March 24, 1942. J. M. BACH 2,277,057

MAGNETIC DEVICE

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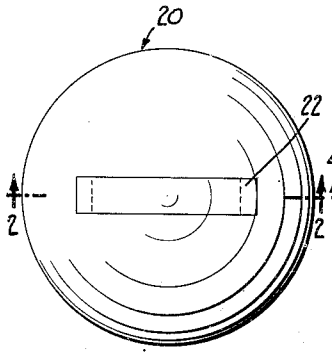


Fig. 1.

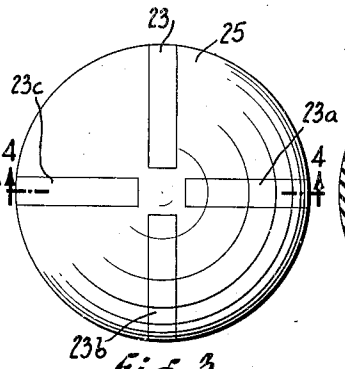


Fig. 3.

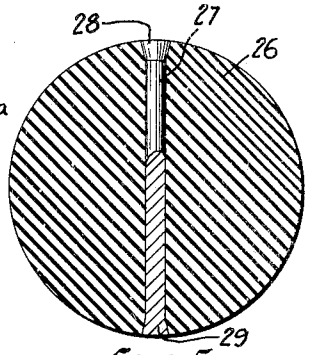


Fig. 5.

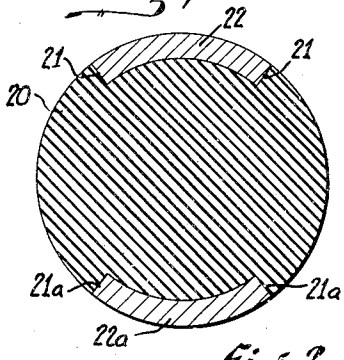


Fig. 2.

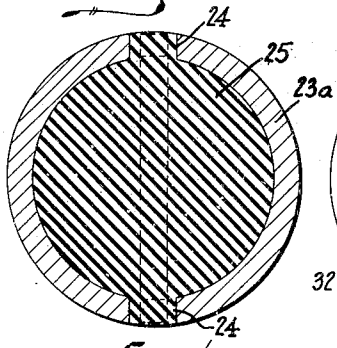


Fig. 4.

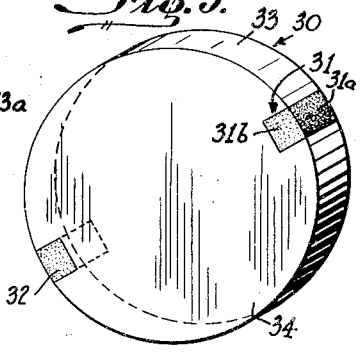


Fig. 6.

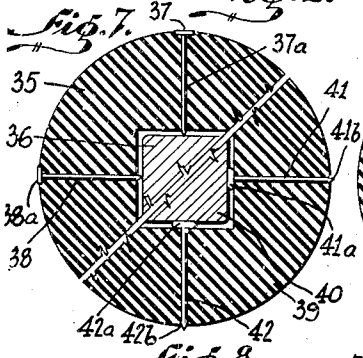


Fig. 8.

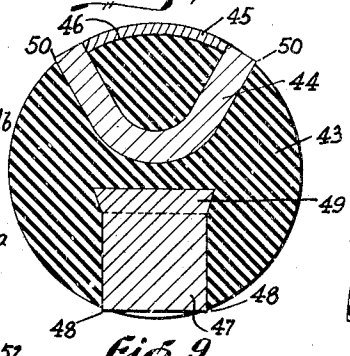


Fig. 9.

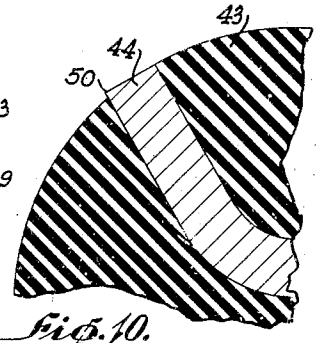


Fig. 10.

