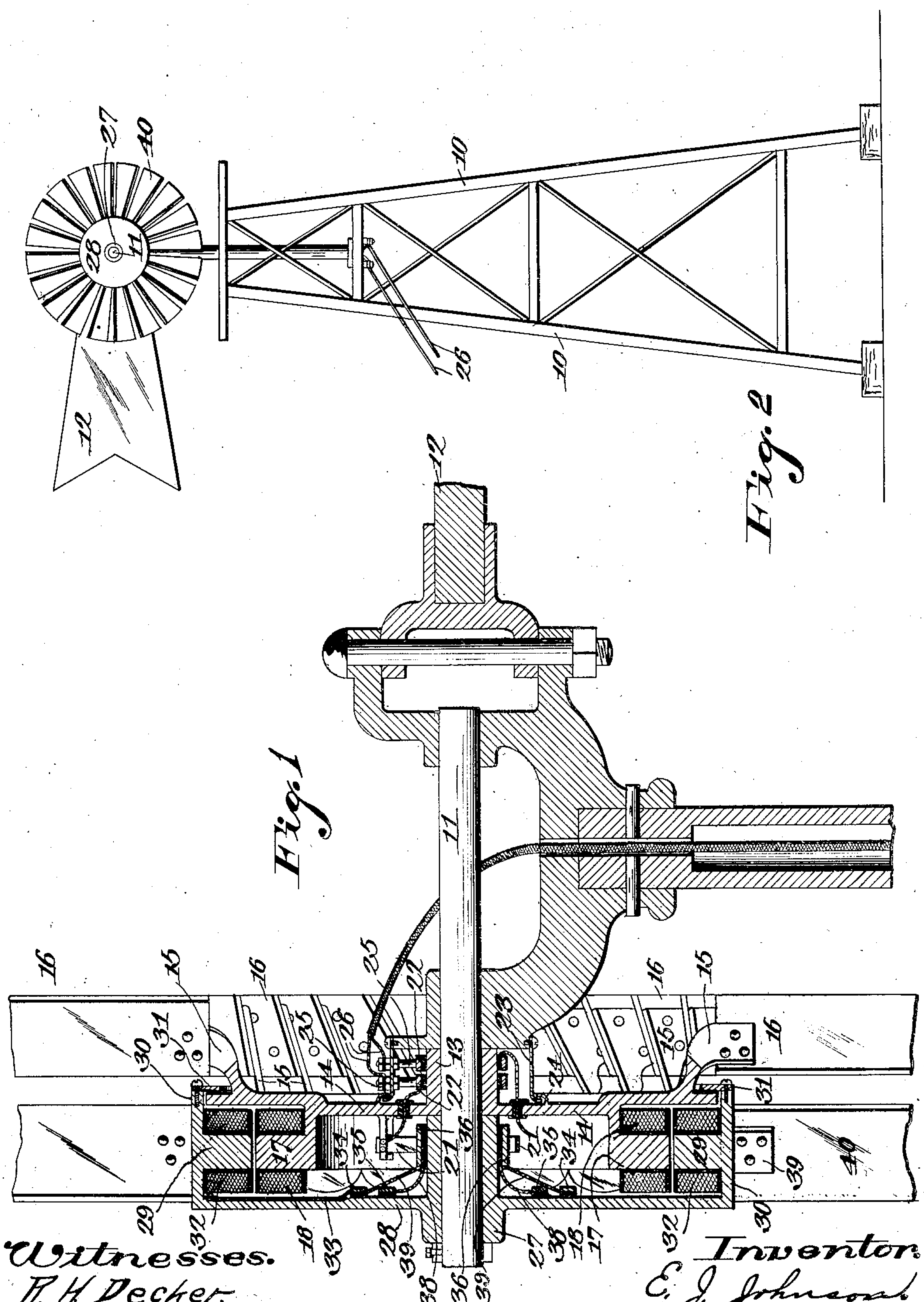
No. 889,883. PATENTED JUNE 2, 1908.

E. J. JOHNSON.

WIND OPERATED DYNAMO.

