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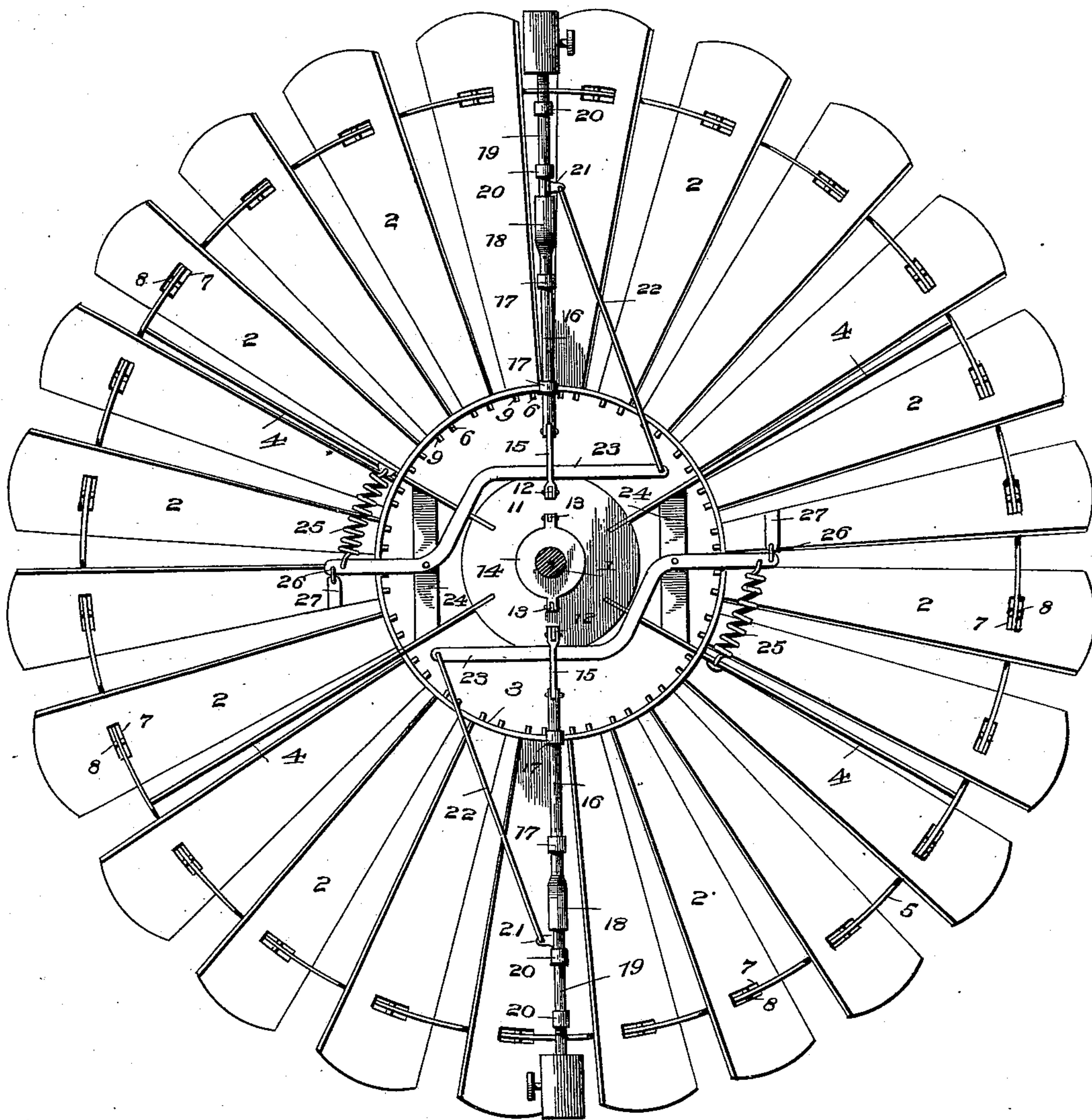
2 Sheets—Sheet 1.

F. LOCKE & D. KENNEDY.
WIND WHEEL.

No. 561,117.

Patented June 2, 1896.

Fig. 1.



