United States Patent

Brown

[15] **3,659,416**

[45] **May 2, 1972**

[54] VAPOR DRIVEN MOTORS

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[22] Filed: **July 14, 1970**

[21] Appl. No.: **54,776**

[52] **U.S. Cl.** **60/25**

[51] **Int. Cl.** **F03g 7/06,** F03g 3/02

[58] **Field of Search** 60/25

[56] **References Cited**

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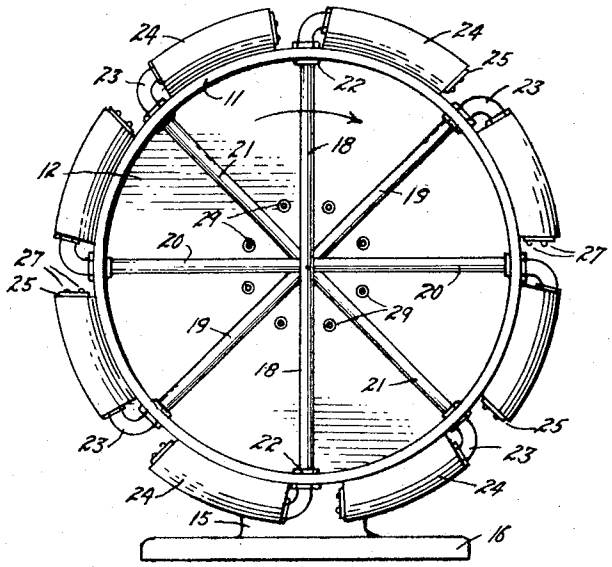
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[57] **ABSTRACT**

A rotatable wheel through which a plurality of similar, axially spaced, tubular fluid-containing spokes diametrically extend, each spoke terminating at each of its extremities in a fluid chamber, the fluid chambers of each spoke being directed in circumferential directions exteriorally of said wheel.

An individual electrical heating element positioned in each fluid chamber, the elements being electrically and individually connected to contacts arranged in a concentric series on said wheel so as to be individually, successively and electrically contacted to energize the elements on the rising side of said wheel to force the liquid through each spoke to the descending side of said wheel to gravitationally impart rotation to the latter.

