United States Patent

Silva

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[54] MAGNETIC TOY

[72] Inventor: **Ruben Silva,** 1709 Church Street, Barstow, Calif. 92311

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[52] **U.S. Cl.** **46/239**
[51] **Int. Cl.** **A63h 33/26**
[58] **Field of Search** 46/239, 240, 45, 236, 238

[56] **References Cited**

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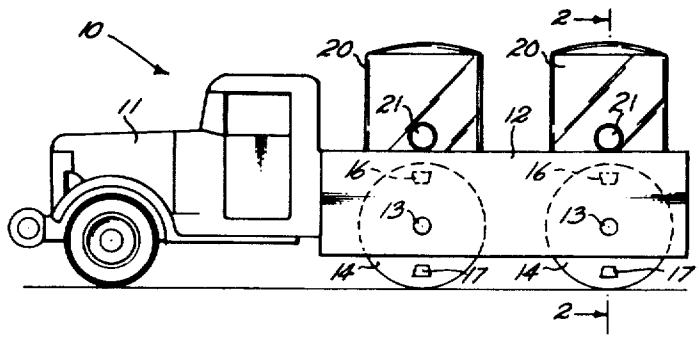
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Primary Examiner—Louis G. Mancene
Assistant Examiner—D. L. Weinhold
Attorney—Gregg William Hornaday

[57] **ABSTRACT**

This invention discloses a magnetic toy having wheels or other rotating member carrying varying magnetic fields and an encapsulated bar magnet above the wheels freely enclosed by a transparent tank enclosure. The varying magnetic fields are created by disposing two or more bar magnets parallel to the axis of the wheel and in reversed polarity.

7 Claims, 4 Drawing Figures



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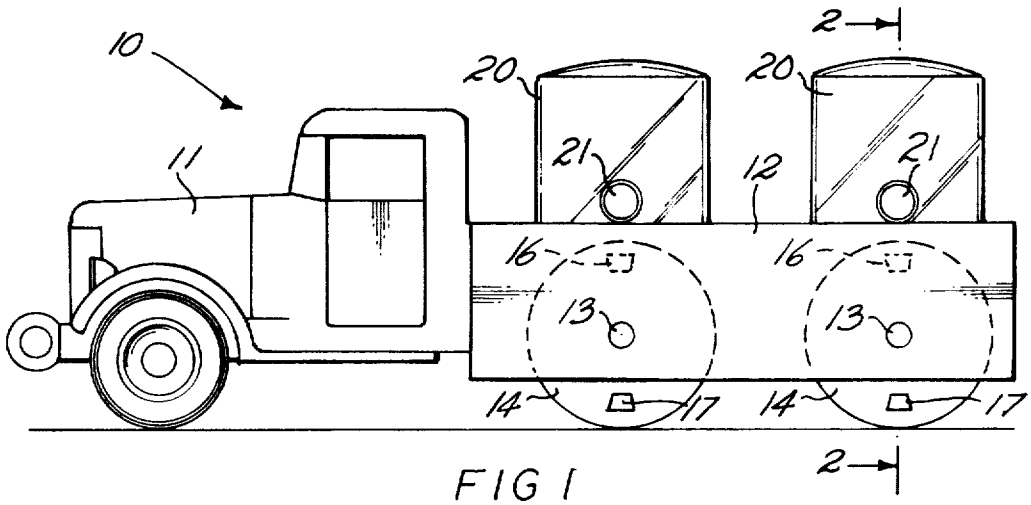


FIG 1

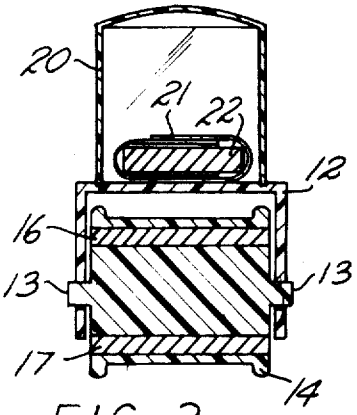


FIG 2

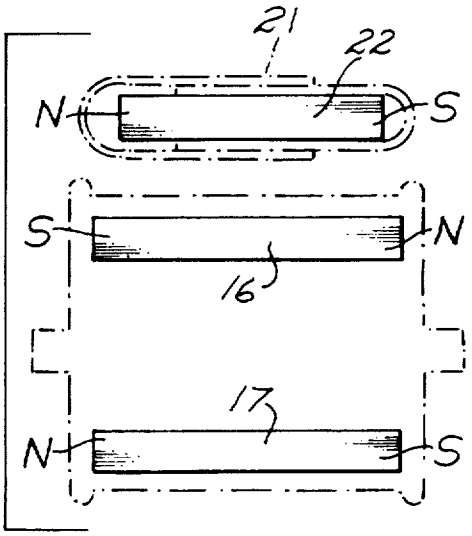


FIG 3

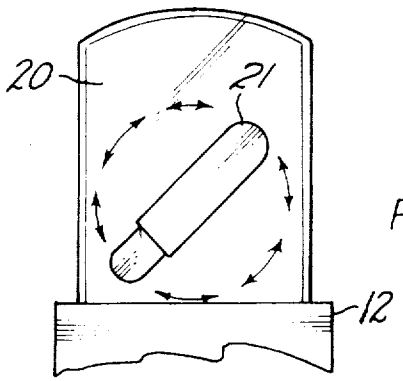


FIG 4

INVENTOR.
RUBEN SILVA
BY
William Kenaday
Attorney

MAGNETIC TOY

SUMMARY

This invention relates to magnetic toys or similar apparatus.

