

M. P. RHOADES & J. A. J. TRICKLE.

WIND-MILL.

No. 192,598.

Patented July 3, 1877.

Fig. 1.

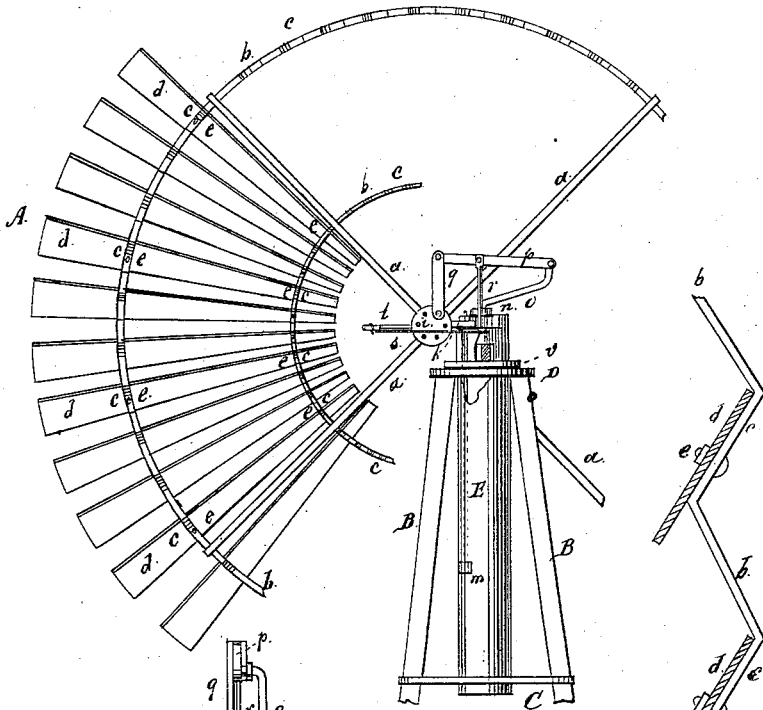


Fig. 3.

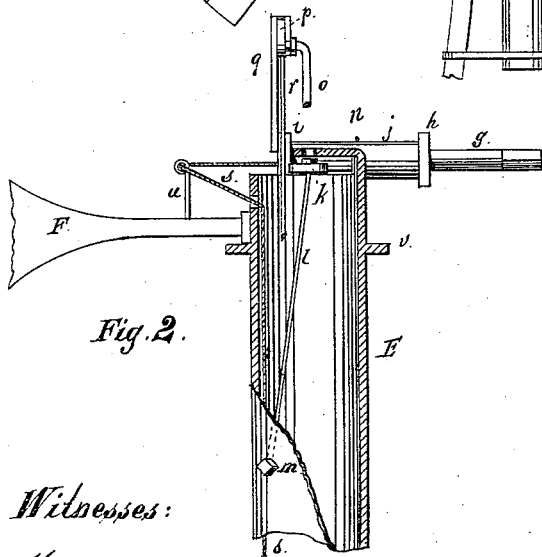
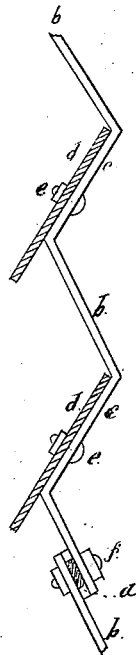


Fig. 2.

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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. 192,598, dated July 3, 1877; application filed May 1, 1877.

To all whom it may concern:

Be it known that we, MATHIAS P. RHOADES, of Cadiz, Green county, State of Wisconsin, and JOHN A. J. TRICKLE, of Clamo, Green county, State of Wisconsin, have invented new and useful Improvements in Windmills, of which the following is a full description, reference being had to the accompanying drawings, in which—

Figure 1 is a rear elevation with the upper end partly in section, and having only a portion of the wheel represented; Fig. 2, an enlarged detail, showing the devices for throwing the wheel in and out of the wind; Fig. 3, an enlarged detail, showing the mode of constructing the rim, and also the mode of attaching the fan-blades.

Wind-wheels, when heretofore made in the rosette form, and provided with one or more back-supporting rims, have had such rims made of wood, with inclined openings or slots cut in them for the reception of the fan-blades or wings; but this construction is defective, for the reason that the sections between the slots are liable to split out, and the slots or cuts, when they do not split, hold water or moisture, causing decay at the junction, and making the blades liable to break at that point, and when the rim is split or the blade is broken it is difficult to repair either of them.

Our improvement relates to devices to overcome this difficulty, and also to devices to bring the wheel to the wind; and its nature consists in making the rims to which the wings or fan-blades are attached of sheet-metal straps, bent to form inclines for the wings or blades, so that they will be arranged at the proper angle or pitch; and in providing a torsion-spring, so connected and arranged that it will act to throw the wheel into the wind.

