

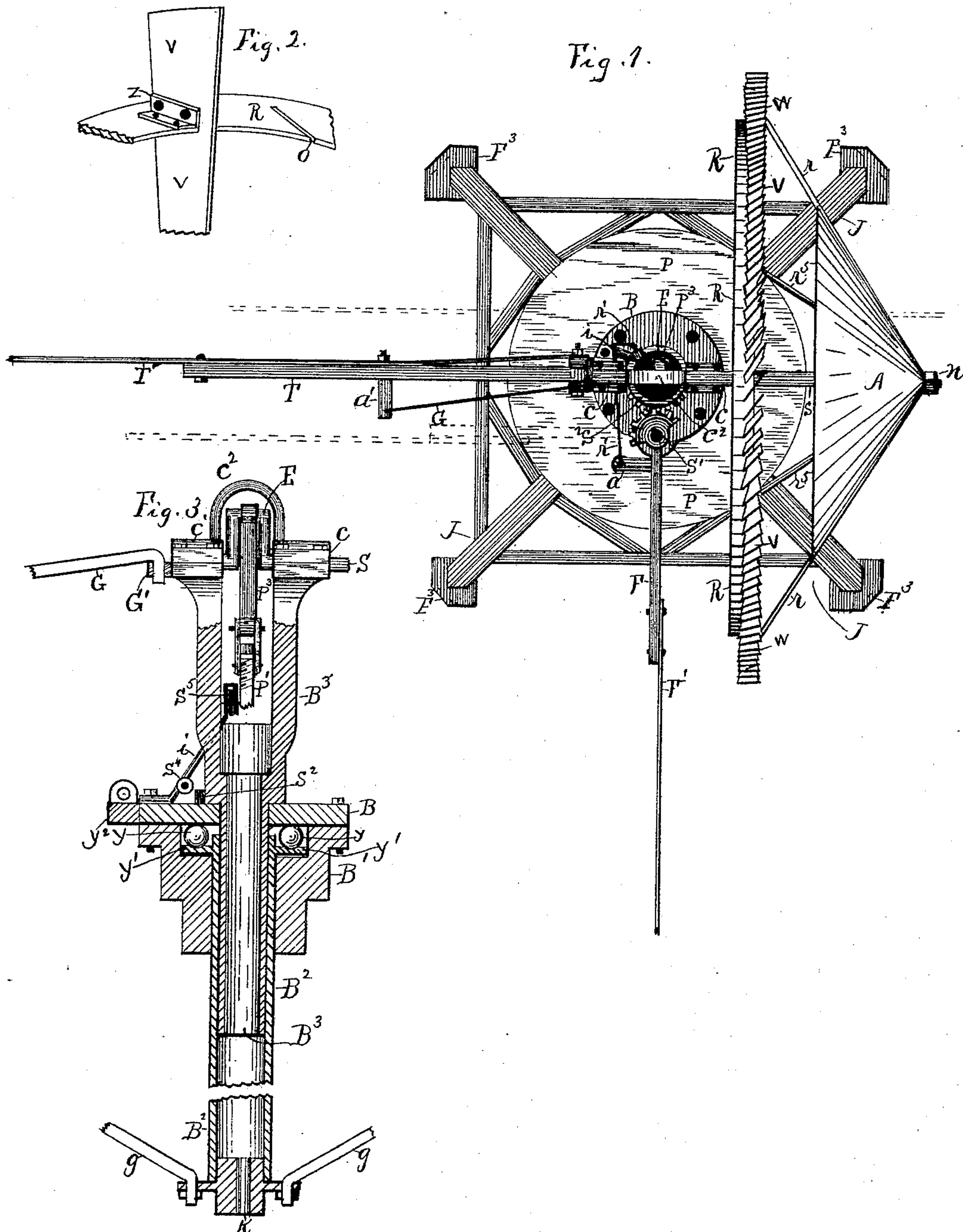
(No Model.)

2 Sheets—Sheet 1.

C. H. VAN DEUSEN.
WINDMILL.

No. 458,602.

Patented Sept. 1, 1891.



Witnesses

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Inventor.

