March 6, 1951 J. CHODACKI ET AL 2,544,298

ELECTROMAGNETIC MECHANISM FOR AGITATING CRADLES

Filed April 19, 1948 2 Sheets-Sheet 1

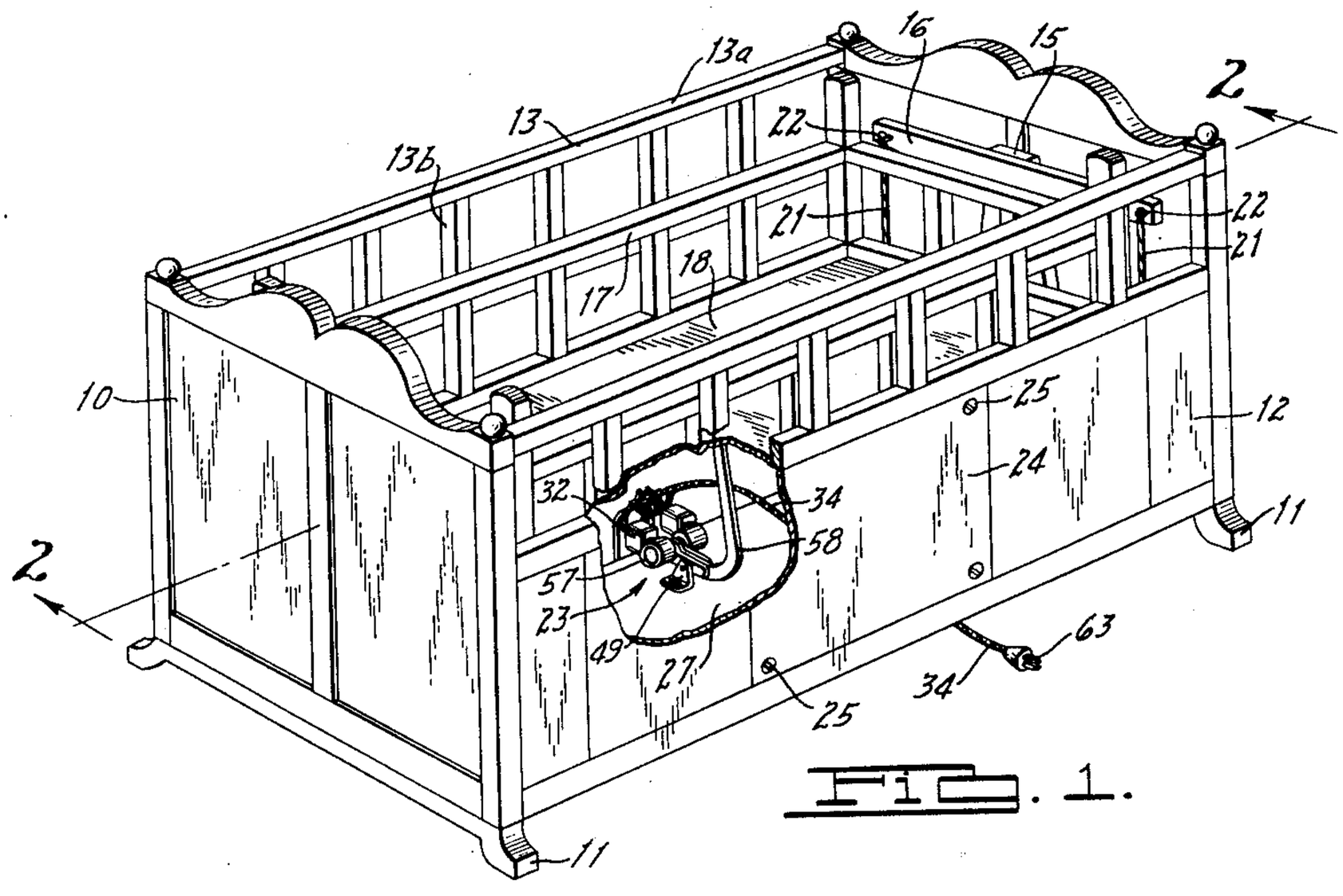

Fig. 1.

