(No Model.) 2 Sheets—Sheet 1.

J. B. GORRELL & G. H. POST.

WINDMILL.

No. 261,442. Patented July 18, 1882.

Fig. 1.

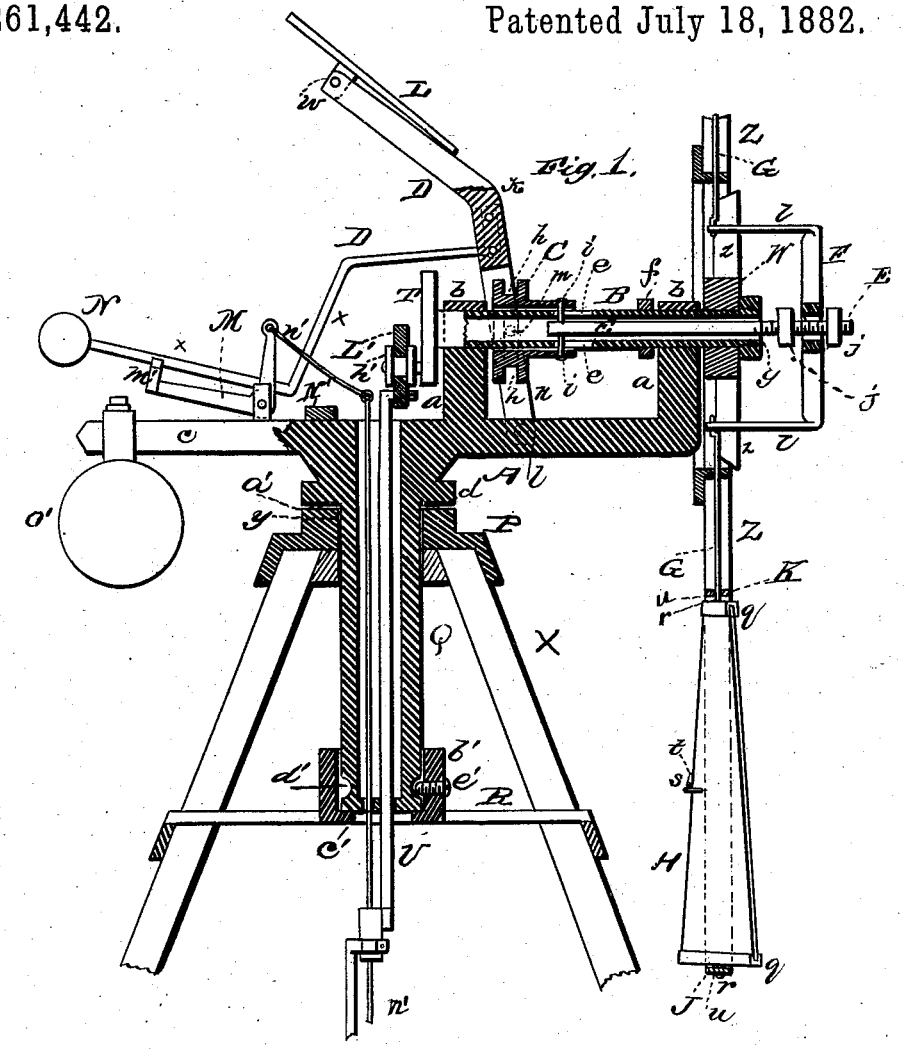
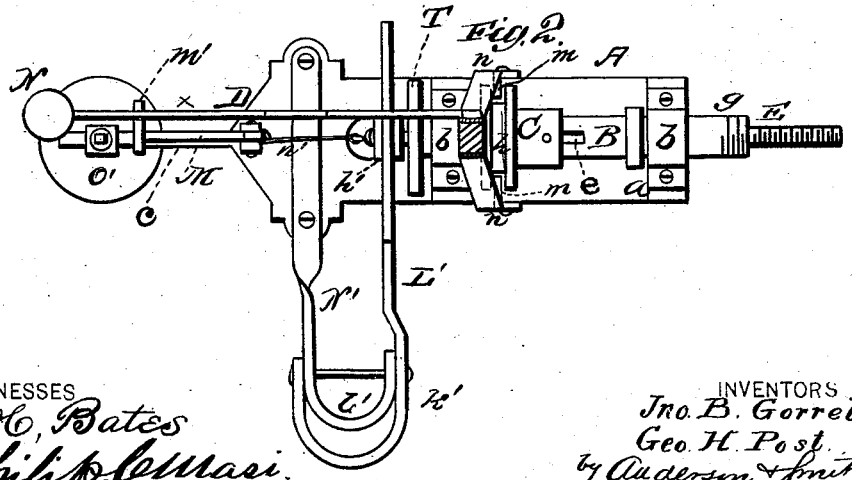


