Nov. 18, 1952

F. I. SAMET

TOY WITH MAGNETICALLY CONTROLLED RESPONSE

Filed Aug. 3, 1948

INVENTOR, FRANK I. SAMET

ATTORNEY
TOY WITH MAGNETICALLY CONTROLLED RESPONSE

Frank I. Samet, New York, N. Y.
Application August 3, 1948, Serial No. 42,291

13 Claims. (Cl. 46—45)

This invention relates to toys having magnetically controlled responses.

It is an object of my invention to provide a toy of the character described which incorporates a type of magnetic response.

More specifically, it is an object of my invention to provide a toy of the character described constituting a stationary member and two movable members, of which one is magnetically controlled, wherein the two movable members may experience a limited relative movement, and thereafter will move together, so that a novel and amusing effect is secured.

It is another object of my invention to provide a toy of the character described which comprises relatively few and simple parts, and has a simple, rugged and durable construction.

It is a further object of my invention to provide a toy of the character described which is capable of formingly differentiating between two persons one of which is familiar with its principle of operation.

It is an additional object of my invention to provide a toy of the character described in the form of an animal with a pivotally mounted head and movable eyes, wherein the eyes can be made to roll within a limited compass while the head is stationary, and beyond that will move the head with them.

It is yet another object of my invention to provide a toy of the character described whose head and eyes will follow a simulated desired object when the object is held in a certain manner, but which will turn away from or be repelled by the same object held in a different manner.

It is still another object of my invention to provide a toy animal of the character described in conjunction with an enclosure, wherein the animal will follow with its head, eyes and body (if the latter is present) a simulated desired object properly held in proximity thereto and thus will emerge from the enclosure, but which will retreat into the enclosure if the desired object is held differently.

Other objects of my invention will in part be obvious and in part will be pointed out hereinafter.

My invention accordingly consists in the features of construction, combinations of elements and arrangements of parts which will be exemplified in the device hereinafter described and of which the scope of application will be indicated in the appended claims.

In the accompanying drawings in which is shown one of the various possible embodiments of my invention,

Fig. 1 is a front view of a toy dog and dog house constructed in accordance with my invention;

Fig. 2 is a sectional view taken substantially along the line 2—2 of Fig. 1 and also showing in section a bone-shaped object used to manipulate the dog;

Fig. 3 is a reduced sectional view taken substantially along the line 3—3 of Fig. 2, the same being illustrative of the details of the means for permitting the dog to move in and out of its house;

Fig. 4 is a sectional view taken substantially along the line 4—4 of Fig. 2 and illustrative of the movable eye mechanism;

Fig. 5 is a sectional view taken substantially along the line 5—5 of Fig. 2 and illustrating the support for the dog’s head; and

Fig. 6 is a fragmentary sectional view similar to Fig. 2 but showing the dog’s eyes in a different position corresponding to a new position of the bone-shaped object.

In general, I carry out my invention by rotatably mounting a hollow, non-magnetic toy head on a supporting element. Desirably, the axis of rotation of the head is inclined somewhat to the vertical so that the head will seek a predetermined position of rest when idle. Optionally, the head mounting additionally may be such as to permit rotation of the head about a horizontal axis so that the head can swivel. Within the head I provide an eye member which is mounted so as to be movable relative to the head, said eye member being supported upon the head supporting element (or, equivalently, upon an element movable with the head supporting element) so that the eye member is movable independently of the head. In the preferred form of my invention, the supporting element for the eye member constitutes a continuation of a spindle which comprises the supporting element for the head. The eye member is located in back of one or more eye openings in the head so that upon movement of said member, the eyes will experience a movement relative to the head, can be made to open or close the eyes, or can be caused to roll.

Moreover, the head and eye member are provided with cooperating abutment portions for limiting relative movement of the eye member with respect to the head so that if the eyes are urged to move beyond their predetermined limit with respect to the head, they will cause the head to move with them.

