No. 622,115. Patented Mar. 28, 1899.

A. M. CARLSON.

WINDMILL.

(Application filed May 9, 1898.)

(No Model.) 3 Sheets—Sheet 1.

FIG. 1.

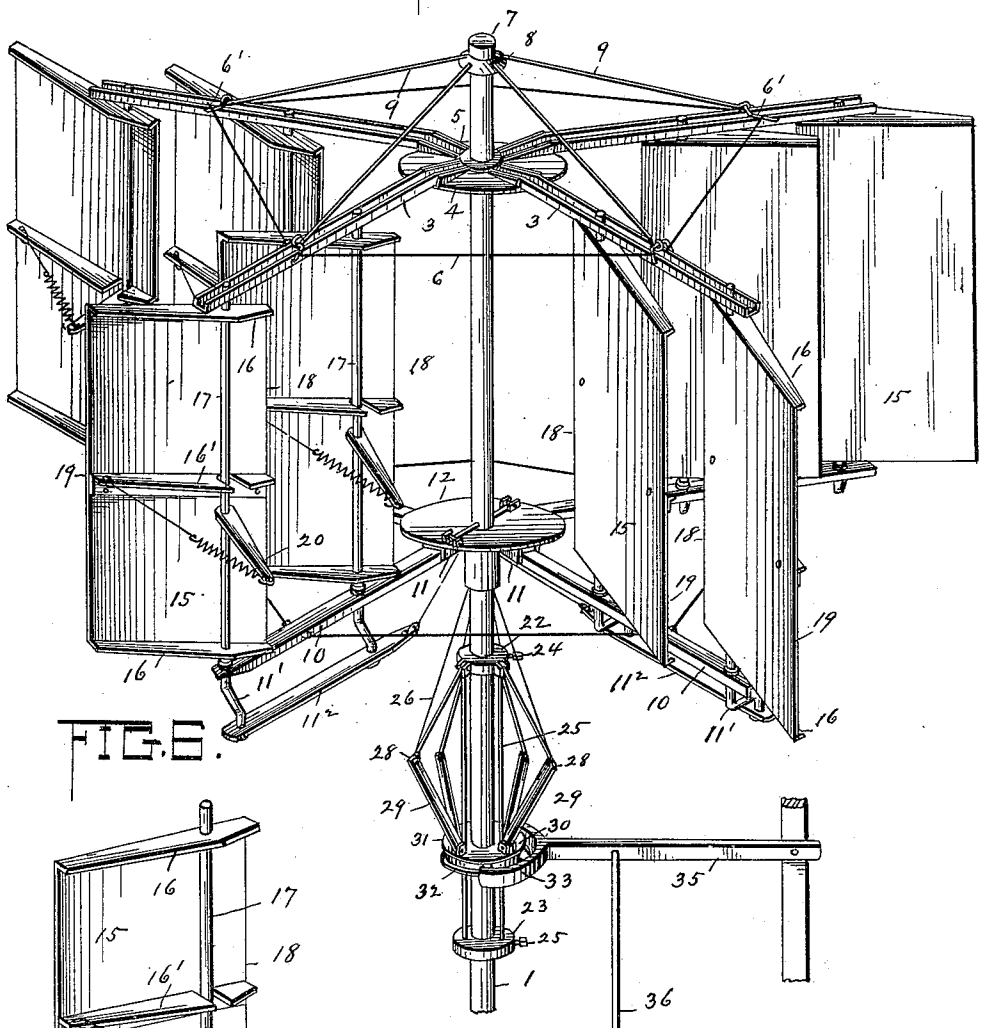


FIG. 6.

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FIG. 2.

