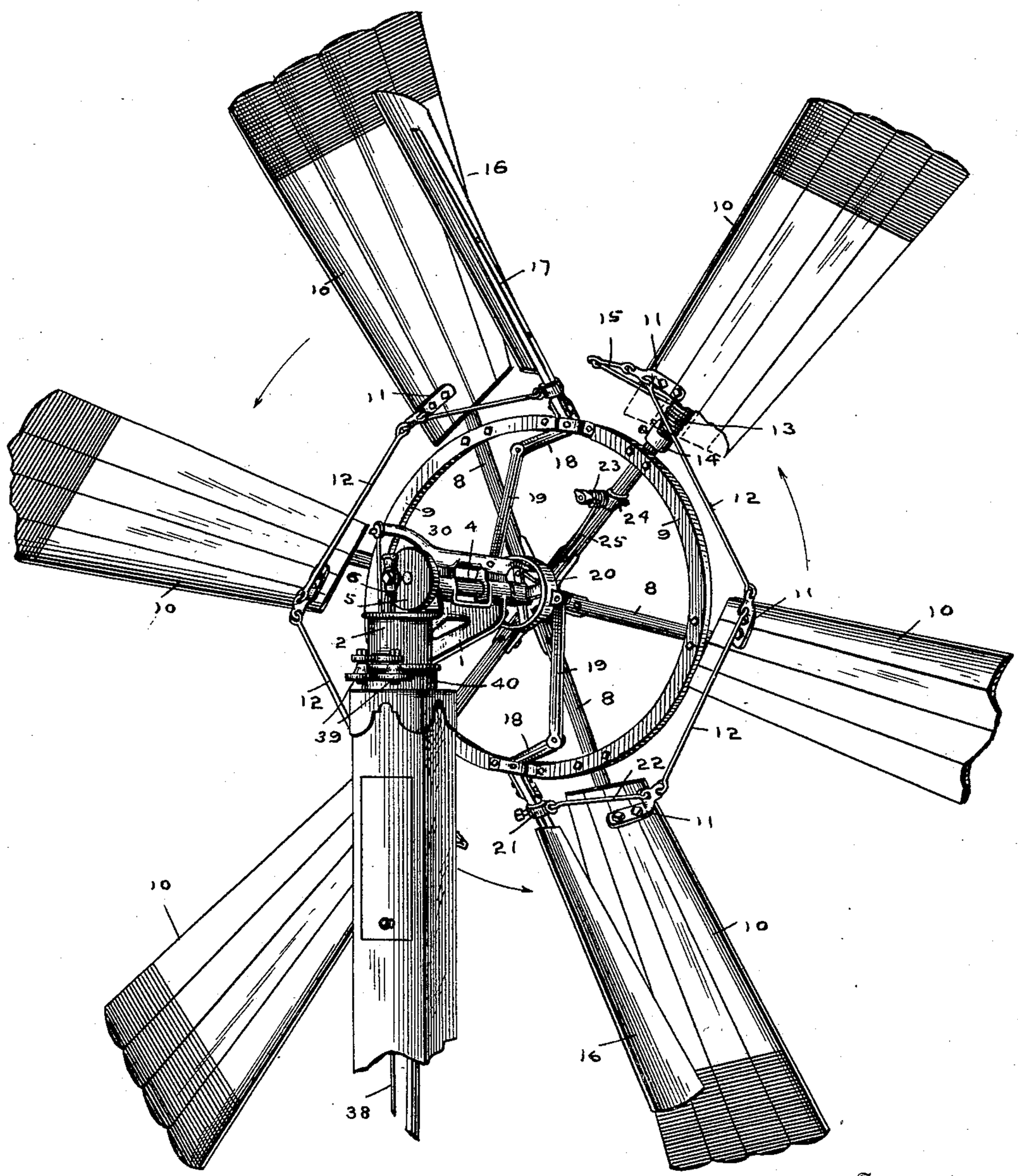
(No Model.) 2 Sheets—Sheet 1.

S. A. ROUSE.

WIND ENGINE.

No. 478,945. Patented July 12, 1892.



Witnesses

H. D. Healy.

E. B. Griffith

Inventor

Seymour A. Rouse.

By his Attorney

C. C. Jacobs.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

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FIG. 2.

