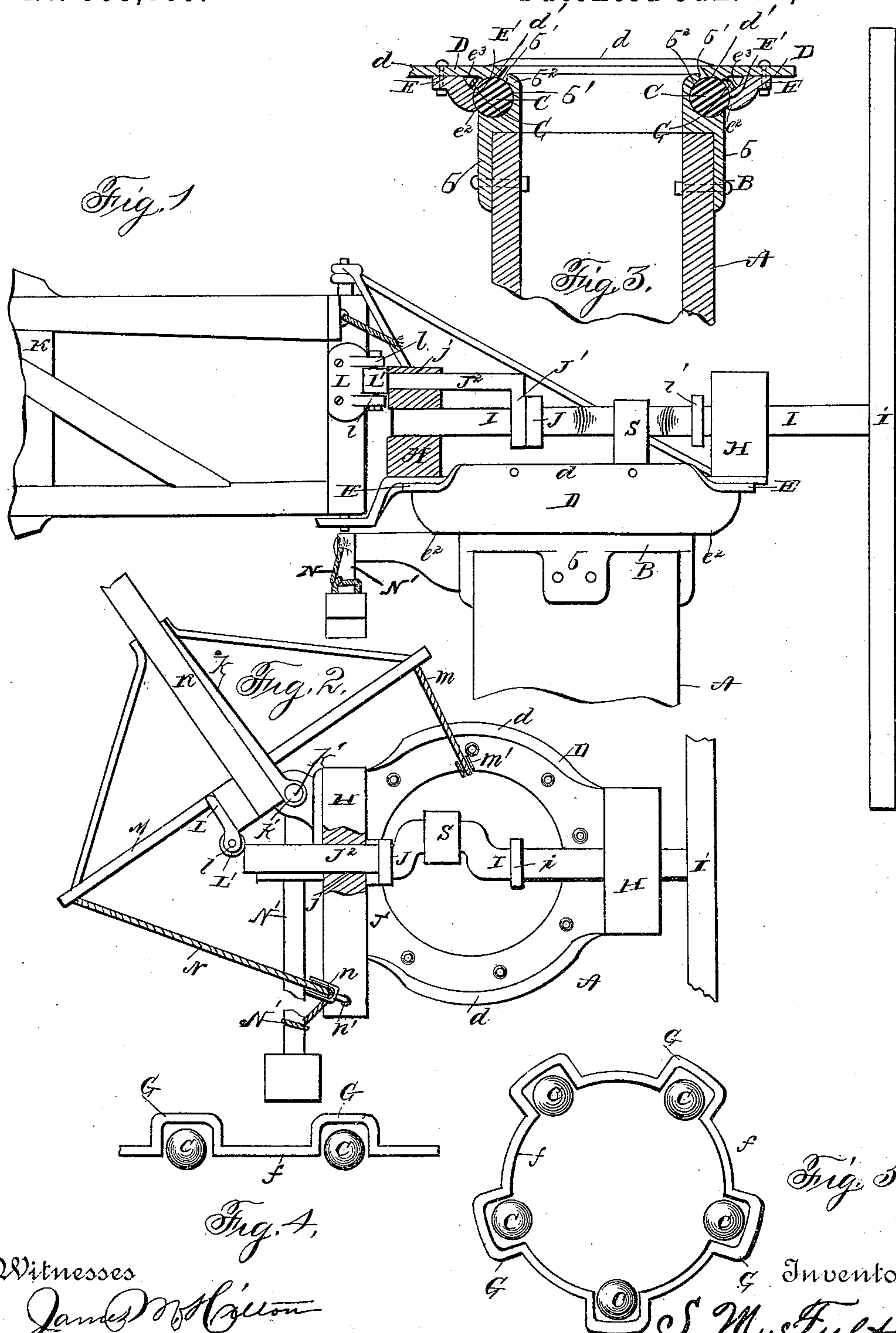


(No Model.)

S. M. FULTON.
WINDMILL.

No. 355,869.

Patented Jan. 11, 1887.



Witnesses

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UNITED STATES PATENT OFFICE.