APPLICATION FILED AUG. 31, 1907.

2 SHEETS—SHEET 1.



Witnesses.
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B. L. Latham.

Inventor.
E. J. Johnson
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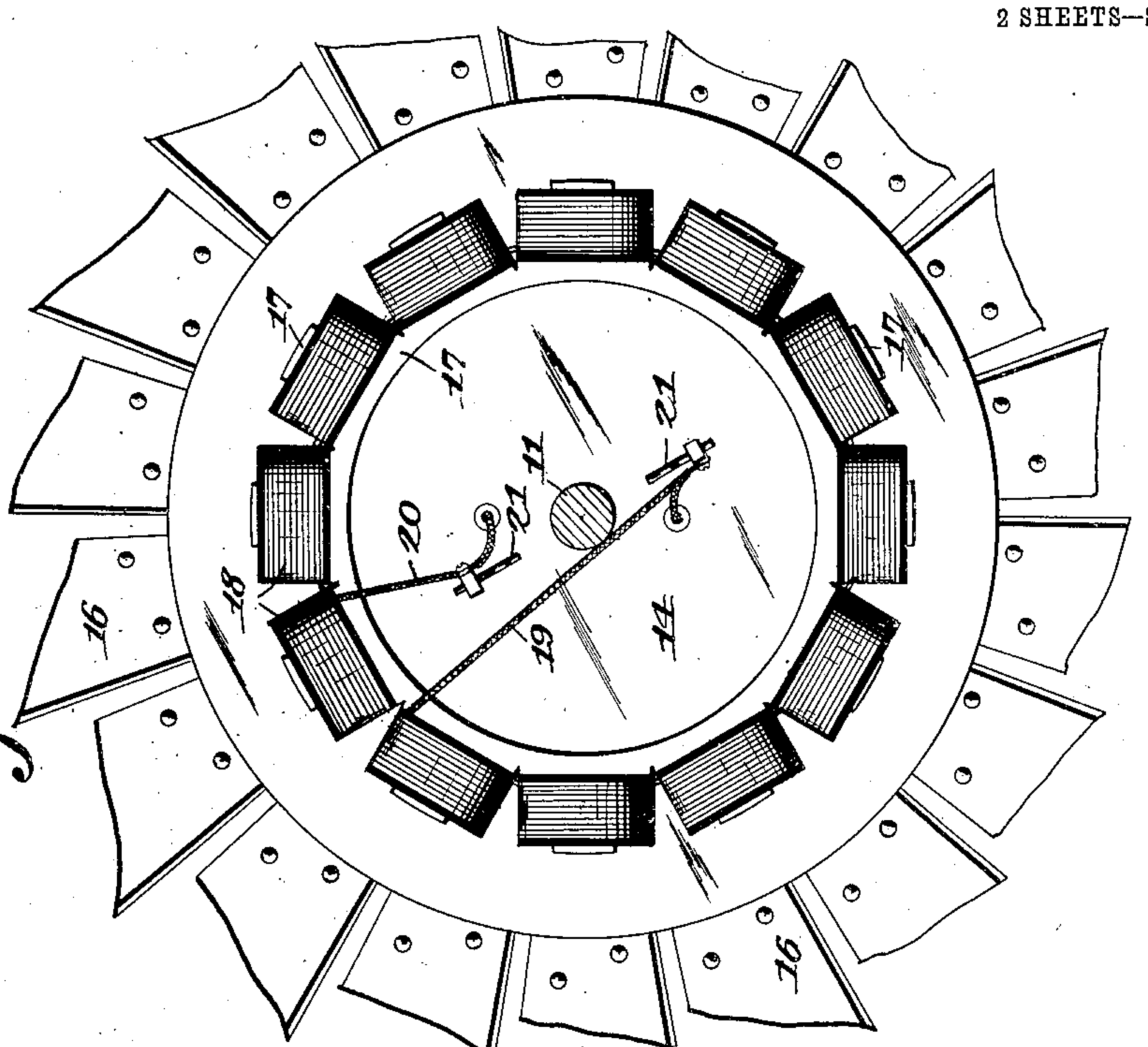