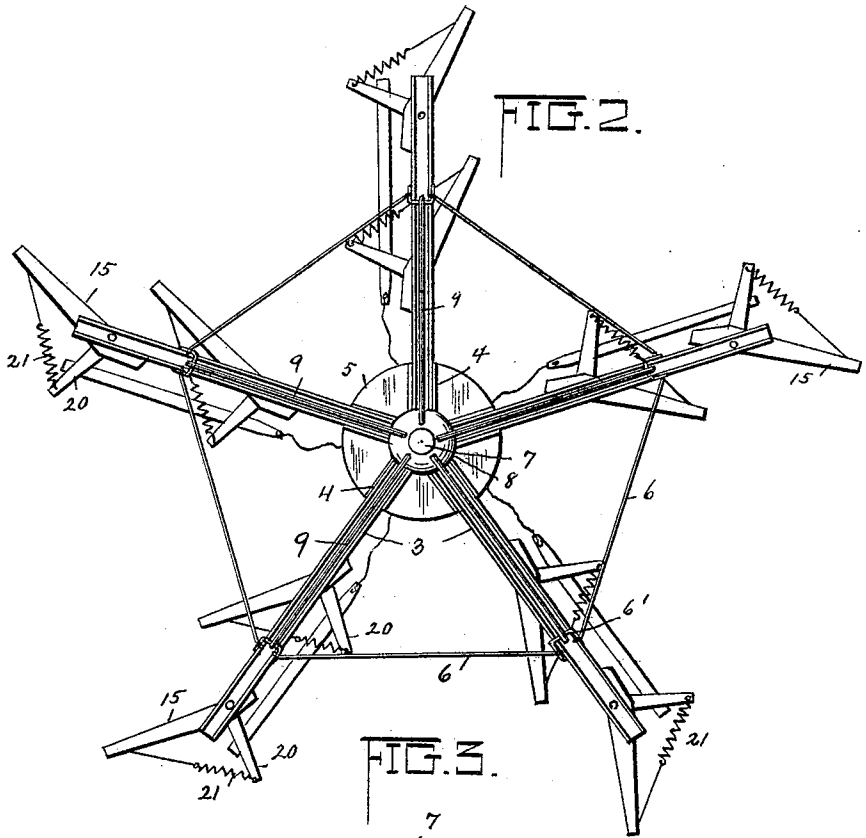
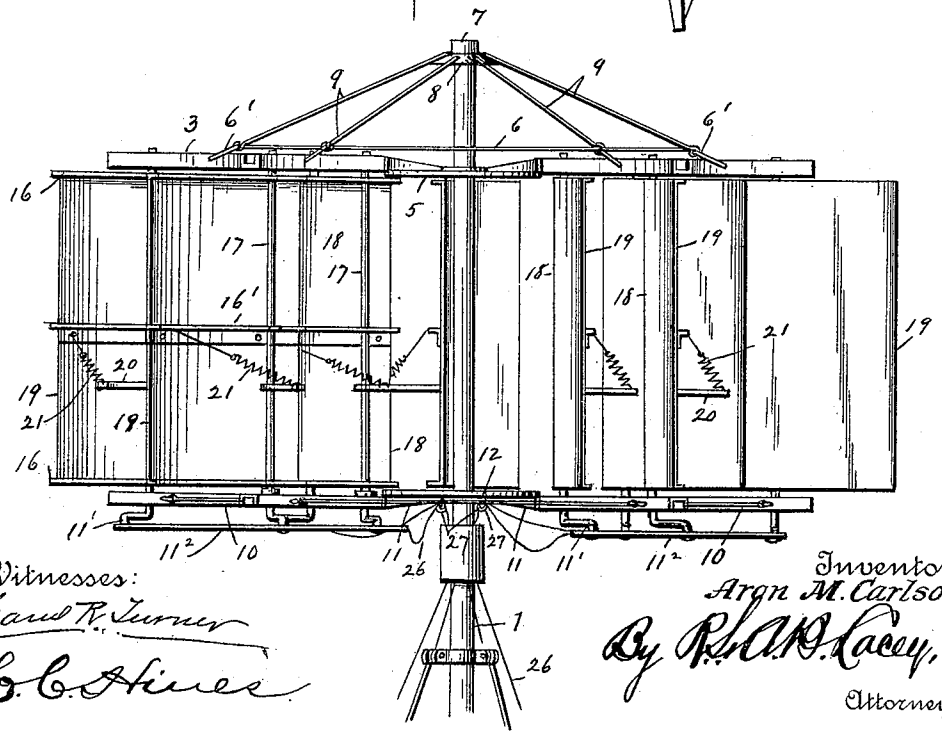


FIG. 3.