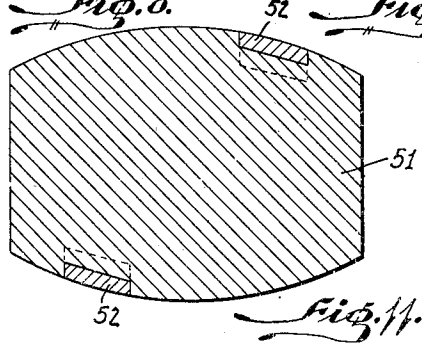


Fig. 11.

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Fig. 12.

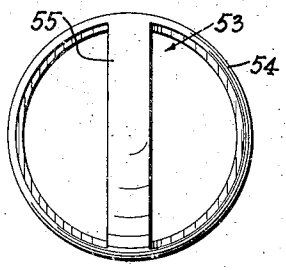


Fig. 14.

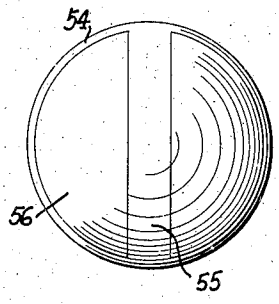
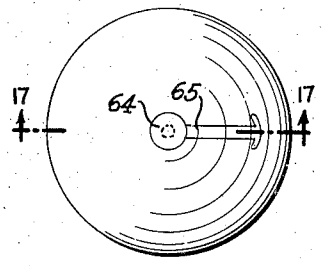


Fig. 16.



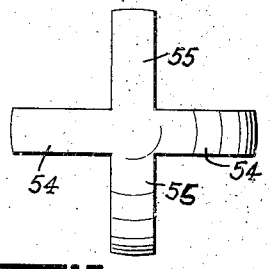


Fig. 13.

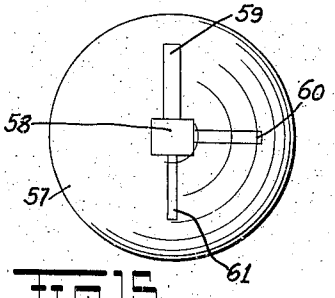


Fig. 15.

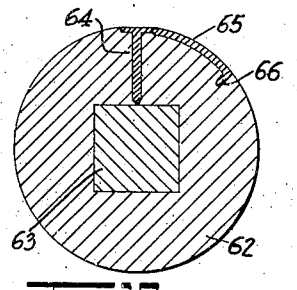


Fig. 17.

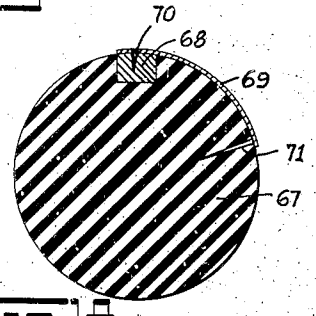
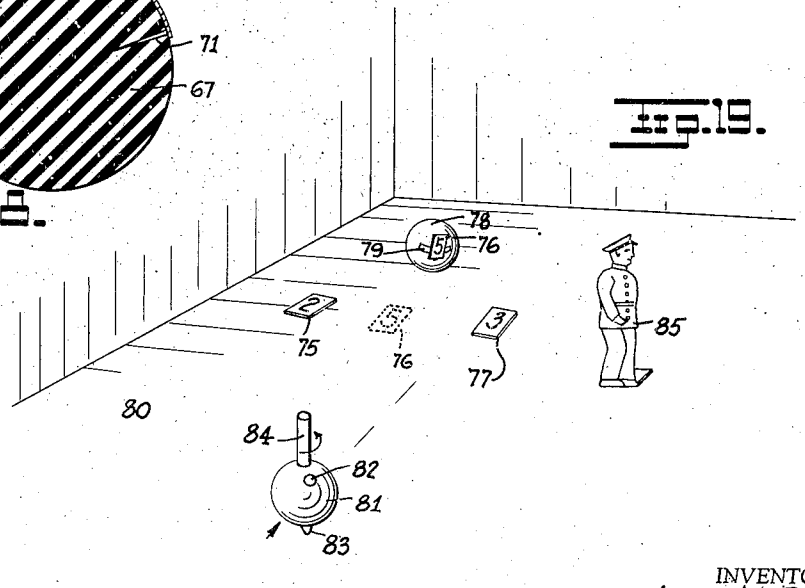


Fig. 18.