In the drawings, A represents the wind-wheel, constructed, for convenience, in four or more sections. *a* are the arms or spokes, secured to the hub at the inner ends in any suitable manner. *b* is the sheet-metal rim, which, for convenience, is made in sections, each section being bolted to its adjoining section, so that when put together the several sections form

a continuous rim. These sheet-metal straps are bent in the form shown in Figs. 1 and 3. *c* are inclines formed by the bends of the sheet metal, to which the wings or fan-blades are secured. The angle of these inclines is such as to give the desired pitch to the wings or fan-blades. *d* are the fan blades or slats. *e* are bolts passing through the fans *d* and inclines *c*, by means of which the fans are secured in place. Two rims are used, as shown, one located near the outer ends of the fans, and the other near their inner ends. *f* are bolts for securing the several sections of the rim together. As shown, these bolts *f* also pass through the arms *a*, so that the same bolt secures the sections of the rim together, and also fastens the rim to the arms or spokes *a*.

Separate bolts may be used for these purposes, if desired.

B are the posts or frame-work upon which the wheel and other parts are supported or mounted, and which are extended to any suitable length. C is a platform, secured to the posts in any suitable manner. This platform holds the lower end of the central tube in position. D is a plate or platform, secured to the top of the posts B. Both of these platforms C D are provided with central openings. E is a central revolving guide-tube, located in the openings in the platforms C D, having at the lower end a suitable bearing on the plate C. *v* is a flange or projection on the tube, resting, when the tube is in position, on the plate D, and forming a bearing for the tube at the top. *g* is the shaft or axle, to the outer end of which the wind-wheel is attached, as usual. *h* is a collar secured to the axle *g*. *i* is a collar or disk, permanently secured to the inner end of the shaft *g*. *j* is a journal box or bearing for the axle, located between the collars *h* and *i*. *k* is a plate supporting the bearing *j*, located above the top of the tube E. *l* is a straight metal rod, the upper end of which is secured to the plate *k*, and the lower end to the side of the tube E, in such manner that it will not turn in its fastenings, thereby forming a torsion-spring. *m* is a bolt or rivet for securing the spring *l* at the lower end. *n* is a projection, permanently secured to the top

of the guide-tube E, between which and the guide-tube the plate *k* is located. *o* is a rod, the lower end of which is supported by a cross-bar at the bottom of the tube E. This rod extends up centrally within the tube E, and passes through a suitable opening in the projection *n*, by means of which it is held in place at the upper end, and is free to turn. The inner end of the plate *k* is secured to this rod *o*, so as to turn with it. The upper end of this rod *o* is bent, as shown in Fig. 1. *p* is a lever, one end of which is pivoted to the outer end of the rod *o*. *q* is a pitman, to the upper end of which the front end of the lever *p* is attached. The lower end of this pitman is connected, by means of a wrist-pin, with the disk or head *i*, thereby giving the lever *p* an oscillating movement. *r* is a piston or pump rod, attached at its upper end near the inner end of the lever *p*, and extending down through the tube E to a pump or other device to be operated. *s* is a cord for turning the wheel around so as to occupy a plane parallel with the vane, and throwing it out of the wind. *t* is an arm or hook, permanently secured to the bearing *j*, near its inner end. *u* is an arm or hook, permanently secured to the inner end of the vane-shaft. One end of the rope or cord *s* is secured to the arm *t*, and passes from thence through hook or loop *u*, and thence through an opening into the guide-tube E, and is extended downward within the frame-work in the usual manner. F is an ordinary vane, attached to the tube E above the cap or plate D. The extension or projection *n* forms a stop, against which the plate *k* strikes, to prevent the spring from throwing the wheel too far around.

In construction the wheel A with the rims *b* is to be made in sections, to facilitate handling and shipping. In use, these sections are secured together and to the arms *a* by means of bolts *f*.

By constructing the rim of metal, as shown, and attaching the fans to the inclines by bolts and nuts, if from any cause a fan be-

comes broken, it can be easily replaced by a new one, as it is only necessary to unscrew the nuts, and remove the broken fan, when a new one can be secured to the bolts by the nuts.

In use, when it is desired to throw the wheel out of the wind, the operator takes hold of the rope *s*, and, by drawing down thereon, lays the wheel so that it is parallel with the vane, in which position the wheel does not operate. When the wheel is to be operated again the rope is unfastened, when the action of the spring *l*, through the plate *k*, forces the wheel into the proper position.

By locating the spring inside of the tube, as shown, it does not occupy much room, and there is less danger of its becoming inoperative from rust and other causes, and it does not prevent the wheel from turning freely with the vane and supporting-head. The spring allows the wheel to follow its natural inclination to travel out of the wind when it is high, and retains it in its proper location with the vane when the wind is moderate, thereby acting as a regulator to give the wheel a steady movement, and to prevent a dangerous velocity in high winds. If the fan-blades become loose they can be tightened by simply screwing up the nuts. A stop is to be provided on the tube E, against which the arm *k* will strike when the wheel is brought parallel with the vane.

What we claim as new, and desire to secure by Letters Patent, is—

1. The metal sections or rim *b*, provided with inclines *c*, for securing the fans at the proper angle, substantially as specified.

2. In a windmill, the torsion-spring *l*, in combination with the tube E and plate *k*, for throwing the wheel into the wind, substantially as specified.

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Witnesses:

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