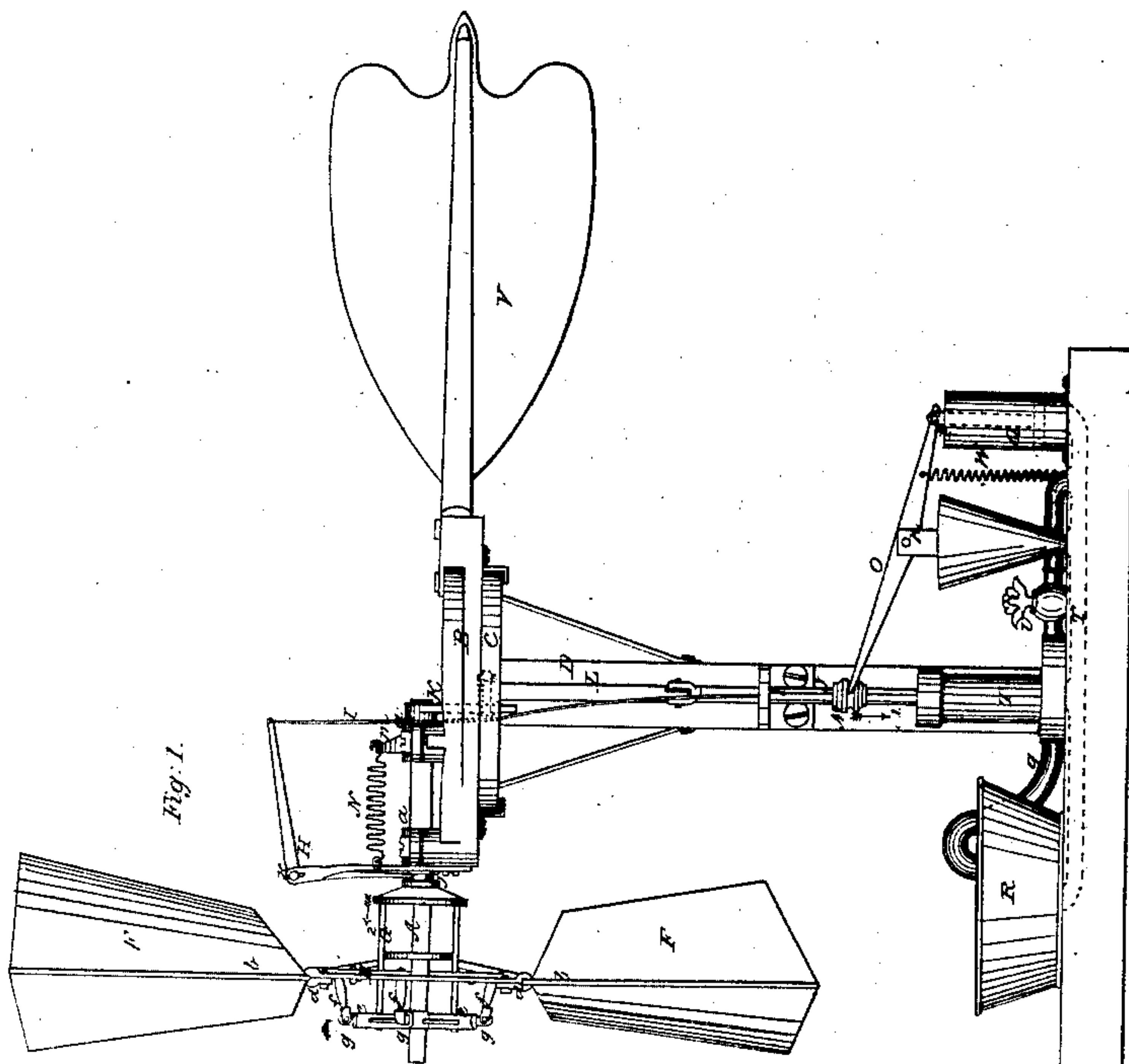
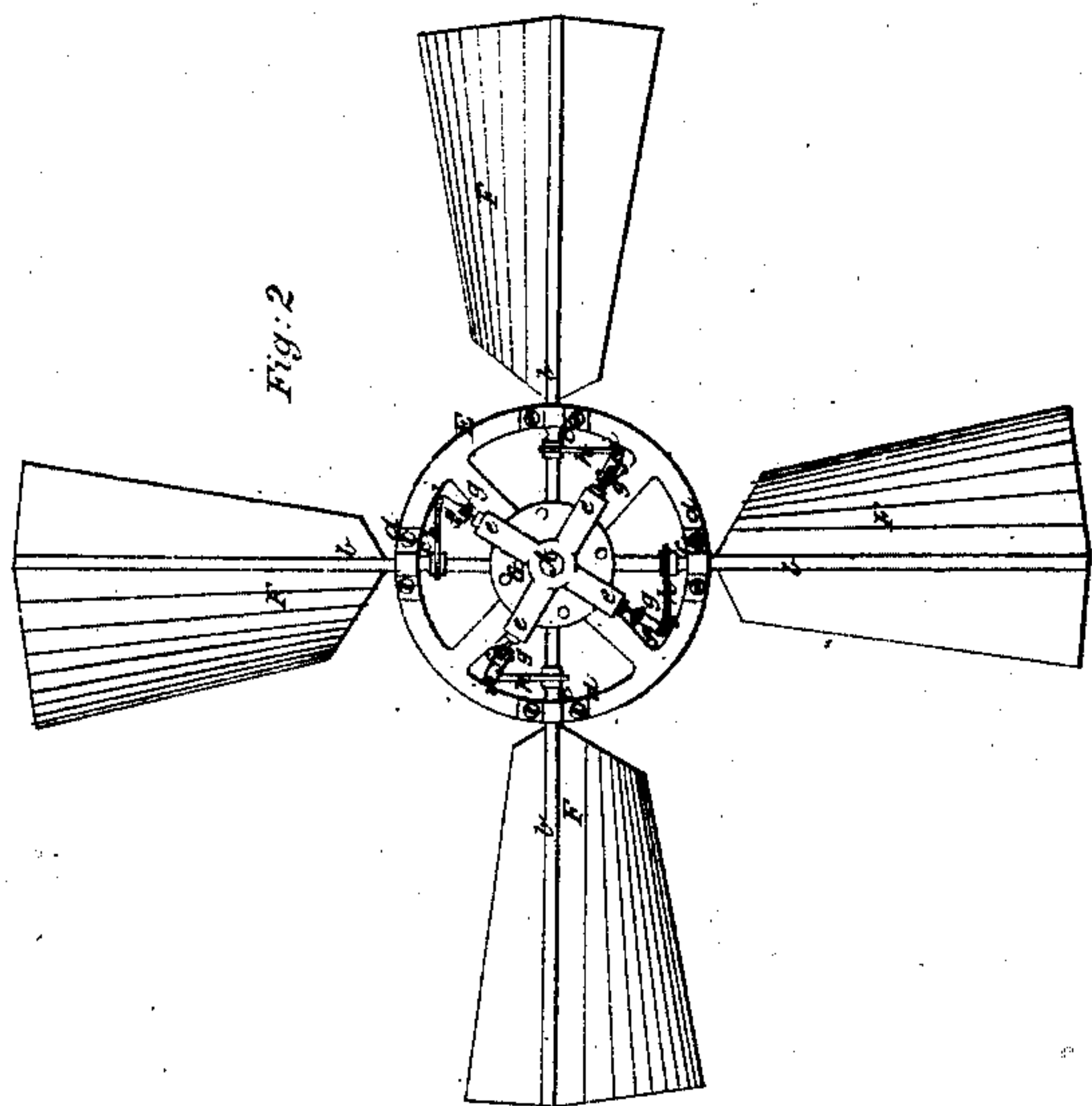


