

No. 619,627.

Patented Feb. 14, 1899.

A. J. SMALLEY.
WINDMILL.

(Application filed Aug. 2, 1898.)

(No Model.)

2 Sheets—Sheet 1.

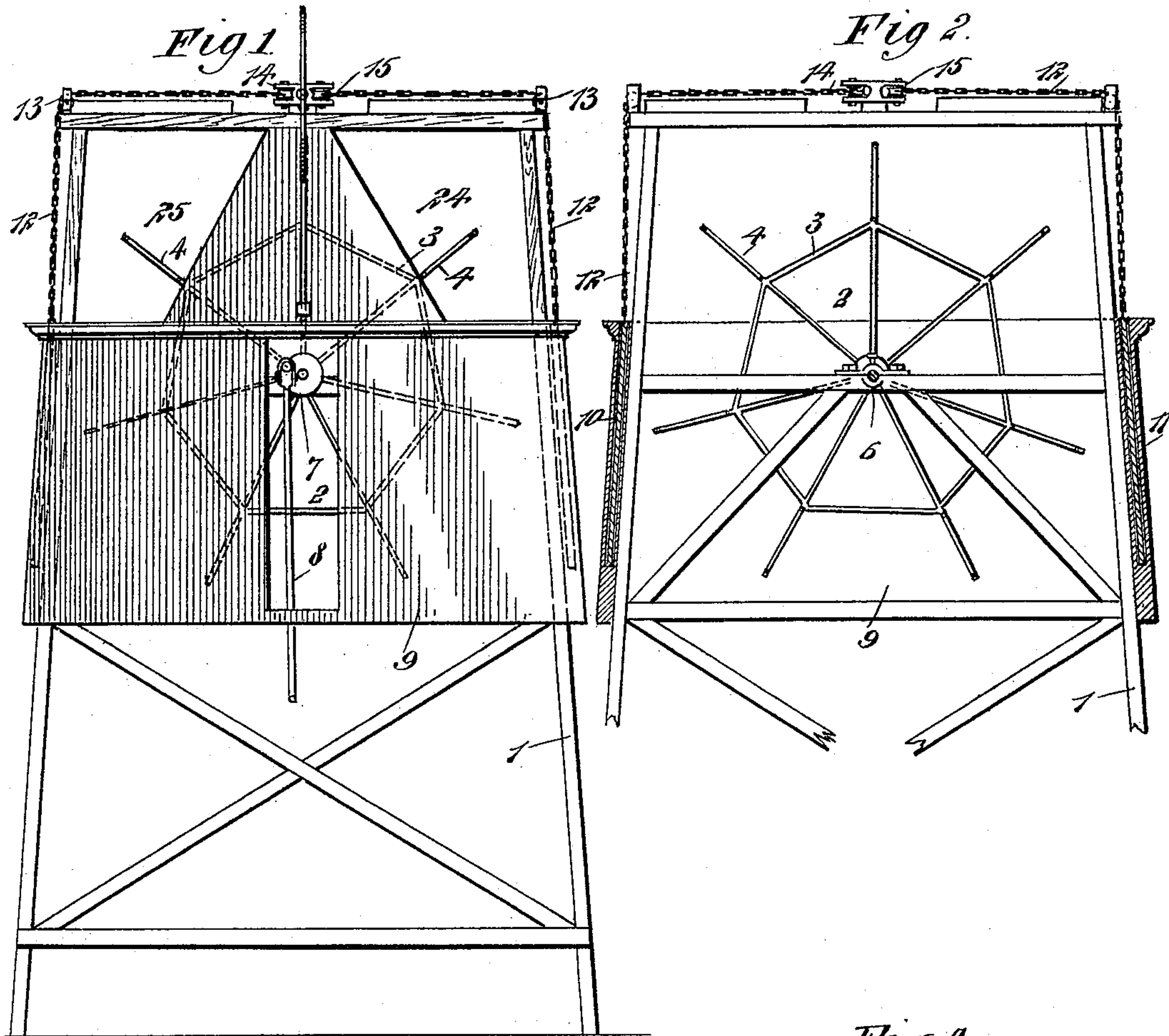