Toys utilizing magnetic means for motion of component parts have been known and used by children and adults previously. The purpose of these toys is to create an attractive and entertaining motion which will interest and amuse children and adults. It is a purpose of this invention to create an unexpected and surprising motion in the toy. Seeing the toy standing static on a surface, a child or adult would not expect the result obtained by rotating the wheels of this toy. Upon rotating the wheels, the capsule which is visible jumps up and down and flips and flops in every direction in very rapid, quick movements. This is a toy which an individual will be moved by his curiousity to pick up, play with, and attempt to determine how it works.

The object of this invention is to provide an attractive and entertaining toy which will arouse the curiousity of a child or an adult.

A further object of the invention is to provide a toy which will be puzzling and confusing and create an unexpected movement.

Other objects and advantages of the present invention become apparent to those skilled in the art upon consideration of the following detailed description of the preferred embodiment thereof, reference being had to the accompanying drawings, wherein:

FIG. 1 is a side elevational view of the toy in the embodiment of a truck carrying two tanks.

FIG. 2 is a sectional view of the toy taken on line 2—2 of FIG. 1, showing the encapsulated bar magnet positioned in the tank and the bar magnets positioned within the wheel.

FIG. 3 is a schematic view showing the polarity and relative locations of the magnets.

FIG. 4 illustrates the rotating flipping action of the upper magnet when the lower magnets are rotated.

Referring to the drawings, a toy truck 10 will be seen in FIG. 1. The toy contains a forward portion resembling the cab of a truck. This portion is not an important part of this invention, as any type of vehicle can be substituted. It need not be a vehicle, as it could as well be a toy animal or in any other related configuration. The rear portion of the toy illustrates the invention.

The base 12 attaches to the forward portion 11 or is an extension of the forward portion. The base 12 carries axles 13 which are positioned in a hole of the base in a manner to allow rotation. Two wheels 14 are shown mounted to the base by means of the axle 13. An end view of the bar magnets 16, 17 are seen positioned in the wheels. Transparent tanks 20 are positioned atop the base. An end view of the capsules 21 are seen within the tanks. It is evident from FIG. 1 that movement of the toy truck in either the forward or reverse direction will cause rotation of the wheels 14 and consequent movement of the bar magnets 16 and 17 which are affixed within the wheel.

Referring to FIG. 2 the capsule 21 can be seen encapsulating bar magnet 22. The capsule is located within the transparent tank 20 and is so disposed within the tank that it enjoys total freedom of movement around all axes. It is only restrained by the walls, bottom and top of the tank. The capsule is constructed of any non-ferrous material, the most readily available being a plastic. The wheel 14 is illustrated showing the relative position of the axle 13 engaging the base 12 with freedom to rotate. The wheel further shows the bar magnet 16 and 17 firmly affixed within and disposed parallel to the axis of the wheel and near the outer radius of the wheel.

Referring to FIG. 3 the relative polarities of the bar magnets can be seen. All figures illustrate the wheel having two bar magnets. Additional bar magnets can be used, but at least two are necessary in order to maintain movement of the encapsulated magnet. It should be evident from FIG. 3 that rotation of the wheel will cause a change in the magnetic field passing the encapsulated magnet 22. On the principle that unlike poles attract and like poles repel, the magnet 22 will be caused to move rapidly to a new position.

FIG. 4 illustrates one of the possible movements of the encapsulated magnet as it moves to a position to correspond with the principle above stated.

A typical use of this toy might be to push it along the floor or the rug of a house and observe the movement of the capsules 21 to the amusement of all.

While only a presently-preferred embodiment has been disclosed in detail herein, I do not thereby intend that my invention be limited to such details. Instead, I appreciate that modification and variations will occur to those skilled in the art, and I am aware that certain features of my invention can be used without the others, all without departing from the spirit of my invention and the intended scope of the appended claims.

Having fully disclosed and completely described my invention together with its mode of operation, what I claim as new is:

1. A magnetic toy, which comprises:
   a. a base;
   b. a wheel mounted to said base to allow movement of said base;
   c. means for mounting said wheel to said base to allow rotation of said wheel;
   d. a first bar magnet attached to said wheel;
   e. a second bar magnet attached to said wheel;
   f. a tank attached to said base in such proximity to said wheel that it is within the field of one of said first or second magnets, depending upon the position of said wheel;
   g. a third magnet freely disposed within said tank to permit flipping and flopping movement of said third magnet as the wheel and its corresponding magnets and fields are rotated.

2. A magnetic toy as recited in claim 1, wherein the base mounts additional wheels to permit said base to be in the configuration of a toy vehicle.

3. A magnetic toy as recited in claim 1, wherein the tank is transparent to allow observation of the movement of the said third magnet.

4. A magnetic toy as recited in claim 1, wherein the said third magnet is encapsulated in a non-ferrous material to permit greater flipping action.

5. A magnetic toy as recited in claim 1, wherein said first and second magnets are attached with their polar axes parallel to the axis of said wheel and with their relative polarities reversed, to cause changing magnetic fields to pass the third magnet as said wheel is rotated.

6. A magnetic toy as recited in claim 1 having the following additional elements:
   a. additional wheels mounted to said base to permit said base to be in the configuration of a toy vehicle;
   b. said tank is transparent to allow observation of the movement of said third magnet;
   c. said third magnet is encapsulated in a non-ferrous material to permit greater flipping action;
   d. an additional tank mounted to the base to correspond with each separate wheel.

7. A magnetic toy as recited in claim 5 having the following additional elements:
   a. additional wheels mounted to said base to permit said base to be in the configuration of a toy vehicle;
   b. said tank is transparent to allow observation of the movement of said third magnet;
   c. said third magnet is encapsulated in a non-ferrous material to permit greater flipping action;
   d. an additional tank mounted to the base to correspond with each separate wheel.

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