(No Model.) 2 Sheets—Sheet 1.

J. G. BENSTER.

WINDMILL.

No. 306,212. Patented Oct. 7, 1884.

Fig. 1.

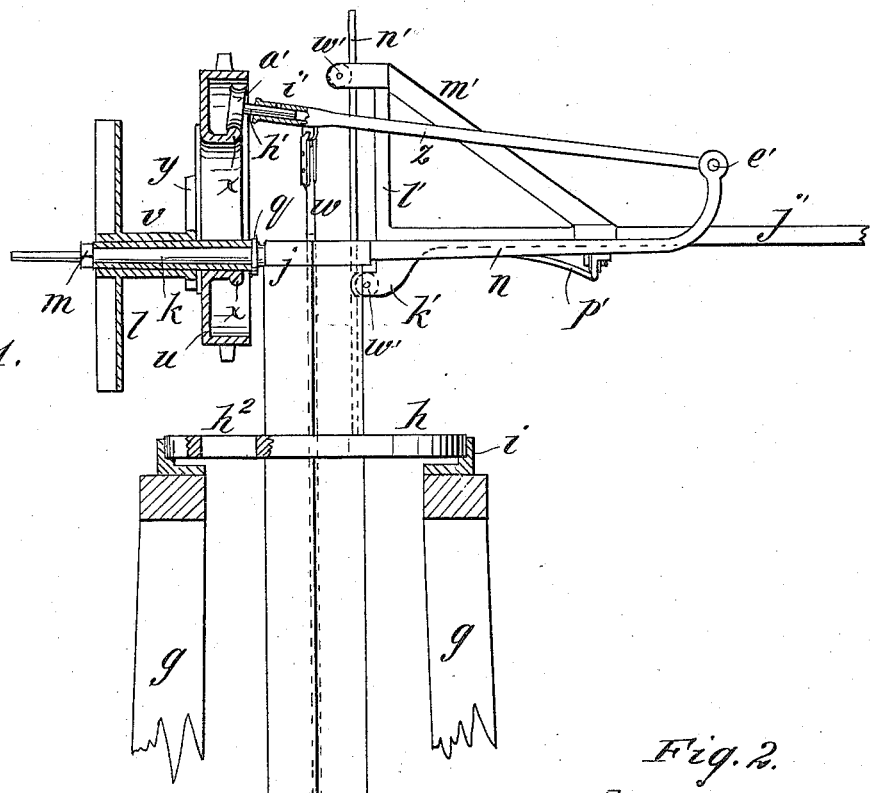
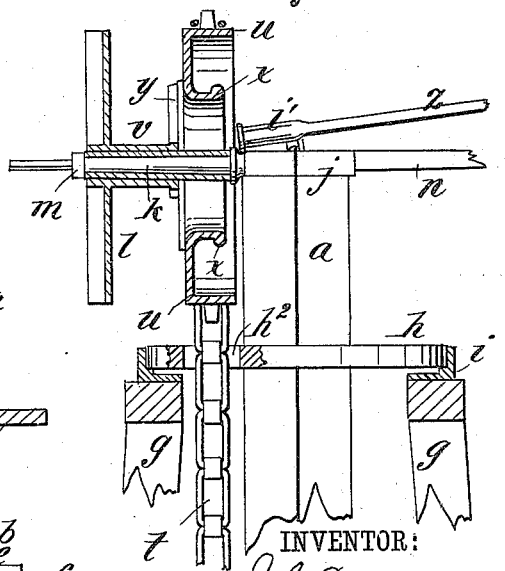
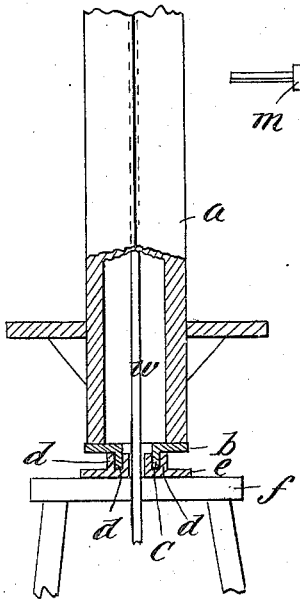


Fig. 2.





