United States Patent [19]

Horvath

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[54] **ORBITER WITH ROCKING MOTION**

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[73] Assignee: **Roland J. Beecroft,** Corvallis, Oreg. ; a part interest

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[52] **U.S. Cl.** **74/22,** 272/36

[51] **Int. Cl.** **F16h 21/00**

[58] **Field of Search** 74/22, 61, 75, 63, 74/55; 272/36, 38, 40, 7; 46/202

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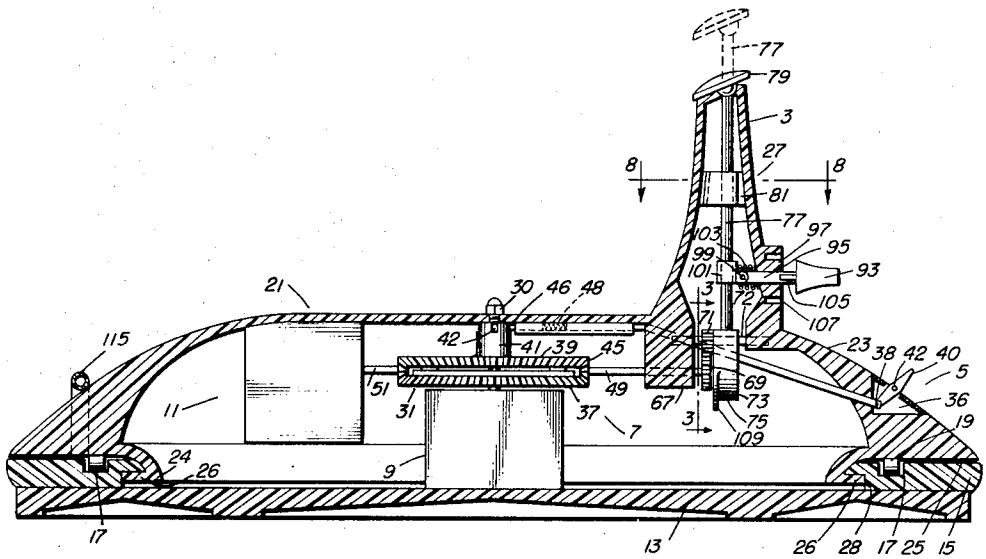
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[57] **ABSTRACT**

Apparatus for producing orbital movement and rocking motion to a platform which may comprise a seat or enclosure for an infant, and also for providing music concurrently with the orbital and rocking motion. The means for providing the orbital movement, the rocking movement and the music are independently controllable so that one may operate while the other or others are inoperative.

10 Claims, 8 Drawing Figures



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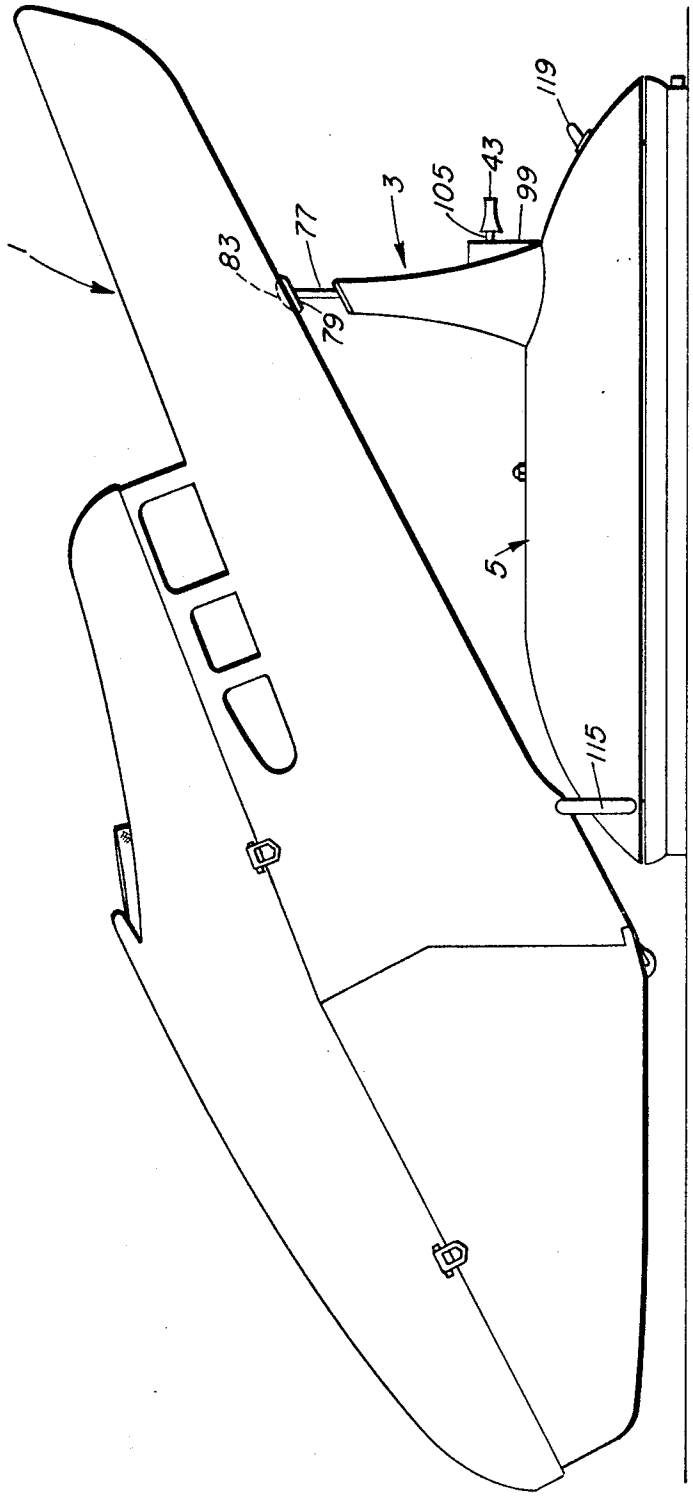


