United States Patent

[11] **3,609,606**

[72] Inventor **William D. Podesto**
2200 Sixth Ave., Seattle, Wash. 98121

[21] Appl. No. **883,697**
[22] Filed **Dec. 10, 1969**
[45] Patented **Sept. 28, 1971**

[54] **MAGNETIC KINETIC SCULPTURE**
5 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** **335/209,** 335/306, 46/238, 46/1
[51] **Int. Cl.** **H01f 7/00**
[50] **Field of Search** ..... 335/306, 209; 46/236, 238; 308/10; 46/1 R

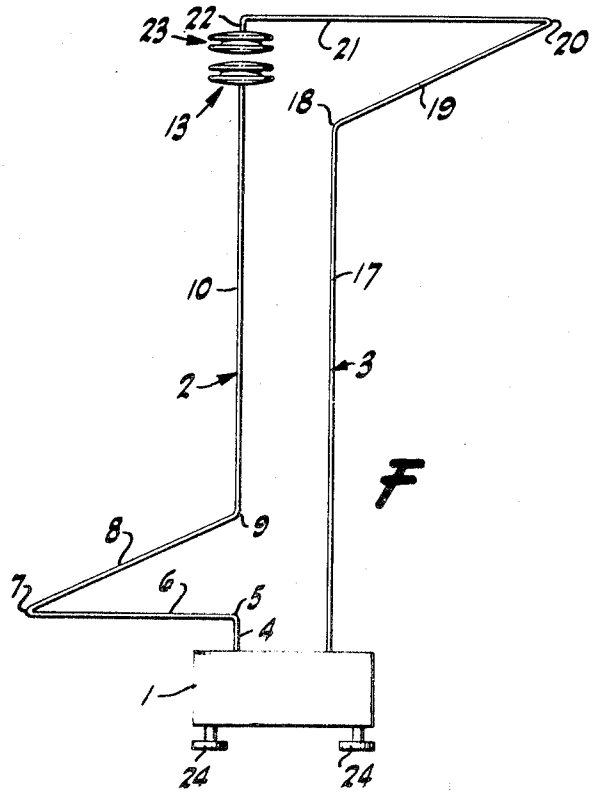
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Primary Examiner—G. Harris
Attorney—Boyken, Mohler, Foster & Schwab

ABSTRACT: A magnetic kinetic amusement device and sculpture in which a pair of permanent magnets are separately supported by spring wires above a supporting base in spaced, substantially opposed relation with their corresponding poles adjacent each other, the supporting wires being shaped to enable universal random movement of the magnets relative to each other, and to support the magnets with their fields of force interlapping to effect prolonged random movement of the magnets due to repulsion of their corresponding poles when one magnet is forcibly moved relative to the other, and released.