Fig. 4

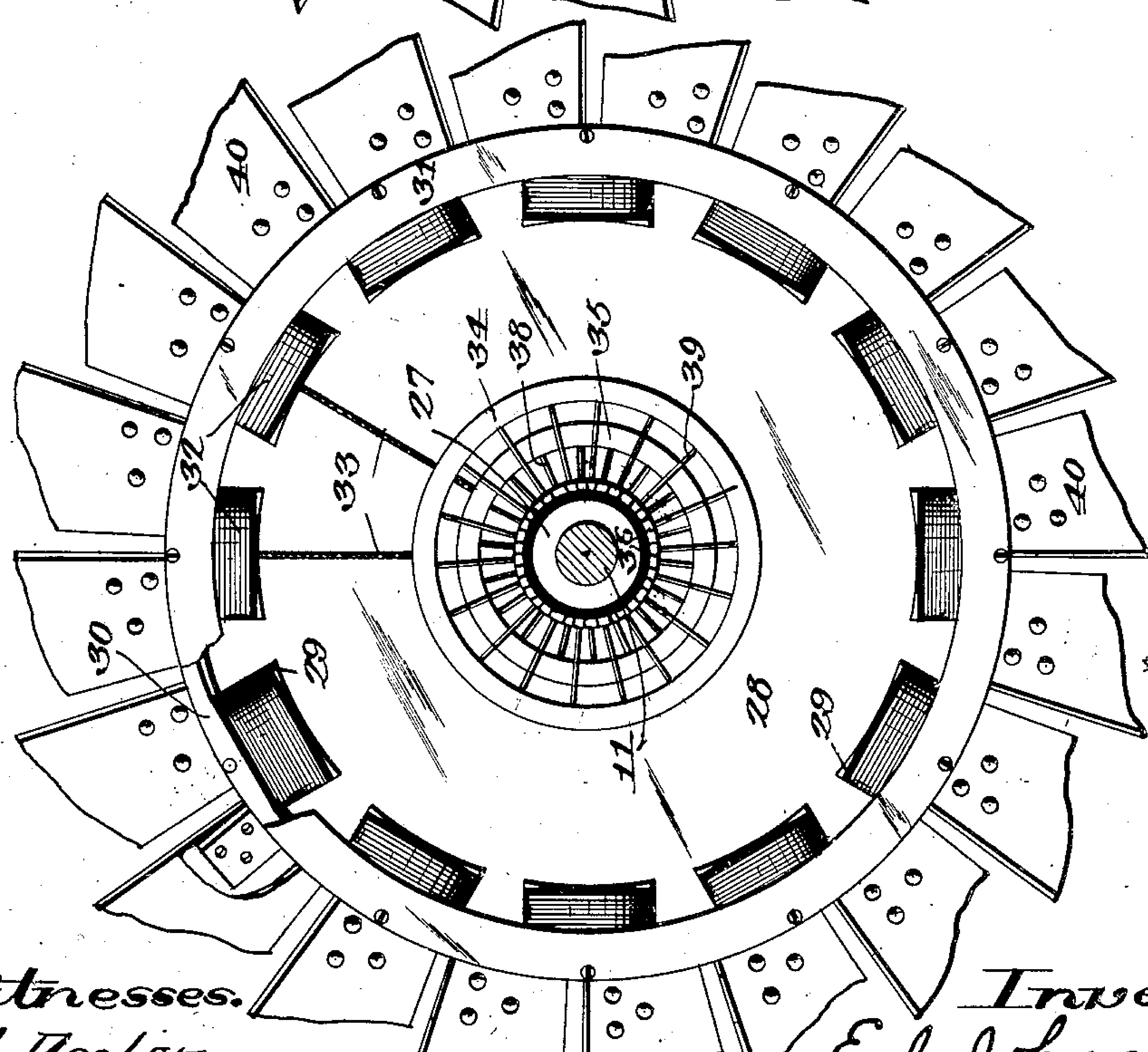

Fig. 3

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UNITED STATES PATENT OFFICE.

