P. V. BRYMER.

WINDMILL.

APPLICATION FILED FEB. 26, 1921.

1,407,373.

Patented Feb. 21, 1922.

2 SHEETS—SHEET 1.

Fig. 1.

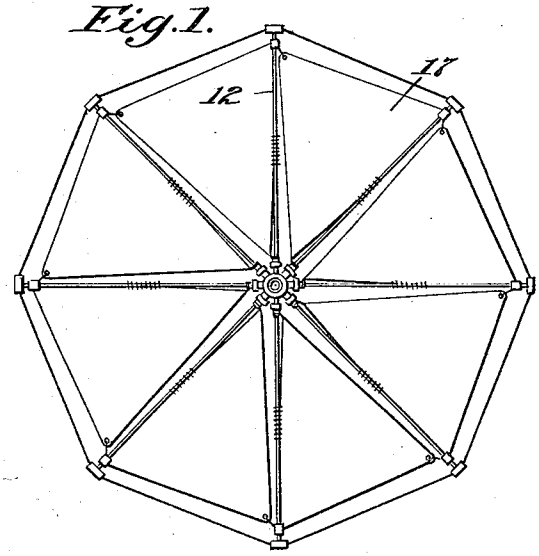


Fig. 4.

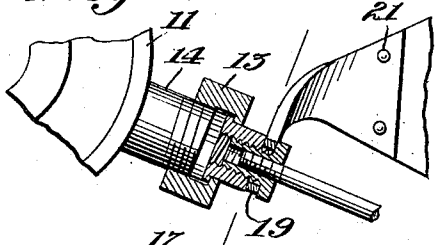


Fig. 5.

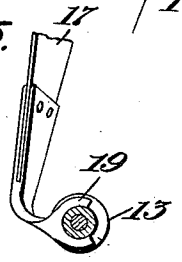
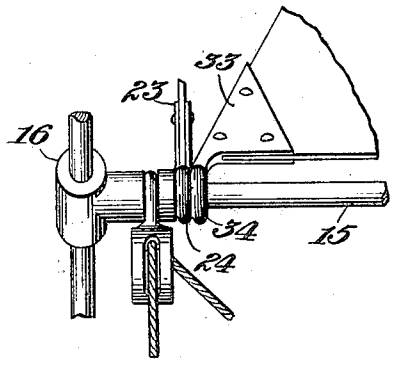


Fig. 6.



Inventor:
Park V. Brymer,

By Cushman, Bryant & Darby
Att'ys.

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2 SHEETS—SHEET 2.

Fig. 2.