The eye member carries a magnet whose polar axis (the axis joining the north and south poles) is normal to the forehead. This magnet cooperates with one or more magnets in an exterior object such as a simulated bone. The exterior object preferably is elongated and has one pole of each of its magnets adjacent a different end of the object, said magnet or magnets having their polar axes arranged parallel to the longitudinal axis of the object.

With this arrangement, when the exterior object is approached to the toy head and a pole of
the object magnet is brought into propinquity with the forwardly extending pole of the head magnet, the eye member will swing in one of two ways, depending upon which pole of the exterior object is approached to the toy head. If the pole of the object magnet is of the opposite polarity from the forward pole of the head magnet, the head magnet will follow movement of the exterior object. Should the exterior object be moved away from the head magnet, the eye member will move up with it. When the exterior object is rolled, the eye member will roll with it. When the exterior object is moved from side to side, the eye member will move with it, and if the movement from side to side is extensive enough, the eye member will cause the head to move from side to side. In general, when the eye member moves to a limit of its travel with respect to the head and the mounting of the head is such as to permit movement of the latter in the same direction, continued movement of the eye member will move the head in such direction when the exterior object is properly handled.

If the pole of the object magnet is of the same polarity as the forward pole of the head magnet, the head magnet will be repelled upon approach of the object magnet, so that when the exterior object is brought near the head, the head will move away from the exterior object. This will have the effect of causing the head to swing away from the exterior object and thus appear to refuse to accept the same.

It may enhance the attractiveness of the toy by mounting the head supporting element in such fashion that it too is permitted movement, preferably in a horizontal plane. With such an arrangement if the forward pole of the magnets in the exterior object has a polarity opposite to that of the forward pole of the magnet in the toy head, not only will the toy head swing after the exterior object as it is moved from side-to-side, but the head also will reciprocate as a whole as the exterior object is moved back and forth.

Conversely, by mounting the supporting element of the exterior object, the head will return to its starting point, and also move from side to side.

Back-and-forth movement of the toy, as distinguished from side-to-side movement, may be taken advantage of to make the toy even more fascinating. This is accomplished by employing an enclosure, for instance a house or fence, into or out of which the toy can move through a suitable opening by proper manipulation of the exterior object. Thus, when the exterior object is properly approached to the toy as if to offer the same thereto, the toy will move out of the enclosure, but when the exterior object is reversed and approached to the toy, the toy will retreat into the enclosure.

Referring now in detail to the drawings, the reference numeral 10 denotes a toy constructed in accordance with my invention. Said toy includes a thin-walled hollow dog's head 12, constructed from a light non-magnetic material such as rubber, Bakelite, or a synthetic plate. The head preferably is shaped to provide a substantial snout 14 and the underside of the head is entirely open. Said head is provided with a pair of eye openings 16 above the snout and below the forehead 17.

The head is supported on a spindle 18 which, as best shown in Fig. 2, is inclined forwardly at a slight angle to the vertical, e.g., 20°. The spindle includes a lower portion 20 of greatest diameter, an intermediate portion 22 of lesser diameter and a top portion 24 of smallest diameter, the spindle being shouldered where these portions join. To facilitate mounting of the head on the spindle in such fashion as to allow rotation of the head about the longitudinal axis thereof, said head is provided with a top metal bridge 26 (see Fig. 5). This bridge consists of a strip 28 which spans the interior of the head in the region of the ears and has its ends suitably fixed thereto, as by disposition in opposed registered slots 30 formed in the head. The strip is held in position in a cam-Lamont manner, as by being wedged in the slots or by having a drop of glue 32 deposited at the lower ends of the slots after the strip has been positioned.

At the center of the strip I provide a pair of integral, rearwardly extending, parallel, vertically spaced ears 32, 34 which are provided with registered apertures 35, 33 of proper size to rotatably receive the intermediate spindle portion 22. The lower aperture 33 may be just slightly larger than said portion, e.g., .005 of an inch, and the upper aperture 35 is elongated in a front-to-back direction (see Fig. 5), thus enabling the head to turn about the longitudinal axis of the spindle 18 and additionally to permit a limited rotation of the head about a horizontal axis so that the head can experience a swivelling motion.