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2

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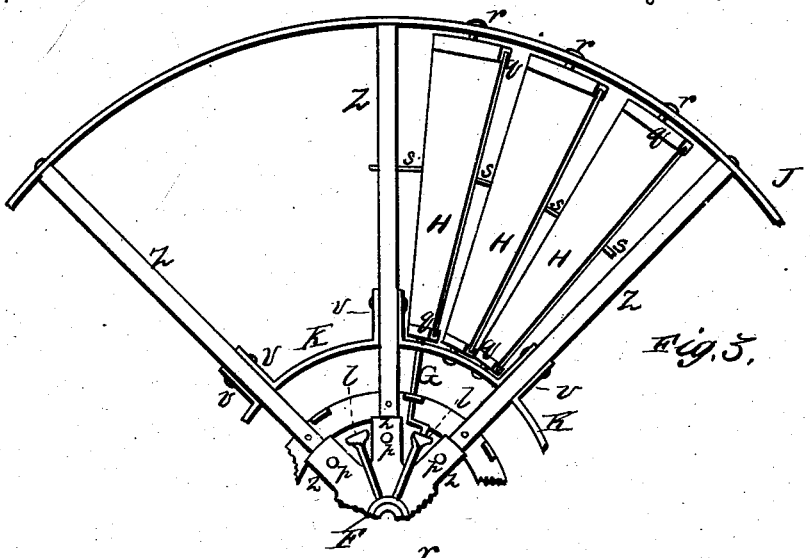

Fig. 3.

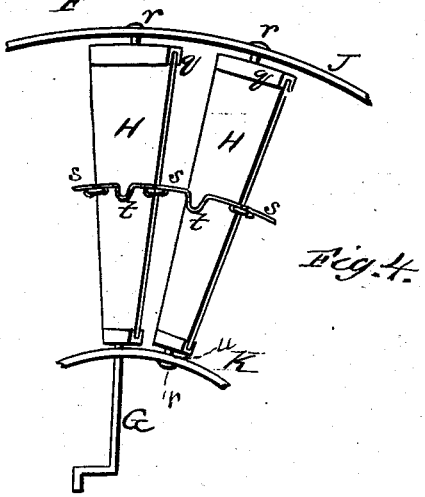

Fig. 4.

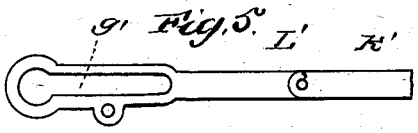

Fig. 5.

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UNITED STATES PATENT OFFICE.

JOHN B. GORRELL, OF LA OTTO, AND GEORGE H. POST, OF NEW ERA, IND.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 261,442, dated July 18, 1882.

Application filed April 1, 1882. (No model.)

To all whom it may concern:

Be it known that we, JOHN B. GORRELL and GEORGE H. POST, citizens of the United States, residents respectively of La Otto and New Era, in the counties of Noble and De Kalb and State of Indiana, have invented a new and valuable Improvement in Windmills; and we do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a vertical sectional view of our windmill. Fig. 2 is a top or plan view of the same. Fig. 3 is a front view of part of the wheel. Fig. 4 is a rear view of part of the wheel. Fig. 5 is a detail view.

This invention has relation to windmills; and it consists in the novel construction and arrangement of parts, as will be hereinafter fully described, and particularly pointed out in the claims.

The main casting or horizontal piece which supports the machinery of this wind-engine is formed mainly in front of the pivotal portion, an extension or arm in the opposite direction, or toward the wind, being provided to support a weight which is designed to counterbalance the machinery.

In the accompanying drawings, the letter A designates the main casting or body-piece, which extends horizontally, and is provided with supports *a a* for the journal-boxes *b b*, the extension or arm *c* for the adjustable counter-balance or weight *o'*, and the vertical stem-pipe Q and shoulder-bearing *d* near the upper end of said stem-pipe.

B indicates the hollow shaft, having a fixed collar, *f*, threaded end *g*, and longitudinal slots *e*. This shaft B extends through the central aperture of the large spider W, which forms the center of the wheel-frame, and is firmly secured thereto. It is seated in the journal-boxes *b b*, and carries at its inner end the crank-wheel T.

C represents the sliding collar on the hollow shaft, said collar being circumferentially grooved at *h*.

D indicates the governor-arm, bent at an obtuse angle at *k*, and forked at its lower end to embrace the grooved sliding collar C, the ends of the arms of the fork being pivoted to the main casting below the collar at *l*. Bearing-pins *m*, extending through the branches of the fork *n*, serve to engage the groove *h* of the sliding collar.

