Aug. 5, 1958 K. E. NELSON 2,846,223

MELODY PLAYING FIGURE CARRYING TOY CARROUSEL

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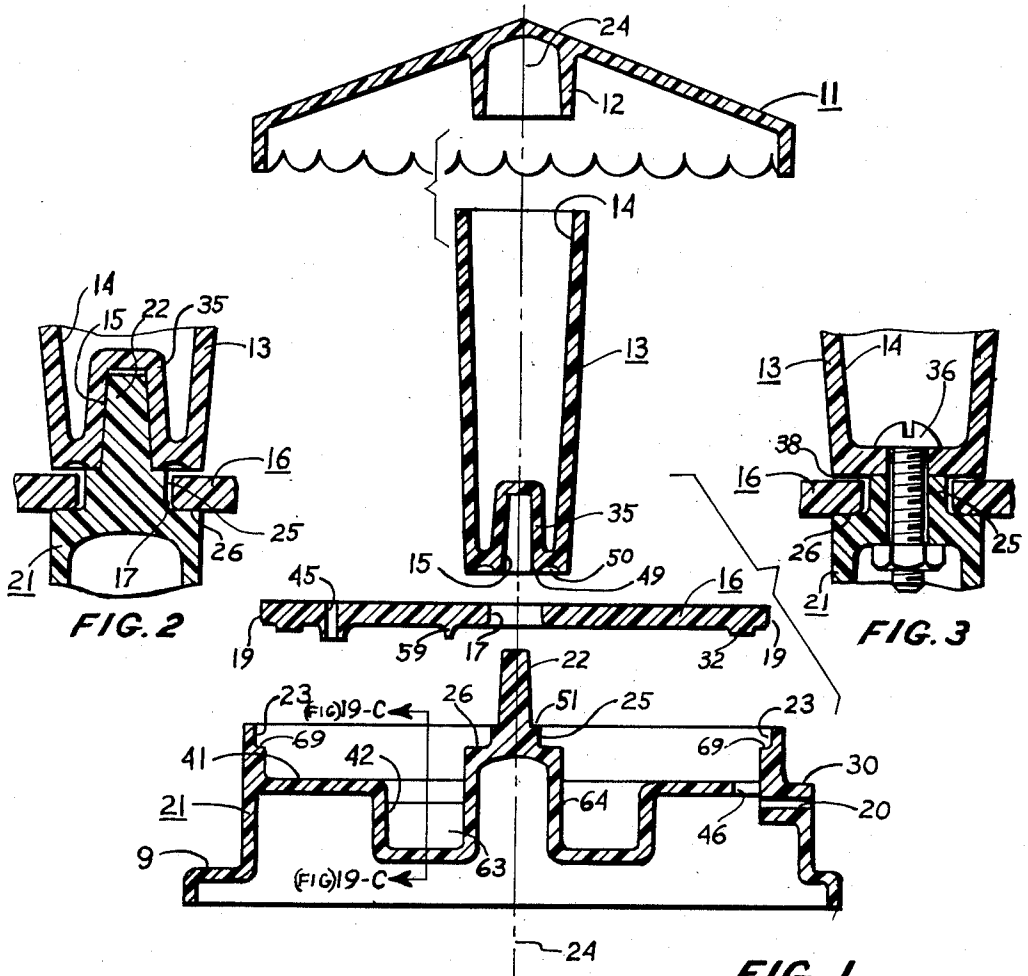