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FIG. 4.

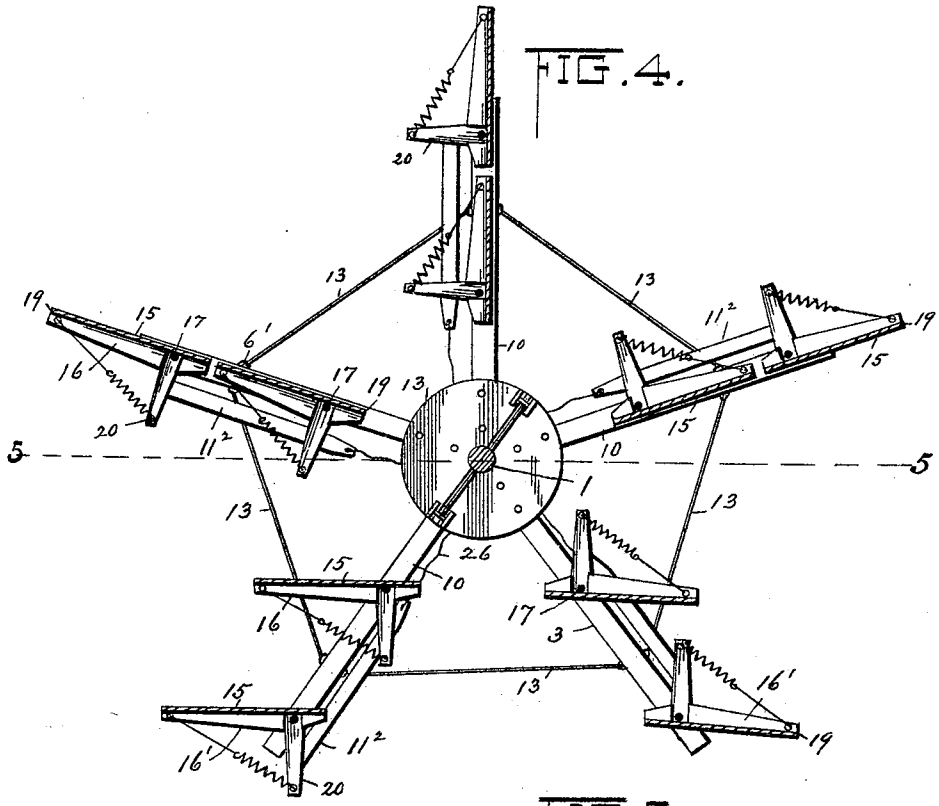
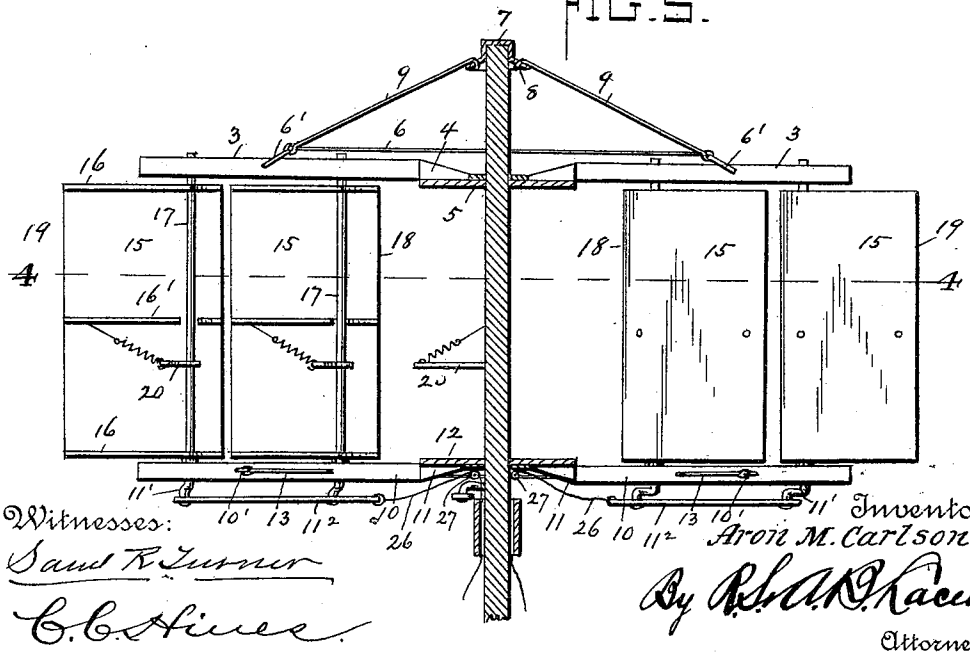


