March 5, 1968 J. T. SHACKEL 3,371,358

ROCKING CRADLE

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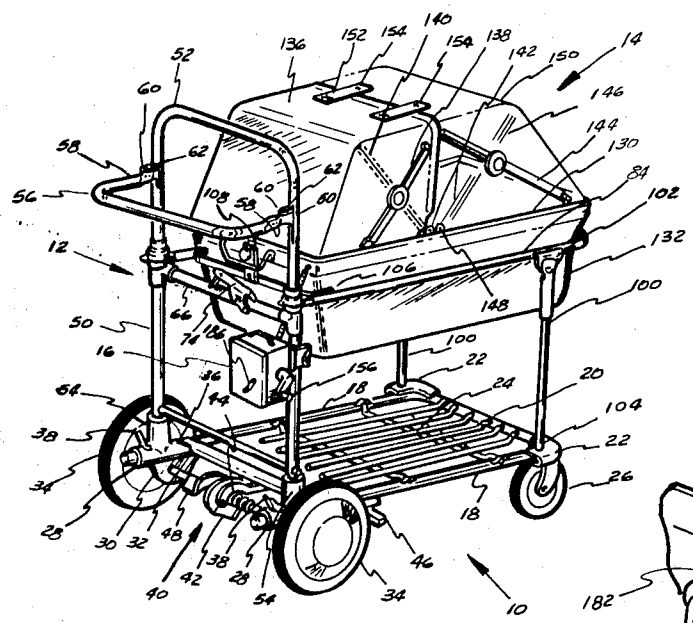