FIG. 1

FIG. 2

FIG. 3

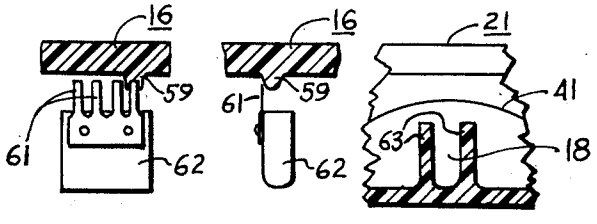


FIG. 19

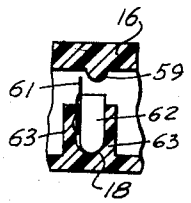


FIG. 20

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MELODY PLAYING FIGURE CARRYING TOY CARROUSEL

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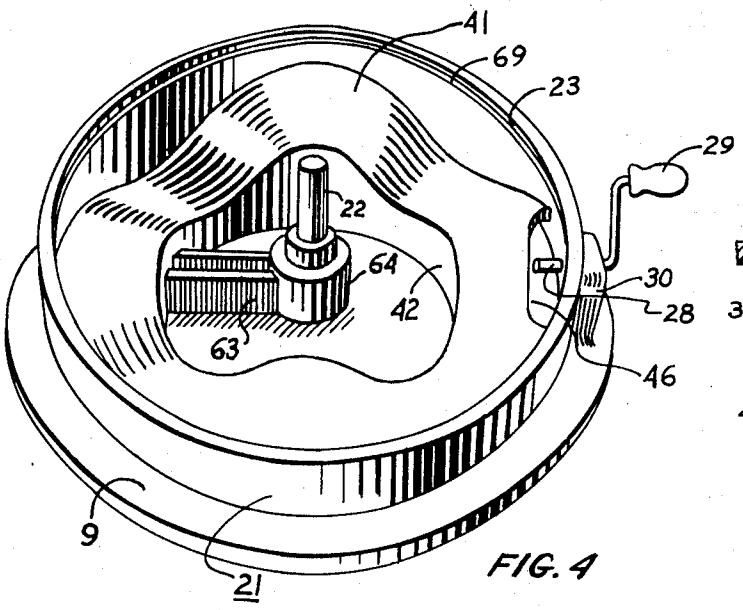


