

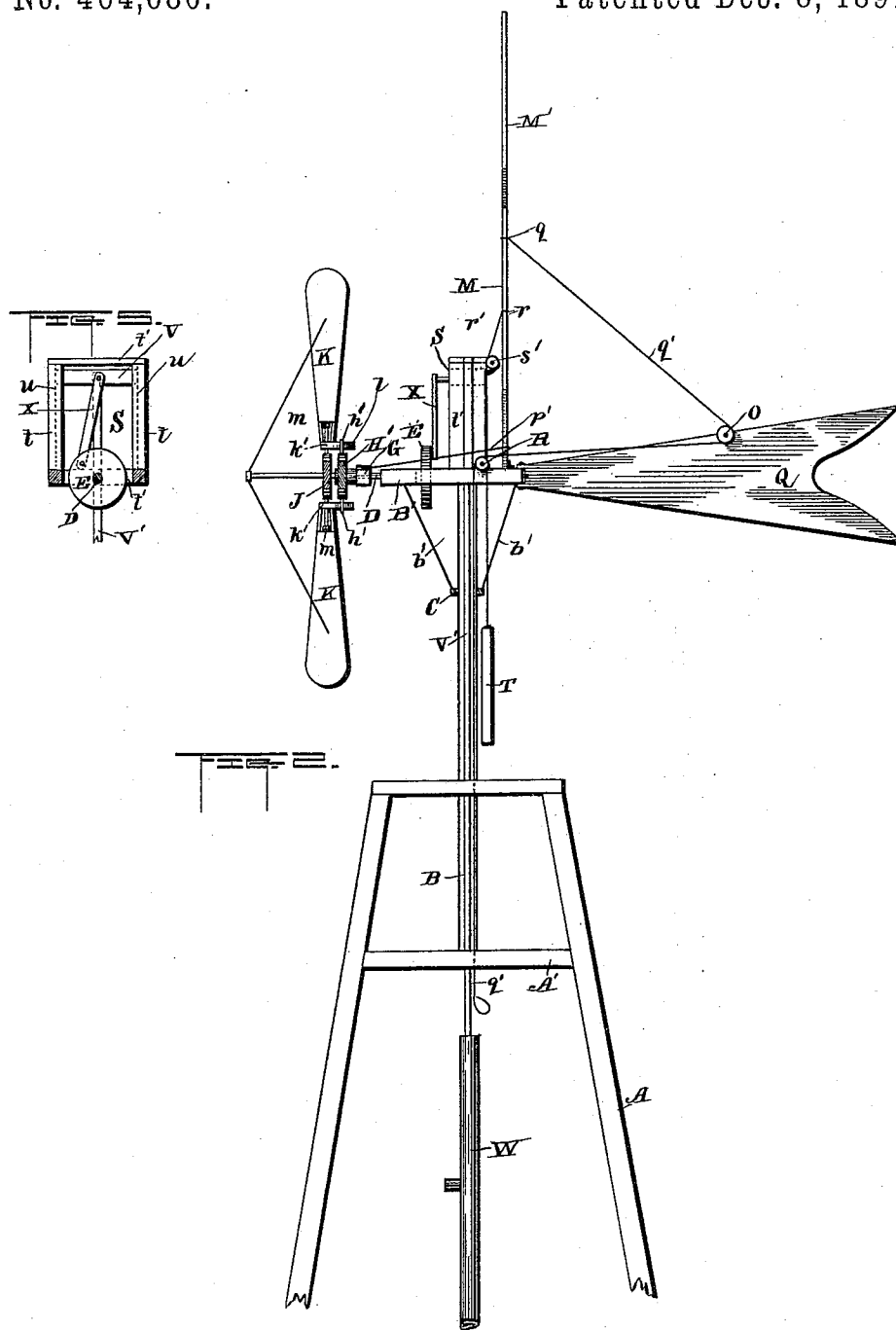
(No Model.)

