

No. 608,027.

Patented July 26, 1898.

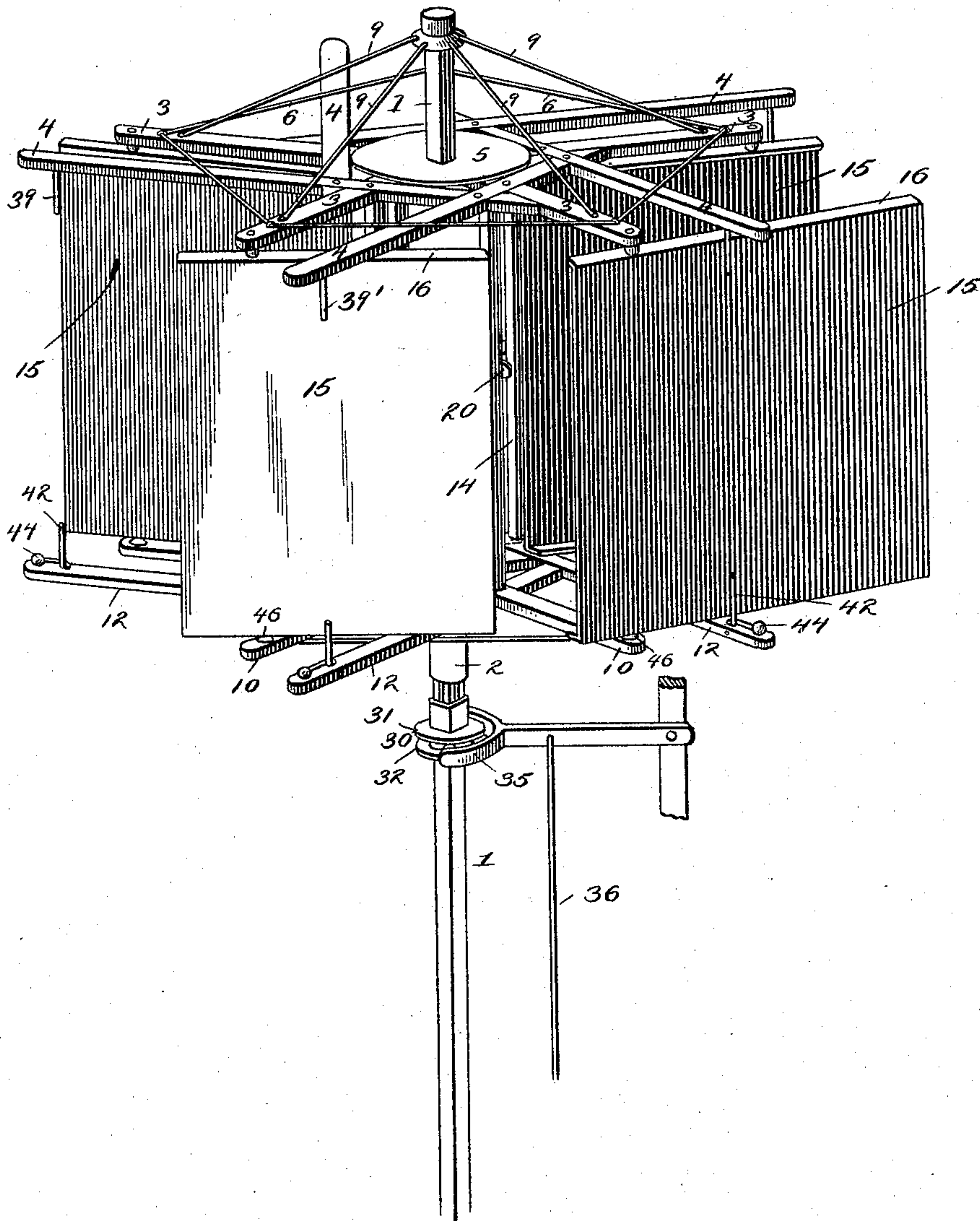
A. M. CARLSON.  
WINDMILL.

