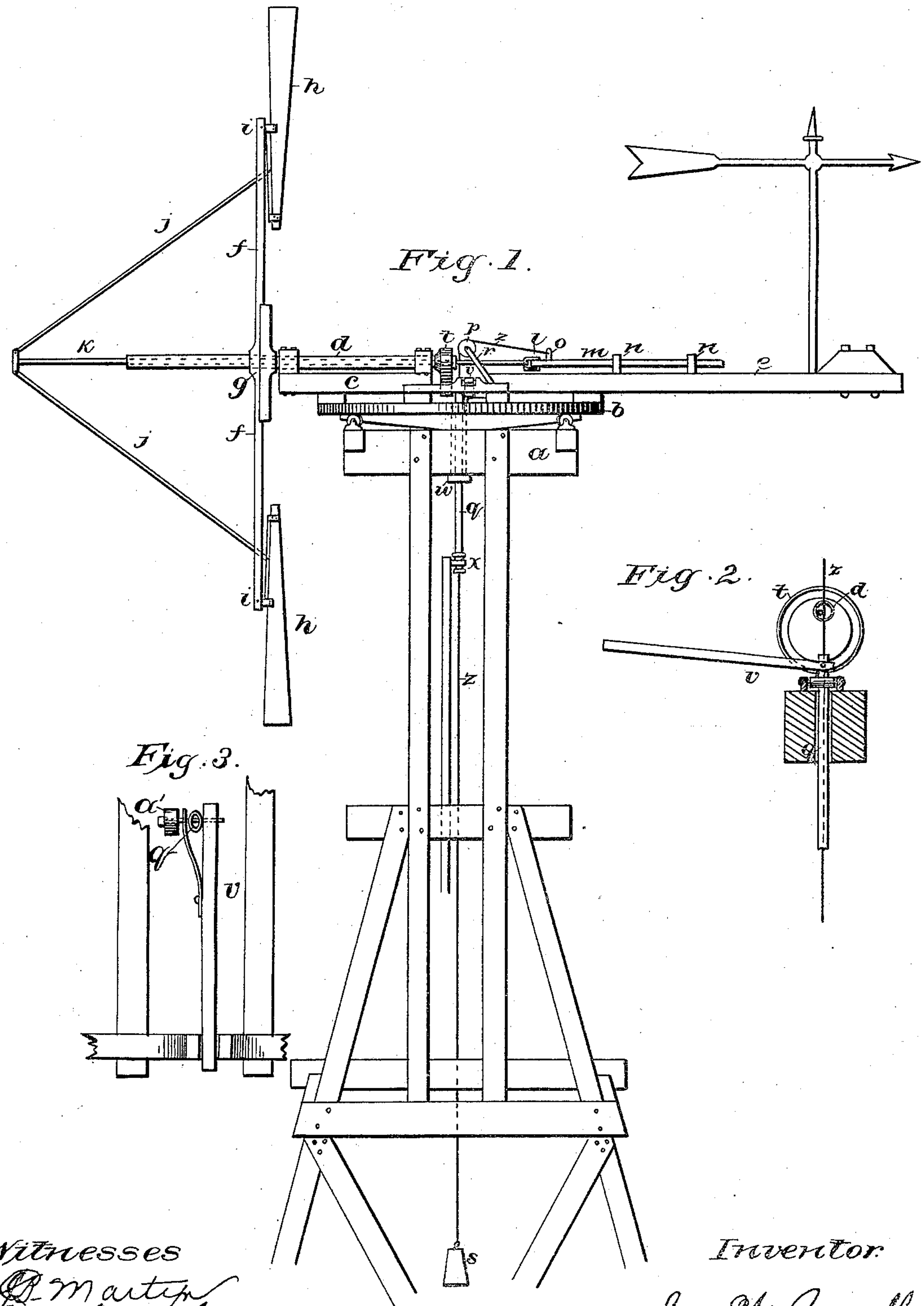
(No Model.)

I. W. RUSSELL.

WINDMILL.

No. 302,285. Patented July 22, 1884.



Witnesses

Inventor:

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UNITED STATES PATENT OFFICE.

