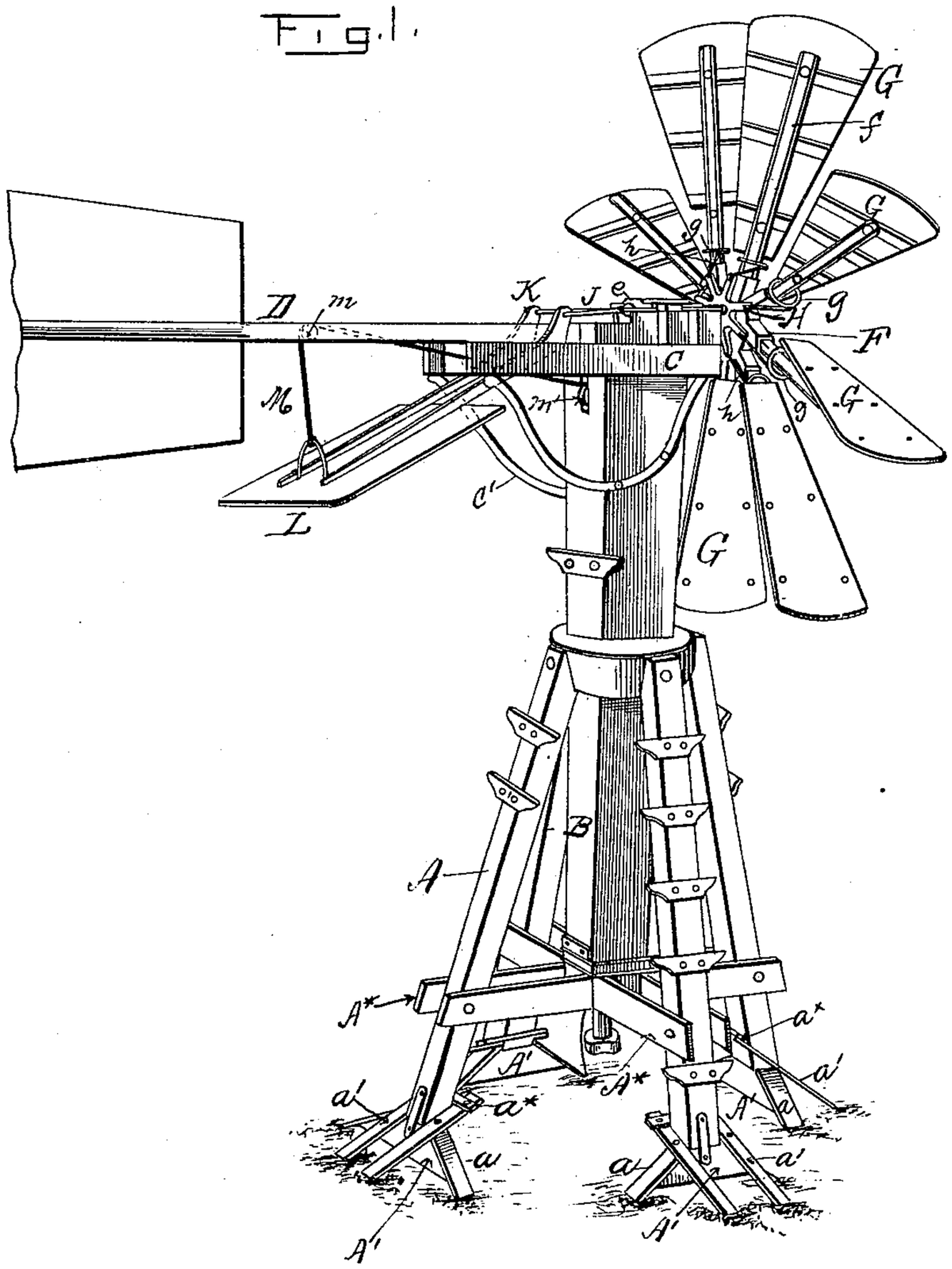
(No Model.) 2 Sheets—Sheet 1.

A. W. LANE.

SELF REGULATING WINDMILL.

No. 332,261. Patented Dec. 15, 1885.

Fig. 1.



