United States Patent

[11] 3,621,424

[72] Inventor **Joseph O. Query**
117 Summer St., Somerville, Mass. 02143

[21] Appl. No. **81,683**
[22] Filed **Oct. 19, 1970**
[45] Patented **Nov. 16, 1971**

[54] **MAGNETIC ENGINE**
4 Claims, 1 Drawing Fig.

[52] **U.S. Cl.** **335/306,** 310/103
[51] **Int. Cl.** **H01f 7/02**
[50] **Field of Search** 335/209, 302, 306; 310/46, 103, 152

[56] **References Cited**

UNITED STATES PATENTS

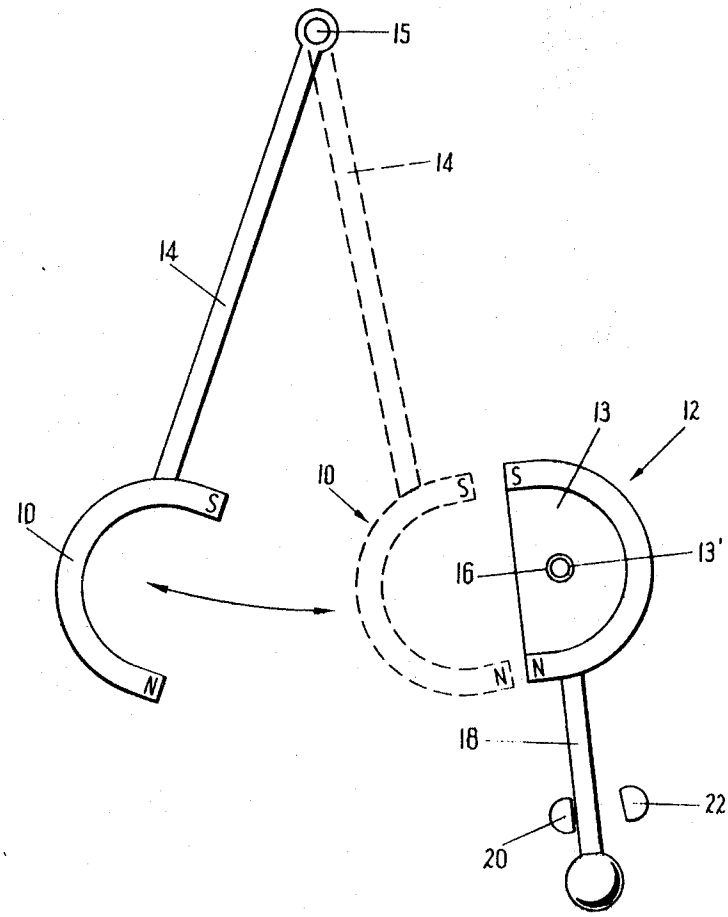
2,833,943 5/1958 Anthony ..... 310/103 X

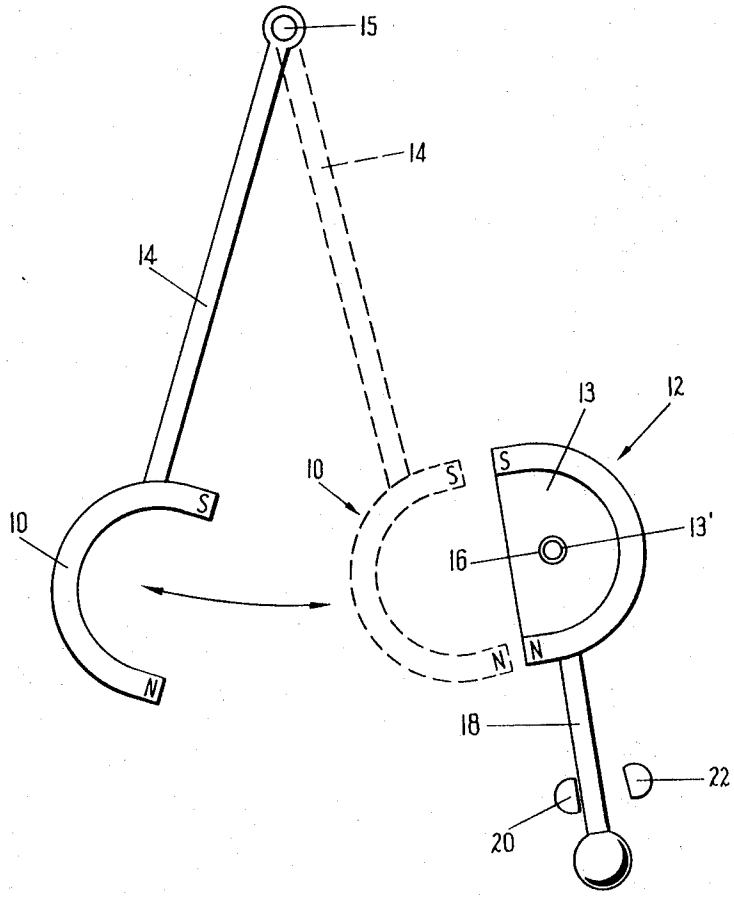
FOREIGN PATENTS

688,402 3/1953 Great Britain 335/306

Primary Examiner—G. Harris
Attorney—Wolf, Greenfield and Sacks

ABSTRACT: A first and a second magnet comprise the magnetic engine. The first magnet is coupled to the free end of a pendulum and the second magnet is pivotally mounted, and responsive to the swinging of the first magnet to cause pivotal or rotary motion of the second magnet.