FIG. 1

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FIG. 2

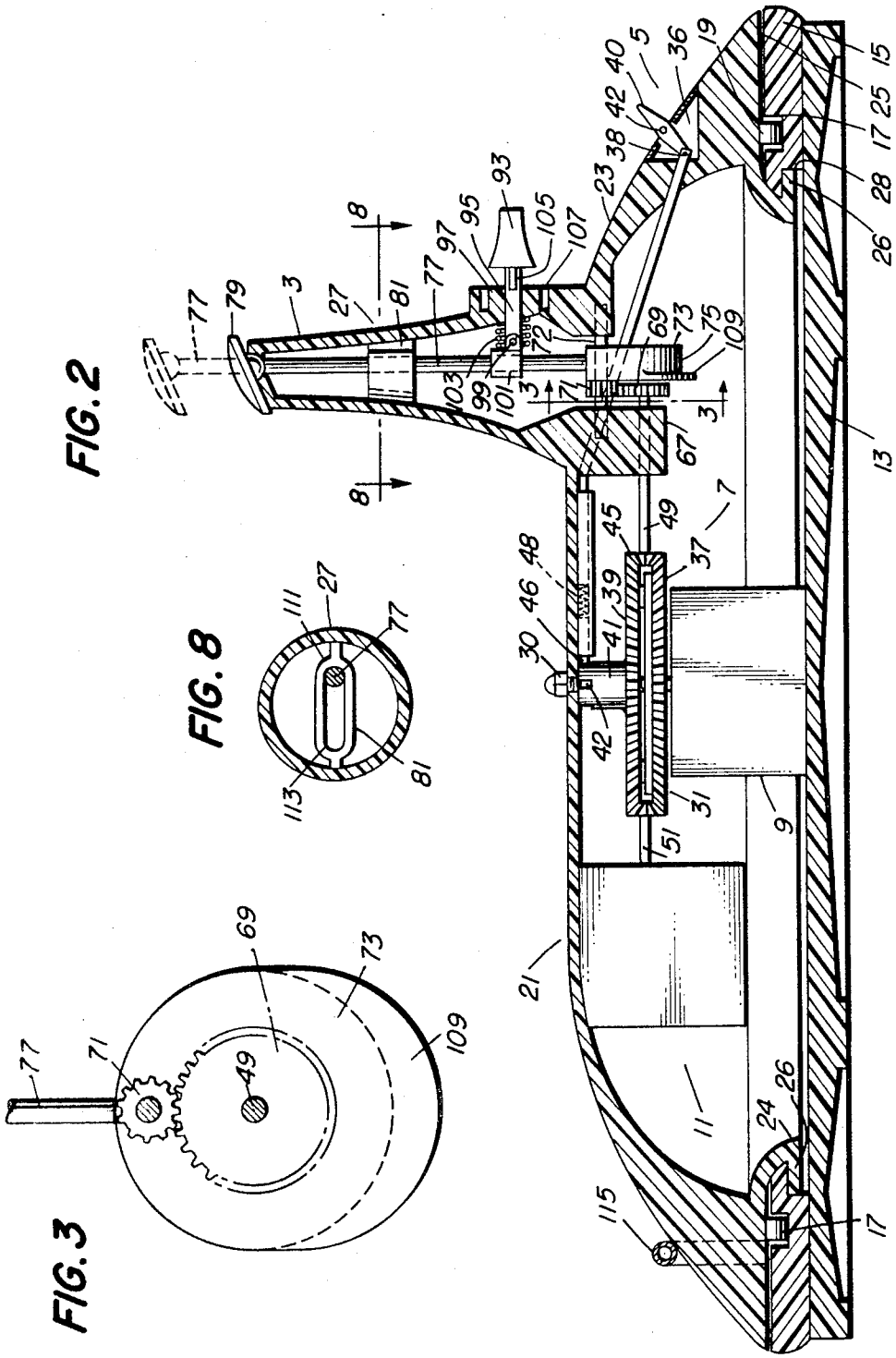


FIG. 8

FIG. 3