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(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

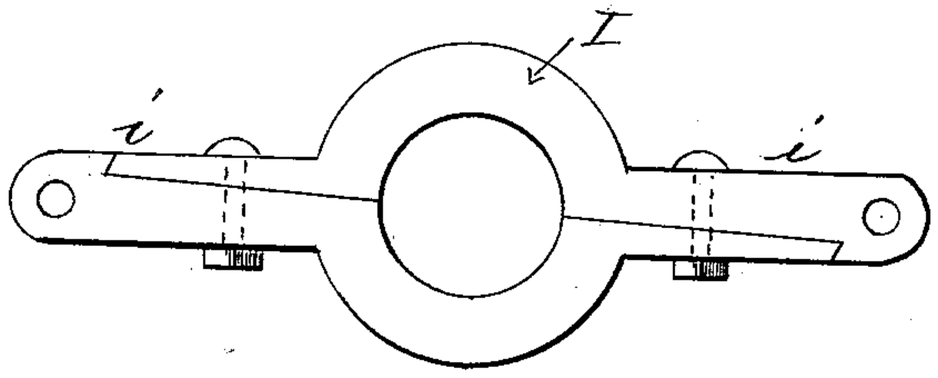


Fig. 5.

Fig. 2.

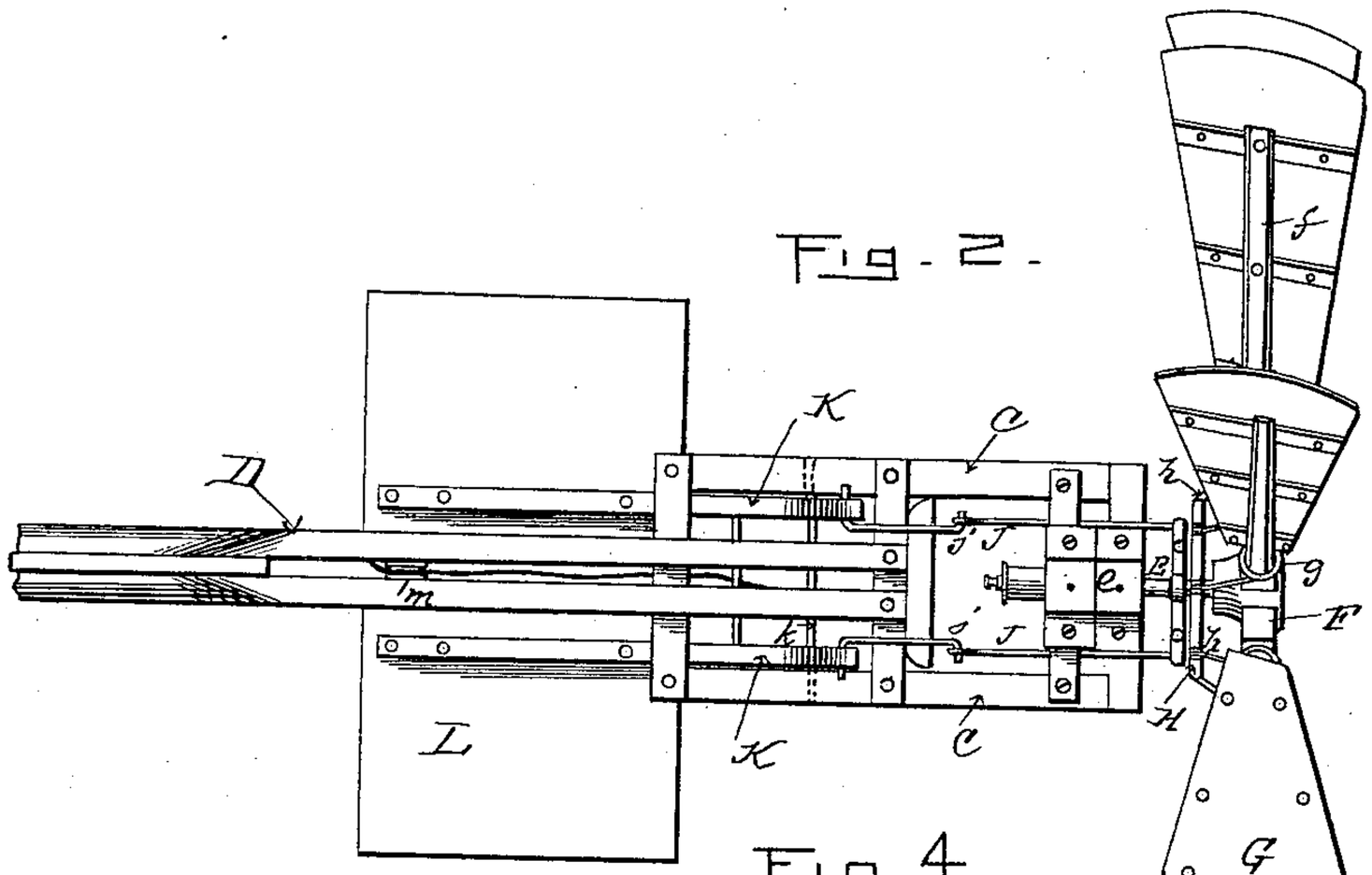
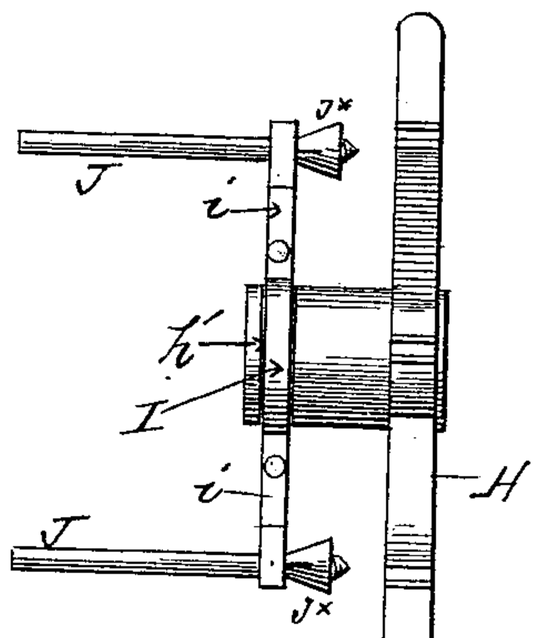


