United States Patent [19]

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[54] **MAGNETIC AMUSEMENT DEVICE**

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[52] **U.S. Cl.** ..... **273/1 M,** 35/19 A, 46/236, 74/DIG. 4, 272/8 N, 335/306

[51] **Int. Cl.** **A63f 9/00**

[58] **Field of Search**..... 273/1 M; 35/19 A; 46/236, 46/238; 272/8 R, 8 N; 335/306; 74/DIG. 4, 210

[56] **References Cited**

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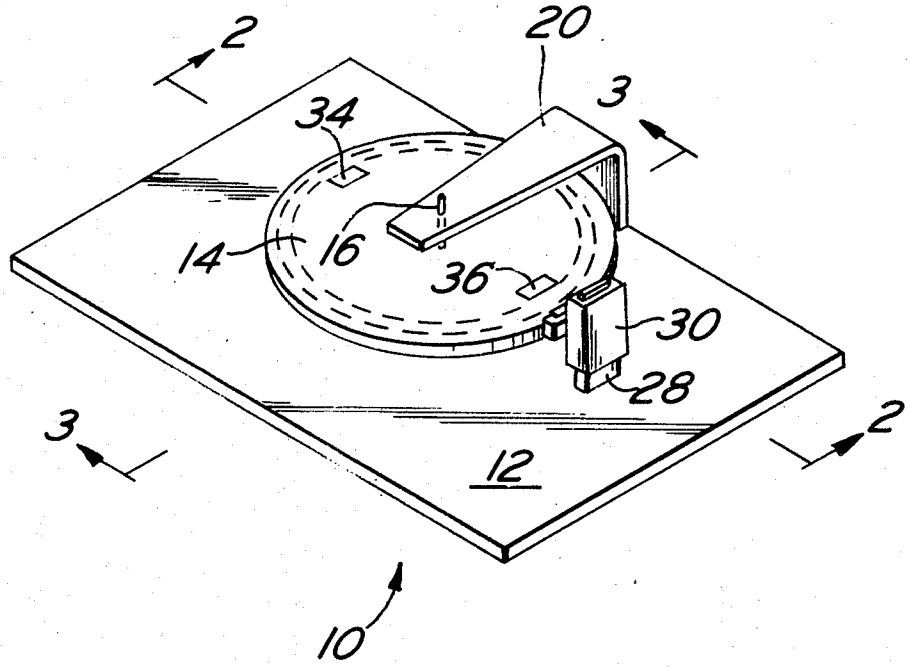
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Attorney, Agent, or Firm—Seidel, Gonda & Goldhammer

[57] **ABSTRACT**

A disc supporting a first magnet at its periphery is caused to revolve by magnetic induction due to movement of a second magnet adjacent but spaced from the periphery of the disc. The second magnet is mounted for reciprocal movement in a direction generally parallel to the axis of rotation of said disc.