FIG. 5.



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UNITED STATES PATENT OFFICE.

ARON M. CARLSON, OF PIERRE, SOUTH DAKOTA.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 622,115, dated March 28, 1899.

Application filed May 9, 1898. Serial No. 680,159. (No model.)

To all whom it may concern:

Be it known that I, ARON M. CARLSON, a citizen of the United States, residing at Pierre, in the county of Hughes and State of South Dakota, have invented certain new and useful Improvements in Windmills; and I do hereby 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.

My invention relates to certain new and useful improvements in windmills of the type shown in my former application for Letters Patent, Serial No. 642,516, filed June 26, 1897, and allowed January 7, 1898.

The object of the present invention is to generally improve and simplify the construction of this type of mill, to provide simple and effective means for throwing the sails out of operation, and also to provide each sail with a yielding connection whereby it may swing quickly into operation without unduly jarring or straining the windmill-frame.

With these and other objects in view my invention consists in certain novel features of construction, combination, and arrangement of parts, as will be hereinafter more fully described, and specifically set forth in the appended claims.

In the accompanying drawings, forming a part of this specification, Figure 1 is a perspective view of my improved windmill as it appears in operation. Fig. 2 is a plan view of same. Fig. 3 is a side elevational view of the windmill as it appears when out of operation. Fig. 4 is a horizontal section on line 4 4 of Fig. 5. Fig. 5 is a vertical section on line 5 5 of Fig. 4. Fig. 6 is a perspective view of one of the wind-sails and its shaft.

Referring now more particularly to the accompanying drawings, wherein like reference-numerals designate corresponding parts throughout the several views, 1 represents a vertical cylindrical shaft provided with journals 2 2, which are mounted in suitable bearings fixed in the usual tower. (Not shown.)

3 3 represent a series of radial arms formed of channel-iron, and 4 4 a series of channel-iron socket-pieces to which the inner ends of the radial arms are fixed, said socket-pieces being mounted upon a disk brace 5, rigidly secured to and encompassing the upper end of the shaft.

6 6 represent brace-rods secured to bails 6′ 6′, pivoted to the upwardly-projecting webs 3′ 3′ of the radial arms and extending around the entire series to assist in bracing their outer ends to retain the same in their relative positions.

7 represents a cylindrical protecting-cap encompassing the upper end of the vertical shaft, and its lower edge terminates in a conical flange 8, from which a series of diverging brace-rods 9 9 extend to the outer ends of the radial arms 3 3 and are secured to the said pivoted bails 6′ 6′.

10 10 represent a corresponding series of radial arms arranged vertically below the arm 3 3, and 11 11 represent the corresponding socket-pieces to which the inner ends of said arms are secured, said socket-pieces being rigidly mounted upon the under side of a disk brace 12, encompassing the shaft 1 at a suitable distance below the disk brace 5.

13 13 represent lower brace-rods secured to the downwardly-projecting webs 10′ 10′ and extending entirely around the series similar to the upper brace-rods 6 6.

15 15 represent the wind-sails, each comprising a rectangular plate formed with parallel horizontal end flanges 16 16 and an intermediate flange 16′ and mounted on a vertical shaft 17, projecting through said flanges.

Each shaft 17 is mounted to oscillate in the outer ends of each pair of the corresponding upper and lower radial arms 3 10, and the lower ends thereof terminate in crank-arms 11′ 11′, the several crank-arms of the sails on each pair of corresponding radial arms being connected by ordinary connecting-rods 11^2 11^2. Any desired number of sails may be mounted on each pair of radial arms, the number varying according to the size of the mill, two being shown in the present instance for purpose of illustration.

