

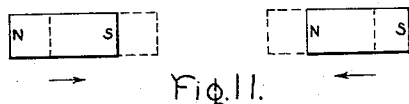
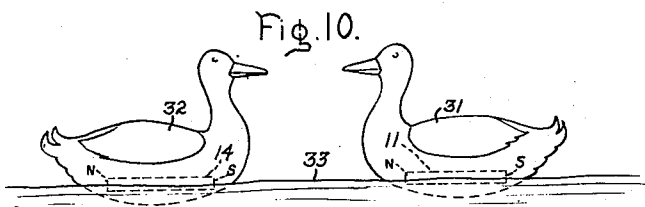
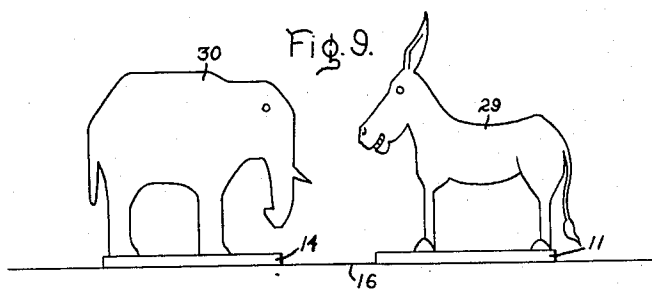
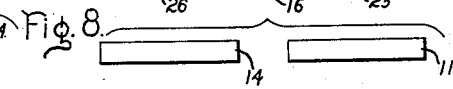
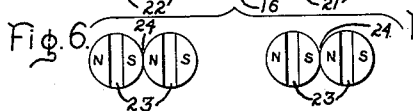
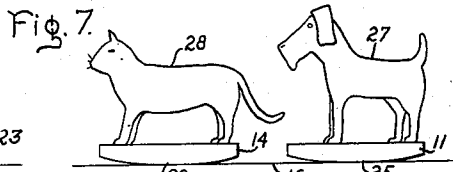
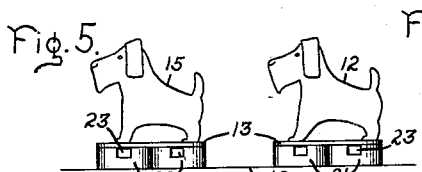
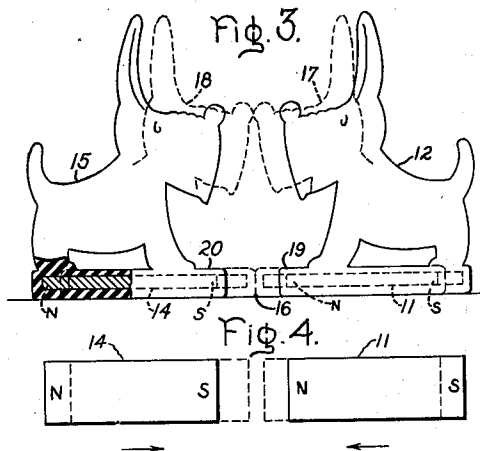
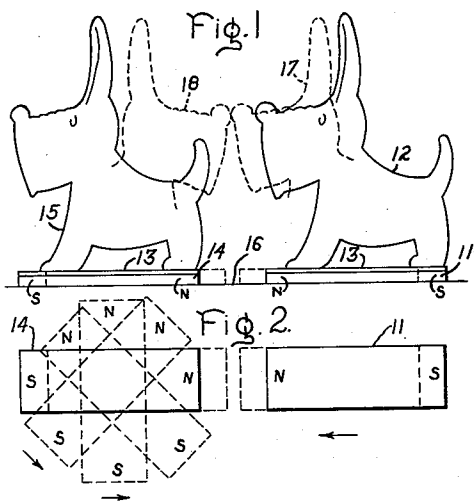
July 15, 1941.

W. J. BRAKE

2,249,454

MAGNETIC NOVELTY

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UNITED STATES PATENT OFFICE

2,249,454

MAGNETIC NOVELTY

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3 Claims. (Cl. 46—45)

This invention relates to magnetic novelties and more particularly to novelties employing permanent magnets associated with objects or figures of various character, and has for an object the provision of such devices wherein the magnetic properties are utilized to make the figures move relative to each other in a predetermined manner.

