2 Sheets--Sheet 1.

C. H. EGGLESTON & W. M. PHELPS.

Wind-Mill.

No. 162,636. Patented April 27, 1875.

Fig. 1

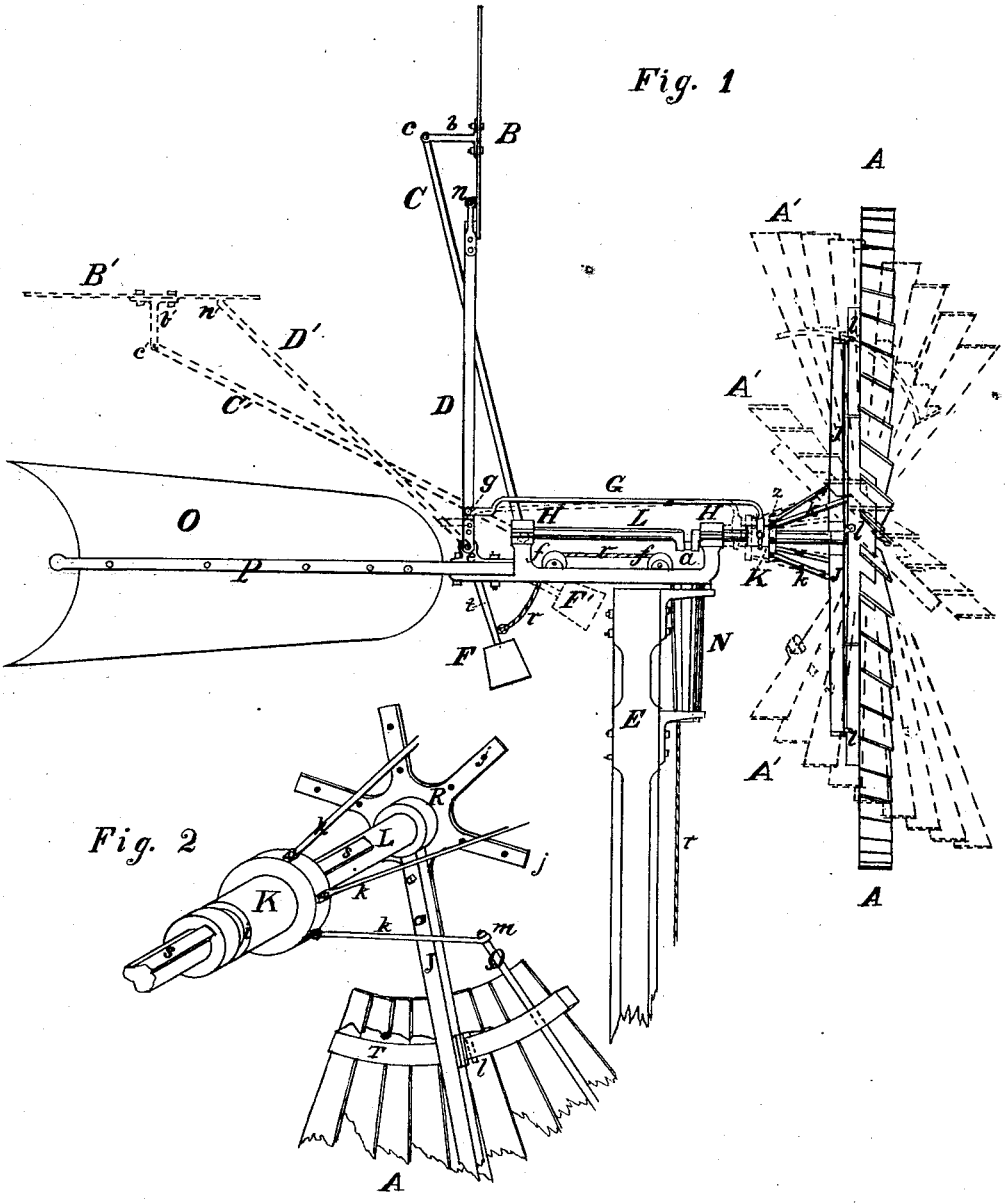


Fig. 2

Witnesses

J. E. Ferguson

G. Crawford

Inventors

Charles H. Eggleston

William M. Phelps

per Wells Bros.

