# E. Cleaver. Wind Wheel.

116555

*Fig. 1.* PATENTED JUL 41871

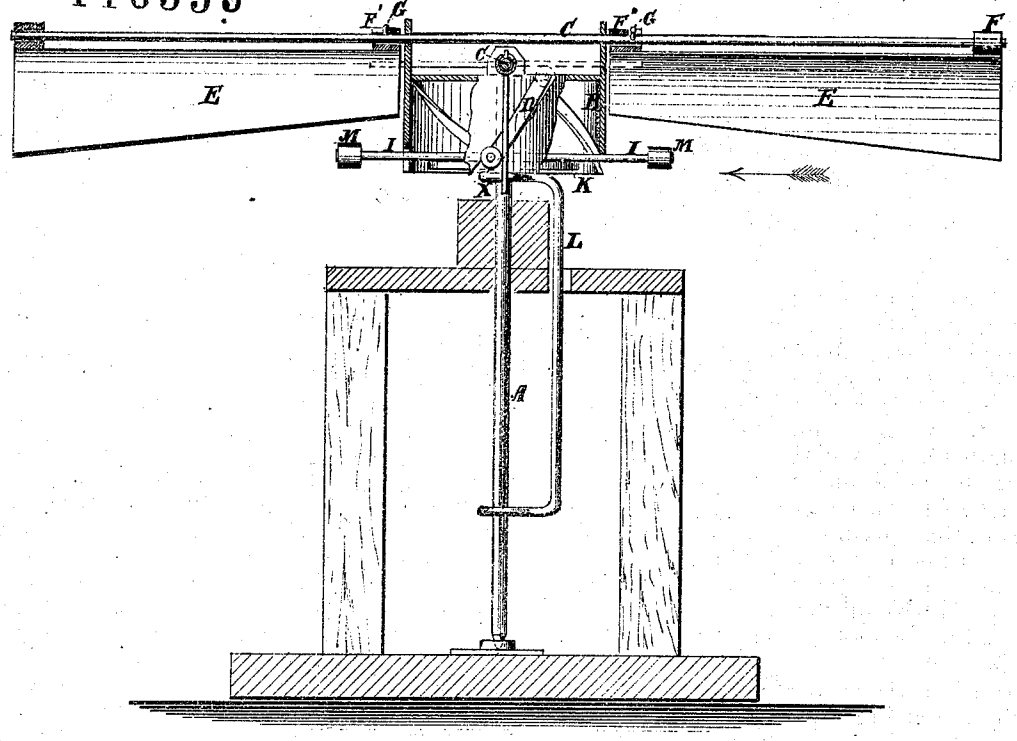
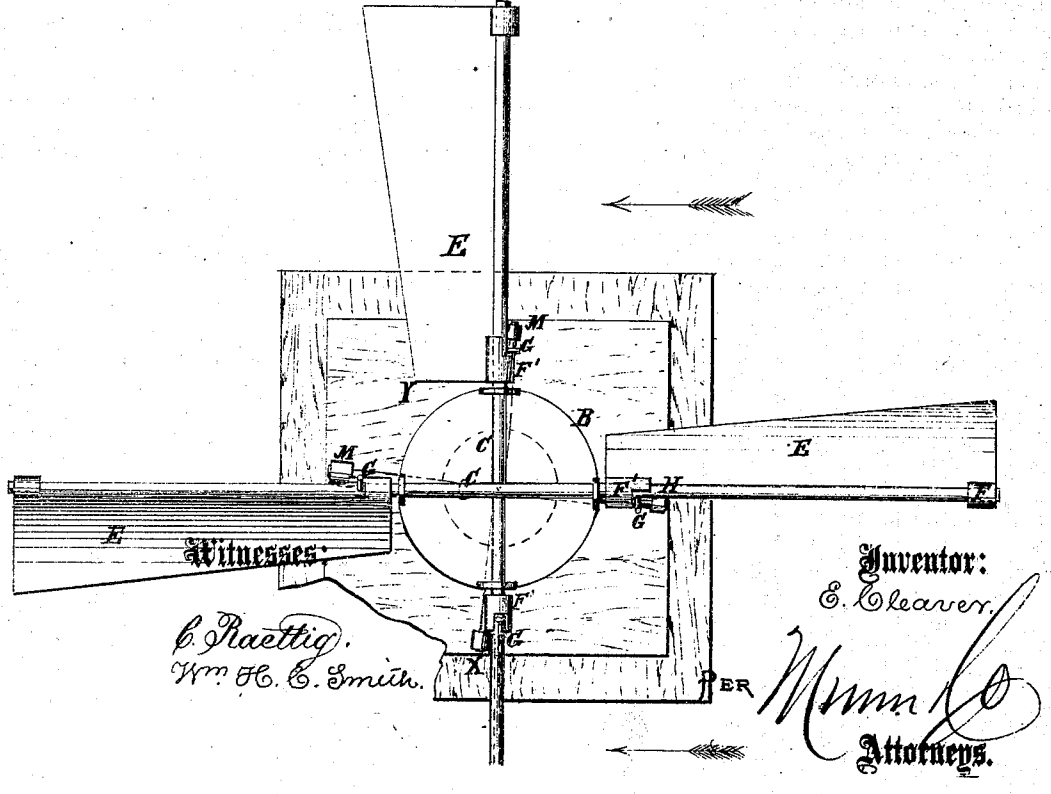