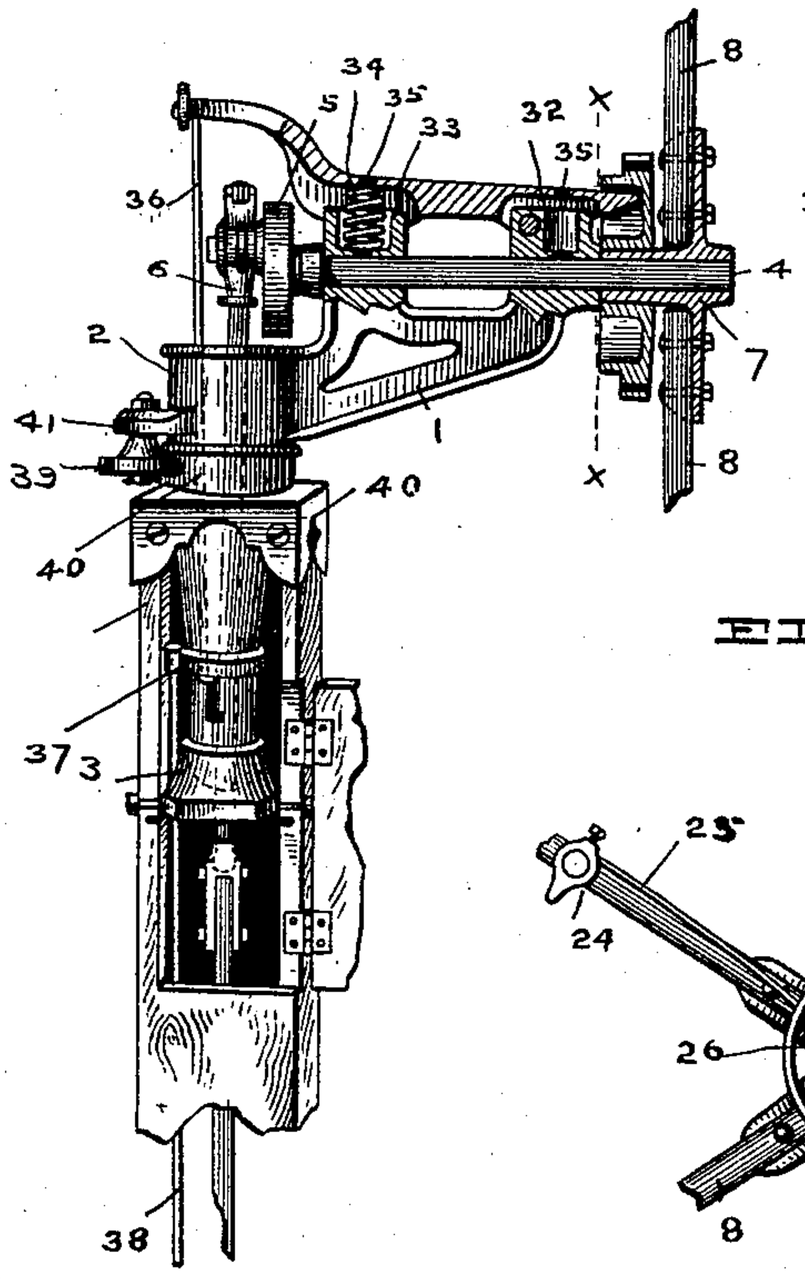


FIG. 3.

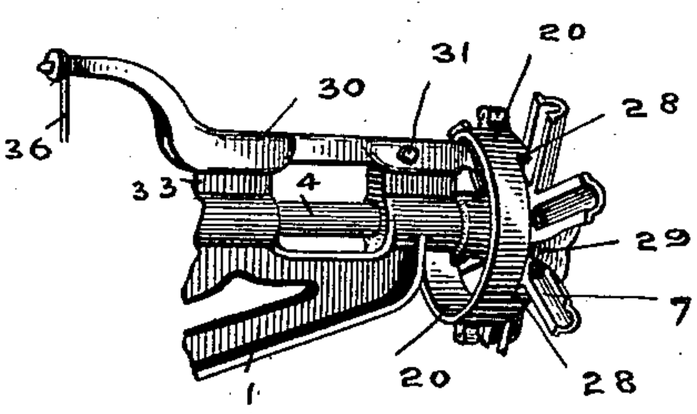


FIG. 4.

