Nov. 18, 1958 J. DE PASQUA 2,860,727

MECHANICALLY AGITATED CRADLE

Filed Aug. 23, 1957 2 Sheets-Sheet 1

Fig. 1

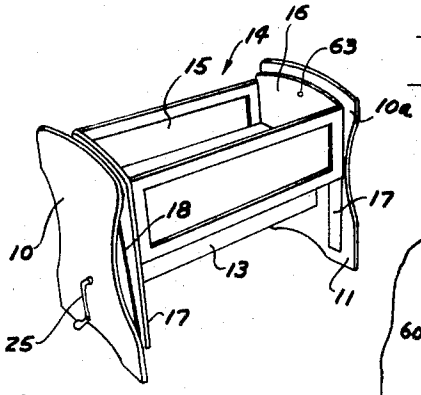


Fig. 5

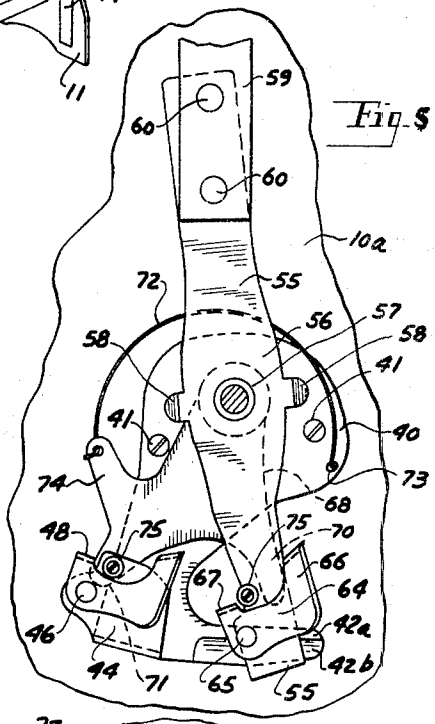


Fig. 4

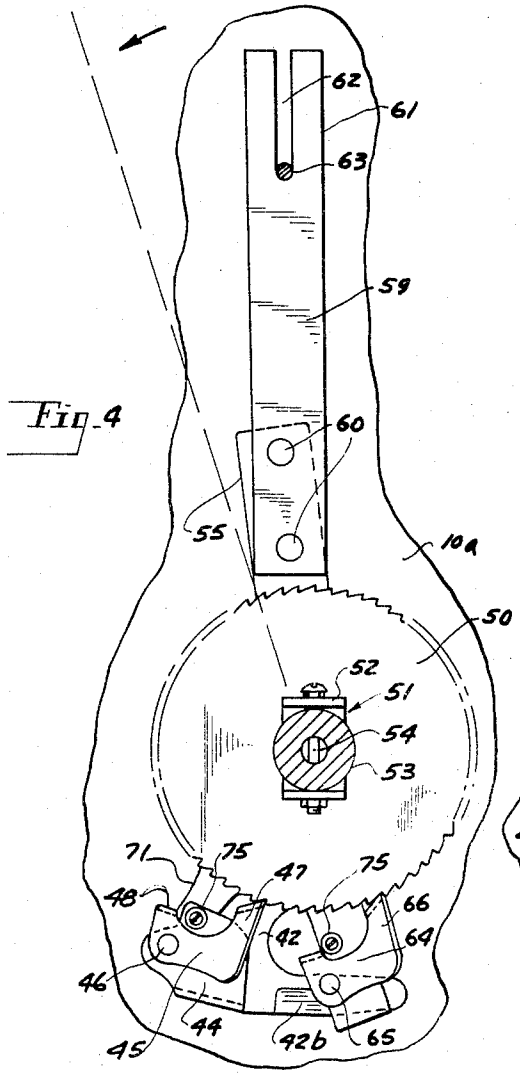
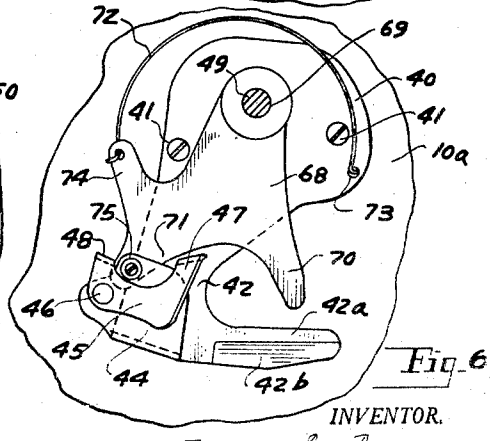


