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Shrewsbury

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(54) **WIND TURBINE**

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F03D 3/06	(2006.01)
F03D 9/25	(2016.01)
F03D 9/28	(2016.01)

(52) **U.S. Cl.**

CPC ***F03D 3/061*** (2013.01); ***F03D 3/062*** (2013.01); ***F03D 9/25*** (2016.05); ***F03D 9/28*** (2016.05); *F05B 2240/211* (2013.01); *F05B 2240/311* (2013.01); *Y02E 10/74* (2013.01)

(58) **Field of Classification Search**

None

See application file for complete search history.

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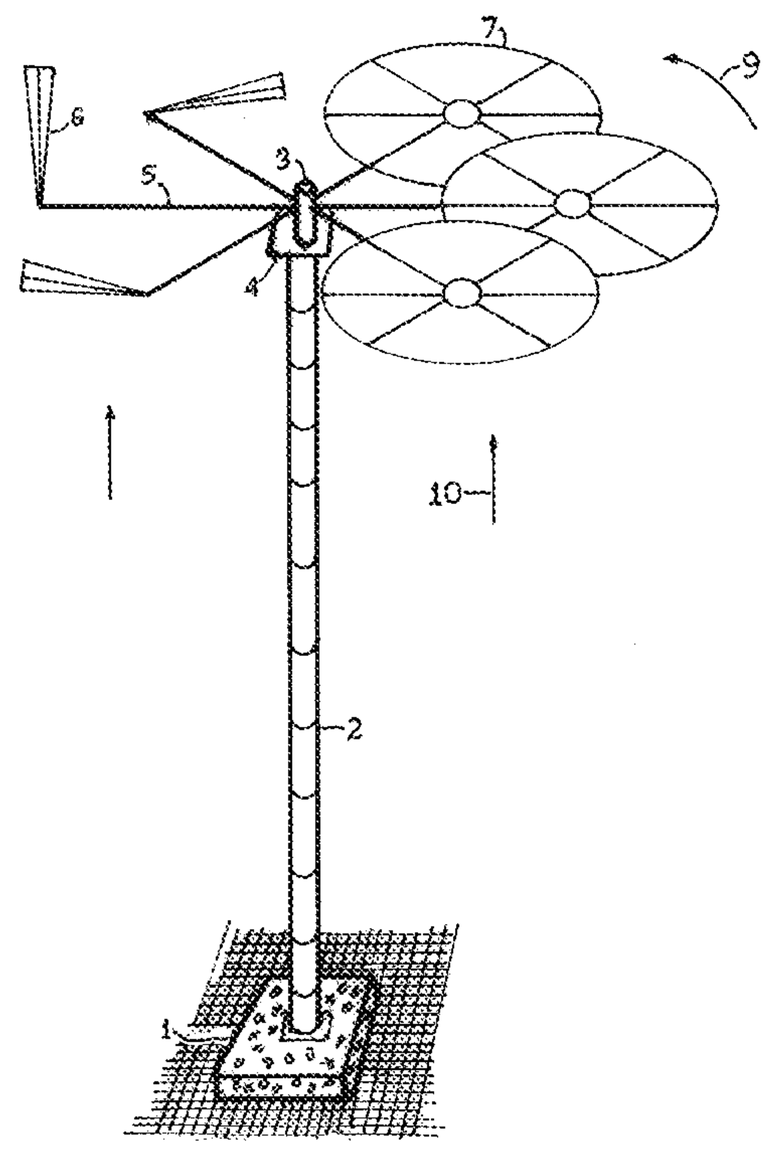
(57) **ABSTRACT**

The present invention is a wind turbine that includes a mandrel, a plurality of supporting arms or trusses, and a plurality of umbrella-like vanes. The wind mandrel is adapted for rotating in a generally circular orientation with respect to a vertical axis of a turbine-receiving structure during operation wherein the circular orientation is generally parallel to a ground surface.