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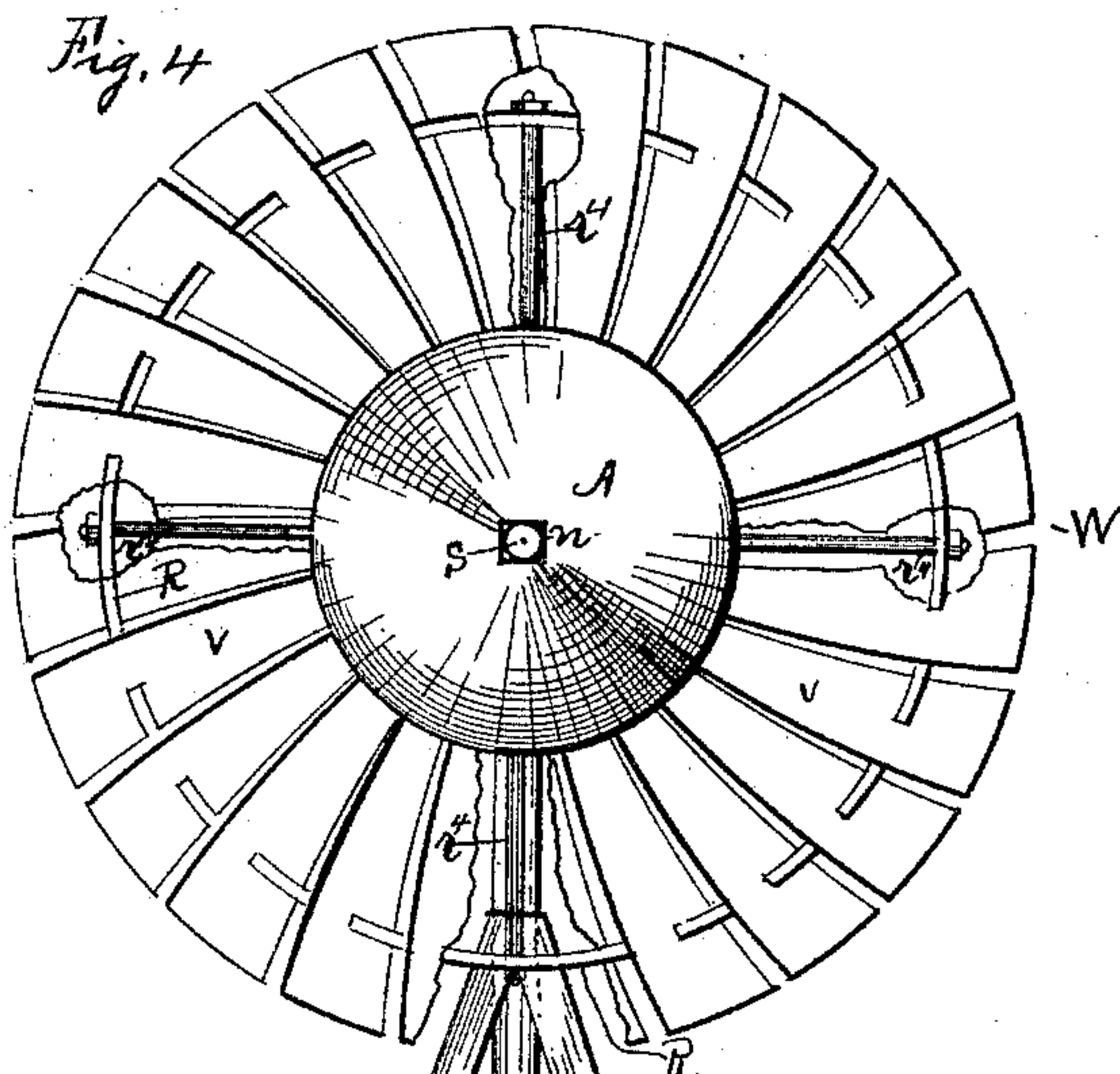
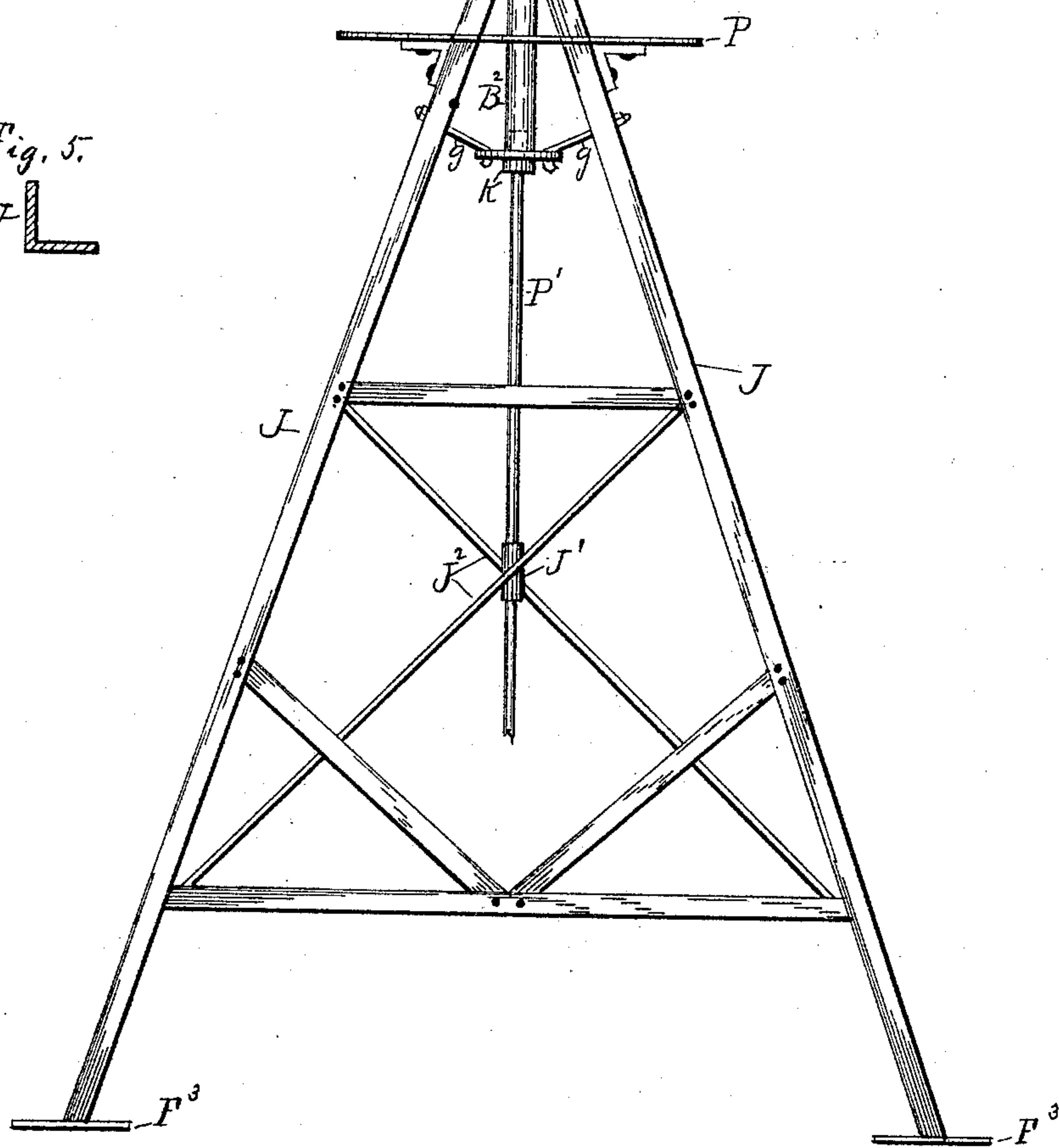