The head also includes suitable eyes. In the form of my invention shown herein, the eyes comprise a flat sheet metal plate 40 (Fig. 4) having replicas 42 of a dog's eyes on its front surface. Any conventional method of forming these eyes may be employed, as for example, printing, etching, hand-painting or die-stamping. The eyes are smaller than the eye openings and are spaced apart a distance between the centers equal to the distance between the centers of the eye openings. Said plate may be of a generally rectangular outline as indicated in Fig. 4 and is provided with an opening 44 disposed on the vertical center line of the plate for a purpose which soon will be apparent. The upper edge of the opening has an integral rearwardly extending lug 46 which is formed with a through aperture 48. The plate is disposed immediately in back of the eye openings, and, for convenience, the top edge of the dog's head is made flat and vertical at its interior surface.

Said plate is carried by a sheet metal lever 60 which swivels on the spindle 18. The lever has a pair of laterally extending, parallel, vertically spaced ears 62, 64 which are provided with a set of registered apertures 59, 58. The lower aperture 58 is slightly, e.g., .005 of an inch, larger than the diameter of the upper spindle portion 24. The upper aperture 56 is elongated in a front-to-back direction wherein said lever can turn about the longitudinal axis of the spindle 18 and rock about a horizontal axis. The end of the lever 50 in back of the spindle carries a counterweight 60 which counterbalances all the elements carried on the forward end of the spindle. The lever is captively held on the spindle by a nut 62 screwed on to the threaded tip of the spindle.

The forward end of the lever has an upwardly extending time 64 which is received in the opening 50 of the eye plate 40. This opening lies on the vertical center line of the plate and preferably is in back of the center of gravity of said plate, whereby the plate tilts forwardly and rests against the interior surface of the forehead. The
2,618,099

5. the eye plate is directly in back of the portion of the dog's head having the eye openings 16.

The forward end of the lever 59 also supports a bar magnet 66. In the preferred form of my invention, this magnet is made from a highly magnetic material, for example, Alnico IV. Any suitable combination is employed to mount the bar magnet on the lever. For instance, the lever may be provided with a pair of laterally extending flanges 68, 70 (Fig. 4) which embrace the top and bottom edges of the magnet and which have vertically extending legs 72 engaging a side surface of the magnet. The forward pole (in this instance, the south pole) of the magnet extends well into the snout 14 and desirably is disposed immediately adjacent the interior surface of the snout. In order to enable this pole of the magnet to maintain such a position with respect to the forward wall of the snout, the interior surface of the snout may be given an arcuate configuration in this region centering about the opening 56. Optionally, and in order to prevent side play of the eye plate, the opening 44 may include a notch 74 in its lower edge. This notch receives a downwardly extending rib 76 integral with the lever 50.

I prefer to have all of the movable elements, except the magnet, made of a light metal or material, for instance, aluminum or an aluminum alloy, in order to keep the weight of the head as low as possible, whereby the head and eyes are more easily movable by magnetic force.

Although it is within the scope of my invention simply to mount the spindle 16 within the stationary body of an animal so that the head rotates on a neck, a more engaging result is obtained by mounting the spindle in the manner illustrated in the drawings. As shown, the spindle is secured on a bar 78. Said bar is supported in such fashion that it can reciprocate in a vertical plane. To this end, the forward and rear portions of the bar are pivotally mounted on the outer ends of a pair of links 80, 82 (Fig. 3) whose other ends are pivotally fastened to a base plate 84. The distance between the points of pivotal mounting of the links on the base plate is about equal to the distance between the points of pivot attachment of the links to the bar, whereby when the bar is reciprocated it will remain parallel to itself.