Att'ys

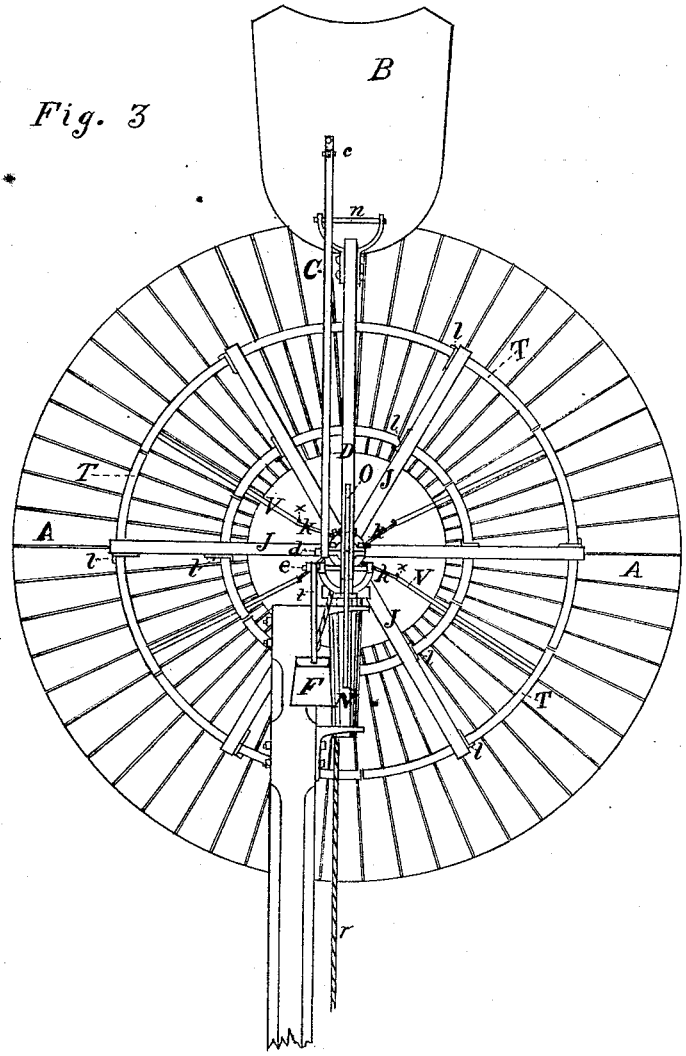
2 Sheets--Sheet 2.

C. H. EGGLESTON & W. M. PHELPS.

Wind-Mill.

No. 162,636. Patented April 27, 1875.

Fig. 3



Witnesses
J. S. Ferguson
G. Cranton

Inventors
Charles H. Eggleston
William M. Phelps
per Wells Bros. Attys.

UNITED STATES PATENT OFFICE.

CHARLES H. EGGLESTON AND WILLIAM M. PHELPS, OF MARSHALL, MICHIGAN, ASSIGNORS OF ONE-HALF THEIR RIGHT TO C. S. CRANE, OF SAME PLACE.

IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. **162,636**, dated April 27, 1875; application filed October 5, 1874.

To all whom it may concern:

Be it known that we, CHAS. H. EGGLESTON and WILLIAM M. PHELPS, both of the city of Marshall, State of Michigan, have invented a new and Improved Windmill, of which the following is a full and accurate description, reference being had to the accompanying drawings.

Figure 1, Sheet No. 1, is a side view. Fig. 2, Sheet No. 1, is an enlarged isometrical view, showing a portion of the main shaft, the sliding collar, and its connection with one of the sections of the wheel-wings. Fig. 3, Sheet No. 2, is a rear view of the wheel.