WITNESSES:

Donn Swtchell.

C. Sedgwick

INVENTOR:

J. G. Benster

BY Munn & Co

ATTORNEYS.

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

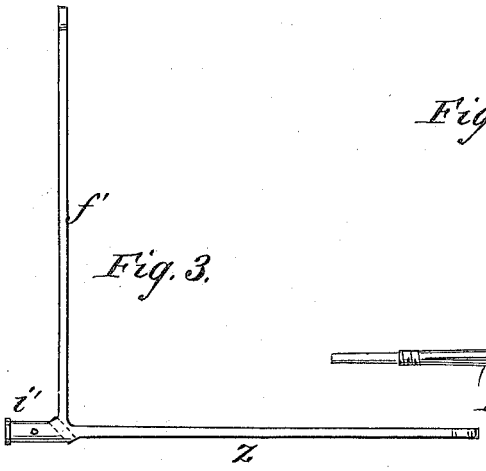


Fig. 4.

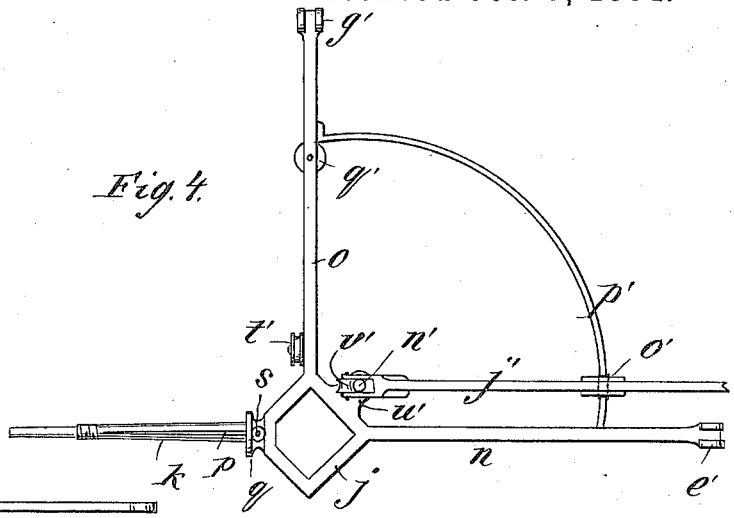


Fig. 5.

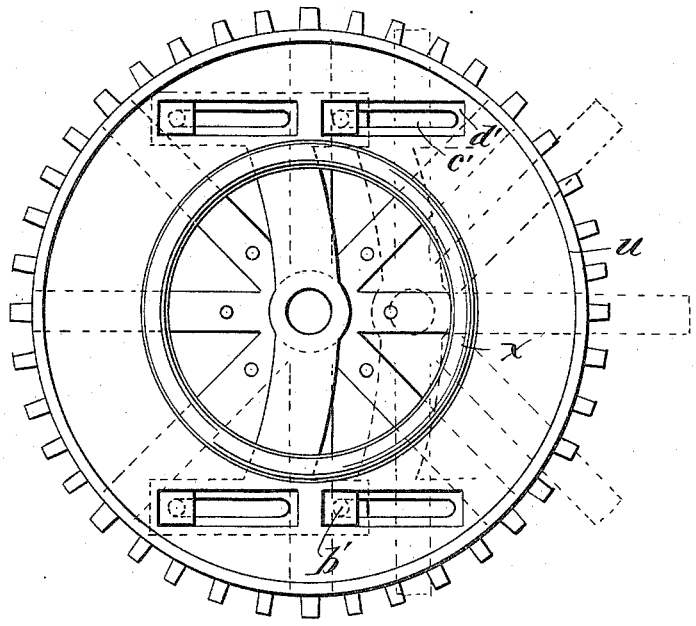
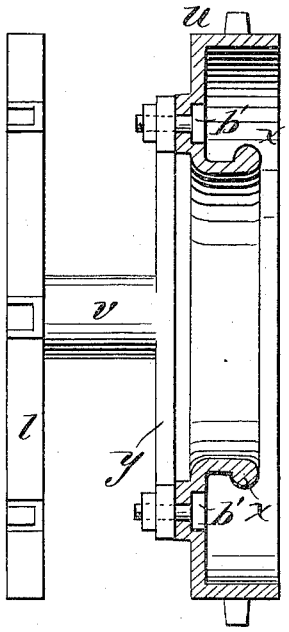