The bar also may carry some or all of the animal's body. As illustrated, only a portion of the animal body is employed, this constituting a pair of fore paws 86 located in proper position with respect to the head 12 and fixedly attached at their rear ends to the bar, whereby they will move backward and forward with the bar and head.

The base plate 84 supports an enclosure 88 which may be of any configuration suitable to the type of animal used. In the instant case, the enclosure comprises a dog house with the usual front, back and side walls and peaked roof. The front wall of the dog house has an opening 96 through which the head 12 extends and can move. As shown Fig. 4, and explained in detail in Fig. 2, the head is defined that when in its foremost position, defined by abutment of the front link 80 against a stop 92 on the base plate, said bar is located on the front-to-back center line of the dog house. Likewise, when the bar is in its extreme rearmost position, defined by abutment of the back link 82 against a second stop 94, the bar is on the front-to-back center line of the dog house. The links 80, 82 desirably are made about as long as possible, without being exposed, in order that the side-to-side movement of the bar will be unnoticeable.

In the foremost position of the bar, the head extends almost the whole way out of the dog house as seen in Fig. 2 and in the rearmost position of the bar only the tip of the snout projects through said opening.

In order to move the head, I provide an exterior, free, manually manipulable member 96, which simulates an object attractive to the toy animal in the enclosure. In the form of my invention herein described, this object is a bone and the same may be fashioned from any suitable self-form-maintaining material, for instance, papier-mâché or clay. The object 96 houses one or two magnets 88, 100 which are so placed, that only a single pole of a magnet is adjacent an end of the object. If the object is elongated and two magnets are used, as is the case here, one pole, for example the north pole, of one magnet is located adjacent one end of the object, and the opposite pole of the other magnet is located adjacent the opposite end of the object.

In addition, the magnets may have their polar axes aligned and parallel to the longitudinal axis of the object.

In using the toy, one end of the free exterior object is approached to the snout of the animal. If the end of the object presented has a magnetic pole of opposite polarity to the pole of the head magnet 66 and the object is approached close enough to the snout, the force of magnetic attraction will cause the head magnet to approach the object, and, if the object is moved, to follow the same. Should the head, when approached by the object, be within the dog house, and should the object thereafter be moved away from the dog house the head will follow the object out of the dog house. If, when the head is either inside of, partly out of, or as far out of the dog house as it can move, the object 96 is moved up and down the magnet will move up and down with it, causing the eyes to open or close.

It may be mentioned here that the counterweight 60 either may be so adjusted as to have the eyes normally below the eye openings 16 or so that the level of said eye openings may be below, and if the object is approached to the head near the tip of the snout, the eyes will open. If the object is moved from side-to-side when held at the proper level to keep the eyes open, the eyes will move from side-to-side with the object.

The plate 16 is somewhat narrower than the space between the vertical abutment portions 102 of the animal's head in the horizontal path of travel of the plate so that when the object is moved from side-to-side, within a limited range, the eyes will move without causing any corresponding movement of the head. However, when the object is moved beyond this range, one or the other sides of the plate will strike the corresponding abutment portion, and thereafter, when the object is moved in the same direction the head will move with it.

It also will be appreciated that by rotating the object 96 through a small circle, the animal's eyes may be caused to roll.

The center of gravity of the head is forward of the opening 36 in the ear 34 so that when the head is at rest, the snout is at its lowestmost position with reference to the horizontal axis of rotation passing through said opening. If the
object is raised beyond the level required to open the eyes, the upper edge of the plate 40 will stroke the rearwardly extending interior surface 104 of the head in back of the flat vertical portion of the head around the eye openings. Thereafter, as the object is moved further upward, the head will rock in a clockwise direction (as viewed in Fig. 2) through a limited arc determined by the front-to-back dimension of the elongated opening 38.

