

(No Model.)

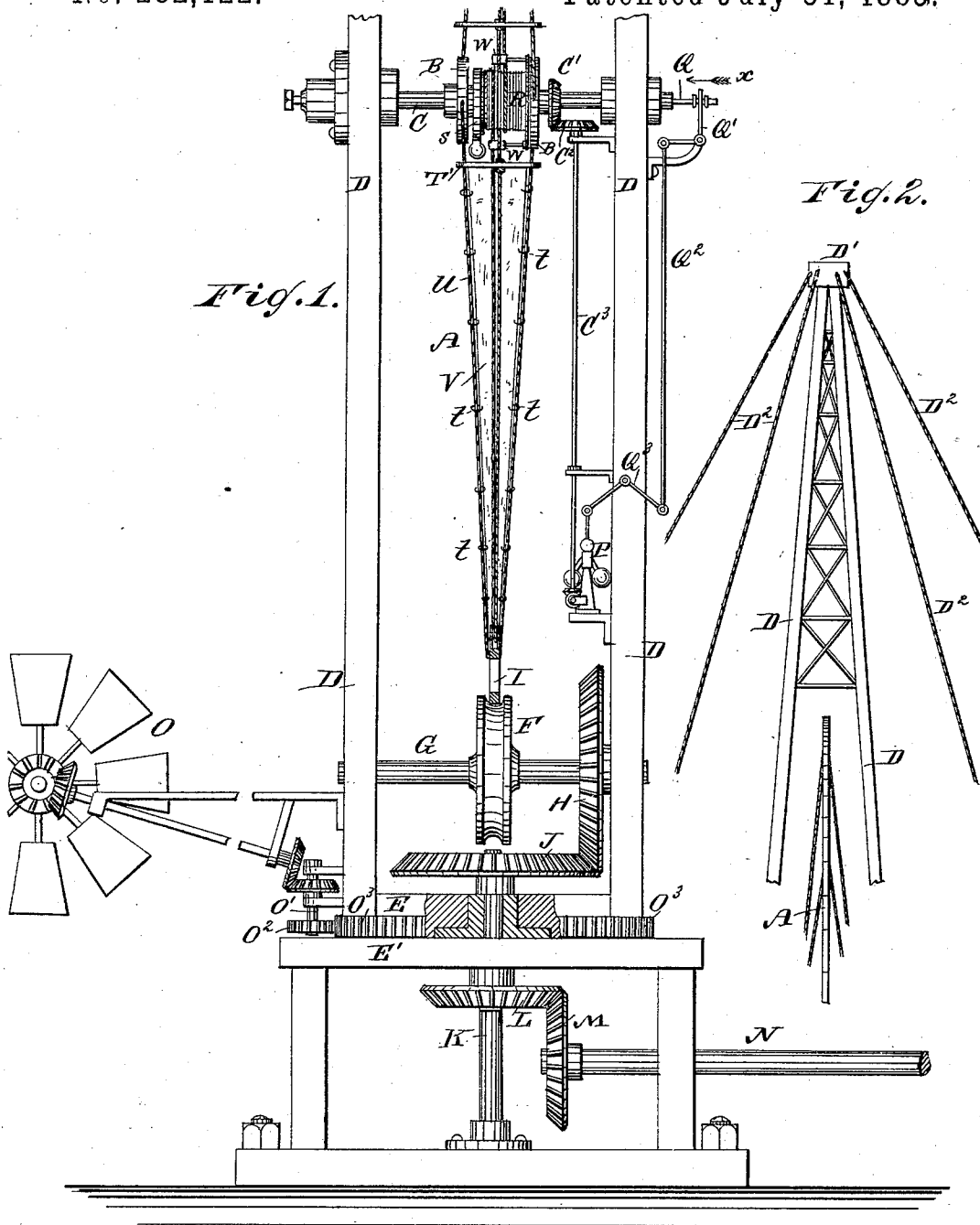
2 Sheets—Sheet 1.

C. F. W. SCHRAMM.

WINDMILL.

No. 282,122.

Patented July 31, 1883.



WITNESSES:

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(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

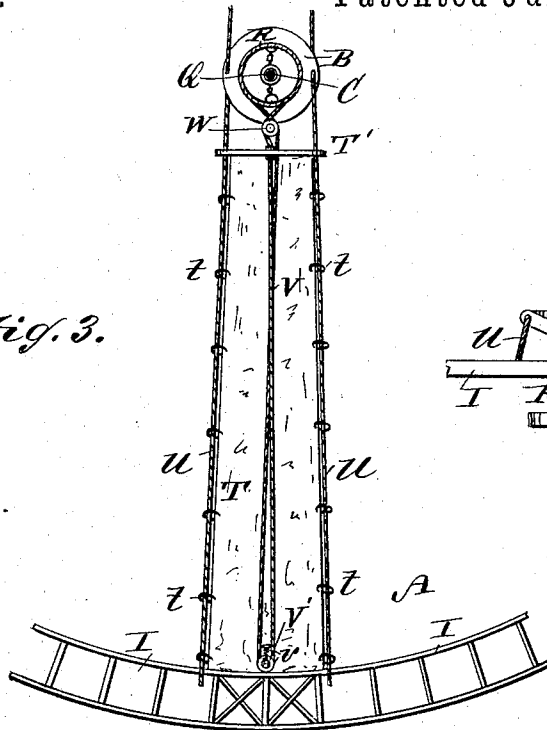


Fig. 4.

