Dec. 15, 1959 N. LESK ET AL 2,916,745

POWER ACTUATED RHYTHMICAL MOVEMENT ACCESSORIES FOR CHILDREN'S CRIBS

Filed Sept. 17, 1954 4 Sheets-Sheet 1

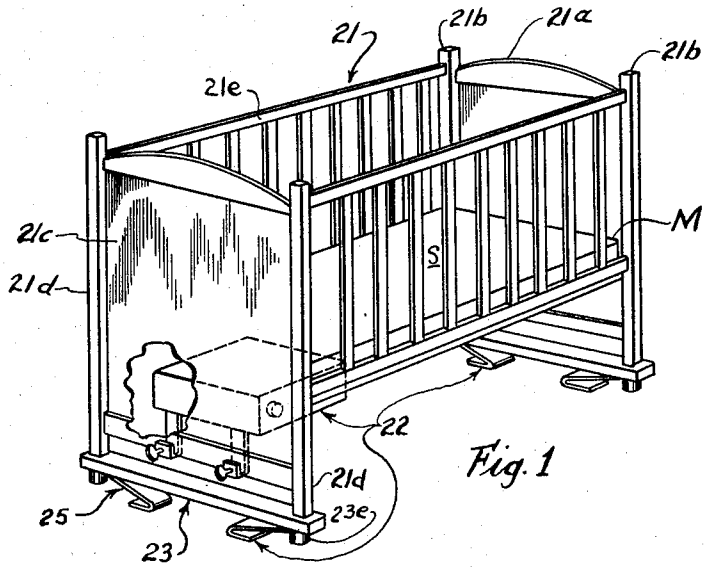


Fig. 1

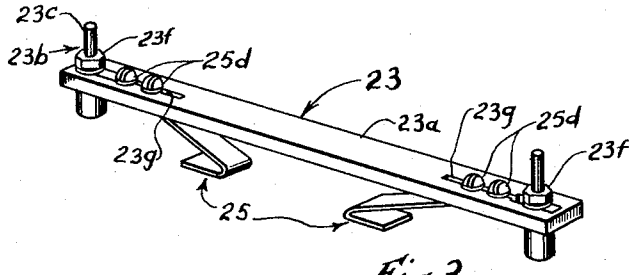


Fig. 3

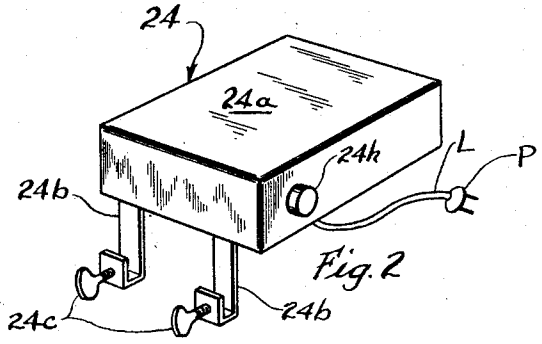


Fig. 2

NORMAN LESK
MITCHEL KLEINMAN
INVENTORS

BY

Barnett + Barnett
ATTORNEYS

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Fig. 4

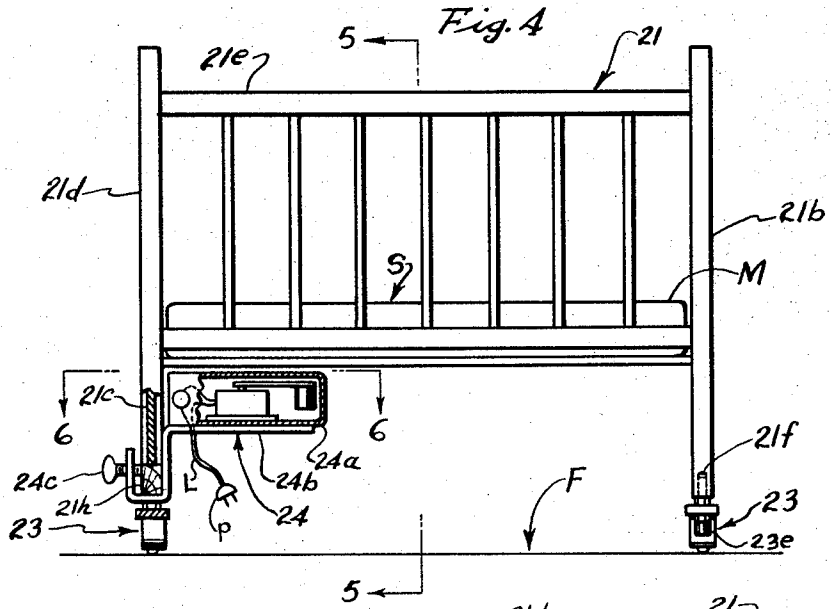
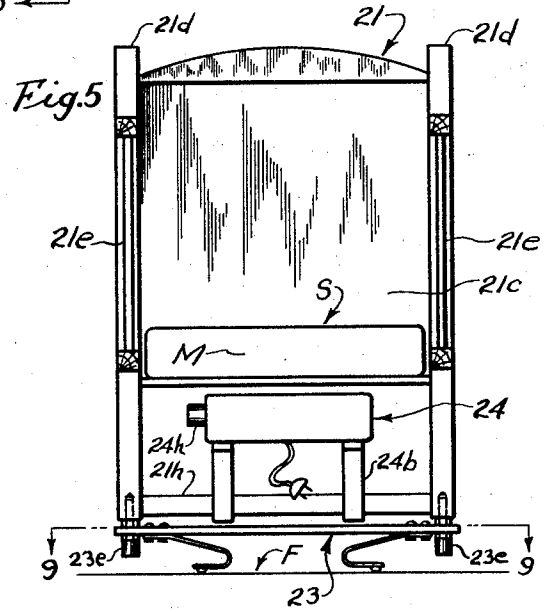