(Application filed June 26, 1897.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



WITNESSES:

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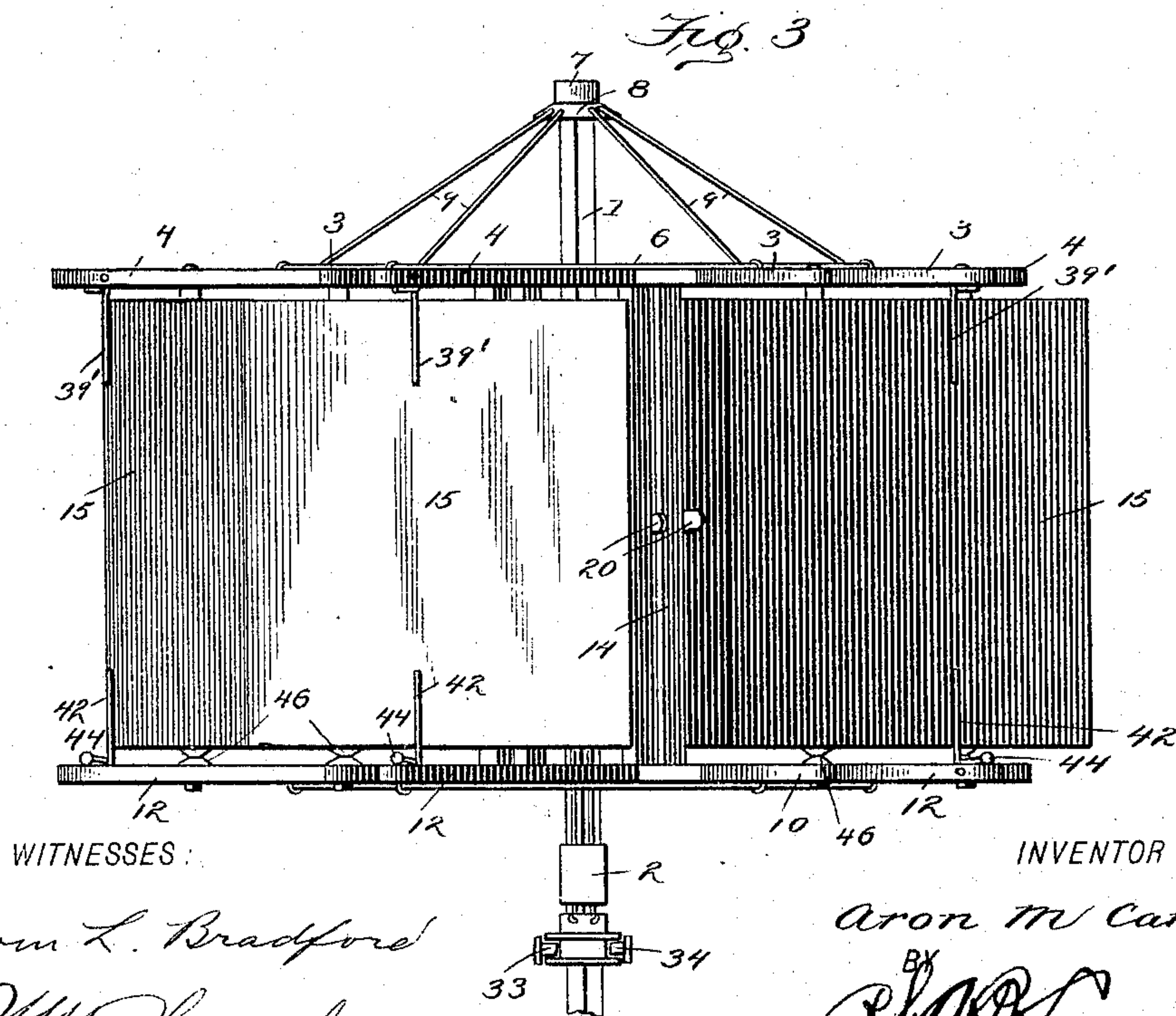
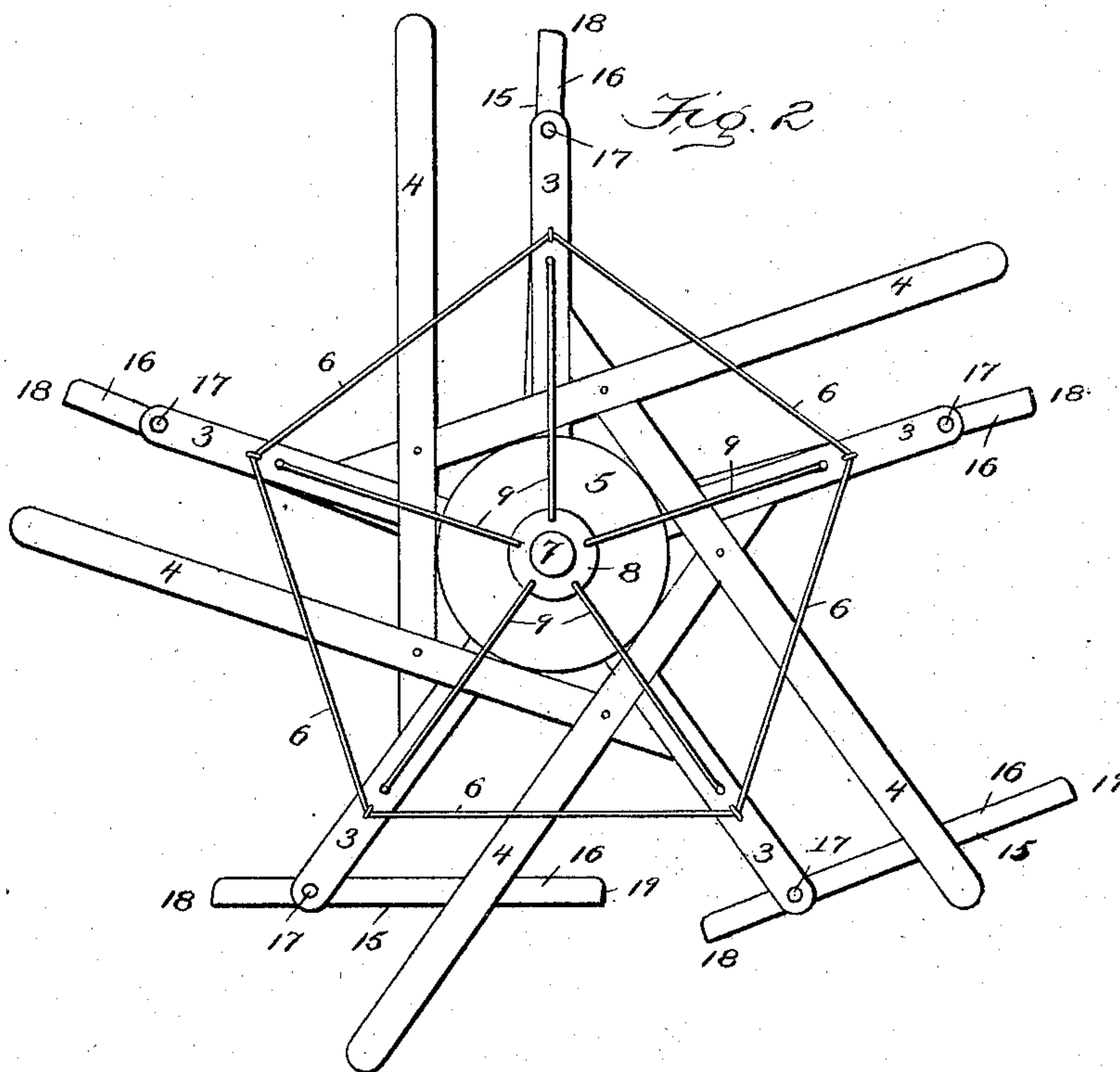
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