SAMUEL MATHIESEN FULTON, OF GALT, CALIFORNIA.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 355,869, dated January 11, 1887.

Application filed May 5, 1886. Serial No. 201,232. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL MATHIESEN FULTON, a citizen of the United States, residing at Galt, in the county of Sacramento and State of California, have invented a new and useful Improvement in Windmills, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to improvements in windmills; and it consists of the peculiar and novel construction and combination of parts, substantially as hereinafter fully set forth, and specifically pointed out in the claims.

The object of my invention is to provide improved means for automatically turning the wheel partially out of the wind when the strength thereof rises above the estimated force to which the device has been adjusted, so that the driving shaft and the machinery operated thereby will not be run above the normal capacity; to provide an improved turn-table which shall reduce the friction and wear on the parts, while at the same time it is so constructed as to prevent high winds from displacing it and the wheel carried thereby, and finally to provide an improved windmill with devices of the character named which shall be very simple, strong, and durable in construction, thoroughly effective for the purposes designed, and comparatively cheap and inexpensive.

In the accompanying drawings, Figure 1 is a side elevation of a windmill embodying my invention, partly in section, showing the vane and tower partly broken away. Fig. 2 is a plan view of the parts shown in Fig. 1. Fig. 3 is a vertical sectional view through the turn-table, and Figs. 4 and 5 are detached detail views of parts of my invention.

Referring to the drawings, in which like letters of reference denote corresponding parts in all the figures, A designates the windmill-tower which has a circumferential track or lower section of the turn-table, B, bolted to its upper end, and which is provided with an enlarged opening at its middle or center, in which the crank or driving shaft is free to rotate. The lower section of the turn-table or track, B, is provided with depending lugs *b* for the passage therethrough of the bolts, and on its upper edges it is provided with a deep circumferential groove, *b'*, that forms a seat or track

for anti-friction rollers or bearings C that are fitted therein, the upper edge of the groove-seat *b'* being curved over the balls C, as at *b''*, to prevent upward play thereof.

D designates the upper section of the turn-table, which is provided with an enlarged opening at its middle, in which the crank-shaft of the mill works, and this upper section of the turn-table is provided with a rounded upper edge and a lateral projecting rim, *d*, that overhangs the tower and provides a bearing for a depending flange, E, that is bolted to the rim *d*, the ring D being further provided with a thin rib, *d'*, that has a curved lower surface which bears on the rollers or balls C. The flange E is cast in one piece and provided on its inner face with a transversely-curved groove, *E'*, that bears against the balls C, and the lower edge thereof is curved inwardly toward the track B, so that it lies under the balls, as at *e''*, while the upper edge of the flange or casting E is provided with a shorter groove, *e'*, which receives guiding-strips G.

It will be observed that the edges *b'' e''* lie over and under the anti-friction rollers or balls C, so that the turn-table cannot be lifted off the tower by a high or strong wind, while at the same time the upper section of turn-table, D, that carries the casting E and guides G, is free to rotate in a horizontal plane in either direction around the tower, the friction-rollers C decreasing the friction and wear on the opposing faces of the upper and lower sections of the turn-table, B and D, and the casting E.

The guides G are fitted loosely in the groove *e'* of the casting E, and at their ends they abut against the shoulders formed by the casting E, and the guides are bow or bracket shaped in form to fit over the balls C, and the guides are connected by rods *f*, which are arranged in close proximity to and out of contact with the upper section of the turn-table or track, B. The guides and their connecting-rods are cast in a single piece, and the guides are fitted loosely in the track and rotate independently of the turn-table. The guides serve to keep the balls apart and separate them from each other in their proper places, so as to maintain the turn-table in level position at all times to adapt it to rotate with a minimum of friction. The guides are independent of the turn-table and

the balls, and they rotate with and guide the latter.

