(No Model.)

# H. J. WOLCOTT.

## WINDMILL.

No. 365,422. Patented June 28, 1887.

Fig. 1

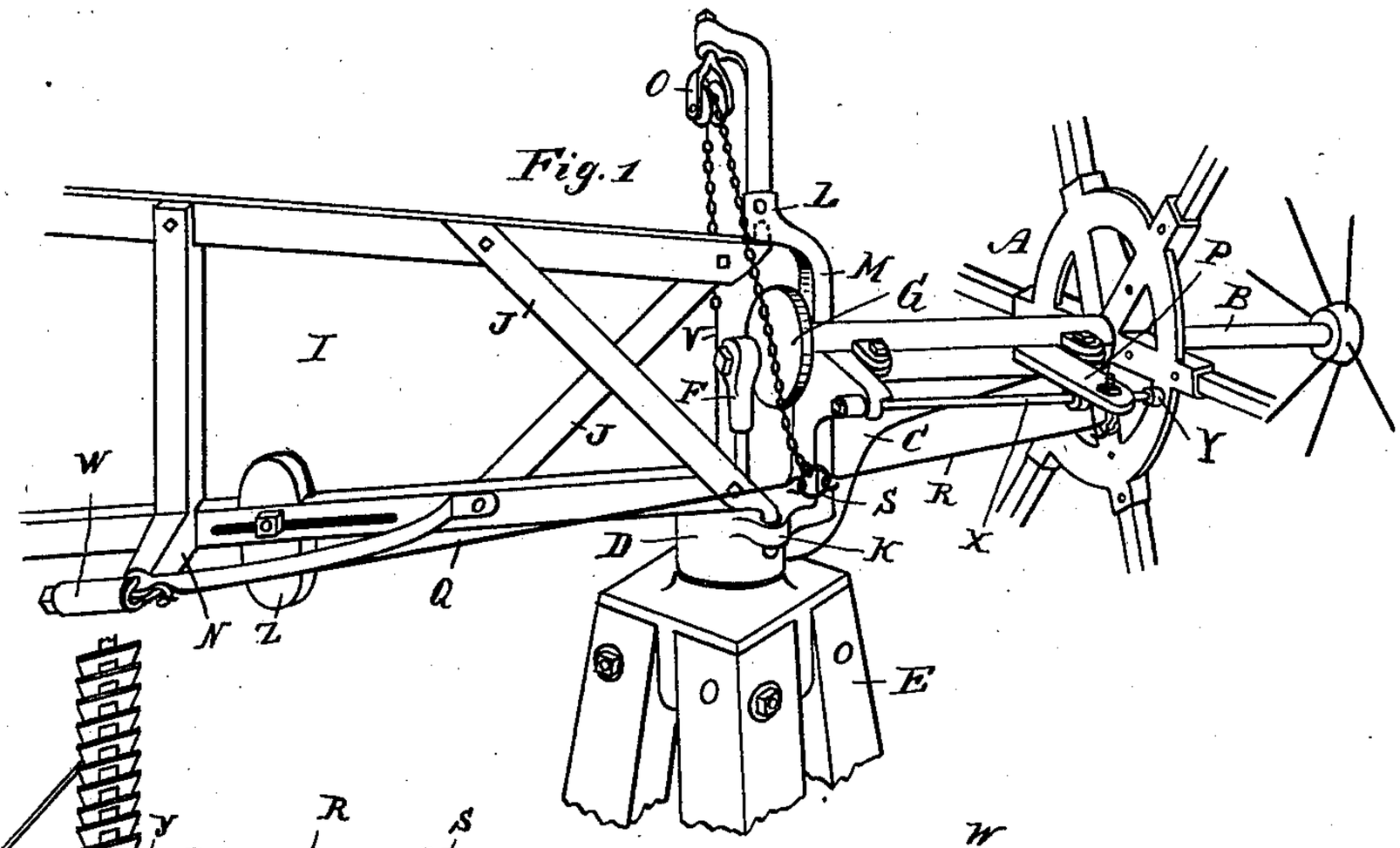



Fig. 2

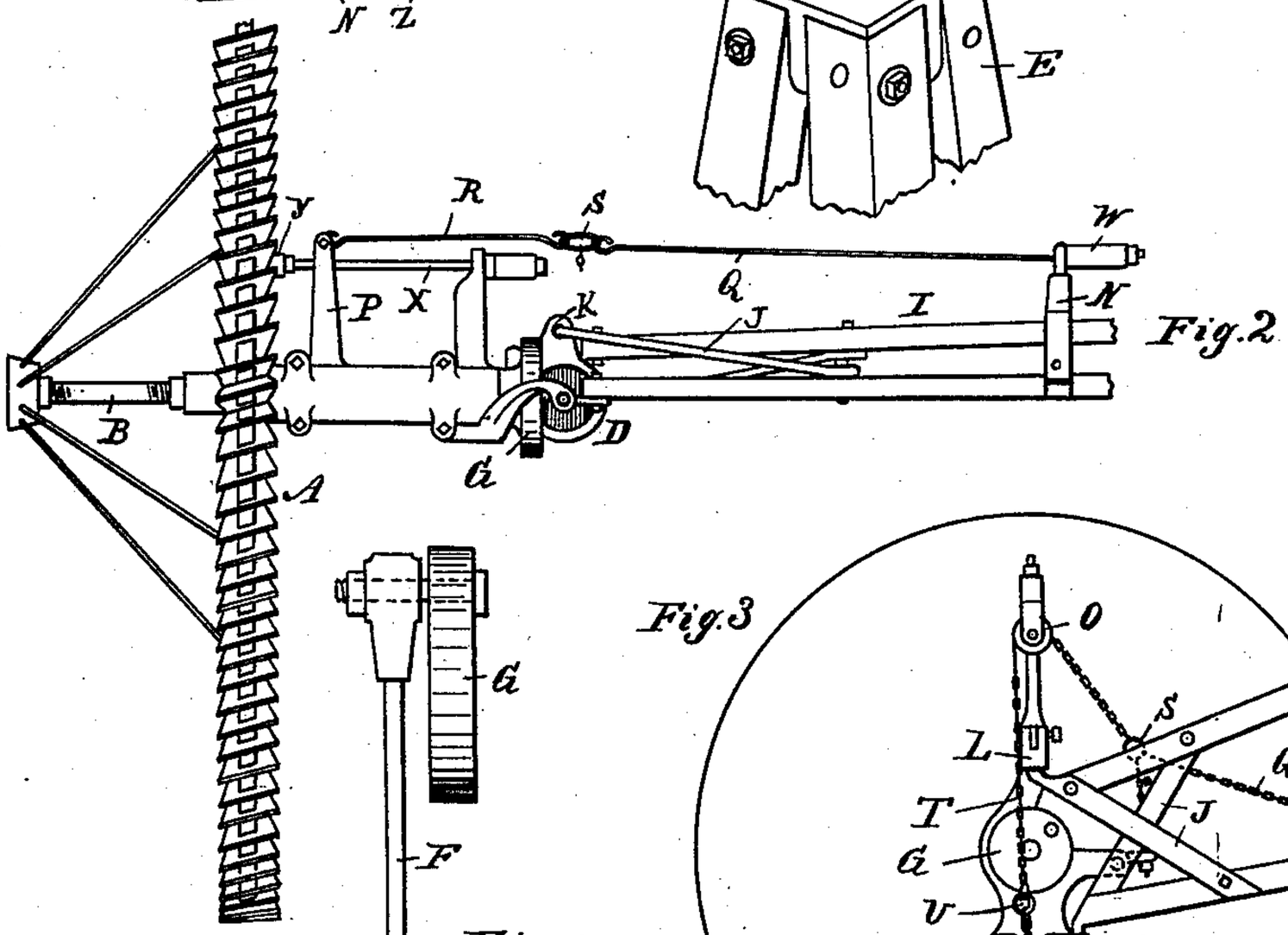



Fig. 3

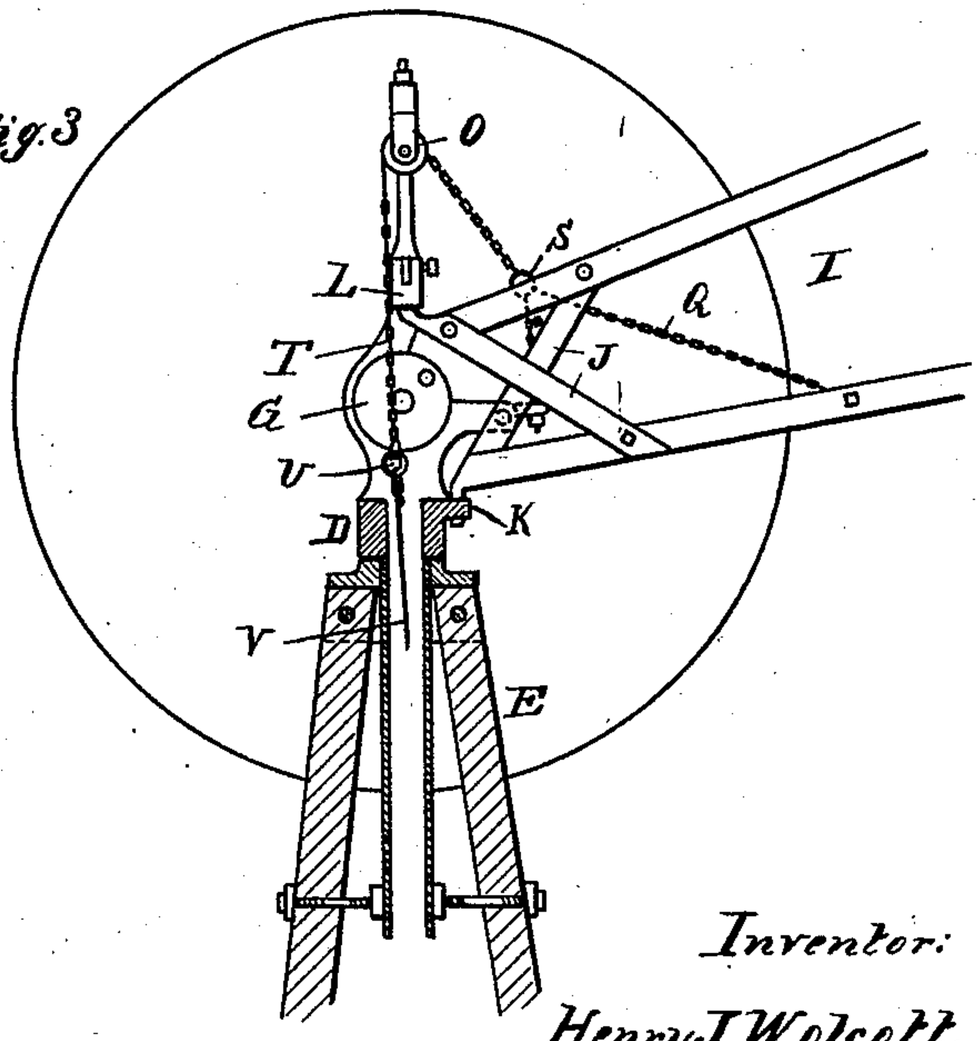
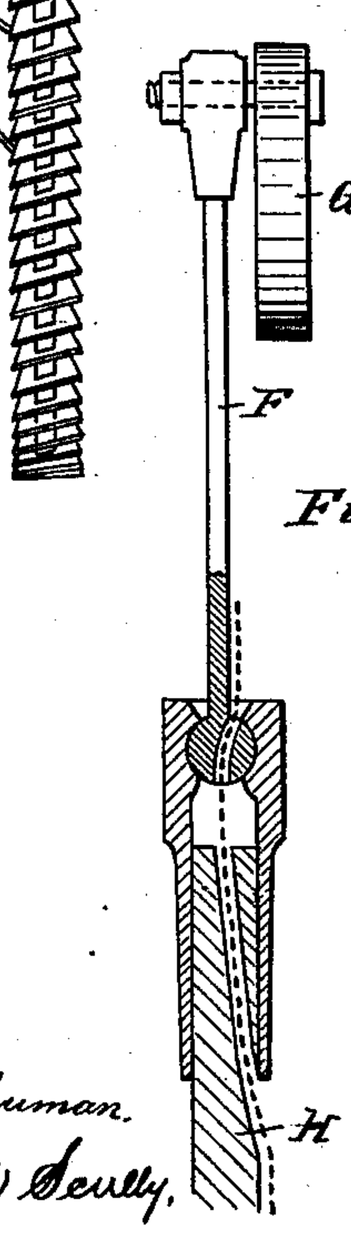



Fig. 4

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# UNITED STATES PATENT OFFICE.

HENRY J. WOLCOTT, OF ALBION, MICHIGAN.

## WINDMILL.

SPECIFICATION forming part of Letters Patent No. 365,422, dated June 28, 1887.

Application filed July 15, 1886. Serial No. 208,080. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY J. WOLCOTT, of Albion, in the county of Calhoun and State of Michigan, have invented new and useful Improvements in Windmills; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to new and useful improvements in the construction of windmills, as hereinafter described, and shown in the accompanying drawings, in which—

Figure 1 is a perspective view of my improved windmill. Fig. 2 is a plan view. Fig. 3 is a side elevation with the wheel turned out of the wind. Fig. 4 is a vertical central section through the pitman, turn-table, and pump-rod.

My improved mill belongs to that class in which a solid wind-wheel is employed in connection with a rudder which governs the angular position of said wheel in relation to the direction of the wind, according to the variable force of the same; but the manner in which I arrange and construct the parts to accomplish this end is novel in several important particulars, as will be seen from the following description.