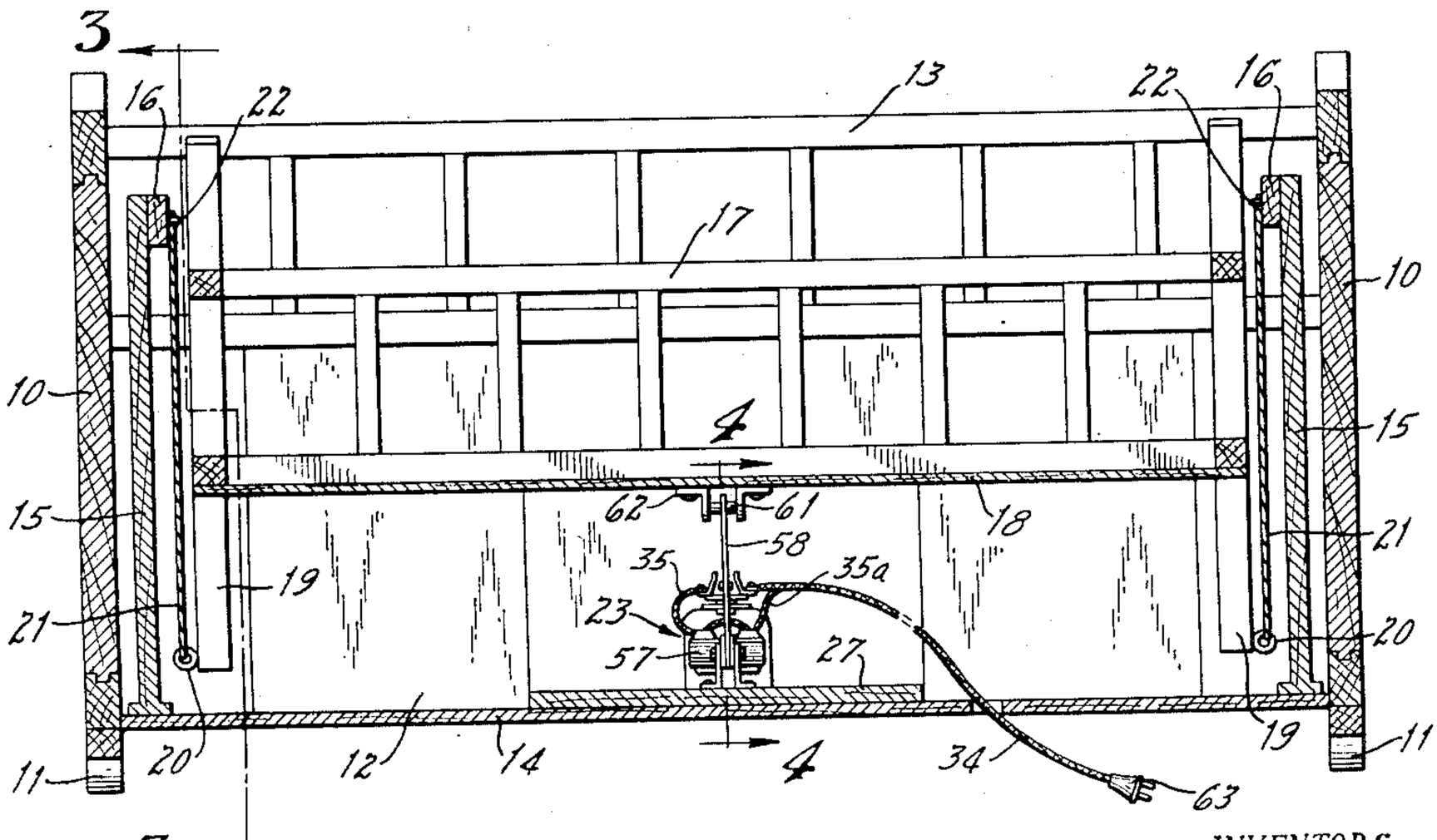

Fig. 2.