EMIL J. JOHNSON, OF MADRID, IOWA.

WIND-OPERATED DYNAMO.

No. 889,883. Specification of Letters Patent. Patented June 2, 1908.

Application filed August 31, 1907. Serial No. 390,909.

To all whom it may concern:

Be it known that I, EMIL J. JOHNSON, a citizen of the United States, residing at Madrid, in the county of Boone and State of Iowa, have invented a certain new and useful Wind-Operated Dynamo, of which the following is a specification.

The object of my invention is to provide a combined wind-wheel and electric dynamo so arranged that a maximum amount of current may be generated by the use of two wind-wheels having their blades oppositely disposed, so that they will turn in opposite directions.

A further object is to provide improved means for collecting the current and for protecting the dynamo from rain, whereby a simple, durable and inexpensive construction is obtained.

My invention consists in the construction, arrangement and combination of the dynamo with the wind-wheels whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims and illustrated in the accompanying drawings, in which—

Figure 1 shows a central vertical sectional view of the upper portion of a wind-mill provided with two oppositely moving wind actuated wheels, and a dynamo connected with said wheels, embodying my invention. Fig. 2 shows an elevation of a wind-mill tower having my improved device supported thereon. Fig. 3 shows an enlarged detail side view of the armature portion of the dynamo with the wind-wheel blades attached thereto, and—Fig. 4 shows a similar view of the field portion.

Referring to the accompanying drawings, I have used the reference numeral 10 to indicate a wind mill tower of ordinary construction having at its top a horizontally arranged shaft 11 and a vane 12. This vane is pivotally supported in the usual manner so that it may be set to throw the wind-wheels out of the wind, or to hold them toward the wind, as desired.

Rotatably mounted upon the shaft 11 is a hub 13. Fixed to this hub is a disk shaped web 14 having projected laterally and outwardly from one side a series of brackets 15, to each of which is attached a wind-wheel blade 16. On the other side of the web 14 is a dynamo field core 17 having mounted thereon a series of coils of wire 18, connected together by means of the conductors 19 and 20, each of which is connected to a commutator brush 21. These wires are extended through the web, and each is connected to one of the current collecting rings 22 on the hub 13, and insulated from it.

Mounted on the top of the wind mill tower is a cylindrical casing 23 surrounding the collector rings 22 and having one edge curved outwardly. Fixed to the web 14 is an annular rim 24 arranged to overlap the outwardly curved edge of the casing 23, so that a rain tight joint is provided between the casing and the said rim. The said casing supports two collector brushes 25 with their inner ends in engagement with the collector rings 22. These brushes are connected by the conductors 26 which extend to a point below the wind mill top.

Mounted upon the shaft 11 adjacent to the hub 13 is a second hub 27 having thereon a disk shaped web 28. Formed on the side of the web 28 near its periphery is the armature core 29, arranged in position directly over the field core 17. Formed on the outer edge of the core 29 is a rim 30 overlapping the periphery of the web 14, and fixed to said rim 30 is a short circular apron 31 projected inwardly from the rim 30 to stand close to the adjacent face of the web 14, and thus serve to prevent the entrance of rain between the field and armature cores. Mounted upon the armature core is a series of wire coils 32, connected by means of a conductor 33, the ends of which conductor are connected respectively to the collecting rings 34 and 35, which are fixed to the web 28, and insulated from it. Mounted upon the hub 27 is a commutator 36, the alternate sections of which are connected by conductors 37 and 38 with the collector rings 34 and 35, as clearly shown in Fig. 3. Formed on the periphery of the armature core 29 is a series of radial arms 39, to which wind-wheel blades 40 are fixed, said blades being oppositely disposed relative to the blade 16 so that one wind-wheel will be rotated in one direction, and the other wind-wheel in an opposite direction.

