Jan. 21, 1958 I. MARINSKY 2,820,319

BALL AND RACE TOY

Filed June 10, 1955 2 Sheets-Sheet 1

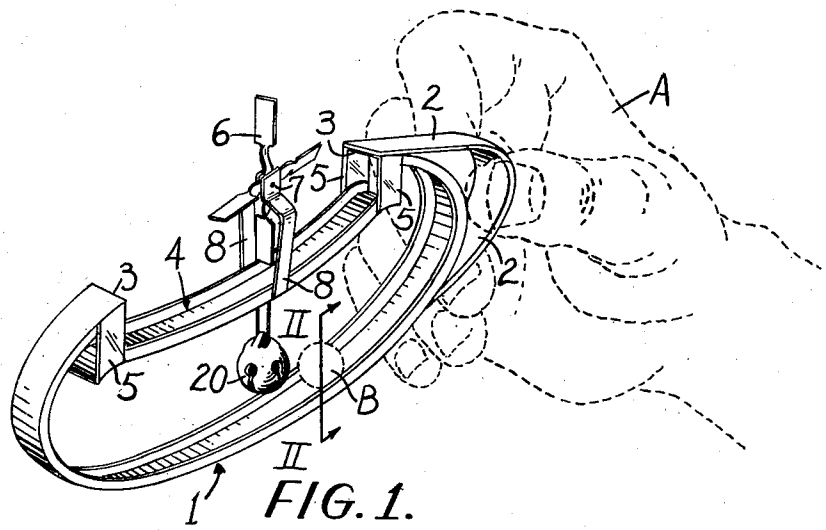


FIG. 1.

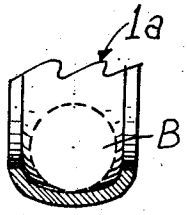


FIG. 3.

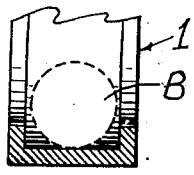


FIG. 2.

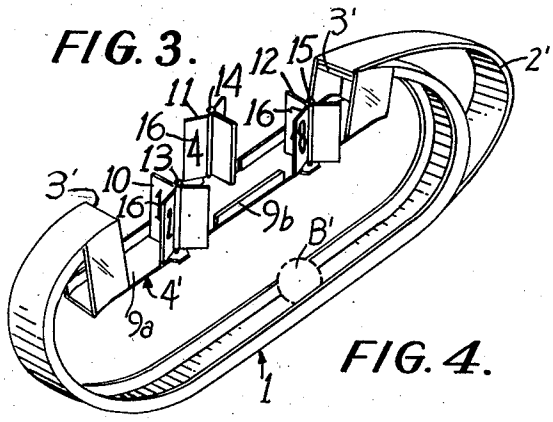


FIG. 4.

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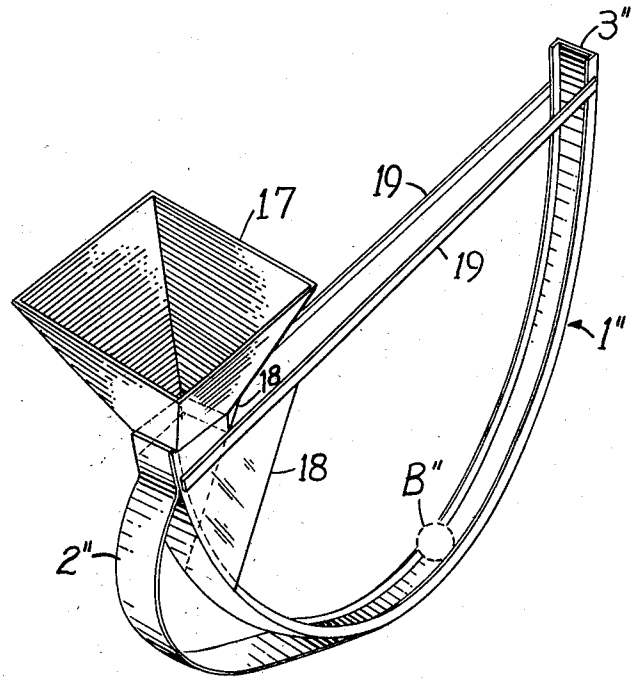


FIG. 5.

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BALL AND RACE TOY

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6 Claims. (Cl. 46—42)

Generally speaking, the present invention relates to the moving-ball toy art and, more particularly, pertains to a ball-race toy, cooperable with a ball to allow a user to impart entertaining and cyclic motion thereto over a cyclic ball path when motion is sufficiently skillfully manually applied to the toy.