20 Claims, 4 Drawing Sheets



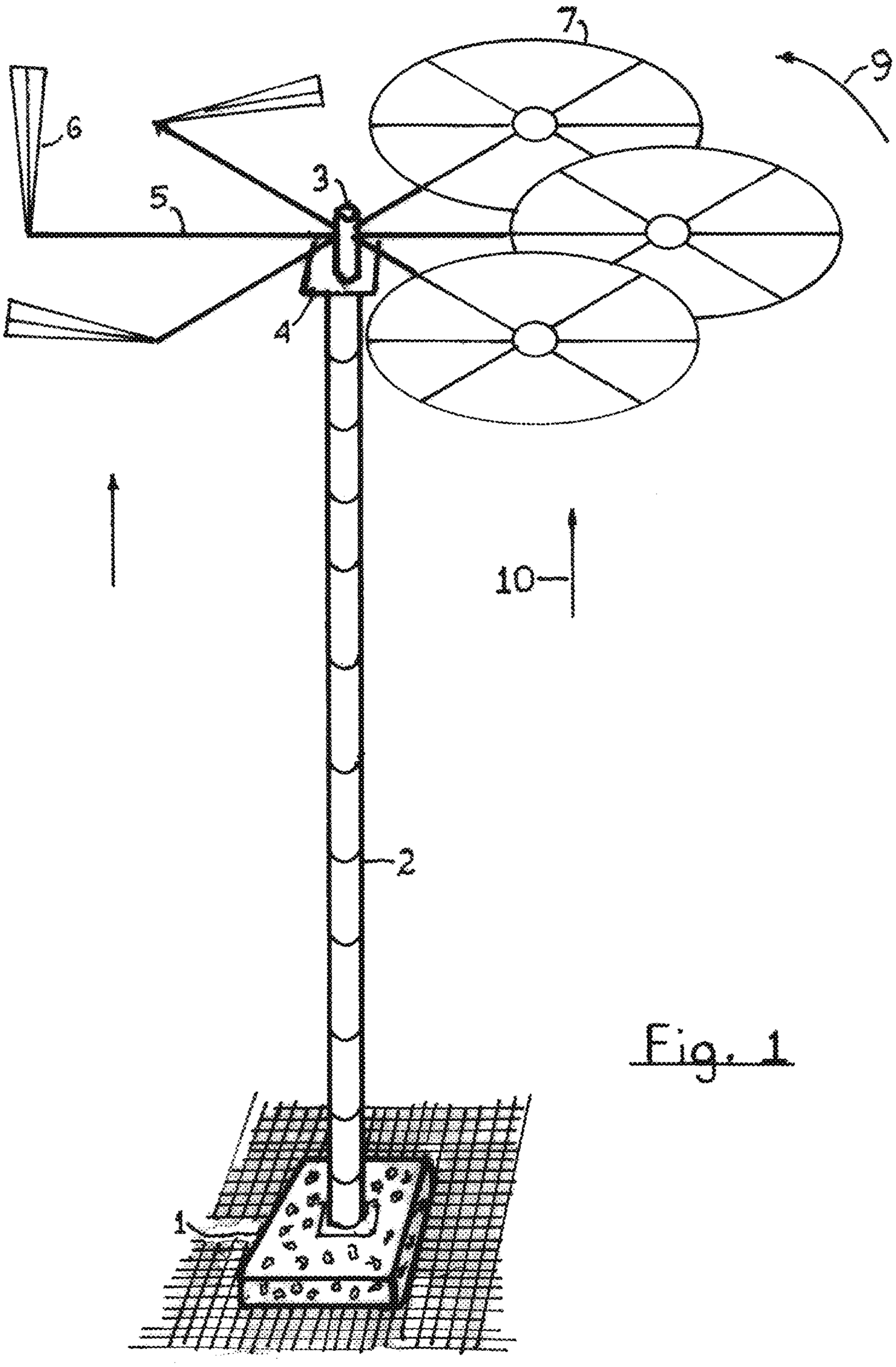


Fig. 1

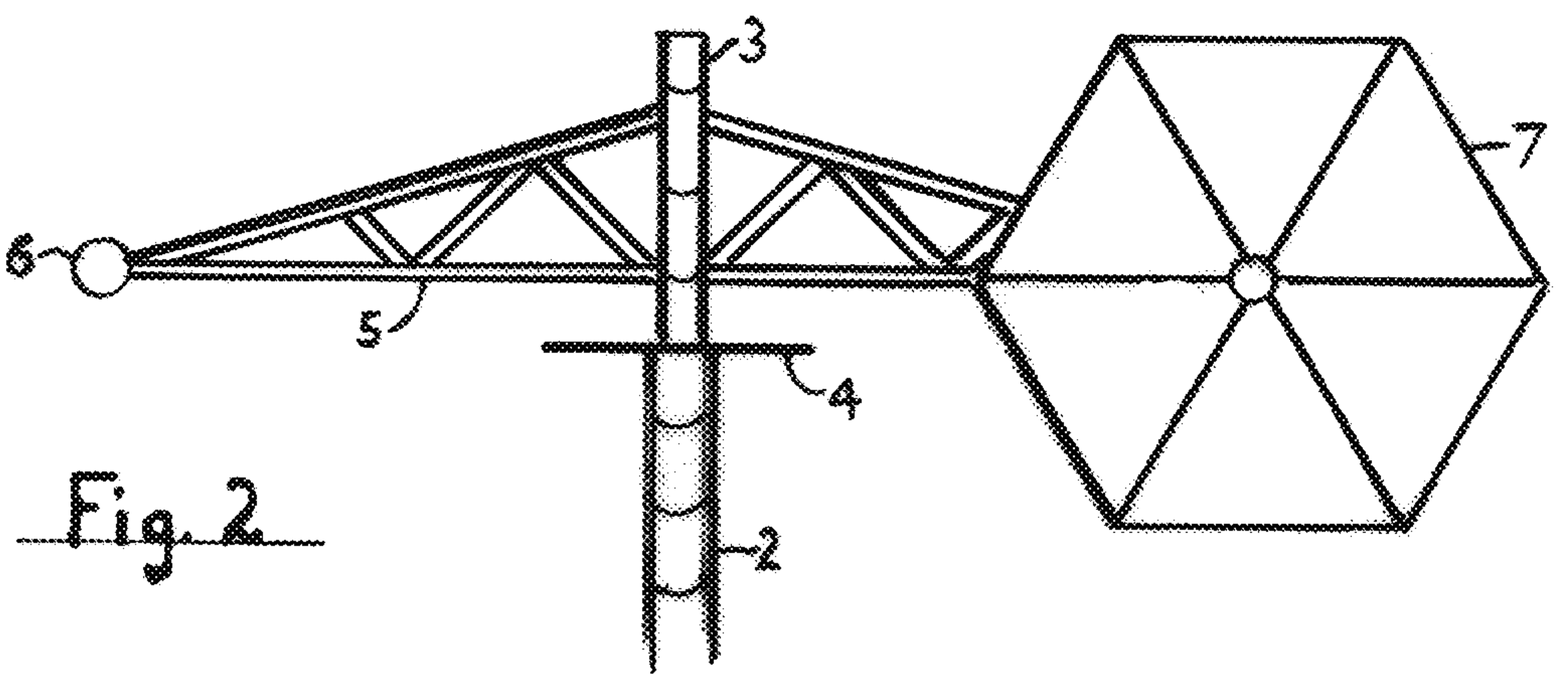


Fig. 2

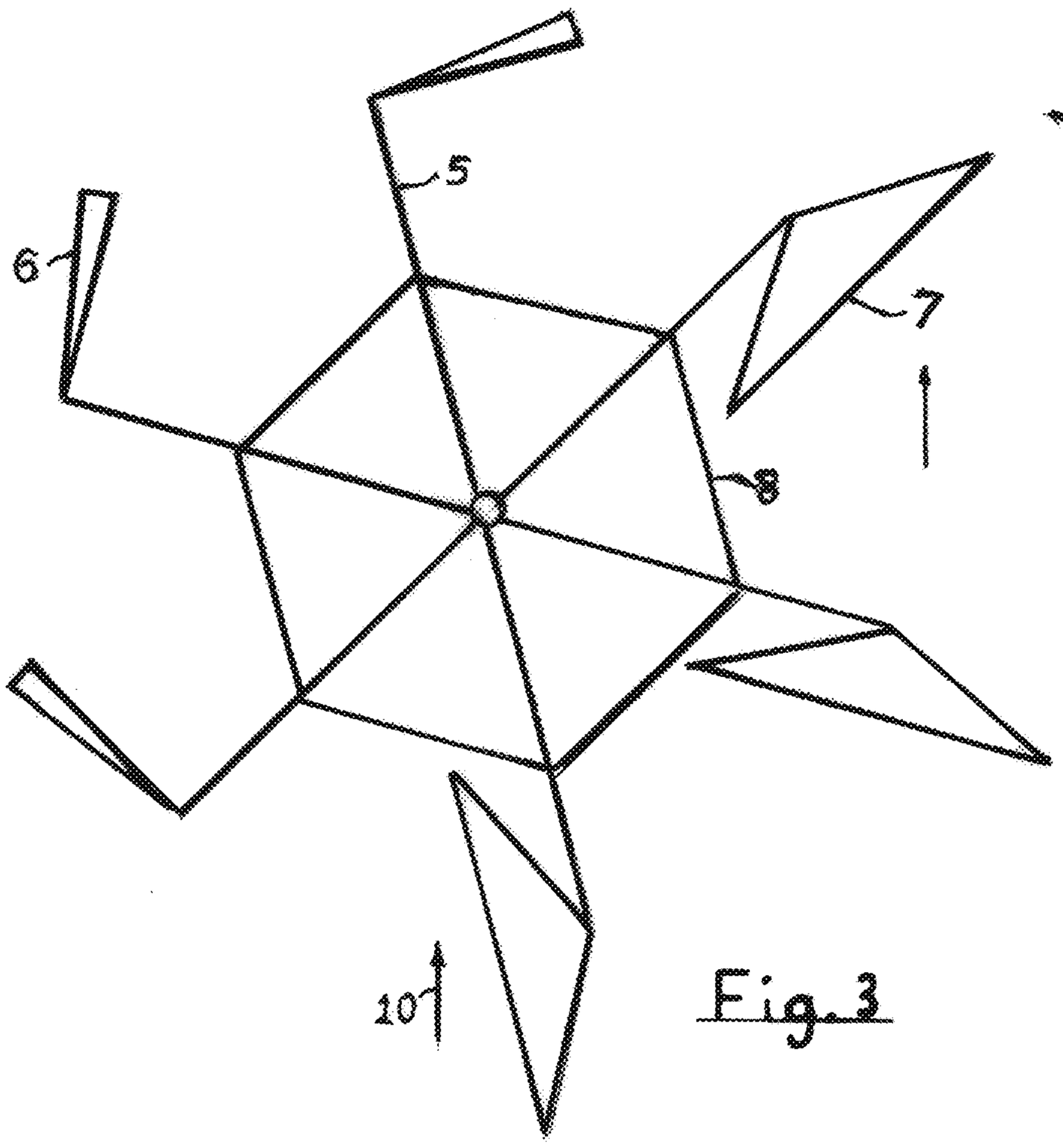


Fig. 3

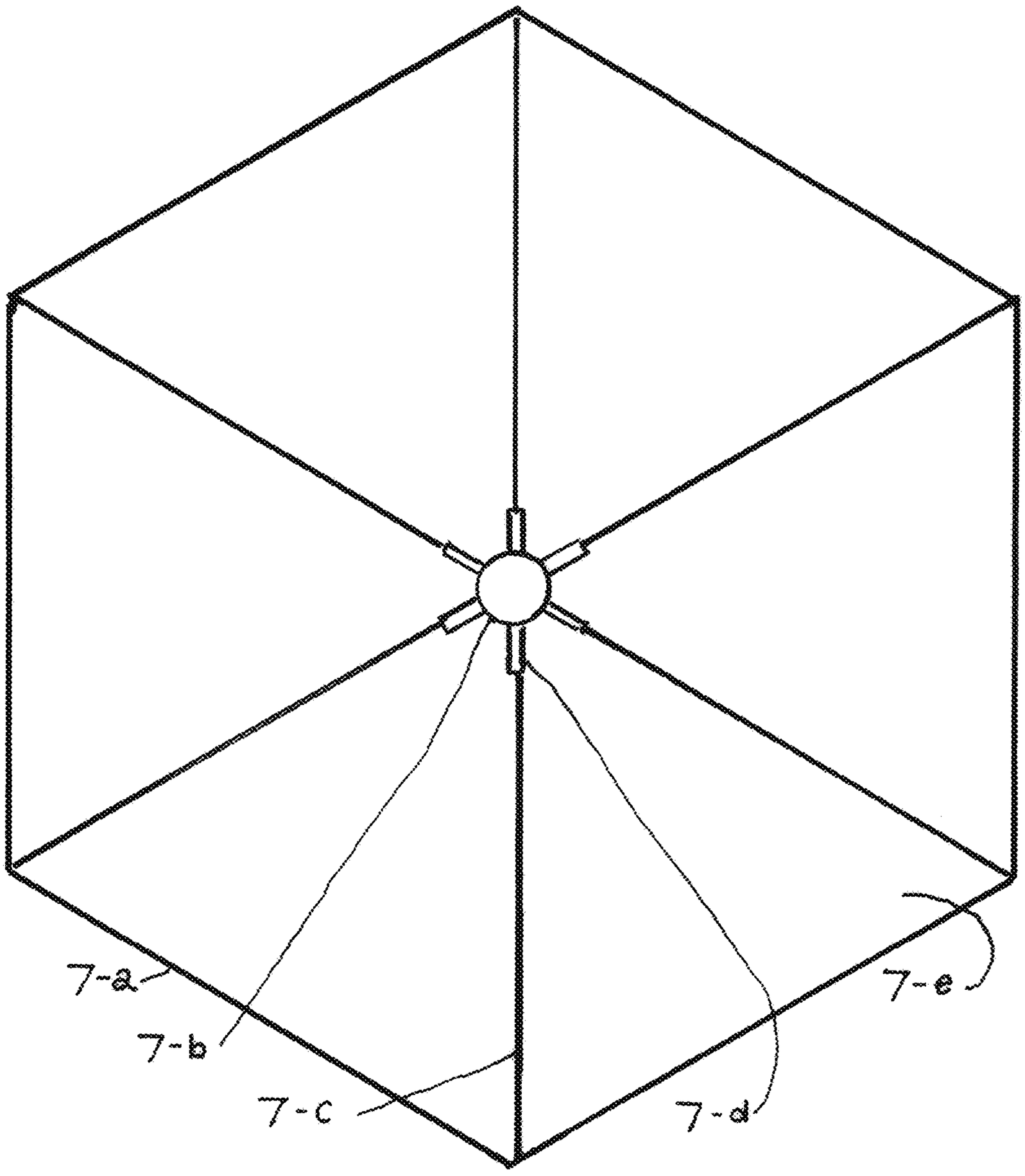


Fig. 4

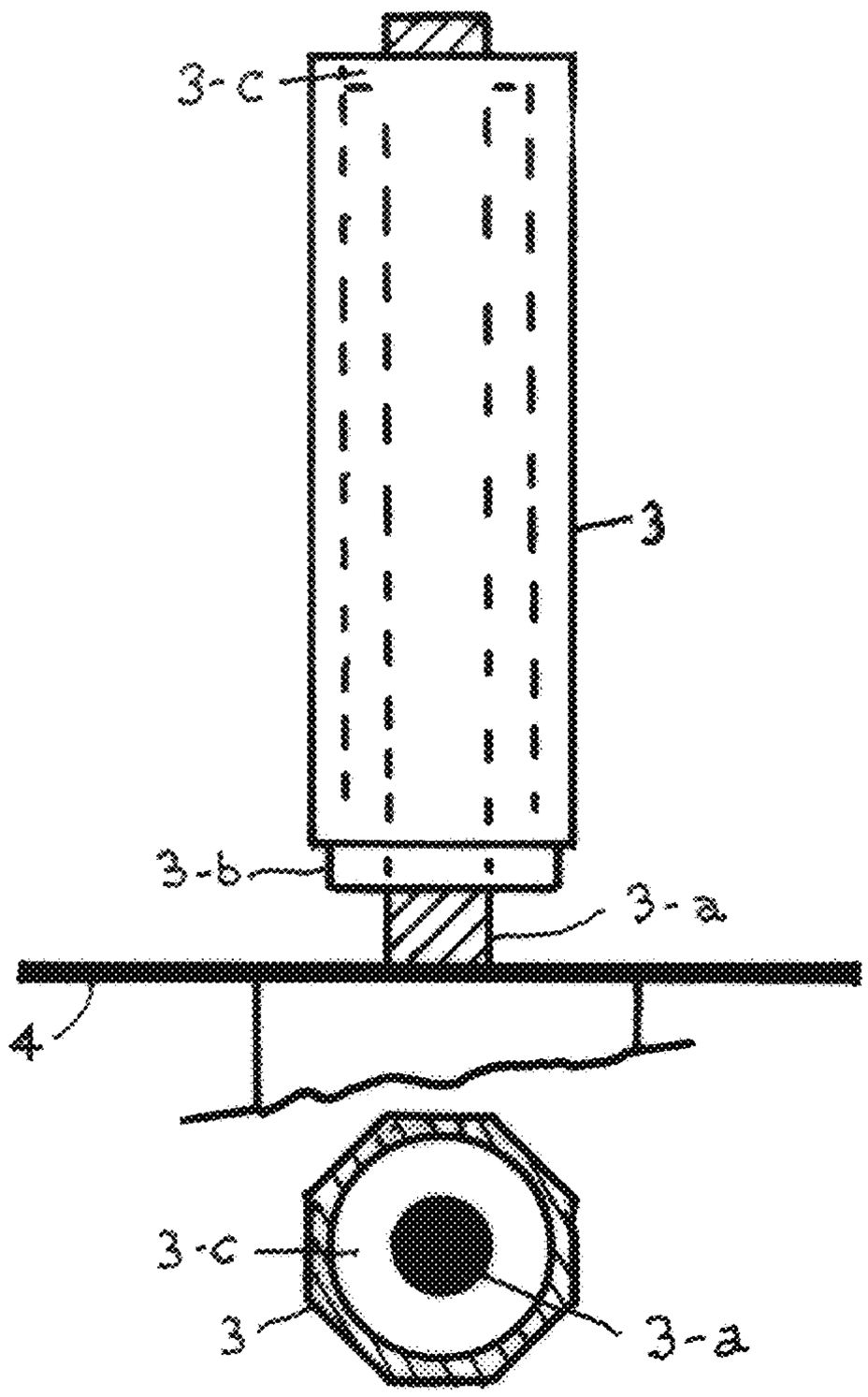


Fig. 6

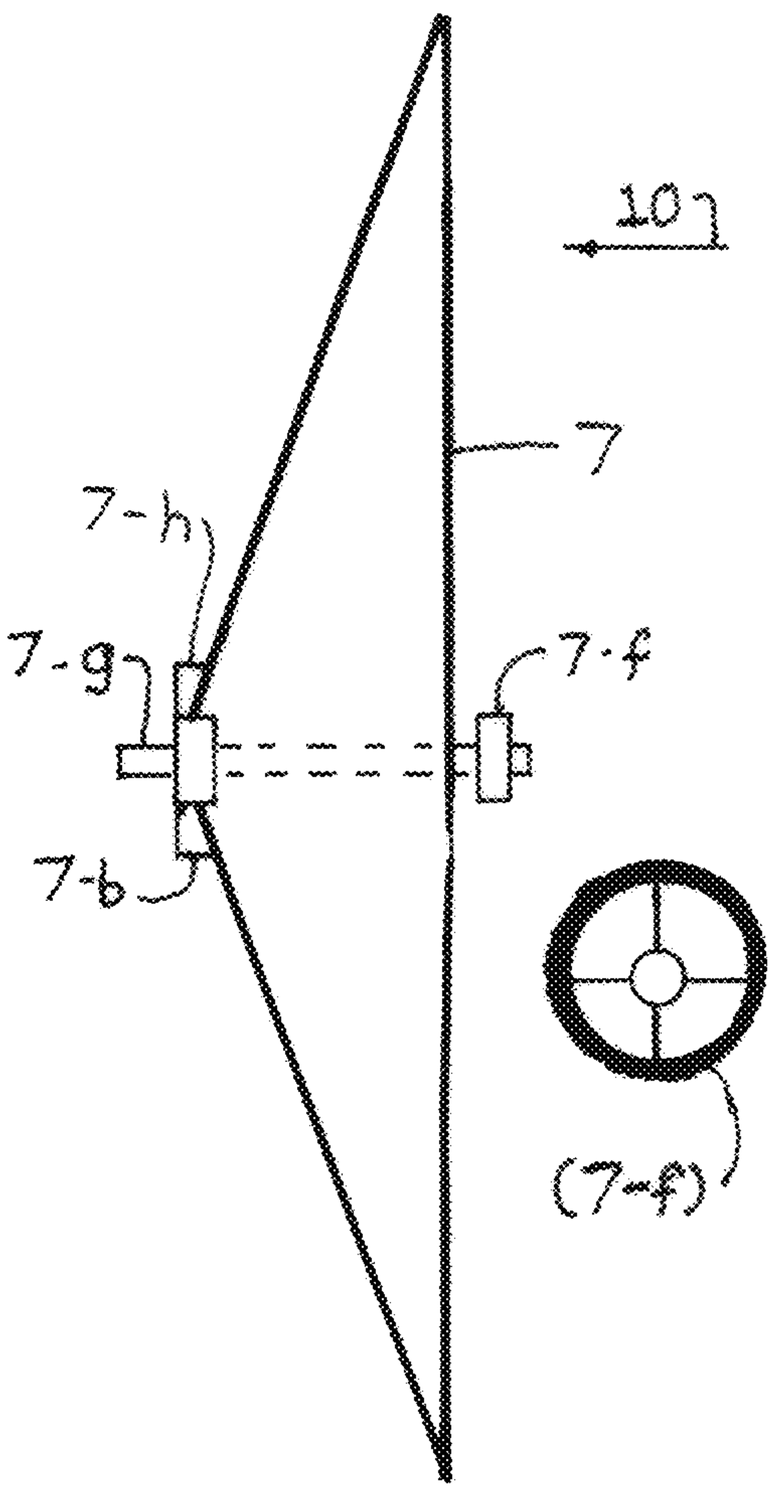


Fig 5

WIND TURBINE

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention generally relates to devices, components, apparatuses, and systems related to wind turbines. More specifically, the present invention is a wind turbine that includes a mandrel, a plurality of supporting arms or trusses, and a plurality of