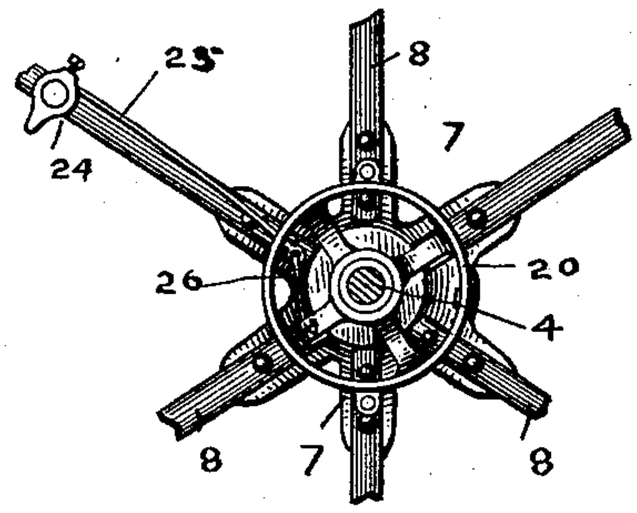


FIG. 5.

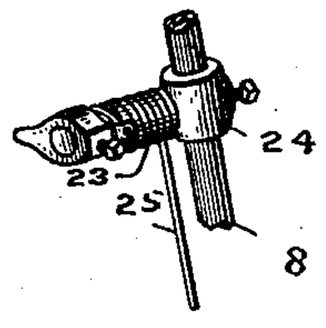


FIG. 6.

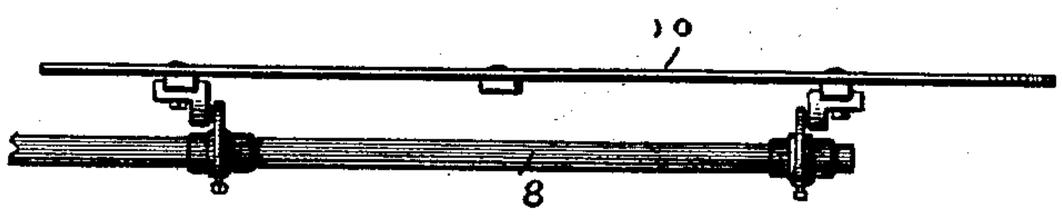


FIG. 8.

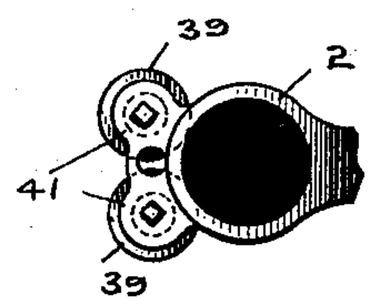
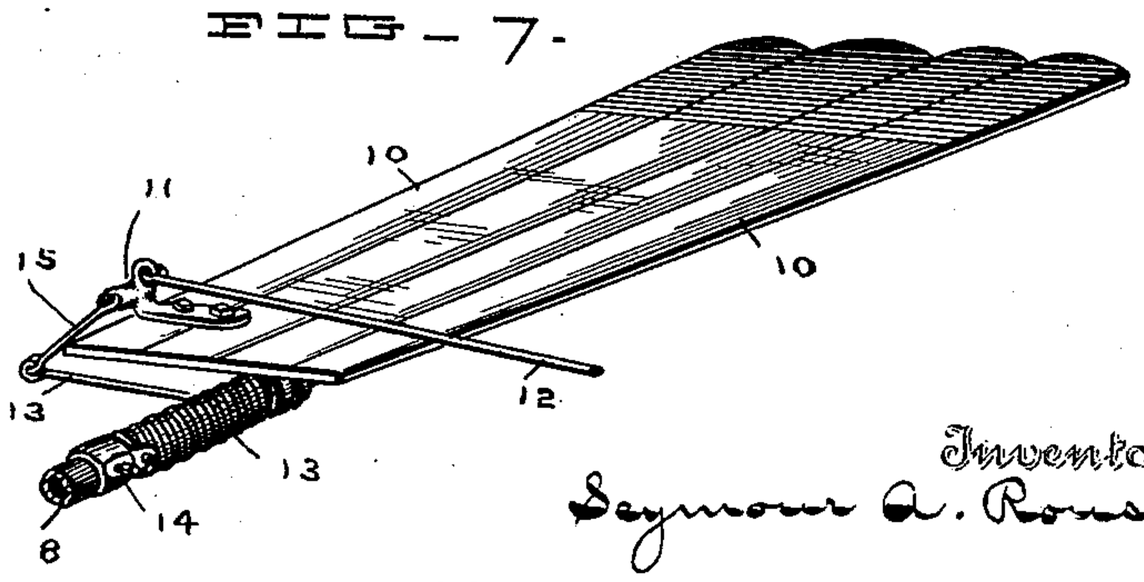