D. Halladay,

Wind Wheel,

N^o 11,629.

Patented Aug. 29, 1854.



UNITED STATES PATENT OFFICE.

DANIEL HALLADAY, OF ELLINGTON, CONNECTICUT.

IMPROVED GOVERNOR FOR WINDMILLS.

Specification forming part of Letters Patent No. 11,629, dated August 29, 1854.

To all whom it may concern:

Be it known that I, DANIEL HALLADAY, of Ellington, in the county of Tolland and State of Connecticut, have invented a new and useful Improvement in Windmills; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a side elevation of my improved windmill. Fig. 2 is a face view of the wings or sails.

Similar letters of reference indicate corresponding parts in the two figures.

The nature of my invention consists in having the wings or sails attached to movable or rotating spindles having levers or equivalent devices connected to them, said levers or equivalents being also connected to a head which rotates with the wings or sails and upon the same shaft, the head having a lever connected to it, which is operated by a governor which slides the head upon the shaft and causes the levers or their equivalents to turn the wings or sails so as to present a proper resisting-surface to the wind, and thereby produce a uniform velocity of the wings or sails, which are made to have a greater or less obliquity, according to the velocity of the wind.

To enable others skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A represents a horizontal shaft, which works in suitable bearings *a a* upon a cap B, said cap B working loosely upon a circular plate C, attached permanently to a proper support or frame-work D. (See Fig. 1.) The shaft A projects some distance beyond the edge of the cap B, as shown in Fig. 1, and has a wheel E attached permanently to it.