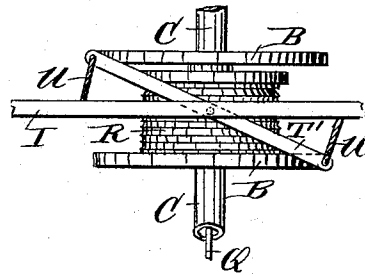
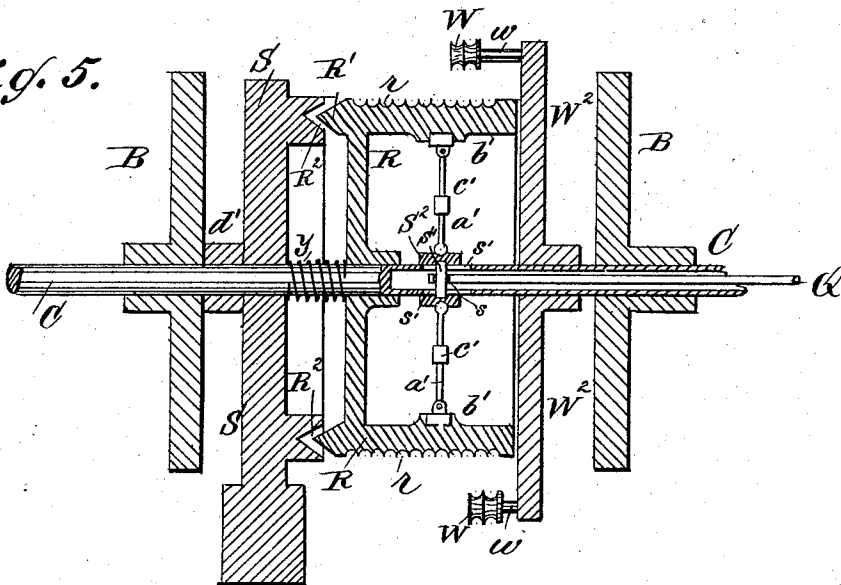


Fig. 5.



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UNITED STATES PATENT OFFICE.

CARL F. W. SCHRAMM, OF BROOKLYN, NEW YORK.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 282,122, dated July 31, 1883.

Application filed April 9, 1883. (No model.)

To all whom it may concern:

Be it known that I, CARL F. W. SCHRAMM, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Windmills, of which the following is a specification.

The object of my invention is to provide a new and improved windmill which is simple in construction, strong, durable, and light, and which regulates itself rapidly and automatically, according to the strength of the wind.

In the accompanying drawings, in which like letters indicate like parts, Figure 1 is a front-end elevation of my improved windmill, parts being broken out and others shown in section. Fig. 2 is an elevation of the upper parts of the revolving vertical frame in which the wheel is journaled. Fig. 3 is a side view of parts of the wheel. Fig. 4 is an enlarged plan view of parts of the same. Fig. 5 is an enlarged longitudinal sectional elevation of the hub part of the wheel.

The wind-wheel A is provided with hub-disks B, mounted rigidly on a hollow shaft, C, journaled in a vertical frame, D, adapted to revolve on its vertical axis around a circular base-block, E, on a base, E', formed on the ground, on a tower, a building, or any other structure. The outer edge of the rim I of the wind-wheel A is in contact with the circular outer surface of a friction-wheel, F, preferably grooved, which wheel F is mounted on a transverse shaft, G, journaled in the lower part of the frame D. On the shaft G a bevel cog-wheel, H, is rigidly mounted, which engages with a bevel cog-wheel, J, mounted rigidly on a vertical shaft, K, journaled in the circular base-block E. From the shaft K the power can be transmitted by means of bevel cog-wheels L m and a shaft, N, or other suitable devices.

The frame D is provided with a vane-wheel, O, which operates, by means of suitable gearing, a vertical shaft, O', held on the frame D, on which shaft O' a pinion, O², is mounted, which engages with a circular rack, O³, surrounding the lower end of the frame D and fixed on the base E', whereby the frame D will be rotated on its longitudinal axis when the

wheel O revolves, whereby the wind-wheel will be so adjusted that its wings will always catch the wind. The upper end of the frame D is made tapering, and is pivoted in a socket, D', to which wire cables D² are fastened, the lower ends of which extend to the ground, or to the roof of the building, &c., whereby the upper end of the frame D will be braced and steadied and held in place without interfering with the revolving of the frame.