When the other end of the object is presented to the head, the magnet will be repelled thereby so that when the object is held to the snout and the head is in its foremost position, it will retreat into the dog house as the object is advanced. Moreover, the head will turn to the side in order to move away from the vicinity of the object. This action may be taken advantage of to increase the amusement afforded by the toy, for, if one purposing to be the owner of the toy who has shown an interested bystander how the head apparently follows the bone hands the bone to a bystander, the bystander automatically will grasp the bone in a reverse position and, although he manipulates the bone in an apparently similar manner, exactly the opposite result will be obtained.

It should be observed that this latter feature of the toy is due to the fact that the head magnet has only a single pole in front.

It thus will be seen that I have provided a toy of the character described which achieves the several objects of my invention and is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiments above set forth, it is to be understood that all matter herein described or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A toy comprising a hollow head of a nonmagnetic material with an eye opening, a spindle, a bearing fixed to said head and rotatable on said spindle about the longitudinal axis thereof, an eye member disposed within said head, said eye member having a representation of an eye and being located behind the eye opening, a second bearing fixed to said eye member and rotatable on said spindle about the longitudinal axis thereof whereby said head and eye member are independently rotatable about the longitudinal axis of said spindle, a magnet within said head and connected to and movable with said eye member, said magnet having at least one pole thereof in proximity to the inner surface of said head, and an exterior object including a magnet adapted to be approached to said head.

2. A toy comprising a hollow head of a non-
and eye member are independently rotatable about the longitudinal axis of said spindle, said second bearing being oversized whereby said head additionally is limitedly rotatable about an axis perpendicular to the longitudinal axis of said spindle, abutment members being spaced apart farther than the corresponding dimension of the eye member whereby said eye member may experience a limited movement with respect to the head before said abutment members are contacted thereby and, thereafter, the head will move with the eye member as the eye member continues to move in the same direction, a magnet within said head and connected to and movable with said eye member, said magnet having at least one pole thereof in proximity to the inner surface of said head, and an exterior object including a magnet adapted to be approached to said head and in cooperation with the magnet in said head to cause movement of said eye member independently of or with said head.

9. A toy comprising a hollow head of a non-magnetic material with an eye opening, a spindle which is forwardly inclined with respect to a vertical plane passing from one side to the other of the head, a bearing fixed to said head and rotatable on said spindle about the longitudinal axis thereof, an eye member disposed within said head, said eye member having a representation of an eye and being located behind the eye opening, a second bearing fixed to said eye member and rotatable on said spindle about the longitudinal axis thereof whereby said head and eye member are independently rotatable about the longitudinal axis of said spindle, said second bearing being oversized whereby said eye member additionally is limitedly rotatable about an axis perpendicular to the longitudinal axis of said spindle, abutment members in the head and adapted to be contacted by said eye member as it turns about said spindle, said second bearing being oversized whereby said eye member may experience a limited movement with respect to the head before said abutment members are contacted thereby and, thereafter, the head will move with the eye member as the eye member continues to move in the same direction, a magnet within said head and connected to and movable with said eye member, said magnet having at least one pole thereof in proximity to the inner surface of said head, and an exterior object including a magnet adapted to be approached to said head and in cooperation with the magnet in said head to cause movement of said eye member independently of or with said head.

