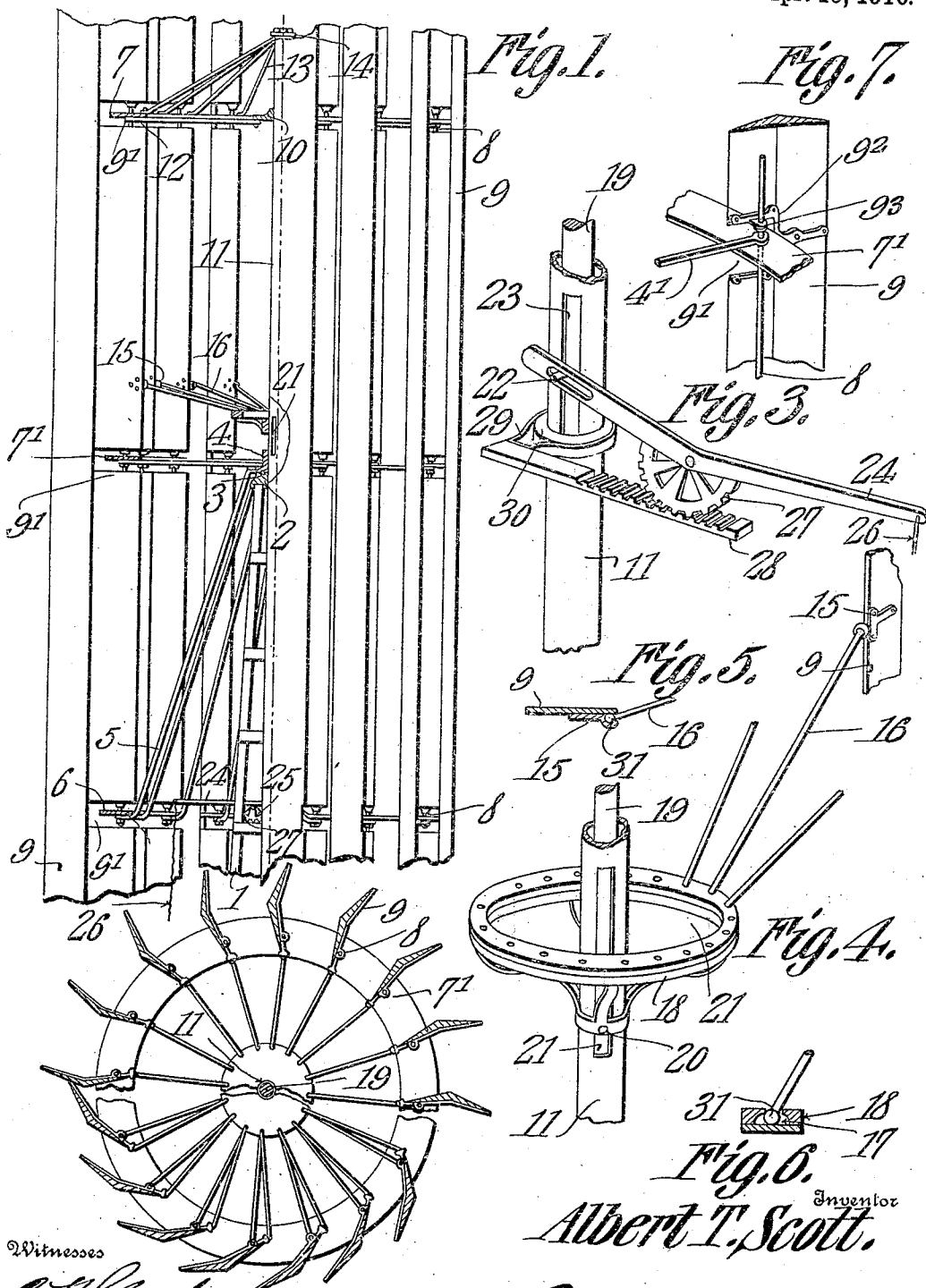


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WINDMILL.

APPLICATION FILED JULY 6, 1909.

955,289.

Patented Apr. 19, 1910.



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WINDMILL.

955,289.

Specification of Letters Patent. Patented Apr. 19, 1910.

Application filed July 6, 1909. Serial No. 506,065.

To all whom it may concern:

Be it known that I, ALBERT T. SCOTT, a citizen of the United States, residing at Waterville, in the county of Douglas and State of Washington, have invented a new and useful Windmill, of which the following is a specification.

This invention relates to improvements in horizontal windmills and its primary object is to produce a windmill of such a construction that an ordinary tower may be used and the strain will be distributed so as to utilize the full strength of a large wheel without causing undue vibration of the tower or support.

A further object of the invention is to produce a windmill which may be easily started or stopped and which will readily accommodate itself to variations in the speed of the wind so as to prevent injury to the machinery.

These objects, and such other objects as will hereinafter appear, are attained by the use of the mechanism illustrated in the accompanying drawings and the invention consists in certain novel features of the same which will be hereinafter first fully described and then particularly pointed out in the appended claims.

In the drawings,—Figure 1 is a vertical sectional elevation of a windmill embodying my invention. Fig. 2 is a view showing the open and closed positions of the blades in horizontal section. Fig. 3 is a detail view of the brake and the adjacent parts. Fig. 4 is a detail view of the furling spider and the furling rods operated thereby. Fig. 5 is a detail section through the connection between a furling rod and a blade. Fig. 6 is a detail section of a part of the furling spider. Fig. 7 is a detail view of a portion of a blade and the central supporting ring.

