

(No Model.)

W. S. LAMB.
WINDMILL.

No. 475,872.

Patented May 31, 1892.

Fig. 1.

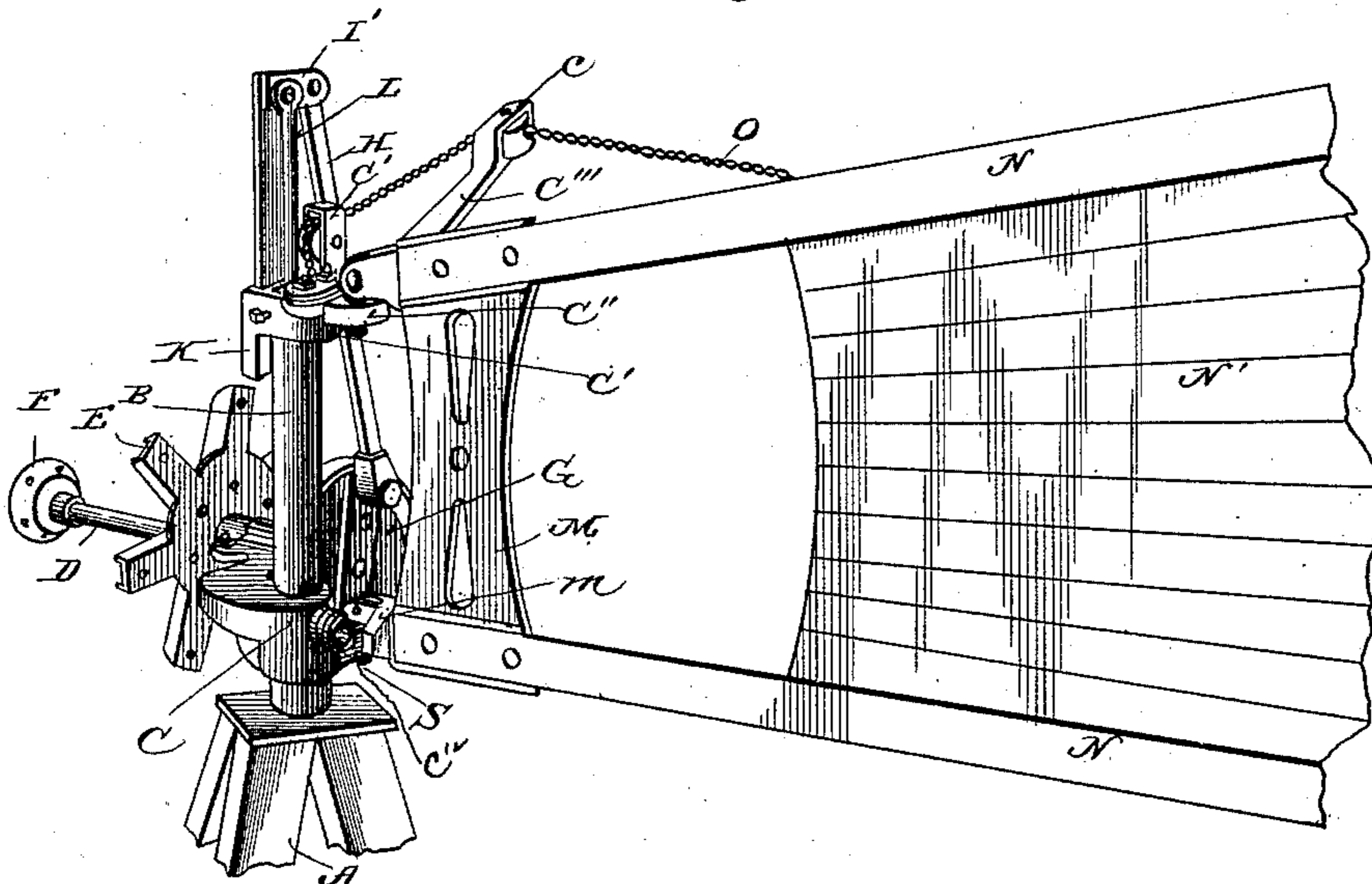


Fig. 2.

