(No Model.) 2 Sheets—Sheet 1.

J. B. GORRELL.

WINDMILL.

No. 384,756. Patented June 19, 1888.

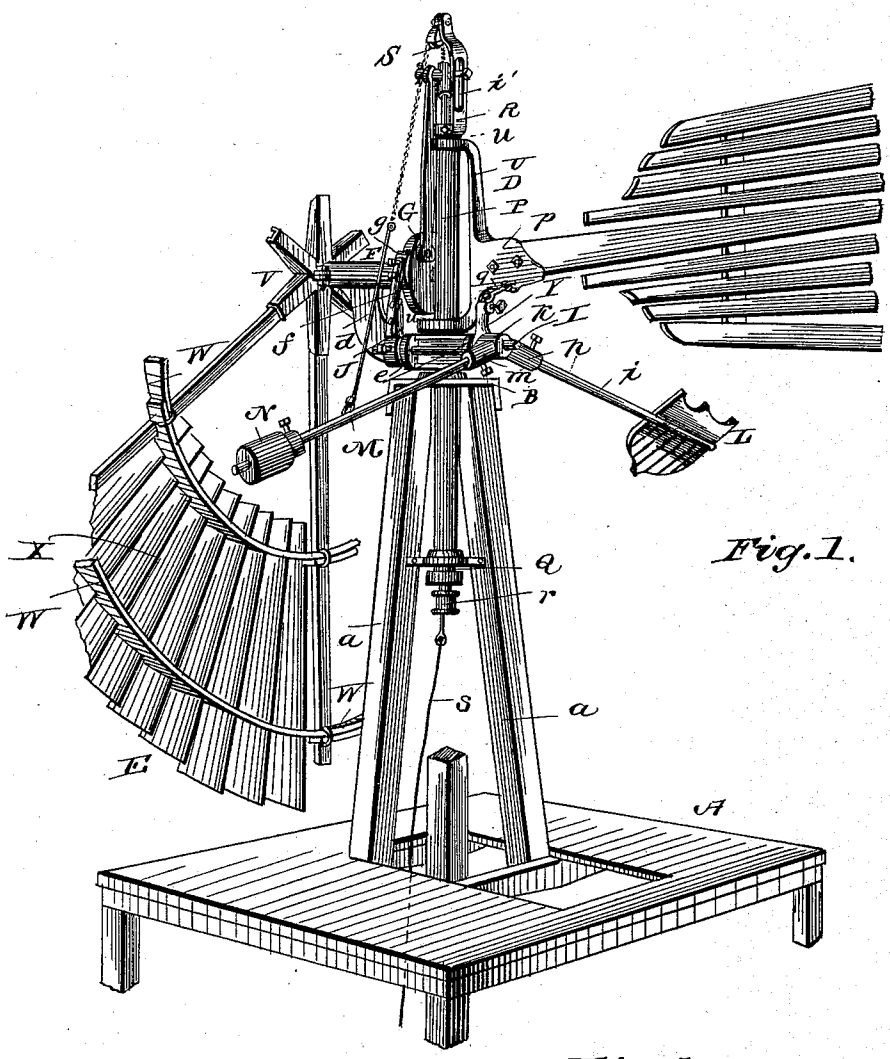


Fig. 1.

Fig. 5.

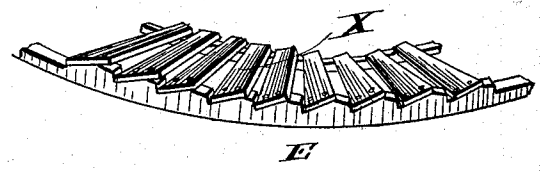
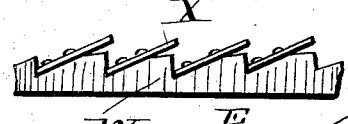


Fig. 6.



WITNESSES.

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(No Model.) 2 Sheets—Sheet 2.

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WINDMILL.

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Fig. 2.