Applicant is aware that various toys allowing the motion of a ball in a race or runway have been invented and developed heretofore; but all such toys, known to applicant, have suffered from numerous disadvantages. While it should be possible for a normal person to learn how to operate such a toy, to make the toy interesting and educational, some skill and coordination shoud be necessary to operate it successfully—and such prior toys have been too easy to operate because of such factors as a nearly or completely enclosed runway, which also hides the ball from view. Such toys have also lacked the fascination of having the ball perform some interesting action while in a special part of its path.

Generically speaking, the present invention comprises ball race means partially constraining the motion of said ball over portions of a cyclic ball path (said portions usually lying virtually in a single plane) and a handle member, manually graspable and in force-imparting, ball-actuating relationship to said race means. By a cyclic ball path is meant, herein, a path which when completely traversed once by a ball returns the ball to its starting point: that is, such a path is a closed circuitous path (when the toy is successfully operated). Said ball race means, generically speaking, includes longitudinally arcuate ball-guiding channel means, has a ball exit region, and has a ball reception region; said cyclic ball path is completed through an action region, through which said ball is movable in an active, entertaining manner, between said ball exit and ball reception regions. In one generic form of the present invention, said ball-guiding channel means is of generally U-shaped lateral cross-section, but the U is shallow. Intentional manual, centrifugal, and gravitational forces on the ball are in said single plane of the ball path, directed against said channel means, but accidental forces may be normal to said plane. The construction of the channel, relative to the side of ball ordinarily used with the toy (usually a so-called "marble"), is such that it will hold the ball when the acceleration thereof is directed out of said plane by a small angle; the ball is thus restrained from leaving the channel under the action of forces normal to said plane and small compared to the (planar) forces acting in said plane, but permitted to leave the channel under the action of forces comparable to said planar forces and normal to said plane. Therefore, an element of skill and coordination is required to keep the ball in its path.

In one generic form of the present invention, said action region is an aerial action region betwen said ball exit region and said ball reception region, through which the ball can move without constraint. Manual motion of the handle means, and thus of the toy as a whole, if

skillfully performed, results in movement of the ball along said channel means until it projects under its own momentum from said exit region into the air, where it moves freely (and, of course, not necessarily in said single plane) until captured in said ball reception region, through the skill of the user, to return to the channel means. In this form, the ball-race means usually includes a mouth portion, tapering like a horn, which defines the ball reception region and guides the ball into said channel means.

In another generic form of the present invention, said action region is defined more restrictedly; said ball race means includes action-channel means constraining said ball to move through said action region. In this form, the present invention includes ball-actuated means held by said action-channel means and having portions lying partially in said ball path to be movable by the impact of said ball. In a preferred form, said ball-actuated means includes a plurality of vane members mounted in relatively rotatable relationship to said action-channel means and lying partially in said action region. These vane members are thus rotated by the impact of the ball as it passes along its path. Audible ball-actuated means may also be provided in some forms.

In any of the above forms of the present invention, the user's object in operating the toy is to make the ball traverse its path, with resulting action, as many times (cycles), in succession as he can.

From the above description of the basic form and various preferred forms of the present invention, it will be apparent to those skilled in the art that the hereinabove-mentioned disadvantages of prior ball and race toys are virtually entirely eliminated and overcome in and through the use of the present invention. For example, it is apparent that the present invention, while operable by any normal child or adult, will require for successful operation the existence or development of a sizable amount of skill and eye-hand coordination in the user. Further, the user will find the toy entertaining and fascinating by reason of the actions performed by the ball as it passes through the action region, as well as by reason of the visibility of the ball in its path. It is also clear that the toy may be constructed very simply, strongly, and inexpensively. It should be noted that the handle permits the device to be effectively manipulated without the probability of intrusion of the user's hand into the path of the ball.

With the above points in mind, it is an object of the present invention to provide a toy which requires, and by its use develops, such skill and eye-hand coordination in its user that he can by manipulation of the toy cause a ball to describe a cyclic path and perform certain interesting actions while in portions of said path.

It is also an object of the present invention to provide a toy, with the characteristics set forth in the preceding object, in which a ball may be visibly set in motion while in a race, caused to perform an interesting action, and returned to said race by a skillful person, but in which the accidental actions of an unskillful person will cause the ball to readily leave the race or fail to return to it.

It is a further object of the present invention to provide a toy, as characterized in the above first two objects, in which an action of the ball in its path is to move freely through the air until recaptured by the user.

A further object of the present invention is to provide a toy, as characterized in the above first two objects, in which an action of the ball in its path is to hit against a ball-actuated member to cause the entertaining movement of said member.