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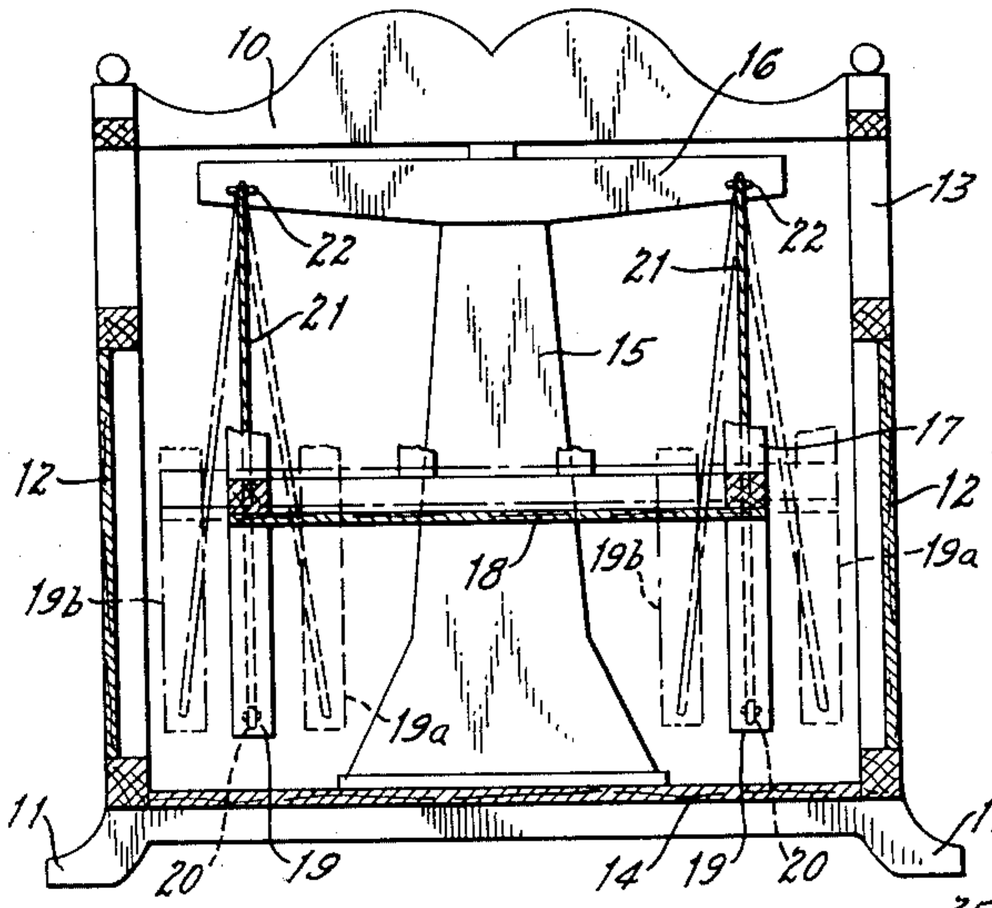


FIG. 3.

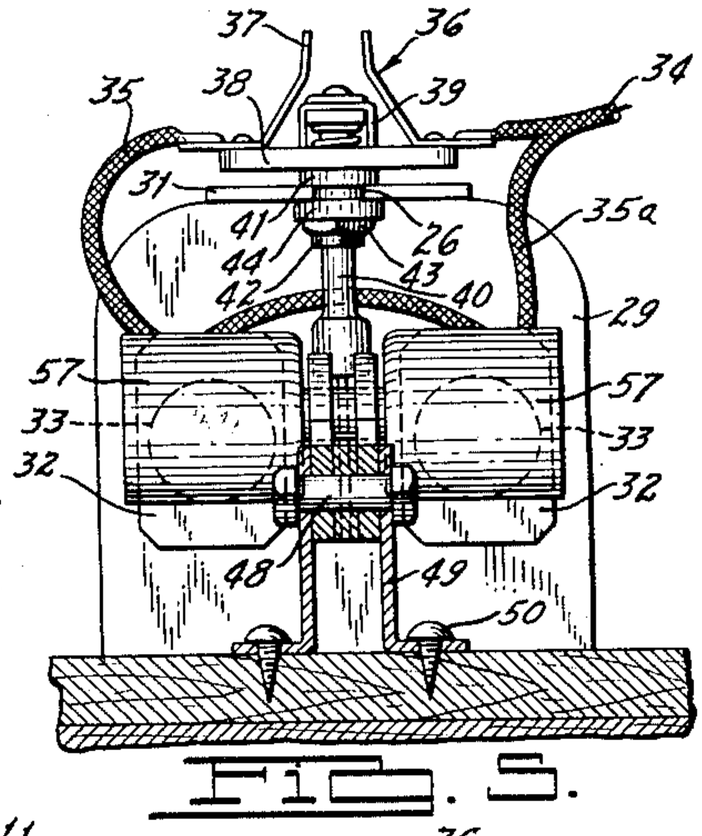


FIG. 5.