Fig. 5



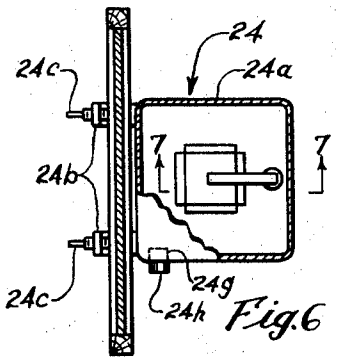


Fig. 6

NORMAN LESK
MITCHEL KLEINMAN
INVENTORS

BY

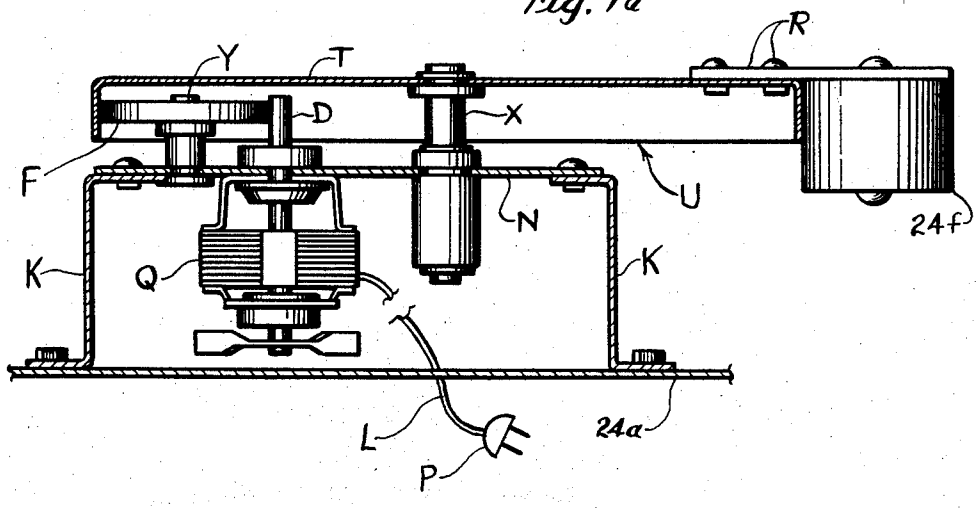
Barnett & Barnett
ATTORNEYS

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POWER ACTUATED RHYTHMICAL MOVEMENT ACCESSORIES FOR CHILDREN'S CRIBS

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Fig. 7a



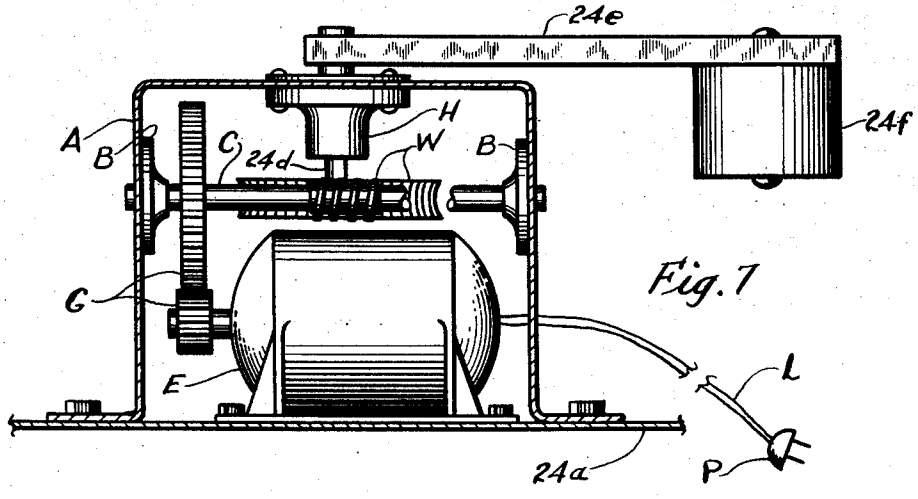


Fig. 7

NORMAN LESK