FIG. 1

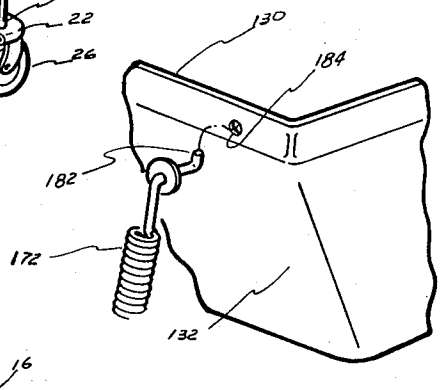


FIG. 2

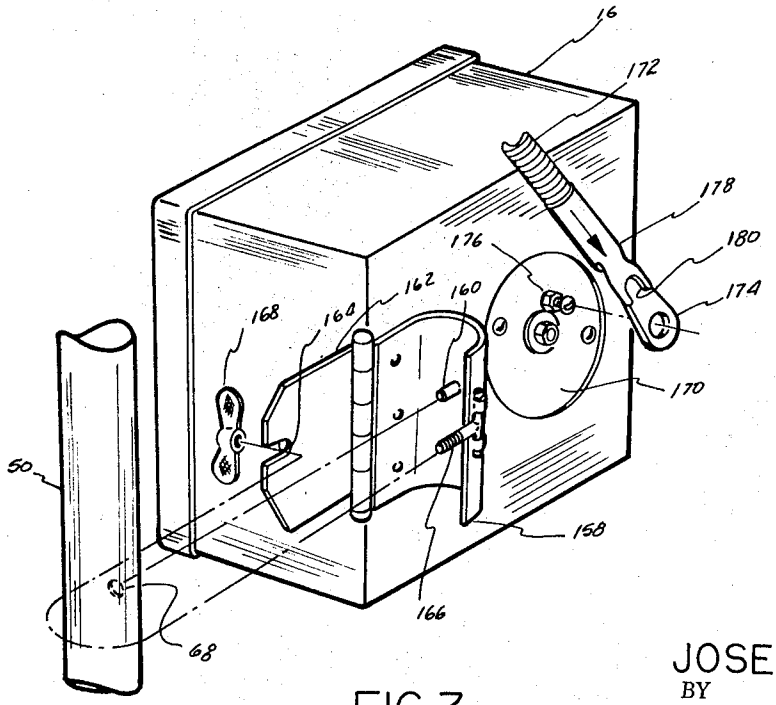


FIG. 3

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ROCKING CRADLE

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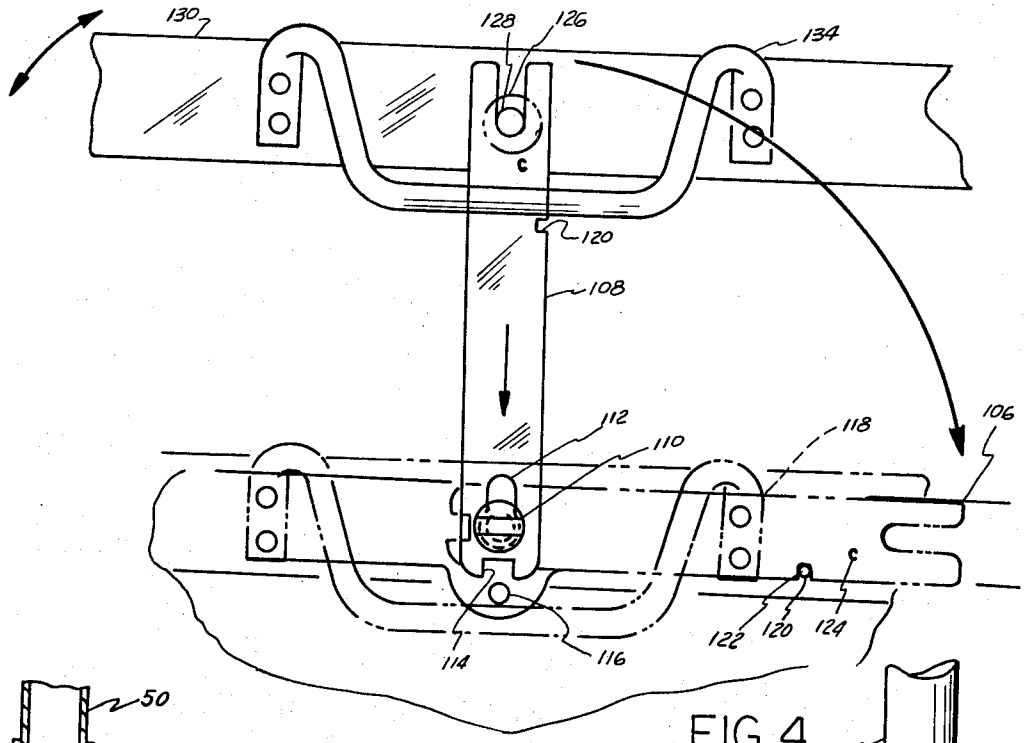