A solid wheel, A, mounted on a horizontal shaft, B, is journaled on top of the lateral arm C of the vertical standard D. The latter turns on a vertical axis in a socket formed on top of the derrick E, and a pitman, F, connecting the crank-disk G with the pump-rod H, has a free vertical play through such standard, all in the usual manner.

I is the rudder which governs the mill. Its inner end is provided with the cross-braces J, which are secured upon opposite sides at the inner end of the rudder, and have projecting free ends, forming hinge-pins, by means of which the rudder is hinged to the standard. To this end the latter is provided with two hinge-knuckles, K L, the former being directly formed on the standard and so as to bring the hinge at a lateral distance from the axis of the standard, while the other knuckle is in the axis of the standard, and is formed in the end of the arm M, which forms a part of the standard. The rudder is further provided with a laterally-projecting arm, N, and a similar arm, P, projects from the arm C of the standard. The free ends of these arms are connected together, preferably by rods Q R, which form a hinge-joint, S, between them, to which the chain T is secured. This chain passes over a sheave, O, in any suitable manner, in the axis of the standard, and connects with a rod or cord, V, which leads to the ground by means of a swivel, U.

A tension-joint, such as shown in the drawings, in which W represents a rubber cushion, is formed in the connection between the arms N and P.

X is a rod loosely supported in suitable bearings parallel, or nearly so, to the shaft B of the wind-wheel. It is provided at one end with a brake-shoe, Y, which acts as a brake on the hub of the wind-wheel when suitable pressure is brought to bear by the brace-rod J on the opposite end of the rod, when the wheel is completely folded, thus keeping the wheel from revolving.

The parts, being constructed as described, are arranged to operate in practice as follows: When the windmill operates under normal conditions—that is, with a fair working wind—the rudder and wind-wheel are in their normal relative positions to each other, as shown in plan in Fig. 2, from which it will be seen that the axis of the wind-wheel passes to one side of the rudder, which latter makes a slight angle therewith, being held in this position by the connecting-rods Q R, which are now extended in the direction of their greatest length. By this arrangement an initial tendency is created in the wheel to turn out of the wind and fold against the rudder, so as to be parallel thereto, or nearly so.

Aside from the ordinary action of steering, the wind produces another action on the rudder, owing to the peculiar way in which the latter is hinged. In its normal position the rudder is at an angle with a vertical plane; but while the wind-wheel is folding against the rudder the latter gradually diminishes this angle, then becomes vertical, and then during the last stage of folding assumes a reversed slanting position. The action of the wind created by these changing angles of the rudder creates during its earlier stages of folding a lifting tendency in the rudder, which assists the folding tendency of the wind-wheel, and

during the latter stages of folding it creates an opposing tendency.

The weight of the rudder is the factor which opposes the folding of the wind-wheel, for it will be seen that in the action of folding the lower hinge must travel rearwardly in a circle around a vertical axis of the mill, and has thus to lift up the rudder. As the lower hinge, however, travels rearwardly, the opposing action of the weight of the rudder increases and always tends to restore the parts into their normal positions. Thus no folding of the wind-wheel can take place unless the force of the wind on the wind-wheel creates a sufficiently-strong folding action upon the wind-wheel to overcome the weight of the rudder. The complete folding of the wind-wheel into a plane parallel, or nearly so, with the rudder, however, will not take place until a sufficiently-strong wind is blowing to carry the wheel with its constantly-diminishing folding force against the opposing force of the rudder, and ordinarily the wind-wheel will be arrested intermediate between its extreme positions by the balancing of the opposing forces, and thus permit the wheel to continue to work with its face placed obliquely to the wind, more or less, with the same uniformity of speed and power.

As the weight of the rudder is the force which opposes the folding action, I provide it with the adjustable weight Z, the action of which decreases or increases by adjusting it nearer to or farther from the hinges of the rudder, and by this means the folding of the wheel can be delayed or precipitated at will, as the requirements of speed or power demand.

The tension device W acts as a cushion when the wind-wheel is too suddenly thrown into the wind.

What I claim as my invention is—

1. In combination, the rudder I, having the lateral arm N, standard D, having the lateral arm P, the connecting-rods Q R, and the tension device W, all substantially as described.

2. In a windmill, a hinged rudder and a wind-wheel turning on a vertical axis, in combination with the lateral arms N P, and connection Q R, having a hinge-joint, S, and the tension device W, and the chain T, secured at one end to said hinge joint and at its other end to the rod V, substantially as described.

HENRY J. WOLCOTT.

Witnesses:
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E. SCULLY.