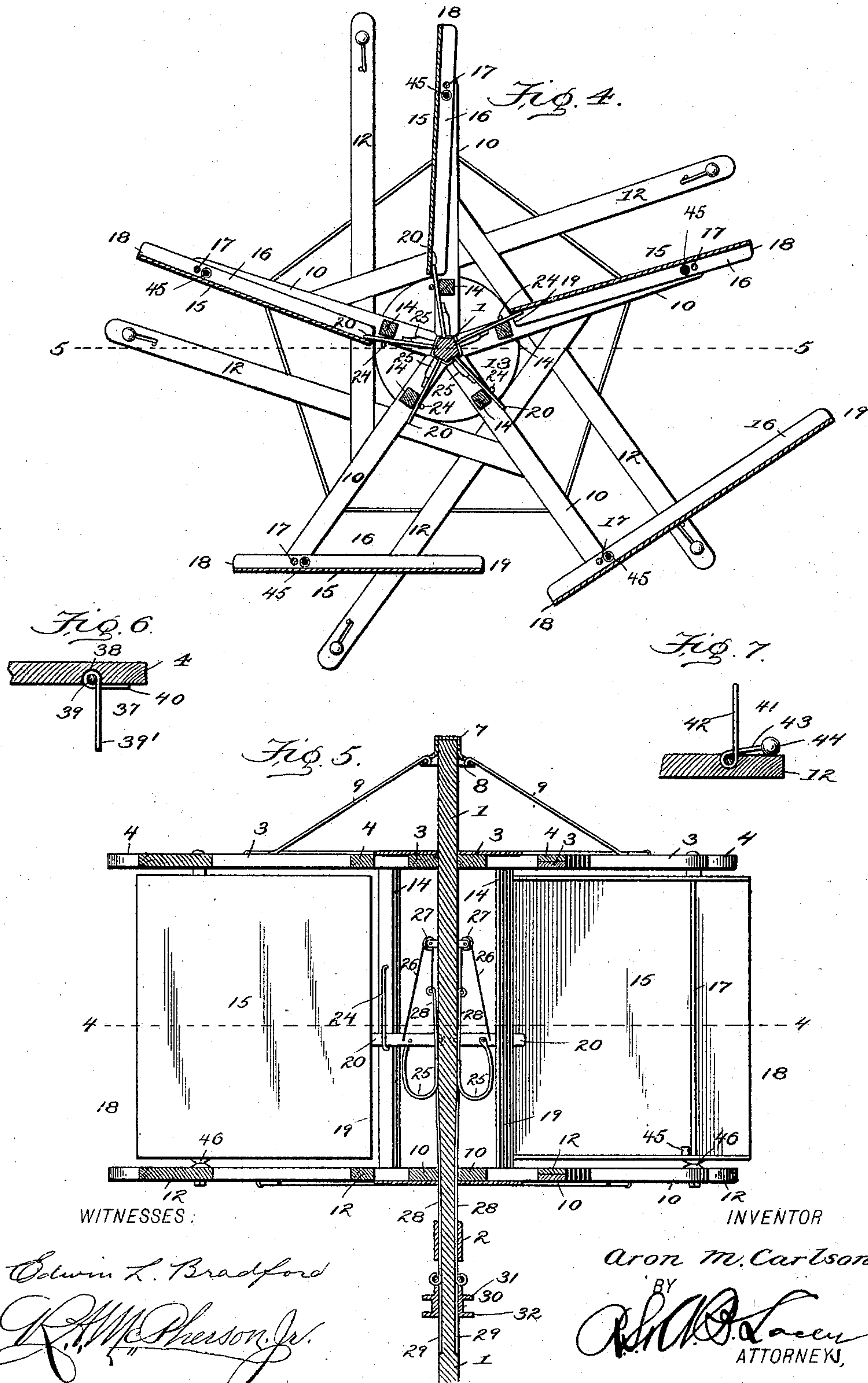
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3 Sheets—Sheet 3.