INVENTORS
Joseph O. Query
BY
Wolf, Greenfield & Sacks
ATTORNEYS

MAGNETIC ENGINE

BACKGROUND OF THE INVENTION

The present invention relates in general to a magnetic engine, and is more particularly concerned with a magnetic engine including first and second interresponsive magnetic means.

One important object of the present invention is to provide an improved magnetic engine.

Another object of the present invention is to provide a magnetic engine that efficiently transfers pendulum-type motion into rotary or pivotal motion.

A further object of the invention is to provide a magnetic engine according to the preceding objects that is relatively simple in design, durable in construction, and may be fabricated using conventional items that are of relatively low cost.

SUMMARY OF THE INVENTION

To accomplish these and other objects, the magnetic engine of this invention comprises a first magnet coupled to the free end of a pendulum capable of arcuate motion. A second magnet is pivotally secured adjacent to the first magnet, and the like poles of both the first and second magnets are in facing relationship to each other. The second magnet has a counterweight coupled thereto for normally biasing the second magnet to a first or rest position, and for returning the second magnet from a second position to the first position. The second magnet changes from the first position to the second position as the pendulum swings towards it and reverts to the first position when the pendulum swings away.

Numerous other objects and advantages of the invention should now become apparent upon a reading of the following detailed description in conjunction with the appended drawing which is a plan view of one embodiment of a magnetic engine constructed in accordance with this invention.

DETAILED DESCRIPTION OF THE INVENTION

The magnetic engine includes two horseshoe-shaped magnets **10** and **12**, with magnet **10** suspended at the free end of pendulum bar **14**. The top end of pendulum bar **14** is pivoted at **15**, while the bottom end of bar **14** may be connected to magnet **10** by any means, e.g. glueing. The bar **14** may typically be a thin wooden strip.

The horseshoe magnet **12** is carried by a semicircular plate **13** which may be constructed of any nonmagnetic material such as wood. Plate **13** has a hole **13'** disposed along centerline **1** at approximately its midpoint. Pivot pin **16** fits in the hole **13'** in plate **13** and allows magnet **12** and plate **13** to freely rotate thereabout. Plate **13** may be secured to magnet **12** in any conventional manner, e.g. glueing.

A counterweight **18** extends from the bottom portion of magnet **12** and is adapted to fit between stops **20** and **22**. The counterweight **18** biases the magnet **12** to the position shown in the drawing with counterweight **18** contacting stop **20** when pendulum arm **14** and magnet **10** are remote from magnet **12**. The assembly may be mounted in a housing (not shown) which contains the stops **20** and **22** positioned to contact counterweight **18** and limit its arcuate movement.

When the magnet **10** moves to the right toward magnet **12**, the north (N) poles of the magnets **10** and **12** approach each other. The drawing shows magnet **10** and pendulum **14** in broken lines just as magnet **12** is about to move to its second position, with counterweight **18** contacting stop **22**. At that time the north poles of both magnets **10** and **12** are closer together than the south (S) poles, and thus the greatest

repelling force is between the north poles. Simultaneously, the mechanical force of magnet **10** on magnet **12** causes magnet **12** to rotate counterclockwise to the second position. In one mode of operation the north poles of magnets **10** and **12** may physically contact each other, thereby aiding in the movement of magnet **12** to the second position, with counterweight **18** contacting stop **22**.

When magnet **12** moves to its second position, the south (S) pole of that magnet moves counterclockwise sufficiently to cause the two south poles of the two magnets to be substantially in contacting relation. When the pendulum **14** reaches its farthest rightward excursion the repelling forces between the south poles of the magnets aids in swinging pendulum **14** in the opposite direction away from magnet **12**. With this arrangement the added propelling force provided by the opposed south poles along with the inherent energy associated with pendulum **14** is believed to cause pendulum **14** to return substantially to its initial starting position shown in full lines in the drawing. When pendulum **14** has swung away from magnet **12** a sufficient distance, counterweight **18** causes magnet **12** to revert to its first position, with counterweight **18** contacting stop **20**. This motion of magnets **10** and **12** continues until frictional forces cause pendulum **14** to come to rest.

To provide for operation of this magnetic engine over longer time spans, a spring means (not shown) may be provided coupled to arm **14** to aid in the pendulum action and keep counterweight **18** translating between stops **20** and **22**.

A certain amount of work can be provided by the apparatus shown in the drawing. For example, a member could be attached to counterweight **18** to translate the rotational movement into work. For example, the end of counterweight **18** could be coupled to a piston cylinder arrangement or a gearwheel (not shown).

It is contemplated that the engine shown in the drawings may be used quite extensively in the clock and watch art to provide timing mechanisms that would not need to be wound as often as is now required without this arrangement. It is the aid of the magnetic field that should enable longer continuous operation of the device.

Having described certain embodiments of this invention, other modifications of and changes in these embodiments are contemplated as falling within the spirit and scope of this invention, and to be limited solely by the appended claims.

What is claimed is:

1. A magnetic engine comprising,

a first magnet,

a pendulum secured at one end and having said first magnet coupled to the free end thereof,

a second magnet,

said first and second magnet each having at least one like pole in facing relationship to each other,

means located adjacent said first magnet for pivotally supporting said second magnet,

and counterweight means coupled to said second magnet, wherein said second magnet normally assumes a first position under the bias of said counterweight and is moved to a second position by said first magnet as it approaches said second magnet.

2. A magnetic engine as defined in claim **1** wherein said first and second magnets are horseshoe-shaped magnets.

3. A magnetic engine as set forth in claim **1** further comprising first and second stop means spaced on either side of said counterweight means for limiting movement thereof.

4. A magnetic engine as defined in claim **3** wherein said counterweight extends below said second magnet and is positioned between said first and second stops.

* * * * *