*Fig. 2.*




Witnesses:

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# UNITED STATES PATENT OFFICE.

ELLWOOD CLEAVER, OF NORTH WALES, PENNSYLVANIA.

## IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. 116,555, dated July 4, 1871.

*To all whom it may concern:*

Be it known that I, ELLWOOD CLEAVER, of North Wales, in the county of Montgomery and State of Pennsylvania, have invented a new and Improved Wind-Wheel; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification.

My invention relates to certain improvements upon wind-wheels, which will be first described in connection with all that is necessary to a full understanding thereof and then clearly pointed out in the claim.

Figure 1 is a vertical section of my improved wind-wheel, and Fig. 2 is a plan view.

Similar letters of reference indicate corresponding parts.

A is the vertical shaft, on the top of which is mounted a large hollow cylinder, B, or it may be a skeleton frame of iron, of any kind, of a little greater height than the breadth of the vanes. This cylinder supports at its upper end two long arms or rods, C, horizontally and at right angles to each other, and it has four spiral grooves or slots, D, in it, beginning at the bottom a little in advance—*i. e.*, the direction in which the wheel is to turn—of the vertical planes of the vanes E, one of which hangs from each projecting part of said rods, said slots inclining rearward as they rise to the top. The vanes have tubular knuckles F F′, which slide onto the rods, and they are capable of turning thereon, but are limited to about one-fourth of a revolution by a pin, G, passing through a notch, H, in knuckle F, which also holds the vane from sliding off the rod. The pins and notches are so arranged that the vane may be lifted by the wind when returning to the side for taking it again. The vanes are held in the vertical position for taking the wind by the said pins and by arms I radiating from a ring or disk, K, placed on the shaft A, so that the said arms will project out through the slots D near the lower ends, and they are supported on the upper end of a rod, L, coiled around the shaft and extending downward, and coiled around it also at the lower end, so as to rise and fall on said shaft, but without turning with it, for regulating the vanes. When in the lowest position the vanes will hang vertically in front of the arms I while taking the wind, as indicated at *x*, Figs. 1 and 2, while the opposite vanes, returning to the wind, will be turned up, as indicated at *y*, Fig. 1; but if the arms are forced upward by the rod L they will turn the vanes, taking the wind up against them into a horizontal position, and will hold those returning, and so turned up by the wind, in the same position, so that neither will take the wind more than the other, and the wheel will stop. The said arms, being raised part way up, will limit the action of the wind on the vanes, and they may be used as a regulator therefor by the attachment to the shaft below the rod L of any governor for regulating speed. The said arms are to have friction-rollers M applied where they bear against the vanes, and may also have them where they bear against the walls of the slots, to cause them to work with as little friction as possible. When the rod L is let down the arms I will be forced down by the wind acting on the vanes. It will be seen that this construction is very simple, and that it furnishes a very efficient apparatus, which may be very readily controlled. The arrangement of the rods C to extend across the cylinder B and shaft A is an important feature, for it makes the supporting of them a very simple matter; whereas, if separated at the center, it would require very powerful fastening to hold them. I may employ three or four of these rods in a large wheel, if preferred; but for smaller wheels I prefer to employ only two.

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

1. The combination of the vertical shaft, the rods C, and vanes hinged thereon, the spirally-slotted cylinder supporting the rods, and the vertically-adjustable arms I, all substantially as specified.

2, The combination, with the arms I, of the lifter L, substantially as specified.

The above specification of my invention signed by me this 23d day of January, 1871.

ELLWOOD CLEAVER.

Witnesses:

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