Fig. 4.



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UNITED STATES PATENT OFFICE.

ANDREW WILSON LANE, OF JANESVILLE, CALIFORNIA.

SELF-REGULATING WINDMILL.

SPECIFICATION forming part of Letters Patent No. 332,261, dated December 15, 1885.

Application filed August 15, 1885. Serial No. 174,457. (No model.)

To all whom it may concern:

Be it known that I, ANDREW WILSON LANE, a citizen of the United States, residing at Janesville, in the county of Lassen and State of California, have invented certain new and useful Improvements in Self-Regulating Windmills; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to wind mills or wheels, and has for its object the provision of means whereby such mills are made self-regulating, and in which either the force of the wind or manual power is made avail of to regulate and control the rate of speed, thereby rendering the device automatic and self-regulating and at the same time placing it under control of men.

The invention consists in the construction and combination of parts hereinafter described, and pointed out in the claim.

The accompanying drawings illustrate what I consider the best means for carrying my invention into practice.

Figure 1 is a perspective view of a windmill with my improvements attached. Fig. 2 is a plan view of the upper portion. Fig. 3 is a detail of the collar. Fig. 4 is a detail of collar and spider. Fig. 5 is a sectional detail of blade and spoke with uniting-hinge.

Similar letters indicate corresponding parts in all the figures where they occur.

A represents the framing or uprights, and A′ the feet or timbers, which are placed on each upright, and which have beveled ends, as shown, with stakes *a a* driven down over each end and stakes *a′ a′* driven at right angles to stakes *a a* over the outer side of the feet, and provided with a cross-strip, *a**, nailed or otherwise secured to the stakes *a′ a′* inside of the uprights A. This construction forms a complete lock and holding means for the uprights and prevents all possibility of the overthrowal of the frame, while at the same time avoiding the necessity for inserting or planting the uprights in the soil.

At a suitable height from the ground the uprights A are united by cross-braces A*, which are placed in pairs and extend across the frame at right angles to each other. At the center, where they meet, they are let into each other and locked together. In addition to forming a brace for the uprights, these cross-braces afford a support for the flume, tube, or shaft B, and furnish a turn-table for the same to revolve upon. The tube or shaft B incases the pitman-rod *b* and extends up and supports the working parts of the machine.

