(No Model.) 2 Sheets—Sheet 1.

L. A. COOPER.

WINDMILL.

No. 377,602. Patented Feb. 7, 1888.

Fig. 1.

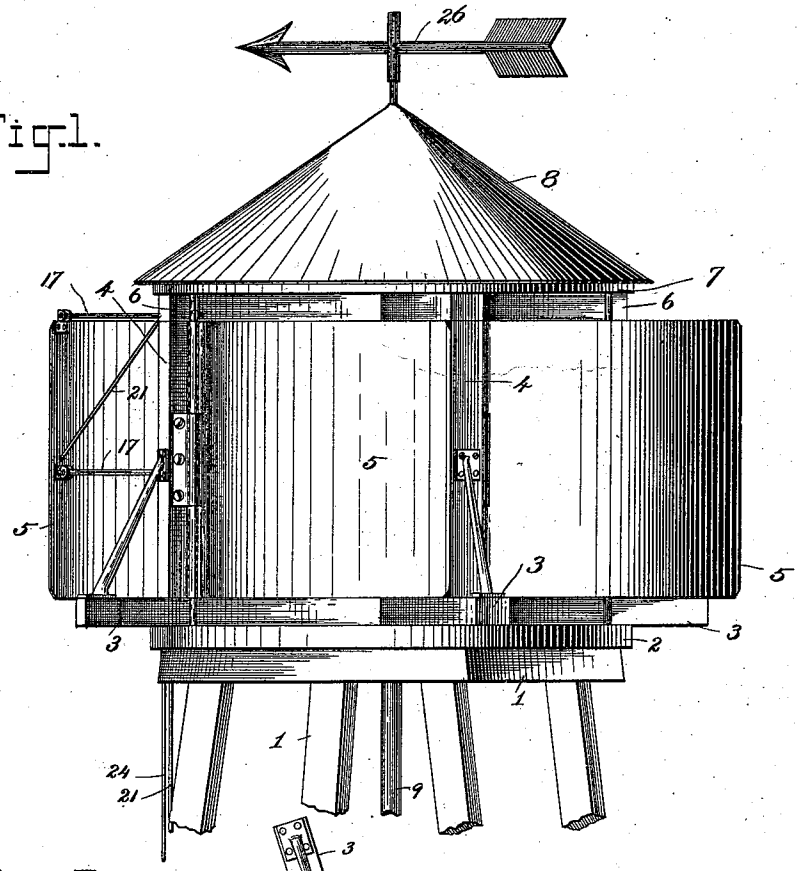
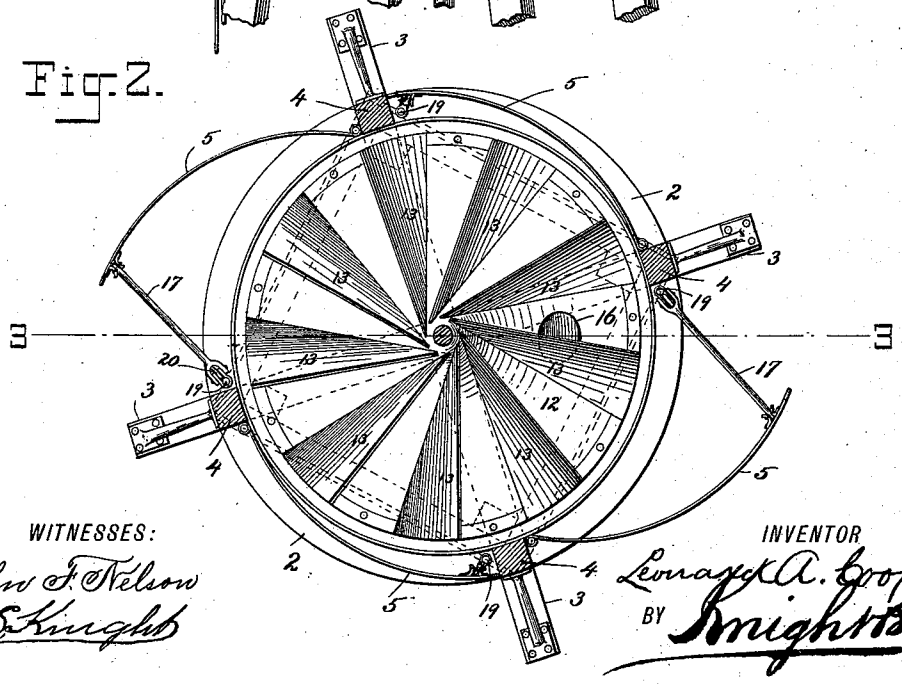


