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TOY HEMISPHERE WITH MUSIC BOX THEREIN

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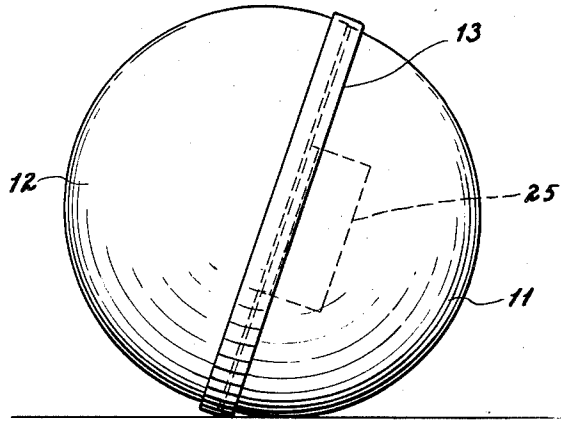


Fig. 1

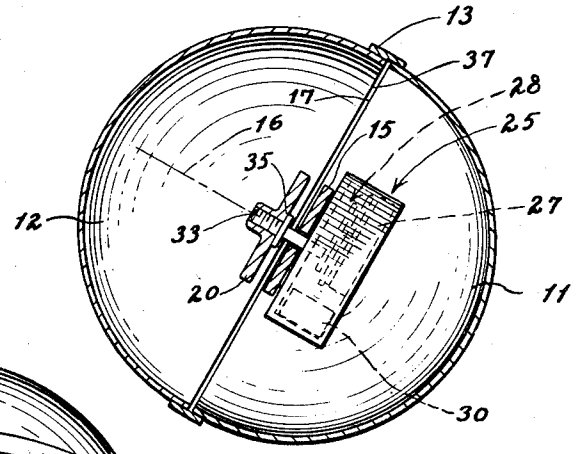


Fig. 2

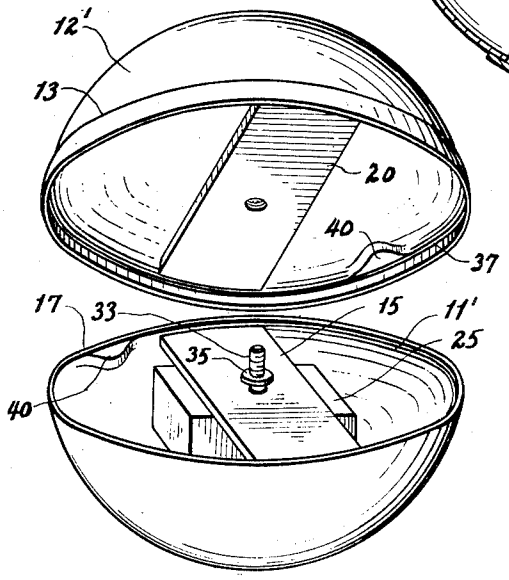


Fig. 3

INVENTOR.
Alfred A. Anthony
BY Emery, Vanner, Whittemore & Dix.
ATTORNEYS

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TOY HEMISPHERE WITH MUSIC BOX THEREIN

Alfred A. Anthony, Westport, Conn.

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2 Claims. (Cl. 46—111)

This invention relates to musical toys and more especially to a toy having a spring-operated music box contained in a shell from which a shaft of the music box extends and is connected to another element of the toy to produce relative movement of the shell and the other element of the toy by the same spring power which operates the music box. In the preferred embodiment of the invention, the toy is a ball which rolls on the floor, or other supporting surface, along irregular and amusing courses as the music box plays.

It is an object of the invention to provide a musical toy having a spring-operated music box therein and having elements of the toy which are rotated one way with respect to each other to wind the spring and in which the operation of the spring to play the music box rotates the elements of the toy with respect to one another to produce various combinations of motion of the toy on a supporting surface.

In accordance with one feature of the invention, the shaft of the music box is employed as the element for holding the relatively movable parts of the toy in assembled relation with one another, and the surfaces of the different parts of the toy are oriented with respect to the shaft to permit relative rotation about the axis of the shaft.

Another feature of the invention relates to the construction of the toy with the different elements of the toy forming a ball having the music box and motor located so that their center of gravity causes the ball to have a position of equilibrium in which the axis of the winding shaft of the motor is at an acute angle to a horizontal surface on which the ball rests. This causes the ball to roll along a curved path of variable radius of curvature as the music box plays and the spring unwinds.

Other objects, features and advantages of the invention will appear or be pointed out as the description proceeds.

In the drawing, forming a part hereof, in which like reference characters indicate corresponding parts in all the views;

Figure 1 is a side elevation of a ball embodying this invention;

Figure 2 is a sectional view through the ball shown in Figure 1; and

Figure 3 is an exploded view of the ball shown in the other figures.

Figure 1 shows a ball **10** formed with two shells **11** and **12**. In the construction shown, each of the shells **11** and **12** is a hemisphere. One of the shells has a rim **13** extending over the edge of the other shell to cover the seam between the confronting end faces of the shells when they are in assembled relation.

Figure 2 shows the inside construction of the shells **11** and **12**. The shell **11** has a plate **15** extending across it near the open end of the shell. For purposes of economy and reduction in weight, the plate **15** is merely a strut extending along a diameter of a plane which intersects the

sphere at right angles to a radial line **16** at the center of the ball in the plane defined by the end face **17** of the shell **11**.

There is a similar plate **20** extending across the shell **12** and this plate **20** is preferably also a strut and in a similar position on the shell **12** as is the strut **15** on the shell **11**.