Fig. 6.



WITNESSES:

Dorin Twitchell.

C. Sedgwick

INVENTOR:

J. G. Benster

BY Munn & Co.

ATTORNEYS.

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

JOSHUA G. BENSTER, OF DUNCAN, NEBRASKA.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 306,212, dated October 7, 1884.

Application filed July 16, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOSHUA G. BENSTER, of Duncan, in the county of Platte and State of Nebraska, have invented a new and Improved Windmill, of which the following is a full, clear, and exact description.

My invention consists of improvements in the construction and arrangements of the supporting apparatus for the wheel-supporting frame, also of said frame, also of the wheel and transmitting apparatus, and also of the apparatus for mounting and operating the tail-vane, all being designed to provide a simple, substantial, and durable windmill, all as hereinafter fully described.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is partly a side elevation and partly a sectional elevation of my improved windmill. Fig. 2 is a section of the upper part of the mill as represented in Fig. 1, with some modification of the transmitting-gear. Fig. 3 is a plan of a device forming part of the transmitting-gear for working a pump. Fig. 4 is a plan view of the frame for supporting the wheel, transmitting-gear, and the tail-vane. Fig. 5 is a side elevation of the cam and chain-wheel employed for transmitting the power of the wind-wheel, and Fig. 6 is a section of the said cam and chain-wheel.

For supporting the wind-wheel and its frame I employ a hollow staff, *a*, which has a step for the support of the lower end, consisting of a plate, *b*, having a hole through the center surrounded by a flange, *c*, which rests in an annular groove between two flanges, *d*, of a plate, *e*, also having a hole through the center and supported on a bench, *f*, or a bridge-tree of any kind, which is supported on the tower *g*, a suitable distance below the top of the tower. On the top of said tower the staff is supported in a disk, *h*, which rests in an annular recess of the ring *i*, mounted on the top of the tower.

The frame for the support of the wind-wheel, transmitting-gear, and tail-vane consists of the square socket *j*, wheel-axle *k*, and arms *n* and *o*. The socket is slightly taper, and fits on the upper end of the staff *a*, tapered to fit said socket, so as to require no other fastening, and allowing the frame to be readily dismounted to take down the wheel for its protection in case a cyclone is approaching. The axle *k* is permanently attached to socket *j*, and the wheel turns on it, said wheel being here represented by the spider *l*, to the arms of which the wheel-arms are to be attached, said spider being secured on the axle by a nut, *m*, or other suitable means. The axle has a groove, *p*, along its upper surface extending under collar *q* to an oil-cavity, *s*, where oil may be supplied from time to time to lubricate the wheel as required.