FIG. 4

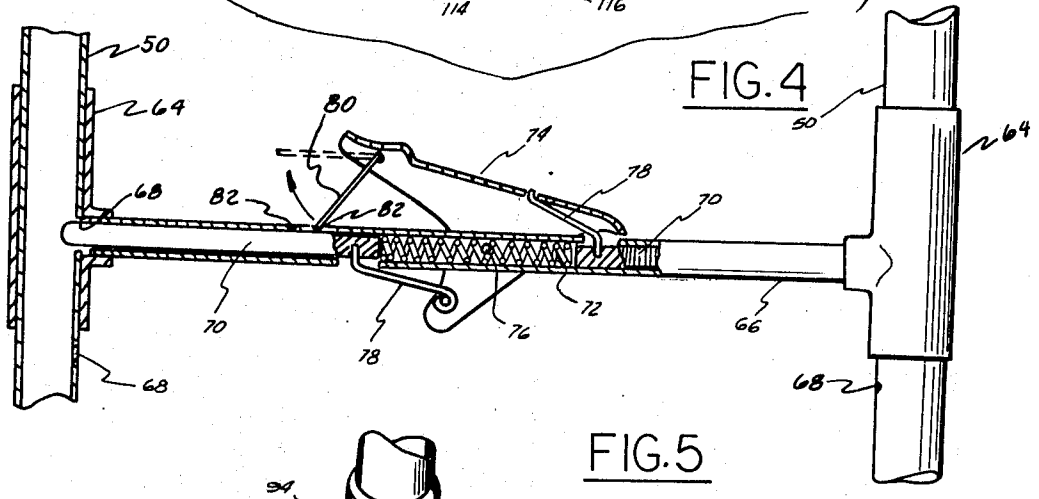


FIG. 5

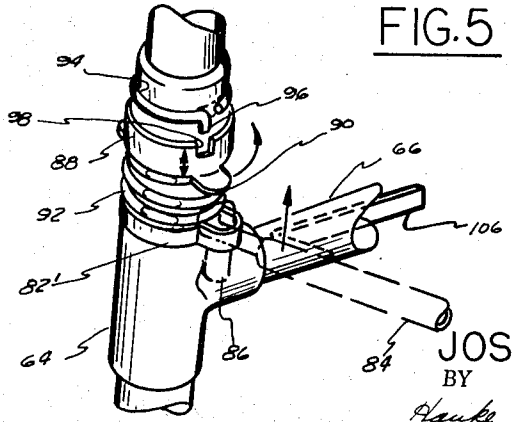


FIG. 6

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ROCKING CRADLE

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ABSTRACT OF THE DISCLOSURE

A crib unit supported on a wheel bearing chassis for self-rocking movement relative to the chassis. A motor provides a source of motion to the crib unit through a semi-rigid link. The link provides a motion transmitting connection from the motor to the crib when the crib is in a balanced condition. However, the link in response to a predetermined force opposing the motion of the crib about its axis, assumes a non-rigid connection between the motor and the crib.

The crib unit is mounted at a selectively variable height to the chassis by a horizontal tubular support member having a pair of locking elements interengageable in sockets provided in a pair of upright supports. A lever member is operable to actuate the locking elements into a disengaged position with respect to their sockets upon the release of a safety latch.

Background of the invention

(1) *Field of the invention.*—This invention relates to cradles and more specifically to a cradle supported for powered rocking movement on a wheel bearing chassis, the connection between the source of power and the cradle taking the form of a semi-rigid link.

(2) *Description of the prior art.*—Motor driven cradles of the prior art generally comprise a cradle assembly supported for pendular movement to a suitable frame with some form of drive means arranged to achieve a continual motion. A serious drawback inherent in conventional motor-driven cradle arrangements is that the driving means continues to produce a reciprocal pivotal movement of the cradle irrespective of the position of the infant disposed therein. It is desirable that the drive means provide a continuous motion of the cradle while the infant is disposed in a normal position in the center of the crib so that the infant is subjected to a gentle rocking motion. However, as is common with infants, they sometimes manage to work themselves into an unbalanced position wherein they are disposed along the sidewall of the cradle in an abnormal position. Until noticed by the mother, the infant is otfen subjected to bouncing toward and away from the sidewall of the cradle as the motor continues its driving motion. The elimination of this problem is one of the major features of the present invention wherein is disclosed a novel form of link between the output of the driving motor and the cradle. When the infant is in a normal position, the link provides a driving connection between the output of the motor and the cradle, however, when the infant is in an abnormal unbalanced position, the link provides a nondriving connection between the motor and the cradle.

It is often desirable to adjust the height of the cradle relative to its frame, however, the means for achieving this height adjusting feature in the prior art requires a complicated locking apparatus. The reason for this is the inherent requirement for a high safety factor in articles for retaining infants. There must exist no possibility that the height adjusting device can be accidentally disengaged. For this reason, a simple reliable height and adjusting device has not been available for baby buggies. This is another major problem associated with the prior art

and which is solved by the preferred embodiment of the present invention.

Summary of the invention

The preferred embodiment of the present invention, which will be subsequently described in greater detail, obviates the aforementioned problems involved in the prior art and in addition provides some special advantages. The preferred embodiment takes the form of a wheeled chasis having a pair of spaced, upright supports and a supporting framework attached to the upright supports at a selectively variable height. A pair of pivot elements are mounted to the supporting framework and are movable between an upright braced position and a collapsed position. In the upright position, the pivots provide a pivotable support for the cradle unit. In the collapsed position, the cradle unit rests directly on a supporting frame so that it is nonmovable relative to the chassis.

A suitable driving motor, which may take the form of a spring powered motor, a battery powered motor, an AC plug-in type motor or the like, is mounted to one of the upright supports with an output member adapted to rotate about a generally horizontal axis parallel to the pivotal axis of the cradle. Preferably, an elongated coil spring member provides a link between the output member of the motor and the cradle. The coil spring link has a stiffness such that it normally provides a direct, rigid connection between the output of the motor and the cradle so that the cradle assumes a pendular motion. However, a force applied on the cradle tending to oppose the rocking motion produced by the motor causes the link to yield so that the cradle assumes a motionless state while the motor continues to rotate.