7 Claims, 6 Drawing Figures



PATENTED MAY 2 1972

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SHEET 1 OF 3

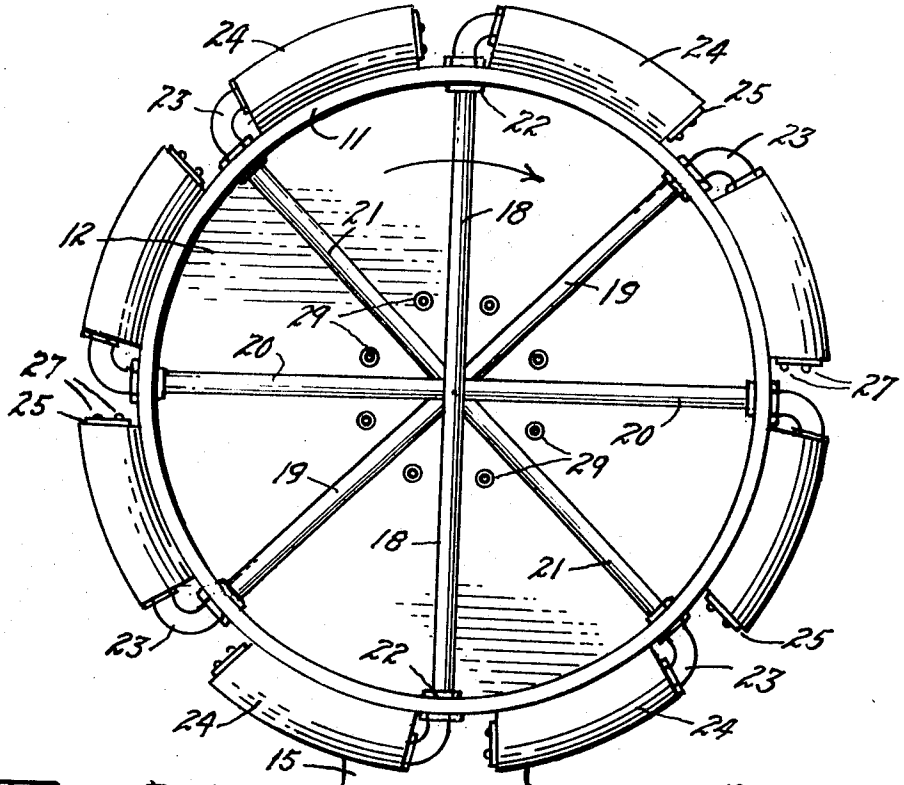


Fig. 1

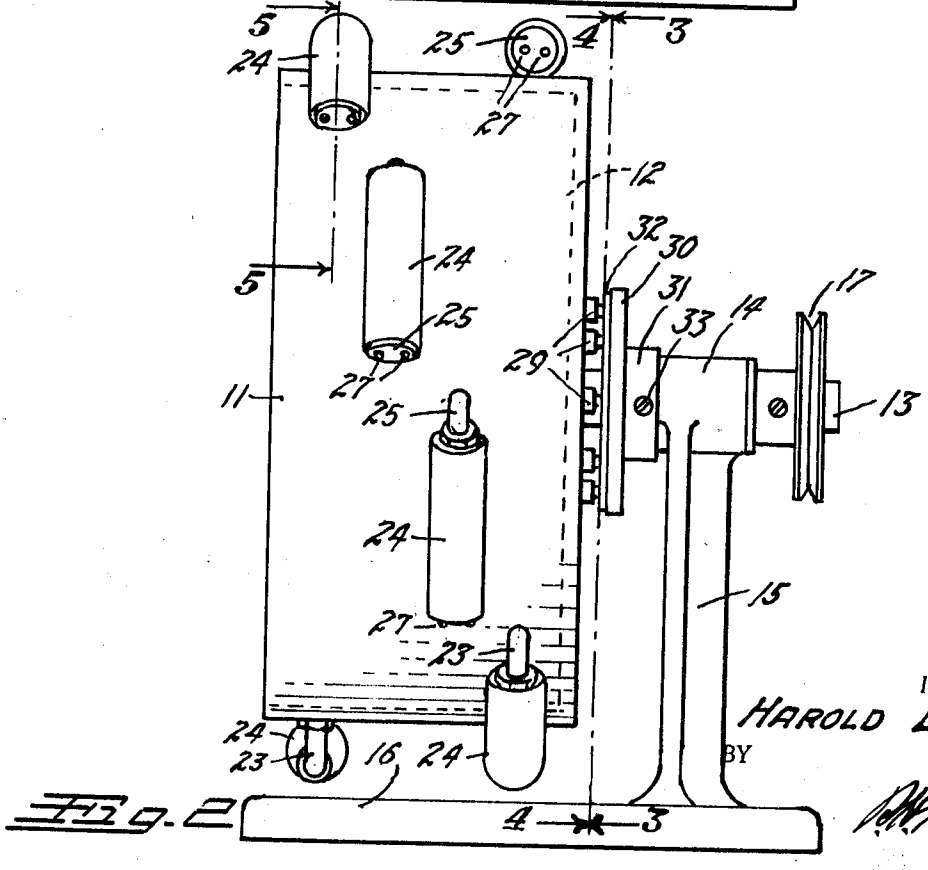


Fig. 2