MITCHEL KLEINMAN
INVENTORS

BY

Barnett + Barnett
ATTORNEYS

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POWER ACTUATED RHYTHMICAL MOVEMENT ACCESSORIES FOR CHILDREN'S CRIBS

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Fig. 9

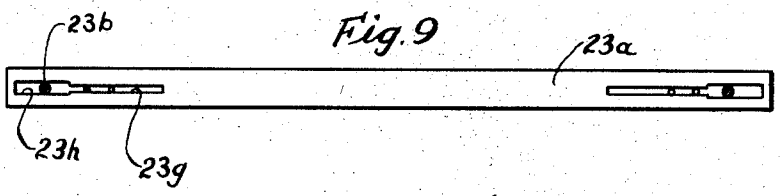


Fig. 8

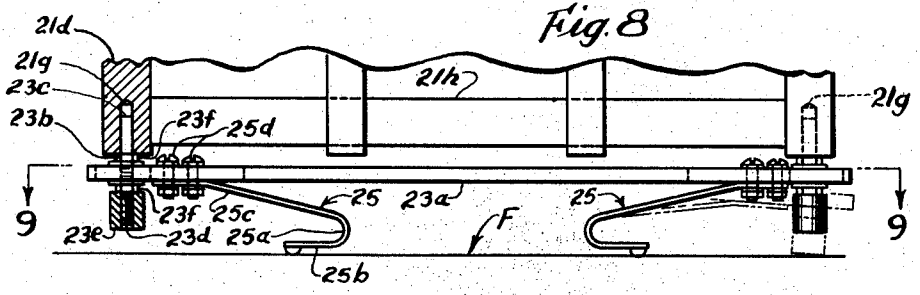


Fig. 8a

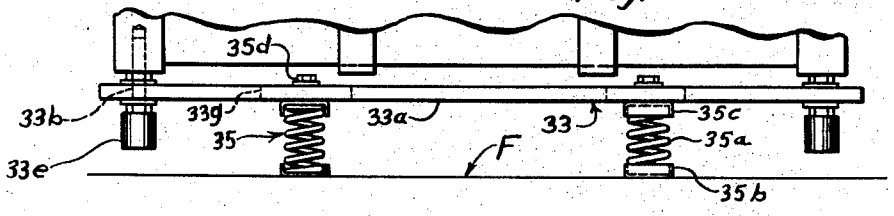
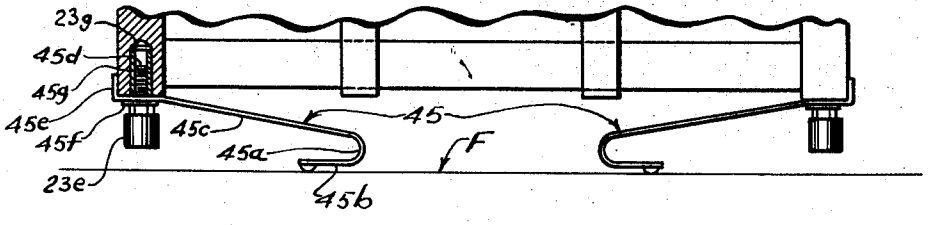