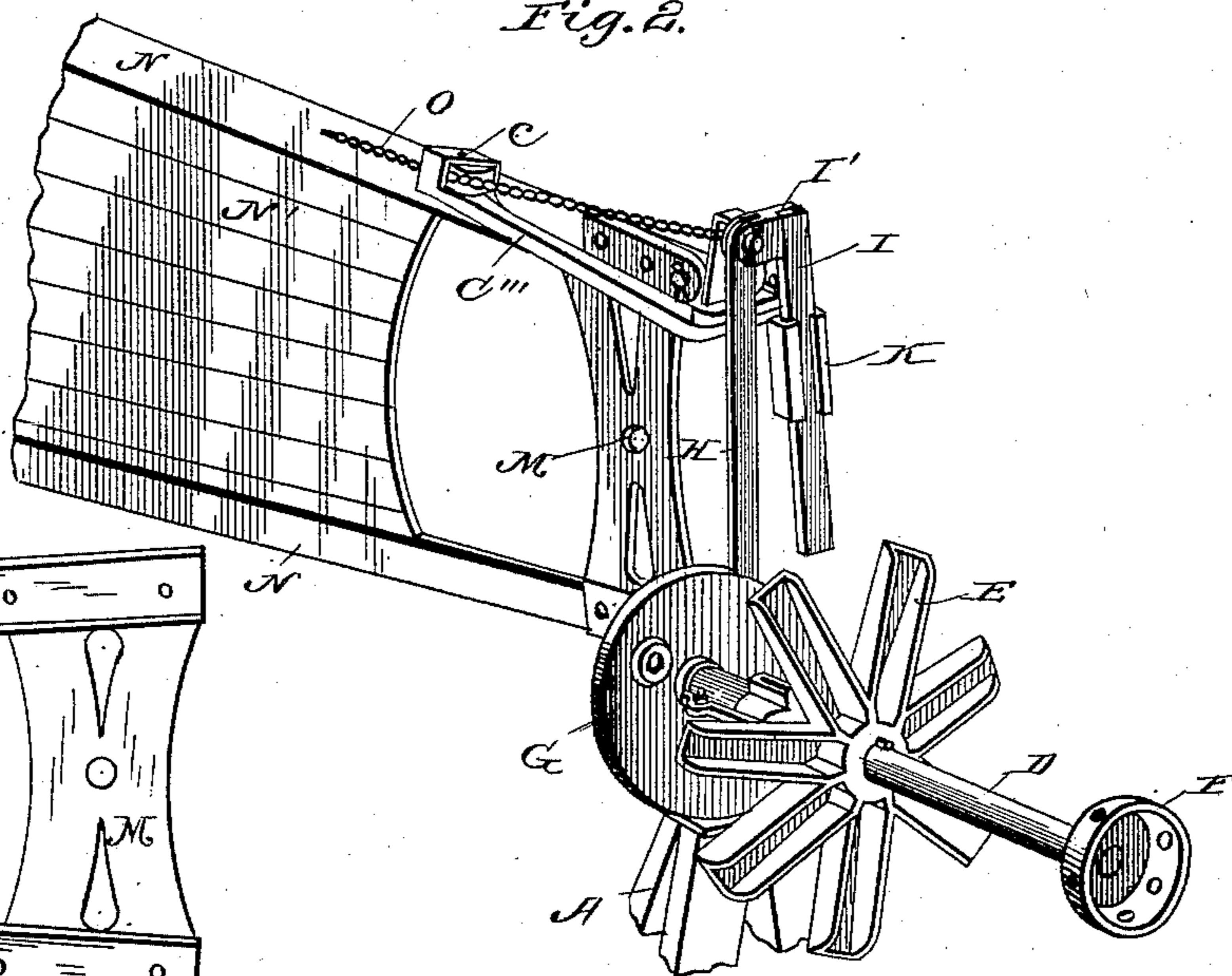
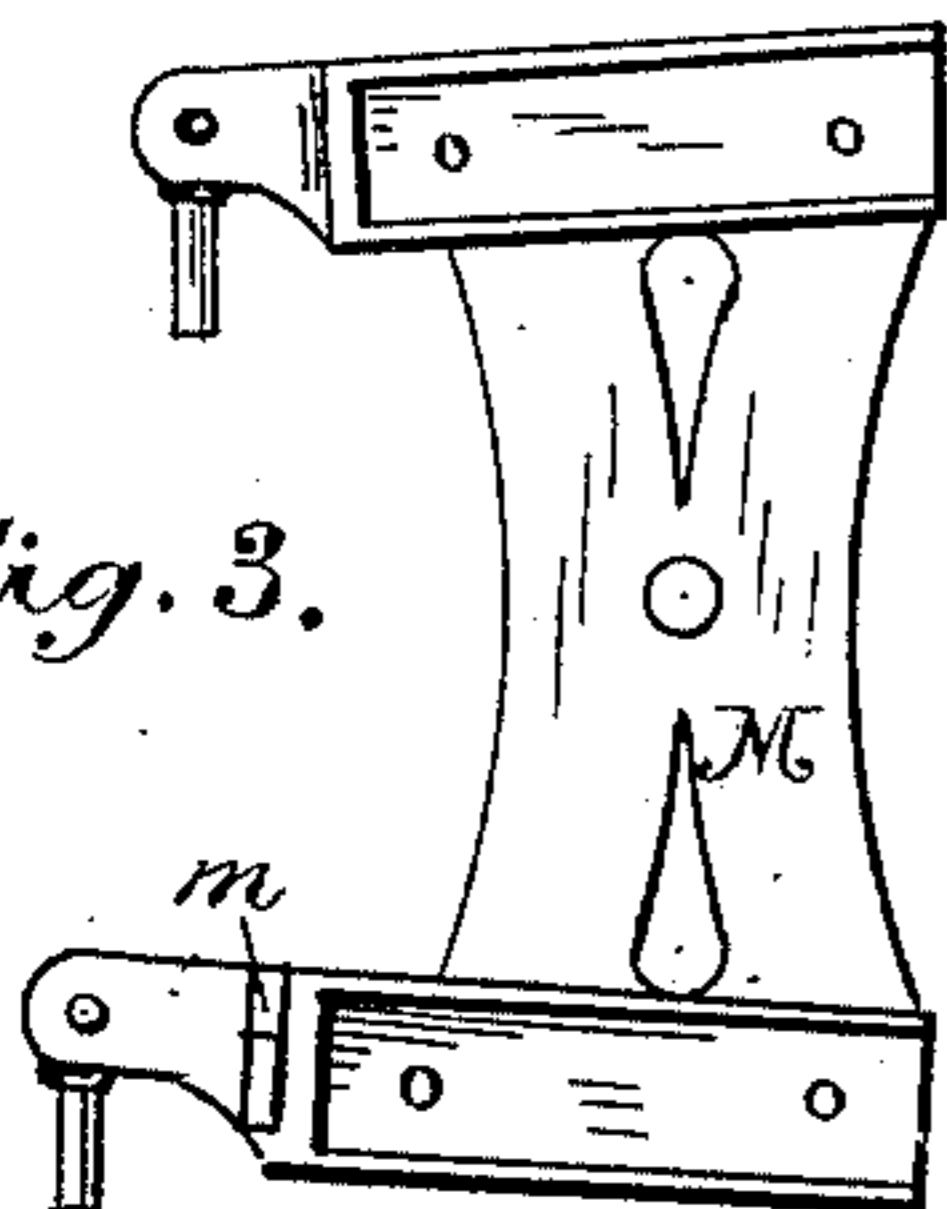