Fig. 19.



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UNITED STATES PATENT OFFICE

2,277,057

MAGNETIC DEVICE

Jesse M. Bach, Bronx, N. Y.

Application February 24, 1940, Serial No. 320,615

7 Claims. (Cl. 273—118)

This invention relates generally to magnetic devices, wherein permanent magnet means form a source of power.

It is an object of the present invention to provide a scientific device containing magnetic characteristics.

It is ancther object of the present invention to locate this source of magnetic power on or within a carrier having certain characteristics which enable the carrier to accomplish functional acts or actions of its own.

It is still another object of the present invention to provide magnetic power means associated with a carrier adapted to perform rolling, rocking, swinging or similar actions and whereby the said means may be utilized for attracting suitable objects during such action or movement of the said carrier.

Still another object of the present invention resides in the provision of magnetic power means in or on a carrier which means will adapt said carrier to be utilized as an element in games, toys, advertising and display purposes, or any such purpose where it is desired to employ magnetic power means in connection with a carrier having in itself certain inherent qualities which may be taken advantage of simultaneously with or relatively to said magnetic means.

Yet, another advantage of the present invention is to provide removable or displaceable magnetic power means in conjunction with a carrier or a like body to selectively utilize said body per se or together with said magnetic means.

A still further object of the present invention resides in the provision of magnetic means the mass of which is distributed preferably over a curved surface of a carrier to maintain the equilibrium of said carrier when it is at rest or in action.

Still a further object of this invention is to provide in a carrier a centrally arranged magnetic power source from which extend branches or magnetic conductors to the surface of said carrier.

It is still another object of the present invention to provide magnetic means shiftable and regulatable with respect to its carrier, so that the magnetic influence of said means may be varyingly extended beyond the carrier proper.

Yet, another object of the present invention contemplates the provision of magnetic power means not only in contact with the active surface of a carrier, that is, for example, the rolling or like surface of said carrier, but also remote from said active surface where it may act upon a body other than the carrier.

These and other objects and advantages of the invention will appear from the following disclosure thereof together with the attached drawings which illustrate certain forms of embodiments thereof. These forms are shown for the purpose of illustrating the invention since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various parts of which the invention consists, can be variously changed and organized and that the invention is not limited to the precise arrangement and organization of the instrumentalities as herein shown and described.

In the drawings:

Fig. 1 is a top plan view of a spherical object made in accordance with the invention;

Fig. 2 is a sectional view taken along line 2—2 of Fig. 1;

Fig. 3 is a top plan view of a modified form of the said invention;

Fig. 4 is a sectional view taken along line 4—4 of Fig. 3;

Fig. 5 is a sectional view of another form embodying the invention;

Fig. 6 is a perspective view of a disc-shaped carrier made in accordance with the invention;

Figs. 7 and 8 are partial sectional views of modified forms embodying the invention;

Fig. 9 is a sectional view of a device made in accordance with the invention in a modified form;

Fig. 10 is an enlarged portion of a device slightly modified from that shown in Fig. 9;

Fig. 11 is a carrier embodying the invention in a modified form and shown in section;

Fig. 12 is a side elevational view of a skeleton embodying the invention;

Fig. 13 is a top plan view of Fig. 12;

Fig. 14 is a view of a frame utilizable in connection with a carrier in the form of a ball;

Figs. 15 and 16 are modified forms of the invention;

Fig. 17 is a sectional view taken along line 17—17 of Fig. 16;

Fig. 18 is a sectional view of the invention in a still further modified form;

Fig. 19 is a perspective diagrammatic view of a game, in which the invention may be utilized.

Referring now to the drawings in more detail, Figs. 1 to 5 and 7 to 10 disclose various embodiments of the invention, wherein the carrier above referred to is of spherical form, and made

of any suitable material, either resilient or not, insulating or non-magnetic material. However, it is preferable to make the carrier for certain purposes out of rubber or rubber composition.