8. A toy comprising a hollow head of a non-magnetic material with an eye opening, a spindle which is forwardly inclined with respect to a vertical plane passing from one side to the other of the head, a bearing fixed to said head and rotatable on said spindle about the longitudinal axis thereof, said bearing being oversized whereby said head additionally is limitedly rotatable about an axis perpendicular to the longitudinal axis thereof whereby said eye member may experience a limited movement with respect to the head before said abutment members are contacted thereby and, thereafter, the head will move with the eye member as the eye member continues to move in the same direction, a magnet within said head and connected to and movable with said eye member, said magnet having at least one pole thereof in proximity to the inner surface of said head, and an exterior object including a magnet adapted to be approached to said head and in cooperation with the magnet in said head to cause movement of said eye member independently of or with said head.
11. A toy comprising a hollow head of a non-magnetic material with a pair of eye openings, said toy having a forehead whose interior surface is substantially flat, a spindle which is forwardly inclined with respect to a vertical plane passing from one side to the other of the head, a bearing fixed to said head and rotatable on said spindle about the longitudinal axis thereof, a flat plate having a pair of eyes represented thereon in substantially the same spaced relationship as said eye openings, said plate being located immediately back of said forehead and being parallel thereto, a lever, a second bearing being oversized whereby the lever additionally is limitedly movable about an axis perpendicular to the longitudinal axis of the spindle, a swivel pivotedly connecting said plate to said lever whereby the eyes are guided for up and down and sideways movement relative to the eye openings while remaining substantially parallel to the interior surface of the forehead of the toy, abutment members within said head adapted to be contacted thereby and, thereafter, the head will move with the eye member as the eye member continues to move in the same direction, a magnet within said head and connected to and movable with said eye member, said magnet having at least one pole thereof in proximity to the inner surface of said head, and an exterior object including a magnet adapted to be approached to said head and in cooperation with the magnet in said head to cause movement of said eye member independently of or with said head.

12. A toy comprising a hollow head of a non-magnetic material with a pair of eye openings, said toy having a forehead whose interior surface is substantially flat, a spindle which is forwardly inclined with respect to a vertical plane passing from one side to the other of the head, a bearing fixed to said head and rotatable on said spindle about the longitudinal axis thereof, a flat plate having a pair of eyes represented thereon in substantially the same spaced relationship as said eye openings, said plate being located immediately back of said forehead and being parallel thereto, a lever, a second bearing fixed to said lever and rotatable on said spindle about the longitudinal axis thereof whereby said lever and eye member are independently rotatable about the longitudinal axis of said spindle, said second bearing being oversized whereby the lever additionally is limitedly movable about an axis perpendicular to the longitudinal axis of the spindle, a swivel pivotedly connecting said plate to said lever whereby the eyes are guided for up and down and sideways movement relative to the eye openings while remaining substantially parallel to the interior surface of the forehead of the toy, abutment members within said head adapted to be contacted by the plate as it is moved from side to side, said abutment members being spaced apart farther than the corresponding dimension of the plate whereby said plate may experience a limited movement with respect to the head before said abutment members are contacted thereby and, thereafter, the head will move with the eye member as the eye member continues to move in the same direction, a magnet within said head and carried by said lever, said magnet having only a single pole extending forwardly, said pole being in proximity to the inner surface of the head, and an exterior object including a magnet adapted to have a single pole thereof approached to said head.

The following references are of record in the file of this patent:

**UNITED STATES PATENTS**

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>796,419</td>
<td>Halberg</td>
<td>Aug. 8, 1905</td>
</tr>
<tr>
<td>847,715</td>
<td>Wood</td>
<td>Mar. 19, 1907</td>
</tr>
<tr>
<td>1,424,082</td>
<td>Budin</td>
<td>Aug. 8, 1922</td>
</tr>
<tr>
<td>1,595,801</td>
<td>McDonald</td>
<td>Aug. 10, 1926</td>
</tr>
<tr>
<td>2,036,076</td>
<td>Philippi</td>
<td>Mar. 31, 1936</td>
</tr>
<tr>
<td>2,107,672</td>
<td>Lang</td>
<td>Feb. 8, 1938</td>
</tr>
<tr>
<td>2,277,672</td>
<td>Stone</td>
<td>Mar. 31, 1942</td>
</tr>
<tr>
<td>2,427,310</td>
<td>Harding</td>
<td>Sept. 9, 1947</td>
</tr>
<tr>
<td>2,427,442</td>
<td>Campbell</td>
<td>Sept. 16, 1947</td>
</tr>
</tbody>
</table>

**FOREIGN PATENTS**

<table>
<thead>
<tr>
<th>Number</th>
<th>Country</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>9,811</td>
<td>Great Britain</td>
<td>1894</td>
</tr>
</tbody>
</table>