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

WILMER S. LAMB, OF FREEPORT, ILLINOIS.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 475,872, dated May 31, 1892.

Application filed August 14, 1890. Serial No. 361,965. (No model.)

To all whom it may concern:

Be it known that I, WILMER S. LAMB, a resident of Freeport, in the county of Stephenson and State of Illinois, have invented certain new and useful Improvements in Windmills; and I do hereby 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 pertains to make and use the same.

My invention relates to improvements in windmills, and is fully described and explained in this specification and shown in the accompanying drawings, in which—

Figures 1 and 2 are opposite perspective views of the working parts of a windmill embodying my invention. Fig. 3 is a side view of the vane-casting.

In the views, A is the upper portion of a windmill-tower of any suitable construction.

B is a cylindrical tube journaled in the cap of the tower and stepped at its lower end in a suitable plate set in the tower to receive it, and C is the wind-wheel-supporting casting rigidly fastened to the tubular standard B. The wind-wheel casting and parts rigidly connected therewith may for convenience be termed the "wind-wheel head." The casting C is provided with a suitable box or bearing in which is journaled the wind-wheel shaft D of the mill, the line of the wind-wheel shaft being considerably at one side of the axis of the tube B, which is the vertical axis of the mill. On the wind-wheel shaft is rigidly mounted the ordinary spider E, placed near the center of the shaft, and on the ends of the shaft are rigidly mounted the cap F, forming a part of the frame of the wind-wheel and the crank-plate G, provided with a crank-pin whose distance from the center may be varied by placing it in any one of a series of holes formed in the crank-plate to receive it. On the crank-pin is pivoted the lower end of a pitman H, which extends upward and is pivoted at its upper end to one end of a cross-bar I'. To the other end of the cross-bar is rigidly secured a slide I working vertically only in a guide K, fixed to the standard B, preferably directly in front of the vertical axis of the mill, and to the intermediate portion of the cross-bar is pivoted the upper end of a pump-rod L, which extends downward