umbrella-like vanes. The wind turbine is adapted for rotating in a generally circular orientation with respect to the vertical axis of a turbine-receiving structure during operation wherein the circular orientation is generally parallel to a ground surface.

Description of the Related Art

Devices, components, apparatuses, and systems related to wind turbines are well known in the art.

The Applicant is unaware of inventions or patents, taken either singly or in combination, which are seen to describe the present invention as claimed.

SUMMARY OF THE INVENTION

The present invention is a wind turbine that includes a mandrel, a plurality of supporting arms or trusses, and a plurality of umbrella-like vanes. The wind turbine is adapted for rotating in a generally circular orientation with respect to the vertical axis of a turbine-receiving structure during operation wherein the circular orientation is generally parallel to a ground surface.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an environmental, perspective view of a wind turbine according to the present invention, wherein the wind turbine is mounted upon a turbine-receiving structure, such as a tower;

FIG. **2** is an environmental, elevational view of the wind turbine of FIG. **1**;

FIG. **3** is a top view of the wind turbine of FIG. **1**;

FIG. **4** is a front view of an umbrella-like vane of the wind turbine of FIG. **1**;

FIG. **5** is a side view of the umbrella-like vane of FIG. **4**; and

FIG. **6** is a top and elevation view of a mandrel of the wind turbine of FIG. **1**.

It should be understood that the above-attached figures are not intended to limit the scope of the present invention in any way.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIGS. **1-6**, the present invention is a wind turbine that comprises a rotating mandrel **3**, a plurality of arms or trusses **5** extending laterally away from and mounted, secured or attached to the mandrel **3**, and a plurality of umbrella-like vanes **6**,**7** mounted, secured or attached on the ends of arms or trusses **5** opposite mandrel **3**. The mandrel **3** is adapted for being sufficiently secured for operation to a turbine-receiving structure **2**, such as a tower or pole **2**, having a generally vertical axis and a sufficient height. The plurality of arms or trusses **5** and plurality of umbrella-like vanes **6**,**7** are adapted for rotating in a generally circular orientation with respect to the vertical axis of the structure **2** during operation wherein the circular orientation is generally parallel to a ground surface.