Fig. 5.



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UNITED STATES PATENT OFFICE.

CHARLES H. VAN DEUSEN, OF VERONA, ILLINOIS.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 458,602, dated September 1, 1891.

Application filed July 28, 1890. Serial No. 360,147. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. VAN DEUSEN, a citizen of the United States of America, residing at Verona, in the county of Grundy and State of Illinois, have invented certain new and useful Improvements in Windmills, of which the following is a specification, reference being had therein to the accompanying drawings and the letters of reference thereon, forming a part of this specification, in which—

Figure 1 is a top plan view of the windmill. Fig. 2 is a perspective view of a section of one of the sails and a section of one of the rims, showing the manner of attachment of the sails to the rims. Fig. 3 is a central vertical section of the parts connecting the wheel with the tower and a side view of the crank and pitman and the boxes of the crank. Fig. 4 is a front elevation of the windmill and its tower, and Fig. 5 is a cross-section of one of the angle-iron legs of the tower.

This invention relates to certain improvements in windmills, which improvements are fully set forth and explained in the following specification and claims.

Referring to the drawings, J represents the tower-legs, which are made of angle-iron, as shown in cross-section in Fig. 5, and which are connected at their upper ends, so as to form a box, through which passes the hollow rotatable shaft B^2 , the lower end of which stands and is stepped on the step K, which is adjustably suspended by the radially-arranged rods g , having their outer screw-threaded ends passed through the tower-legs and provided with nuts, so that they may be used to regulate the position of the step K, as occasion may require. The upper end of hollow shaft B^2 is provided with an annular flange Y' near its upper end, for carrying a series of balls Y , that roll in an annular groove in the upper surface of said flange and form the ball-bearings for supporting the parts above it.

B' is a hub sleeved over hollow shaft B^2 near its upper end, below said flange, and formed with an annular chamber for receiving said flange and balls, and is provided with an annular ring-plate B, firmly bolted thereto and covering and resting on said ball-bearings, as shown in Fig. 3.

B^3 is the turn-table of the wheel W. Its

upper end is forked and supports on each fork the boxes C and C' , in which is journaled the crank-shaft S of the wheel, the crank E being located between said boxes and carrying the pitman P^3 and pump-rod P' . Said boxes are connected by means of the arch C^2 for strength. The lower end of said turn-table is hollow and forms a spindle, which passes down through plate B and into hollow shaft B^2 , and is rotatable therein. The said turn-table B^3 is shouldered, so as to rest by means of the shoulder on plate B and turn in said plate and in said hollow shaft B^2 . The pump-rod P' connects at its upper end with the lower end of pitman P^3 and passes centrally down through the lower spindle of turn-table B^3 , from thence through step K and a box J' , supported centrally in the tower by means of the cross brace-rods J^2 .

T is an arm hinged to the rear side of plate B at Y^2 in line with shaft S when in its normal position and has secured to its rear end a tail-vane T' . The said tail-vane and its arm are supported at their rear end by means of the rod G, one end of which hooks into an eye G' at the top of the turn-table in the rear and at one side of one of boxes C' and its opposite end hooks into the outer end of arm a' , projecting from the side of arm T, the position of said rod and arm being such as to elevate the tail-vane T' when the wheel W turns to be in line with it and cause it to operate as a weight to return the wheel W to its normal position when the wind subsides and permits the side vane to return.

F is an arm having a side vane F' secured to its outer end and arranged at right angles with tail-vane T' . The inner end of arm F is pivoted to the top of plate B by means of a stud-bolt, and is provided on its inner end with the toothed segment S' for meshing with a row of teeth S^2 on the side of turn-table B^3 , the object of such connection being to rotate said turn-table by means of said side vane when the gale of wind is sufficient to turn said side vane to be in line with the tail-vane, and also bring the wheel W in line with the tail-vane and its edge to the wind, as shown by the broken lines in Fig. 1. When the gale subsides, the weight of the tail-vane will by means of said segment-gears and rod G return the wheel and side vane to their normal positions. The arm F of the side vane is pro-