E designates the center slide-rod, which is connected to the sliding collar by means of a bolt, *i*, passing through the slots *e* of the hollow shaft in which the slide-rod has its bearing. The outer end of the slide-rod is threaded, and is provided with nuts *j*.

F represents the small spider, formed of light metal and having arms *l*, bent to extend between the radial frame-arms Z of the wheel, or between the arms *z* of the large spider, which are recessed in rear to receive the ends of said frame-arms, the same being secured by screws or bolts *p*.

H indicates the radial slats or sails of the wheel, usually made of thin wood and re-enforced at each end by cross-pieces *q*, giving the ends sufficient body to hold the pivot-screws *r*, and at the same time stiffening the thin slats. These slats are arranged between each two arms of the frame of the wheel, and all the slats are connected by the light wire links or connections *s*, having the intermediate bends, *t*, to give them flexibility and prevent breaking.

G represents a crank-rod, which is secured to the end of one slat of each section between two successive arms of the wheel, and is connected to the end of one of the bent arms *l* of the small spider F. The crank end is so arranged that when the small spider is pushed outward from the wheel the slat will then be turned edgewise to the wind or at right angles with the general plane of the wheel.

J indicates the outside rim of the wheel, which consists of a strap or straps of thin metal perforated at regular distances to form bearings *u* for the pivot-screws *r*, which extend into the outer ends of the slats. The outer rim is secured to the ends of arms Z.

K indicates the inside rim-sections, having bent ends *v*, whereby they are secured to the sides of the frame-arms Z. These rim-sections K are also perforated at regular distances to form bearings *u* for the pivot-screws *r*, which extend into the inner ends of the slats.

L represents the governor-vane, which is piv-

oted to the upper end of the oblique arm of the governing device, the pivot *w* being horizontal and nearer one end of the vane than the other. The axis of rotation, therefore, of the vane is horizontal.

The governor-arm D is provided with a bent arm, *x*, which extends toward the wind over the crank-wheel downward and then forward, having on its end the governor-weight N, which is sufficient to hold the vane down in an ordinary wind, thereby keeping the slats in gear, but is light enough to be lifted in a gale by the wind-pressure against the vane, throwing the governor-arm forward, and, through the medium of the sliding collar, slide-rod E, spider F, and crank-rods G, turning the slats edgewise or out of the wind.

P represents an under recessed casting, forming a strong cap for the tower-frame X, designed to be leveled and bolted securely to the upper timbers. This cap is formed with a central circular bearing, *y*, for the stem-pipe Q, on which the entire machine turns with the wind, and at the upper end of this circular bearing is formed on said cap the bearing-surface *a'*, on which the shoulder-bearing *d* at the upper end of the stem-pipe is seated and moves.

R indicates a strong cross-bar having a central annular portion, *b'*, within which the lower end of the stem-pipe extends, resting on an annular ledge-bearing, *c'*, therein. Around the lower end of the stem is a horizontal annular groove, *d'*, into which the end of a screw-pin, *e'*, extends, serving to hold the stem in place, and at the same time to permit the free movement of rotation.

Through the stem-pipe Q passes the pitman U, the upper end of which is pivoted to the lever L', which is formed with a cam-slot, *g'*, which engages the grooved anti-friction roller *h'* on the crank-wheel T. The pivot end *k'* of the lever L' is bent in bow form to embrace the bowed end *l'* of the arm N', to which it is pivoted. The arm N' is firmly secured by screws or bolts to the main casting A.

M represents an angle-lever having at the end of its horizontal arm a transverse bearing, *m'*, on which the weight-arm *x* rests. To the upright arm of said angle-lever is attached an operating cord or rope, *n'*, which passes down through the hollow stem Q, and enables the attendant to readily raise the governor-arm D, and through its connections to turn the slats of the wheel edgewise to the wind.

Having described this invention, what we claim, and desire to secure by Letters Patent, is—

1. In a wind-engine, the central spider, W, of the wheel-frame, its recessed arms *z*, and the arms Z of the frame, the outer rim, J, and the inner rim-sections, K, the slats H and their cross-pieces *q* and pivots *r*, and the bent link-connections *s*, substantially as specified.

2. In a wind-engine, the bent governor-arm D and its vane L and the bent weight-arm *x*, in combination with the angle-lever M, its transverse bearing *m'*, and the operating cord or rope *n'*, substantially as specified.

3. In a wind-engine, the combination, with the casting A, having the hollow stem Q and the wheel, its hollow slotted shaft B, center slide-rod, E, sliding collar F, governor, and vane, of the counterbalance-weight *o'*, substantially as specified.

In testimony that we claim the above we have hereunto subscribed our names in the presence of two witnesses.

JOHN B. GORRELL.
GEO. H. POST.

Witnesses:
WM. GORRELL,
MILTON CLARK.