No. 749,806. PATENTED JAN. 19, 1904.

E. RUE.

WINDMILL.

APPLICATION FILED FEB. 24, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

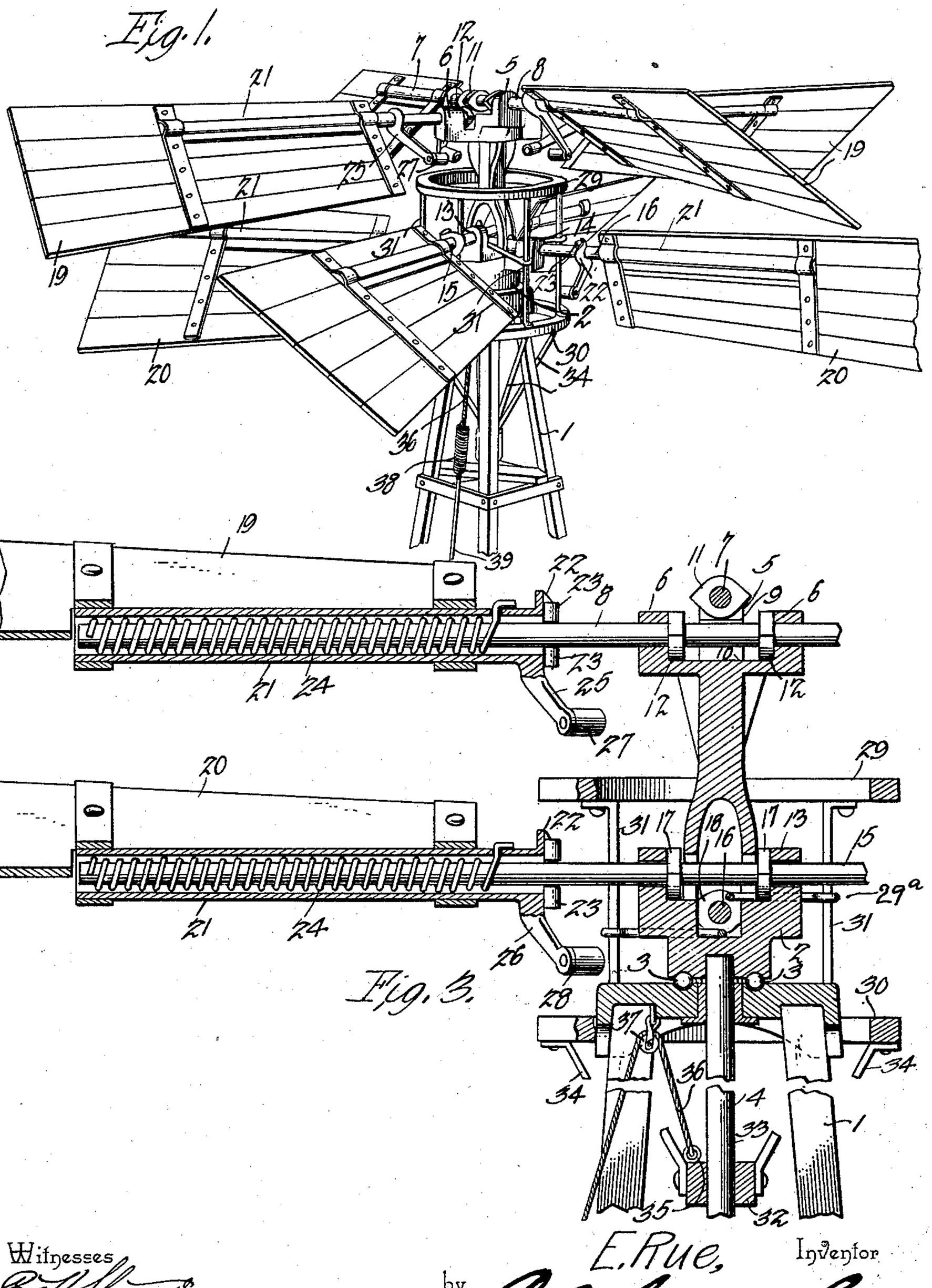

Fig. 3.

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NO MODEL. 2 SHEETS—SHEET 2.