FIG. 4

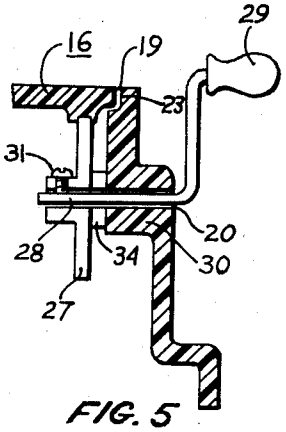


FIG. 5

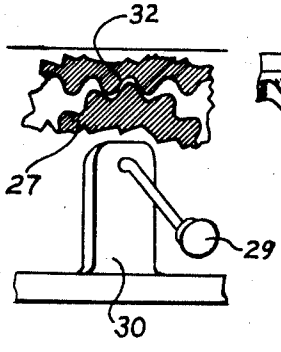


FIG. 6

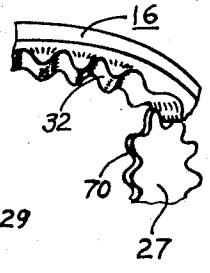


FIG. 7

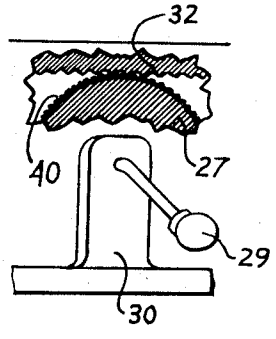


FIG. 8

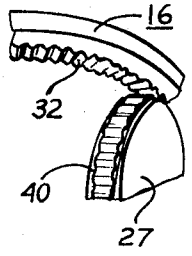


FIG. 9

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MELODY PLAYING FIGURE CARRYING TOY CARROUSEL

Filed July 14, 1955 4 Sheets-Sheet 3

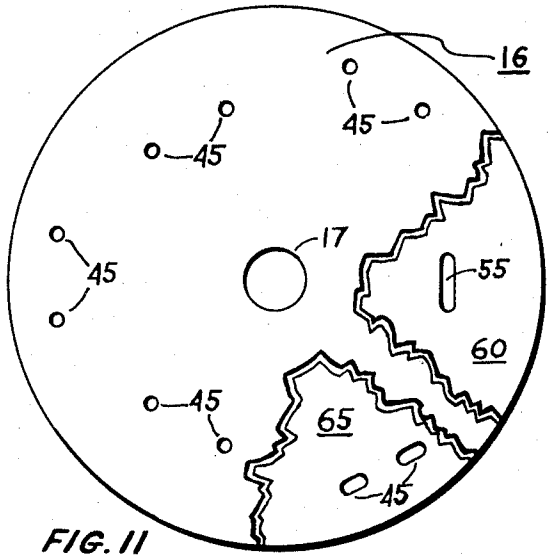


FIG. 11

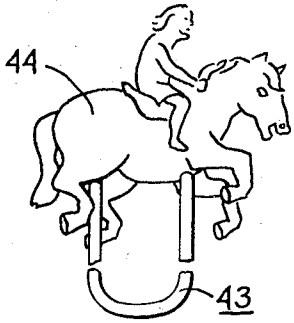


FIG. 12

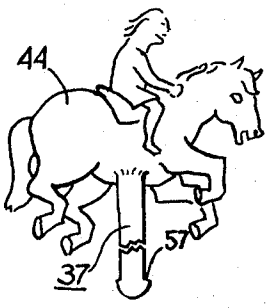


FIG. 13

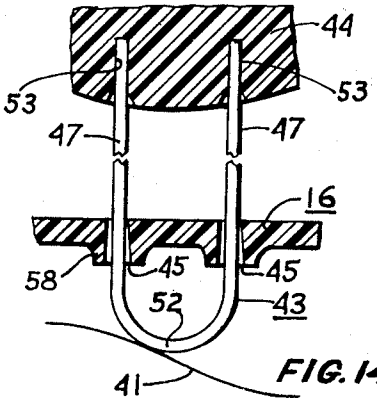


FIG. 14

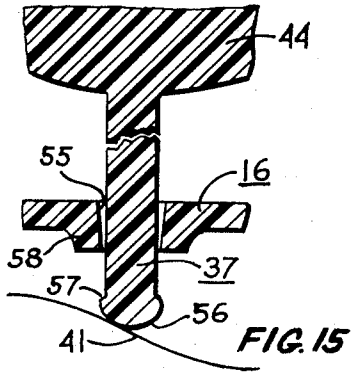


FIG. 15

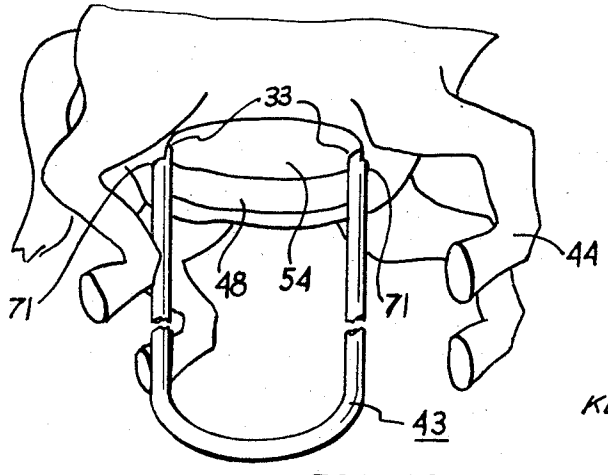


FIG. 10

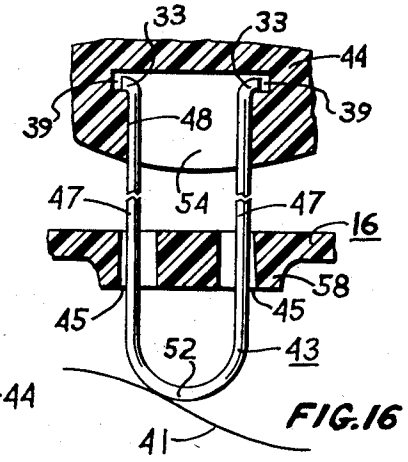


FIG. 16

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MELODY PLAYING FIGURE CARRYING TOY CARROUSEL

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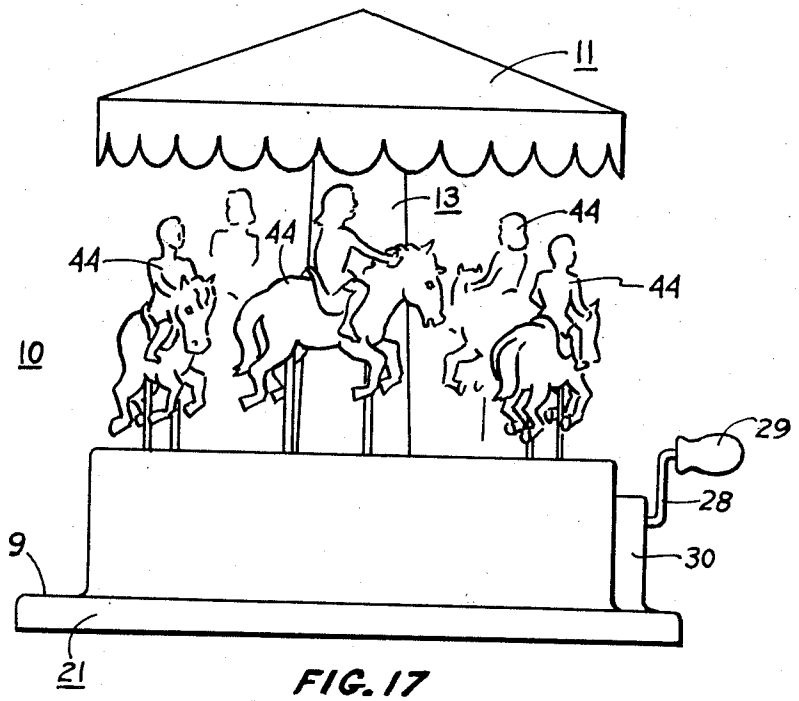