Another object of this invention is the provision of magnetic toys for amusement purposes. A further object of this invention is to provide magnetic novelties of illusory or mystifying character which are moved about without apparent cause. Still another object of this invention is to provide such devices which are of long life, of simple construction, and which are adapted to be produced in an economical manner.

The novelties in question are primarily useful as toys, souvenirs for advertising purposes and the like.

In carrying my invention into effect, I take advantage of the well-known phenomenon that the like poles of two magnetized elements when brought into proximity repel each other and, conversely, under similar conditions, the unlike poles of two magnetized elements exert a corresponding attractive force on each other. I employ two objects or fanciful figures simulating animals, human beings, or inanimate objects and secure each of these figures to one of the permanently magnetized elements. Depending upon the effect which I desire to obtain, I mount the north pole end of one magnet at a given position relative to the figure and I mount either the north or the south pole of the other magnet at the corresponding position of the other figure. Each article includes a figure and a permanent magnet and is adapted to move freely over a smooth surface so that upon manual movement of one of the articles in proximity to the other article the latter will be attracted or repelled and thereby made to assume various positions.

The novel features which are characteristic of my invention are pointed out in the appended claims. My invention, however, will best be understood from reference to the following specification when considered in connection with the accompanying drawing in which Fig. 1 illustrates an elevational view of two figures mounted on permanent magnets in accordance with my invention; Fig. 2 is a plan view showing various relative positions of the magnets of Fig. 1; Fig. 3 illustrates a modification of the articles of Fig. 1, wherein the permanent magnets are concealed from view; Fig. 4 is a plan view showing the posi-

tion of the magnets of Fig. 3 before and after they are drawn together by the attractive force; Figs. 5 and 6 are modifications illustrating a different form of permanent magnet; Figs. 7 and 8 illustrate still another modification in which the lower surface of each of the magnets is shaped to reduce to a minimum the frictional contact between the magnets and the surface over which they move; Fig. 9 is similar to Fig. 1 but discloses different objects or figures mounted on the magnets; and Figs. 10 and 11 disclose views of articles which are adapted to float in a fluid medium.

The permanent magnets employed in carrying out my invention are preferably formed from permanent magnet steels having a relatively high coercive force as compared, for example, to the old or usual form of chrome steel in which the coercive force rarely exceeds about 65 oersteds. As a suitable material I have found that permanent magnet alloys containing iron, nickel, and aluminum as the basic or essential ingredients, as described in United States Patents Nos. 2,027,994 to 2,028,000 inclusive, to Tokushichi Michima, and Nos. 1,947,274 and 1,968,564 to William E. Ruder, are highly satisfactory materials for forming the permanent magnets used with my invention. If desired, however, the magnet may be formed by a sintering process as disclosed in a copending application, Serial No. 196,691, filed March 18, 1938, to Goodwin H. Howe, entitled "Sintered permanent magnet," and assigned to the same assignee as the present invention. Magnets made from such alloys, when magnetized to saturation and then removed from the influence of the magnetizing force, exhibit a residual induction of approximately 7500 gauss and a coercive force of approximately 440 oersteds. Inasmuch as it is the coercive force which determines the ability of a permanent magnet to resist demagnetization, magnets made from such materials may consequently be made much shorter in length than those made from low coercive force materials and such magnets will maintain their magnetism almost indefinitely. The first factor contributes to a lighter article, since a relatively strong magnetic force is produced with a minimum weight of magnetic material, thereby reducing the friction force and facilitating ease of movement over the surface, while the second factor contributes to the provision of an article of long life.