The yieldable link provides an important advantage in that the weight of an infant disposed in an abnormal position along the side of the cradle produces a torque sufficient to override the stiffness of the link so that the cradle remains motionless until the infant is rearranged in a normal position. Another advantage of this drive arrangement is that the mother can readily impose a force on the cradle effective to override the motor and maintain the cradle in a stationary state without rendering the motor inoperative.

Another feature of the preferred embodiment illustrating the invention takes the form of means for locking the cradle at a selected height to the upright supports above the base of the device. The cradle is supported by a framework having a transverse supporting member spanning the two upright members. The transverse support has spring loaded locking elements projectable from its ends into suitable sockets provided in the upright members. Although this arrangement for locking a pair of units in a selected relative position is old, the means for disengaging the locking elements in their respective sockets provides a special safety advantage over the art. This disengaging handle has a safety latch preventing inadvertent disengagement of the cradle supporting framework from the upright supporting member. Thus, there is no possibility of an unintentional manipulation of the locking unit permitting the cradle to collapse while the infant is disposed therein.

It is therefore an object of the present invention to provide an improved motorized rocking cradle wherein the link between the output of the motor and the cradle achieves a continual rocking motion which can be overridden by an opposing force applied to the cradle so that the cradle assumes a motionless state while the motor continues to operate.

It is another object of the present invention to provide a motorized cradle arranged on a wheeled chassis and supported by a mounting arrangement permitting the cradle to be locked to the chassis at a selected height.

It is a still further object of the present invention to provide a safety latch arrangement to prevent inadvertent disengagement of a locking apparatus of the type wherein a first elongated member having locking elements projectable into and out of its extreme ends is associated with a pair of spaced transverse members having longitudinally spaced sockets for receiving the locking elements.

It is a still further object of the present invention to provide a buggy for infants having a supporting framework convertible between a first condition wherein a cradle is fixed relative to the chassis and a second condition wherein the cradle is pivotably supported to the chassis.

Still further objects and advantages of the present invention will become more readily apparent to one skilled in the art to which the invention pertains upon reference to the following detailed description.

Description of the drawings

The description makes reference to the accompanying drawings in which like reference characters refer to like parts throughout the several views in which:

FIGURE 1 is a perspective view of a self-rocking cradle illustrating a preferred embodiment of the invention;

FIGURE 2 is an enlarged view of a section of the cradle illustrating the engagement with the drive link;

FIGURE 3 is an exploded view of the drive motor illustrating its connection with the lower end of the drive link and its associated upright suport member;

FIGURE 4 is an enlarged view of the carrier unit and illustrating the means for pivotably supporting the cradle in a raised position with the alternative non-pivoting position illustrated in phantom;

FIGURE 5 is a fragmentary end elevational view of the locking arrangement for locking the cradle supporting frame to the chassis; and

FIGURE 6 is an enlarged fragmentary perspective view illustrating details of the upright support and cradle supporting framework.

Description of the preferred embodiments

Now referring to the drawings, FIG. 1 illustrates a wheeled chassis generally indicated at **10** provided with a movable supporting assembly **12**. A cradle unit **14** is pivotably supported to the supporting assembly **12** and operably connected through a motor **16** to achieve a continuous pendular motion.

The chassis **10** comprises a pair of spaced apart, parallel, longitudinal extending, preferably tubular side bars **18** connected at their forward end to a transverse, tubular forward bar **20** preferably by fixtures **22**. The sidebars **18** and the forward bar **20** form a framework to which a gridlike platform **24** is secured.

A conventional, pivotable wheel assembly **26** is supportably atached to each of the fixture **22**.

A sleeve **28** is slidably connected near the rear end of the sidebars **18**. A downwardly directed lug **30** depends from each of the sleeves and provides means for supporting a rear axle **32** provided with traction wheels **34**. The sleeves **28** are interconnected one to the other by a brace **46** and intended to be locked at a predetermined position to the side bars **28** through a pin and socket arangement (not shown) which is releasably connected to handles **38**.