Fig. 6



INVENTOR.
Joseph De Pasqua
BY
Louis Chayka
ATTORNEY

Nov. 18, 1958 J. DE PASQUA 2,860,727

MECHANICALLY AGITATED CRADLE

Filed Aug. 23, 1957 2 Sheets-Sheet 2

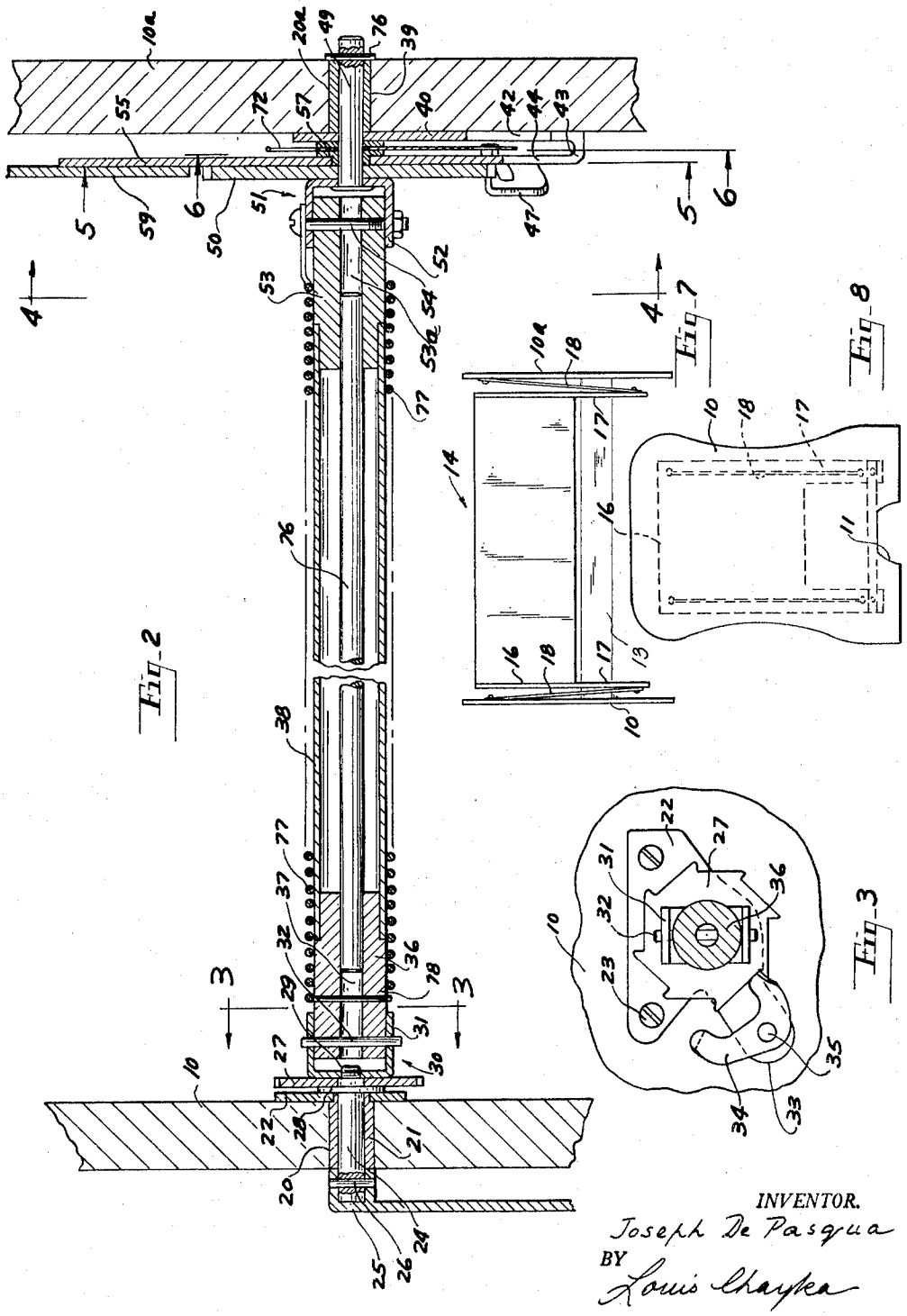


Fig. 2

Fig. 7

Fig. 8

Fig. 3

INVENTOR.
Joseph De Pasqua
BY
Louis Charyka
ATTORNEY

United States Patent Office

2,860,727

Patented Nov. 18, 1958

2,860,727

MECHANICALLY AGITATED CRADLE

Joseph De Pasqua, Detroit, Mich., assignor to Mechanical Swinging Cradle Company, Detroit, Mich., a corporation of Michigan

Application August 23, 1957, Serial No. 679,913

2 Claims. (Cl. 185—38)

The object of the invention is to provide a cradle equipped with a mechanism to impart to it a swaying, reciprocal movement without the need of any electric motor. This, the applicant believes, is desirable for the reason that the cradle is self-contained, being adapted to be operated in any location irrespective of the availability of an outlet for use of electric current. Another reason for the desirability of a mechanically operated cradle is the fact that the elimination of current carrying wires eliminates also the danger of any personal injury due to a faulty insulation of the wires or similar causes. Still another reason for the use of the cradlle lies in the fact that the cradle is economical in that it may be operated by spring means alone, and that the initial cost of the cradle is, as a rule, the only outlay for its use and operation.

Finally, the object of the invention is to provide a cradle which may be operated automatically for a long period of time, upon a single winding of a spring motor which is a part thereof.

I shall now describe my improvement with reference to the accompanying drawings in which,

Fig. 1 is a perspective view of the cradle, equipped with a spring driven motor;