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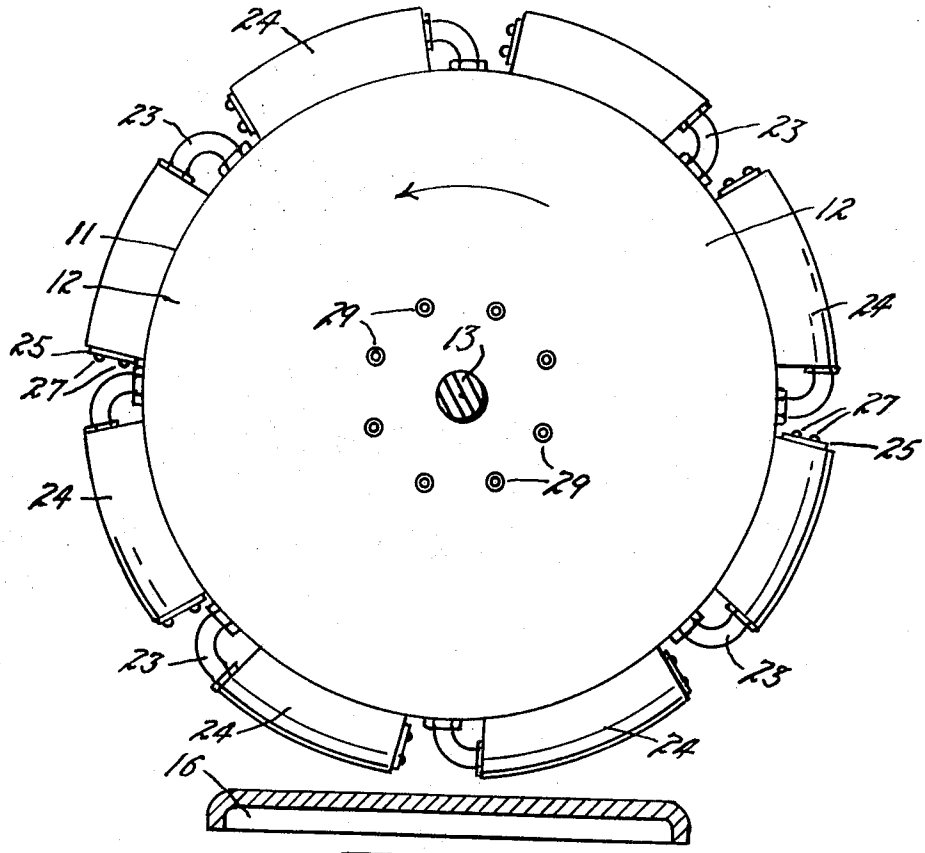


FIG. 3

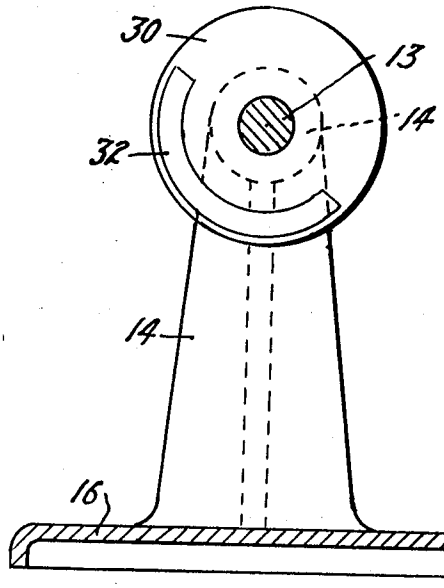


FIG. 4

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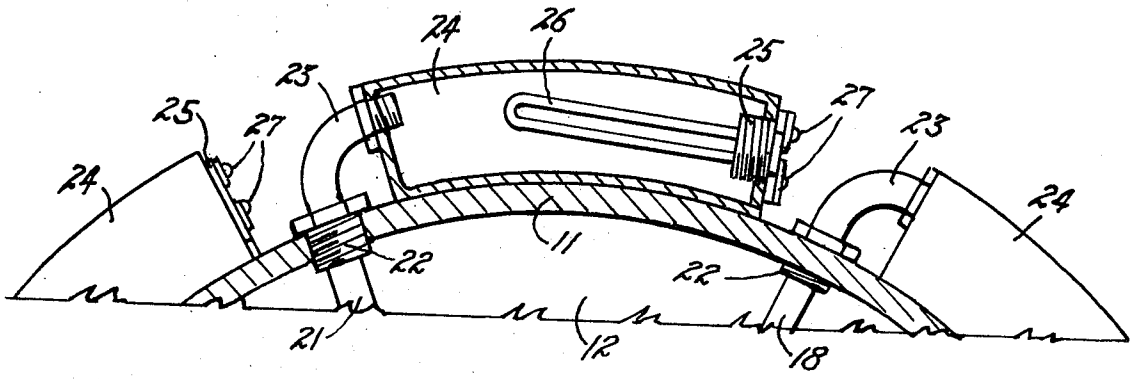