vided with a laterally-extending arm a , to the outer end of which is attached a cord r' , which passes over the pulleys S^4 and S^5 , boxed on standard i , secured to the top of plate B, and passes thence down through the hollow stem of turn-table B^3 and hollow shaft B^2 to the foot of the tower, by means of which cord the side vane may be operated from below to fold it and the wheel up in line with the tail-vane and secure them so folded out of the wind when desired. The hub of the wheel W is ordinary, and is secured on crank-shaft S near the box C, and is provided with radial arms or spokes r^4 , to which arms or spokes are secured two concentric rims or bands R, one located a short distance from the hub, and to which is secured the inner ends of the sails V, and one secured to the outer ends of said spokes r^4 , and to which are secured the outer ends of the said sails. The manner of attaching the sails V to said rims or bands is shown more particularly in Fig. 2. The rim is provided with a diagonally-arranged recess O, one for each sail, to be placed in and be secured to the rim by means of an angle-plate Z, placed in the angle of said rim and sail and secured to each by means of rivets or screws, which forms a very neat and substantial fastening. As the sails are secured to the inner rim near the hub of the wheel in the same manner, the said inner rim is not shown in detail. The shaft S of the wheel extends out forward to some little distance and is provided with brace-rods r^5 , connecting the outer end of said shaft with the outer rim R of the wheel for bracing the wheel. The sails V of the wheel do not extend to its hub and consequently leave a space at the center of the wheel through which the wind can blow unless diverted to the sails. In order to cover said space and divert the wind to the sails, the wheel is provided with a detachable cone-shaped shield A, attached thereto by means of passing the extending end of the crank-shaft through an aperture in the apex of said shield and holding it on by means of a nut n and securing its rear part to the wheel by means of the radially-arranged brace-rods r ; or the shield may be attached to the wheel by any other suitable means. The conical form of the shield causes the wind to be deflected to the sails instead of being permitted to pass through the space in the center of the wheel, which greatly increases the power of the wheel. As the shield is detachable, it can be applied to any wheel of this character having an open center.

The legs of the tower are made of angle-iron, as shown in cross-section in Fig. 5, and are secured together by proper bars and braces made of metal and riveted or bolted at their ends to the tower-legs, as shown, thus forming the tower entirely of metal. The lower ends of the tower-legs are provided with feet F^3 for being buried in the earth to keep the tower from being blown over or sagging. The sails V are slightly concaved between their

ends, as shown in Fig. 4, for rendering them more capable of holding the wind and causing it to escape between them rather than pass over the periphery of the wheel. P is a platform upon which to stand in order to oil or adjust the mill, and may be reached by any kind of a ladder or stairway, not necessary to be shown.

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

1. In the windmill shown and described, in combination with the tower, the step K, rods g for adjustably suspending said step in the tower, hollow shaft B^2 , standing on said step and having an annular flange Y' near its upper end, ball-bearings Y for resting on said flange, annular plate B, resting on said ball-bearings, and the turn-table B^3 , rotatably supported by said plate, substantially as and for the purpose set forth.

2. In the windmill shown and described, the combination of the tower, the hollow suspended step K, box J' , cross brace-rods J^2 for supporting said box, and pump-rod P' , substantially as and for the purpose set forth.

3. In the windmill shown and described, the wheel W, having the sails V, curved between their ends, substantially as and for the purpose set forth.

4. In the windmill shown and described, the combination of the wheel W, having sails V, curved between their ends, the rim R, having the diagonal recesses O, the angle-plate Z, and the curved shield A, arranged in front of the open center of the wheel and having its apex extending from the wheel, substantially as and for the purpose set forth.

5. In the windmill shown and described, the combination, with the wheel W, of the conical shield A, arranged immediately in front of the center of said wheel, crank-shaft S, turn-table B^3 , hollow shaft B^2 , having annular flange Y' , ball-bearings Y, tail-vane T' , side vane $F' F'$, and rod G, the said vanes being pivoted to said turn-table and adapted to fold the wheel to be in line with said vanes when they are brought in line or parallel with each other, substantially as and for the purpose set forth.

6. In a windmill, the combination, with the wheel R, of the detachable conical shield A, arranged forward of the center of said wheel and having an aperture in its apex, shaft S, having its forward-extending end passing through said aperture and having the vent n turned thereon to secure said shield on said shaft, and the brace-rods r , having their forward ends secured to the periphery of said shield and their rear ends detachably connected to said wheel, substantially as and for the purpose set forth.

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