IRA W. RUSSELL, OF STORM LAKE, IOWA.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 302,285, dated July 22, 1884.

Application filed March 19, 1883. (No model.)

To all whom it may concern:

Be it known that I, IRA W. RUSSELL, of Storm Lake, in the county of Buena Vista and State of Iowa, have invented a new and Improved Windmill, of which the following is a full, clear, and exact description.

My invention relates to improvements in that class of windmills in which the regulating apparatus operates upon the vanes by means of a sliding rod operating through the bore of the wheel-head shaft; and it consists of the peculiar combination of the parts constituting the regulating apparatus and the device for converting rotary into reciprocating motion in windmills.

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

Figure 1 is a side elevation of the windmill. Fig. 2 is a front view of the cam and its connections for changing rotary into reciprocating motion. Fig. 3 is a top view of a part of the apparatus used for giving the proper reciprocating motion to the pump-rod.

On the upper part of a suitably-formed tower, *a*, I mount a turn-table, *b*, which has a beam, *c*, mounted radially on one side of the top, for carrying the wheel and its shaft *d*, and opposite thereto it has the balance-beam *e*. The wheel, with arms *f*, of wood, bolted to a suitably-formed hub, *g*, will have the vanes *h* jointed to them at *i*, thus giving the vanes the greater wind-surface outside of the pivotal points *i*, to cause them to be turned on their pivots by the unequal pressure of the wind together with the centrifugal force generated by the wheel when in motion, and said vanes are connected by rods *j* with a shifting-rod, *k*, located in the bore of the shaft, made hollow for the purpose, the said rod being capable of sliding therein, but revolving with the shaft, and being swiveled at *l* with a square rod, *m*, located on the balance-beam *e* in bearings *n n*, allowing it to slide, to which is attached a small chain or wire rope at *o*, which is taken over a pulley, *p*, mounted over the pump-rod *q*, by means of a device, *r*, made to straddle the balance-beam and shifting-rod, the upper part of the pump-rod being made hollow to allow the chain or rope to pass down through it. A weight, S, is attached to the end of the chain, to counteract the pressure of the wind upon the vanes, the weight being to pull the vanes to the wind, and said vanes being so adjusted that the tendency of the wind is to turn them endwise with the wind, so that in excessively strong winds the wheel will stop, the vanes being turned endwise to it. In this arrangement the sliding rod is carried a little to one side of the center of the bore of the shaft, and the pulley is set a little in the opposite direction, thereby giving room for the chain *z* to pass close to the side of the rod without interference, as shown in Fig. 2. The wheel itself swings around to the leeward of the tower, and thus does not need a tail to keep it in position. The mill is thrown out of the wind by removing the weight S from the chain.

To the shaft *d* is fastened the cam-disk *t*, which operates the pump-rod *q* by means of a cam-track provided with a roller, *a'*, to run therein, attached at the upper end of the hollow part of the pump-rod, and opposite thereto the rod *v*, Fig. 2, is pivoted at *u* to the rod *a*, while the other end of said rod is pivoted horizontally to one side of the turn-table, said rod acting as a guide to hold the pump-rod in a vertical position with the least possible friction. The pump-rod may be provided with a guide at *w*, Fig. 1, and a swivel at *x*.

y, Fig. 2, is a friction-roller to hold the pump-rod firmly to the face of the cam. The cam-track may approach the circumference of the cam more rapidly upon one side, thereby giving the rod a quicker downstroke and slower upstroke, therefore utilizing the power to greater advantage, as the upstroke requires the greater amount of force. A hollow upright shaft should pass through the upper part of the tower *a* and turn-table *b*, as shown by the outside broken lines, to secure the mill to the tower, said shaft being large enough to allow the pump-rod to pass through without friction.

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

1. In a windmill, the combination of the

shifting-rod k, connected at one end by a swivel, l, with the sliding rod m, supported in bearings $n\,n$, said rods being operated by the weight S, attached to a chain passing over a pulley, p, substantially as described.

2. The combination, with the main shaft d and cam t, of the cam-roller a', attached directly to the pump-rod q, the guide v, and anti-friction roller y, substantially as and for the purpose set forth.

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Witnesses:
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