Fig. 8b



NORMAN LESK
MITCHEL KLEINMAN
INVENTORS

BY

Barnett + Barnett
ATTORNEYS

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2,916,745

POWER ACTUATED RHYTHMICAL MOVEMENT ACCESSORIES FOR CHILDREN'S CRIBS

Norman Lesk, Laurelton, and Mitchel Kleinman, Brooklyn, N.Y.

Application September 17, 1954, Serial No. 456,646

8 Claims. (Cl. 5—109)

This invention relates to power actuated rhythmical movement means for children's cribs, and more particularly to readily attachable accessories, each supplied as an assembly unit for mounting on a conventional non-rocking child's crib without any change of construction or alteration of the latter.

Among the objects of the invention is to generally improve power rhythmical movement accessories of the character described which shall comprise few and simple parts that may be easily attached in operative position as an accessory on children's cribs of conventional construction, which operation shall repeatedly produce smoother and gentler rhythmic movement than heretofore conducive to relaxation and sleepiness in an occupant of the crib, which shall be adjustable to accommodate cribs of different dimensions of the various manufacturers, which shall be dependable and reliable in operation without supervision, which shall be inexpensive to manufacture yet rugged to withstand rough usage, which shall be selectively adjustable for a wide range of degrees of rhythmic crib movement, which shall be safe under all conditions of use especially to practically stop the rhythmic movement transmitted to the crib when the occupant stands up from a lying down position, and which shall be efficient and practical to a high degree in use.

Other objects of the invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists of features of construction, combinations of elements and arrangements of parts which will be exemplified in the constructions hereinafter disclosed, the scope of the application of which will be indicated in the claims following.

In the accompanying drawing in which various embodiments of the invention are shown:

Fig. 1 is a perspective view showing a conventional non-rocking type of child's crib equipped with an electrically operated rhythmic movement accessory in operative assembly to embody the invention, the crib being partly broken away to expose a portion of the accessory power drive.

Figs. 2 and 3 are perspective views of the power drive and one of the end spring mountings of the accessory assembly unit, respectively, shown in Fig. 1.

Fig. 4 is a side elevational view of the child's crib and accessory shown in Fig. 1, partly broken away to show the detachable mounting on the crib.

Fig. 5 is a mid-sectional view corresponding to a cut taken on line 5—5 in Fig. 4 showing the relative position of the spring mounting and drive power unit of the accessory assembly unit.

Fig. 6 is a sectional view as seen from line 6—6 in Fig. 4 partly broken away to expose certain actuating elements of the power drive.

Fig. 7 is an enlarged cross-sectional view taken on line 7—7 in Fig. 6 showing details of the power drive construction.

Fig. 7*a* is an enlarged cross-sectional view similar to Fig. 7 showing an alternate form of power drive construction.

Fig. 8 is a fragmentary enlarged view of a lower end portion of the crib footboard structure, partly broken away to show the detachable coupled assembly of the bar spaced-apart leaf spring mounting with the caster sockets of the crib.

Fig. 8*a* is a fragmentary enlarged view similar to Fig. 8 but showing helical springs used in place of the leaf springs of the mounting.

Fig. 8*b* is a fragmentary enlarged view similar to Fig. 8 showing the spaced apart leaf springs mounted directly to the lower end portion of the crib footboard, and

Fig. 9 is a sectional view taken on line 9—9 in either Figs. 5 or 8 showing the top plan view of the bar spaced apart leaf spring mounting.

