

C. R. WHITE.

WINDMILL.

APPLICATION FILED JUNE 30, 1908.

925,063.

Patented June 15, 1909.

2 SHEETS—SHEET 1.

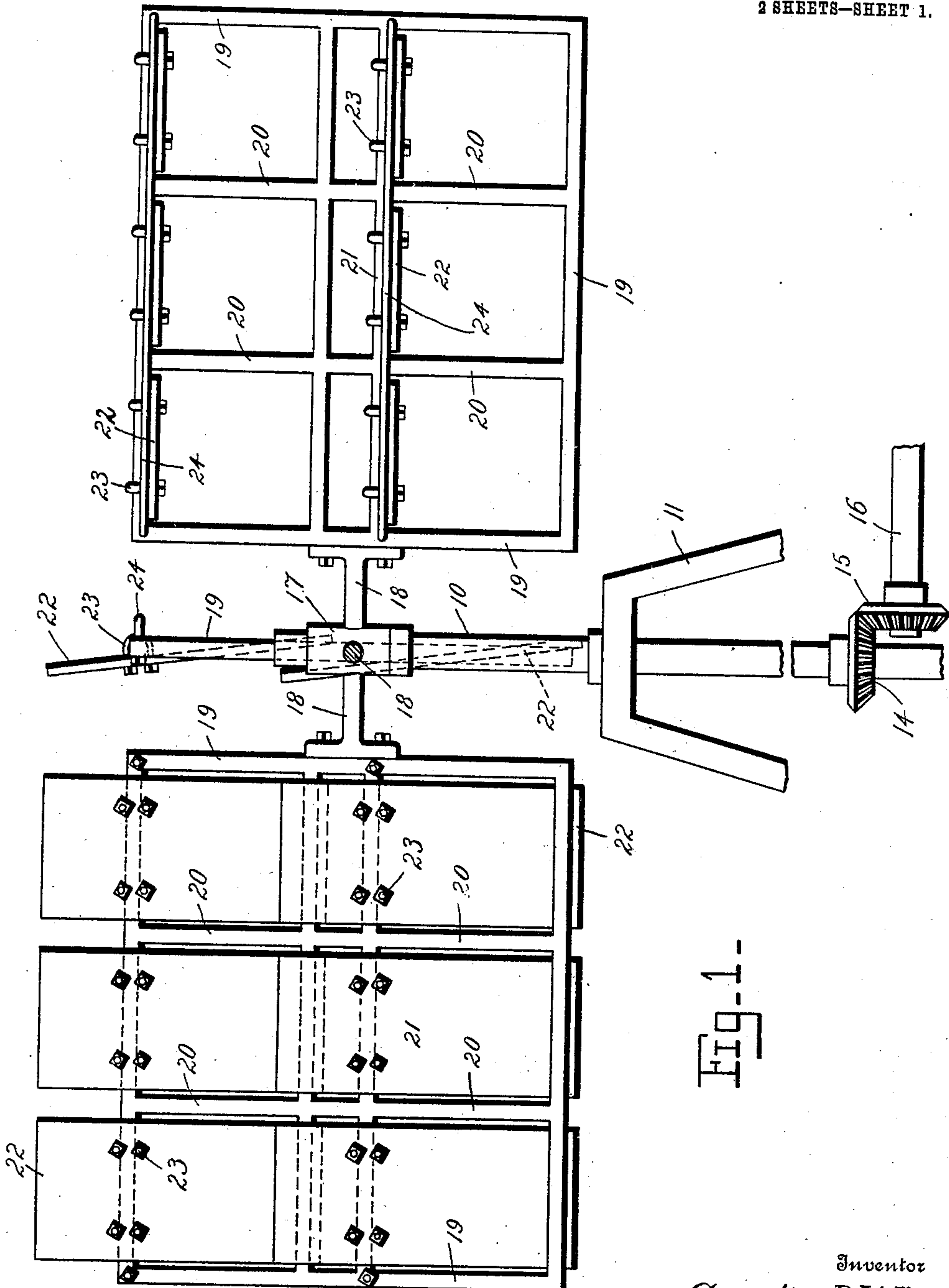


Fig. 1--

Witnesses

F. Inoyama.

C. H. Woodward.

Inventor

Cornelius R. White.

By

David D. Dwyer

Attorneys.