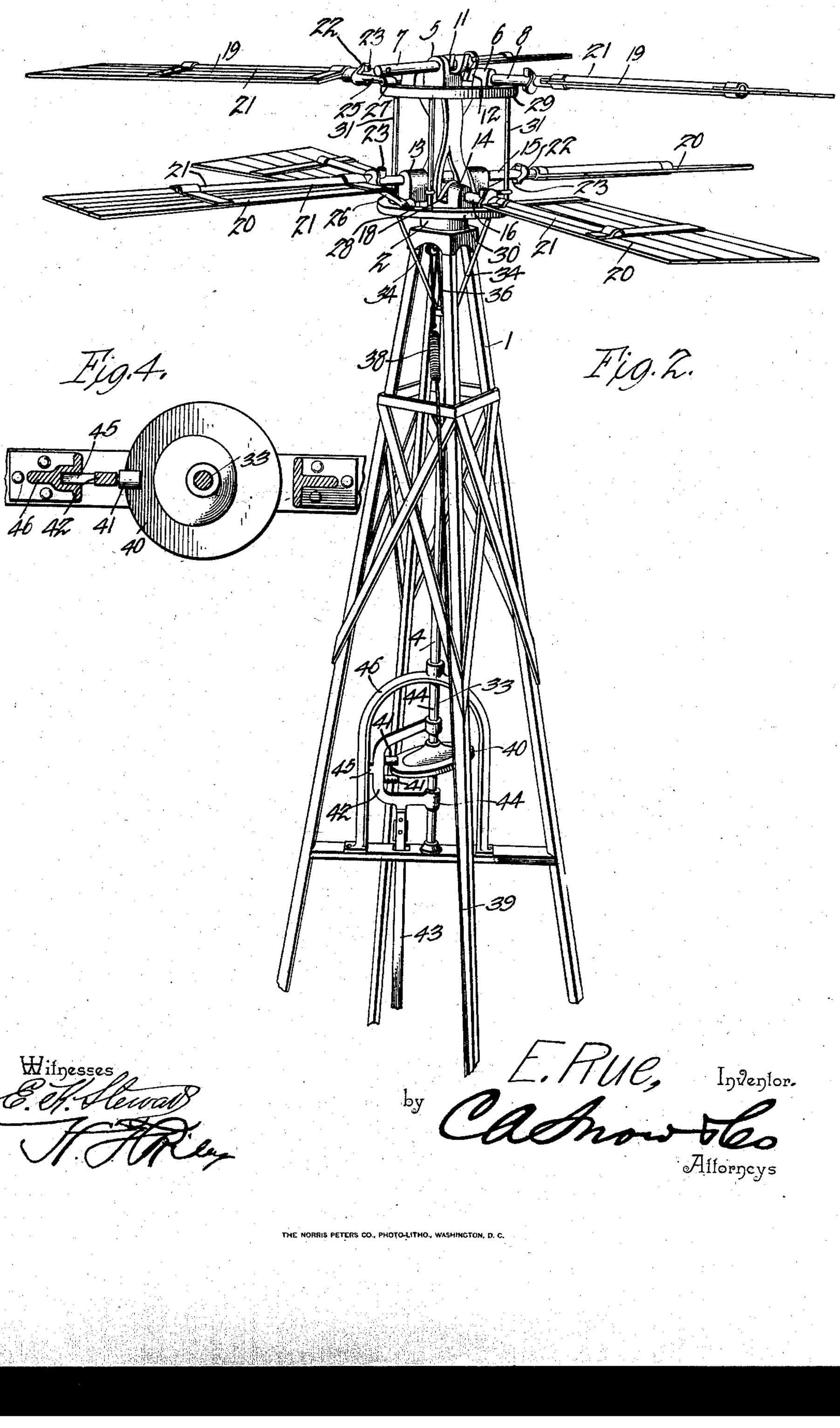

Fig. 2.

Fig. 4.

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No. 749,806. Patented January 19, 1904.

UNITED STATES PATENT OFFICE.

EDWARD RUE, OF AMBOY, MINNESOTA, ASSIGNOR OF ONE-HALF TO CHRISTIAN L. PETERSON, OF AMBOY, MINNESOTA.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 749,806, dated January 19, 1904.

Application filed February 24, 1903. Serial No. 144,756. (No model.)

To all whom it may concern:

Be it known that I, EDWARD RUE, a citizen of the United States, residing at Amboy, in the county of Blue Earth and State of Minnesota, have invented a new and useful Windmill, of which the following is a specification.