For obtaining combined lightness and strength the rim of the wheel is composed of two concentric rings united by radial rods, or the rim can be made of any other kind of lattice-work.

On the shaft C a bevel cog-wheel, C', is mounted, which engages with a bevel cog-wheel, C², on the upper end of a shaft, C³, adapted to operate a centrifugal governor, P, of any suitable construction, which governor is mounted on the revolving frame D. A rod, Q, passes loosely and longitudinally through the hollow shaft C, and has one end held to turn in one end of an elbow-lever, Q', pivoted on the frame D, and connected by a rod, Q², with an elbow-lever, Q³, pivoted on the frame D and connected with the governor P.

A drum or wide pulley, R, provided with as many circumferential grooves r as there are wings in the wheel, is loosely mounted on the shaft C, so that it can turn and slide on the same. The pulley or drum R has one edge, R', beveled and adapted to pass into a V-shaped angular groove, R², in a disk, S, loosely mounted on the shaft C, adjoining the beveled edge of the pulley R, which disk S is weighted so heavily at its lower end that it cannot be revolved on the shaft by the friction between the shaft and the aperture of the disk. A cross-piece, S', passes through a longitudinal slot, s, in the rod Q, and through a longitudinal slot, s', in the tubular shaft C, and is attached to a sleeve, S², held to slide longitudinally on the tubular shaft C. The drum or pulley R is provided with an inwardly-projecting hub, R³, against which the sliding sleeve S² is adapted to strike. A spiral spring, Y, surrounding the shaft C presses the drum or pulley R from the weighted disk S. Radial arms a' are pivoted to the sliding sleeve S², and to 10

the outer ends of the said arms friction-clutch shoes b' are fastened, which rest against the inner curved surface of the drum or pulley R. The arms a' can be lengthened or shortened by means of screw-nuts c' , provided on the said arms. A washer, d' , is mounted on the shaft C between the loose disk S and the adjoining fixed hub-disk B, as shown in Fig. 5, to prevent the disk S from coming in contact with the hub-disk and being rotated by the same. The wings T are made of sail-cloth, or of a series of hinged slats, or made flexible and collapsible in any other suitable manner.

To the side edges of the wings T rings t are attached, through which the wire cables U, forming the wing-frames, pass, which cables are secured to the rim I, where they are separated the width of the wing, and the other ends of the cables are attached to the opposite hub-disks, B, at the edges, at diametrically opposite points—that is, the inner end of one cable U is attached to one disk B, and diametrically opposite the inner end of the other cable U is secured to the other disk B. The inner end of the wing T is attached to a bar, T', through the ends of which the cables U of the wings T pass, so that the said bar can travel on the cables—that is, move on the same from the hub toward the rim, and back. A rope, V, passing through one of the grooves r in the drum or pulley R, has its ends attached to the opposite sides of the bar T', and passes over a pulley, V', held by a spring, v , to the rim, and over pulleys W, held on arms w , projecting from a disk, w^2 , mounted rigidly on the shaft C. The double pulleys V' for the ropes of the different wings must always be so arranged that they will be above the groove r for the corresponding rope on the pulley or drum R, so that the several ropes will not interfere with each other. It is to be distinctly understood that one groove, r , is provided on the pulley R for the rope V of each wing, and above or over each groove r a pulley, W, must be held. A suitable brake may be provided, which acts on the rim of the wheel. If desired, the edges of the rim I and of the wheel F can be provided with cogs.

The operation is as follows: If the wings T are extended and their inner ends are at the hub, the wheel will have the greatest power. If the wheel revolves too rapidly, the balls of the governor P swing from each other and move the rod Q in the inverse direction of the arrow x , thereby drawing the sliding sleeve S^2 in the same direction, whereby the arms a' will be inclined toward the right and the clutch-shoes b' release the pulley or drum R, leaving the same free to rotate on the shaft C. The centrifugal force then throws the flexible wings T toward the rim of the wheel, the ropes V moving through the grooves r and the pulleys V', thereby revolving the drum or pulley R. The wings are thus folded by the centrifugal force and present very little surface to the wind, and thereby the speed of the wheel will be decreased. If the wheel revolves too slow-