# UNITED STATES PATENT OFFICE.

ARON M. CARLSON, OF PIERRE, SOUTH DAKOTA.

## WINDMILL.

SPECIFICATION forming part of Letters Patent No. 608,027, dated July 26, 1898.

Application filed June 26, 1897. Serial No. 642,516. (No model.)

*To all whom it may concern:*

Be it known that I, ARON M. CARLSON, a citizen of the United States, residing at Pierre, in the county of Hughes and State of South Dakota, have invented certain new and useful Improvements in Windmills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as it appertains to make and use the same.

My invention relates to improvements in windmills; and the object is to produce a simple, effective, and durable mill of this class.

To this end the novelty consists in the construction, combination, and arrangement of the same, as will be hereinafter more fully described, and particularly pointed out in the claims.

In the accompanying drawings the same reference characters indicate the same parts of the invention.

Figure 1 is a perspective view of my improved windmill as it appears in operation. Fig. 2 is a plan view of same; Fig. 3, a side elevational view of the windmill as it appears when out of operation. Fig. 4 is a horizontal section on line 4 4 of Fig. 5. Fig. 5 is a vertical section on line 5 5 of Fig. 4. Fig. 6 is a detail view of the outer end of one of the upper guard-braces, showing the gravity retaining-dog; and Fig. 7 is a similar view of one of the corresponding lower guard-braces, showing the pivoted trigger in place.

1 represents a vertical polygonal shaft provided with cylindrical journals 2 2, which are mounted in suitable bearings fixed in the usual tower. (Not shown.)

3 3 represent a series of radial arms, and 4 4 a corresponding series of guard-braces arranged parallel with said arms and in the same horizontal plane near the end of the shaft.

5 represents a disk brace encompassing the upper end of the shaft and to which the inner ends of the radial arms are fixed.

6 represents a brace-rod secured to the upper faces of the radial arms and the guard-braces and extending around the entire series to assist in bracing their outer ends to retain the same in their relative positions.

7 represents a cylindrical protecting-cap encompassing the upper end of the vertical shaft, and its lower edge terminates in a conical flange 8, from which a series of diverging brace-rods 9 9 extend to the outer ends of the radial arms 3 3.

10 10 represent a corresponding series of radial arms arranged vertically below the arms 3 3, and 12 12 represent the corresponding guard-braces extending parallel with and in the same horizontal plane as the arms 10 10.

13 represents the disk brace encompassing the shaft 1 and to which the inner ends of the radial arms 10 10 are fixed.

14 14 represent a series of vertical braces arranged concentrically about and parallel with the shaft 1, their upper and lower ends being rigidly fixed to the inner ends of the upper and lower radial arms 3 and 10, respectively.

15 15 represent the wind-sails, each comprising a rectangular plate formed with parallel horizontal flanges 16 16, having a bearing on a vertical rod 17, fixed in each pair of outer ends of the corresponding upper and lower radial arms 3 10.

18 represents the front edge, and 19 the rear edge, of the sail, and each sail is pivoted to its respective rod about one-quarter of its length from its front edge 18, after the manner of a wind-vane, so that when unconfined the entire series will present their front edges to the wind, in which position they offer no resistance, and consequently the mill remains stationary.

20 20 represent a series of radial horizontal levers, each one of which is fulcrumed at its rear end to a bolt 21, fixed in the shaft 1 about midway between the upper and lower series of arms 3 10, and the outer free end of each lever 20 extends through a vertical guide-brace 24, one of which is fixed to the side of each of the braces 14, and the projecting end of each lever extends into the path of the rear edge 19 of its corresponding sail.

A leaf-spring 25 is fixed at its inner end to the shaft, immediately below each lever, and its free end is pivoted to said lever about midway of its length to normally hold it in a horizontal position with its end projecting into



the path of the rear edge of the sail, as hereinbefore described.

26 represents a flexible cord or cable, one end of which is fixed to said lever, and its opposite end extends upwardly and rearwardly to a pulley 27, fixed on the shaft, thence downwardly, where it is secured to the upper end of one of a series of vertical rods 28, which extends downward through a vertical groove 29 in the shaft 1, and its lower end is secured to the upper edge of a vertical sleeve 30, encompassing said shaft and revolving with it.

31 32 represent two annular parallel flanges formed integral with the sleeve 30, between which project the oppositely-disposed studs 33 34 on the bifurcated end of a lever 35, fulcrumed in a bracket fixed at a convenient point on the tower-frame, and from said lever 35 a hand-rod 36 extends downward a suitable distance, where it may be conveniently manipulated by a person standing on the ground, and its operation is such that in its normal position the levers 20 remain horizontal and form a stop for the sails to limit their movement in one direction when the mill is in operation; but if the rod 36 be drawn down it carries the sleeve with it, and, through the mechanism just described, raises the levers 20 out of the path of the sails and allows them to swing clear.