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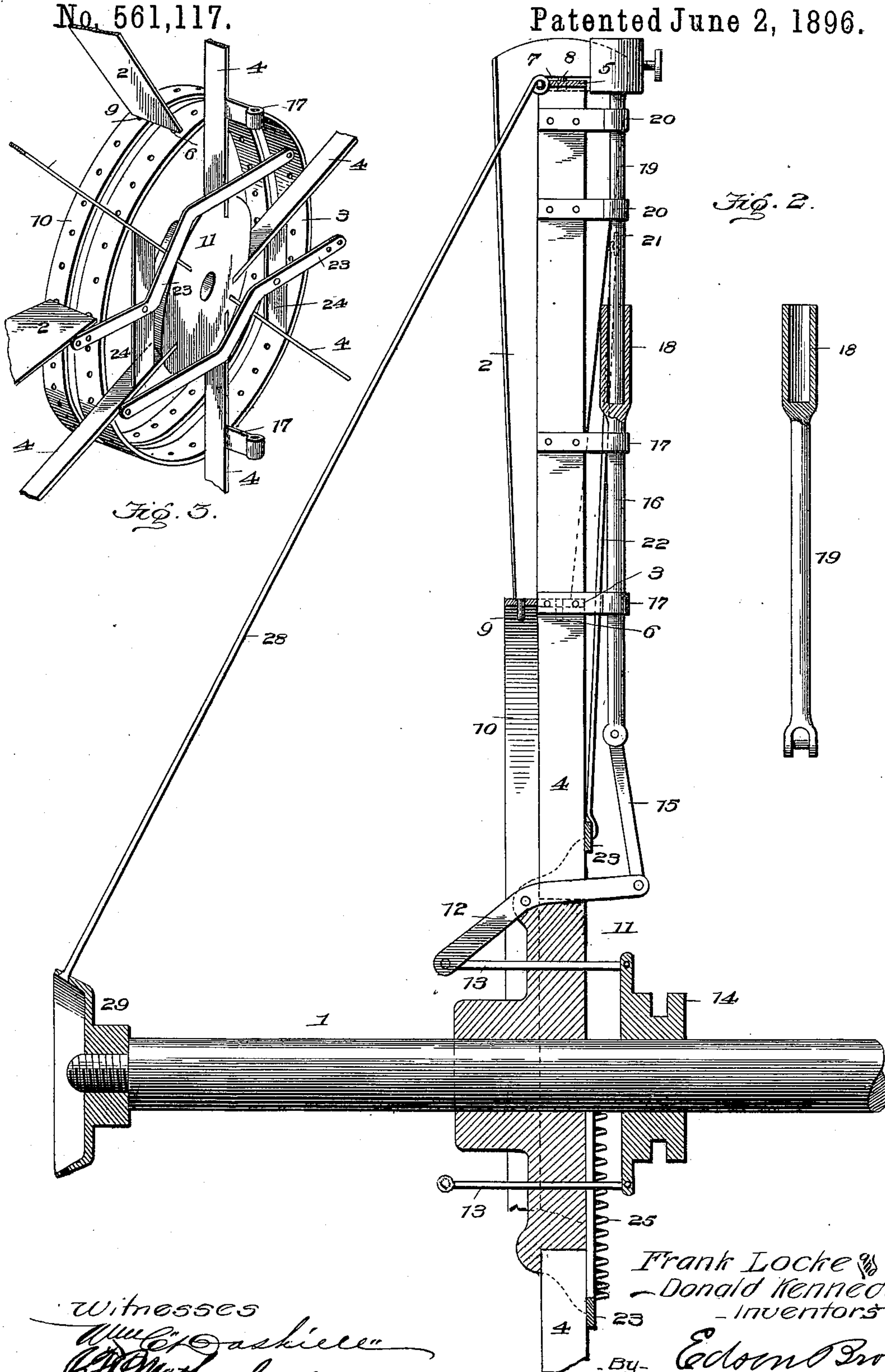
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WIND WHEEL.

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UNITED STATES PATENT OFFICE.

FRANK LOCKE AND DONALD KENNEDY, OF SILVER CREEK, MINNESOTA.

WIND-WHEEL.

SPECIFICATION forming part of Letters Patent No. 561,117, dated June 2, 1896.

Application filed July 25, 1895. Serial No. 557,149. (No model.)