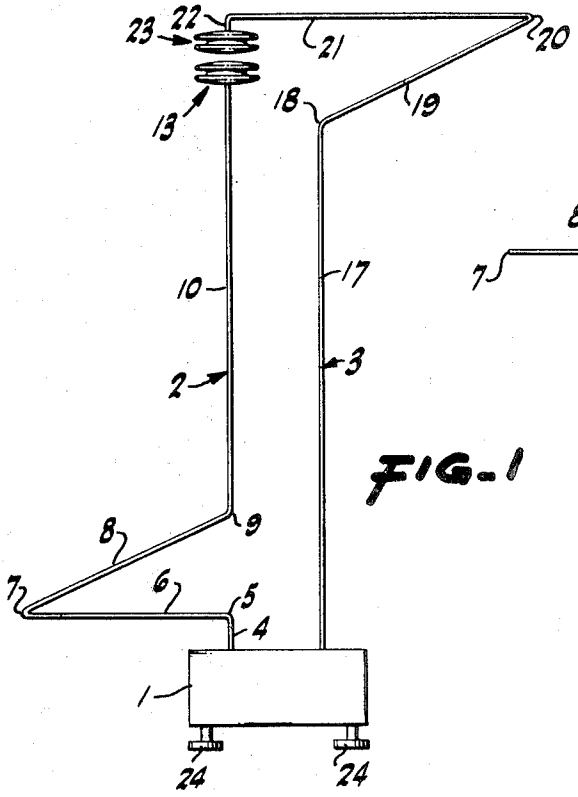


FIG. 1

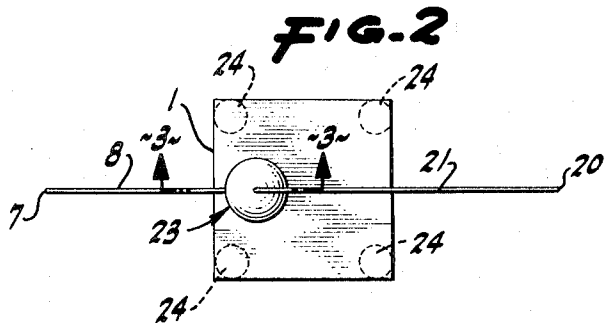


FIG. 2

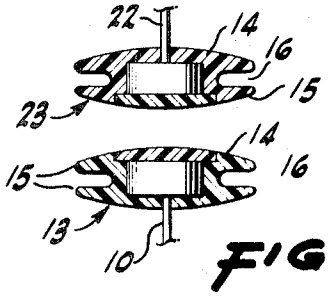


FIG. 3

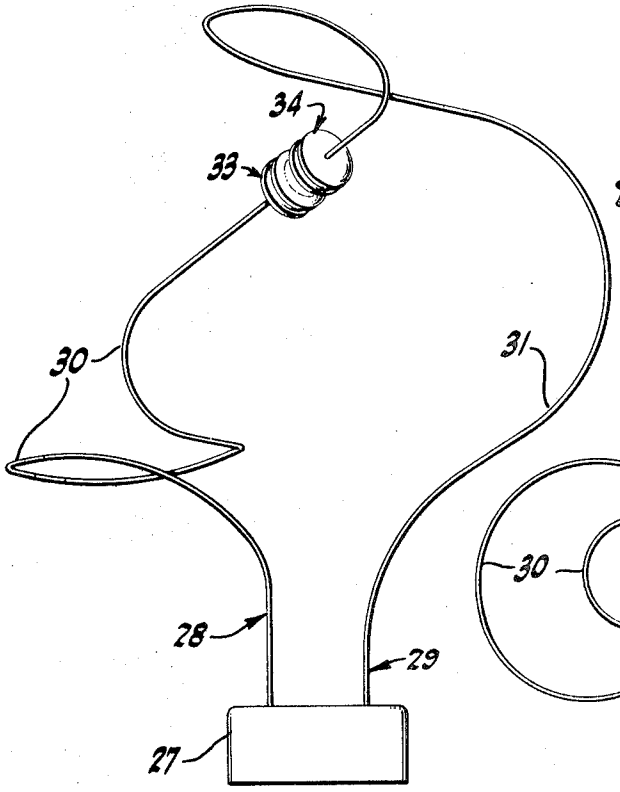


FIG. 4

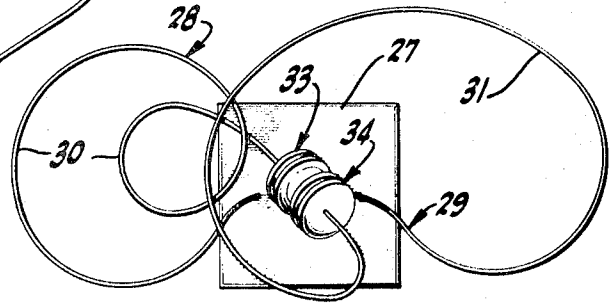


FIG. 5

INVENTOR
WILLIAM D. PODESTO
BY Bogken, Mohler, Foster & Regan
ATTORNEYS

MAGNETIC KINETIC SCULPTURE

SUMMARY

Mobiles are known as kinetic sculpture, comprising delicately balanced units suspended by wire or string, so that the units will move relative to each other when stirred by a breeze.

One of the objects of the present invention is the provision of magnetic kinetic sculpture comprising units that include permanent magnets, and which units are supported on spring wires that are constantly yieldably urging the units toward a static, directly opposed, spaced relation, in which their corresponding poles face each other, but which units are precluded from reaching said static position by the repulsion of corresponding poles, thus resulting in a prolonged, random movement of the magnetic units relative to each other.

Another object of the invention is the provision of a magnetic kinetic sculpture in which the moving force is the combination of the tension force of springs tending to move a pair of permanent magnets having their corresponding poles facing each other, to a directly opposed, spaced, relation, and the repulsive force of said corresponding poles operating to keep the magnets out of said opposed relation, resulting in a prolonged random universal movement of the magnets toward and away from each other at each of the opposite sides of the space between the magnets.