FIG. 17

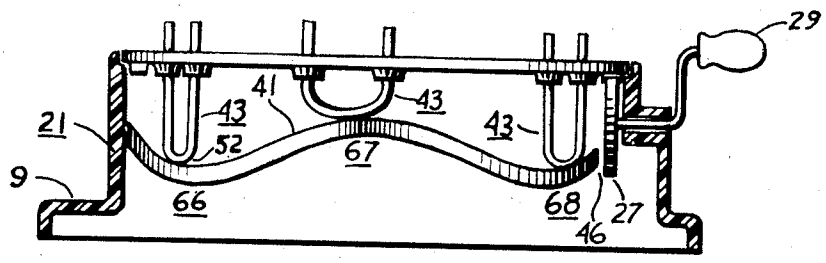


FIG. 18

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United States Patent Office 2,846,223 Patented Aug. 5, 1958

2,846,223

MELODY PLAYING FIGURE CARRYING TOY CARROUSEL

Kenneth E. Nelson, Hempstead, N. Y.

Application July 14, 1955, Serial No. 521,958

9 Claims. (Cl. 272—31)

The instant invention relates to articles of manufacture for amusing children and in particular it relates to a melody playing miniature carrousel made principally with plastic material.

It is common knowledge that the carrousel ride is exceedingly popular with children at amusement areas. It is customary that toy manufacturers duplicate most commonplace articles of manufacture as toys for children. Following the practice of making toy guns, cars, trucks and other items, toy manufacturers have duplicated the carrousel. However it is not frequent that one sees a miniature toy carrousel because heretofore the construction of this type of toy was both difficult to make sturdy and at the same time relatively inexpensive. As a result few carrousels are available for sale as a toy for children.

It is therefore the principal object of the instant invention to provide a novel structural design for a miniature carrousel. The novel design makes it possible to produce a sturdy toy which is also inexpensive to manufacture. Accordingly a carrousel manufactured in accordance with the instant invention is in the popular price range for purchase by the public. To achieve the stated object, the main components are designed for plastic construction. The shape of each individual structural component is free from complex and compound surfaces. This permits the use of the simplest designs for molds for making these components. Thread surfaces and other overlapping integrated surfaces are completely eliminated to avoid the need of complex, compound molds which in themselves are expensive and in addition costly to use because the articles formed from such complex molds are not easily removed from the mold. Furthermore the novel design of the instant invention achieves further simplicity by making the carrousel of a minimum number of components. The components in turn are designed to be held together by press-fit connections and thus avoid elaborate assemblage.

Minimizing the number of carrousel components reduces the number of molds required to fabricate the article. Furthermore it also simplifies the assemblage of the article. To achieve this end result, the carrousel is made up of four major components: a canopy, an upright column, a rotating circular table and a base. The other accommodating components consist of a drive gear and shaft therefor, figurines and cam followers therefor and a board with tines. The canopy, column and base are designed to be attached by press-fit connections and the table is mounted on a stud formed as a part of the base.

Figurines are disposed about the table by supporting cam followers. The figurines are oscillated vertically by revolving the table; the followers are carried in unison therewith. The followers slidably engage an undulated cam surface integral with the base. Rotation of the table is accomplished by a plastic gear directly engaging a ridged under surface of the table. The gear in turn is mounted by a shaft extending through the side wall of the base.

It is customary to operate a carrousel with music. Accordingly means for mounting tines are provided in the base. The tines are activated by picks jutting out from the under surface of the table. The picks are disposed about the table under surface so that they play a melody upon striking the tines when the table revolves.

The above and other objects and features of the instant invention will become more readily apparent when read in connection with the accompanying drawing, in which:

Fig. 1 is an elevation view in cross-section showing the components of the carrousel in disassembled position;

Fig. 2 is a sectional view showing one form of structure for joining the upright column to the base member;

Fig. 3 is a sectional view showing another form of structure for joining the upright column to the base member;

Fig. 4 is a perspective view of the base member;

Fig. 5 is a sectional view showing the gear structure for driving the revolvable table;

Fig. 6 partly in section and Fig. 7 a perspective view illustrate one type of gear design for driving the revolvable table; whereas, Fig. 8 partly in section and Fig. 9 a perspective view illustrate another gear design;

Fig. 10 is a perspective view showing a structure for mounting a figurine to a cam follower;

Fig. 11 is a face view of the rotating table member with broken-off sections shows alternative shapes of apertures for the different types of cam followers illustrated herein;