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FIG. 4

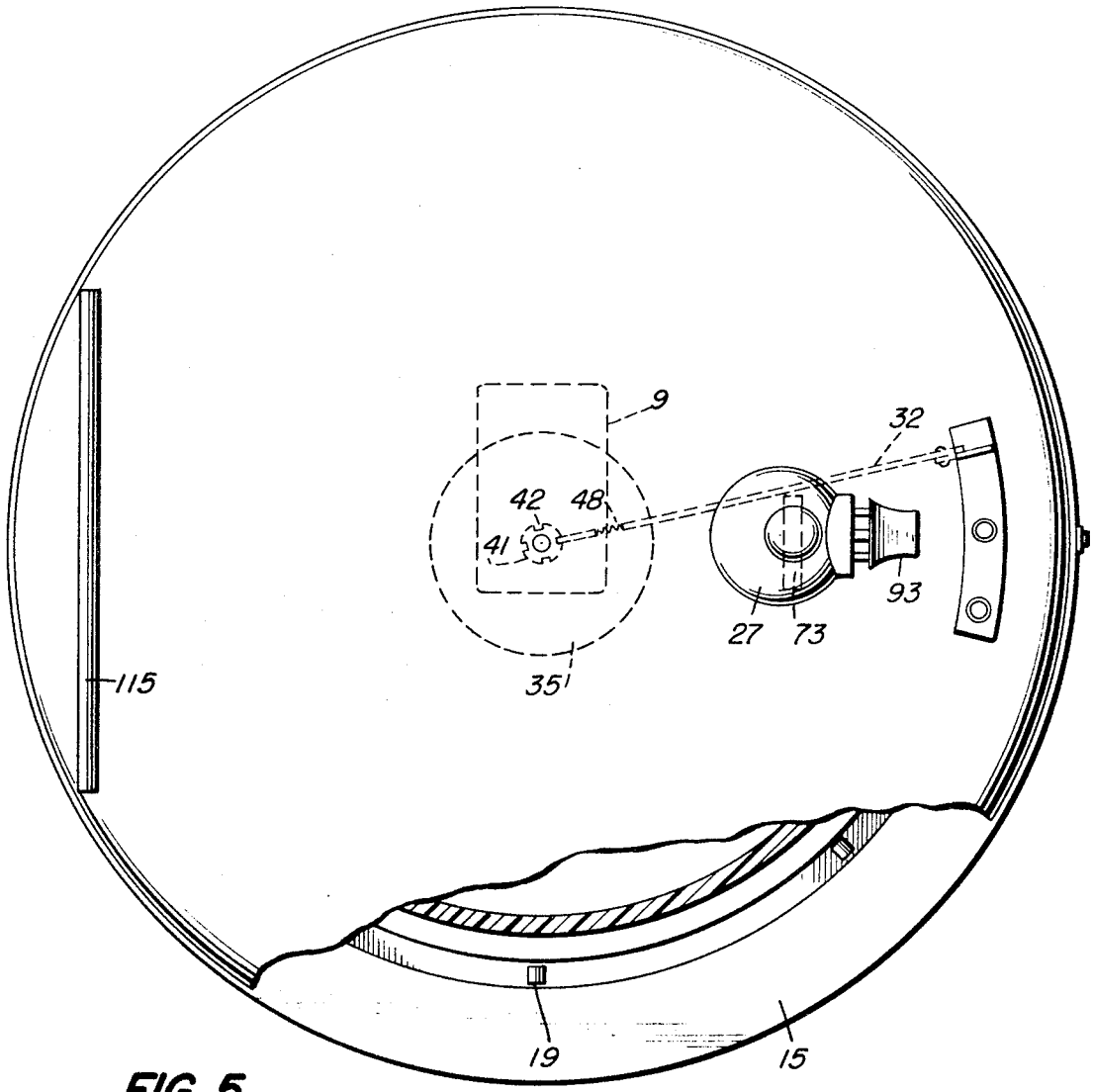
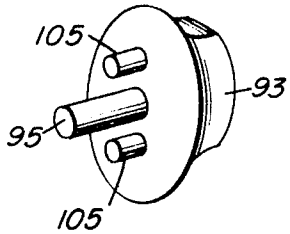