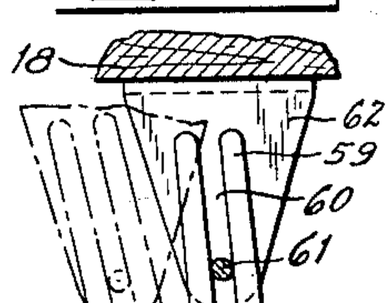


FIG. 4.

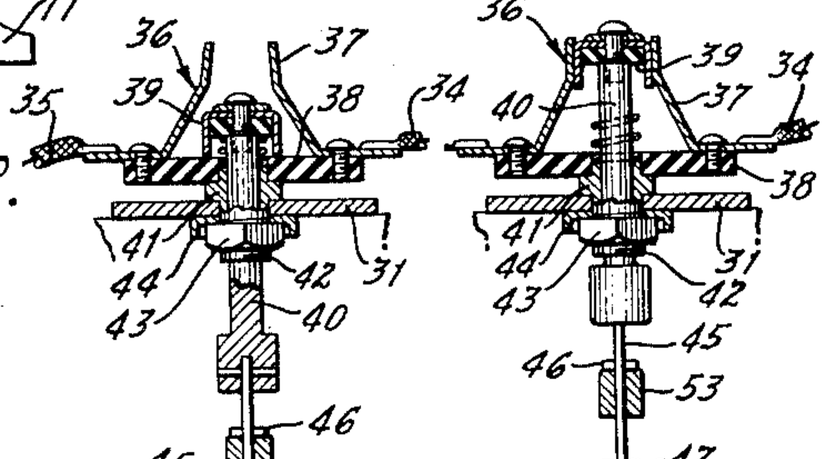
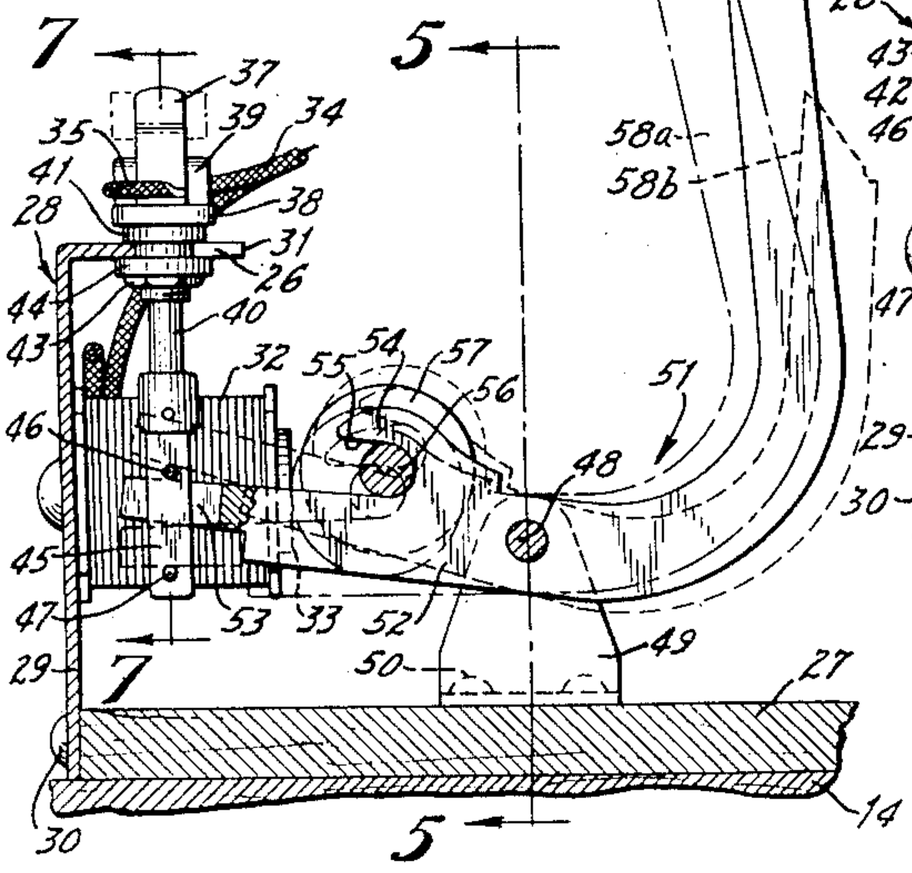


FIG. 7.