Fig. 5

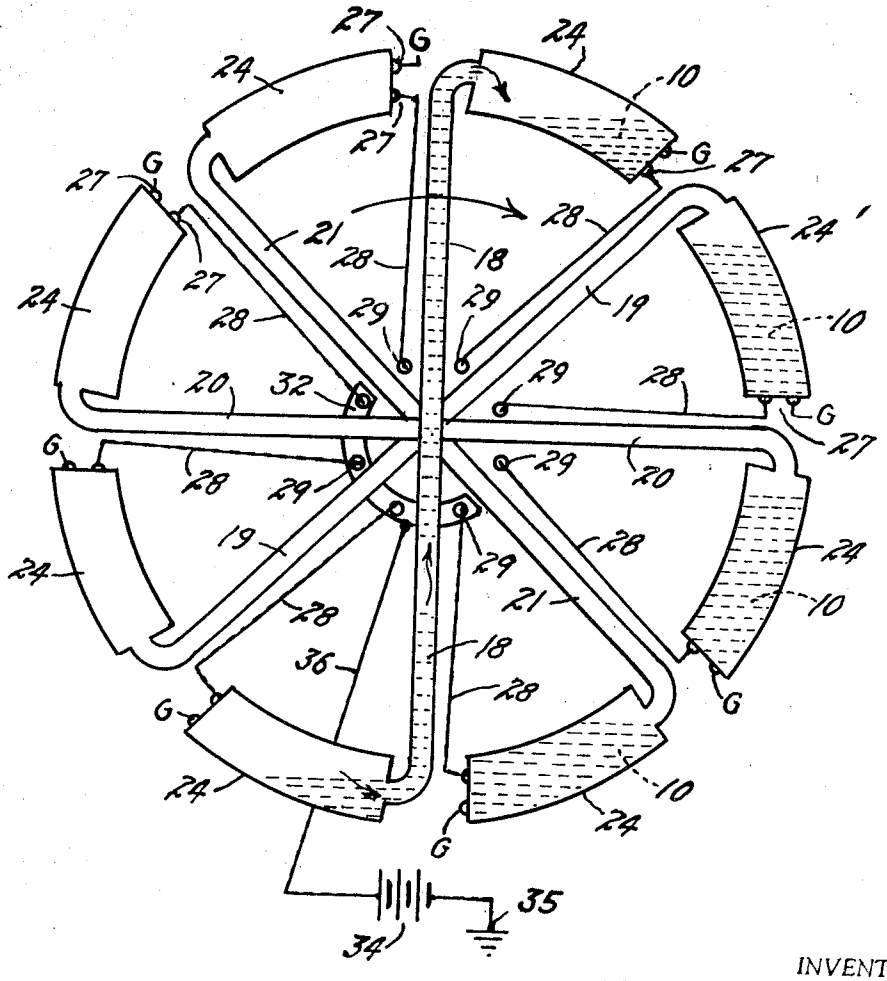


Fig. 6

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VAPOR DRIVEN MOTORS

This invention relates generally to what might be termed a vapor engine, that is, to a power source which is actuated from alternate expansion and contraction of the vapor from a sealed volatile fluid medium which characteristically is a liquid that can be readily vaporized and condensed by thermal variations.