37 37 represent a series of triggers, one of which is pivoted on a bolt 39 in the parallel walls of a slot 38 in the outer end of each of the guard-braces 4 4. Each of these triggers is formed with a depending arm 39 and a horizontal arm 40, resting against the under face of the guard-brace 4, to form a stop for the depending arm 39, which in turn acts as a limit-pin for the outer end of the pivoted sail. If, however, the sail should swing entirely around its rod and strike the opposite side of the trigger, the edge of the sail will raise it and pass and the trigger will fall back to its normal position. A somewhat similar trigger 41 is pivoted to the outer end of each of the lower guard-braces 12 12, with its vertical arm 42 extending into the path of the sail and its horizontal arm 43 provided with a weight 44 to normally hold the arm 42 in a vertical position to limit the outward movement of the sail and at the same time allow the sail to swing inward from the opposite side when occasion requires.

45 represents oil-cups secured upon the sails 15, and 46 bearing-washers encompassing the rods 17 and secured to the sails and radial arms. The oil-cups feed oil to the said washers.

Although I have specifically described the construction and relative arrangement of the several elements of my invention, I do not desire to be confined to the same, as such changes or modifications may be made as clearly fall within the scope of my invention without departing from the spirit thereof.

Having thus fully described my invention, what I claim as new and useful, and desire to secure by Letters Patent of the United States, is—

1. In windmills, the combination of a shaft 1, the upper and lower series of arms 3 10 radiating therefrom, the upper and lower series of guard-braces 4 12 extending parallel with said arms, wind sails or vanes 15 each pivoted adjacent their outer ends to the corresponding pair of upper and lower radial arms, a trigger on the outer end of each upper guard-brace 4 having a pivot loop or eye fulcrumed on a bolt 39, a stop-arm 40 adapted to abut against the brace and a depending arm 39, adapted to project into the path of the outer end of the sail to limit its movement in one direction, a trigger 41 on the outer end of each lower guard-brace 12 having a pivot-eye fulcrumed to a bolt, a vertical arm 42 and a weighted stop-arm 43 to normally hold the arm 42 in position to limit the outward movement of the sail, while allowing it to swing inward, pivoted levers on the shaft adapted to project into the path of the inner ends of the sails to limit their movement in the reverse direction, springs to normally hold said levers projected, and means for retracting the levers against the tension of said springs, substantially as described.

2. In windmills, the combination of a shaft, arms radiating therefrom, guard-braces extending parallel with said arms, wind sails or vanes pivoted adjacent their outer ends to said radial arms, stop devices on the outer ends of the guard-braces to limit the movement of the sails in one direction, pivoted levers on the shaft adapted to project into the path of the inner ends of the sails to limit their movement in the reverse direction, springs to normally hold said levers projected, cords or cables 26 attached at one end to said levers and passed over pulleys 27 on the shaft, a sleeve on said shaft, rods connecting the opposite ends of said cords or cables and sleeve, and means acting on the said sleeve and rods to retract said levers against the tension of the springs, substantially as described.

3. In windmills, the combination of a shaft, arms radiating therefrom, guard-braces extending parallel with said arms, the vertical braces 14 arranged concentrically about the shaft and carrying guide-braces 24, wind sails or vanes pivoted adjacent their outer ends to said radial arms, stop devices on the outer ends of the guard-braces to limit the movement of the sails in one direction, pivoted levers on the shaft having their free ends operating in said guide-braces 24 and adapted to project into the path of the inner ends of the sails to limit their movement in the reverse direction, springs 25 to normally hold said levers projected, cords or cables 26 attached at one end to said levers and passed over pulleys 27 on the shaft, a grooved sleeve



30 on said shaft, rods 28 connecting the opposite ends of said cords or cables and sleeve, a pivoted lever 35 having a bifurcated end provided with studs 33 34 projecting into the  
5 groove of said sleeve, and a pull-rod 36 connected with said lever 35, substantially as described.

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

ARON M. CARLSON.

Witnesses:

THOMAS DRAKE,  
S. C. YARNELL.