The lower section of the turn-table, D, is provided with standards or bearings H, in which are journaled a crank-shaft, I, the crank of which works in an opening in the turn-table. The upper end of a pitman or plunger rod, S, is pivotally or loosely connected with the crank of the wheel shaft in the ordinary manner, so that when the shaft is rotated the pitman will be reciprocated vertically to operate the machinery which is connected therewith. This shaft carries the wind-wheel I' at one end, which wheel is of any preferred construction, and the said shaft is movable longitudinally in its bearings. This shaft is provided with a collar, i, that limits the forward or outward movement thereof by coming in contact with one of the standards, and a similar collar, J, that comes in contact with a detent, J', that is disposed vertically and loosely fitted around the crank-shaft, on which it is movable longitudinally. This detent has an arm, J², that is arranged at right angles thereto and projected rearwardly therefrom through a slot, j, in the upper end of the rear standard, in which the crank-shaft is journaled.

K designates the regulating vane or tail, which is of the ordinary or any preferred construction. This vane is provided at its front end on one side with straps k, which are pivoted to trunnions k', suitably secured to the rotary upper section, D, of the turn-table, and the vane is further provided at its front end, but on the side opposite the straps k, with a bracket-casting, L, that is bolted to the vane and provided with forwardly-projecting perforated lugs l, in which are journaled the shaft or trunnions of a vertically-disposed anti-friction roller, L', which is adapted to be struck by and normally held in the path of the arm J² of the movable detent J'.

The vane is further provided at its front end with a cross-bar, M, to one end of which is secured a rope, m, that runs over a pulley, m', journaled on the turn-table and extending to the ground, so that the vane can be operated to throw the wheel out of use, and to the other end of the bar is secured one end of a rope, N, that runs over a pulley, n, which is journaled in an angular support, n', carried by the turn-table, and the opposite end of the cord or rope N is secured or connected to the outer weighted end of an arm, N', which is pivoted at its opposite end to and carried by the rotary upper section, D, of the turn-table.

The operation of this part of my invention is as follows: The wheel is normally held by the vane in a moderate breeze, so as to rotate the crank-shaft to drive the machinery, and the vane is in alignment with the shaft, as shown in Fig. 1. When the wind increases so as to have great force, it will move or drive the wheel before it, and consequently the crank-

shaft will be moved longitudinally in its bearings, thus forcing the collar J in contact with the detent J', moving it longitudinally. The arm J² of the detent is thus forced rearwardly through the slot in the standard, and bears on the friction-roller L with sufficient force to turn the vane laterally on its pivots, as shown in Fig. 2, whereby the wheel will be turned partly out of the wind and the upper section of the turn-table revolved, the wheel being still at work, but with less velocity, so as to continue to run the machinery to be operated thereby. When the vane turns laterally by the impact thereon of the detent, it draws on the cord N to overcome the resistance and elevate the weighted end of the pivoted arm N', and when the wind subsides the weighted arm drops by gravity and draws the vane to its normal position in alignment with the driving-shaft, as will be very readily understood, the roller acting on the detent-arm to force the same and the crank-shaft forward.

I do not desire to confine myself to the exact details of construction and form and proportion of parts herein shown and described as an embodiment of my invention, as I am aware that slight changes therein can be made without departing from the principle thereof.

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

1. In a windmill, the combination, with the tower, of the lower section, B, of the turn-table affixed thereto and having an annular channel or groove in its upper side and the curved upper edge, b², the upper rotary section, D, of the turn-table, fitted upon the lower section and carrying a depending casting, E, on its under side that is arranged around the lower section, B, and provided with the inwardly-curved edge e², and the ball-bearing intermediate of the lower and upper sections, B D, of the turn-table and the casting E, substantially as described, for the purpose set forth.

2. In a windmill, the combination, with a tower, of a lower turn-table section, B, rigidly affixed thereto and having an annular groove in its upper side, the upper section, D, of the turn-table, fitted upon the lower section and carrying a depending casting, E, on its under side, and provided with a groove or channel, e², in its upper inner edge, the ball-bearings fitted in the groove of the lower section, and the loop-shaped guides fitting over the ball-bearings within the groove e² of the casting and connected by rods f, substantially as described, for the purpose set forth.

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

SAMUEL MATHIESEN FULTON.

Witnesses:

WM. RICHMOND,
GEO. W. FULTON.