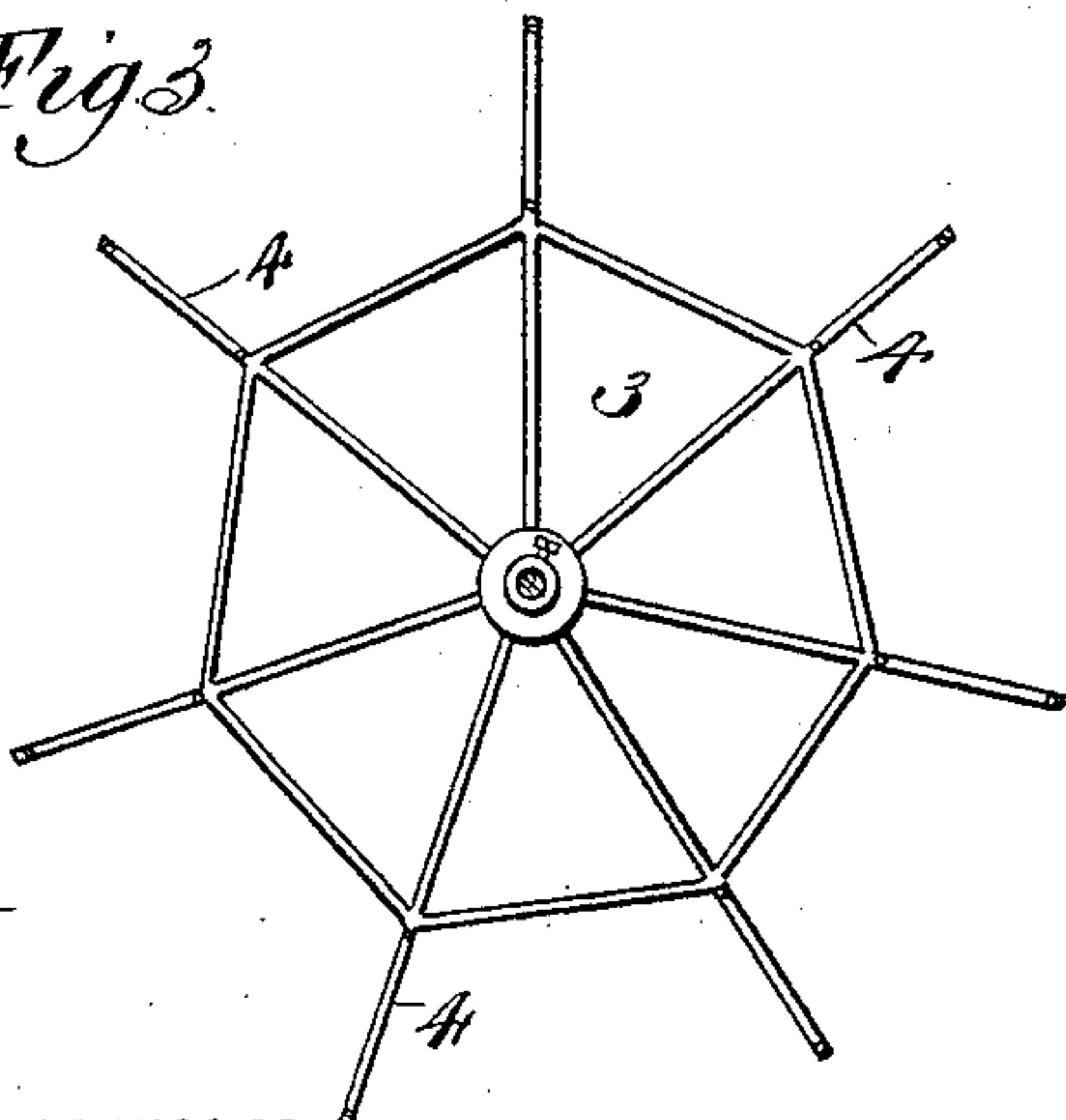
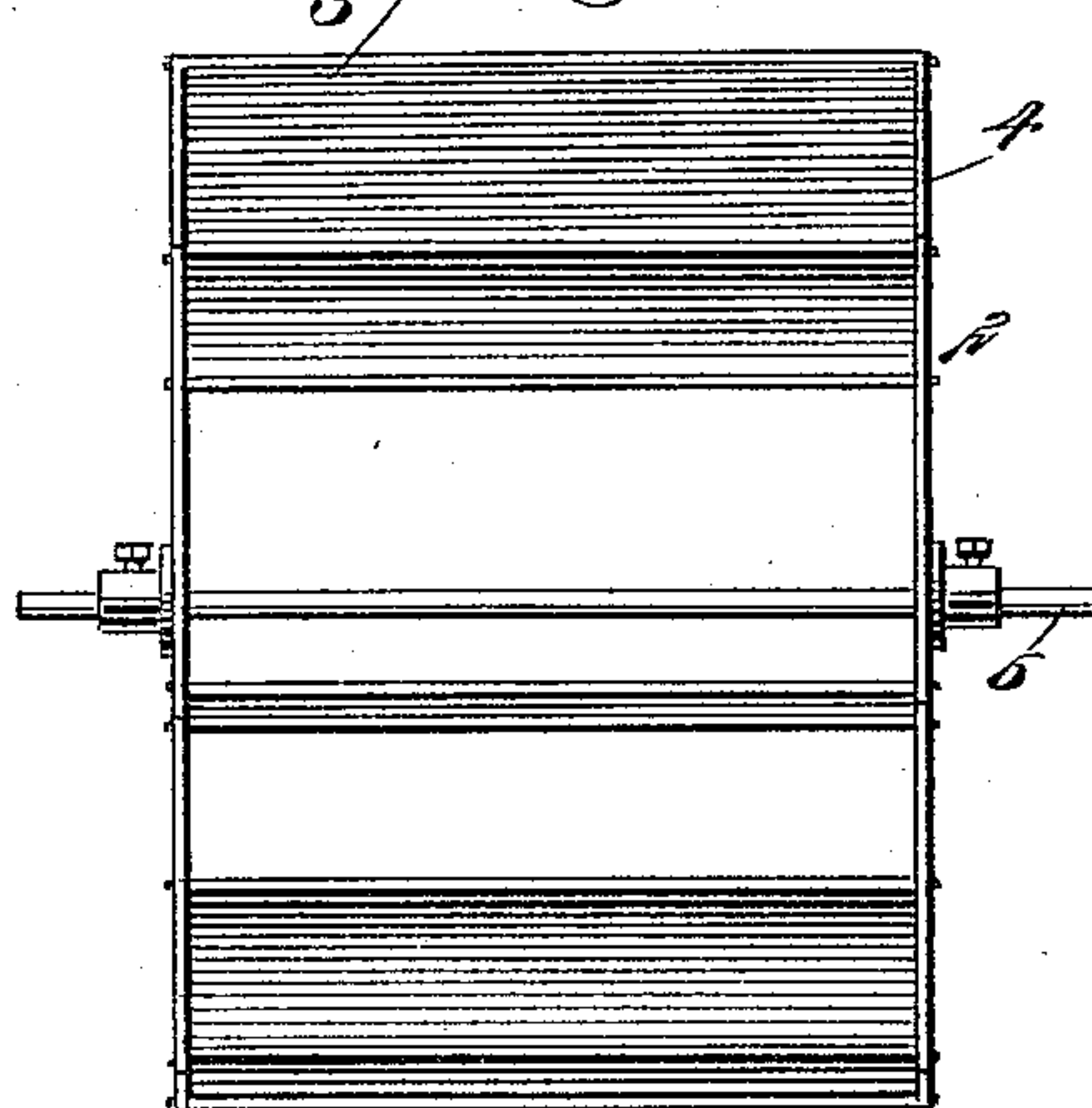