In Figs. 1 and 2, there is shown a ball-shaped carrier 20 having recesses 21, 21a which may be diametrically opposed and arranged in the surface of the said carrier. Within said recesses 21, 21a there are located the arcuately shaped permanent magnet pieces 22, 22a, the respective upper surfaces of which are coterminus with the spherical surface of the ball. The said magnetic pieces may be cemented or otherwise fixed in place within said recesses and besides being utilizable as magnets also serve as instrumentalities to give momentum to the ball 20 when set in motion. It is further to be noticed that the magnetic pieces may also act as reinforcing elements for the ball 20. This latter purpose becomes more apparent from the disclosure in Figs. 3 and 4 where the permanent magnet pieces comprise four arcuately shaped members 23, 23a, 23b, 23c, a pair of which substantially extends, respectively, along the circumference of the ball carrier 25, each pair being substantially at right angles to each other. The magnet pieces 23 to 23c are inserted in respective recesses, one of which is indicated by numeral 24.

Fig. 5 shows a ball-shaped carrier 26 through which passes a pin 27 made of magnetic material, the said pin preferably having flared ends or tips 28, 29 whose surfaces are contoured to conform with the spherical shape of the said carrier 26. It is understood that the magnetic piece 27 may comprise an integral member, as shown in Fig. 5, or may be built up from two or more pieces, which are threadedly or otherwise connected together.

Fig. 6 shows a disc-shaped carrier having permanent magnetic elements 31 and 32 which are attached either fixedly or slidably to the circumferential wall 33 and to at least one of the side faces 34 of said carrier. It is to be noted that part 31a of magnetic element 31 is positioned flush with the rolling surface of wall 33 whereas part 31b of said element either projects from side wall 34 or may be even with said side wall 34. By slidably fitting said piece 31 into said carrier 30 part 31b may be regulatedly spaced from side face 34. It is understood that either wall 33 or one of the side faces, say 34, may be utilized as the contacting surface with a suitable support (not shown), so that either part 31a or 31b may be the utilized part of the magnetic piece 31.

In Fig. 7 centrally disposed within ball-shaped carrier 35 is a substantially rectangular magnetic bar 36. Driven within ball carrier 35 is a plurality of pin-like elements 37, 38 the tapered or pointed ends of which contact the said bar 36, whereas the head portions 37a, 38a are substantially flush with the outermost surface of said carrier 35.

In Fig. 8 the ball carrier 39 contains a similar bar magnet 40, the pin-like elements 41, 42 being however disposed such that the respective heads thereof 41a, 42a are in close contact with said bar 40 whereas the pointed ends 41b and 42b slightly project beyond the outermost curved surface of ball carrier 39.

In Fig. 9 the ball-shaped carrier 43 is provided with a horse-shoe magnet 44, which ends are carried to the surface of said carrier and are joined by a keeper or armature 45, the latter being preferably secured to said carrier at 46 in any suitable manner. A bar magnet 47 may also be placed within ball 43, edges 48 of which bar may slightly project from the surface 43 of said carrier. The inner end of bar 47 may be somewhat flared, as indicated by numeral 49 to facilitate securement of said bar within said carrier.

Fig. 10 illustrates on an enlarged scale a portion of ball carrier 43 with a part of horse-shoe magnet 44, the keeper or armature shown in Fig. 9 being eliminated. Edges 50 of the magnet 44 slightly protrude from the surface of said carrier 43 to provide effective attraction surfaces on said carrier.

Fig. 11 shows a carrier 51 barrel-shaped in form provided with magnetic power pieces 52 arranged in spaced apart relation on the curved surface of said carrier.

Figs. 12 and 13 disclose a skeleton or frame 53 having cross arms 54, 55 made of magnetic material and in which may be contained a spherical body 56, as shown in Fig. 14. The curved cross arms 54, 55 thus form part of the arcuate surface of said body 56.

Fig. 15 shows in top plan view a spherical carrier 57 in which there is disposed a magnet bar 58 from the polar area of which extend differently sized elements 59, 60, 61, which conduct magnetic flux of different intensities to various points of the surface of carrier 57.