10 Claims, 4 Drawing Figures



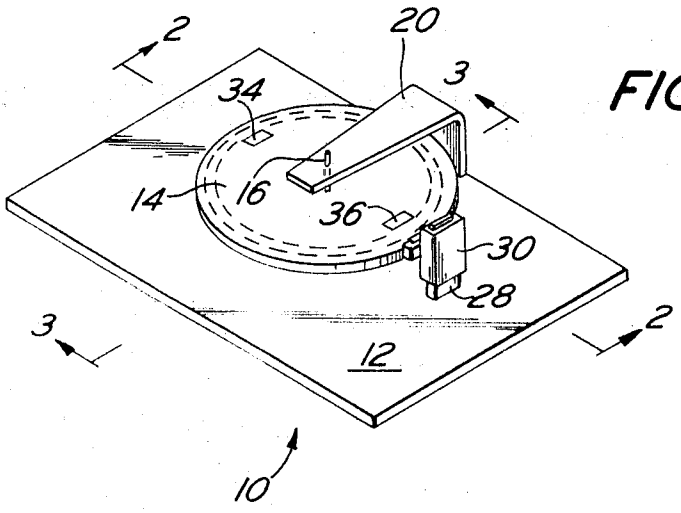


FIG. 1

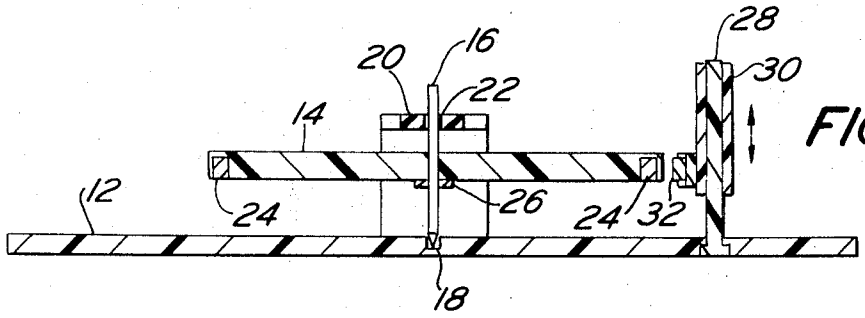


FIG. 2

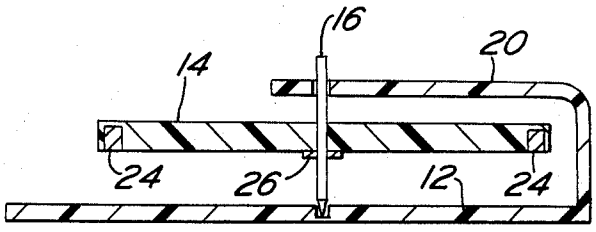


FIG. 3

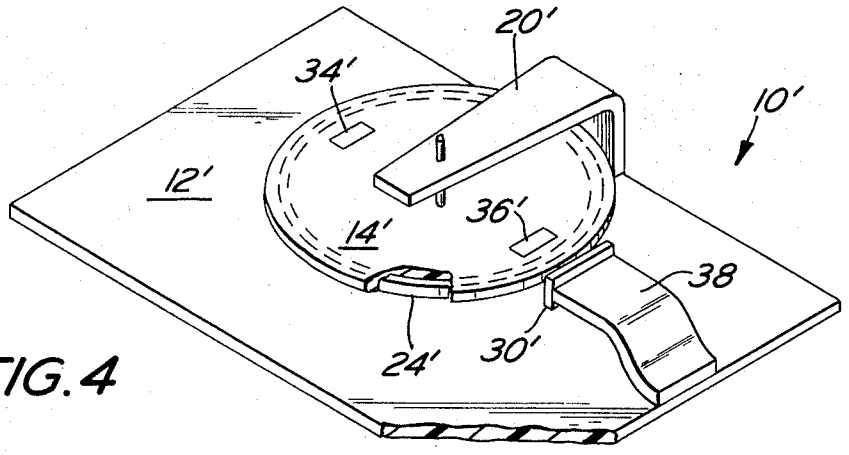


FIG. 4

MAGNETIC AMUSEMENT DEVICE

This invention relates generally to an amusement device but may be utilized for other purposes. A disc is mounted on support structure for rotation about an axis. The disc is preferably made from nonmagnetic material such as plastic but may be made partially of magnetic material adjacent its axis of rotation and of nonmagnetic material adjacent its periphery. A first magnet is supported by the disc at or adjacent one of its peripheries such as the outer periphery.

A second magnet is supported adjacent to but spaced from the periphery of the disc. The second magnet is supported by a carrier mounted for movement in a direction generally parallel to the axis of rotation of the disc. As the second magnet is manually or mechanically moved in a direction generally parallel to the axis of rotation of the disc, it induces magnetic forces which cause the disc to rotate about its axis. Skill can be attained whereby the movement of the second magnet occurs while poles on the magnet supported by the disc move past the second magnet. With practice, it is possible to cause the disc to rotate at a rate of about **120** rpm.