FIG. 7.



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UNITED STATES PATENT OFFICE.

SEYMOUR A. ROUSE, OF INDIANAPOLIS, INDIANA.

WIND-ENGINE.

SPECIFICATION forming part of Letters Patent No. 478,945, dated July 12, 1892.

Application filed April 22, 1891. Serial No. 389,970. (No model.)

To all whom it may concern:

Be it known that I, SEYMOUR A. ROUSE, of Indianapolis, county of Marion, and State of Indiana, have invented certain new and useful Improvements in Wind-Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like figures refer to like parts.

My invention relates to improvements in the construction of wind-engines or wind-wheels, and will be understood from the following description.

In the drawings, Figure 1 is a perspective view of the entire device. Fig. 2 is a side view, partly in section, of the main casting, turn-table, and brake mechanism. Fig. 3 is detail perspective view of a part of the main casting, the brake mechanism, and the spider of the wind-wheel. Fig. 4 is a section on the line *x x*, Fig. 2, looking toward the brake-wheel. Fig. 5 is a detail view of the clip and the spring which is connected to the brake-wheel for taking up the slack of the links. Fig. 6 is an edge view of one of the sails, showing its hinge connections to a spoke. Fig. 7 is a detail perspective view of one of the sails with one of the controlling-springs mounted on the spoke. Fig. 8 is a top plan view of a part of the turn-table with its friction-wheels.

In detail, 1 is the main casting formed integral with the tubular turn-table 2, whose socket is set in a base 3 in the mast-post in the usual manner.

4 is the wheel shaft or axle having bearings in the main casting and carrying on its rear end the crank-wheel 5, to which is connected the pitman 6, which is in turn connected to the pump-rod below.

7 is the hub or spider of the wind-wheel, having arms to which the inner ends of the spokes 8 are bolted, these being also secured midway to the framework 9 of the wheel.

10 are the sails, which are connected to the spokes by suitable hinges, one method of connecting them being shown in Fig. 6.

11 are brackets bolted to the sails and having double eyes to receive the links or connecting-rods 12, and the three sails on each side are connected in a series by these links, as shown in Fig. 1.

13 is a spring coiled on one of the spokes outside of the frame 9, one end being held in an adjustable collar or clip 14, the other end extending outward and connected to a short link 15, which is in turn connected to the bracket 11. The tension of this spring is normally exerted to hold the sails on that side of the wheel to the wind, and a similar spring is attached on the opposite side of the wheel to operate the sails on that side.

16 are governing-vanes, of which there are two, each of which is mounted on a rod 17, bolted to an angular casting 18, pivoted at its center to the frame 9 and at its opposite end to a link 19, whose inner end is pivoted to the brake-wheel 20, the links 19 from the two vanes being pivoted on opposite sides.

21 is an adjustable shackle mounted on the vane-rod and connected by a link 22 to the bracket 11 of one of the sails of each series. Thus it will be seen that the sails on each side are connected by their links to each other and to one of the vanes, and each series of the sails is connected together through the links 9 and the brake-wheel 20, and therefore operate simultaneously, both being normally controlled and held to the wind by the coiled spring 13.

23 is a spring coiled on a wrist, connected by an adjustable collar 24 to one of the spokes within the frame. This spring has an extension 25, which is pivoted to the link 26, which latter is pivoted to one of the spokes of the brake-wheel 20, as shown in Fig. 4, and its tension operates to throw the brake-wheel sufficiently against the tension of the governing-springs 13 to take up any slack in the links and prevent any rattling or unnecessary wear of the parts. The brake-wheel 20 is notched, as at 28 in Fig. 3, the shoulders of these notches engaging at the proper time with a stop 29, formed on the spider, as shown in Fig. 3.