This application is a continuation-in-part of our application entitled "Electrically Operated Crib Rocker," Serial No. 331,388, filed January 15, 1953, now abandoned.

Referring in detail to the drawing, 21 denotes a child's crib which may be of any conventional non-rocking type provided with an attachable power actuated rhythmical movement accessory 22 constructed to embody the invention.

Crib 21, as shown in Figs. 1, 4 and 5, may have an upright head board 21*a* formed with spaced vertical edge posts 21*b* separated from foot board 21*c* formed with spaced vertical edge posts 21*d*, spaced apart guard rail sides 21*e* extending between head board 21*a* and foot board 21*c* and enclosing horizontally extending rest surface S of mattress M, the latter being suitably supported by said head board 21*a* and foot board 21*c* in any well understood manner.

As seen from Figs. 1, 4 and 5, accessory 22 which forms a multi-part unit may comprise a pair of spring mounting members 23 providing a resilient cushioning support for the crib head board 21*a* and foot board 21*c* from the ground or floor F and a suitable power drive unit 24.

Each spring mounting member 23, as shown in detail in Figs. 3, 4, 5, 8 and 9, has a horiozntally disposed crossbar 23*a* which carries, to extend vertically thereon, stud shanks 23*b* adjustably spaced apart in slots 23*h* for selectively conforming to the span of the distance between caster pin socket holes 21*f* and 21*g* bored up into the pairs of spaced edge posts 21*b* and 21*d*, respectively, into which holes 21*f* and 21*g* shank portions 23*c* of stud shanks 23*b* upstanding from each bar 23*a* are fitted thereby replacing individual caster shanks usually provided in said holes 21*f* and 21*g*. Downwardly extending threaded portion 23*d* of each spaced stud shank 23*b* passes through each crossbar 23*a* terminating in a height adjusting stop block 23*e* which can be set to positively limit the maximum tilting movement of the crib 21 from a horizontal level, as is clear from the position shown in dotted lines in Fig. 8.

Spaced inwardly from opposite ends of each crossbar 23*a* and located between stop blocks 23*e*, there may be

provided suitable resilient cushioning means, such as, bowed leaf springs **25** each having a mid-portion bight **25***a* terminating in a lower level end **25***b* formed to rest on floor F.

Upper level end **25***c* opposite lower level end **25***b* of spring **25** may be adjustably secured to the under side of crossbar **23***a* by suitable means, as for example, elongated slots **23***g* and screw clamp connectors **25***d*, at various distances from each other with a gap between bights **25***a* which are in alignment with crossbar **23***a*. Upper end **25***c* is longer than lower end **25***b* so that the latter forms a spanning base length support about half the width of crib **21**, as is clear from Figs. 5 and 8. The spacing adjustment positions of the springs **25** on crossbar **23***a* can be simply made by loosening screw clamp connectors **25***d*, selectively moving upper ends **25***c* toward or away from each other along slots **23***g* and then again tightening said connectors **25***d*. Stud shanks **23***b* may also be adjustably secured in slots **23***h* at various distances apart on each crossbar **23***a* to conform to differences of spacing of crib post socket holes **21***f* and **21***g*. To this end, a pair of nut and washer connectors **23***f* may be provided for firmly screw clamping each threaded portion **23***d* in set position on crossbar **23***a*, as shown in Figs. 8 and 9.

Power drive unit **24** may include a suitable enclosing casing **24***a* which is demountably supported from the crib structure, as for example, by spaced bracket arms **24***b* terminated by adjustable wing bolt anchoring clamp ends **24***c* which releasably fasten to lower horizontally extending edge border cross stretcher **21***h* of foot board **21***c* so as to locate the enclosed power drive unit **24** to extend just below mattress M in a relatively centralized position above the span of the supporting base length formed by the aligned lower level spring ends **25***b*, as is clear from Figs. 1, 4, 5 and 8.