F represents the wings or sails, which are secured to spindles *b*, said spindles passing radially through the rim of the wheel E and into its hub, the spindles being prevented from withdrawing by collars *c*, which bear against the inner edge of the rim and bearings *d*, (see Fig. 2,) which are secured by screws over the spindles, the spindles being loose in the wheel E and allowed to turn upon their axes. Four wings or sails are represented; but any proper number may be used.

G is a head fitted loosely upon the shaft A

and having projections *e* at its front end, to which projections small levers *f* are attached by pivots *g*, the outer ends of the small levers *f* being secured to the ends of levers *h* by pivots *i*. The levers *h* are secured permanently to the spindles *b*, as shown in Fig. 2. The inner end of the head has a groove *j* turned on it, in which groove a forked lever H fits. (See Fig. 1.) The lever H is bent and has its fulcrum at *k*, and to the outer end of the lever H a wire or rod I is attached, said wire or rod passing down in a groove *l* in a vertical rod J, the upper end of which is connected to a crank K on the inner end of the shaft A by a connecting-rod L. The lower end of the wire or rod I is attached to a sliding head or boss M on the rod J.

N is a spring, one end of which is connected to the vertical portion of the bent lever H and the opposite end to a projection *m* on the inner bearing *a* of the shaft A. The sliding head or boss M on the rod J has a recess *n* in it, in which a fork at one end of a lever O fits, said lever O having its fulcrum at *p*. The opposite end of the lever O is attached by a pivot to a piston-rod P, the piston of which works within a cylinder Q. (See dotted lines, Fig. 1.) R is a reservoir containing water, and S is a pipe which projects over the top of said reservoir, the opposite end of the pipe being connected to a pipe T, which communicates with the cylinder Q, reservoir R, and a pump T at their bottoms. (See dotted lines, Fig. 1.) The rod J, it will be seen, is the piston-rod of the pump T.

U is a cock in the pipe S.

V is a horizontal wing attached to the cap B for the purpose of keeping the wings or sails F facing the wind.

W is a spring attached to the lever O.

Operation: The reservoir R is filled with water, and the wings or sails F, wheel E, and head G rotate with the shaft A, and the crank K at the inner end of the shaft A works the piston-rod J of the pump T, and the water in the reservoir R is drawn through the pipe T and forced again into the reservoir R through the pipe S. In case the shaft A revolves too rapidly the cock U is somewhat turned, so as to check the free passage of water through the pipe S, and the water will then be forced against the under side of the piston in the cylinder Q and will raise it, and the head or boss

M will consequently be moved down upon the rod J (see arrow 1) and the wire or rod I will draw downward the horizontal arm of the lever H, while the vertical arm will force outward the head G on the shaft A, (see arrow 2,) and the levers *f h* will turn the spindles *b* and the wings or sails F move obliquely to the wind, and the motion of the mill will be decreased in a corresponding degree. When it is desired to increase the motion of the mill, the cock U is opened, and the water having a free passage through the pipe S the head or boss M is raised upon the rod J and the head G on the shaft A brought back to its original position by the spring N, the wings or sails presenting a greater surface to the wind. The spring W causes the lever O to resume its original position or depresses the piston in the cylinder Q, when the water has a free passage through the pipe S.

The windmill, as above described, is arranged for operating a pump, and the arrangement of the reservoir R and cylinder Q with the pipe-connections merely act as a governor, it being understood that in practice the pump T draws the water from a well, instead of the reservoir R, herein shown. The above arrangement would be the most economical where pumping alone is required; but in other cases, as grinding grain, churning, thrashing, &c., a ball-governor would be operated by the rod J, which would then be

connected to the shaft A by bevel-gearing and have a rotary motion.

I do not confine myself to any form or kind of governor.

The above mill is more particularly designed for farmers' use and in other cases where a moderate power is required. They are not expensive to manufacture, and may be moved with little difficulty from place to place in order to perform different sorts of work required to be done.

I do not claim attaching the wings or sails to spindles *b*, which turn on their axes irrespective of the arrangement for turning said spindles in order to give them the desired obliquity, and thereby presenting a greater or less surface to the wind.

What I claim, therefore, and desire to secure by Letters Patent, is—

Attaching the spindles *b* of the wings or sails F to a sliding head G by means of the levers *f h* or their equivalents and operating said head G by means of the lever H or its equivalent, and a governor of any proper construction for the purpose of giving the desired obliquity to the wings or sails, and thereby insuring an equal motion and power during the variable velocity of the wind.

DANIEL HALLADAY.

Witnesses:

JOHN BURNHAM, Jr.,
HENRY MCCRAY.