30 is a brake-lever, which is pivoted at 31 to a projection on the top of the main casting, which is cored out to form an oil-cup 32, and a similar projection 33 receives the spring 34 within its oil-cup, the spring operating to hold the brake end of the lever away from contact with the inner face of the brake-wheel, and this brake-lever forms the covers

or caps for the oil-cups and has openings 35 to admit the oil. Its outer end is slightly curved upward and provides means of attachment for the brake-rod 36, which is connected to the collar 37, adapted to move up and down on the shank of the turn-table, and to this collar is connected a rod 38, which extends down the mast within reach of the operator.

39 are a pair of friction-wheels set radial to and their faces adapted to contact with the post-cap 40. These wheels are mounted on short shafts having bearings in projections 41 of the turn-table and are adapted to bear laterally—that is, on each side of a line drawn through the center of the wheel-shaft and turn-table—against the periphery of the post-cap, so as to prevent any lateral displacement of the parts and to counteract the strain occasioned by the gravity of the wind-wheel. Hence the weight of the machine is thrown upon these friction-wheels, causing the engine to be extremely sensitive upon the post, and thereby able to adjust itself to the lightest wind. The engagement of the stop upon the spider with the notches formed on the rim of the brake-wheel regulates the angle of the sails to the wind when the machine is thrown into or out of gear. Thus the regulating-vanes 16 are normally held close to the vane of the sails. When the force of the wind deflected from the face of the sails upon the governing-vanes becomes great enough to overcome the tension of the governing-springs 13, the vanes 16 are thrown backward into the wind, throwing the sails themselves out of the wind more or less. When a sudden gust of wind strikes the wheel, the governing-springs act promptly, opening all the sails simultaneously in proportion to the force of the wind and the speed of the wheel, allowing the surplus wind to pass through the wheel, and as the force of the wind abates the springs automatically operate to bring the sails back into the wind, thus insuring a regular action and the close regulation of the wheel at all times.

When it is desired to throw the wheel out of gear, the operator pulls upon the rod 38. This brings the end of the brake-lever in frictional contact with the inner face of the brake-wheel 20, stopping the same; but the momentum of the wind-wheel will carry the latter around and, through the links 10, connecting the vanes and sails, which are also connected to the brake-wheel, will operate to throw the sails gradually out of the wind, and when the stop 29 has engaged with the shoulder of the notch 28 on the brake-wheel the sails are completely out of the wind and the latter will pass through the sails without revolving the mill.

It is obvious that changes may be made in my mill without departing from the principle of my invention. The springs 23, connected to the brake-wheel, could be removed and the operation would be the same, only there would be more or less noise.

As will be observed, this invention belongs to that class of wind-engines wherein the wind-wheel is controlled by vanes located between the sails, and the ordinary tail-vane is entirely dispensed with. My invention, however, relates more particularly to the regulation of the mill, one series of springs controlling the sails and normally holding them in operative position to the wind, while another spring controls the governing-vanes, its tension operating directly against the springs that control the sails and tending to draw the vane away from the sail in front of it, thereby taking up the slack in the pivotal connection of the vane and sail mechanisms. I am not aware that any such manner of controlling the sails and holding them to the wind by one set or series of springs and the controlling of the governing-vanes by a different spring whose tension normally operates to take up the slack of the links and hold the parts taut, whereby noise and wear is prevented and a reliable regulation of the mechanism secured, has ever been provided before the date of my invention.

What I claim as my invention, and desire to secure by Letters Patent, is the following:

1. In a windmill, a wind-wheel, its spokes extended beyond the wheel-frame, sails pivoted to such spokes, an equal number of sails on one side the wheel, connected together by links to insure simultaneous action, a spring mounted on one of the spokes of each series and its extended end also connected to and through the several links, whereby its force is normally exerted to hold such series of sails in position to catch the force of the wind, a brake-wheel loosely mounted on the wheel-hub, a governing-vane pivoted to the wheel-frame and also connected to such series of sails and to the brake-wheel, and a spring mounted on one of the wheel-spokes within the wheel-frame, its inner extended end pivoted to the brake-wheel, the tension of such spring normally acting to control the governing-vane and in opposition to the force of the spring that controls the angle of the sails, all combined substantially as shown and described.