The present invention may be utilized as a toy for purposes of amusement. The present invention may be utilized for other purposes such as for testing dexterity and timing. The second magnet may be mounted for reciprocation or for oscillation adjacent to and spaced from the periphery of the disc.

The magnets used are preferably of the flexible type sold in strip form. This facilitates the ease with which the device of the present invention may be constructed and at the same time minimize the costs involved. The magnet on the disc is preferably supported within a groove adjacent the periphery of the disc.

It is an object of the present invention to provide a novel device for causing a disc to rotate as a function of and in response to reciprocation or oscillation of a second magnet adjacent the periphery of the disc.

It is another object of the present invention to provide a novel amusement device of the magnetic type.

It is another object of the present invention to provide apparatus for inducing rotation of a disc in response to reciprocation or oscillation of an actuator without touching the disc.

Other objects will appear hereinafter.

For the purpose of illustrating the invention, there is shown in the drawing a form which is presently preferred; it being understood, however, that this invention is not limited to the precise arrangement and instrumentality shown.

FIG. **1** is a perspective view of a device in accordance with the present invention.

FIG. **2** is a sectional view taken along the lines **2—2** in FIG. **1.**

FIG. **3** is a sectional view taken along the lines **3—3** in FIG. **1.**

FIG. **4** is a perspective view of another embodiment of the present invention.

Referring to the drawing in detail, wherein like numerals indicate like elements, there is shown in FIG. **1** a device in accordance with the present invention designated generally as **10.** The device **10** includes support structure **12** which may be a flat sheet of plastic material. While plastic material may be used for the support

structure **12,** other materials such as metal and wood, as well as laminates may be utilized.

A circular disc **14** is rotatably supported about its axis by means of a pin **16.** The pin **16** is guided at its lower end by means of an aperture **18** in the support structure **12.** The upper end of the pin **16** extends through a guide hole or aperture **22** in the bracket **20.** The bracket **20** is angled so as to have a cantilever arm overlying the disc **14** and an arm fixedly secured to and supported by the support structure **12.**

The disc **14** is preferably made from an inexpensive, non-metallic material such as a polymeric plastic. The suitable polymeric plastic for the support structure **12,** disc **14,** and the bracket **20** include polystyrene, polyvinylchloride, acrylics, etc. The disc **14** is provided with a groove or recess adjacent its outer peripheral surface. A magnet **24** is mounted within the groove or recess and retained therein in any convenient manner such as by clips, adhesive, force-fit, etc. The magnet **24** is preferably a flexible strip magnet. A wide variety of such magnets are sold commercially. One suitable magnet is sold commercially by the B. F. Goodrich Company under the trademark Koroseal. While the entire disc **14** may be made from a polymeric plastic, only the outer peripheral portion containing the magnet **24** need be of a nonmagnetic material.

The disc **14** may be supported in any desired elevation with respect to the upper surface of the support structure **12** in any convenient manner. Thus, the pin **16** could have a shoulder on which the disc **14** rests. As shown, such shoulder is accommodated by means of a flange **26** secured to the pin **16.**

A guide support member **28** is connected to the support structure **12** and located adjacent the periphery of disc **14.** A carrier **30** having a magnet **32** is reciprocably supported by the member **28.** Carrier **30** is in the form of a sleeve which surrounds the member **28.** Preferably the member **28** and carrier **30** are rectangular so as to preclude relative rotation whereby the magnet **32** will be immediately adjacent to but spaced from the periphery of disc **14.** Member **28** and carrier **30** are preferably made from non-metallic materials as described above.