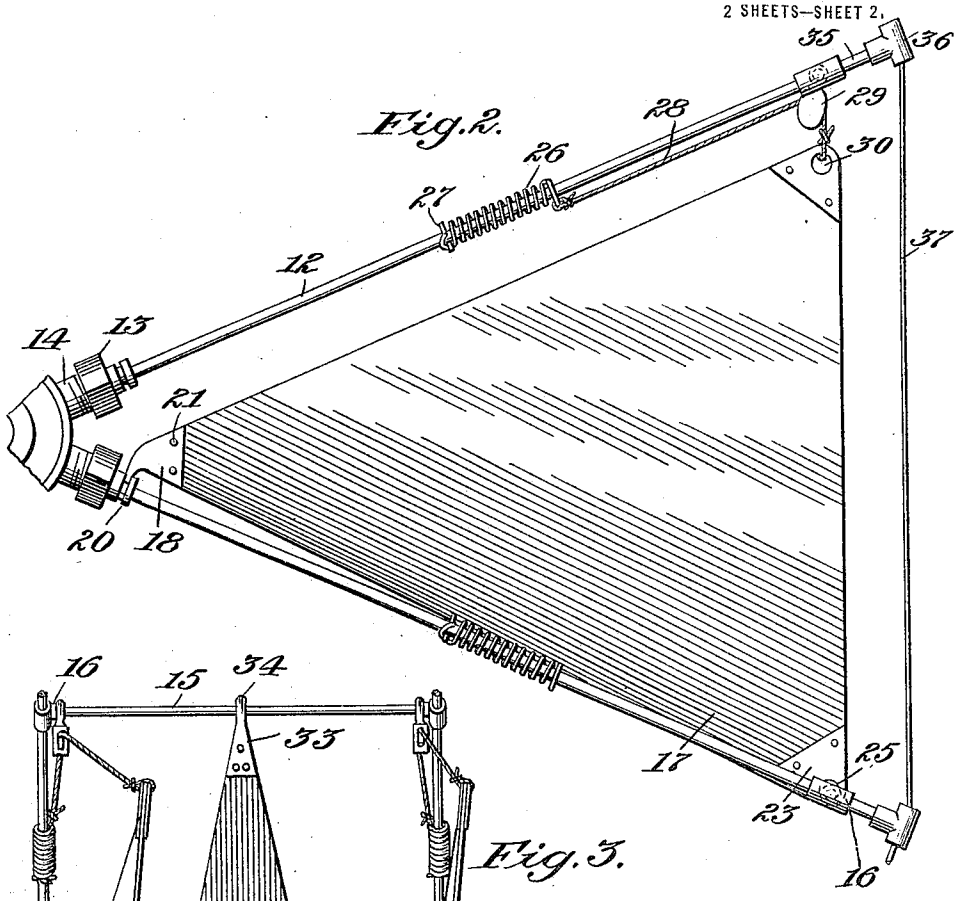
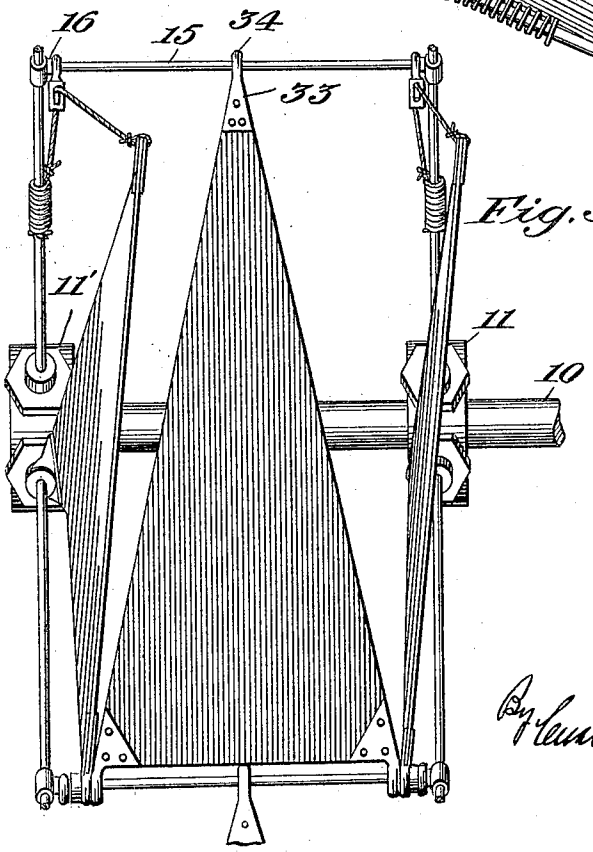


Fig. 3.



Inventor:
Park V. Brymer,
By Lenderman, Bryant & Darby
Att'ys.

UNITED STATES PATENT OFFICE.

PARK V. BRYMER, OF JERSEY CITY, NEW JERSEY.

WINDMILL.

1,407,373. Specification of Letters Patent. Patented Feb. 21, 1922.

Application filed February 26, 1921. Serial No. 448,043.

To all whom it may concern:

Be it known that I, PARK V. BRYMER, a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented new and useful Improvements in Windmills, of which the following is a specification.

This invention relates to wind motors and has as its object the provision of a novel and efficient form of motor of the type comprising a wheel having a plurality of adjustable vanes or sails adapted to catch the wind. An object of the invention is to provide a device of this type having a sail or vane surface of very large area which will readily and automatically adapt itself to the direction in which the air currents are traveling.

Another object of the invention is to provide a wind wheel of knock-down or collapsible structure which may be quickly assembled or disassembled by one who is not a skilled mechanic.

Other objects of the invention are of a more minute character, and reside in the details of construction hereinafter described and claimed; these objects will become obvious as the description proceeds.

In the accompanying drawings I have shown one form of the device in which the invention may be embodied, and in these drawings:—

Fig. 1 is a side elevational view,

Fig. 2 is an enlarged side elevation of one of the wheel sections,

Fig. 3 is an end elevation of the section shown in Fig. 2,

Fig. 4 is a detail view showing the connection of the lower end of each sail and supporting arm with the hub,

Fig. 5 is another detail view showing the connection of the sail with the supporting arm at the inner end of each arm, and

Fig. 6 is an enlarged detail showing the construction at the outer end of the supporting arms.