FIG. 5



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FIG. 6

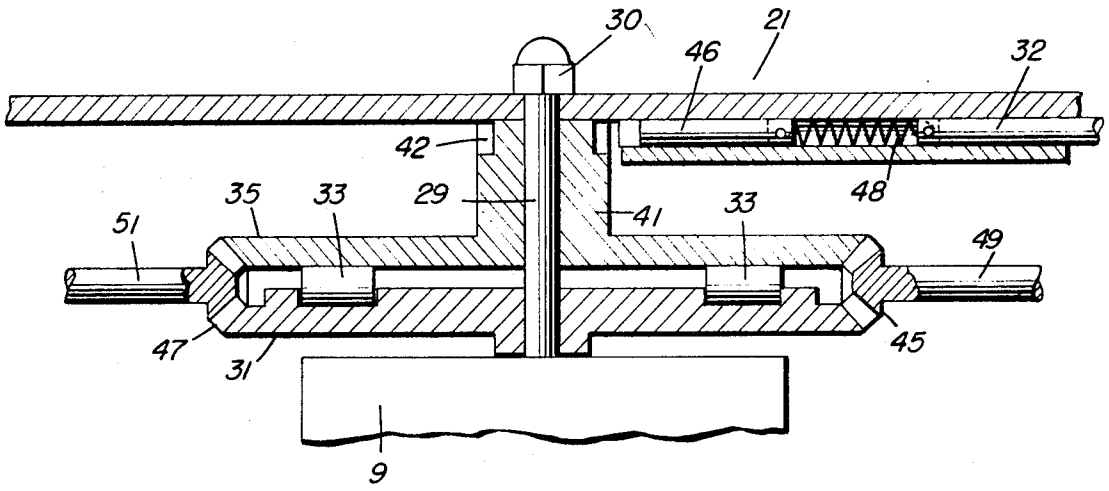
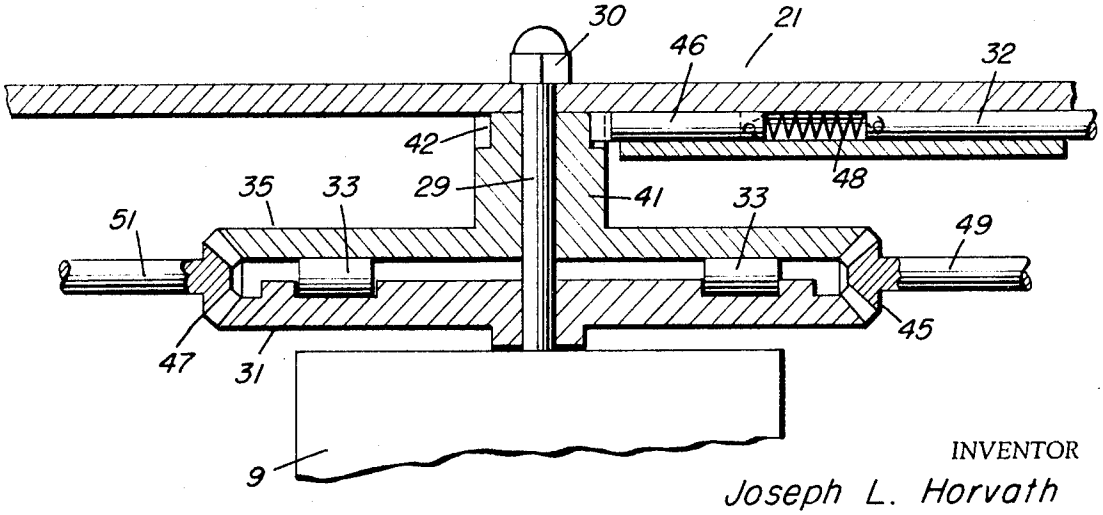