A wheel braking and locking mechanism **40** comprises a pedal **42** connected through a toggle arrangement **44** to a braking bar **46**. A second pedal **48** is interconnected for cooperative movement with pedal **42**. The pedals **42** and **46** are arranged so that they are alternately in either a raised or lowered position. Thus, when the operator steps on the pedal **42** the braking bar **46** engages the wheels **34** to lock the wheels in a nonrotatable position. In this lowered position of the pedal **42**, the pedal **48** is in a raised position. To disengage the braking bar **46** from the wheels **34**, the operator steps on the raised pedal **48** to move it to a lowered position, the pedal **42** goes to a raised position. Thus it can be seen that the operator actuates the braking bar **46** to either a released position or a locked position by stepping on whichever pedal is in the raised position. The actuating force is always applied by the sole of the operators foot.

The supporting assembly **12** comprises a pair of tubular upright members **50** joined at their upper end by a connecting cross bar **52**. The lower ends of the uprights **50** are joined to socket portions **54** forming an integral part of the sleeves **28**.

A generally U-shaped handle bar **56** is pivotably secured at **58** to the upright members **50**. A loop element **60**, connected to each of the uprights **50**, is arranged to engage an abutment portion **62** provided on each leg of the handle bar **56** to hold the handle bar in a raised position. The handle bar **56** may therefore be locked in a horizontal position by the loops **60** or released to a lowered downward position as desired.

Now referring to FIGS. 1 and 5, a suporting fixture **64** is slidably associated with each of the upright members **50** and interconnected one to the other by a transverse support member **66**. The uprights **50** are provided with a series of longitudinally spaced apertures **68**. A pair of plungers **70**, are slidably disposed in the transverse support **66**, and biased by a spring member **72** toward an extended position wherein they engage a selected pair of apertures **68** in the uprights **50**.

A release handle **74** pivotably connected to the support member **66** at **76**, provides means for retracting the plungers **70** through a pair of links **78**. The release handle **74** is movable betwen a lowered position wherein it retracts the plungers **70** from engagement with the uprights **50** and a raised position associated with the extended position of the plungers **70**.

A safety catch **80** is pivotably connected to the release handle **74** and arranged such that when the handle **74** is in its raised position, the lower end of the safety catch **80** drops into one or the other of notches **82** provided in the support member **66**. When the safety catch **80** is engaged with one of the notches **82**, the release handle **74** is locked against movement toward a release position. To lower the release handle **74**, the safety catch **80** must be raised to a position illustrated in phantom so that the handle **74** can be lowered by an intentional manipulative movement.

Now, referring to FIGURE 6, the fixtures **64** also are provided with sockets **82**. A U-shaped, elongated, cradle suporting member **84** has downwardly turned fingers **86** at the end of each of its legs which fit into the sockets **82**. An annular locking ring **88** having a depending ear **90** is associated with each of the sockets **82**. Each locking ring **88** is rotatable between a first position wherein the ear **90** is disposed over the finger **86** and prevents the finger **86** from being disengaged from its respective socket **82**, and a second position wherein the ear **90** is rotated to a position wherein it clears the socket **82** to permit disengagement of the finger **86**.

A spring member **92** biases the locking ring **88** away from the socket **82** and toward a locking element **94**. Each locking element **94** has a downwardly depending extension **96** which engages a cutout portion **98** in the ring **88** when the ear **90** is arranged over its associated socket **82**. Thus, it can be seen that the U-shaped support **84** may be quickly assembled and locked in a variety of selected vertical poistions to the uprights **50**.

As can best be seen in FIGURE 1, a pair of spring-loaded legs **100** are pivotably connected to the forward portion of the support member **84** through lugs **102**. The lower end of the legs **100** as provided with a narrowed end (not shown) arranged to fit in sockets **104** provided in fixtures **22**.

Referring to FIGS. 1 and 4, the opposite legs of the support member **84** are interconnected by a cross brace **106** joined adjacent the uprights **50**. A finger **108** is movably attached to the cross brace **106** by means of a pin **110** engaged in a closed elongated slot **112** formed in

the finger **108**. The finger **108** is movable between a raised upright position wherein a slot **114** provided at the lower end of the finger **108** clears a pin **116** and a lowered upright position wherein the slot **114** engages the pin **116**. In the lowered position, the finger **108** is rigidly locked in an upright position by the pins **110** and **116**. By raising the finger **108** so that the slot **114** clears the pin **116**, the finger **108** can be lowered to a horizontal position as illustrated in phantom at **118** wherein a cut-out **120** formed in the finger **108** engages a locking pin **122** carried by the brace **106**. To further assist the brace **106** in retaining the finger **108** in its lowered position, the finger **108** is provided with a dimple portion **124** which engages a complimentarily shaped bulge (not shown) provided in the brace **106**.