Fig 3.



WITNESSES:
Ralph
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Fig 4.



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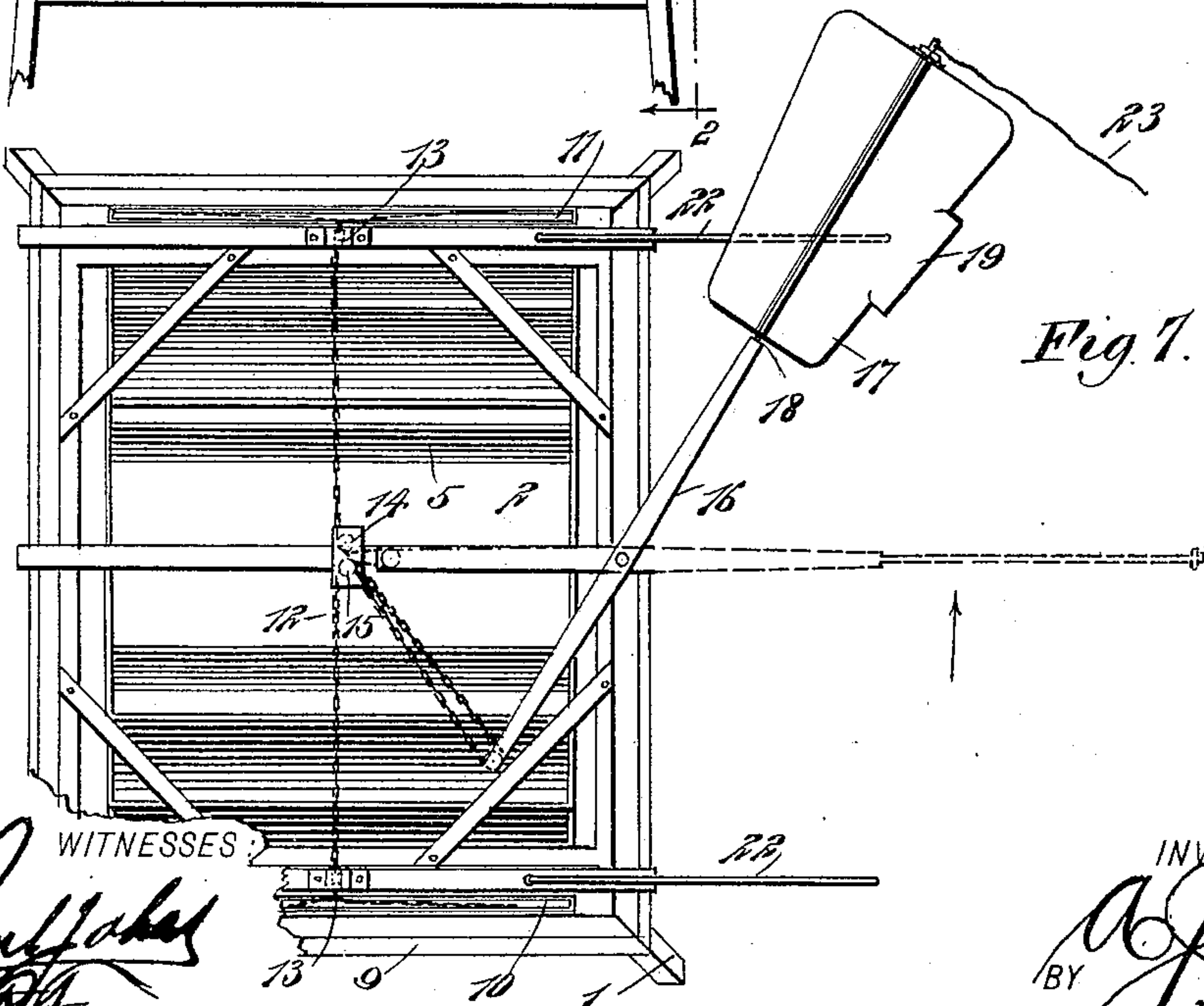