through the standard in the usual manner. The phrase "parallel to itself" is hereinafter used to indicate that the cross-bar moves in one plane and is always perpendicular to its one direction of motion, or at least maintains a fixed angle with reference to that direction. The position of the wind-wheel shaft, crank-plate, and crank-pin is such that when the crank-pin is in the horizontal plane of the axis of the wind-wheel shaft, the pitman H is approximately vertical, and in consequence of this arrangement of the parts the pitman is very nearly vertical, and its lower end moves almost directly upward during that part of the stroke in which the mill is doing the greatest amount of work. The cross-bar I' is fastened to the rear face of the slide I, and against the rear face of the cross-bar is pivoted the upper end of the pump-rod L of the mill, which extends downward through the tubular standard in the ordinary manner. The thickness of the cross-bar I' is such that the pump-rod lies at the vertical axis of the mill, in which it moves up and down without any lateral movement whatever. There is therefore no tendency of the pump-rod to wear upon the tube or any of its attachments, and, in fact, the friction and consequent wear of the moving parts is reduced to a minimum. One advantage of the construction thus described is that it renders it possible to give the pitman and pump-rod a long stroke without enlarging any of the parts except the crank-plate. The directness of the upstroke of the pitman during the moment when it is doing the greatest work prevents any tendency of the slide I to bind in the guide and the entire pumping mechanism is therefore durable, as well as simple and compact.

On the upper end of the tube B is rigidly fastened a second casting C', formed with a short projecting lug C'', extending in a direction approximately parallel to the line of the wind-wheel shaft, and another arm C''' extends in a direction nearly at right angles to the wind-wheel shaft. The vane-casting M is connected at its upper end to the short arm or lug C'' and at its lower end to the main casting C, both connections being by means of universal joints, and a vane made up of two main ribs N and a wind-surface N' is bolted to the vane-casting M in the ordi-

nary manner. The arrangement of the pivots of the vane-casting is such that the free end of the vane is raised or lowered as the vane is swung upon its pivots with reference to the wind-wheel casting, the arrangement of the parts being such that the vane is lowest when it lies approximately parallel with the wind-wheel shaft. The upper and lower arms of the vane-casting are each provided with short pintles, each pivoted in its arm upon a horizontal axis. The pintles pass vertically through the lugs C C and upon them the vane swings from side to side; but as they are not in the same vertical line but are in the same vertical plane parallel to the wind-wheel shaft, swinging the vane in either direction from this plane causes the vane to move upward upon the pindle-pivots as an axis. The normal position of the vane is therefore that in which it is approximately parallel to the wind-wheel shaft, and as the vane swings toward the wheel, or the wheel swings toward the vane under the pressure of the wind, the free end of the vane rises, gravity tending constantly to return it to its normal position. On the outer end of the arm C''' is a box c, forming a housing for a pulley, and at the upper end of the tube B is secured a similar box c', containing a second pulley. A chain or rope O has one of its ends fastened to the vane at a considerable distance from the pivot thereof and passes thence over the pulleys c c' and downward through the tube B to the ground. This chain, whose arrangement is one common in windmills of this general class, serves as a means for bringing the vane toward the wheel and bringing the mill out of the wind.

On the inner edge of the vane-casting M and at the lower end thereof is formed a shoulder m, adapted to strike against a corresponding stop upon the main casting C, in order that the movement of the vane from its normal position may be in one direction only, and on the casting C at a point corresponding with the position of the shoulder m is

formed a lug, which holds in place a spring S, serving as a cushion between the vane-casting and the casting C. The object of this construction is to prevent the shock caused by the sudden swinging of the mill into the wind, which in mills of this class has heretofore been a constant source of breakage. The spring S may have any desired degree of elasticity and completely takes up the jar between the vane-casting and the wind-wheel support.

Having now described my invention and explained its operation, what I claim as new, and desire to secure by Letters Patent, is—

1. In a windmill, the combination, with a pumping-rod, of a suitably-mounted vertical guiding-bar, a cross-bar connecting the pumping-rod to the guiding-bar and holding the former in a path parallel to the latter, and a pitman connecting said cross-bar with the actuating parts of the mill.

2. The combination, with the wind-wheel shaft bearing the crank-plate with crank-pin thereon, of a pitman carried by the crank-pin, a pumping-rod at one side of the line of said shaft, a cross-bar substantially parallel to the plane of the crank-plate and connecting the pumping-rod and pitman, and guiding devices confining the cross-bar to a vertical path.

3. The combination, with the windmill-head having rigid lugs at top and bottom, of the vane resting upon said lugs and connected with each by a vertical pivot hinged upon a horizontal axis, the upper of said pivots being at the greater distance from the axis of the head, whereby the vane swinging upon the vertical pivots must rise at the outer end and swing upon the horizontal hinge-axes.

In testimony whereof I have signed this specification in presence of two subscribing witnesses.

WILMER S. LAMB.

Witnesses:

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