2 Sheets—Sheet 2.

C. R. SUNDSTROM.
WIND WHEEL.

No. 464,680.

Patented Dec. 8, 1891.



Witnesses
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UNITED STATES PATENT OFFICE.

CARL RICHARD SUNDSTROM, OF LINDSBORG, KANSAS.

WIND-WHEEL.

SPECIFICATION forming part of Letters Patent No. 464,680, dated December 8, 1891.

Application filed August 28, 1890. Serial No. 363,304. (No model.)

To all whom it may concern:

Be it known that I, CARL RICHARD SUNDSTROM, a citizen of the United States, residing at Lindsborg, in the county of McPherson and State of Kansas, have invented certain new and useful Improvements in Wind-Wheels; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to certain new and useful improvements in wind-wheels.

The object of the invention is to obtain a device of the character described which will regulate its speed according to the velocity of the wind, which can be easily started and stopped, and which will be strong and durable.

To the accomplishment of the above the invention consists in certain novel parts and combination of parts, as will hereinafter be fully described and specifically claimed, reference being had to the accompanying drawings, in which—

Figure 1 represents a front elevation of my improved wind-wheel; Fig. 2, a side view, partly in section; Fig. 3, a top plan view of the operative parts; Fig. 4, an enlarged detail of the lower end pieces of the fans, and Fig. 5 a detail of the frame to which I attach my piston-rod.

In the drawings, A represents an ordinary tower provided with a cross-beam A', on which is mounted a hollow shaft or piping B, which extends to a suitable height above the tower.

Mounted upon one end of the shaft or pipe B is the main frame of the mill B', such frame being mounted upon the shaft by means of a plate fastened to the under side of the frame, and formed in such a manner as to fit upon the end of the pipe and permit the main frame to revolve thereon, the plate being also provided with an opening a' to permit of the passage therethrough of a piston-rod, as will be hereinafter described.

Secured to main frame B' at different points are four or more brace-rods b', which extend downwardly and are connected to a collar C, loosely mounted on the pipe or shaft B, and adapted to revolve thereon. The main frame

B' is provided with suitable bearings, in which is mounted the wheel-shaft D, such shaft extending through the piece d', and provided on its inner end with a crank or gear-wheel E.

Outside of the main frame and connected to such frame by means of rods e' is a frame or cross-piece G. The rods e' extend through the grooves or channels the entire length of the main frame, as shown at f', Fig. 3, and are not secured at their inner ends, this arrangement permitting said cross-piece to be moved backward or forward.

The cross-piece G is provided with suitable bearings g', in which is mounted a hollow shaft H, through which runs the wheel-shaft D before referred to. Mounted on this shaft H is a wheel or disk H', which is provided with a series of forked arms h', for the purpose hereinafter described.

J represents a hub mounted on the outer end of the wheel-shaft D and rigidly secured thereto. Secured to this hub are rods I', these rods serving as supporters for the fans K, which consist of the frame i' and lower end pieces k', which frames may be covered with any suitable material. These lower end pieces k' are formed with a curved extension l, which is adapted to run in the forked arms h' herebefore referred to, the lower end piece k' of each fan being provided with holes to accommodate the rods I', which are loosely mounted therein, thus allowing the fans to revolve thereon.

The arrangement of the parts above described is such that when the frame G is moved backward or forward it will carry with it the wheel or disk H', and by means of the forked arms h', in engagement with the extension l, the fans K will be turned to a greater or less distance.

Between the fans K are mounted fans K', which are constructed in a similar manner to the fans K, except that they do not extend down beyond the collar m' and into engagement with the forked arms of the wheel or disk H'. The fans K K' are connected by a series of wires n', so that any movements of the fans K will cause a similar movement of the fans K'.