Figs. 12 and 13 illustrate alternative structures for mounting a figurine to cam followers differing in design from the structure illustrated in Fig. 10;

Figs. 14, 15 and 16 illustrate, in section, the three variations of cam followers and accommodating structures for attaching same to the figurines as illustrated in perspective in Figs. 12, 13 and 10 respectively;

Fig. 17 is an elevation view of the assembled carrousel;

Fig. 18 is a view partly in section that provides a clear picture of the undulated cam surface and the sliding engagement of the cam followers therewith;

Fig. 19A is a sectional view showing a pick striking a tine;

Fig. 19B is a side view of Fig. 19A;

Fig. 19C is a sectional view showing the seating structure for the tines member, and

Fig. 20 is a sectional view showing the tine member seated in the structure therefor.

Referring now to the figures, a carrousel **10** is made up of a canopy **11**, an upright column **13**, a revolving circular table **16** and a base **21** (see Figs. 1 and 17). These components are made of plastic material in keeping with the objects hereinbefore stated. Each component is of one piece construction. The components are fabricated by conventional plastic molding processes.

Canopy **11** is symmetrical about longitudinal axis **24** and shaped to resemble the top of a carrousel. Canopy **11** has a vertically and downwardly projecting stud **12**. The outer surface of stud **12** is tapered gradually to a narrower diameter at its lower extremity so that it may be joined to column **13**. Column **13** is provided with a concentric inner bore **14** tapered to a gradually narrower diameter as it recedes from its upper end. The upper end of bore **14** is designed to accommodate stud **12** therein. Canopy **11** is joined to column **13** by force-fit of stud **12** into the upper end of bore **14**. Column **13** extends longitudinally along and concentrically with axis **24**. Bore **14** terminates at the lower extremity of column **13** which is, at that end, provided with a tapered recess **15** formed by an inwardly projecting wall **35**. Recess **15** is tapered gradually to a wider diameter at the lower extremity of column **13**. Recess **15** is adapted to receive in telescopic force fit engagement a tapered stud **22**. The

taper defines a narrower diameter at the upper end of stud 22. Stud 22 juts upwardly from base 21 and through a centrally disposed aperture 17 in table 16. Aperture 17 encircles cylindrical shoulder 25 concentric with and at the lower extremity of stud 22. The diameter of shoulder 25 is greater than that of stud 22. Upon assemblage of the components, the inner portion of the lower end 49 of column 13 rests upon the horizontal ledge 51 of shoulder 25. A clearance is maintained between the adjacent edges of surface 49, shoulder 25 and the upper surface of table 16. Also, an annular clearance is maintained between the aperture 17 in table 16 and shoulder 25. These clearances provide a degree of play during the operation of carrousel 10 and prevents table 16 binding against shoulder 25. An annular recess 50 at surface 49 further ensures the clearance at this area of the assemblage. The undersurface 49 of column 13 prevents table 16 separating from base 21.

Other arrangements may be used equally as well to connect column 13 to base 21. For example, in Fig. 3, column 13 is shown connected to base 21 by bolt and nut means 36. In this embodiment column 13 terminates with a flat surface 38 which is supported directly on the upper surface of shoulder 25. Stud 22 does not appear in this embodiment.

The under surface of table 16 surrounding and adjacent to shoulder 25 rests on an annular and horizontal ledge 26 at the base of shoulder 25. The surface of ledge 26 and the under surface of table 16 contiguous therewith are provided with smooth finishes to enable table 16 to slidably revolve thereon with a minimum of friction. The peripheral edge 19 of table 16 is shaped to accommodate a close but spaced from relationship with respect to the adjacent inner surface 23 of the cylindrical side wall of base 21.

Table 16 is revolved about axis 24 by a gear 27. Gear 27 is mounted alongside a housing 30 jutting from the side wall of base 21. The journal 28 engages a bore 20 at housing 30 and extends into the interior of base 21. Housing 30 serves to strengthen the base structure at the region of bore 20. A washer 34 and gear 27 are mounted on journal 28. Gear 27 is affixed to journal 28 by a set screw 31, or, if a plastic or wooden gear is used it may be force-fitted onto journal 28. The contiguous surfaces of gear 27 and washer 34 are provided with smooth finishes to minimize friction thereat. Journal 28 is contoured external of housing 30 to support a handle 29. A circular raised ridge or flat gear 32, concentric with axis 24, projects downwardly from the under surface of table 16 and serves as a gear wheel. Gear wheel 32 engages gear 27. Accordingly, upon turning of handle 29, gear 27 revolves in unison therewith and thus drives table 16 about axis 24.