To all whom it may concern:

Be it known that we, FRANK LOCKE and DONALD KENNEDY, citizens of the United States, residing at Silver Creek, in the county of Wright and State of Minnesota, have invented certain new and useful Improvements in Wind-Wheels; and we do hereby 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.

This invention relates to wind-wheels of that class wherein the blades or fans are pivoted in such manner that variations in the pressure of the wind tends more or less to swing them out of direct impact position or edge to the driving-current with a resistance in the form of spring-actuated governors; and it consists of the construction, arrangement, and combination of the several parts, in general and specifically, as will be more fully described and claimed.

The object of the invention is to provide an improved arrangement of parts for controlling the blades or fans by the governors, so as to secure an extreme sensitiveness to the variations in the wind, and thereby automatically regulate the running of the wheel in a changeable wind, with a consequent uniformity of applied motion.

The object set forth is attained by the construction shown in the accompanying drawings, which may be varied within the scope of mechanical equivalency without departing from the nature or spirit of the invention, and wherein—

Figure 1 is a front elevation of a wind-wheel embodying the features of the invention. Fig. 2 is a central vertical longitudinal section of the wheel. Fig. 3 is a detail perspective view of the central part of the wheel.

Similar numerals of reference are used to indicate corresponding parts in the several views.

Referring to the drawings, the numeral 1 designates the main shaft or axis of the wheel. The wheel itself, which carries the blades or fans 2, comprises an inner ring 3, to which are attached radially-extending braces 4, having their outer terminations secured to an outer ring 5, concentric with said ring 3. The said inner ends of the blades or fans 2 are piv-

otally attached to the inner ring 3 by pivots or pintles 6, which depend loosely through openings in said ring 3, and as a whole are radially arranged with reference to the main shaft or axis 1. Near the outer ends of said blades or fans 2 a slot 7 is formed in each, whose greatest length extends transversely of the width of each of the blades and through which the outer ring passes. The said slots 7 are of such dimension as to permit the blades or fans to have free movement in opening or closing and thereby facilitate an unimpeded operation of the parts of the mechanism, which will be hereinafter referred to.

Journalled in the ring 5 and extending vertically across the slots 7 are pivots or pintles 8, one being supplied to each blade or fan, and an outer pivotal connection is thereby secured, which allows a portion of each blade or fan at its outer end to project beyond the ring 5 and being free to receive the unbroken impact of the wind at this point. The inner pivots or pintles 6 are situated nearer one edge of each blade or fan, and at or about the same distance from the opposite edge of each blade or fan is a similarly-positioned pivot 9, which projects through an opening in a ring 10, contiguously arranged to the ring 5, and has a semirotating movement when the parts are in operation. The pivots or pintles 6 and 9 may be formed by the terminating ends of a U-shaped frame or plate secured to each blade or fan or otherwise constructed, so long as each pair of pivots or pintles on each blade or fan extend radially inward in parallel planes. When in normal operating position, it will be understood that the blades or fans will stand obliquely to radial planes projected straight from the axis, and the pivots or pintles 6 and 9 will in like manner stand obliquely. This is to compensate for the squaring of the blades or fans, at which time the ring 10 moves around and the said pivots or pintles assume similar planes. The braces 4 extend inwardly and are secured to a central hub 11, through which the main shaft or axis 1 is keyed or otherwise connected, and substantially in the same longitudinal plane as said shaft are angle-arms 12, which are movably extended and have their lower outer ends connected by means of link-rods 13, which also pass through

said hub 11 and are attached to a box-collar 14, which has bearing on the said shaft or axis to accomplish a well-known purpose. The inner upper ends of said arms 12 are
 5 connected by link-rods 15 to the lower ends of rods 16, which move in guides 17, attached to a portion of the braces 4 at regular and proper intervals. The outer ends of the rods
 10 16 are formed with sockets 18, in which are fitted the inner ends of weight-rods 19, also mounted and moving in guides 20, attached to the braces 4, to which the guides 17 are connected. The arms 12 and link-rods 13
 15 have sufficient play in the hub 11 to permit of their proper function, and on the inner portion of the weight-rods 19 are formed or attached ears 21, to which the outer ends of link-rods 22 are connected. The inner ends
 20 of the rods 22 are movably connected to the inner upper ends of angle-levers 23, arranged in planes parallel with the face of the hub 11 and pivoted to short braces 24, extending transversely across and secured to adjacent
 25 braces 4. The outer ends of the levers 23 have springs 25 attached thereto and to an adjacent brace 4 and also provided with link-rods 26, which have their opposite ends connected to lugs 27, secured to a contiguous
 30 blade or fan of the wheel. The springs 25 tend to return the levers 23 to their normal position, and the link-rods 26 assist in squaring the blades or fans.