Other and allied objects of the present invention will occur to those skilled in the art after a careful study of

the present specification, the accompanying illustrations, and the appended claims.

To facilitate understanding, reference will be made to the hereinbelow-described drawings, in which:

Fig. 1 is a perspective view of a preferred embodiment of the present invention, held by a user's hand (dashed lines);

Fig. 2 shows a section through a broken-off portion of the ball-guiding channel means of the device of Fig. 1, taken at the position and in the direction shown by the line and arrows II—II of Fig. 1;

Fig. 3 shows a section, similar to that of Fig. 2, through a modified form of the ball-guiding channel means usable in the device of Fig. 1;

Fig. 4 is a perspective view of a second preferred form of the present invention, parts similar to those of the device of Fig. 1 being numbered similarly, but with primed numerals; and

Fig. 5 is a perspective view of a third preferred embodiment of the present invention, parts similar to those of the device of Fig. 1 being numbered similarly but with doubly primed numerals.

In the device of Figs. 1 and 2, the longitudinally arcuate ball-guiding channel means takes the form of the shallow channel member generally U-shaped in section, indicated at **1**. The handle means takes the form of the strip **2**, attached to the back of channel **1** so that the user's hand A will not impede the motion of ball B in the inside of the channel. The channel shown at **1** in Figs. 1 and 2 is of a "squared-off" shape in section; it may be replaced by a channel of the (equivalent) curved shape shown in Fig. 3 at **1***a*, or by other channels restraining the ball's movement within approximately the same lateral arc as does channel **1**. Similarly, the longitudinal curvature of channel **1**, although it should total about 360 degrees of arc, need not be of the configuration shown, provided that it is gradual.

The action region, in the device of Fig. 1, is defined as the portion of the ball path between the ball exit region and the ball reception region—which in this device are equivalent, each being at a free end **3** of the channel **1**; constraining the motion of the ball while in the action region is the action-channel **4**, which is connected to the channel **1** by holders **5**. The ball B, in use, is moved rapidly through the channel **1** until it reaches one of the free ends **3** and, leaving channel **1** virtually at a tangent, drops into action-channel **4**, through which it rolls until at the other free end it drops back into channel **1**. Channel **4**, like channel **1**, can have a variety of cross-sectional shapes (both laterally and longitudinally) other than the configuration shown.

The ball-actuated means may include bell **20**, attached to the bottom of channel **4** to lie in the path of the ball as it passes through channel **1**; and vaned member **6**, rotatably mounted by a pin **7** to supports **8**, which are attached to action-channel **4**. As the ball passes through channel **4**, it hits one of the vanes of member **6**; and as the ball passes repeatedly when the device is successfully operated, member **6** is maintained in rotary motion in either sense, clockwise or counter-clockwise, chosen by the user at the start. Also, as the ball returns through channel **1** on each cycle, the bell **5** is audibly struck.

In the embodiment shown in Fig. 4, the ball-guiding channel means and handle means take forms similar to those of Fig. 1; although action-channel **4'** is shown with a flat bottom **9***a* and a rim **9***b* having gaps to permit the rotation of the ball-actuated means—which are rotatable members **10**, **11**, and **12**, mounted by pins **13**, **14**, and **15**, respectively, to projections from bottom **8**—it should be noted that by mounting members **10**, **11**, and **12** on the rim of the channel, no longer adjacent to the bottom thereof, it is again possible to use a curved channel like that of Fig. 3. In the form of Fig. 4, each of the rotatable members is hit in succession by ball B'; various symbols, such as the numbers shown, as at **16**, may be marked on the vanes to increase user interest and allow various games to be played with the device (as, it might be an object of such a game to have certain number triplets be visible at once).

In the embodiment shown in Fig. 5, the action region is the aerial action region about the device; the ball exit region is at the free end **3''** of channel **1''**; the ball reception region is defined by the mouth member **17**, which is connected to channel **1''** at the back directly (above handle **2''**) and at the sides by the triangular members **18**—when the ball enters the reception region within member **17**, it may bounce from wall to wall once or twice, and the members **18** serve to prevent the ball's leaving the channel from this cause (which is beyond the control of the user). Strengthening members **19** may be connected from members **18** to free end **3''** to give strength to channel **1''** and preserve its shape.

Numerous modifications and variations of the present invention will occur to those skilled in the art after a careful study hereof. All such, properly within the basic scope and/or teachings of the present invention are intended to be included and comprehended herein as fully as if specifically described, illustrated and claimed herein.