A still further object of the invention is the provision of a magnetic kinetic sculpture that includes the foregoing objects including provision physically preventing sufficient proximity of the opposite attracting poles of the magnets to draw the opposite poles together during movement of the magnets relative to each other.

Other objects and advantages will appear in the description and drawings.

DESCRIPTION OF DRAWINGS

FIG. 1 is a side elevational view of one device.

FIG. 2 is a top plan view of the device of FIG. 1.

FIG. 3 is an enlarged cross-sectional view of line 3—3 of FIG. 2.

FIG. 4 is a side elevational view of modification of FIG. 1.

FIG. 5 is a reduced-size top plan view of the device of FIG. 4.

DETAILED DESCRIPTION

Referring to FIG. 1, a base 1 of any suitable material, size, and configuration is provided. The weight, size, and material of the base should be such as to support the device, as a whole, stationary on a supporting surface against tipping over when the elements carried thereby are static or when in movement or when initially actuated to start movement.

A pair of upstanding spring wires 2, 3 are stationarily secured at their lower ends to said base, it being understood that the word "base" is intended to include any element rigid with said base, whether integral with the latter or added. In FIG. 1 the wires 2, 3 extend vertically into spaced openings formed in the main body of a base along a horizontal line in a vertical plane bisecting the base. Said wires are preferably of the same gauge of tempered music or piano wire, hence of spring steel adapted to retain any bends or conformation given the wire.

Wire 2 is bent at a point 5 adjacent its lower end to provide a horizontally extending portion 6 that terminates in a return bend 7.

The lower end portion 4 of wire 2 extends vertically upwardly from base 1 for a relatively short distance, and is formed with a lower bend at point 5 therealong to provide a horizontally extending lower section 6 that extends in a direction away from wire 3.

Section 6 terminates in an acute return bend 7 providing an upper section 8 that extends back to an upper bend 9 that is at a point above the bend 5, and from bend 9 the major length 10 of the wire 2 extends vertically upwardly to a magnet 13.

Magnet 13 may be a circular or cylindrical disclike section of a bar magnet having a central axis perpendicular to the plane of the disc with north and south poles on said axis at opposite sides of the disc, and the upper end of length 10 of the wire 2 is rigidly connected with magnet 13 centrally of the lower side.

Magnet 13 is preferably encased in nonmagnetic material, such as a suitable plastic, to provide an outer disc-shaped covering 14 coaxial with the magnet 13.

The magnet 13, as shown in FIG. 1, is horizontally disposed, and the terminal upper end of length 10 of wire 2 may extend into, and be bonded to the plastic 14 or nonmagnetic material extending over the underside of the magnet, although it may be secured directly to the magnet.

The nonmagnetic cover 14 may be relatively thin where it extends over the upper side of the magnet, but a rim 15 of said material extends radially outwardly of the magnet a substantially greater distance.

The upper and lower surfaces of cover 14 may be convexly rounded, and rim 15 may be formed with an annular radially outwardly opening recess 16.

Wire 3 extends vertically upwardly, as at 17, from base 1, and adjacent its upper end it is formed with a lower bend 18 that is similar to bend 9, thereby providing a laterally extending lower section 19 of said wire, similar in inclination to section 8 of wire 2.

Section 19 terminates at its outer end in a return bend 20 that is similar to return bend 7 of wire 2, providing an upper return section 21 that is at an acute angle relative to lower section 19, and which upper section 21 has a short terminal end portion 22 that extends vertically downwardly. This terminal end section 22 is secured at its outer end to a magnet generally designated 23, which magnet may be the same as magnet 13, except that is is inverted. The section 21 extends into the outer nonmagnetic cover of the magnet, centrally thereof, and may be bonded thereto, or to the central portion of the magnet itself. The structure of the magnet, including its cover, has the same numerals as used for magnet 13. The corresponding poles of magnets 13, 23 face each other.

The wires 2, 3 shown in FIGS. 1, 2, including the bends therein, are the same vertical plane, or approximately the same plane (FIG. 2).

Assuming the magnets are not on the ends of the springs or wires 2, 3, the preferred positions of the wires on base 1 are such that the sections 10, 22 of the wires 2, 3 would be in alignment, and spaced apart a sufficient distance that the magnets 13, 23, including their coverings, when secured on the free ends of sections 10, 22 would also be spaced apart, but sufficiently close to each other so their corresponding poles will repel each other to prevent their coaxial alignment when at rest. The rims 15 of nonmagnetic material function to space the magnets a sufficient distance apart to prevent them from being held together by the attraction of their unlike poles in the event axial movement of the magnets should accidentally position the magnets in side-by-side relation.