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

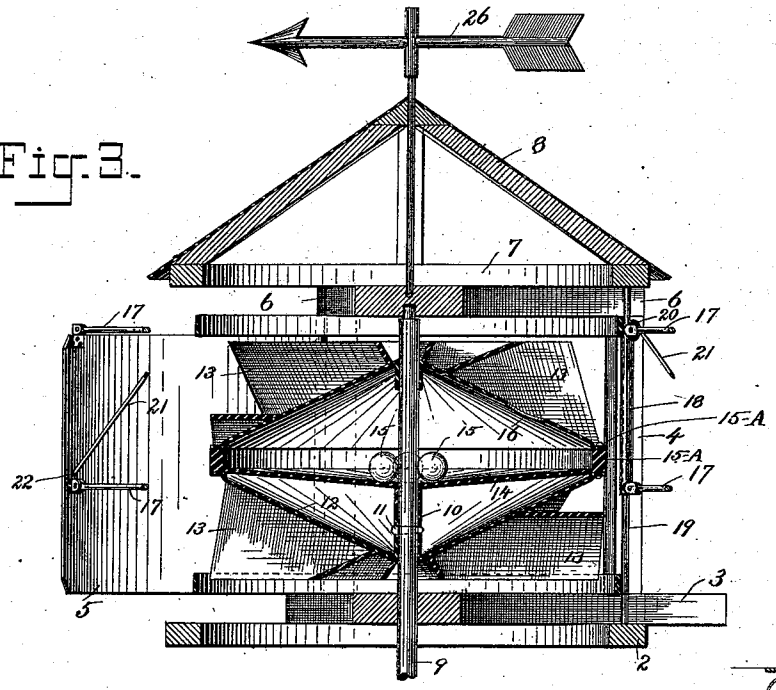


Fig. 4.

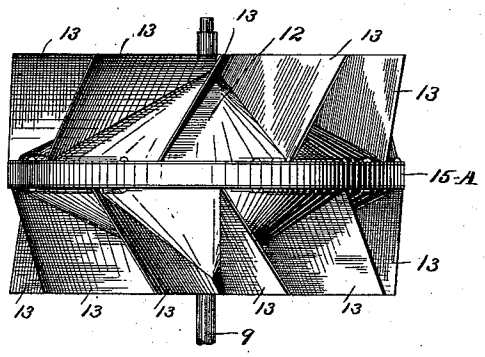
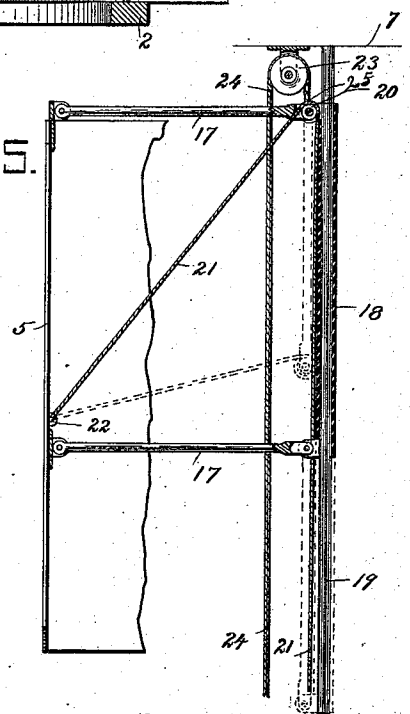


Fig. 5.



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UNITED STATES PATENT OFFICE.

LEONARD A. COOPER, OF ATCHISON, KANSAS.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 377,602, dated February 7, 1888.

Application filed September 26, 1887. Serial No. 250,742. (No model.)

To all whom it may concern:

Be it known that I, LEONARD A. COOPER, a citizen of the United States, residing at Atchison, county of Atchison, and State of Kansas, have invented certain new and useful Improvements in Windmills, of which the following is such a full, clear, and exact specification as to enable those skilled in the art to make and use the same.

My invention relates to that class of wind-motors known as the "horizontal windmill;" and it has for its object to construct and arrange the wheel in its relation with the other parts so as to give a greater percentage of power and produce more uniform and gradual revolutions of the wheel than are generally characteristic of wind-motors.