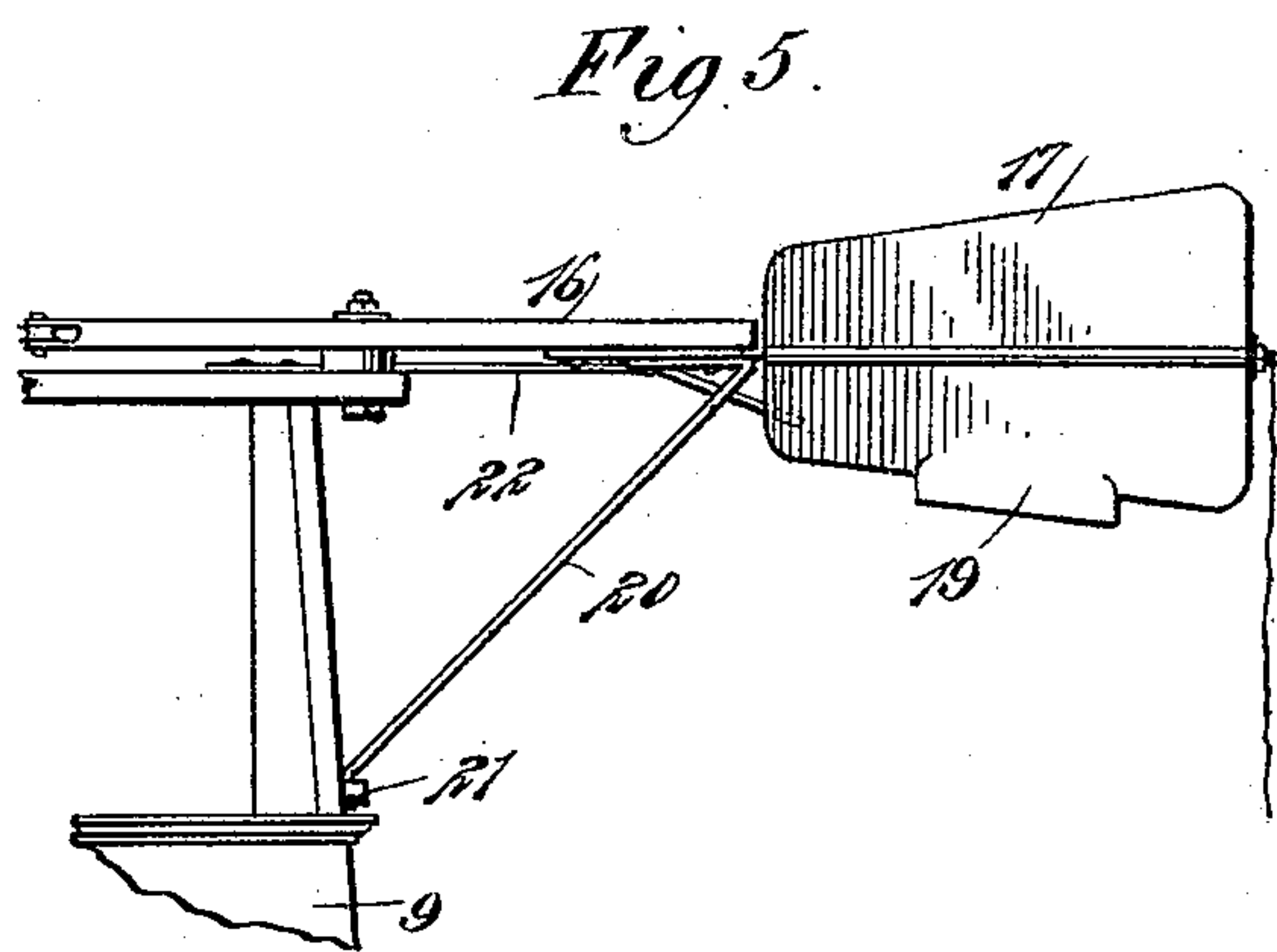
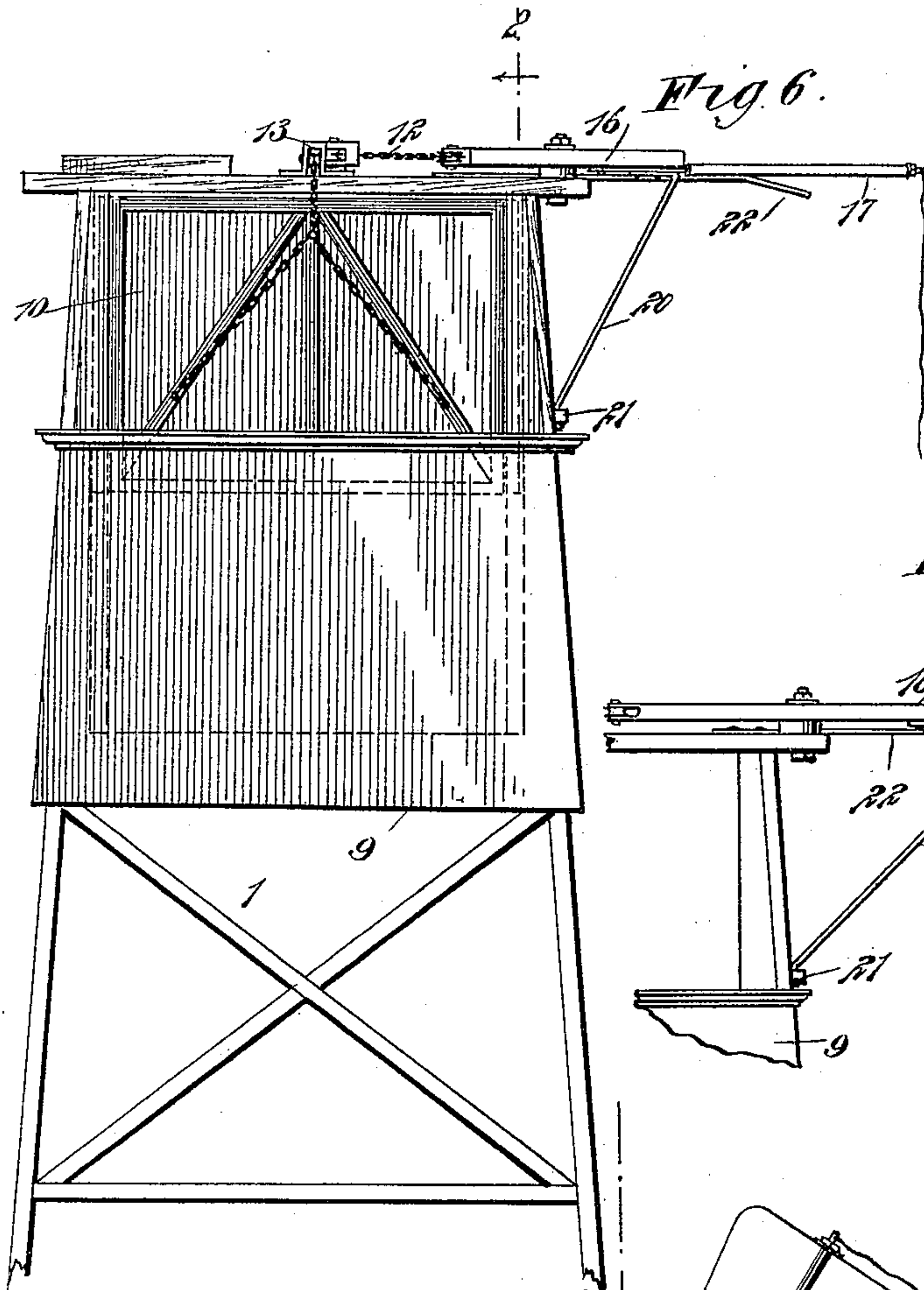
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2 Sheets—Sheet 2.