FIG. 8.



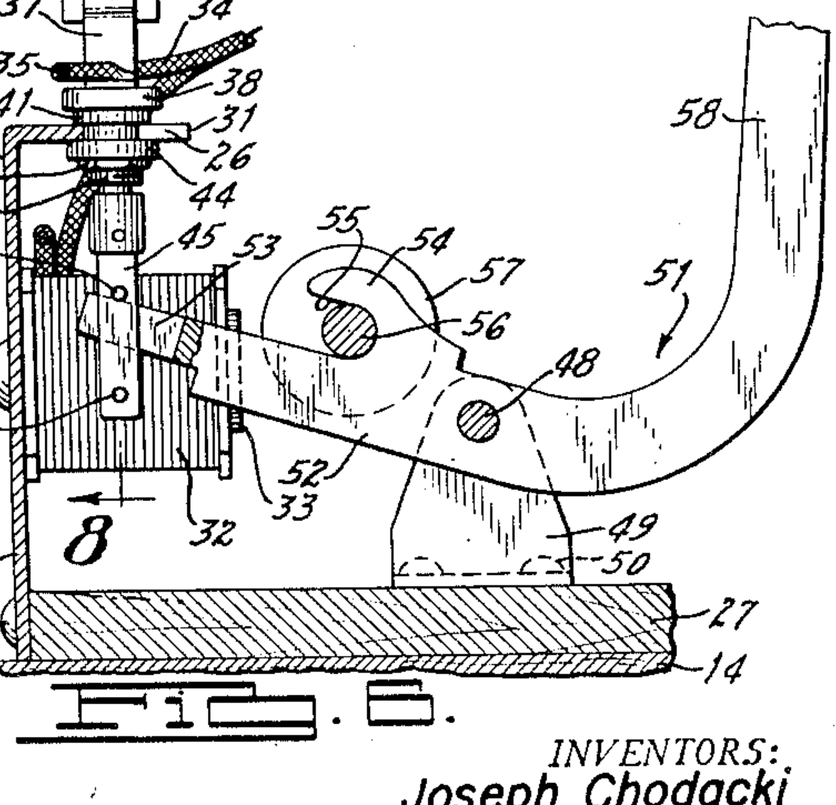


FIG. 6.

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Patented Mar. 6, 1951 2,544,298

UNITED STATES PATENT OFFICE

2,544,298

ELECTROMAGNETIC MECHANISM FOR AGITATING CRADLES

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Application April 19, 1948, Serial No. 21,938

3 Claims. (Cl. 5—109)

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The object of our improvement is to provide a cradle for the use of children in which an electromagnetic device will supply the necessary impulses to impart to the cradle a swinging, pendulum like movement. A further object of our improvement is to provide a cradle of the kind in which the amount of electric current necessary for the agitation of the cradle is very small, as said current is used only for a series of temporary impulses, with relatively long periods therebetween when said current is switched off.

Another object of our improvement is to provide a cradle in which the electromagnetic device is concealed within the framework of the cradle, and which may be used in the manner of an ordinary cradle without interference from the mechanism installed therein. In other words, the cradle is built in such a manner that, if desired, it may be agitated by the electromagnetic means therein, or it may be agitated manually without the need of said means, but without the necessity of removing said means from the cradle.

A further object of our improvement is to provide a cradle in which the agitation will be gentle, eliminating the chances of jerky movements of the cradle in its operative use, this being due to special structural features of our improvement.

We shall now describe our said improvement with reference to the accompanying drawings in which:

Figure 1 is a perspective view of our cradle, with parts broken off for the purpose of exhibiting the position of the electromagnetic means within;

Figure 2 is a longitudinal, sectional view on line 2—2 of Figure 1;

Figure 3 is a sectional view on line 3—3 of Figure 2;

Figure 4 is an enlarged, sectional view on line 4—4 of Figure 2;

Figure 5 is a sectional view on line 5—5 of Figure 4;

Figure 6 is an enlarged view of the mechanism shown in Figure 4, with parts in different operative positions;

Figure 7 is a sectional view on line 7—7 of Figure 4;

Figure 8 is a sectional view on line 8—8 of Figure 6.