ly, the balls of the governor P swing toward each other, and the rod Q is pushed in the direction of the arrow x , and the sliding sleeve S^2 will be moved in the same direction, and, coming in contact with the end of the hub R^3 , presses the beveled edge R' of the pulley or drum R into the beveled groove R^2 of the disk S, whereby the friction will hold the drum or pulley R to the disk S, which does not rotate, and thus the drum R will be locked in position. The arms a' are then inclined toward the left and the clutch-shoes b' do not hold the drum. The wheel continues to revolve and the drum R is fixed, and the friction of the ropes V on the drum naturally moves the ropes, and by this movement the wings T are drawn toward the hub part of the wheel—that is, they are extended—and the speed is increased. When the wings have been extended to such an extent that the wheel has the desired speed, the governor revolves so rapidly that the rod Q is drawn in the inverse direction of the arrow x a short distance, and draws the sleeve S^2 a short distance in the inverse direction of the arrow. Thereby the arms a' are straightened and cause the clutch-shoes to hold the drum to the arms a' , so that the drum R will be revolved with the shaft. As soon as the sleeve S^2 is drawn in the inverse direction of the arrow x the spring Y pushes the drum R from the disk S. As soon as the speed increases or decreases, the wings are adjusted automatically, in the manner described above. As the spokes of the wheel are made of wire cables the wheel will be very light, strong, and durable.

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

1. A wind-wheel journaled in a revolving frame, combined with a wheel in contact with the rim of the wind-wheel and adapted to be operated from the rim of the wind-wheel, and journaled in the same revolving frame with the wind-wheel, substantially as herein described, and for the purpose set forth.

2. In a windmill, the combination, with the revolving frame D, of the wind-wheel A, journaled in the same, the wheel F, journaled in the frame D in contact with the rim of the wind-wheel, and operated from the rim of the wind-wheel, and of devices for transmitting the motion from the wheel F, substantially as herein described, and for the purpose set forth.

3. In a windmill, the combination, with the revolving frame D, of the wind-wheel A, journaled in the same, the wheel F, mounted on the shaft G, journaled in the frame D, which wheel F is in contact with the rim of the wind-wheel, the bevel cog-wheel H, mounted on the shaft G, and the bevel cog-wheel J, engaging with the cog-wheel H, and mounted on a vertical shaft, K, substantially as herein described, and for the purpose set forth.

4. A wind-wheel constructed with collapsible wings, combined with ropes secured to the inner ends of the wings and passing over pul-

leys at the rim, a loose pulley on the shaft, over which pulley the ropes of the several wings pass, and devices for automatically locking the pulley in position, so that it cannot rotate, substantially as specified.

5 5. A wind-wheel constructed with collapsible wings, combined with ropes secured to the inner ends of the wings, and passing over pulleys on the rim and a loose pulley on the shaft, over which pulley the ropes of the several wings pass, devices for automatically locking the pulley in position, so that it cannot rotate, and a governor for operating the locking devices, substantially as specified.

15 6. A wind-wheel constructed with collapsible wings, combined with ropes secured to the inner ends of the wings, and passing over pulleys on the rim and a loose pulley on the shaft, and a disk mounted loosely on the shaft and weighted to such an extent that the shaft cannot revolve it, and devices for bringing the loose pulley in contact with the weighted disk, so that the pulley will be held fixed, substantially as specified.

25 7. A wind-wheel constructed with collapsible wings T, combined with the loose pulley R on the shaft, the pulleys V' on the rim, the ropes V, the weighted disk S, mounted on the shaft, the spring Y, and devices for pressing the pulley R against the disk S, substantially as herein specified.

30 8. A wind-wheel constructed with collapsible wings T, combined with the loose pulley R, provided with a beveled edge, R', the pulleys V' on the rim, the ropes V, the weighted

disk S, provided with a groove, R², the spring Y, and devices for pressing the pulley R against the disk S, substantially as specified.

9. A wind-wheel constructed with wire-cable spokes U and collapsible wings T, combined with the loose pulley R, the pulleys V', the ropes V, the bar T', sliding on the cables U, the weighted disk S on the shaft, and devices for pressing the pulley R against the disk S, substantially as specified, and for the purpose set forth.

10. A wind-wheel constructed with collapsible wings, combined with the pulley R, the pulleys V', the ropes V, the disk S, the disk w², the arms w, the pulleys W, and devices for engaging the pulley R with the disk S, substantially as herein specified.

11. A wind-wheel constructed with collapsible wings, combined with ropes for stretching the wings, the loose pulley R, the sliding sleeve S', the rod Q, operated by a governor, the cross-piece S', the arms a', pivoted on the sleeve S' and carrying clutch-shoes at the ends, and the weighted disk S, substantially as herein specified.

12. A wind-wheel constructed with spokes made of wire cables U, attached, the width of the wings apart, to the rim, and having their inner ends secured at diametrically-opposite points to opposite hub-disks, B, substantially as specified.

CARL F. W. SCHRAMM.

Witnesses:

CHAS. R. CLARKE,
JAMES M. HUNT.