiate any suitable number of spokes 42, the inner parts of which are connected by braces 43, arranged concentrically relative to the hub. The outer portions of these spokes are connected by a ring 44. From the rear margin of this ring 44 extend inward a number of parallel oblique slits or recesses 45, into which are inserted the outer ends of the vanes 46, which extend radially from the hub 41, and which are arranged in sets or series between the spokes. Each of these vanes 46 is of concavo-convex form transversely, and the concave surfaces of the vanes are placed forward, the vanes being thus adapted to utilize the maximum force of the wind. These vanes are furthermore braced or secured together by ropes or cords or other flexible connections 47, which pass around the outer ends of the spokes 42, and which are looped, as at 48, and pass through eyes or openings 49 in the outer ends of the vanes. It is to be further observed that these vanes are each formed on its front part with a recess or slit 50, into which the ring 44 fits, the vanes being thus securely retained in position.

From the above description it will be seen that I have produced a windmill which is simple, durable, and inexpensive in construction, which utilizes the full effective force of wind-currents, is self-regulating, and is easily thrown into and out of action, as described, by an attendant.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. An improved windmill comprising two vertical wind-wheels located the one above the other, a vertical shaft geared to the shafts of said wind-wheels, and a suitable revoluble supporting frame-work for said shafts, substantially as set forth.

2. An improved wind-mill comprising two vertical wind-wheels located the one above the other, a vertical shaft geared to the shafts of said wind-wheels, a suitable revoluble frame-work for supporting said shafts, a vertical axially-revoluble main shaft, and a belt connecting said main shaft to the vertical connecting-shaft, substantially as set forth.

3. An improved windmill comprising a suitable tower, a cap-plate mounted upon said tower and provided with a vertical tubular

5 casing, a vertical tubular support or standard extending through said casing, a revoluble frame-work mounted upon said standard, an upper and a lower wind-wheel shaft journaled in said frame-work, and a vertical revoluble shaft journaled in said frame-work and geared to the said wind-wheel shafts, substantially as set forth.

10 4. An improved windmill comprising a revoluble supporting frame-work composed of vertical bars arranged in pairs, horizontal bars or beams connected to the vertical bars, bearings carried by said frame, horizontal wind-wheel shafts journaled in said bearings one

above the other, a tail-vane pivoted upon one 15 of said vertical bars, a horizontal arm projecting from one of the vertical bars and carrying a pulley, a flexible connection passing around the pulley and connected to the tail-vane, a counterweighted arm pivoted upon 20 the frame, and a link-bar connecting the arm with the tail-vane, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK C. JACOBY.

Witnesses:

JNO. L. CONDRON,
H. E. PRICE.