Referring to Fig. 1 of the drawing, I have shown an elevational view of two articles made

in accordance with the principles of my invention. The numeral 11 designates a bar-type permanent magnet which may be constructed of a high coercive force material as already described and which may be polarized with the poles north (N) and south (S) as indicated. In this case the north pole is positioned at the front end of the figure 12. The figure or object 12 is intended to simulate a dog such as a Scottish terrier and is preferably constructed of a moulded composition, although other suitable non-magnetic materials may be employed so long as the objects made therefrom are sufficiently light in weight to permit the assembled articles to move with minimum friction over the surface. The object 12 may be secured to the permanent magnet 11 in any suitable manner but I have shown a cardboard or paper element 13 interposed between the object and the magnet. With such a construction, the object may be secured to the magnet by gluing or other equivalent means.

The numeral 14 designates a second permanent magnet similar to the magnet 11 but in this case the magnet is mounted with the south pole (S) at the front end of the object 15. The object 15 is attached to the magnet in a manner similar to that described in connection with the object 12. The bottom surface of each of the magnets 11 and 14 is made smooth to permit the articles to move with maximum freedom over the surface 16, which should be a smooth horizontal surface, such, for example, as a table top, a floor, or a glass show case.

To obtain a more complete understanding of the operation of the articles shown in Fig. 1, assume that the objects 12 and 15 positioned on the permanent magnets 11 and 14 respectively, are in the position represented by the full lines in Fig. 2. If now the object or figure 12 is manually pushed to the left the object 15 will be repelled and will tend to scoot away from the object 12, and if the alignment is maintained such action will continue. In practice, however, due to non-uniformity in frictional contact pressure between the surface 16 and the under surface of the magnet 14 the alignment of the magnets will not be maintained and as the object 12 is moved toward the object 15 the latter will jump quickly away from the object 12, then turn in the manner illustrated and finally return so that the head ends of both objects will be drawn together as indicated by the dotted lines 17 and 18 of Fig. 1. Fig. 2 discloses in a general way the various positions assumed by the object 15 during the process of reversal. This same effect may be produced by moving the object 12 so that it approaches the rear end of the second object from a slight angle. Also by quickly moving the object 12 toward the object 15 from a plurality of positions and suddenly withdrawing it each time, the object 15 may be made to jump around into various positions in rapid succession.

In Figs. 3 and 4, I have illustrated a construction which adds to the illusory character of the articles. In this modification the permanent magnets 11 and 14 are concealed so that the articles may be moved about over the surface 16 without apparent cause by the invisible forces produced by the concealed means, thereby adding to the mystery of the operation. The objects or figures 12 and 15 are shown formed integrally with their respective base portions 19 and 20 and with the magnets 11 and 14 embedded in the bases. The undersurface of each of the base portions should be made smooth to reduce the frictional contact with the surface 16 to a minimum.

In using this construction it is convenient to first mould the object and its base as an integral unit from a plastic material and position the magnet in the base afterwards. As illustrated, the object 15 is mounted on its magnetic element 14 in a position relatively opposite to that of the object 12 and its corresponding magnetic element 11, as described in connection with Fig. 1.

Thus if the figures be placed upon a smooth surface and the object 12 moved so that the unlike poles are adjacent, the attractive force exerted between the unlike magnetic poles will draw the object 15 toward the figure 12 so that they will touch noses as indicated by the dotted portions 17 and 18. The relative positions of the magnets both before and after attraction is indicated in Fig. 4. I have thus provided a magnetic novelty wherein the objects are moved about without apparent cause, thereby exciting curiosity and causing persons attracted thereby to speculate as to the cause for movement.

In Figs. 5 and 6 I have shown each of the objects 12 and 15 mounted on a plurality of permanent magnets 21 and 22 respectively, the magnets in this case being of generally horseshoe shape with the poles N, S separated by diametrical slots 23. In using this arrangement two of the magnets are positioned as indicated with their unlike poles together and with the poles facing away from the surface 16. The intermediate layer of non-magnetic material 13 may then be secured to the pole faces and the objects 12 and 15 may be attached to layer 13 in any convenient manner. This construction enables the use of a magnet of standard design which is widely used in the electrical industry and therefore contributes to economy in production. It is, however, subject to the disadvantage that there is necessarily a small air gap 24 between the two magnets which tends to reduce the effective force of the magnets for moving the articles to the desired relative positions.