The upper end of the finger **108** has an open ended slot **126** to receive a pin **128** carried by a rectangular, rigid, frame **130** defining the upper open end of the cradle unit **14**. It is to be understood that the forward end of the support member **84** has a similarly arranged finger for pivotally supporting the forward end of the frame **130** so that the frame **130** is thus pivotable about a longitudinal axis spaced above the support **84**. The frame **130** has dimensions such that when the fingers **108** are lowered to their downward horizontal position, the cradle unit **14** is nested directly on the support member **84** in a non-movable position relative to the chassis **10**.

The frame **130** provides means for suspending a generally basket shaped portion **132**. It is intended that an infant is to be disposed in the portion **132** which is fabricated from a suitable flexible, clothlike, plastic material.

A pair of handle members **134** fixed to the frame **130** provides means for lifting the cradle unit **14** away from its supporting members.

A hood assembly **136** provided with a pair of pivotably interconnected braces **138** and **140** is arranged for movement between a position wherein it partially encloses the upper open end of the cradle assembly **14** and a collapsed position wherein it permits access to the interior of the basket portion **132**. This motion is achieved by pivotably connecting the brace positions **140** at their lower end at **142** to the support **130**. Preferably the hood **135** is lowered and raised from the rearward position of the frame **130**.

A second pair of interconnected brace members **144** and **146** are pivotably connected at **148** to the frame **130** and carry a transparent hood **150**. The interconnected braces **144** and **146** are arranged such that they can be collapsed toward the forward end of the cradle unit **14** or raised to a position wherein the transparent hood **150** cooperates with the hood **136** to totally enclose the interior of the carrier unit **14**. In the raised positions, the hoods are interconnected by a latch **152** carried by the hood **136** which engages a pin **154**. Thus an infant may be disposed in the carrier unit **14** and completely protected from the elements while at the same time being readily observable by the mother.

Now, referring to FIG. 3 the motor **16** preferably is spring-wound by a separable handle **156**. The frame of the motor **16** carries an arcuate locking portion **158**. The locking portion has a diameter generally corresponding to the diameter of the tubular upright **50** and carries a pin **160**. The pin **160** has a diameter permitting it to be engaged with one of the apertures **68** formed in the upright **50**. Thus, the motor **16** can be affixed to the upright **50** by arranging the pin **160** wherein it engages one of the apertures **68** and the arcuate portion **158** partially embraces the upright **50**. A locking member **162** is hinged to the motor **16** and arranged such that a slot **164** engages a threaded pin **166** carried by the portion **158**. The locking portion **162** is securely fastened to the portion **158** by a wing nut **168**. This mounting arrangement for the motor **16** permits the motor to be rigidly

secured to the upright **50** at a selected position relative to the cradle unit **14**.

The motor **16** is preferably mounted so that an output member **170** is supported for rotation about an axis generally parallel to the axis of pivotal movement of the cradle unit **14**. As best seen in FIGS. 2 and 3, a coiled spring member **172** provides a link between the output member **170** of the motor **16** and the frame **130** of the cradle unit **14**. The lower end of the spring **172** has an eye portion **174** which engages an eccentrically arranged pin **176** carried by the output member **170**. A locking sleeve **178** is movable towards and away from the eye **174** with a slot **180** to engage the pin **176** to retain the eye **174** thereon.

The upper end of the spring **172** has a bent portion **182** to engage an aperture **184** defines in a short side of the frame **130** spaced from the axis of pivotal movement of the cradle **14**.

Thus, it can be seen that as the output member **170** rotates, the spring **172** provides a driving connection with the carrier **14** to produce a reciprocal rotational movement about the axis of pivotal support of the cradle unit **14**. The spring **172** has a stiffness such that it produces a gentle rocking motion of the cradle unit **14**. However, when a weight is imposed on the cradle unit **14** tending to oppose the rocking movement thereof, the spring **172** has a stiffness such that it yields or buckles in response to rotation of the cutput member **170**. This stiffness of the spring **172** is chosen so that when the weight of an infant in the cradle unit **14** is disposed in an abnormal position, a torgue is produced acting on the spring **172** sufficient to override the longitudinal movement of the spring so that the cradle portion **14** remains motionless while permitting the output member **172** to continue to rotate.