The principal object of the present invention is to reduce the complexity and increase the efficiency of prior vapor engines and to provide a relatively simple rotatably mounted wheel having a plurality of equally spaced, diametrically mounted, fluid-containing spokes, each spoke terminating in a fluid chamber at each of its extremities and each fluid chamber being provided with a self-contained thermal unit which can be individually actuated to successively force fluid from said wheel to the fluid containers on the descending side of said wheel to create continuous gravitational unbalance to said wheel.

A further object is to provide a thermal unit for the above purpose which can be readily embedded in the fluid of each fluid chamber and which can be individually and successively energized as each chamber approaches the rising side to vaporize and force the fluid therefrom to the descending side of said wheel.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention, reference is made to the accompanying drawings which form a part hereof. Like numerals refer to like parts in all views of the drawings and throughout the description.

In the drawing:

FIG. **1** is a front elevational view of the basic form of the improved vapor driven motor;

FIG. **2** is a right-side elevational view thereof;

FIG. **3** is a vertical cross sectional view taken on the line **3—3**, FIG. **2**;

FIG. **4** is a similar cross sectional view taken on the line **4—4**, FIG. **2**;

FIG. **5** is an enlarged, detail, fragmentary section taken on the line **5—5**, FIG. **2**; and

FIG. **6** is a diagram showing the principle of operation of the gravitationally actuated motor.

The fluid employed herein may be water or any other volatile fluid medium capable of ready evaporation. The fluid is indicated on the drawing at **10** in FIG. **6**.

The improved motor employs a rotatable wheel consisting of a cylindrical cup-shaped drum **11** having a circular end wall **12** from which a wheel shaft **13** fixedly, axially, and horizontally protrudes. The shaft **13** is horizontally journaled in a conventional anti-friction bearing **14** formed on a pedestal **15** which protrudes vertically from a suitable supporting base **16**. The shaft **13** is provided with any suitable power transmission device, such as indicated by a belt sheave **17**.

Any desired number of hollow tubular spokes extend diametrically through the drum **10** in axially spaced and radially spaced relation.

As illustrated, there are four tubular spokes, as indicated by the numerals **18, 19, 20**, and **21**, mounted at their extremities in and through the cylindrical wall **12** of the drum **11** in any suitable manner such as by means of conventional externally and internally threaded pipe nipples **22**. An elbow fitting **23** is sealed in and extends forwardly of the direction of rotation, from each nipple **22** and each elbow fitting supports, and connects with, and is sealed to, one extremity of a fluid chamber **24** on the exterior of the drum **11**. The fluid chambers extend forwardly from the direction of rotation of each spoke.

The fluid chambers **24** are cylindrical and are preferably, but not necessarily, longitudinally arcuate so as to substantially correspond to the external curvature of the drum **11**. The elbow fittings **23** eccentrically enter the trailing extremity of each fluid chamber **24** so as to be positioned adjacent the radially distant wall of the latter, to facilitate complete expulsion of the fluid **10** from the fluid chambers **24** as they approach the bottom of the wheel.

The leading extremity of each fluid chamber is sealed by a threaded, electrically insulated header **25** which supports a tubular electrical resistance immersion heater **26** (commercially known as a "Calrod") in place within each fluid chamber **24** to which electric current may be fed through a pair of binding screws **27** as is conventional with "Calrod" installations.

In the present instance one of the binding screws **27** of each heater **26** is electrically grounded. The other binding screw of each pair is electrically connected, as indicated at **28**, to a conventional spring loaded brush contact **29**. The brush contacts **29** protrude through the end wall **12** as an annular series of uniformly spaced brush contacts which are concentrically positioned on the exterior of the end wall **12** as shown in FIG. **3**.

A circular commutator disc **30** provided with an axial attachment flange **31** is concentrically mounted on the shaft bearing **14**, against which, the brush contacts **29** frictionally bear. The commutator disc **30** is provided with a concentric, arcuate, inset contact leaf **32** over which the brush contacts **29** will successively slide to close circuits to the immersion heaters **26** as the wheel rotates. The circumferential position of the contact leaf **32** can be adjusted and preset on the bearing **14** through the medium of a suitable set screw **33**.