2. In a wind-engine, a main casting suitably supported, a wheel-frame mounted on a shaft revolving in bearings therein, sails pivoted to the spokes outside the wheel-frame and connected in an equal series on each side the wheel, a spring mounted on one of the spokes outside the wheel-frame, controlling each series of sails and holding them in position to catch the force of the wind, a brake-wheel loosely mounted on the hub of the wind-wheel, a governing-vane pivoted to the wheel-frame, connected to one of the sails of each series outside the wheel-frame, its inner end connected by a link to the brake-wheel, in combination with a spring mounted on one of the spokes of the wind-wheel, its inner end connected to the brake-wheel, the tension of such latter spring operating to draw the vane away from the sail in front of it and to hold

the link connections of the governing mechanism taut, thereby preventing all noise and wear of parts, substantially as shown and described.

3. In a wind-engine, a wind-wheel revolving on a shaft having bearings in a main casting suitably supported, sails pivoted to the spokes of the wheel, an equal number thereof connected to each other, and a spring secured to one of the spokes, whose tension normally holds the sails of its series to the wind, a brake-wheel loosely mounted on the inside of the hub of the wind-wheel, notched to engage with a stop formed upon the spider, in combination with a governing-vane set between each series of sails, pivoted to the wheel-frame and to the brake-wheel, and a spring connected to the brake-wheel and to such vane, whose tension normally operates against the tension of the spring that controls the sails, substantially as shown and described.

4. In a wind-engine, a revolving wheel suitably mounted on the framework, sails hinged thereto and connected in two equal divisions, springs holding such sails to the wind, a governing-vane between each series of sails, a spring connected to the wheel, whose tension normally operates to draw the vane away from the sail in front of it, in combination with a brake-wheel loosely mounted on the inside of the hub of the main wheel, provided with notches for engaging a stop upon such wheel, and a brake-lever adapted to contact frictionally with the inner periphery of such brake-wheel, the vanes and sails of both series connected together through such brake-wheel, whereby the increase of the force of the wind operates against and is resisted by the combined tension of both sets of springs, substantially as shown and described.

5. In a wind-engine, a wind-wheel revolving on a shaft having bearings in a main casting, sails hinged outside the wheel-frame to the spokes, the sails connected together on opposite sides of the wheel in two separate and equal divisions, a pair of governing-vanes set opposite each other across the diameter of the wheel between the sails and pivoted to the wheel-frame, a brake-wheel loosely mounted inside and upon the hub of the wind-wheel, such governing-vanes pivotally connected to the brake-wheel, the latter notched to engage with a stop formed on the spider, a spring mounted on one of the spokes near the lower end of its sail and pivotally connected to the links that connect each series of sails, by whose tension such sails are held to the wind, and a spring connected to one of the spokes within the wheel-frame and to the brake-wheel, its tension normally operating to take up the slack of the links connecting the vane and sail mechanism, preventing noise and wear of the parts, substantially as shown and described.

6. In a wind-wheel, a main casting suitably supported, a wind-wheel whose shaft is revolved on bearings in such main casting, projections formed on the shaft of the main casting, cored out to form oil-cups, a brake-wheel mounted on the hub of the wind-wheel, and a brake-lever pivoted to the main casting, forming a cover for the oil-receptacles and operated by a suitable rod or cord below, whereby the inner end of the brake-lever is brought into frictional contact with the inner periphery of the brake-wheel, substantially as shown and described.

7. In a wind-engine, a wind-wheel mounted on a shaft revolving in bearings in the main casting, such main casting suitably supported upon the mast-post, in combination with a pair of friction-wheels carried in bearings on the mast and contacting with the outer periphery of the post-cap, such wheels located on either side of a line drawn through the center of the shaft of the wind-wheel and bearing radially against the post-cap on either side of such line, whereby lateral displacement is prevented and the weight of the main wheel thrown upon such friction-wheels, substantially as shown and described.

In witness whereof I have hereunto set my hand this 9th day of April, 1891.

SEYMOUR A. ROUSE.

Witnesses:
E. B. GRIFFITH,
H. D. NEALY.