The invention relates to improvements in windmills.

The object of the present invention is to improve the construction of windmills and to provide a simple and comparatively inexpensive one of great strength and durability adapted to run at a uniform speed in high winds and capable of being readily operated to arrange its blades out of the wind for stopping it.

A further object of the invention is to provide a windmill of this character having a horizontal wind-wheel provided with yieldably-mounted blades adapted to feather and capable of swinging automatically to present less fan-surface to the wind when the latter increases in force beyond a predetermined point.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is a perspective view of the upper portion of a windmill constructed in accordance with this invention. Fig. 2 is a perspective view of the entire apparatus. Fig. 3 is a vertical sectional view, the parts being arranged as shown in Fig. 1. Fig. 4 is a horizontal sectional view.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates a tower, designed to be constructed in any suitable manner and provided at its top with a suitable bearing and receiving a rotary frame or turn-table 2, antifriction-balls 3 or other suitable antifriction devices being preferably located between the rotary frame and the turn-table or cap-piece of the tower. The cap-piece is provided with a central bearing-opening through which passes a vertical shaft 4, which is suitably connected with the rotary frame or turn-table. The rotary frame or turn-table is provided at its upper and lower portions with bearings for the reception of upper and lower shafts. The upper bearings 5 and 6 are arranged in pairs at opposite sides of the top of the rotary frame to receive the upper shafts 7 and 8, which are arranged in different horizontal planes to enable them to clear each other, and the bearings, which consist, preferably, of approximately L-shaped arms, form lower shoulders 9 and 10, arranged to be engaged by cams 11 and 12 of the shafts 7 and 8. These cams 11 and 12, which are oppositely tapered, as shown, form stops for limiting the rotation of the shafts and permit the same to turn one-quarter of a revolution for feathering.

The lower bearings 13 and 14 are arranged in a similar manner, the bearings 13 being disposed above the bearings 14 to permit the lower shafts 15 and 16 to clear each other. These shafts are provided with cams 17 and 18, which are arranged to engage the shoulders of the bearings 13 and 14 to limit the rotation of the lower shaft.

The upper and lower blades 19 and 20 are provided with sleeves 21, located above the center and extending longitudinally of the blades and provided at their inner ends with cams 22, which engage projections 23 of the shafts. These sleeves form housings or casings for coiled springs 24, disposed on the shafts and connected with the same and with the sleeves and holding the cams yieldably in engagement with the projections 23, which are preferably in the form of antifriction devices. These antifriction devices consist of antifriction rollers or sleeves mounted on pins which extend through and project from opposite sides of the shafts.

The blades of each shaft are arranged at right angles to each other, and when one blade is in a vertical position the other will be in a horizontal position. The blades are pivotally or hingedly mounted on the shafts above the center, and the cams limit the rotary movement of the shafts. The blades at one side of the windmill will present their faces to the wind to be operated on by the same, and those at the other side will be arranged edgewise of the same as they come into the same, thereby

reducing the resistance to a minimum. Should the wind increase in force beyond a predetermined point the power of the coiled springs, they will be turned to a greater or less degree out of the wind and will present less fan-surface to the same. As soon as the force of the wind abates the cams and the springs will return the blades to their normal position.

Extending from the inner ends of the sleeves, which are fixed to the blades, are arms 25 and 26, located adjacent to the cams and provided at their outer ends with antifriction devices 27 and 28, which are arranged to be engaged by upper and lower rings 29 and 30. The depending rods or bars 31 are rigid on the ring 29 and project through the open ends of the guide-arms 29ª, which are carried by the turntable 2, and the lower extremities of the rods terminate in feet which normally rest upon the ring 30, so that an upward movement of the ring 30 will impart a like movement to the ring 29, at the same time permitting the ring 29 to rotate independent of the ring 30, which is held against rotation by the rods or bars 34, which connect it to the slide 32, arranged on the vertical shaft 33 at a point below the top of the tower. The slide is provided with a suitable eye 35, which is connected with one end of a rope or cable 36 or other flexible connection extending upward from the slide to a guide-pulley 37. The flexible connection 35 is preferably attached to one end of a coiled spring 38, which has its other end attached to a wire 39 or other suitable operating means which extends to the base of the tower for enabling the vertically-movable rings to be raised to engage the arms and turn the blades to a horizontal position, as illustrated in Fig. 2 of the drawings. When the blades are arranged in a horizontal plane, they present their edges to the wind, and the windmill is thereby stopped. The coiled spring of the operating device forms an elastic or yieldable connection and enables the operating rope or cable to be pulled to a position for holding the blades in a horizontal plane, and the latter will be gradually turned to such position without liability of straining or otherwise injuring the parts. As soon as the operating rope or cable is released the springs of the blades will return the same to their normal position.