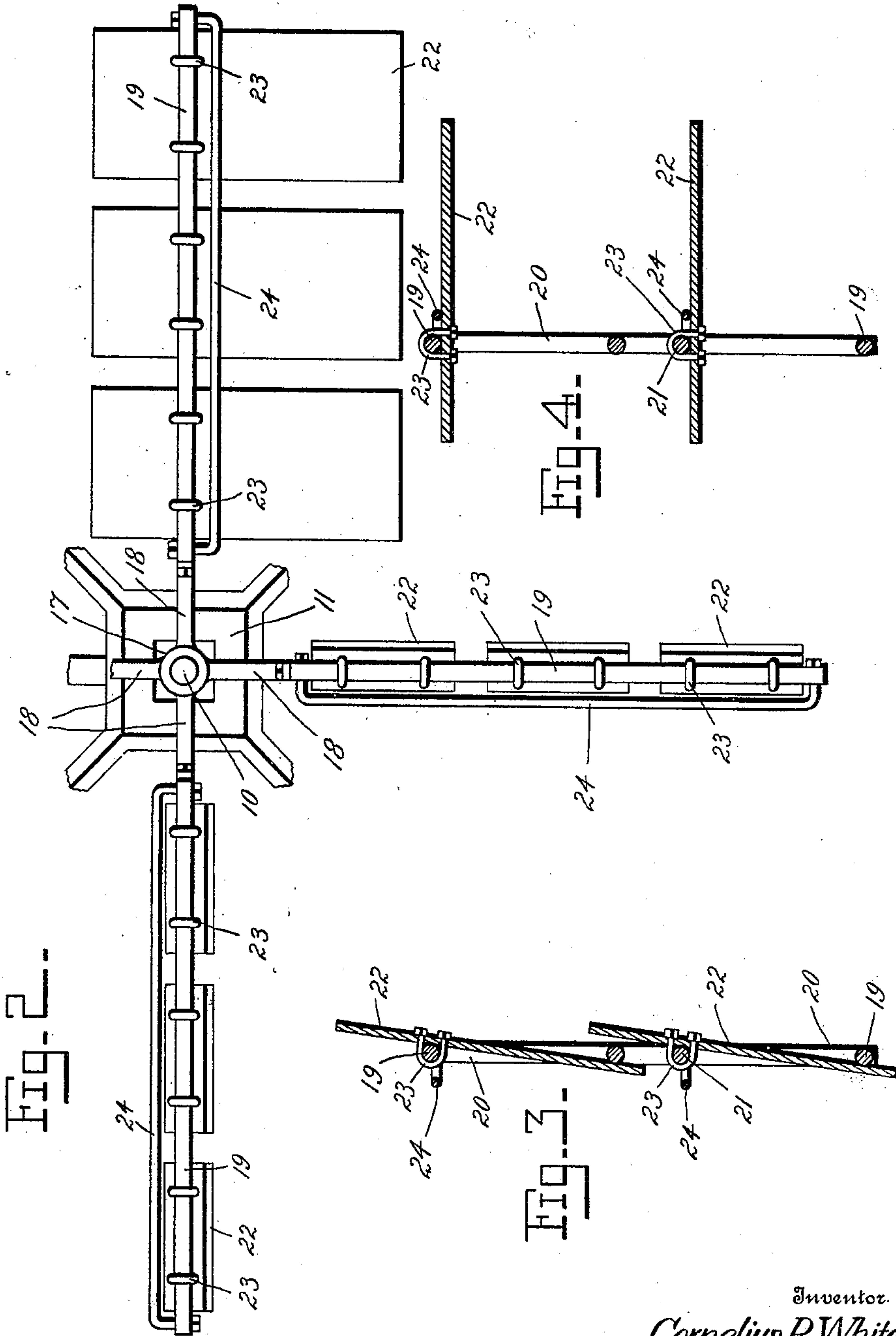
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Witnesses
T. Sonoyama.
C. H. Woodward.

Inventor.
Cornelius R. White

By *Cornelius R. White*
Attorneys.

UNITED STATES PATENT OFFICE.

CORNELIUS R. WHITE, OF HAYDEN, COLORADO, ASSIGNOR OF ONE-HALF TO DAVID L. SELLERS, OF HAYDEN, COLORADO.

WINDMILL.

No. 925,063.

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To all whom it may concern:

Be it known that I, CORNELIUS R. WHITE, a citizen of the United States, residing at Hayden, in the county of Routt, State of Colorado, 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 will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to windmills and has for one of its objects to improve the construction and increase the efficiency and utility of devices of this character.

Another object of the invention is to provide a simply constructed windmill structure wherein the force of the wind is more economically employed and the greater percentage of the power utilized.

With these and other objects in view the invention consists in a frame mounted for rotation in the path of the wind and provided with a plurality of swinging valves adapted to assume a vertical position when the wind is acting upon one side and to assume a substantially horizontal position when the valves are moving against the wind.

The invention further consists in a vertical shaft carrying a plurality of radially disposed arms, the arms provided with open frames from each of which the valves are mounted to swing and maintained in a vertical position when acted upon by the wind and to assume a substantially horizontal position when moving against the wind.

The invention further consists in a frame mounted for rotation and provided with a plurality of spaced supporting members having valves mounted to swing thereon, the valves adapted to assume a vertical position under the action of the wind and to assume a substantially horizontal position when moving against the wind, and stop devices connected to each valve to limit the movement in one direction.

The invention further consists in certain novel features of construction as hereafter shown and described, and then specifically pointed out in the claims, and in the drawings illustrating the preferred embodiment of the invention, Figure 1 is a side elevation partly in section of the improved device. Fig. 2 is a plan view of the same. Fig. 3 is an enlarged

sectional detail of a number of the valves illustrating their construction and operation when closed, or in operative position. Fig. 4 is a similar view showing the valves in open position or in the position they assume during the return movement.