The center of gravity of the magnets 13, 23 is preferably substantially over the center of the base 1 to insure stability of the device when the magnets are static, and when in motion, and the base may be provided with conventional, adjustable levelling feet 24 to compensate for their imbalance due to the force of gravity.

In FIGS. 4, 5, a base 27 is similar to base 1, and is adapted to be positioned on a table or other support.

Spring wires 28 are secured at their lower ends to base 27. These springs or wires have the same characteristics as wires 2, 3 and may be in the same relative positions as wires 2, 3 at their lower ends.

Said wires extend upwardly from the base and wire 28 may have one or more artistic bends or curves 30 intermediate the base 1 and its terminal upper end.

Wire 29 may also have one or more bends or different curves 31 intermediate base 27 and its terminal upper ends.

The terminal upper ends of wires 28, 29, respectively, have magnets 33, 34 secured thereto, which magnets may correspond to magnets 13, 23 in structure. Said wires 28, 29 support magnets 33, 34 in spaced relation with their corresponding poles facing each other, and were it not for the repellent force of the corresponding poles, said magnets would be in substantially axial alignment. The spacing between the magnets is such that the repellent force of the poles prevents their movement to coaxial alignment. As in the example of FIGS. 1, 2, the magnets may have universal random movement, i.e., they may move toward and away from each other in any direction, but always against the resistance of the springs supporting them and tending to move them back toward coaxial alignment. Either or both magnets may move in circular and arcuate directions as well as straight paths.

The wires or springs supporting the magnets may assume many different artistic contours providing for creative sculptures appealing to the aesthetic senses of the observer.

In operation, upon forcibly springing one or both wires 2, 3 or 33, 34 to one or opposite sides and releasing them, the magnets will have a random movement which is completely unpredictable, the resiliency of the spring wires tending to return the magnets to coaxial alignment and the similar poles on the magnets repelling such return. Upon the forces of the springs and the magnetic fields of the magnets reaching a balance, the magnets will come to rest, with their axes offset, although tremors transmitted to the magnets through the base will cause relative movement of the magnets distinguishable from movement of mere spring-supported, nonmagnetic elements.

While the structure of FIGS. 1, 2 is preferable due to the fact that the force of the spring supports is not expended in moving the magnets upwardly against the force of gravity as in FIGS. 3, 4, upon downward movement of the magnets, and an adjustment of the magnets relative to each other is readily effected, nevertheless the action is quite similar. The forming of the wires to provide universal movement is quite important. The gauge of the wires, their resiliency, and the strength of the magnets are features that may vary according to the desired effects.

The wires themselves may be of any suitable material having the resilient characteristic of steel piano or music wire and the magnets are preferably of the type having at least the character of those known in the trade as ALNICO magnets, each having oppositely outwardly facing sides of opposite polarity.

The magnets, or the nonmagnetic material, or both, may assume different external contours to represent abstract or realistic objects, provided a sufficient field of magnetic force is present.

I claim:

1. A magnetic, kinetic sculpture, comprising:
a. a supporting base,
b. a pair of permanent magnets each having corresponding polarity on one of their sides,
c. spring means secured to said base supporting said magnets spaced thereabove in spaced-opposed relation for independent universal movement with their sides of corresponding polarity facing each other and with the field of force of one of said magnets within the influence of the field of force of the other magnet, whereby prolonged random, universal movement of said magnets will occur under the repulsive influence of said fields of force and the resiliency of said spring means, upon moving one or both of said magnets away from the other and releasing it.

2. In a sculpture as defined in claim 1;
d. said spring means comprising a pair of independent, spaced spring wires, and
e. a covering on said magnets of nonmagnetic material.

3. In a sculpture as defined in claim 1;
d. said spring means comprising a pair of independent spring wires bent intermediate said magnets and their lower ends to provide said universal movement of said magnets under said repulsive influence and said resiliency of said spring means.

4. In a sculpture as defined in claim 1;
d. said spring means comprising a pair of vertically extending, horizontally spaced spring wires including means thereon for supporting said magnets spaced one over the other and said wires being bent to provide for said universal movement.

5. In a sculpture as defined in claim 2;
f. said magnets being generally disclike and disposed horizontally with their said sides of corresponding polarity vertically facing each other,
g. said spring wires each including adjoining laterally projecting sections thereof extending angularly relative to each other to provide for vertical movement between said magnets.