Preferably, the wind turbine comprises six (6) umbrella-like vanes **6**,**7** that are proportionally positioned relative to the mandrel **3** to provide an efficient energy-producing apparatus when the wind turbine is secured upon the tower or pole **2**.

FIG. **1** shows an environmental, perspective view of a wind turbine mounted upon a tower **2** that is supported by a base **1** of concrete or any solid material heavy enough and strong enough to support the tower and turbine. The wind turbine rotates in a circular orientation with respect to the vertical axis of the structure **2** during operation wherein the circular orientation is generally parallel to a ground surface. A rotating mandrel **3** is secured about an upper end of the tower **2** and is to which rotating arms or trusses **5** are solidly secured or attached. Mandrel **3** is fitted with pulley, sprocket or gears that drive any convenient, common power mechanism, generator, water pump, hydraulic pump, winch or combination of these. An umbrella-like vane **6**,**7** is mounted on the end of arm **5** opposite mandrel **3**. Vanes **6**,**7** are the same vanes respectively in either an open position or a closed condition. When in the open position, the wind acts upon the face sides of the vanes **7** causing them to rotate until the back sides of the vanes **6** has come through rotation to be acted upon by the wind and closed by it for diminished wind resistance while rotating back to where the wind again opens and drives the vanes **7** in the direction shown by **9** until rotation again brings vanes **7** to where wind hits their back sides.

FIG. **2** shows an environmental, elevational view of the turbine showing a tower **2** with a platform **4** for mounting an energy-producing apparatus to be driven by the turbine. Platform **4** can be any convenient size and shape, placed at any height convenient to connect to a pulley, sprocket or gear that is used to drive the energy-producing apparatus. Mandrel **3** is shown with connecting arms or trusses **5** of any convenient length, construction of which can be light weight material strong enough to carry their own weight plus that of the umbrella-like vanes **6**,**7**. Trusses **5** is preferably built similar to the drawings, with top and bottom cord with cross members tying them together for strength. Vanes **6**,**7** are shown respectively in closed and open positions.

FIG. **3** shows a top, plan view of the turbine. Wind direction is indicated by **10** showing that because the vanes **6**,**7** are positioned in a 360 degree circle, wind coming from any direction will act on the face sides of the vanes **7** on one half of the circle and concurrently on the back sides to close the vanes **6**, thereby reducing drag vanes travel back to the opposite side of turbine to again be driven with force. Bridge **8** is shown connecting arms or trusses **5** together to tie structure together so that force exerted at any point transmits through the entire wind turbine. Direction of rotation with respect to direction of the wind **10** is indicated by curved arrow **9**.

FIG. **4** shows an umbrella-like vane with **7***e* being "sail cloth" or parachute cloth or any light-weight cloth selected for strength and having been treated for sun and weather resistance. Arms and trusses **5** shown in FIGS. **2** and **3** connect to and carry hub **7***b* to which pivoting, skeletal rod holder **7***d* is attached. Skeletal rods **7***c* are connected to ball bearings that are mounted in **7***d*, **7***c* and **7***d* are the opening and closing framework of the vane with cloth or fabric **7***e* being sewn or otherwise attached to the framework and with strong flexible cord **7***a* as an outer border of the vane and

sized to take strain off from rods limiting their opening ability high winds. Flexible cord **7***a* also attaches to fabric **7***e*.

FIG. **5** shows a side view of an open umbrella-like vane **7** showing hub indicated by **7***b* and **7***f*. The hub **7***b*,**7***f* has an outer ring or nut **7***h* that acts as a stop to limit the opening of the vane to a shape similar to that shown in the drawing. Bolt **7***g* and nut **7***h* attach vane hub **7***f* to arm or truss **5**. Direction of the wind **10** is indicated to show direction of wind in relationship with opened vane.

FIG. **6** shows mandrel **3** which is preferably a metal tube that turns on bearings **3***b*,**3***c* which are mounted on an inner shaft **3***a*. The inner shaft, alternatively could be longer, extending upward out of the outer shaft bearing assembly to have the trusses attach to it **3***a* above top of mandrel **3** which will in that case connect to tower support.

It is to be understood that the present invention is not limited to the embodiments and non-limiting examples described above or as shown in the attached figures, but encompasses any and all embodiments within the spirit of the invention.