In Fig. 1 the full lines represent the wheel in the wind in working order, and the dotted lines show the position of the parts when thrown out of the wind, and the wheel at rest.

The wheel A A is made up of the ordinary small rings set in ribs T, Figs. 1, 2, and 3, but arranged in sections. These sections are hinged radially upon the arms J of the wheel by means of the hinges *l l*, Figs. 1 and 2, attached to the ribs T, so as to allow them to swing round the arms J, and present their edges to the wind when the wheel is at rest. An arm, Q, Fig. 2, is attached to each section, to which is hinged, at *m*, a link, *k*, which is also hinged to the sliding collar K. The collar K moves freely upon the shaft L, but is held from revolving upon the shaft by the key *s* fitting loosely into a corresponding groove in the collar. This collar has a groove, *i*, cut in its outer surface near its rear end, in which a yoke upon the end of the connecting-rod G works loosely. The rod G is hinged at *g* to the standard D of the governing-vane B. The standard D is hinged at *e*, so as to vibrate in a vertical plane, parallel to the axis of the wheel. The vane B is hinged at *n*, to vibrate in the same plane. A short bracket, *b*, is attached rigidly to the back of the vane B. To this bracket is hinged, at *c*, a tilting rod, C, which is also hinged at its lower end at a point in front of the standard D. The lower hinge of C is shown at *d*, Fig. 3. The arm *t* and weight F are rigidly connected to the standard D, tending always to hold it in an upright position. A crank, *a*, is formed in the main shaft L, to which a pitman, for working a pump, may be attached. H H are the bearings of the main shaft. *f f* are pulleys, over which the rope *r* are carried. N is the main pivot, on which the whole turns. It is hollow, to admit the passage of a pitman and the rope *r*. O is the vane for holding the wheel always facing the wind.

The operation of this wheel is as follows, viz: The weight F is so adjusted as to hold the standard D and its vane B upright against a breeze of given force. When the force of the wind exceeds this limit, the vane B, and standard D, and rod C are oscillated backward, carrying with them the rod G and sliding collar K, and, by means of the links *k*, causing the sections A to revolve upon their hinges, and assume a position approximating more or less to that indicated by the dotted lines A′ A′. The tilting rod C and its connections are so proportioned that when the wing-sections of the wheel have been revolved so as to present the edges of the wings to the wind the vane B shall assume a horizontal position.

In order to stop the wheel, it is only necessary to pull down upon the rope *r* attached to the arm *t*, thus throwing the various parts of the wheel into the position indicated by the dotted lines, when all the wings and vanes will present only their edges to the wind, enabling it to sustain, without any serious strain, a severe storm.

Practical experience has demonstrated that it is prime importance in a windmill that less force should be required to operate the governing device when it first begins to act than when it approaches its limit of action, so that it may act gradually, and never allow the mill to be thrown suddenly out of the wind in gusty weather, as is the case with most devices. We secure this gradual movement by means of the peculiar arrangement of the various parts of our device. As the vane B moves backward under the pressure of the wind the tilting rod C causes the vane B to tilt over more and more, but evenly, and just in proportion to the increasing force of the wind, and presenting less and less surface to

the action of the wind, the whole being regulated automatically, and insuring a regular even motion to the wheel.

Having thus described our improvement, what we claim as our invention, and desire to secure by Letters Patent, is—

1. An automatic regulating device for a windmill, consisting of a vane, B, hinged upon a weighted hinged standard, D, and tilting rod C, when constructed and operated in the manner and for the purpose substantially as shown and specified.

2. The combination of the vane B, tilting rod C, and weighted hinged standard D, with the connecting-rod G, sliding collar K, links *k*, arms Q, and sections A, when constructed and operated in the manner and for the purpose substantially as shown and specified.

CHARLES H. EGGLESTON.
WILLIAM M. PHELPS.

Witnesses:
JAMES H. CAMPBELL,
L. E. GALLUP.