Suitably controlled mechanical or electrical motor means of any well known construction may be provided to operate power drive unit **24** which, as here shown in Figs. 4, 6 and 7, has an electric motor E bolted to bottom side of casing **24***a* and is equipped with a speed reduction mechanism, as for example, a combination of meshing gears G and worm and wheel W, which drive vertically disposed shaft **24***d* for normally rotating a radially extending arm **24***e* in a horizontal plane therewith.

A suitable rigid framework A may be provided for supporting aligned spaced bearings B in which opposite end portions of horizontally extending countershaft C are journalled, the latter carrying to turn therewith one of said gears G and the worm of the worm and wheel W. Said framework A may also support in alignment an overhang bearing H for drive shaft **24***d*, as is clear from Fig. 7.

Said arm **24***e* may terminate in a weighted portion **24***f*, the relatively slow rotation of which by drive shaft **24***d* produces the desired rhythmic movement for crib **21** in the manner more fully hereinafter described.

For connecting motor E to an available electric power source (not shown) in the well understood manner, as a portable appliance, flexible lead wires L and circuit plug P are provided to extend from motor E, as is clear from Figs. 1 and 2.

To vary the speed of rotation of said weighted portion **24***f* to obtain a frequency in resonance with the crib's weight characteristics, suitable electric motor speed variation control means may be connected in the well known manner in the motor power supply circuit, such as a rheostat **24***g*, and finger knob **24***h* extending beyond casing **24***a* for convenient manipulation, shown for example, in Figs. 2, 4, 5 and 6.

The practical utility of the invention will now be apparent. After constructing the multi-part unit forming accessory **22**, namely, spring mounting members **23** and power drive unit **24** as described above and shown in the drawing, said accessory multi-part unit can be readily installed for operation by simply fitting upturned shank portion **23***c* of each member **23** into edge post caster socket holes **21***f* and **21***g* of any standard non-rocking child's crib **21** by first adjusting the spacing of stud shanks **23***b* and tightening the nut and washer connectors **23***f* about crossbar **23***a* and then securely anchoring power drive unit **24** in a centralized position by fastening anchoring clamp ends **24***c* to edge border cross brace **21***h*.

After adjusting the level of blocks **23***e* on stud **23***d* above floor F to positively limit the maximum tilting of the crossbar **23***a* with the crib **21** to the highest degree of safety, crib **21** with accessory **22** installed is then ready for practical service on placing a child on mattress rest surface S.

To produce desired gentle and smooth rhythmic movement, plug P of electric flexible lead wire L is connected to any suitable electric supply outlet (not shown) in the well understood manner, motor E then being energized to rotate drive shaft **24***d* with radial arm **24***e* and weighted portion **24***f* at a relatively slow speed (r.p.m.), the latter moving in a horizontal plane path.

Crib **21** with accessory power drive unit **24** disconnected from the power supply normally has mattress rest surface S thereof in a relatively horizontal balanced level position of equilibrium, but on energizing motor E the cyclic rotation of weighted portion **24***f* of arm **24***e* sets up an actuating force sufficient to produce swaying on cushioning springs **25** in a gentle and smooth rhythmical movement when the rate of rotation of arm **24***e* is substantially equal to the combined resonant frequency of crib **21** mounted on members **23** with an occupant lying on mattress M.

In practicing the invention, for example, it has been found that where a standard sized crib is utilized having a distance of about 29 inches between socket holes **21***f*, **21***g* in posts **21***b*, **21***d*, respectively, the floor contact points of lower ends **25***b* of bowed leaf springs **25** may be adjusted for a spaced apart distance of about 14 inches so that power drive unit **24** mounted to underlie the crib spring and spaced equally between posts **21***d* and having weight **24***f* of about 1 pound driven at about 76 r.p.m. in a circular path of a radius of about 5 inches elevated approximately 12 inches from the floor, will produce the desired rhythmic, rocking motion of crib **21**.

In order to compensate for differences in the resonant frequency of crib **21** due to its weight, center of gravity and weight of its contents including spring, mattress, bedding and occupant, motor speed adjusting rheostat **24***g* is designed to vary the speed of motor E from a minimum of 68 to a maximum of 78 r.p.m. on turning knob **24***h*. This variation of 10 r.p.m. has been found sufficient to bring most cribs and contents into resonance.