My invention consists, essentially, in arranging a horizontal or other suitable wind-wheel on a vertical shaft or spindle in an inclosure which is provided with a number of doors which may be operated from the ground by suitable mechanism, and through which wind is admitted to the wheel, and providing the interior of the body or shell of the wheel with a slightly-dished flooring arranged horizontally around the vertical spindle or shaft, and placing upon this centrally-inclined flooring a number of weighty balls, which huddle in the center of the said flooring when the wheel is at rest or revolving very slowly and roll out and distribute themselves about the inner walls of the shell of the wheel when the centrifugal action is increased by the more rapid revolutions thereof, and thus produce greater power on the spindle; and a further advantage attained by the employment of the balls is that during gusty weather, when the wind comes and goes suddenly and is of short duration, the force of the weighty balls will ordinarily keep up the revolutions of the wheel from the time of the expiration of one flaw to the time of the commencement of another, and in this way the revolutions are kept at a uniform speed during flawy winds. When the centrifugal force is relaxed, the balls gravitate to the center of the wheel, and thus make the latter very light at the edges and subject to revolution by very light winds. There are other features of novelty which I will now describe with reference to the accompanying drawings, and then my invention will be specifically pointed out in the claims.

In the said drawings, Figure 1 is a side elevation of my windmill, showing two of the doors open. Fig. 2 is a top or plan view of the same. Fig. 3 is a vertical section taken on the line 3 3, Fig. 2. Fig. 4 is an edge view of the wheel. Fig. 5 is a view showing the mechanism for operating the doors.

1 1 are the upright and cross pieces which comprise the tower, on the top of which rests a circular sill, 2, and upon the latter are supported two cross-beams, 3, which cross each other directly in the center. At each end of these beams is an upright or jamb, 4, to which the doors 5 are hinged, and upon the tops of which are supported two similar cross-beams, 6. Upon these cross-beams is supported a circular sill, 7, upon which the roof 8 rests.

9 is the spindle, which has its upper bearing in the beams 6 at their intersection, and passes loosely through the beams 3, and is supported at its lower end in a bearing on a cross-bar, which is not shown. To this spindle is secured the wind-wheel by means of the collar 10 and pin 11. This wheel is composed of a hollow shell, 12, preferably of diamond shape in vertical cross-section, with the ends truncated, as shown, and to the outside of which shell are secured any desired number of sails, 13.

14 is the supplemental circular flooring situated on the interior of said shell and inclined centrally, as before described, and upon which the desired number of balls 15 may be placed through the aperture 16 in the shell. This wheel may be composed of sections and put together in the tower. For instance, the lower half of the shell may be placed on the spindle and secured by the pin 11; then the supplemental flooring is put in, after which the upper half of the shell is put on and the sections secured to the rim 15^A by means of rivets or bolts, as shown.

The doors 5 are opened or closed, according to the direction of the wind, from the ground by means of mechanism which consists of the two parallel arms 17, hinged at the top and near the middle of the door, respectively, and which are also hinged at their other ends to a sleeve, 18, adapted to slide vertically on a shaft or rod, 19, secured at its upper and lower

ends in the circular sills. In the hinge of the upper arm 17 is a pulley, 20, over which a cord, 21, that is secured to the door at 22, passes and terminates within reach of the operator, and hung from the sill 7 is another pulley, 23, over which passes a cord, 24, having one end secured to the sleeve 18 at 25 and its other end terminating, like the cord 21, within the operator's reach. It will thus be seen that by drawing upon the cord 21 the sleeve will be drawn downward and the door at the same time will be drawn inward, and that by drawing upon the other cord the sleeve will be drawn upward and the arms will force the door open. The mechanism for all the doors may be identical.

A vane, 26, is placed on the top of the roof to indicate the direction of the wind, in order that the operator may open the two doors in a line therewith, and thereby permit the current to strike the sails only while they are turned broadside and to leave the inclosure through the opposite door.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. The combination, with the spindle 9, of a wheel keyed thereon, sails secured to said wheel, a centrally-inclined flooring or plate surrounding said spindle, and a number of balls or weights on said incline, substantially as set forth.

2. The combination, with the sails, of a hollow shell to which said sails are secured, a centrally-inclined plate arranged horizontally in said shell, and a number of balls supported by said plate, substantially as set forth.

3. The combination, with the door 5, sleeve 18, and a rod, 19, of the arms 17, hinged to said door and sleeve, respectively, and the cord 21, connected to said door and passing over pulley 20, connected with said sleeve, substantially as set forth.

4. The combination, with the door 5, sleeve 18, and rod 19, of the arms 17, hinged to said door and sleeve, respectively, and the cord 21, secured to the door and passing over a pulley, 20, on said sleeve, and the cord 24, secured to said sleeve and passing over pulley 23 at the upper end of the rod 19, substantially as set forth.

LEONARD A. COOPER.

Witnesses:
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