The wheel may be further strengthened by
 35 brace-rods 28, extending from the outer ring 5 to a cap 29 on the outer end of the shaft, and it will be understood that any preferred form of tail-vane will be employed, and such other appurtenances as are requisite for the proper
 40 operation of the pump-rod and which are well known in the art. The action of the said weighted rods is such that during a moderate wind they will, by reason of their gravity and centrifugal force caused by the revolution of
 45 the wheel, increase the speed of rotation of the wheel within a safe limit; but during the prevalence of high winds or a gale they will, by reason of a too-great velocity of the wheel, be thrown outward from the rim 5. This
 50 outward movement of the weighted rods and the consequent movement of the connecting link-rods 22 will actuate the levers 23; and these levers 23, acting against the springs 25, through the link-rods 26, will feather the
 55 blades or fans of the wheel, and consequently reduce the speed. The box-collar 14 is adapted to be connected with an unshipping device of any usual or preferred construction, and this box-collar, being connected through
 60 the links 13, levers 12, and links 15, can be operated to adjust the rods 16 radially any desired distance. The weighted rods 21 are
 65 loosely connected by their stems fitting in the sockets 18 of the radial rods 16, and said weighted rods are connected by the links 22 with the governor-levers 23 to control the feathering movements of the blades or fans.

The rods 16 are thus in a measure independent of the governing mechanism for the blades or fans, and the rods 16 can be adjusted by the box-collar to control the inward radial
 70 movements of the weighted rods, so as to secure greater sensitiveness of the wheel to the action of the wind. The springs 25 return the levers 23 to their normal position and resist the violent jarring effect on or vibration
 75 of the wheel, thereby serving as a cushion. The said springs also tend to hold the blades or fans in position, and are of sufficient strength to overcome the face pressure of the wind.

Various minor changes could be made in
 80 the arrangement of the several parts and substituted for those shown and described without sacrificing the invention.

Having thus described the invention, what is claimed as new is—
 85

1. The combination of a shaft, the fixed and loose rings, the outer ring, the radial fans or blades provided with pivots fitted in the rings, the radial rods 16 guided on rigid arms of the wheel, a box-collar fitted on the wheel-
 90 shaft and connected by intermediate devices with the rods 16, the weighted rods 21 also guided in rigid arms of the wheel and having a loose or sliding connection with the rods 16, the levers 23 having connections with the
 95 blades or fans, and rods 22 connecting the levers 23 and the weighted rods, substantially as and for the purposes described.

2. In a wind-wheel, the combination of the blades or fans, a pair of weighted rods mov-
 100 ably held by said wheel, angle-levers located at the center of the wheel to which said weighted rods are connected, springs attached to opposite portions of said angle-levers, and link-rods attached to the lower outer ends of
 105 said angle-levers and to the adjacent blades or fans, substantially as described.

3. In a wind-wheel, the combination of a wheel having movable blades or fans and provided with slots near their outer ends and pair
 110 of pivots at the inner end of each, an outer ring passing through said slots, pivots extending across said slots and through the outer ring, an inner ring to receive a portion of the pairs of pivots at the inner ends of the
 115 blades or fans, an adjacent semirotating inner ring to receive the remaining portions of the said pairs of pivots, weighted rods movably carried by the wheel, angle-levers attached to the said rods, springs connected to
 120 said levers and a part of the wheel, link-rods also attached to the levers and a part of the blades or fans, and means for connecting the said rods to the shifting mechanism, substantially as described.
 125

In testimony whereof we affix our signatures in presence of two witnesses.

FRANK LOCKE.

DONALD KENNEDY.

Witnesses:

WALTER FRANTZEN,
 S. J. POWNELL.