Thus, in operating accessory **22** after power is supplied to energize motor E for causing rotation of weight **24***f*, rheostat knob **24***h* is first set to permit maximum speed of rotation at 78 r.p.m. Should the crib fail to respond by remaining stationary, knob **24***h* is then turned to reduce the speed of rotation of weight **24***f* until a resonant frequency equivalent to that of crib **21** is obtained at which point rocking will commence and continue until either the power is shut off or the resonance of the system is disturbed, as for example, by the child occupant standing up in the crib.

It will now be apparent that accessory **22** in utilizing resonance of the system will require a minimum of power for its operation, a 1/64 H.P. motor having been found quite adequate, and also provides the hereinbefore mentioned safety feature whereby a child occupant by standing up will alter the center of gravity of crib **21** thus also changing the resonant frequency thereof a sufficient amount to cause the rocking motion to cease. Blocks **23***e* extending down from the ends of crossbar **23***a* are adjusted to a position above the level of floor F serving as stop means to prevent tipping or tilting of crib **21** beyond a safe angle, as is clear from the broken line position shown in Fig. 8, and provides an added safety fea-

ture whereby a child occupant will not be able to overturn crib 21 by leaning over the guard rail sides 21*e*.

A modified form of spring mounting member 33 is shown in Fig. 8*a* to be constructed with crossbar 33*a*, stud shanks 33*b* and adjusting stop blocks 33*e* similar to crossbar 23*a*, stud shanks 23*b* and stop blocks 23*e* of member 23 but, instead of bowed leaf springs 25, helical spring units 35 may be provided adjustably secured to the underside of crossbar 33*a* by suitable means, as for example, elongated slots 33*g* and bolt and washer connectors 35*d*. Helical spring units 35 may be formed in any well known manner, as for example, with a helical spring 35*a* secured between lower and upper terminal cups 35*b* and 35*c*, respectively, lower cup 35*b* serving as a floor engaging surface for each of the units 35.

When so desired, a separate leaf spring unit may be fashioned to embody the invention for direct mounting in each of the caster socket holes 21*f* and 21*g* of crib 21. To this end, Fig. 8*b* shows mounted on crib 21 modified bowed leaf springs 45 each having a mid-portion bight 45*a* terminating in floor resting lower level 45*b* and upper level 45*c* secured adjacent the end thereof to one of the socket holes 21*f* and 21*g* of posts 21*b* and 21*d* by suitable means, as for example, a threaded shank 45*d* extending through an opening in upper level 45*c* and clamped thereto between nut and washer 45*f* and caster socket fitting sleeve 45*g* which is internally threaded to adjustably receive shank 45*d*. Upper level 45*c* may be formed with a terminal upturned flange 45*e* for contacting the outer faces of posts 21*b*, 21*d* to prevent rotating or swiveling of spring 45 in socket holes 21*f* and 21*g*.

Spring mounting members 33 with helical spring units 35 may be installed for operation as part of accessory 22 in the same manner as spring mounting members 23 described above, helical spring units 35 being spaced apart and centralized with respect to the width of crib 21 along slots 33*g* and secured in adjusted position by bolt and washer connectors 35*d* for optimum sensitivity to the rotation of weight 24*f*. Separate leaf springs 45 when used instead of members 23 or 33 may be of predetermined portions so that the floor contact points of lower ends 45*b* will be spaced apart a proper distance to render the required sensitivity and may be provided in different sizes for use on different size and weight cribs. When mounted in caster socket holes 21*f* and 21*g*, separate leaf springs 45 will be in alignment with each other and function in the same manner as members 23 and 33 above described.

Instead of the electric motor power drive means and arm construction for rotating weight 24*f* shown in Fig. 7, an electric motor driven phonograph record turntable unit U of any well known construction may be utilized to carry weight 24*f* in its said circular path. Such unit U is shown in Fig. 7*a* to comprise a plate N supported from a bottom side of casing 24*a* by brackets K and carrying suitable bearings in which are journalled stub shafts X and Y and drive shaft D of electric motor Q, turntable T being mounted for rotation on shaft X and driven by motor Q through intermediate friction drive wheel F rotating on shaft Y in the well understood manner, electric motor Q being provided with lead wires L and circuit plug P for connection to an available power source in the same manner as motor E. Weight 24*f* may be secured to the periphery of turntable T by any means, as for example, bracket and bolts R and will function as the drive mechanism shown in Fig. 7 and described above.