18 represents the front edge, and 19 the rear edge, of the sail, and each sail is pivoted to its respective shaft about one-quarter of its length from its front edge 18 after the manner of a wind-vane, so that when unconfined the entire series will present their front edges to the wind, in which postion they offer no re-

sistance, and consequently the mill remains stationary.

20 20 represent arms rigidly secured at one end to the sail-shafts 17, and 21 21 represent resilient springs secured to the outer ends of said arms, said springs being connected in turn to the intermediate flanges 16′ of the sails adjacent to the rear edges 19 of the latter, so that a yielding stop connection is afforded to prevent the sails from swinging out into the wind suddenly and violently and unduly jarring or straining the windmill-frame, and yet at the same time to allow the sails to swing easily and quickly into operation.

22 23 represent collars adjustably secured to the vertical shaft 1 by set-screws 24, and 25 represents guide-rods extending around the shaft and parallel therewith and connecting said collars.

26 represents a flexible cord or cable, one end of which is secured to one of the connecting-rods 11^2 11^2, and its opposite end extends rearwardly and passes over a pulley 27, mounted on a bracket fixed to the under side of the disk brace 12, thence downwardly, where it is secured to an eye formed on the lower end of one of a series of links 28, pivoted at its upper end to the collar 22 and at its lower end to the upper end of one of a series of coöperating links 29, which is in turn pivoted at its lower end to a vertical sleeve 30, sliding on the guide-rods 25 and encompassing the shaft 1 and revolving therewith.

31 32 represent two annular parallel flanges formed integral with the sleeve 30, between which project oppositely-disposed studs on the bifurcated end 33 of a lever 35, fulcrumed in a bracket fixed at a convenient point on the tower-frame, and from said lever 35 a hand-rod 36 extends downward a suitable distance, where it may be conveniently manipulated by a person standing on the ground, and its operation is such that in its normal position it allows the sails to swing out in operative position; but if the rod 36 be drawn upon it carries the sleeve with it, and through the mechanism just described moves the connecting-rods 11^2 11^2 inward, and thereby throws the sails out of the wind to the position shown in Fig. 3, so that the mill remains stationary.

Although I have specifically described the construction and relative arrangement of the several elements of my invention, I do not desire to be strictly confined to the same, as such changes or modifications may be made as clearly fall within the scope of my invention without departing from the spirit thereof.

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

1. In a windmill, the combination of a vertical shaft 1, the upper and lower series of arms 3 10 radiating therefrom, shafts pivoted to each pair of corresponding upper and lower arms, wind-sails pivoted adjacent to their front edges to said shafts, an arm projecting from each shaft, a spring connecting the outer end of each arm with the rear edge of its respective sail, and means for moving said sails out of operative position, substantially as described.

2. In a windmill, the combination of a vertical shaft 1, the upper and lower series of arms 3 10 radiating therefrom, a plurality of shafts pivoted to each pair of corresponding upper and lower arms and provided at their lower ends with crank-arms, a connecting-rod uniting the said crank-arms, wind-sails pivoted adjacent to their front edges to said shafts, an arm projecting from each shaft, a spring connecting the outer end of each arm with the rear edge of its respective sail, and means connected with said connecting-rods for moving said sails out of operative position, substantially as described.

3. In a windmill, the combination of a vertical shaft, upper and lower collars on said shaft connected by guide-rods, a sleeve sliding on the rods, pivoted links connecting the sleeve and upper collar, upper and lower series of arms radiating from the shaft, a plurality of sail-shafts pivoted to each pair of corresponding upper and lower arms and pivoted at their lower ends with crank-arms, a connecting-rod uniting the crank-arms of all the shafts on each pair of radial arms, wind-sails pivoted adjacent to their front edges to sail-shafts, an arm on each shaft, a spring connecting the outer end of each arm with the rear edge of its respective sail, cords or cables connecting the several connecting-rods to the links, and a lever for operating the sliding sleeve, substantially as described.

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

ARON M. CARLSON.

Witnesses:
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