The motor **16** also is provided with an operating lever **186** to permit the operator to manually actuate the motor **16** into a rotating or nonrotating condition.

Although I have described and illustrated but one preferred embodiment of my invention, it will be apparent to one skilled in the art to which the invention pertains that various changes and improvements may be made therein without departing from the spirit of the invention or the scope of the appended claims.

I claim:

1. A self-rocking cradle assembly comprising:

(a) a cradle unit;

(b) a frame;

(c) support means, said support means arranged to pivotally support said cradle unit to said frame for movement about a generally horizontal axis;

(d) motor means, said motor means adapted to provide a source of continuous motion;

(e) a connection between said motor means and said cradle, said connection arranged to produce a pendular motion of said cradle unit relative to said frame, said connection comprising an elongated link, said link having a resilient character, said link having one end connected to the output of said motor means and the opposite end attached to said cradle unit, said link having a first condition wherein said link has a stiffness sufficient to transmit motion from said motor means to said cradle unit and a second condition wherein said link assumes a yieldable condition to provide a non-driving connection between the output of said motor and said cradle unit where in said link element comprises an elongated coil spring, said coil spring yieldable in response to a predetermined longitudinal compressive force.

2. A self-rocking cradle as defined in claim **1**, wherein said motor means includes a drive member, said drive member supported for rotation about an axis substantially parallel to the axis of pendular motion of said cradle unit, means rotating said drive member about said axis of rotation, said link having a connection to said drive

member laterally spaced from said axis of rotation and a second opposite connection to said cradle unit laterally spaced from the axis of pendular motion of said cradle unit.

3. A self-rocking cradle as defined in claim 2, including:
(a) ground engaging wheels supporting said frame;
(b) said frame having a pair of spaced apart support sections overlying said wheels;
(c) a pivot element carried by each of said support sections, said pivot elements movable between an upright position wherein said cradle unit is suspended therefrom for reciprocal pivotal movement and a second collapsed position wherein said cradle unit is supported in a weight bearing relationship on said support members and restrained against relative movement with respect to said frame.

4. A self-rocking cradle as defined in claim 3, wherein said frame has an upright support member, said link is releasably connected to said cradle and said motor means, and including means releasably locking said motor means at a selected vertical height relative to the axis of pendular motion of said cradle to said upright support member.

5. A self-rocking cradle as defined in claim 4, wherein said locking means comprises;
(a) said upright support member having a socket;
(b) said motor means having a pair of depending, cooperating collar halves, said collar halves arranged to releasably embrace said upright support member;
(c) a depending lug, said depending lug affixed to one of said collar halves, said depending lug interengageable with said socket when said collar halves are embracingly engaged with said upright support member.

6. A self-rocking cradle as defined in claim 3, wherein said frame has a pair of spaced apart, parallel, elongated upright support sections; and including means for supporting said cradle unit at a selected height from the base of said frame, said cradle supporting means comprising;
(a) a plurality of longitudinally spaced sockets provided in said upright support members, said sockets arranged in pairs and facing one another;
(b) a transverse support member spanning said upright support members, said transverse support member having a tubular configuration including opposite open ends;
(c) a bolt element associated with each of said open ends, said bolt elements axially slidably disposed within said transverse support member;
(d) means biasing said bolt elements toward an extended position wherein the outer ends of said bolt elements project in to a selected pair of sockets;
(e) handle means for retracting said bolt elements from said sockets and into said transverse support member, said handle means movable between a first position associated with the extended position of said locking elements and a second position associated with the retracted position of said locking elements, and
(f) means releasably locking said handle means in said first position to prevent unintentional manipulation of said handle means toward said second position; and
(g) means supporting said cradle unit to said transverse support member.

7. A self-rocking cradle as defined in claim 6, including a hood assembly attached to said cradle unit, said hood assembly including a pair of cooperating hood sections arranged for movement between a raised position wherein said hood halves combine with said cradle unit to provide a totally enclosed container, and a collapsed condition wherein said hood halves permit access to the interior of said cradle unit.

8. A self-rocking cradle as defined in claim 7, wherein at least one of said hood halves is formed of a transparent material, said transparent hood half permitting visual observation of the contents of said cradle unit when said hood halves are in said raised condition.

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