The engaging gear faces may take the form of fine serrated gear teeth for gear 27 and coarser teeth for gear 32 as shown in Figs. 8 and 9. In keeping with one object of the instant invention washer 34 and gear 27 are made of plastic except that the gear teeth of the embodiment of Figs. 8 and 9 are a part of a preformed rubber band 40. Washer 34 may be eliminated by molding a shoulder onto the gear 27 in place of the washer. The peripheral surface of band 40 is provided with closely spaced serrations which engage the teeth of gear wheel 32. Band 40 may be fastened to gear 27 by being glued thereto or it may be held on by making the diameter of the rubber band slightly smaller than the diameter of the wheel of gear 27 and therefore held on by the elasticity and friction of the rubber. Also, a groove may be provided in the wheel of gear 27 to accommodate the rubber band. Other gear designs would be equally effective to drive table 16; for example, the gear designs of Figs. 6 and 7 would serve equally as well to drive table 16 around axis 24. In this embodiment, gear 27 is provided with molded or stamped teeth 70. Annular ledge 9 at the lower extremity of base 21 provides a convenient surface for the child to grip when operating carrousel 10.

In accordance with the carrousel design, a plurality of figurines 44 are oscillated vertically as table 16 revolves. Vertical oscillation of the figurines is accomplished by a plurality of cam followers 43 engaging a cam surface 41. Cam surface 41 is an integral part of base 21. Adjacent housing 30, cam surface 41 is provided with a cutout area 46 which is occupied by gear 27 and washer 34. Cam surface 41 consists of an annular undulated surface 41 jutting horizontally from the interior surface of the side wall of base 21. The inside and outside diameters of cam surface 41 are concentric to axis 24. A vertical wall 42 at the inner edge of cam surface 41 serves to reinforce the cam structure and also to connect the cam to the rest of base 21. Each figurine 44 is supported by a cam follower 43 attached thereto. As illustrated in the embodiment of Figs. 12 and 14, cam follower 43 is a U-shaped metal pin oriented so that its apex or runner 52 is in sliding engagement with cam surface 41. Cam surface 41 is provided with a smooth surface to facilitate this engagement. Follower 43 is provided with resilient upright legs 47 extending through respective circular apertures 45 disposed about table 16. The upper ends of legs 47 of each follower 43 jut into and engage a pair of accommodating bores 53 at the underside of each figurine 44. The upper engaged ends of legs 47 are glued or press fitted in bores 53 to hold figurines 44 on respective followers 43.

Figs. 10 and 16 show an alternative structure for mounting figurines 44. The underside of figurines 44 are provided with a large hollow interior 54 having an internal lip surface 48. This lip surface 48 may be formed by molding the hollow 54 into the figurines, and the lip surface 48 may be circular, elliptical, or any other form to provide for convenience in the molding process used. At or near the top of lip surface 48 are provided a pair of diametrically opposite and transverse holes 39 that are designed to register with respective hooks 33 of upright legs 47. To accomplish this, the upper extremity of legs 47 are provided with transversely and outwardly jutting hooks 33 which reach into and engage holes 39. Hooks 33 are maintained in engagement with holes 39 by the spring pressure caused by the edges of lip surface 48 bearing against the resilient legs 47. To further insure stability of figurine 44 on upright legs 47 vertical grooves 71 are provided along lip 48 and meet with holes 39. In this particular embodiment, the bores of apertures 45 are enlarged and generally elliptical in shape, note the alternative section 65 of table 16 shown in Fig. 11, to permit the insertion of hooks 33 therethrough upon assemblage of the article.

The bores of apertures 45 are tapered to define a narrower diameter at the upper surface of table 16. Tapering the bores of apertures 45 minimizes a bearing, rubbing or binding contact against legs 47 extending therethrough as legs 47 move up and down while cam followers 43 are caused to slide along cam surface 41. The tapered apertures provide a slight play which cause legs 47 to rock back and forth as table 16 is rotated, and as cam followers 43 are raised and lowered on the rising and falling cam surface 41 this arrangement freeing legs 47 from constant sliding contact on any part of apertures 45. From another embodiment hereinafter described, it will be seen that the taper can be reversed, that is the narrow diameter is provided at the undersurface of table 16, to accomplish the same effect. The undersurface of table 16 surrounding bores 45 (and also bores 55 of the embodiment next described) is reinforced by a downwardly extending embossment 58 to strengthen the table structure thereat.

