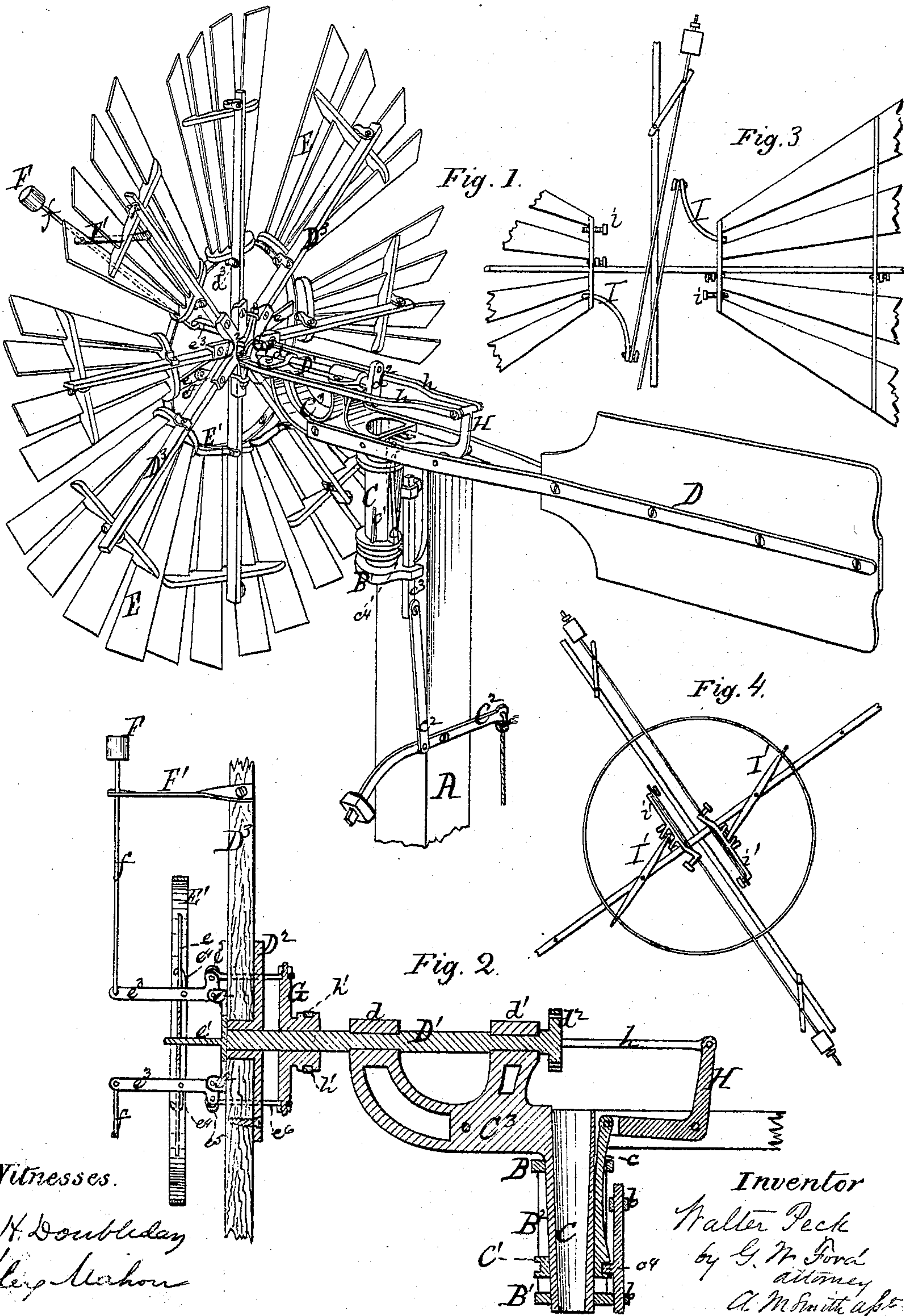


W. PECK.

Wind-Mills.

No. 129,165.

Patented July 16, 1872.



Witnesses.

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## IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. 129,165, dated July 16, 1872.

### SPECIFICATION.

*To all whom it may concern:*

Be it known that I, WALTER PECK, of Rockford, in the county of Winnebago and State of Illinois, have invented a new and useful Improvement in Windmills; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawing and to the letters of reference marked thereon.

Figure 1 is a perspective view taken from the rear side. Fig. 2 is a vertical section taken longitudinally of the main shaft and vane, and Figs. 3 and 4 represent modifications of the devices for changing the angle at which the fans are presented to the wind.

Similar letters of reference denote corresponding parts in all the figures.

This invention consists in certain novel features of construction and arrangement, which will be fully explained.