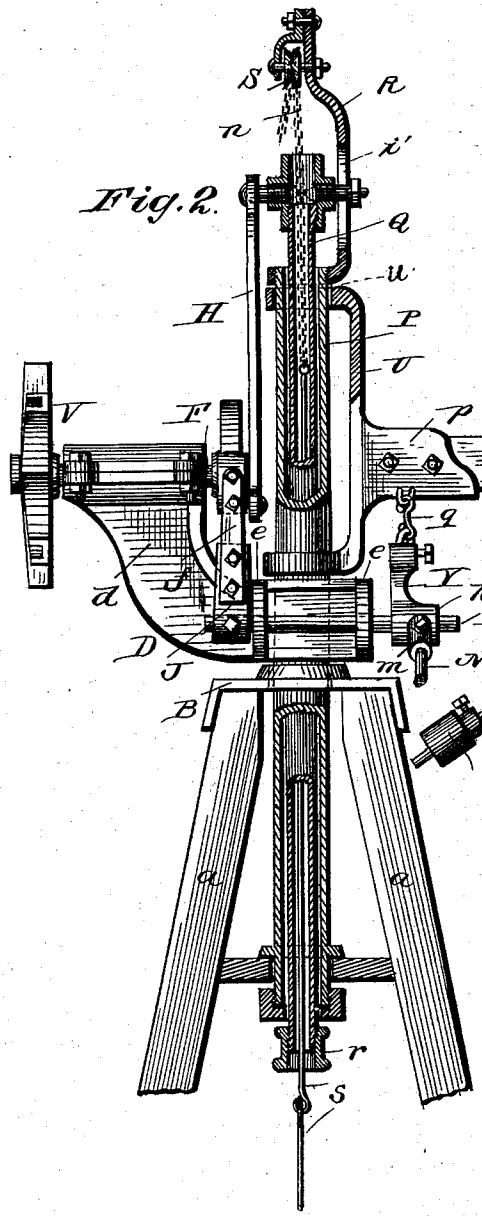


Fig. 3.

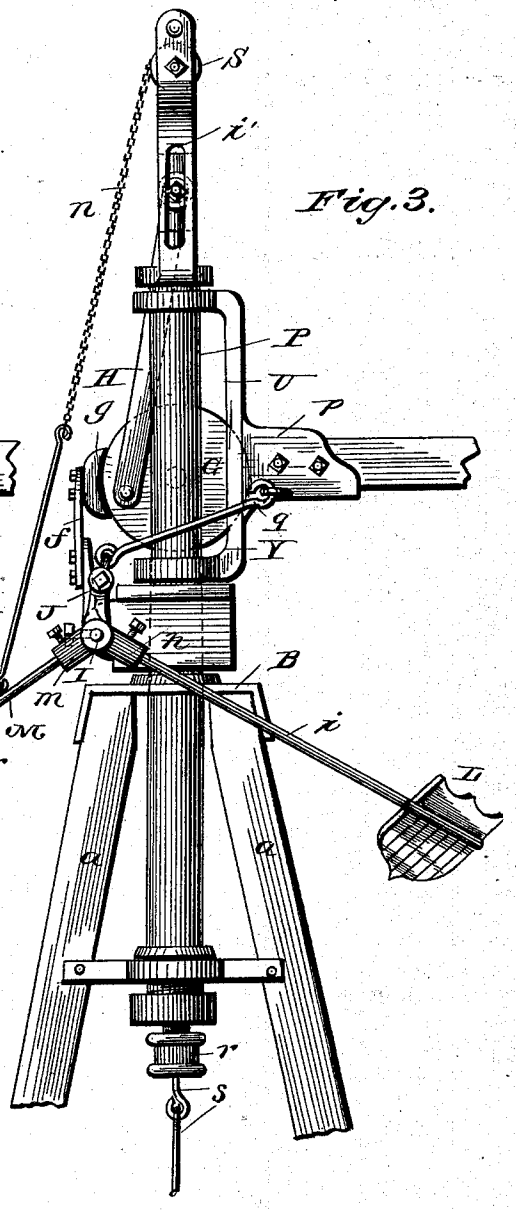
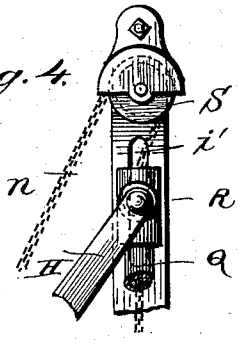


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN B. GORRELL, OF LA OTTO, INDIANA, ASSIGNOR OF TWO-THIRDS TO W. J. HOGUE AND F. A. HOGUE, OF SAME PLACE.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 384,756, dated June 19, 1888.

Application filed July 21, 1887. Serial No. 244,924. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. GORRELL, a citizen of the United States, residing at La Otto, in the county of Noble and State of Indiana, have invented certain new and useful Improvements in Windmills; and I do 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 has relation to wind-wheels; and the improvements will be fully understood from the following description and claims when taken in connection with the annexed drawings, in which—

Figure 1 is a perspective view of a portion of my improved mill, showing the parts in a position when out of gear. Fig. 2 is an elevation of the upper portion of the same, showing parts in vertical section. Fig. 3 is a side elevation. Fig. 4 is a detail view of the crown casting or guide, and Figs. 5 and 6 are detail views of the wheel.

Referring by letter to the said drawings, A indicates the ordinary platform, from which rises the standards *a*, which are capped with a casting carrying a plate or turn-table, B, for the rotatable casting D. These parts are all firmly braced in position to support the mill and operating mechanism. This rotatable or main casting D rests upon the cap-plate of the tower, and has its outwardly and upwardly curved branches *d* provided with bearings at its upper end for the horizontal shaft of the wheel E, the spokes of the shaft being secured to the outer end of shaft F. The shaft F has secured to its inner end a disk or wheel, G, which is connected eccentrically with the lower end of the pitman. The casting D is also provided in a plane relatively at right angles to its curved arm *d* with two lug-journals, *e e*, for supporting the governor-shaft I. Made fast to the inner end of this shaft, by means of a set-screw or other suitable device, is an arm, J, to the outer end of which is secured a spring-bar, *f*, having at its outer end a brake-shoe, *g*, which is designed to engage the periphery of the wheel G when the action of the mill is to be stopped, as will be presently explained.