Referring to the drawings more in detail, 10 indicates a shaft upon which the motor may be fixedly mounted. The motor comprises a hub, which, in the present instance, is shown as two spaced collars 11, 11′ mounted upon the shaft. It will be understood, of course, that instead of being formed of separate elements the hub may be of one piece extending longitudinally of the shaft. Radiating from each collar are a plurality of arms 12 which may be connected to the hubs by means of couplings 13 swiveled upon the ends of the arms and having a threaded engagement with nipples 14 on the collars. At points spaced from the shaft the aligned arms of each collar are connected by transverse stays 15, the ends of which are fitted into T-shaped couplings 16 upon the outer ends of the arms 12.

A sail or vane 17 is swingingly secured in position between the adjacent arms on each collar. The sails may be of any suitable material, but preferably are of substantially rigid metallic construction and of triangular shape so as to fit between the arms. At its inner angle each sail has secured thereto a connecting member 18 having a forked end 19 extending laterally from the sail with its fingers encircling a groove 20 in the upper end of the coupling 13. The connecting member may be secured to the sail in any suitable manner, as by rivets 21. At one of its outer angles the sail has a connecting member 23 formed with an extending ear 24, through which passes the stay 15. It will be noted that the opening 25 in the connecting member is considerably larger than the stay 15 for the purpose of permitting the sail to swing laterally in either direction, as indicated in Fig. 3, the swinging movement taking place at the connecting member 23 and the connecting member 18.

The third angle of the sail has a yielding connection to the other arm so that all of the sails are normally maintained in alinement. In the present instance this connection comprises a spring 26 secured to the arm as by a pin 27, and having a line 28 extending upwardly through a pulley 29, secured to a stay 15, and connected to an ear 30 of the sail. It will be evident that with each sail mounted in the manner above described it is normally held in a position substantially in line with the arms 12, but is permitted to swing laterally in either direction because of its swinging mounting.

If desired, additional sails may be mounted upon the wheel so as to extend circumferentially of the same. One of such sails is shown in Fig. 3, and is of substantially triangular shape with connecting members 33 at each corner provided with eyes 34 through which pass the stays 15. These sails are held in substantially rigid position, but materially increase the sail area of the motor.

In order to strengthen and render more

durable the entire wheel construction, the T-shaped couplings 16 may have short rods 35 extending outwardly therefrom and having, at their outer ends, additional hollow members such as T-shaped couplings 36 for the purpose of holding in position stay wires 37 extending around each series of arms.

It should be understood that my invention is not limited to the exact details of construction shown in the drawings and above described; but the disclosure is merely illustrative of the invention. Such modifications may be made in the illustrated embodiment of the invention, without departing from the scope of the invention, as come within the skill of a mechanic and within the scope of the following claims.

What I claim is:

1. A wind motor comprising a hub, a plurality of arms radiating from said hub, triangular sails between the adjacent arms and pivotally mounted upon one arm, and yielding means permitting said sails to swing independently laterally in either direction but normally maintaining said sails in alinement.

2. A wind motor comprising a hub, a plurality of arms radiating from said hub, triangular sails between the adjacent arms and pivotally mounted upon one arm, and yielding means permitting said sails to swing independently laterally in either direction but normally maintaining said sails in alinement, said means comprising a yielding connection between the sails and said arms.

3. A wind motor comprising a wheel having a hub, a plurality of series of arms radiating from said hub, said series being spaced apart along the axis of said hub, a sail swingingly mounted between the adjacent arms of each series, and yielding means permitting said sails to swing independently laterally in either direction but normally maintaining the several sails of each series in alinement.

4. A wind motor comprising a hub, a plurality of arms radiating from said hub and detachably mounted thereon, triangular sails between the adjacent arms and pivotally mounted upon one arm, and yielding means permitting said sails to swing independently laterally in either direction but normally maintaining said sails in alinement.

5. A wind motor comprising a wheel having a hub, a plurality of series of arms radiating from said hub, said arms being detachable from said hub, said series being spaced apart along the axis of said hub, a sail swingingly mounted between the adjacent arms of each series, and yielding means permitting said sails to swing independently laterally in either direction but normally maintaining the several sails of each series in alinement.

6. A wind motor comprising a wheel having a hub, a plurality of series of arms radiating from said hub, said series being spaced apart along the axis of said hub, a sail swingingly mounted between the adjacent arms of each series, yielding means permitting said sails to swing independently laterally in either direction but normally maintaining the several sails of each series in alinement, and sails between said series extending circumferentially of said wheel and positioned in a plane at an angle to said first-mentioned sails.

In testimony whereof I have hereunto set my hand.

PARK V. BRYMER.