For example, other types of handle, other than the strip with two-point connection to the channel, may be used. The ball-actuated means may take other forms generally rotatable under the impact of a ball, or may include audible-contact means other than the bell shown, or the bell may be omitted. Further, as is made evident by the position of the bell, the ball-actuated means may be placed at almost any region in the ball path, which region will then constitute said action region by definition; that is, the channel **4** or **4'** need not define the action-region, even though in the illustrated forms of Figs. 1 and 2 it does so and thus constitutes the action-channel.

It should also be noted that although the ball exit and reception regions are defined by differing structures in the device of Fig. 5, in the devices of Figs. 1 and 4 said regions are defined by similar structures; which of the free ends **3** (or **3'**) is called, e. g., the ball exit region depends on the direction chosen by the user for the ball to travel.

The exact compositions, configurations, relative positionings and cooperative relationships of the various component parts of the present invention are not critical, and may be modified substantially within the basic teachings, spirit and scope of the present invention.

The embodiment of the present invention specifically described, illustrated and claimed herein is examplary only, and is not intended to limit the scope of the present invention, which is intended to be interpreted in the light of the prior art and the appended claims only, with due consideration for the doctrine of equivalents.

I claim:

1. A toy, cooperable with a ball to allow a user to impart entertaining and cyclic motion thereto over a cyclic ball path, comprising: ball race means partially constraining the motion of said ball over portions of said cyclic ball path; said ball race means including longitudinal arcuate ball-guiding channel means, said channel means being inwardly open and cooperable to receive, guide, and constrain said ball to move along the inside of the arcuate curvature thereof; a handle member, attached to said channel means, suited to be manually grasped to allow ball-actuating motion to be given to the toy; said cyclic ball path being completed through an action region, through which said ball is movable; said ball race means also including outwardly open action-channel means cooperable to receive, guide, and constrain said ball to move along the outside of said action-channel means through said action region, said ball race means having a ball exit region and a ball reception region connecting the inwardly open ball-guiding channel means and the outwardly open action-channel means at each end of

said action-channel means, said action region being positioned between said ball exit region and said ball reception region along the outside of the outwardly open action-channel means; signal-operating means mounted adjacent said ball race means at least partially in said ball path to be movable by impact with said ball; and signal means actuated by said signal-operating means.

2. A toy, cooperable with a ball to allow a user to impart entertaining and cyclic motion thereto over a cyclic ball path, comprising: ball race means partially constraining the motion of said ball over portions of said cyclic ball path lying virtually in a single plane; said ball race means including longitudinal arcuate ball-guiding channel means, said channel means being inwardly open and cooperable to receive, guide, and constrain said ball to move along the inside of the arcuate curvature thereof; a handle member, attached to said channel means, suited to be manually grasped to allow ball-actuating motion to be given to the toy; said cyclic ball path being completed through an action region, through which said ball is movable; said ball race means also including outwardly open action-channel means cooperable to receive, guide, and constrain said ball to move along the outside of said action-channel means through said action region, said ball race means having a ball exit region and a ball reception region connecting the inwardly open ball-guiding channel means and the outwardly open action-channel means at each end of said action-channel means, said action region being positioned between said ball exit region and said ball reception region along the outside of the outwardly open action-channel means; signal-operating means mounted adjacent said action-channel means and having portions lying partially in said ball path to be movable by the impact of said ball; and signal means actuated by said signal-operating means; said ball-guiding channel means being of generally U-shaped lateral cross-section with the open portion of the U inwardly directed, said channel means restraining said ball from lateral channel-leaving motion in response to a force normal to said single plane and small relative to planar forces applied to said ball in said plane.

3. A toy, cooperable with a ball to allow a user to impart entertaining and cyclic motion thereto over a cyclic ball path, comprising: ball race means partially constraining the motion of said ball over portions of said cyclic ball path lying virtually in a single plane; said ball race means including longitudinal arcuate ball-guiding channel means, said channel means being inwardly open and cooperable to receive, guide, and constrain said ball to move along the inside of the arcuate curvature thereof; a handle member, attached to said channel means, suited to be manually grasped to allow ball-actuating motion to be given to the toy; said cyclic ball path being completed through an action region, through which said ball is movable; said ball race means also including outwardly open action-channel means cooperable to receive, guide, and constrain said ball to move along the outside of said action-channel means through said action region, said ball race means having a ball exit region and a ball reception region connecting the inwardly open ball-guiding channel means and the outwardly open action-channel means at each end of said action-channel means, said action region being positioned between said ball exit region and said ball reception region along the outside of the outwardly open action-channel means; display-operating means mounted adjacent said ball race means at least partially in said ball path to be movable by the impact of said ball; and display means moved by said display-operating means; said ball-guiding channel means being of generally U-shaped lateral cross-section with the open portion of the U inwardly directed, said channel means restraining said ball from lateral channel-leaving motion in response to a force normal to said single plane and small relative to planar forces applied to said ball in said plane.