Near the end of the main frame is an upright or vertical arm M, which extends to a suitable height above the wind-wheel, and

which is provided at its upper end with a wing or sail M'. This rod is bifurcated or fork-shaped at its lower end, one arm of such fork being secured to each side of the main frame, as shown at o', Fig. 3, in such a manner as to permit the arm M to be rocked to either side of its vertical position. Secured to each arm of this fork is a rod or brace p', which extends forward and is connected to the movable cross-piece G. By this means it will be seen that when the arm M is moved from its vertical position in either direction it will move the frame G backward or forward and with it the wheel or disk H', causing the tilting of the fans in the manner herebefore described.

Connected to the arm M at the point q is a rope q' or cord, which extends downwardly to and over the pulley O, located on the sail Q, the rope passing from thence to and around a pulley R, located on the main frame and inside of piping B to within reach of the ground, the object of such arrangement being to tilt the arm M and thereby turn the fans until they are edge to the wind, thus stopping the wheel.

At a point r on the arm M is secured a cord or chain r', which runs to and over a pulley s', located on a frame S, hereinafter to be described, thence down through the main frame and down outside of the shaft to within a short distance above the top of the tower, where it is connected with a weight T sufficiently heavy to return the arm M to its vertical position when the rope q' is released, and to hold it in such a position during an ordinary wind.

Behind the crank or gear-wheel E and in front of the arm M is secured in the main frame an upright frame S, which consists of the upright pieces t and cross-pieces t'.

Arranged to move up and down in grooves u (shown in dotted lines in Fig. 5) is a cross-piece V, to which is secured the piston-rod V', which extends down through the opening a' in the main frame, and thence through the pipe or shaft B, and is connected with pump W or other desired mechanism. A piston-rod X, connected with the crank v of crank-wheel E, is also pivoted to this cross-piece, the arrangement being such that when the crank-wheel is revolved by the turning of the wind-wheel it will cause the cross-piece V to move up and down, carrying with it the piston-rod V', thereby furnishing the required power.

The operation of the parts is as follows: When the arm M is in a vertical position, the fans will be at such an angle as to receive the full force of the wind. The velocity of the

wind becoming greater, the arm M will be forced from a vertical position, turning the fans at such an angle that they will not receive its full force, the weight T preventing the arm from being inclined too great a distance. Thus it will be seen that the greater the velocity of the wind the less force it will exert on the fans, the speed of the wheel being thus kept at a uniform rate. Should the velocity of the wind become too great, the fans will, by means of said arm, be turned with their edges directly toward the wind, stopping the wheel entirely and lessening the danger of its becoming damaged. When it is desired to stop the wheel, it can be done by means of the rope q', which, by being operated, will pull the arm from its vertical position, thereby stopping the wheel, the weight T returning it to an upright position as soon as the rope is released. The weight T will also bring the parts into an operative position as the velocity of the wind becomes less.

By the construction and arrangements of the parts as above described it will be seen that I obtain a wind-wheel which shall run at a uniform speed, which can be easily stopped and started, and which will be light and durable.

I am aware that prior to my invention the blades of windmills have been pivoted and have been moved by a sail, the position of which is determined by the strength of the wind, the required motion being imparted to the said sails by means of cranks secured thereto and having a pivotal connection with pitmen actuated by the sail, and I do not therefore claim such a construction; but

What I do claim is—

In a wind-wheel, the combination, with a wheel-shaft having a hub J upon the end thereof, of blades K centrally pivoted to the said hub, and having curved spring-arms on their base projecting toward the rear, of a disk H', mounted upon the said wheel-shaft and revolving therewith, split pins h', projecting from the said disk and engaging the said curved arms, and a pivoted governor vane or sail M', adapted to cause a forward or rearward motion of the said disk H', whereby the pins h' thereon will be caused to slide upon the said arms, as described.

In testimony whereof I affix my signature in presence of two witnesses.

CARL RICHARD SUNDSTROM.

Witnesses:

F. GOODHOLM,
J. O. MUNTER.