The improved device may be multiplied to a practically unlimited extent by simply adding supporting frames and their valves, but for the purpose of illustration a single set of the rotating frames and their valves are shown, but it will be understood that as many of the frames and their swinging valves may be connected with each windmill apparatus as may be required, and it is not desired therefore to limit the invention to any specific number of the frames or valves.

The improved device comprises a main vertical shaft or standard 10 mounted for rotation upon a suitable frame 11 and upon which the operating mechanism is arranged.

The shaft 10 may be employed for transmitting motion in any desired manner and for the purpose of illustration is shown provided with a beveled gear 14 connected to another beveled gear 15 upon a drive shaft 16, the drive shaft being utilized to transmit motion in any direction or for any required purpose.

Mounted upon the shaft 10 above the frame 13 is a hub 17 having a plurality of radially extending arms 18, in the illustration four, and connected to the free ends of each of the arms 18 is an oblong frame 19 divided by vertical members 20 into a plurality of spaces and likewise divided by a plurality of horizontal members 21 into a plurality of vertically arranged spaces, the two sets of members 20—21 thus dividing the frame 19 into a plurality of openings defined by the members 19—20—21.

As many of the members 20—21 may be employed as required to increase or decrease the capacity of the mill, and it will be understood that the invention is not limited to any specific number of these elements, but for the purpose of illustration the frames 19 are shown with six of the openings, or two rows of three each.

Swinging upon the upper member of the frame 19 and likewise upon the horizontal members 21 are a plurality of valves, and as the valves are precisely alike the description of one will suffice for all. Each valve con-

sists of a plate 22, preferably of sheet metal, and with spaced U bolts 23 mounted for swinging upon the upper member of the frame 19 and upon the members 21, as shown. The bolts 23 are preferably spaced from one end of the valves 22, so that the valves are partly-balanced so that less power is required to throw them "out of the wind" at the return movement.

10 The plates 22 are long enough so that the upper row of the plates overlaps the upper portion of the lower row of plates, while the lower ends of the lower row of plates overlap the lower member 19 of the frame, so that
15 when the force of the wind bears against the forward sides of the plates 22 they will not move beyond a substantially vertical position, as indicated at the left of Fig. 1 and in Fig. 3, while at the same time the plates will
20 turn upon their bearings when the plates are moved against the wind, or at the return stroke of the mill as shown at the right of Fig. 1 and in Fig. 4, as hereafter explained.

Attached to each of the side members of the frame 19 and likewise to the vertical intermediate members 20 are stops formed of wire 24 so disposed that they bear against the plates 22 when the latter are disposed in their horizontal position, or when moving
30 against the wind, and thus preventing the plates from being overturned upon their bearings when in operation. The stop members 24 will be so arranged that the plates 22 will be checked before they reach an exact
35 horizontal position, so that a slight portion of the plate will likewise depend "into the wind", and thus more quickly assume the vertical position when the arms 18 have rotated to a sufficient extent to bring the
40 valves into the wind again.

By this simple arrangement it will be obvious that when the structure above described is mounted in a locality where the wind blows freely the force of the wind bearing upon the vertically arranged valves at one side of the shaft will rotate the shaft until the rear sides of the valves are presented against the wind, when the valves will swing automatically into a substantially horizontal
50 position and thus present a limited surface only to the wind, and then as the motion continues the forward sides of the valves can

come into action and are again acted upon by the wind and so on continuously, the valves assuming a vertical position during a portion of the rotation of the shaft and automatically assuming a horizontal position during the remainder of the rotation. By this means a very large percentage of the force of the wind is utilized, and by increasing the number of the frames and the valves connected with each shaft, the power possible to be attained is practically unlimited, the power being limited only by the sizes of the apparatus which it is practical to construct.

The valves may be of any required size, and increased or decreased as required to adapt the apparatus to the mechanism which it is to operate.

What is claimed, is:—

1. In a windmill, a main shaft mounted for rotation, a frame mounted upon said shaft and partaking of its motion and including a plurality of spaced horizontal radial members, and spaced vertical members, a valve device having means spaced from one end for swingingly engaging said radial members, and a stop wire having laterally directed terminals connected at the ends thereof to each of said radial members and extending into the paths of said valves with the body of the wire limiting their movement in one direction.

2. In a windmill, a main shaft mounted for rotation, a frame mounted upon said shaft and partaking of its motion and including a plurality of spaced intermediate members, a valve having means spaced from one end for swingingly engaging the upper frame member, a plurality of valves swingingly engaging the lower intermediate member, and a wire directed laterally at the ends and connected thereby to said frame members with the body of the wire extending across the path of the valves and operating to limit the movement of the same in one direction.

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

CORNELIUS R. WHITE.

Witnesses:

ROBERT E. NORVELL,
DAVID FLITNER.