4. A toy, cooperable with a ball to allow a user to impart entertaining and cyclic motion thereto over a cyclic ball path, comprising: ball race means partially constraining the motion of said ball over portions of said cyclic ball path lying virtually in a single plane; said ball race means including longitudinal arcuate ball-guiding channel means, said channel means being inwardly open and cooperable to receive, guide, and constrain said ball to move along the inside of the arcuate curvature thereof; a handle member, attached to said channel means, suited to be manually grasped to allow ball-actuating motion to be given to the toy; said cyclic ball path being completed through an action region, through which said ball is movable; said ball race means also including outwardly open action-channel means cooperable to receive, guide, and constrain said ball to move along the outside of said action-channel means through said action region, said ball race means having a ball exit region and a ball reception region connecting the inwardly open ball-guiding channel means and the outwardly open action-channel means at each end of said action-channel means, said action region being positioned between said ball exit region and said ball reception region along the outside of the outwardly open action-channel means; display-operating means mounted adjacent said action-channel means and having portions lying in said ball path to be movable by impact of said ball; and display means rotatably moved by said display-operating means; said display means including a plurality of vane members mounted in relatively rotatable relationship to said action-channel means and lying partially in said action region; said ball-guiding channel means being of generally U-shaped lateral cross-section with the open portion of the U inwardly directed, said channel means restraining said ball from lateral channel-leaving motion in response to a force normal to said single plane and small relative to planar forces applied to said ball in said plane.

5. A toy, cooperable with a ball to allow a user to impart entertaining and cyclic motion thereto over a cyclic ball path, comprising: ball race means partially constraining the motion of said ball over portions of said cyclic ball path lying virtually in a single plane; said ball race means including longitudinal arcuate ball-guiding channel means, said channel means being inwardly open and cooperable to receive, guide, and constrain said ball to move along the inside of the arcuate curvature thereof; a handle member, attached to said channel means, suited to be manually grasped to allow ball-actuating motion to be given to the toy; said cyclic ball path being completed through an action region, through which said ball is movable; said ball race means also including outwardly open action-channel means cooperable to receive, guide, and constrain said ball to move along the outside of said action-channel means through said action region, said ball race means having a ball exit region and a ball reception region connecting the inwardly open ball-guiding channel means and the outwardly open action-channel means at each end of said action-channel means, said action region being positioned between said ball exit region and said ball reception region along the outside of the outwardly open action-channel means; signal operating means mounted adjacent said ball race means at least partially in said ball path to be movable by impact with said ball; and signal means actuated by said signal-operating means; said signal means including sound-producing signal means cooperable to produce and emit sound in response to actuation thereof by said signal-operating means.

6. A toy, cooperable with a ball to allow a user to impart entertaining and cyclic motion thereto over a cyclic ball path, comprising: ball race means partially constraining the motion of said ball over portions of said cyclic ball path lying virtually in a single plane; said ball race means including longitudinal arcuate ball-guid-

ing channel means, said channel means being inwardly open and cooperable to receive, guide, and constrain said ball to move along the inside of the arcuate curvature thereof; a handle member, attached to said channel means, suited to be manually grasped to allow ball-actuating motion to be given to the toy; said cyclic ball path being completed through an action region, through which said ball is movable; said ball race means also including outwardly open action-channel means cooperable to receive, guide, and constrain said ball to move along the outside of said action-channel means through said action region, said ball race means having a ball exit region and a ball reception region connecting the inwardly open ball-guiding channel means and the outwardly open action-channel means at each end of said action-channel means, said action region being positioned between said ball exit region and said ball reception region along the outside of the outwardly open action-channel means; signal-operating means mounted adjacent said ball race means at least partially in said ball path to be movable by impact with said ball; and signal means actuated by said signal-operating means; said signal means including a plu-

rality of vane members mounted in relatively rotatable relationship to said ball race means and lying at least partially in said ball path; said ball-guiding channel means being of generally U-shaped lateral cross-section with the open portion of the U inwardly directed, said channel means restraining said ball from lateral channel-leaving motion in response to a force normal to said single plane and small relative to planar forces applied to said ball in said plane; said signal means including sound-producing signal means cooperable to produce and emit sound in response to actuation thereof by said signal-operating means.

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