The tower 1, may be of the usual skeleton tapered form with a small annular cap 2, at its upper end. Upon this cap is formed a way in which are placed bearing balls 3, on which a collar 4 rests and runs, the said collar being secured to the driving shaft which extends vertically through the tower. From this collar, radial bars 5 extend downward to carry a ring 6, in which, and similar rings 7 and 7', I mount the pivot rods 8, to which the blades or vanes 9 of the wheel are secured. The ring 7 is arranged above the collar or hub 4 and is connected with a collar 10, on the driving shaft 11, by spokes 12,

and is also connected by truss rods 13, with a disk 14, at the upper end of the shaft so that torsional strain will be overcome and the wheel maintained in its proper operative position. The ring 7' is arranged in the same plane with the collar or hub 4 and is connected with the same by radial braces or spokes 4'. The pivot rods 8 extend between the rings 6 and 7 and pass through the ring 7', the said rings 6 and 7 being disposed equidistant from the ring 7'. The blades 9 are supported vertically by the rings and are carried by the pivot rods so as to turn freely. The blades are of a shallow V-shaped formation in cross-section and are so arranged that their outer edges overlap when the said edges are swung inward and the blades will then close together and present a solid unbroken surface to the wind which will be turned aside without setting the machine in motion. The inner edges of the blades are notched, as shown at 9', to fit around the several rings 6, 7 and 7', and brackets 9² are secured to the blades around said notches to reinforce the blades. The said brackets are formed with lateral lugs 9³ through which the pivot rods 8 pass and to which said rods are secured by suitable lock nuts as shown and as will be readily understood. On the inner edges of the blades, at a point above the cap 2, I provide sockets 15, which are engaged by the outer ends of furling rods, 16, the inner ends of said rods being engaged in sockets 17, in a spider 18, which is slidably mounted on the driving shaft and is raised or lowered thereon by means of a controlling rod 19, arranged within the hollow driving shaft and provided (at its upper end) with a cross pin 20, having its ends projecting through a longitudinal slot 21, in the shaft and connected rigidly with the spider. The lower end of this controlling rod is provided with a similar cross pin, 22, which projects through a longitudinal slot, 23, in the driving shaft and has its end engaging a lever 24, fulcrumed on a bracket 25, of any suitable construction on the tower and having its outer end carrying a suitable cable or rod 26 which extends to a point near the ground within convenient reach of the operator. On the under side of the lever is formed a segmental gear 27, which meshes with a slidable rack 28, supported in any convenient manner on the tower or frame and carrying at one end a band 29, preferably of

metal, which is arranged to be carried by the rack against a brake disk 30 rigidly secured on the driving shaft. When the band is carried against the disk so as to embrace the same, the frictional contact between the parts will serve to arrest the motion of the shaft and consequently stop the machine. The ends of the furling rods, it will be observed, are formed into balls, 31, which engage the sockets in the spider and on the blades, respectively, and the outer balls or enlargements will move outward under centrifugal force and thereby swing the blades more or less toward the closed position when excessive speed is attained.

The operation will be readily understood. When the blades are in the open position, they will lie approximately radially to the driving shaft. In this position, a current of air striking the reëntrant faces of the blades will force the wheel to rotate, the deflecting faces of the blades on the opposite side of the wheel turning aside the air currents so as to overcome resistance to the rotation of the wheel.

It will be noticed that the wheel incloses or extends down over the tower so that an ordinary skeleton tower of small cross-sectional area may be used. Furthermore, the weight of the wheel is borne by the upper end of the tower which is carried up into the wheel so that stability of the parts is assured while the use of fans of great length is permitted. Moreover, by this arrangement the driving strain is received by the tower at the angle most effectual to resist the same.

Having thus described the invention, what is claimed is:—

1. The combination of a tower, a cap on the upper end of the tower, a collar rotatably mounted on the cap, a shaft disposed vertically within the tower and extending up through the said cap and collar and secured to the collar, a series of rings ar-

ranged concentrically around the said shaft, connections between the rotatable collar and the lowest of said rings, connections between the rotatable collar and the middle ring, connections between the upper end of the shaft and the uppermost of the said rings and vertically disposed blades pivotally mounted on the said rings.

2. In a windmill, the combination of a driving shaft, a brake disk rigidly secured thereon, a slidable rack disposed adjacent said disk, a brake band adapted to be carried against the disk by the rack, a lever provided with a gear meshing with said rack, means for operating said lever, a series of blades, and means operated by the lever to open or close the blades.

3. The combination of a hollow vertical shaft, a series of blades disposed concentrically around the shaft, a spider slidably mounted on the shaft, connections between the spider and the blades, an operating rod mounted in the shaft and connected to the spider, a lever engaging the lower end of said rod and carrying a gear, a rack in mesh with said gear, a brake disk on the shaft, and a brake band carried by said rack and arranged to frictionally engage the brake disk.

4. The combination of a driving shaft, rings carried by said shaft, vertical blades disposed concentrically around the driving shaft, and having their edges notched to fit over the said rings, brackets secured on the blades around the edges of the notches and provided with lateral lugs, and pivot rods mounted in the rings and passing through and secured to said lugs.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

ALBERT T. SCOTT.

Witnesses:

A. J. DAVIS, -
M. B. MALLOY.