FIG. 7



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ORBITER WITH ROCKING MOTION

This invention relates broadly to apparatus for producing orbital or rotational movement concurrently with the creation of rocking motion and the operation of a music producer, and in its more specific aspects it relates to such apparatus which has been especially designed to provide the orbital and rocking motions to a seat, enclosure, platform or the like, which is adapted to contain an infant in order to produce amusement and quiet for periods of time; and the nature and objects of the invention will be readily recognized and understood by those skilled in the arts to which it relates in the light of the following explanation and detailed description of the accompanying drawings illustrating what I at present believe to be preferred embodiments or mechanical expressions of my invention from among various other forms, arrangements, combinations and constructions, of which the invention is capable within the spirit and scope thereof.

One of the prime purposes of my invention is to provide an apparatus for quieting, soothing and amusing infants up to the age of approximately 40 weeks. Any mother will appreciate that it is highly desirable to be free of an infant in this approximate age bracket for periods of time to release her for other chores, rest, or the like. The apparatus of this invention has been designed specifically for the purpose of quieting, soothing and keeping an infant amused for periods of time so that the person in charge of the infant may be relieved of the cares and noises associated with minding an infant. The structural concept which I have evolved comprises generally an enclosure in which the infant may be disposed, and includes means for producing rotational motion to the enclosure, and also for providing rocking motion thereto. The apparatus further includes means operable by the main orbiting means to produce music. It will be recognized, and experiments which I have carried on indicate, that the parent, or person minding the baby, will be free for approximately **30** minutes when the infant is positioned within the enclosure and is subjected to the rotational and rocking motion thereof and soothed by the music.

I have so constructed the means which generates the rocking motion so that the enclosure is rocked approximately **10** times for each complete revolution, or orbit, of the enclosure. It is preferable, though not necessary, that the rocking stroke which is applied to the enclosure is on the order of three quarters of an inch, and I have discovered, through experimentation, that this stroke length appears to be adequate for the infant. I have also arranged my operational mechanism so that the enclosure is rotated at approximately 3 rpm, 30 rocks per minute, 1 second up and 1 second down.

One of the significant characteristics of my invention resides in the construction, operation and arrangement whereby the music may be operated alone, the orbital movement generated alone, or the rocking motion alone, or all three operated concurrently, or any two operated concurrently without the other. The advantageous results of my unique arrangement will be readily appreciated. The music alone may function to soothe and quiet the infant whether or not it is in the enclosure, and either rocking motion or combined with the orbital motion, or the orbital motion alone may achieve the desired results.

It is within my contemplation to adapt this apparatus to a variety of uses and such adaptations will still fall within the spirit and scope of the invention. As one example, from among many, the enclosure may be removed and a platform, table or the like substituted therefor which would be caused to rotate and/or rock by the motive power. Displays, or the like, could be mounted on the table or platform.

In achieving my purposes, I have not sacrificed simplicity of operation and control, relatively low costs of manufacture and assembly, ease of operation and long life under normal operating conditions, and also the safety of the infant.

With the foregoing general objects, features and results in view, as well as certain others which will be apparent from the following explanation, the invention consists in certain novel features in design, construction, mounting and combination of elements, as will be more fully and particularly referred to and specified hereinafter.

Referring to the accompanying drawings:

FIG. **1** is a side elevational view of the entire apparatus.

FIG. **2** is a side elevation view of the operating mechanism with parts broken away.

FIG. **3** is a view taken on line 3—3 of FIG. **2.**

FIG. **4** is a top plan view of the housing in which the operating mechanism is disposed.

FIG. **5** is a view of the knob for controlling the rocking motion.

FIG. **6** is a vertical sectional view of parts of the operating mechanism with the turntable in dis-engaged relation with respect to the rotation generating member.

FIG. **7** is a view similar to FIG. **6** only with the turntable engaged with and operated by a rotation generating member or gear.

FIG. **8** is a view taken on line 8—8 of FIG. **2.**

In the accompaning drawings, I have used the numeral **1** to designate, in its entirety, the enclosure or infant seat, the numeral **3** to designate, in its entirety, the mechanism producing the rocking motion in the enclosure, the numeral **5** the housing or rotatable member, in which the actuating mechanism designated generally by the numeral **7** is disposed, and the numeral **9** to designate the electric motor or other power means for operating the actuating mechanism. I have used the numeral **11** to generally designate the music producing means of the apparatus.