Accessory 22 imparts a relatively slow rhythmical rocking or swaying motion to crib 21 conforming substantially in frequency to the r.p.m. of weight 24*f*. The frequency range utilized herein as well as the quality of the rocking motion has proved soothing to children having a tendency to induce sleep in contrast to prior art devices which set up vibratory or bouncing motion in the crib.

It is thus seen that there is provided improved power operated accessory constructions for imparting a rhythmical rocking or swaying motion to children's cribs in which the several objects of the invention are achieved and which are well adapted to meet conditions of practical use.

As various possible embodiments might be made in the above invention, and as various changes might be made in the constructions above set forth, it is to be understood that all the matters herein set forth or shown in the accompanying drawings are to be interpreted as illustrative and not in a limiting sense.

Having thus described our invention, we claim as new and desire to secure by Letters Patent:

1. In an accessory for imparting rhythmical rocking and swaying movement to a standard non-rocking child's crib having four corner supporting posts each fitted with a caster pin socket hole, a crossbar of a length sufficient to extend between and beneath two of said corner posts along one end of the crib for supporting said crib end thereon in an upright position, stud shanks carried on opposite ends of said crossbar extending upwardly to engagingly seat in said caster pin sockets to retain said crib end in said supported upright position, and resilient spring cushioning means carried by said crossbar having floor contacting points in alignment therewith positioned inwardly from each end thereof and symmetrically positioned between said stud shanks for supporting said crossbar a predetermined spaced distance above a floor surface to provide for said crib rocking and swaying.

2. In the accessory defined in claim 1 in which said resilient spring cushioning means includes a pair of spaced apart bowed leaf springs, one end portion of each spring being shorter than the other, the shorter spring portion terminating in said floor contacting points.

3. In the accessory defined in claim 1 in which said resilient spring cushioning means includes a pair of spaced apart helical springs.

4. In the accessory defined in claim 1, in which said crossbar includes means for adjustably spacing said floor contacting points toward and away from each other.

5. In the accessory defined in claim 1 in which said resilient spring cushioning means includes a pair of spaced apart bowed leaf springs, one end portion of each spring being shorter than the other, the shorter spring portion terminating in said floor contacting points, said crossbar including means for adjustably spacing said bowed leaf springs with said floor contacting points closer to or further away from each other and means for adjustably spacing said stud shanks to conform to the width of over or under sized cribs.

6. In the accessory defined in claim 1 in which adjustable stop means are provided on opposite ends of said crossbar to extend downwardly into said spaced distance above the floor surface for limiting the rocking movement of the crib and for preventing accidental tilting due to shifting of a crib occupant's weight.

7. In an accessory for imparting rhythmical rocking and swaying movement to a standard non-rocking child's crib having a horizontally disposed rest surface extending between oppositely positioned end panels supported between pairs of corner posts, a crossbar of a length sufficient to extend between and beneath a pair of said corner posts beneath each end panel of the crib for supporting said crib ends thereon in an upright position, means carried on opposite ends of said crossbars for attaching the crossbars to a bottom portion of each pair of corner posts to retain said crib ends in said supported upright position, resilient spring cushioning means carried by each of said crossbars for supporting the latter a predetermined distance above a floor surface, said spring cushioning means having a pair of floor contacting points in alignment beneath each crossbar spaced inwardly from each end thereof and symmetrically positioned between said post attaching means, an eccentric weight and power drive for rotating said weight at a predetermined speed, and means for mounting said weight and power drive on one of said crib end panels below said rest surface for

travel in a horizontal plane effective when operative to impart said rhythmical rocking and swaying movement to the resilient spring cushioning means mounted crib.

8. The accessory defined in claim 7 including means for selectively varying the predetermined speed of rotation of said weight to conform to the resonant frequency of the crib and an occupant.

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