Figs. 7 and 8 illustrate further modifications in which the generally bar-shaped magnets 11 and 14 are provided with under surfaces 25 and 26 of slightly convex form to reduce the frictional contact with the surface 16 and thereby enable the articles to move more freely. The figures 27 and 28 are intended to represent a dog and a cat, respectively, and they may be placed directly on the magnets as illustrated or an intermediate non-magnetic layer, such as the element 13 of Figs. 1 and 5 may be employed if desired.

If the magnets are polarized as indicated, and the dog moved toward the cat, the cat will first jump away quickly and then turn and return to face the dog in a manner as explained in connection with Figs. 1 and 2.

The articles disclosed in Fig. 9 are illustrated with magnets 11 and 14 similar to those described in connection with Fig. 1. The objects or figures 29 and 30 are shown mounted directly on the magnets in the manner already described. The objects 29 and 30 represent a donkey and an elephant, respectively, and may be used to simulate the emblems of the principal national political parties.

If the magnets are polarized as indicated and the donkey is moved toward the elephant, the elephant will move toward the left for a short distance due to the repellant action of the magnets 11 and 14, then turn and return due to the attractive force, so that the objects no longer face each other. In this way the keen rivalry between

the parties may be simulated. These articles may therefore find useful applications as souvenirs for campaign purposes, in addition to their obvious usage as amusement devices.

In Figs. 10 and 11 I have illustrated the principle of my invention as applied to objects constructed to float in a fluid medium. In the embodiment illustrated, the objects 31 and 32, simulating ducks swimming in a pond or body of water 33, may be constructed in the manner described in connection with Fig. 3 from a light non-magnetic material and adapted to receive the permanent magnet elements 11 and 14, respectively.

It is obvious in view of the foregoing description that if the magnets are polarized as indicated and the object 31 is moved toward the object 32 the attractive force will draw the two objects together. Conversely, with the like magnetic poles adjacent, by moving one of the objects, the other one may be made to scoot around over the pond and thereby assume various positions.

Although I have illustrated and described several physical embodiments of magnetic devices utilizing the principles of my invention, it is obvious that various other arrangements than those disclosed may be employed within the spirit of my invention. For example, all of the magnets may be embedded if desired and the under surfaces of the molded bases may in this case be made of slightly convex curvature. Instead of rounding the entire base bottom on the large radius as shown in Figs. 7 and 8, I may employ an alternative construction in which the central portion of the base is raised to provide a slight pivot at that point for reducing the friction. Also, I do not intend to limit myself to the particular objects shown mounted on the magnets as various other arrangements such as seagoing vessels, automobiles, various other inanimate objects, domestic and wild animals, persons, and the like, may be simulated if desired.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In combination, a pair of cooperating magnetic articles, each of which comprises a miniature figure and a permanent magnet, said miniature figure being secured to said permanent magnet, each of said articles being freely movable in all directions over a horizontal surface, and the magnets being secured to said figures in a manner to produce interacting magnetic fluxes whereby upon manual movement of one of said figures with respect to the other adjacent figure said other figure may be made to assume any one of several different positions on said surface.

2. In a magnetic novelty, the combination of two cooperating magnetized articles, each of said articles comprising a miniature figure made of non-magnetic material and a horizontally disposed permanent magnet, each of said articles being further provided with an undersurface of a character to permit freedom of movement over a horizontal surface and adapted to move in all directions on said surface, one of said articles being manually movable whereby when said article is moved in proximity to the other article an interaction takes place between the magnetic fluxes produced by said magnets to cause said other article to assume any one of several positions on said surface.

3. In a magnetic novelty, the combination of two cooperating magnetized articles, each of said articles comprising a permanent magnet and a miniature figure secured to said permanent magnet, said permanent magnet being light in weight and composed of a high coercive force material, the undersurface of said articles being adapted for freedom of movement in all directions over a surface, one of said articles being manually movable in proximity to said other article whereby the interacting fluxes produced by said permanent magnets cause said other article to assume various predetermined positions on said surface.

WALTER J. BRAKE.