Similar numerals refer to similar parts throughout the several views.

Outwardly, the cradle has the appearance of a

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bed, with two ends 10 forming the headboard and the footboard of the bed, said ends including feet 11 on which said bed is supported. The sides include panels 12 and guards 13 which are in the nature of a grill work, each including a top rail 13*a* and a plurality of upright members 13*b* supporting it. Forming the bottom part of the structure is a floor 14 which supports two standards 15, one adjoining the headboard and the other adjoining the footboard, each standard having a transverse beam 16. The cradle proper is disposed within said bed-like outer casing and is made in the form of a cage 17 provided with a horizontal bottom 18.

This structure includes an upright leg 19 at each corner, each leg being provided with an eye 20 at its lower end for attachment of a cord 21. The cords in turn are connected to the respective ends of the beam 16 by means of eyelets 22 and serve as suspension members for the cradle proper. The mechanism for agitation of the cradle, identified by numeral 23, is disposed on the flooring 14, being mounted on a board 27, and may be reached from outside through an opening in the panel 12, the opening being covered by means of a cover 24 affixed in place by means of screws 25.

Affixed to board 27 by means of screws 30 is an upright bracket 28 having the form of an inverted letter L, said bracket including an upright member 29 and a horizontal member 31. Supported by said upright member 29 are two electromagnets, each including a coil 32 and an iron core 33, the current to energize the electromagnets being supplied by a cable 34 which, by means of a plug 63, may be connected to the conventional wiring system of average homes. The cable contains two wires 35 and 35*a*, the first of which leads to a switch 36. The latter includes two resilient prongs 37 mounted on a supporting plate 38 made of a suitable dielectrical material, the prongs being held in place in a spaced relation to each other as best shown in Figures 5 and 7. A complementary part of the switch is a piston 39 supported on a rod 40. The rod passes through a bushing 41 disposed in an aperture 26 in the horizontal member 31 of bracket 28, said bushing being threaded on its outer surface as shown at 42, and being secured in place by means of a nut 43 bearing against a washer 44.

Extending downwardly from rod 40 is a bar 45 provided with two transverse stop-pins, 46 and 47 respectively, these being in a spaced, vertical relation to each other. Fulcrumed on bolt 48 between two bracket plates 49 having foot flanges

50 is a two-arm lever, generally indicated by numeral 51. One of said arms, 52, being shorter than the other, is made of two parallel members spaced from each other and includes a forked end 53 straddling bar 45 between the transverse stop-pins 46 and 47. A claw 54, being integrally formed upon each member of said arm 52, provides an oblong slot 55 opening towards the electromagnets and serves as a bearing for a shaft 56. The latter supports two rollers 57, spaced from each other so as to be in register with cores 33 of said electromagnets. The longer arm of lever 51, secured in place between two parallel members of arm 52, is substantially disposed at right angle to arm 52 and has a forked end 59, this formation resulting in the creation of a slot 60 running longitudinally within said arm 58. Fitting into said slot is a cross-pin 61 supported by a pair of spaced brackets 62 mounted on the underside of flooring 12.

After having described the details of construction of our cradle, we shall now describe the operation thereof. Owing to the manner of suspension, the inner cage or cradle proper 17 may be swung readily from side to side in a pendulum motion on its cord supports 21. The position of the cradle at the outer limits of its swing is indicated by broken lines 19*a* and 19*b* as shown in Figure 3. Normally, when the cradle is at rest, the forked end of arm 52 in lever 51 is in the position shown best in Figure 4, where said arm abuts the upper stop pin 46 on bar 45 extending downwardly from rod 40 of piston 39. It will be noticed that the piston in this position is out of engagement with prongs 36 of the switch in line 35. The longer arm 58 is shown in Figure 4 in solid lines.

Assuming, now, that an initial swing is imparted to the cradle manually so that long arm 58, actuated by pin 61 on the underside of bottom 18 of cradle 17, will assume the position shown in dotted lines 58*b* in Figure 4. As a result of that, piston 39 will be pushed upwardly by arm 52 so that switch 36 is closed and the electromagnets are energized. In this phase, the position of arm 52 in piston 39 between prongs 37 is shown in Figure 6.