In the drawing, A represents the support to which the mill is secured in an elevated position. B B<sup>1</sup> B<sup>2</sup> is a bracket or supporting frame, consisting of two horizontal flanges, B B<sup>1</sup>, each provided with circular openings, and connected by a vertical web or base, B<sup>2</sup>, which is bolted to standard A. The bracket has also two slotted ears, b b<sup>1</sup>, one at its lower end and one near the top. C is a hollow cylinder mounted in a vertical position in flanges B B<sup>1</sup>, and revolving freely therein. The opening or bearing in flange B<sup>1</sup> is smaller than the bearing in flange B, and the lower end of the cylinder is correspondingly small, leaving a shoulder which rests upon the upper face of flange B<sup>1</sup>, and thus supports said cylinder. After the cylinder is placed in position a pin is inserted in the protruding end below flange B<sup>1</sup> to prevent the cylinder from rising. C<sup>1</sup> is a collar fitting loosely upon the cylinder C. The collar has a vertical arm, c, rising from one side and extending up through the flange B, its upper end fitting in a groove cut for its reception in the outside of the cylinder, the groove being deep enough to let the arm in its full depth, so that it shall occupy no additional room in the bearing in the flange. The lower end of the cylinder has longitudinal ribs or feathers c<sup>1</sup>, which engage with corresponding notches in the inner surface of the collar C<sup>1</sup>. Thus the cylinder and ring must always rotate together, while the ring is free

to slide up and down upon the cylinder, for a purpose which will be explained. C<sup>2</sup> is a bent weighted lever, pivoted to any convenient support and connected, by means of a link, c<sup>2</sup>, with a bar, c<sup>3</sup>, which slides in ears b b<sup>1</sup>. c<sup>4</sup> is a stud or spur projecting from bar c<sup>3</sup> and engaging with a peripheral groove in collar C<sup>1</sup>. Thus the collar and sliding bar are made to rise and fall together. C<sup>3</sup> is a base or frame formed in one piece with cylinder C, and projecting at a right angle from the upper end thereof. Base C<sup>3</sup> serves as a support for the vane D and the main shaft D<sup>1</sup>, the latter being mounted in elevated bearings d d<sup>1</sup>. Shaft D<sup>1</sup> is provided, at its inner end, with a crank, d<sup>2</sup>, arranged centrally of the hollow cylinder C, as is customary in this class of mills. D<sup>2</sup> is a metallic head, having radial sockets in which the arms D<sup>3</sup> are bolted or otherwise secured. E are the wings or fans, each made, by preference, of a number of narrow strips, but any other approved construction may be employed. The fans are hinged centrally to arms D<sup>3</sup>, as at d<sup>3</sup>, in such manner that they can be rocked or oscillated thereon, in order that they (the fans) shall be presented to the wind at different angles, as the force of the wind or the power required shall determine.

I will now describe the construction of the devices immediately connected with the fans for controlling their position. E<sup>1</sup> is a shifting-ring, having a diametrical bar or girt, e, which is mounted on a stud, e<sup>1</sup>, projecting from a short bracket, e<sup>2</sup>, which will be soon described. Each of the fans E is pivoted to ring E<sup>1</sup>, each pivot being at a short distance from its corresponding hinge, so that it can be made to serve as a crank to rock the fan upon its hinges, as will be readily seen. e<sup>3</sup> e<sup>3</sup> are levers, each pivoted at its inner end to an ear formed upon one end of bracket e<sup>1</sup>. (See Figs. 1 and 2.) These levers are connected with bar e by means of links e<sup>4</sup>. They are each provided with a projecting arm, e<sup>5</sup>, arranged opposite to links e<sup>4</sup>, and connected, by links e<sup>6</sup>, with a sliding cross-head, G, on the opposite side of the metallic head D<sup>2</sup>. (See Fig. 2.) F F are governor-balls connected with the free ends of levers e<sup>3</sup> e<sup>3</sup> by rods f. F<sup>1</sup> are supporting-arms, bolted or otherwise secured to arm D<sup>3</sup>, and employed to sustain the outer ends of rods f and governor-balls F, the rods sliding in perforations in