K indicates a triangular casting, which is removably secured at its central point to the outer end of the governor-shaft I. This casting K is provided with a socket-bearing, *h*, in which is removably secured, by means of a set-screw, the inner end of an arm, *i*, the outer end of which has secured to it a governor-vane, L, and this casting is also provided with a socket-bearing, *m*, which is arranged approximately at right angles to the socket-arm *h*, to receive the inner end of a rod, M, which carries at its outer end an adjustable counterbalance-weight, N.

P indicates the stand-pipe, which is suitably secured in the tower, and has its opposite ends threaded, as shown. To the upper end of this pipe is screwed a guide-casting for the cross-head of a vertically-reciprocating rod, and this guide is curved and serves the additional function of supporting a guide-pulley for the pull-chain *n*.

Q indicates the vertically-reciprocating rod, which is hollow and arranged within the stand-pipe P. This rod is provided at its upper end with a hollow cross-head, one of the horizontal branches of which is adapted to pass through the slot *i'* in the crown-casting R, and thereby prevent the rod Q from turning in its reciprocating movements, and the opposite horizontal branch is connected with the upper end of the pitman H. The lower end of the reciprocating rod is provided with a clutch-sleeve, *r*, and through this rod passes the pull-chain *s*, which has a rod attached, and comes down within convenient reach of an attendant. This pull-chain, after leaving the upper end of the rod within the reciprocating rod Q, passes over a guide-pulley, S, journaled in the upper portion of the crown or guide casting R, and thence comes downwardly, and is attached by means of a connecting-rod, F, with the arm M, carrying the adjustable counterbalance-weight.

U indicates the rudder or vane casting, which is provided with two horizontal branches, *u*, having apertures for the passage of the stand-pipe, upon which the whole is allowed to freely turn between the wheel-casting and the upper guide-casting. From the vertical portion of this rudder-casting is an integral outwardly-

extending lug-socket, *p*, to which the inner end of the main bar of the rudder or vane is secured. This casting or the vane is secured by means of a link, *q*, to the perpendicular arm Y of the socket-casting K, which is secured to the outer end of the governor-shaft I. The wheel E is composed of a hub, V, made fast to the main shaft F, and has grooved seats to receive the inner ends of the spokes. Secured to these spokes are two rings, W W, having their face-edges provided with diagonal seats, as shown, for the reception of the blades X. It will be seen that while the blades slightly overlap, yet they do not close joints, but allow the wind to pass between them when the wheel is turned obliquely. It will be seen that when the mill is thrown into gear the counterbalance-weight will drop, thereby raising the arm carrying the governor-vane, which is sufficiently long to extend beyond the periphery of the wheel and will stand at an angle of about forty-five degrees. This movement of the weighted arm will, through the medium of the link *q* and the arm *v*, draw the vane around behind the wheel, thereby holding the said wheel to the wing and the governor-vane out of the way. As the wind becomes very violent, it will act upon the governor-vane L, moving the same, and as its arm is made fast to the shaft I this shaft will be simultaneously turned, and the arm J, with the spring attached, being made fast to the opposite end of the said shaft I, will throw the brake-shoe against the disk G, thereby applying the brake and stopping the wheel from turning. It should be observed that this brake is automatic in its action, and as soon as the counterbalance-weight falls the governor-vane moves around in the position above mentioned and the brake is removed from the disk, so as to allow all of the parts to assume a proper working position. I attach importance to the employment of the governor-vane and to the manner of connecting the same to the counterbalance-weight and vane or rudder. I also attach importance to the construction of the brake and the manner in which the same is connected and operated in conjunction with the governor; and I also attach importance to the fact that the reciprocating rod is hollow, so as to permit the pull rod or chain to pass therethrough.

Having described my invention, what I claim is—

1. The combination, in a windmill, of the wind-wheel and the friction-disk on the shaft thereof, the horizontal shaft I, the arm secured to one end thereof and a brake secured to the said arm adapted to engage the friction-disk, and the tri-branched casting on the opposite end of the shaft to receive, respectively, a counterbalance-weight, a governor-vane, and a connection for the rudder-vane, substantially as specified.

2. In a windmill, the combination, with the wheel-shaft, of the vertical pipe, the hollow rod passing through the same, the disk on the wheel-shaft, the pitman connecting the said disk with the hollow rod, the pull-rod and chain passing through the said rod, the horizontal shaft I, having an arm secured to one end carrying a brake-shoe, the tri-branched casting secured to the opposite end of this shaft and receiving, respectively, a governor-vane, a counterbalance-weight, and a rod connected with the rudder-vane, and the pull-chain connected to the arm carrying the counterbalance-weight, substantially as specified.

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

JOHN B. GORRELL.

Witnesses:
GEORGE HOOPER,
GEORGE HESS.