An alternative cam follower structure is shown in Figs. 13 and 15. For this embodiment, cam follower 37 is an integral part of figurine 44. Cam follower 37 is a plastic leg projecting downwardly from the underside of figurine

44 and has an enlarged semi-spherical runner 56 at its lower extremity. The aperture 55 of table 16 through which cam follower 37 extends (note the alternative section 60 of table 16), and follower 37 are elliptical in shape. Thus follower 37 and the attached figurine 44 are keyed against rotation about the longitudinal axis of bore 55. The bore of aperture 55 is tapered gradually to define a narrower diameter at the undersurface of table 16. The maximum diameter of runner 56 is at least slightly larger than the narrowest diameter of bore 55. The difference in diameters is chosen to permit a forced insertion of follower 37, runner first, down through bore 55. The plastic material of follower 37 is sufficiently resilient to permit runner 56 to travel through bore 55 even though its maximum diameter is a little larger than the diameter of bore 55 at its narrow end. Withdrawal of follower 37 is prevented by an annular abutting shoulder 57 at the upper end of runner 56. Shoulder 57 is shaped to abut against the narrow end of bore 55 and thus prevents runner 56 from travelling back up bore 55.

The operation of a carrousel generally is accompanied by music. Accordingly it would be desirable that carrousel 10 play a simple melody popular with children while it is being operated. This is achieved by a plurality of picks 59 (only one is shown in the figures, note in particular Figs. 19A, B and C) properly disposed along the undersurface of table 16. Picks 59 are disposed in such a fashion that they play a recognized melody as they strike tines 61 attached to a plastic or wooden base 62 therefor. Base 62 is mounted and held in a channel 18 (note Fig. 19C) formed by a pair of upright walls 63. Walls 63 project up from the bottom surface of base 21 and extend laterally from vertical wall 42 to a cylindrical pedestal 64; the latter is concentric to axis 24 and at the base of shoulder 25. To achieve structural and mechanical balance, tines 61 are positioned with respect to gear 27 on the opposite side of axis 24. Normal engagement of gears 27 and 32 would tend to exert an upward force on table 16 to the right of axis 24. The engagement of tines 61 with picks 59 would tend to exert an upward force on table 16 to the left of axis 24. This balanced arrangement helps to keep the table 16 level; whereas, if both the tines and the gear engagements occurred on the same side of axis 24, table 16 would have an additional tendency to tilt downward to the left about axis 24. It is expected that the gear engagement at the right of axis 24 will cause a slight tilting of table 16. To further insure balanced forces to keep table 16 in a level position relative to base 21 as table 16 rotates, the outer portion or circumference of lower end 49 of column 13 exerts a downward force on table 16 at the right of axis 24 while the shoulder 69 on the cylindrical side wall 23 of base 21 exerts an upward force on the undersurface of table 16 at the left, diametrically opposite gear 27. Shoulder 69 need not be extended completely around the inside of base 21, but doing so will simplify the making of dies and also will assure that children playing with the carrousel will find difficulty in breaking same by pressing down on any point of table 16.

In operation figurines 44 are caused to oscillate up and down as table 16 revolves about axis 24. For example, when figurine 44 is at position 66 (note Fig. 18 for the following discussion), runner 52 of cam follower 43 engages a valley of undulated cam surface 41. At this point of its travel, figurine is vertically at its lowest position. As table 16 revolves counterclockwise, figurine 44 formerly at position 66 is now at a peak 67 of undulated surface 41. In this position figurine 44 is vertically at its highest position. Figurine 44 gradually drops vertically until it again reaches its lowest vertical point when runner 52 engages valley position 68 as table 16 continues to revolve.

What is claimed is:

1. A miniature carrousel comprising, an all plastic canopy having a downwardly projecting stud, an all plastic column having a bore entrance receiving said stud in force fit engagement, an all plastic base having a cylindrical side wall and also having mounting means supporting said column in upright position, an all plastic table horizontally disposed and supported at its center by said mounting means for rotation about a vertical axis, said base having an undulated cam face extending horizontally from said side wall and spaced below said table, a plurality of cam followers extending through apertures in said table and having runners in slidable engagement with said cam face, a plurality of figurines disposed annularly about the top surface of said table, each of said figurines being supported along the top of the table by respective ones of said cam followers, and a drive gear engaging said table for rotating same about said axis; whereby rotation of said table results in slidable engagement of said cam followers with said cam face to cause said figurines to oscillate vertically.