The apparatus is operatively mounted on any suitable type of base **13,** preferably of generally circular configuration, the base being provided about its perimeter with an upstanding annular member **15** having an annular groove or track **17** provided in the top surface thereof. The annular member **15** may be epoxied, or otherwise caused to adhere to the base. The casing, or rotatable member, which I have generally designated by the numeral **5,** is mounted on bearings **19** which travel in the track **17** provided in the annular member **15.** The housing **5** is preferably of generally circular configuration and is formed with a top portion **21** from which downwardly depends an annular apron-like portion **23,** having a flat annular base **25** which rests and rides on the bearing elements **19.** The apron **23** is provided with an interior flange **24** from which radially outwardly extends a flange, rim, or the like **26.** A radially inwardly extending flange, rim or the like **28** is provided on annular member **15** and is received in the area between flanges **24** and **26** to maintain the housing against lateral movement on annular member **15** as the

housing rotates relative thereto. Projecting upwardly from the housing is a tubular, sleeve-like member **27**, which as will be explained operatively houses a part of the rocking mechanism causing the enclosure to rock.

A rotary shaft **29** extends upwardly from, and is driven by the electric motor **9**, and is splined or otherwise affixed to gear **31** which will, of course, be rotated by the shaft **29** when it is operational. A cap nut **30** is threaded on the upper end of the rotary shaft **29**, as will be clear from the drawings. The gear **31**, which constitutes the driving gear of a gear train to be described, is provided with a set of circumferentially spaced bearings **33** upon which rides a driven gear **35**, the drive shaft **29** extending freely through and beyond driven gear **35**. Consideration of the drawings illustrates clearly that the diameters of bearings **33** are such that gear **35** will be spaced from gear **31**. Gears **31** and **35** are formed with perimetric teeth **37** and **39**, respectively. An upstanding sleeve or neck **41** is fixed to the central zone of gear **35** for rotation therewith. The rotary shaft **29** extends freely through the sleeve or neck **41**. The upstanding sleeve or neck **41** is provided with a plurality of circumferentially spaced slots **42** therein, in this instance four. The slots **42** open through the periphery of the sleeve or neck. The purpose of these slots will become clear as this description proceeds.

The gear train further includes a pair of pinions **45** and **47** which are positioned between gears **31** and **35**, the teeth of the pinions being in mesh with the teeth **37** and **39** of gears **31** and **35**. Thus, the pinions are driven by gear **31**, and in turn gear **35** is driven by the pinions. Pinion **45** is provided with a shaft **49** which is rotated thereby and extends therefrom while pinion **47** is provided with a shaft **51** which is rotated thereby and extends therefrom.

I shall term shaft **49** the rocking mechanism actuating shaft, and the shaft **51** the winding shaft for the music producing apparatus **11**.

Pinion **47** and its shaft **51** winds the music producing apparatus spring which disconnects automatically when it is wound, and rewinds automatically when it is almost unwound, all as is well known in the music box winding discipline.

I have evolved a simple and easily producible mechanism, in the nature of a positive clutch, for connecting and disconnecting the housing or rotatable member **5** from the means for causing rotation thereof. This mechanism comprises a rigid rod **32** which slidably extends through the apron **23**, as at **34**. The rod **32** extends into a cavity **36**, which is provided in the apron **23**, and one end of the rod is pivotally fixed as at **38** to an end of an operating lever **40** which is pivotally mounted, as at **42**, to the apron. The rod extends inwardly and upwardly within the housing and extends into and is moveably supported by a bracket, tube, or the like, **44**. The bracket, tube or the like is fixed, in any suitable manner to housing **21**. I provide a spring biased rod or plunger **46**, the inner end of which is spaced from the complementary end of the rod **32**, and a biasing spring **48** is operatively disposed between and connected to the two adjacent ends of the rods **32** and **46**. The outer end of the rod or plunger **42** is in alingment with the slots **42** which are provided in the sleeve or neck **41**. It will now be apparent that by actuating the lever **40** downwardly, in the driection of the arrow in FIG. **2**, the rod **32** will be moved toward the plunger **46** to compress the spring **48** and move the plunger **46** toward the neck **41** and into one of the slots **42** as the neck **41** is rotated. This clutching action will cause rotation of the housing **5** since the rods **32** and **36** are disposed within bracket **44**. Thus, the enclosure **1** will be caused to rotate. To stop rotation of the enclosure and the housing the lever **40** is moved upwardly into the position illustrated in FIG. **2** so that the plunger **46** under the action of the spring **48** will be retracted from its operative position in a slot.