For transmitting the power of the wind-wheel I use an endless chain, *t*, and chain-wheel *u*, when the machine to be driven is to have continuous rotary motion, the said chain-wheel being attached to the hub or sleeve *v* of the wind-wheel; but for working a pump-rod, *w*, I provide the wheel *u* with a rim or flange, *x*, inside of the outer rim or flange, and attach said wheel to arms *y* of the hub *v*, so that said wheel may be readily shifted off the center of the hub to adapt flange *x* to act as an eccentric cam to work the lever *z* up and down, to which lever the pump-rod is connected, said lever having a friction-roller, *a'*, to travel on the face of the cam. This wheel *u* may be attached to the hub *v* in any approved way for so shifting it; but I have in this case represented said wheel connected by bolts *b'* with the arms *y*, said bolts extending through slots *c'* in the web of the wheel, along which said web is recessed at *d'*, for letting the heads of the bolts in flush with the inner surface of the said web of the wheel. In this case the flange *x* is represented in rounded form, and the roller *a'* is grooved to fit on it, and said flange projects a little above or outward from the web of the wheel *u*, to which it is attached for support; but it may be of flat or other form and even with or lower than said web, as may be desired. The lever *z* is pivoted at *c'* to the end of arm *n*, for the point on which it swings to rise and fall, by the cam, and said lever has an arm, *f''*, extending out along arm *o* of the supporting-frame, and pivoted to the end thereof at *g'* to stay the said lever *z* against the lateral thrusts of the cam. The friction-roller *a'* is detachably fitted to lever *z* by a stem, *h'*, and socket *i'*, to be readily disconnected by taking the stem out of the socket when the chain-gear is to be used. The arms *n* and *o* are bent upward at the outer ends about half the height

of the throw of the cam *x* to support the lever-pivots in the median position. The arm *j'* of the tail-vane is supported by a kind of crane, *k'*, *l'*, and *m'*, on a rod, *n'*, for swinging around out of and into the wind, and said arm rests by a roller at *o'* on a curved track, *p'*, supported by the arms *n* and *o*, said track being inclined, Fig. 1, so as to ascend from arm *n* to arm *o*, whereby the weight of the tail will cause it to swing around toward arm *n* to keep the wheel to the wind.

To pull the tail around up the inclined track *p'*, a rope is passed from it over guide-pulleys *q'* and *t'*. The rod *n'*, on which the tail-vane swings, is supported in a lug, *u'*, formed on the socket *j*, and in a socket in the disk *h*. The crane has friction-rollers *w'* at the bearing-points on said rod *n'*, to enable the tail-vane to turn and rise and fall easily on said rod.

An important feature of the arrangement of the step of the supporting-staff consists of the contrivance of it whereby rain and snow cannot get in, and it will not freeze up in cold weather. The cam-gear for working the pump-rod is also adapted to avoid freezing, because rain and snow cannot lodge thereon. The disk *h* has a slot, h^2, for the chain *t* to work through.

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

1. The combination of the rotary staff *a*, a tower for supporting the same, the frame carrying the wind-wheel and having arms *n o* turned up at the outer ends, the cam connected to the wind-wheel, the lever *z*, placed in engagement with the cam for operating a pump-rod, and pivoted to the outer end of arm *n*, and having brace-arm *f'*, pivoted to arm *o*, the inclined curved track *p'*, attached to arms *n o*, and the tail-vane supported on rod *n'*, and having arm *j'* in engagement with said track, substantially as shown and described.

2. The combination of the staff *a*, a tower for supporting the same, the frame carrying the wind-wheel, and having arms *n o*, the combined chain-wheel and cam, and means for adjusting it either concentrically or eccentrically with respect to the axle, the lever *z*, pivoted to arm *n*, and having an adjustable roller placed in engagement with the said cam, and an arm, *f'*, pivoted to arm *o*, and a tail-vane, substantially as shown and described.

3. The combination, with a wind-wheel and its axle, of a driving-wheel having an outer rim for a chain or belt, and an inner rim forming a groove for receiving one end of a lever, and means for adjusting said wheel either concentrically or eccentrically with respect to the axle, substantially as shown and described, whereby either a rotary or a reciprocatory motion may be obtained, as set forth.

JOSHUA G. BENSTER.

Witnesses:
R. R. SUTHERLAND,
CHAS. E. WERMUTH.