The central vertical shaft 4 has its lower end stepped in a suitable bearing, and it is provided at its lower portion with a rotary cam 40, which extends between a pair of antifriction devices 41 of a vertically-reciprocating rod 42, and the latter is connected with a pump-rod 43, whereby a reciprocatory motion will be imparted to the same when the windmill is in operation. The slide, which is approximately U-shaped, is provided at its ends with sleeves 44, arranged to slide upon the vertical shaft 4 and located above and below the cam. The slide is also provided with a lug or projection 45, which is guided on a frame 46, as clearly shown in Figs. 2 and 4. Any other suitable means may be employed for communicating motion from the central vertical shaft to the device or machine to be operated, and the blades may be made of any desired size to secure the necessary power, and, if desired, only one set of shafts and blades may be employed.

It will be seen that the windmill is simple and comparatively inexpensive in construction, that it is strong and durable, and that it is adapted to run at a uniform speed in high winds. It will also be seen that should the force of the wind increase and overcome the springs the blades will be turned more or less and expose less fan-surface, thereby effectually preventing the windmill from being injured by rotating too rapidly in heavy storms and high winds.

What is claimed is—

1. In a device of the class described the combination of a rotary frame, shafts journaled on the frame and provided with means for engaging the same for limiting their rotation, blades mounted on the shafts and capable of rotating independently of the same, and springs housed within the blades with and connected to the shafts and maintaining the same normally in operative position, substantially as described.

2. In a device of the class described the combination of a rotary frame, shafts journaled on the frame, blades mounted on the shafts and capable of rotating independently of the same, and provided with cams, means carried by the shafts for engaging the cams, springs connected with the shafts and the blades and holding the cams in engagement with the said means, and stops carried by the shafts and arranged to engage the frame to limit the rotation of the shafts, substantially as described.

3. In a device of the class described the combination of a rotary frame, shafts mounted on the rotary frame and provided with stops for engaging the same, blades arranged on the shafts and provided with cams and having arms, means carried by the shafts for engaging the cams, springs for holding the cams in such engagement, and means arranged to engage the arms for rotating the blades for arranging the same edgewise to the wind, substantially as described.

4. In a device of the class described the combination of a rotary frame having upper and lower bearings, upper and lower shafts provided with means for engaging the frame to limit their rotation, blades yieldably connected with the shafts and provided with arms, and vertically-movable upper and lower rings arranged to engage the arms, substantially as described.

5. In a device of the class described the combination of a rotary frame, a vertical shaft connected with the frame, upper and lower hori-

zontal shafts journaled on the frame and provided with means for engaging the same, blades mounted on the shafts and provided with cams and having arms, means carried by the shafts for engaging the cams, springs for holding the parts in such engagement, a vertically-movable frame slidable on the shaft and provided with upper and lower rings for engaging the arms, and operating mechanism connected with the vertically-movable frame and having an elastic connection, substantially as described.

6. In a device of the class described the combination of a tower, a rotary frame, shafts mounted on the frame and provided with blades, a central vertical shaft connected with the rotary frame and provided with a cam, and a reciprocating frame terminally sleeved on the shaft and designed to be connected with a pump-rod and provided with means for engagement by the cam, substantially as described.

7. In a device of the class described the combination of a rotary frame having bearings, radial shafts carried by the bearings, spring-controlled blades yieldably connected with the shafts and provided with arms, and vertically-movable means arranged to temporarily engage the arms to oppose the springs.

8. In a device of the class described the combination of a rotary frame, shafts carried by the frame, spring-controlled blades yieldably connected with the shafts and provided with arms, and vertically-movable means in temporary engagement with the arms to oppose the springs.

9. In combination with a rotary frame, shafts carried by the frame, yieldable spring-controlled blades on the shafts, arms on the blades, means for temporarily engaging the arms to oppose the spring and a shifting device for actuating said means.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

EDWARD RUE.

Witnesses:
CHAS. THOMPSON,
J. E. BROWN.