A music box **25** is located within the shell **11** and is attached to the plate **15** on the side opposite the plate **20**. The music box **25** includes a spring **27** and mechanism **28** operated by the spring for driving the musical elements which are indicated generally by the reference character **30**. This construction is merely representative of music boxes operated by a spring motor. The music box **25** has a shaft **33** which extends through an opening in the plate **15** and beyond the plane of the end face **17** of the shell **11**. The shaft **33** extends far enough into the shell **12** to fit into an opening in the plate **20**.

The shaft **33** preferably has a shoulder **35**, and the shaft is threaded beyond this shoulder. The threaded end of the shaft **33** screws into the opening in the plate **20**; and preferably screws into the plate until the shoulder **35** comes into contact with the outside face of the plate **20**.

The shoulder **35** is located in such a position, with respect to the plates **15** and **20**, that the end face **17** of the shell **11** has a running clearance with respect to a corresponding end face **37** of the shell **12** when the shoulder **35** is in firm contact with the front face of the plate **20**. Thus, the shaft **33** holds the shells **11** and **12** in assembled relation and at the proper spacing from one another to permit relative rotation of the shells by the spring motor of the music box **25**

The music box **25** is constructed so that the shaft **33** is the winding shaft for the spring motor; and the motor is one in which the shaft **33** rotates in the opposite direction as the spring **27** of the music box motor unwinds when the motor is running to operate the music box.

Figure 2 also shows the rim **13** which is attached to the shell **12**. This rim covers the seam between the confronting faces **17** and **37** and preferably has a slight clearance from the outside surface of the shell **11** so as not to cause friction when the shells **11** and **12** are rotating with respect to one another. The rim **13** is made of thin sheet material so that the ball **10** can roll in any direction without undue interference by the elevation on its surface produced by the rim **13**.

The rim **13** preferably touches the surface on which the ball rests, and the relative movement of the rim **13** and the shell **11**, with both touching the floor, starts the movement of the ball. The rim **13** also serves the additional purpose of preventing dirt from getting inside the shells **11** and **12**. This rim **13** sometimes touches the shell **11** around portions of its circumference, but the pressure is light and produces relatively little friction. The toy can be made without the rim **13**, if desired. If so made, the shells **11** and **12**, with their plates **15** and **20**, can be of identical construction for economy in manufacture. Without the rim **13**, the only operations which have to be performed on the interchangeable shells, to adapt them for assembly in the toy, are the provision of the threaded opening in the plate **20** and the connecting of the music box **25** to the plate **15** with an opening large enough for the shaft **33** to extend through it.

The invention has been illustrated as applied to a ball in which the surface of the ball is formed by hemispherical elements. It will be understood, however, that the shells **11** and **12** do not have to be of the same size and one of them could form more than half of the surface of the ball. For the manufacturing process by which this invention is intended to be made, the use of hemispherical shells is the most economical, but the invention is not to be limited to this construction.

It is not necessary that the toy be spherical. The

shells **11** and **12** can be made substantially spherical so that the toy will roll more irregularly than a sphere.

In the preferred construction, which has a spherical surface, the toy is made to roll along irregular and changing courses by having the music box **25** located on a diameter of the sphere at a position which is at a substantial distance from the surface of the sphere and eccentric of the center of the sphere. If the music box were attached directly to the inside wall of the shell **11**, the sphere would tend to assume a position of equilibrium with the music box at the bottom of the sphere in a manner similar to the way in which a roly-poly orients itself with the weight at the bottom. This would leave the shaft **33**, which extends from the music box **25** through the center of the sphere, in a vertical position so that the shell **12** would merely rotate around the vertical axis of the shaft **33** and the toy would not roll on its supporting surface. The invention can be made in that way, if desired, and in such a case it is a stationary toy unless it is unbalanced intentionally.

With the music box **25** located as illustrated in Figure 2, the toy assumes a position of equilibrium with the axis of the shaft **33** extending along the radial line **16** and at a substantial acute angle to the vertical. As the music box **25** operates, it produces relative rotation of the shells **11** and **12**. In practice, the reaction produced by this driving force causes the shell **11** to roll on a horizontal surface along a curved path which undergoes alternating progressive changes from shorter to longer radius of curvature. These changes in the direction of movement are unexpected and amusing to the spectators.

The course along which the ball rolls can be made even more irregular and surprising by making the shells **11** and **12** so that they are not symmetrical about the normal diameter **16**.

Figure 3 shows a construction which is similar in all respects to Figure 2 except that the shells, indicated by the reference characters **11'** and **12'**, are made with weights **40** on their inside surfaces for producing different degrees of unbalance of the sphere. These weights **40** are preferably regions of greater wall thickness formed during the molding of the shells.

The preferred embodiment of the invention has been

illustrated and described, but changes and modifications can be made and some features can be used in different combinations without departing from the invention as defined in the claims.

What is claimed is:

1. A musical toy comprising a ball, two different elements having outside surfaces which co-operate with one another to form the surface of the ball, at least one of the elements being a hollow shell, a music box within the hollow shell and connected to that element of the ball, a shaft extending from the music box into the other element of the ball and connected to said other element for rotation as a unit therewith, the elements of the ball being held in assembled relation by said shaft but with running clearance between them so that they are rotatable with respect to one another about the longitudinal axis of said shaft, and a spring motor for the music box with mechanism connecting the motor to the shaft, said mechanism operating to wind the spring when the elements of the ball are turned in opposite directions with respect to one another, and said mechanism operating to rotate the elements of the ball in the other direction with respect to one another when the spring motor operates the music box.

2. The musical toy described in claim 1 and in which the shaft extends along a diameter of the ball and the music box is located on said diameter at a substantial distance from the surface of the ball but with its center of gravity eccentric of the center of the ball so that the position of equilibrium of the ball on a plane supporting surface, when the spring motor is not running, is one in which said diameter extends at an acute angle to the plane surface.

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