It is to be understood that the above means for connecting and disconnecting the housing from the rotating mechanism is merely by way of example and other means may be employed, and still fall within the spirit and scope of this invention.

It is to be further recognized that when the motor **9** is energized the gear **35**, through the gear train, will be constantly rotating as well as the rocking mechanism shaft **49**, and that the housing will be rotated or not rotated according to the position of the clutching mechanism. Thus, as will be explained, the rocking mechanism may be actuated to cause rocking of the enclosure whether or not the housing is being rotated.

The shaft **49**, which comprises the actuating means for the rocking mechanism and is rotated at all times when the motor **9** is energized, rotatively extends through a shaft guide bracket **67** and fixedly mounts on its end a spur gear **69** which is in mesh with a pinion **71** which is rotatively mounted on any suitable type of axle or the like **72**. The pinion **71** is fixed to a cam **73** having a peripheral cam track **75**. The cam track provides a smooth three-quarters inch rise and in FIG. **2** of the drawings is illustrated at the bottom of its travel. Extending through the sleeve or mast element **27** is a rocker stem **77**, such stem extends through the top of sleeve **27** and is provided with an inclined disc-like head **79** fixed on the outer or upper end thereof. The rocker stem extends through an elongated guide bracket **81** and in operative rocking position is in vertical alignment with the cam track **75** of the cam **73**. When the rocking mechanism is in operative condition, the lower end of the rocker stem **77** will ride on the cam track and will be reciprocated thereby, the uppermost position being shown in dotted lines in FIG. **2**. The length of the rocking stroke is the same as the length of the rocker stem which extends beyond the upper end of the mast **27** when the stem is in full uppermost position.

The upper end of the rocker stem **77** extends into a concave depression in the bottom of the enclosure **1** and the head **79** is seated in a well **83** provided by the enclosure. It will be observed that the diameter of the well **83** is greater than the diameter of the disc or head **79** so that sufficient area for play or sliding movement of disc **79** in the well is provided. It will be appreciated that this play or movement is necessary as a result of the reciprocal motion of the stem **77** and disc **79** to produce the desired rocking motion in the enclosure, or the like, **1**.

As I have explained above, it is desirable to provide means for stopping the reciprocation of the rocker stem **77** to stop rocking motion in the enclosure **1** even though the motor **9** is operating to actuate shaft **49**, gear **69** and **71** and the cam **73**. This means for preventing reciprocation of the rocker stem **77** while shaft **49** is operating functions in a manner to move and hold the rocker stem **77** in position laterally of the cam track so that the rocker arm is unaffected thereby.

As one example, from among many which may be employed to stop the reciprocation of the rocker stem **77** and the rocking of the enclosure **1**, or the like, I have provided an operating handle or knob **93** which is rotatably mounted on a shaft **95** which extends through a thickened portion **97** of the mast, the inner end of the shaft being pivotally fixed as at **99** to a block **101** which is slidably fixed to the stem **77**. Positioned between the block **101** and the thickened portion **97** is a compression spring **103** which surrounds the shaft **95**. The operating knob **93** is provided with a pair of diametrically opposed locking lugs **105** which extend inwardly therefrom toward the thickened portion of the mast. The thickened portion **97** of the mast is formed with two spaced apart lug holes **107**. For a purpose which will become apparent, the lug holes **107** are spaced apart the same distance as are the locking lugs **105** so that in certain rotative position of the operating knob **93** the locking lugs will be aligned with and received in the locking holes.

The cam **73** is provided with a safety lip, or flange, **109**. This safety lip extends radially outwardly from the inner edge of the cam. The safety lip is not provided at the low point of the cam track **75** but it does extend radially from the cam at all other perimetric areas thereof. The purpose of this lip and its particular formation will be described in detail hereinafter.

In FIG. **2** of the drawings, I have illustrated the rocking mechanism in operative position with the lower end of the rocker stem engaged with the cam track of the cam so that this stem will be caused to reciprocate and impart rocking motion to the enclosure. It will be appreciated that with the operating knob **93** in the position illustrated the locking lugs **105** will abut the thickened portion **97** of the mast and thereby, through the shaft **95** and block **101** will hold the stem **77** in operative position on the cam track against the biasing action of the spring **103** which is compressed when the elements are in this position illustrated in FIG. **2**. The arcuate portion **111** of the elongated guide bracket **81** functions as a back up plate or member for the stem **77**.