At the top of the tube B cross-heads C are provided, which are braced by the curved stay-pieces C′, also secured to the tube at mid-length. The tail-frame D is secured to the tube B and cross-heads C, as shown.

The fan-shaft E is mounted in a bearing, *e*, on the tube and cross-heads, and has the fan-hub F fastened on its outer end and connects with the pitman-rod at its inner end. Upon the spokes *f f* of hub F are centrally hinged the blades or wings G. Near the lower contracted ends of said blades are provided loops or rings *g*, which form a means for turning the fan-blades easily and certainly. By reason of the loops or rings encircling the spoke and drawing equally from either side the blades may be easily turned in either direction without jar or danger of breaking. The curved form presented by these loops or rings gives them great strength, so that there is no danger of their being broken off. Connected to said loops or rings are the links or connecting-rods *h*, the other ends of said parts *h* being united to the spider or frame H, which surrounds the fan-shaft and turns with the fan-wheel.

I is a collar also surrounding said shaft. The collar I and spider H are connected together by a swivel-joint, *h′*, which permits the one to turn, while the other is fixed as regards rotary movement, but which unites them together and impels the longitudinal movement of one upon the shaft to occasion an equal amount of movement of the other in the same direction.

The collar I, as shown in Fig. 3, is formed of two pieces, each containing about one-half of the eye or opening, and each possessing

parts of arms, each of which extends out and complements the part on the opposite piece, these parts being bolted together, as shown, after they are placed over the sleeve on the spider.

As has already been stated, the spider H revolves with the fan-wheel. To arms or flanges *i* of the collar I are attached the connecting-rods J J, which are jointed, as shown at *j*, and extend back and connect with the upper ends of the regulator-arms K. These arms are pivoted on the rod or bar *k*, which passes through the cross-heads C. Beneath the cross-heads the arms K bear the wind board or regulator L, which is set transversely to the tail-frame, as shown, so that the breeze or other aerial force which drives the wind-wheel will strike the wind-board obliquely on the broad side when it is in its lowered position and the blades set to drive the mill. When thus set or allowed to drop, the condition of the parts described as connecting the said board with the fan-blades is such as to cause said blades to assume the oblique position requisite for driving the mill. This is brought about by the jointed rods J being drawn backward, causing a consequent retraction of the connected collar and spider I H and a turning of the blades G upon their hinged centers on the spokes or radial arms *f*, through the medium of links *h* and loops *g*. So long as the board L remains in the lowered position the blades G will continue set for action and the mill will be operated.

In event of the gale or wind becoming so severe as to overcome the gravity of board or regulator L, said part L will be elevated, and this elevation will cause a gradual change of position of the blades or leaves, giving less and less obliquity to the wind, and when they are brought to meet it directly edgewise, when the action of the mill will cease. This is effected by the rods J being thrust forward and the consequent forward movement of the spider and collar, whereby the blades will be turned into the edgewise position before described through the medium of the links *h* and loops *g*. When the wind drops again, the board will lower by gravity and the blades be again turned to catch the breeze. The regulator is also controlled by a cord, M, which is attached to it and passed over a pulley, *m*, in the tail-frame, thence down over pulley *m'* in the shaft or tube B, and down said shaft or tube and out, to be seized by the hand of an operator and caused to throw the wind-board into different positions to regulate the speed of the mill. The jointed rods J J, being straight and working squarely against the collar I, press the same outward or draw it back in a direct even position, thereby preventing all uneven wabbling movement in the swivel-joint and vastly reducing the amount of friction at this point, rendering the movements of the device even and easy.

Where the rods J pass through the arms or flange *i* of collar they are screw-threaded and fitted with jointed clamp-nuts *j**, which take into the threaded portion of the rods J and hold them securely. By this means also the rod J may be shortened or lengthened, as desired, to cause the action upon the hinged blades, resulting from the movements of regulator L, to be greater or less.

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

In a wind-mill, the combination, with the movable blades and spider connected and revolving therewith, of the collar described, consisting of two parts forming the eye and arms, one part being the complement of the other on each side and bolted together over the sleeve of the spider, and the wind-board having connections to the collar by means of rods, as described, and clamp-nuts placed over the ends of said rods to hold them in the collar and afford ready means for adjusting the rods, as set forth.

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

ANDREW WILSON LANE.

Witnesses:
J. M. TREMAIN,
E. R. DODGE.