Rollers 57 which, as will be noted, are located above the centers of cores 33, will now be immediately attracted by said cores, which will cause the rollers mounted on shaft 56 to roll upon the top of arm 52 towards the electromagnets, causing said arm to swing downwardly until the shaft 56 is substantially opposite the centers of the cores 33.

It will be noted that the lower stop-pin 47 is quite a distance below the underside of arm 52 and that said arm 52 has to travel quite a distance before it encounters said pin 47. Once this happens, the downward swing of lever 52 will disengage piston 39 from prongs 37, moving said piston from the position shown in dotted lines 39*a* in Figure 4 to a position shown in solid lines in said figure, thus cutting off the current to the electromagnets. Under the momentum of the movement caused by the pull of the electromagnets, the cradle will complete its swing so that the long arm 58 will swing to a position 58*a* as shown in dotted lines in Figure 4, whereupon, in a pendulum motion, the cradle will swing back when, again, lever 58 actuated by the body of said cradle will cause piston 39 to engage prongs 37 and to close the switch. From here on, the cycle will be repeated.

The cycle, as thus described, executes two full pendulum swings, first in one direction and then in the other direction, but the electromagnets will be active only during one-half of the first swing, that is, from the upper limits of the swing to what is the center or the zero position in the arc described by a swing.

It will be obvious that some changes may be made in the construction of our improvement without departing from the inventive principles disclosed herein.

What we, therefore, wish to claim is as follows:

1. Electromagnetic means to operate a cradle in a pendulum-like motion, said means including an upright bracket mounted upon a base under said cradle, a pair of electromagnets mounted on said brackets and including magnetizable cores, the cores of the electromagnets being disposed alongside each other in a spaced relation to the base, a two-armed lever, fulcrummed in front of the cores upon a bolt disposed transversely with respect to said cores, one of said arms extending substantially upwardly and having means for connection to the cradle, the other arm being disposed substantially horizontally, a pair of axially aligned rollers supported by the last-said arm in a parallel position to said bolt, the rollers being made of metal adapted to be attracted by the electromagnets to cause the upright arm to impart to said cradle, a thrust for a pendulum-like swing, a switch above the electromagnets, means actuated by the roller-supporting arm of the lever, to alternately close the switch and to open it, and cable means to supply current to said electromagnets.

2. Electromagnetic means to operate a cradle in a pendulum-like motion, said means including an upright bracket mounted upon a base under said cradle, a pair of electromagnets mounted on said brackets and including magnetizable cores, the cores of the electromagnets being disposed alongside each other in a spaced relation to the base, a two-armed lever, fulcrumed in front of the cores upon a bolt disposed transversely with respect to said cores, one of said arms extending substantially upwardly for engagement with the underside of the cradle, the other arm being disposed substantially horizontally, and including at its upper side a hook-like claw open towards the electromagnets, a short shaft transversely fitting into said claw and adapted to roll from said claw outwardly upon said arm, a pair of axially aligned rollers mounted on the shaft and straddling said arm, the rollers being made of metal responsive to the pull of the electromagnets to cause the upright arm to impart to said cradle, a thrust for a pendulum-like swing, a switch above the electromagnets, means actuated by the roller-supporting arm of the lever, to alternately close the switch and to open it, and cable means to supply current to said electromagnets.

3. Electromagnetic means to operate a cradle in a pendulum-like motion, said means including an upright bracket mounted upon a base under said cradle, a pair of electromagnets mounted on said brackets and including magnetizable cores, the cores of the electromagnets being disposed alongside each other in a spaced relation to the base, a two-armed lever, fulcrumed in front of the cores upon a bolt disposed transversely with respect to said cores, one of said arms extending substantially upwardly for engagement with the underside of the cradle, the other arm being disposed substantially horizontally, and including at its upper side a hook-like claw open towards the electromagnets, a short

shaft transversely fitting into said claw and adapted to roll from said claw outwardly upon said arm, a pair of axially aligned rollers mounted on the shaft and straddling said arm, the rollers being made of metal responsive to the pull of the electromagnets to cause the upright arm to impart to said cradle, a thrust for a pendulum-like swing, a switch above the electromagnets, piston-like means operatively connected to the roller-supporting lever to close the switch on the up-swing of said arm and to open the switch on the down-swing of said arm, and cable means to supply current to said electromagnets.

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ALBERT ZAK.

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