What is claimed is:

1. A turbine comprising:

a mandrel,

wherein said mandrel is adapted for being secured for operation to a turbine-receiving structure having a generally vertical axis and a sufficient height;

a plurality of supporting arms extending laterally away from said mandrel,

wherein each of said plurality of supporting arms comprises a first end, a second end, and a body extending from said first end to said second end, and

wherein said first end of said each of said plurality of supporting arms is located proximate said rotating mandrel; and

a plurality of umbrella-like vanes,

wherein each of said plurality of umbrella-like vanes comprises a face side and a back side and is adapted for being alternatively placed in an open configuration and a closed configuration during operation,

wherein said each of said plurality of umbrella-like vanes is secured at a location along a corresponding supporting arm of said plurality of supporting arms,

wherein said plurality of supporting arms and said plurality of umbrella-like vanes are adapted for rotating in a generally circular orientation with respect to the vertical axis of the turbine-receiving structure during operation wherein said circular orientation is generally parallel to a ground surface, and

wherein said each of said plurality of umbrella-like vanes, when opened or in said open configuration, provides a solid surface for the wind to act upon but, as said plurality of umbrella-like vanes rotate around the vertical axis of the turbine-receiving structure, said each of said plurality of umbrella-like vanes provides said back side for the wind to act upon and to give little resistance to the wind so as to return said each of said plurality of umbrella-like vanes to said closed configuration as said each of said plurality of umbrella-like vanes rotates into position to be opened and acted upon again, repetitively, as solid rotatable surfaces.

2. The wind turbine according to claim **1**, wherein at least one supporting arm of said plurality of supporting arms forms an angle of about ninety degrees with the vertical axis of the turbine-receiving structure.

3. The wind turbine according to claim **1**, wherein said each of said plurality of umbrella-like vanes is secured proximate said second end of a corresponding supporting arm of said plurality of supporting arms.

4. The wind turbine according to claim **1**, wherein the turbine-receiving structure is a tower or pole.

5. The wind turbine according to claim **1**, wherein speed of rotation of said rotating mandrel is directly proportional to speed of the wind.

6. The wind turbine according to claim **1**, wherein power produced is directly proportional to size, in square feet surface, of said plurality of vanes times force or speed of the wind, and wherein torque is proportional to length of said plurality of supporting arms.

7. The wind turbine according to claim **1**, wherein said plurality of umbrella-like vanes are at least six umbrella-like vanes.

8. The wind turbine according to claim **1**, wherein said plurality of umbrella-like vanes are secured on said plurality of supporting arms that are connected by bridging so that turning action is transmitted from any one of said plurality of umbrella-like vanes into and through a system of said plurality of supporting arms.

9. The wind turbine according to claim **1**, wherein said plurality of supporting arms are made of a lightweight material.

10. The wind turbine according to claim **9**, wherein said lightweight material is aluminum.

11. The wind turbine according to claim **1**, wherein said plurality of umbrella-like vanes are made of a lightweight material.

12. The wind turbine according to claim **11**, wherein said lightweight material is selected from the group consisting of sail cloth and parachute cloth.

13. The wind turbine according to claim **1**, wherein said plurality of umbrella-like vanes are made of a strong material that is sun and weather resistant.

14. The wind turbine according to claim **1**, wherein said rotating mandrel is centrally positioned with respect to said plurality of supporting arms.

15. The wind turbine according to claim **1**, further comprising a turbine-receiving structure.

16. The wind turbine according to claim **15**, wherein said turbine-receiving structure is a tower or pole.

17. A turbine comprising:

a rotating mandrel,

wherein said rotating mandrel is adapted for being rotatably secured for operation to a turbine-receiving structure having a generally vertical axis and a sufficient height;

a plurality of supporting arms extending laterally away from said rotating mandrel,

wherein each of said plurality of supporting arms comprises a first end, a second end, and a body extending from said first end to said second end,

wherein said first end of said each of said plurality of supporting arms is located proximate said rotating mandrel, and

wherein at least one supporting arm of said plurality of supporting arms forms an angle of about ninety degrees with the vertical axis of the turbine-receiving structure; and

a plurality of umbrella-like vanes,

wherein each of said plurality of umbrella-like vanes comprises a face side and a back side and is adapted for being alternatively placed in an open configuration and a closed configuration during operation,

wherein said each of said plurality of umbrella-like vanes is secured proximate said second end of a corresponding supporting arm of said plurality of supporting arms,

wherein said rotating mandrel, said plurality of supporting arms and said plurality of umbrella-like vanes are adapted for rotating in a generally circular orientation with respect to the vertical axis of the turbine-receiving structure during operation wherein said circular orientation is generally parallel to a ground surface, and

wherein said each of said plurality of umbrella-like vanes, when opened or in said open configuration, provides a solid surface for the wind to act upon but, as said plurality of umbrella-like vanes rotate around the vertical axis of the turbine-receiving structure, said each of said plurality of umbrella-like vanes provides said back side for the wind to act upon and to give little resistance to the wind so as to return said each of said plurality of umbrella-like vanes to said closed configuration as said each of said plurality of umbrella-like vanes rotates into position to be opened and acted upon again, repetitively, as solid rotatable surfaces.

18. The wind turbine according to claim **17**, further comprising a turbine-receiving structure.

19. The wind turbine according to claim **17**, wherein at least one supporting arm of said plurality of supporting arms forms an angle of about ninety degrees with the vertical axis of the turbine-receiving structure.

20. The wind turbine according to claim **17**, wherein said each of said plurality of umbrella-like vanes is secured proximate said second end of a corresponding supporting arm of said plurality of supporting arms.

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