WITNESSES
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UNITED STATES PATENT OFFICE.

ALBERT J. SMALLEY, OF EL RENO, OKLAHOMA TERRITORY.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 619,627, dated February 14, 1899.

Application filed August 2, 1898. Serial No. 687,560. (No model.)

To all whom it may concern:

Be it known that I, ALBERT J. SMALLEY, of El Reno, in the county of Canadian and Territory of Oklahoma, have invented a new and
5 Improved Windmill, of which the following is a full, clear, and exact description.

This invention relates to improvements in windmills; and the object is to provide a simple automatically-actuated means for regulating the admission of wind to the wheel, so that the wheel will maintain a regular speed of rotation during variations in wind velocity, and, further, to so construct the parts that in violent winds the wheel will be entirely cut
15 off from direct wind-pressure.

I will describe a windmill embodying my invention and then point out the novel features in the appended claims.

Reference is to be had to the accompanying
20 drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of a wind-wheel embodying my invention. Fig. 2 is a sectional elevation on the line 2 2 of Fig. 6. Fig. 3 is an end view of the wheel-frame. Fig. 4 is a plan view of the wheel. Fig. 5 is a detail view showing the position of the governor-vane when the wheel is in operation.
30 Fig. 6 is an elevation showing the position of the parts while the wheel is not in operation, and Fig. 7 is a plan view thereof.

Referring to the drawings, 1 designates a tower of any suitable construction and in the
35 upper portion of which is mounted the wind-wheel 2. This wind-wheel comprises spiders or end frames 3, having radial arms 4, to which the blades 5 are attached. These blades 5 preferably consist of galvanized iron having
40 the inner and outer edges turned around the wire rods, the ends of which project to engage in openings formed in the arms 4. The frames or spiders 3 are connected to a shaft 6, to one end of which is attached a crank 7
45 for operating the pumping or other rod 8.