With the elements and members in the operative rocking position of FIG. **2** in order to disconnect the rocking elements so that the rocking will cease, it is merely necessary to grasp the operating knob **93** and rotate it 90° so that the locking lugs **105** will be aligned with the locking holes **107**. The knob is then released and when the cam track is at its low point with the rocker stem at its lowest point the locking lugs will be drawn into the locking holes **107** under the action of the spring **103**, and the rocker stem **77** will be moved laterally and free of the cam track. This lateral movement of the stem will only occur at the lowest point of the cam track since this is where there is an opening in the safety lip **109**. This arrangement and construction is provided so that there will not be a sudden drop of the enclosure from a high point of the cam track. The arcuate surface **113** of elongated guide bracket **81** serves to limit the lateral movement of stem **77**.

The housing **5** is provided with a fulcrum rod **115** which is fixed to the housing so that it will orbit therewith. The rod **115** extends slightly above the upper surface of the housing so that it will function as a fulcrum element for the rocking motion of enclosure **1**. The bottom of the enclosure is formed with a transverse groove into which rod **115** seats. See FIG. **1**.

Electric switches **117** and **119** are provided for controlling the operation of the electric motor **9** and the music producing means **11**.

It will be recognized that the rocker mechanism actuating pinion **45** must not rotate at the same speed as the gear **37**; if it did, it will be apparent that the rocking mechanism would not function as desired.

It is to be understood that when the term "enclosure" is used in this specification and in the claims, it is intended to refer to any member such as an enclosure, platform or the like which is rotatable and/or rockable.

I claim:

1. Means for producing rotational movement, including in combination, a rotatable member, a power source, and actuating mechanism connected to said power source and cause to rotate thereby, and manually operable controlled means connected to said rotatable member and rotatable therewith, said rotational control means being releasably connectable to said actuating mechanism to cause rotation of said rotatable member, and said rotational control means includes means actuable into releasable rocking engagement with said actuating mechanism when said rotational control means is reciprocated toward said actuating mechanism.

2. Means for producing rotational movement in accordance with claim **1**, wherein said actuating mechanism is provided with means engageable with an element of said rotational control means when it is reciprocated toward said actuating mechanism.

3. Means for producing rotational movement in accordance with claim **2**, wherein the means with which said actuating mechanism is provided comprise slots.

4. Means for producing rotational movement in accordance with claim **3**, wherein said element is projectible into a slot and retractible therefrom.

5. Means for producing rotational movement in accordance with claim **4**, wherein said element is spring biased in its projecting and retracting movements.

6. Means for producing rotational and rocking motion, including in combination, a rotatable member, a power source, an actuating mechanism connected to said power source and caused to rotate thereby, means for releasably connecting said rotatable member to said mechanism, and an enclosure, said enclosure being connected to said rotatable member and rotated thereby, rocking means on said rotatable member and connected to said enclosure to cause rocking of the enclosure and said rocking means being releasably connected to said actuating means and a sound producing apparatus is provided, and said sound producing apparatus is connected to and operated by said actuating mechanism.

7. Means for producing rotational and rocking movement, including in combination a rotatable member, a power source, an actuating mechanism connected to said power source and caused to rotate thereby, means for releasably connecting said rotatable member to said mechanism, and an enclosure, said enclosure being connected to said rotatable member and rotated thereby, rocking means on said rotatable member and connected to said enclosure to cause rocking of the enclosure and said rocking means being releasably connected to said actuating means and said rocking means includes a reciprocal element connected at one end to said enclosure, rotary means, and the other end of said reciprocal element being in engagement with said ro-

tary means to thereby impart reciprocal motion to said reciprocal element.

8. Means for producing rotational and rocking movement in accordance with claim **7**, wherein means is provided for moving said reciprocal element laterally of said rotary means to remove the reciprocal element out of engagement with said rotary means.

9. Means for producing rotational and rocking movement in accordance with claim **7**, wherein said rotary means includes a cam track and one end of said reciprocal element is in operative rocking producing engagement with said cam track.

10. Means for producing rotational and rocking movement in accordance with claim **9**, wherein the cam track is provided on the periphery of said rotary means and the surface of said cam track is provided with a low point which gradually increases to a high point and means is provided on said rotary means permitting lateral movement of said reciprocal element solely when the cam track on the rotary means is at its low point with respect to the end of the reciprocal element.

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