Figs. 16 and 17 illustrate a spherical body 62 in which is centrally located a magnetic core 63 with which contacts a pin-shaped member 64 conducting magnetic power flux to the surface of said body or carrier 62 and which further connects with a secondary conductor 65 removably positioned at the surface of the body 62, the said conductor 65 having a projection 66 embedded in the material of body 62.

In Fig. 18 the carrier 67 has magnetic bar 68 embedded in its spherical surface and connecting with a conducting member 69. Member 69 is preferably pivoted at 70 to bar 68 and is provided with a pin 71 to secure the said member 69 at any desired location of said surface determined by said pivot connection 70.

The aforesaid devices each including a carrier and magnetic power means connected therewith may be employed for numerous purposes, as it will be easily realized.

It is obvious from the above disclosure that a device of the aforesaid nature may be utilized particularly in games, wherein magnetic attraction of object or objects is desired during various stages of the game.

Fig. 19 shows examples how, for instance, the invention may be employed. There is disclosed, for example, one row of objects 75, 76, 77 made of material which may be attracted by a magnet, as, for instance, sheet iron and which may carry suitable indicia such as numbers 2, 5, 3, etc. Ball carrier 78 has the magnet 79 and it is evident that by rolling the ball 78 along the surface 80 and in alignment with one of said objects, say 76, the carrier may pick up by means of its magnet 79 the said object 76. It is of course necessary that the object 76 be in the path of the rolled magnet 79 to be attracted and kept thereby.

Again the top 81 which carries the magnet 82 may be spun on its pivot 83 by means of a handle 84 in the direction of the object 85 resting in standing position on surface 80, the said object 85 being made of a material, such as sheet iron.

which lends itself to being attracted by said magnet 82.

As the top 81 skims past object 85 the latter will be attracted or displaced by the magnetic influence of magnet piece 82.

Although I have described my improvments with considerable detail and with respect to certain particular forms of my invention, I do not desire to be limited to such details since many changes and modifications in the form, arrangements, proportions and sizes thereof may well be made without departing from the spirit and scope of my invention in its broadest aspect.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent, is:

1. A device of the character described comprising a body of non-magnetic material having a substantially spherical surface, and permanent magnetic means, at least one portion of said means lying in said surface and providing magnetic flux thereat, said portion being conformed substantially to the contour of said surface whereas the remainder of said means is embedded within said body.

2. A device of the character described comprising a body of non-magnetic material provided with an external curved surface, and magnetic means having opposed poles, at least one of said poles of said magnetic means piercing said surface from within said body and forming part of the surface at its piercing location, whereby an area of magnetic influence is obtained adjacent said location.

3. A device of the character described comprising a body of non-magnetic material having a substantially spherical surface, and magnetic means anchored in a recess of said body and provided with at least one portion positioned in and forming part of said surface, whereby areas of magnetic influence and non-magnetic influence, respectively, are obtained at said surface.

4. A device of the character described comprising a body of non-magnetic material and provided with a substantially spherical surface, and a plurality of permanent magnetic means extending in different directions in said surface and supported in cavities provided within said surface, said means forming parts of said surface.

5. A device of the character described comprising a body of non-magnetic material having a substantially curved surface, and permanent magnetic means, said means comprising a plurality of arcuately shaped magnets angularly disposed to each other and embedded in said surface and said body, whereby said body is provided with substantially curved magnets which are flush with the surface thereby providing magnetic and non-magnetic areas on the said surface of said body.

6. A device of the character described comprising a body having a substantially curved surface, and permanent magnetic means, said means being embedded in said surface and forming a portion of said surface, and magnetic elements differing from each other in size and acting as magnetic conductors and extending respectively, from said magnet means in and over said curved surface, whereby magnetic energy is provided at and adjacent respective areas formed by said permanent magnet means and said magnetic elements.

7. A device of the character described comprising a body of non-magnetic material having a substantially curved surface, and permanent magnetic means, said means comprising a permanent magnet extending from an area on said surface through said body diametrically to an area opposite to said first-named area, both said areas containing the ends of said permanent magnet, whereby magnetic polar areas are provided at said ends.

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