In practical use, and assuming the vane 12 to be in position for holding the wind-wheels to the wind, then obviously the blades 40, which carry the armature core will be rotated by the wind in one direction, and the blades 16 which carry the field, will be rotated in the opposite direction. The current generated by the oppositely moving cores and the coils, or wire thereon, will be collected first by the rings 34 and 35 and carried from them by the wires 38 and 39 to the alternate sections of the commutator 36 as an alternating current, from which it is gathered and delivered as a direct current to the conductor rings 22. From these rings, it is carried by the collector brushes 25 to the conductors 26. A portion of the current is also carried by the conductors 19 and 20, as shown in Fig. 4, to the dynamo field core 17, thus exciting the field. Obviously, the construction of the dynamo is such that rain cannot enter into the operative parts thereof. By thus connecting the dynamo members direct with the wind-wheels, the power diverted from the wind-wheels may be converted at once into electric currents, and conducted to an indefinite distance by means of wires, thus doing away with all necessity for gearing devices for transmitting the power, and also doing away with the loss of power by the operation of such parts. Furthermore, by having one of the dynamo cores moving in one direction, and the other in an opposite direction, I am enabled to obtain a maximum amount of electrical current from wind mills of minimum size. Furthermore, the efficiency of a dynamo increases rapidly in proportion to its speed of rotation, and the speed of rotation of a wind wheel is necessarily limited by the force of the wind and other conditions. I provide for practically doubling the speed of movement of the armature relative to the core by providing the means for rotating one in one direction and the other in an opposite direction, so that a maximum of speed of movement of one part relative to the other is obtained from a wind wheel.

Having thus described my invention, what I claim and desire to secure by Letters Patent of the United States, therefor, is—

1. In a device of the class described, the combination of a shaft, a hub mounted on the shaft, a disk shaped web connected with the hub and having brackets on one side, wind-wheel blades fixed to said brackets, a dynamo field on the other side of said web, a second hub mounted on the shaft, a disk-shaped web thereon, a dynamo armature on said disk shaped web overlapping the dynamo field, and a flange on the armature web overlapping the periphery of the disk shaped web on the field, to form a rain tight joint between them.

2. In a device of the class described, the combination of a shaft, a hub mounted on the shaft, a disk shaped web connected with the hub and having brackets on one side, wind-wheel blades fixed to said brackets, a dynamo field on the other side of said web, a second hub mounted on the shaft, a disk shaped web thereon, a dynamo armature on said disk shaped web overlapping the dynamo field, a flange on the armature web overlapping the periphery of the disk shaped web on the field, to form a rain tight joint between them, a stationary circular casing adjacent to the field web, a rim carried by the field web to overlap said casing, and form a rain tight joint therewith, current collecting devices contained within said casing, and wind-wheel blades fixed to the armature core and oppositely disposed relative to the blades on the field core.

3. In a device of the class described, the combination of a shaft, a hub rotatably mounted on the shaft and having two current collecting rings thereon insulated from the hub, a casing fixed to a stationary support and surrounding said rings, current collectors fixed to the casing to engage said rings, a disk shaped web fixed to said hub, a rim on said web to overlap the end of said casing and form a rain tight joint therewith, a dynamo field fixed to one side of the web, brackets fixed to the other side of the web, wind-wheel blades fixed to said brackets, commutator brushes fixed to the web, conductors extending from said commutator brushes to said collector rings, a second hub rotatably mounted upon the shaft, a disk shaped web thereon, a dynamo armature on said disk shaped web overlapping said field, a rim on said armature overlapping the periphery of the web of the field, two collector rings fixed to the armature web, a commutator fixed to the armature hub, and conductors for connecting the collecting rings with the commutator sections.

4. In a device of the class described, the combination of a shaft, a hub mounted on the shaft, a disk shaped web connected with the hub, brackets on one side of said web, wind wheel blades fixed to said brackets, a dynamo field magnet on the other side of said web, a second hub mounted on the shaft, a disk shaped web thereon, a dynamo armature core on said web arranged in position to overlap and coact with the said dynamo field magnet, wind wheel blades fixed to said dynamo armature core, and a flange on the dynamo armature core arranged in position overlapping the flange of the dynamo field magnet, to form a rain tight joint between them.

Des Moines, Iowa, Aug. 9, 1907.

EMIL J. JOHNSON.

Witnesses:
J. G. Pope,
Walter Johnson.