OPERATION

It is believed the operation of the improved motor will be understood by those skilled in the art from the above description of the construction.

Briefly, referring to FIG. **6**, let us assume: that one of the pair of binding screws **27** in each heater **26** is grounded, as indicated by the letter G; that one pole of a battery **34** or other source of electrical energy is also grounded as indicated at **33**; that the other pole of the battery is connected to the contact leaf **32**, as shown at **36**; and that the commutator disc **30** has been preset by the set screw **33** substantially in the position of the diagram of FIG. **6**.

It can be seen that when the rotating wheel is in the position of FIG. **6** the electric circuits are closed, at the contact leaf **32**, to the fluid chambers on the rising side of the wheel and are open to the chambers on the descending side thereof. The result is: vapor pressure is building up in spoke **20**; the built-up pressure is forcing the fluid from the lower chamber on spoke **17** to fill the upper chamber thereon; and the rising chambers on spokes **18** and **19** are being maintained substantially empty so that the wheel is unbalanced so as to maintain gravitational rotation as long as electrical supply is maintained.

The spokes may be of any desired diameters and length. The greater the length, the greater the leverage thereon. There may be any desired number of spokes. The number can be increased by simply increasing the width of the drum **11** to allow "cross over" space. The greater the number the greater the power developed. The lengths and diameters of the fluid chambers may be as desired to obtain the most efficient results.

It is preferred to exhaust all air from each spoke and its associated chambers before final sealing. This lowers the necessary vaporization temperature and also assists in driving the fluid back and forth between the terminal chambers.

Since there are no exhaust gases from this motor it should greatly assist in the reduction of smog and atmospheric contamination.

While each spoke assembly, as illustrated consists of seven elements, to wit, two chambers **24**; two elbow fittings **25**; two nipples **22** and one spoke, it conceivably may be a single unit cast, molded, or blown integrally.

While a selected form of the invention has been above described, it is understood that mechanical variations and detail substitutions can be made by one skilled in the art without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

1. A vapor driven motor comprising:
   a. a rotatable drum mounted on a horizontal axis;
   b. a plurality of equally spaced fluid-containing, similar spokes diametrically mounted in said drum;
   c. a fluid chamber mounted on and communicating with each extremity of each spoke;
   d. a plurality of individual electrically powered heating elements each of which is associated with one of said fluid chambers; and
   e. means for successively and individually energizing the elements on the ascending side of said drum so as to thermally drive fluid through each spoke to the fluid chambers on the descending side of said drum to create rotative unbalance.

2. A vapor driven motor as described in claim 1 in which the spokes comprise:
   a. straight hollow tubes passing through the axis of said rum in drum spaced apart side by side relation.

3. A vapor driven motor as described in claim 1 in which the fluid chambers comprise:
   a. elongated chambers connected at their one extremity to the opposite extremities of their respective spokes so as to lead and preceed the latter in the common plane of rotation of the outer extremity of each spoke.

4. A vapor driven motor as described in claim 3 in which the heating element comprises:
   a. a tubular electrical resistance element,
   b. an insulated heater mounted in the leading extremity of each chamber and supporting the resistance element internally of the chamber.

5. A vapor driven motor as described in claim 1 in which the means for successively and individually energizing the elements comprises:
   a. an annular series of brush contacts axially positioned on one extremity of said drum;
   b. a commutator disc axially and stationarily positioned adjacent said latter one extremity;
   c. an electrical contact leaf mounted on said disc so as to be frictionally and successively contacted by said brush contacts as said drum rotates; and
   d. an electrical conductor connecting each element with one of said brush contacts to successively close electrical circuits to said elements.

6. A vapor driven motor as described in claim 3 in which:
   a. said elongated chambers are curvated to substantially conform to the circumferential curvature of said drum.

7. A vapor driven motor as described in claim 3 in which:
   a. the said connections between the spokes and the adjacent fluid chambers are positioned in close proximity to the radially distant wall of each chamber to facilitate gravitational expulsion of fluid as the chambers approach the bottom of said drum.

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