A boxing 9 extends entirely around the tower to cut off the lower portion of the wheel from wind force, as it is designed that the wind shall only strike against the upper portion of the wheel. Above this boxing and in
50 line with the direction of rotation of the

wheel the tower is wholly open at the opposite sides. These openings, however, are to be more or less automatically closed by doors or closures 10 11, mounted to slide vertically in
55 walls of the boxing 9. A chain 12 has its ends connected to the closures 10 and 11, and the portions of the chain over the closures extend over pulleys 13, mounted on the top of the tower, and from these pulleys a chain extends
60 around the pulleys 14 15, supported in the center of the tower, and the central portion of the chain engages with a pulley on the end of the governor-shaft 16, mounted to swing horizontally on the upper end of the tower. 65

Mounted to swing on the outer end of the governor-rod 16 is a vane 17. As here shown, this vane is mounted to oscillate or rock on a rod 18, connected to the rod 16. For the sake of lightness the rod 18 may be tubular—
70 that is, it may consist of gas-pipe or the like. To hold the vane practically steady against the wind-pressure while the wheel is in operation, I preferably weight the lower edge of the vane, as indicated at 19. To better support the weight of the vane, I extend a brace-rod 20 from the governor-rod 16 downward
75 and inward and seat its lower end in a bearing 21, attached to the tower. Extended from the top of the tower at opposite sides are vane-shifting rods 22, designed to throw the vane out of operative position, as will be hereinafter described. 80

In operation in light winds the vane 17 will remain practically quiet, and consequently
85 the closures 10 and 11 will remain in their lowermost position. Should the wind increase, however, the vane will be deflected to move the governor-rod 16 on its pivot, causing it to draw both the closures 10 and 11 upward, thus
90 cutting off a portion of the wind to the wheel. As the wind lowers the vane will be drawn back to its normal or central position by the weight of the closures moving downward. Should a high wind occur, the vane will be
95 forced sufficiently to one side to cause it to engage with one of the rods 22, which will cause the vane to be turned with its edge to the wind, as indicated in Fig. 6. At this time the wheel will stop operations and will
100 remain out of operation as long as the vane rests upon the rod 22, as indicated.

For convenience in stopping the operation of the wheel when it is desired to stop the machinery the vane may be thrown over onto either one of the rods 22 by drawing upon the
5 cord 23, which extends from the outer end of the vane, or rather from the rod 18 to the ground. At the sides at right angles to the sides having the openings in which the closures are designed to operate the tower has
10 openings 24 25, through which quartering-wind may enter to operate the wheel.

A great advantage of this mill is that it will be regulated by the closures to run at an even rate of speed as well in a twelve-mile as in a
15 thirty-mile wind without increasing the momentum of the wheel. The harder the wind blows the more it presses the vane around and the higher it lifts the closures until the wind only strikes the top edge of one wheel-
20 blade, and if the wind is too violent the closures rise to the top of the tower and the mill stops.

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

1. In a windmill, a tower, a wind-wheel mounted in the upper portion thereof, a boxing for closing off the wind from the lower portion of the wheel, closures for regulating
30 openings at opposite sides of the tower, a governor-rod, a vane on the rod, and connections between the governor-rod and closures, the rod and connections being so arranged as to cause the closures to cover or uncover

the openings simultaneously, substantially 35 as specified.

2. In a windmill, a tower, a wind-wheel mounted in the upper portion thereof, a boxing for closing off the wind from the lower portion of said wheel, vertically-movable clo- 40 sures for regulating opposite openings in the tower above the boxing, chains extended from said closures around pulleys mounted on the tower, a horizontally-movable governor rod or lever having connection with said 45 chain, a vane carried by said rod or lever and mounted to rock, and means for automatically turning said vane with its edge to the wind to stop the mill, substantially as specified. 50

3. In a windmill, a tower, a wind-wheel mounted in the upper portion thereof, a boxing on the tower for cutting off the wind from the lower portion of the wheel, closures mounted to slide in said boxing for regulating 55 opposite openings in the tower above said boxing, chains extended from said closures around pulleys on said tower, a horizontally-swinging lever or rod having connection with said chain, a vane mounted to rock or swing 60 on the outer end of said lever or rod, and rods extended from the upper portion of the tower to deflect said vane when engaged thereby, substantially as specified.

ALBERT J. SMALLEY.

Witnesses:

FRANK CARTER,
E. T. MARSH.