the ends of the arms. The cross-head G, (see Fig. 1,) is made in two parts secured to each other by bolts passing through ears or lugs, as shown, and is mounted loosely upon shaft D<sup>1</sup>. It turns with the shaft but is free to slide thereon longitudinally. H is a bell-crank lever, pivoted between the ribs that support the vane D. The arm *c* of collar C<sup>1</sup> is pivoted to the horizontal arm of the bell-crank lever H, the vertical arm of said lever being expanded into a T-piece, and connected by means of two links, *h h*, with a ring, *h'*, which fits in a groove in the hub or sleeve of cross-head G. (See Fig. 2.) The bearing *d* is formed with a way or groove upon each side, in which the links *h h* slide; hence the pivot which unites said links with the bell-crank lever H is relieved from any twisting strain which might otherwise be imparted by the rotation of the cross-head. The mill is propelled by the action of the wind upon the fans in the usual manner. When the speed increases beyond a certain point, the governor-balls F are thrown outward with sufficient force to lift the weighted bent lever C<sup>2</sup>, with which said balls are connected through rods *f*, levers *e*<sup>3</sup>, arms *e*<sup>5</sup>, links *e*<sup>6</sup>, cross-head G, ring *h'*, links *h*, bell-crank lever H, arm *c*, grooved collar C<sup>1</sup>, stud *e*<sup>1</sup>, sliding-bar *e*<sup>3</sup>, and link *e*<sup>2</sup>. As governor-balls F are thrown outward carrying with them the free ends of levers *e*<sup>3</sup>, these levers pull upon links *e*<sup>4</sup> and bar *e*, thus rotating shifting-ring E', and turning the fans so that they present a more acute angle toward the wind, thereby lessening the effective force of the mill, and checking the motion of the wheel. If the wind be violent enough the slats will be turned with their edges to the wind and the mill will stop. To guard against the balls being thrown out too far by a sudden impulse, thus reversing the position of the fans, and causing the wheel to run backward, I have so arranged links *e*<sup>6</sup> that they will, as levers *e*<sup>3</sup> are moved forward, strike against the socket-arms of head D<sup>2</sup>, and thus serve as stops to limit the throw of said lever; the throw of the fans in the opposite direction being limited either by stops *d*<sup>2</sup> on arms D<sup>3</sup>, (see Fig. 2,) or by spurs on links *e*<sup>6</sup> engaging with the metallic sockets of head D<sup>2</sup>. When preferred the links *e*<sup>6</sup> may be provided with two spurs or stops, *e*<sup>7</sup> *e*<sup>8</sup>, (see Fig. 3,) which shall strike against opposite sides of the socket or arms D<sup>3</sup>, to regulate the throw of the fan. I regard the central stud *e*<sup>1</sup> as being very important, because it insures an easy and accurate operation of the shifting-ring E' by means of bar *e*. Lever C<sup>2</sup> has a heel extension, *e*<sup>5</sup>, to which a wire or cord, *e*<sup>6</sup>, is attached, in order that the position of the fans may be regulated at will, as it will be readily seen that by pulling the cord, thus raising the weighted end of

lever *e*<sup>2</sup>, the sections of fans will be turned edgewise just as they are by the action of the governor.

It will be apparent from the above description, that links *e*<sup>6</sup> may be connected with and operated by any of the devices in common use in mills for adjusting the fans; and, also, that any arrangement of cylinder, loose collar, and its vertical arms may be employed for the same purpose in many other mills in the same manner that they are in mine.

The bent lever *e*<sup>2</sup> will regulate the speed of the mill by resisting the centrifugal action of the governor-balls F, as will be readily understood without further explanation.

In Fig. 3 I have shown devices for turning fans toward and from the wind in those mills where but two sections are employed. In this case the governor-rods *f* are connected with crank-arms I I projecting directly from the fan, and the links from the cross-head G are to be connected to pins *i*. In Fig. 4 two levers, I', are used instead of the bar *e*, for shifting the ring E, the lever *i'* being the equivalent of lever *e*<sup>3</sup>, in Figs. 1 and 2, and are employed in substantially the same manner, except they are connected with the inner ends of levers I' I'.

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

1. In combination with the governor-balls F and hinged fans E, the shifting-ring E', bar *e*, stud *e*<sup>1</sup>, levers *e*<sup>3</sup>, links *e*<sup>4</sup> *e*<sup>5</sup>, rods *f*, weighted lever C<sup>2</sup>, and connecting devices, substantially as set forth.

2. In combination with the cylinder C, provided at its upper end with a groove or channel, and at its lower end with ribs, the loose collar C<sup>1</sup>, sliding-bar *e*<sup>3</sup>, and arm *c*, as and for the purpose set forth.

3. The combination of the shaft-bearing *d* with the links *h h*, ring *h'*, and cross-head G, whereby said bearing *d* is made to support the links against the twisting strain imparted by the revolving cross-head, substantially as set forth.

4. The bracket *e*<sup>2</sup>, provided with ears, in which the levers *e*<sup>3</sup> are pivoted, and with the stud *e*<sup>1</sup>, constructed and applied to the wind-wheel, substantially as set forth.

5. The combination and arrangement of levers *e*<sup>3</sup>, link *e*<sup>6</sup>, and cross-head G, with the socket-arm of head D<sup>2</sup>, whereby the throw of the fans is limited, substantially as set forth.

This specification signed and witnessed this 21st day of February, 1872.

WALTER PECK.

Witnesses:

G. W. FORD,  
CHAS. S. FORD.