2. Apparatus as defined in claim 1 wherein said cylindrical side wall has an opened top designed to be occupied by said table, said table having a circular peripheral edge in a close but spaced relationship from the adjacent edge of the cylindrical wall of said base, the lower extremity of said column being provided with an inwardly projecting wall forming a tapered bore, said mounting means of said base having an upright tapered stud designed for force fit engagement within said last-mentioned bore, said means also having a vertical circular shoulder concentric with and of larger diameter than said upright stud, said shoulder having a circular ledge at its lower extremity, said table having a centrally disposed aperture surrounding said shoulder, the portion of the table under surface adjacent its aperture resting upon said circular ledge of said mounting means, during normal operation of said carrousel there being a small clearance between the edge of said centrally disposed aperture of said table and said circular shoulder and a small clearance between said lower extremity of said column and the adjacent top surface of said table.

3. Apparatus as defined in claim 1 wherein said cam surface is concentric to said axis and has a vertical reinforcing wall at its inner edge, said base having interiorly therein a pair of parallel and spaced apart walls extending transversely between said vertical reinforcing wall and said mounting means, a plurality of picks jutting down from the undersurface of said table, a support member positioned between said parallel walls and carrying musical tines, said tines jutting upwardly to strike said picks, said picks being properly disposed along said table under surface so that upon rotation of said table a musical melody is played by said tines.

4. A miniature carrousel comprising, an all plastic base having mounting means concentrically disposed about a vertical axis, an all plastic table having spaced apart figurines disposed along its top surface, said table being horizontally disposed and supported at its center by said mounting means for rotation about said axis, said base having an undulated cam surface extending horizontally and spaced below said table, a plurality of cam followers projecting through said table and having runners in slidable engagement with said cam surface, each of said figurines having a cam follower attached thereto, and a drive gear engaging said table for rotating same about said axis; whereupon rotation of said table results in slidable engagement of said cam followers with said cam surface to cause said figurines to oscillate vertically, said cam follower comprising, a U-shaped metal pin having its curved apex serving as the runner, said table having spaced apart tapered apertures disposed thereabout through which respective ones of the upright legs of said followers extend, said figurines being provided at their under surfaces with a hollow interior cavity having an annular internal lip, said cavity having diametrically opposite vertical grooves designed to reg-

ister with the upright legs of respective ones of said followers, said figurines having a transverse hole at the upper extremity of each groove, the upper extremities of said legs being provided with transverse and outwardly jutting hooks reaching into and engaging said holes of respective figurines, said hooks being maintained in engagement with said lips by spring pressure caused by said grooves bearing against said legs.

5. A miniature carrousel comprising, an all plastic base having mounting means concentrically disposed about a vertical axis, an all plastic table having spaced apart figurines disposed along its top surface, said table being horizontally disposed and supported at its center by said mounting means for rotation about said axis, said base having an undulated cam surface extending horizontally and spaced below said table, a plurality of cam followers projecting through said table and having runners in slidable engagement with said cam surface, each of said figurines having a cam follower attached thereto, and a drive gear engaging said table for rotating same about said axis; whereupon rotation of said table results in slidable engagement of said cam followers with said cam surface to cause said figurines to oscillate vertically, said cam followers being integral extensions of said figurines, said table having spaced apart tapered apertures disposed therearound through which respective followers extend, said apertures being elliptical in shape and the taper being oriented to define the narrowest diameter at the underside surface of said table, each cam follower comprising a leg projecting downwardly through a respective aperture, said leg being elliptical in cross-section and having an enlarged semi-spherical runner at its lower extremity, the maximum diameter of said runner being slightly larger than the narrowest diameter of said tapered bore to permit a forced insertion of said leg downwardly through said bore therefor, said runner having a shoulder extending transversely beyond either side of the narrow throat of said bore to prevent reverse withdrawal of said follower.

6. Apparatus as defined in claim 1 wherein, said cam followers comprising, legs of single stem structure, and said table apertures being tapered.

7. Apparatus as defined in claim 1 wherein, said cam followers comprising, legs of single stem structure, said table apertures being tapered, the runners of said cam followers being dimensioned slightly larger than the narrowest diameter of said apertures to permit forced insertion of a leg through a respective aperture upon assembly of said carrousel, but prevents withdrawal of said followers during carrousel operation.

8. Apparatus as defined in claim 1 wherein, said cam followers comprising, U-shaped pins having curved apexes serving as the runners, the upright legs of said followers passing through respective table apertures, the upper ends of correlated pairs of said legs being attached to the underside of respective ones of said figurines.

9. Apparatus as defined in claim 1 wherein, said cam followers comprising, U-shaped pins having curved apexes serving as the runners, said table apertures being tapered, the upright legs of said followers passing through respective ones of said tapered apertures, the upper ends of correlated pairs of said legs being attached to respective ones of said figurines.

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