The disc **14** may have indicia **34** and **36** imprinted thereon to designate poles. When the magnet **32** is slightly below the plane of the disc **14** and opposite pole **36,** the disc **14** is induced to rotate in one direction about the axis of pin **16.** When the pole **34** is adjacent to the magnet **32,** the magnet **32** should be raised so as to be slightly above the plane of disc **14.** If the timing of this relationship is attained, the disc **14** will be induced to rotate even faster. If the magnet **32** remains slightly below the plane of disc **14** when the pole **34** moves past it, the disc **14** would be induced to slow down. Thus, it will be seen that some dexterity and skill is required to cause the disc **14** to rotate and continue to rotate faster as the magnet **32** is caused to reciprocate in timed relationship with the rotation of the disc **14.**

In FIG. **4,** there is illustrated another embodiment of the present invention. The device in FIG. **4** is designated generally as **10'** and is identical with the device **10** except as will be made clear hereinafter. Hence, corresponding elements are provided with corresponding primed numerals.

In the device **10',** the carrier **30'** is supported at one end of a flexible cantilever guide support member **38.**

One end of the guide support member **38** is secured to the support structure **12'**. The carrier may be caused to oscillate from a static position wherein the magnet on carrier **30'** is slightly above the plane of the disc **14'**. The magnet on carrier **30'** may be moved or oscillated to a position slightly below the plane of disc **14'** by pressing downwardly on the flexible guide support member **38'** adjacent its free end.

In each of the above described embodiments, the magnet which is manually or mechanically moved to induce rotation of the disc **14** is spaced from the periphery of the disc **14** by a distance of approximately one-eighth of an inch. The thickness of the outer wall of the groove or recess for retaining the magnet **24** may be approximately one-sixteenth of an inch. These dimensions are, within limits, variable. The magnet **32** and **32'** are preferably slightly concave so as to conform with the radius of curvature of the disc **14** and **14'** but may be straight if the radius of curvature is large. Further, the magnet **32** and **32'** may assume the shape of animate objects. Likewise, the indicia **34** and **36** may assume various configurations including arrowheads, circles, animate objects, etc.

The present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof and, accordingly, reference should be made to the appended claims, rather than to the foregoing specification as indicating the scope of the invention.

I claim:

1. Apparatus comprising support structure, a disc having a magnet along substantially one of the peripheral surfaces of the disc, means on said structure supporting the disc for rotation about its axis, and means for supporting a second magnet adjacent to but spaced from said peripheral surface of the disc in a manner so that the second magnet is movable in a direction generally parallel to said axis to induce the disc to rotate about said axis.

2. Apparatus in accordance with claim **1** wherein said last mentioned means supports the second magnet for reciprocation to a position slightly above and to a position slightly below the plane of the disc.

3. Apparatus in accordance with claim **1** wherein said last mentioned means supports the second magnet for oscillation from a position slightly above the plane of the disc to a position slightly below the plane of the disc.

4. Apparatus in accordance with claim **1** wherein said last mentioned means includes a flexible arm having said second magnet supported at one end of the arm.

5. Apparatus in accordance with claim **1** wherein said disc is provided with a notch or recess in which said first mentioned magnet is received.

6. Apparatus in accordance with claim **1** including indicia on said disc designating the poles of the magnet supported by the disc.

7. Apparatus in accordance with claim **1** wherein said support structure and disc are made from a polymeric plastic material.

8. An amusement device comprising a horizontally disposable support structure, an upright pin on said support structure, a round disc having a hole in its center, said pin extending through said hole and supporting said disc for rotation about the axis of said pin, a first magnet secured to substantially the entire length of the outer periphery of said disc, a second magnet movably supported, means for supporting and moving said second magnet adjacent to but spaced from the periphery of said disc in a manner so that the second magnet is moved generally parallel to the axis of said pin from a position slightly above the plane of the first magnet to a position slightly below the plane of the first magnet.

9. An amusement device in accordance with claim **8** when said second magnet is mounted on a carrier supported for reciprocation parallel to the axis of said pin.

10. An amusement device in accordance with claim **8** wherein said second magnet is mounted on a carrier which oscillates with respect to the axis of said pin.

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