Fig. 2 is a longitudinal sectional view of the spring motor and of the escape movement to control the operation thereof;

Fig. 3 is a sectional view on line 3—3 of Fig. 2;

Fig. 4 is an enlarged view of the operative elements of the escape movement on line 4—4 of Fig. 2;

Fig. 5 is an enlarged view of the operative elements of the escape movement on line 5—5 of Fig. 2;

Fig. 6 is a similar view on line 6—6 of Fig. 2;

Fig. 7 is a diagrammatic view in side elevation of the cradle, the view disclosing the manner of its suspension from its end-supporting means;

Fig. 8 is an end view of the cradle.

Similar numerals refer to similar parts throughout the several views.

The cradle includes two end stands **10** and **10***a*, each of them having the form of a flat panel, including at the lower end, two integrally formed stubby legs **11**. The two stands are held together by an oblong box-like structure **13**, to which I shall refer again. Disposed between said stands and suspended from them, is the cradle proper **14**. It includes a substantially rectangular body or bed including two sideboards **15** and two end panels **16**, and a bottom which is not shown. Each of the end panels includes two integrally formed legs **17**, which extend downwardly, but do not reach the ground supporting the stands **10** and **10***a*.

The relative position of one end panel to the adjoining stand is best shown in Fig. 8. The cradle proper **14**, hereinafter briefly identified as the bed, is suspended from the stands by two wires or cables **18**, each of which is at one end secured to the top portion of the stand, and at the other end to the lower portion of a

leg **17**, the wires at each end of the stand being disposed vertically parallel to each other. To insure free movement of the bed between said stands, the end panels of the bed are sufficiently spaced from the stands to avoid frictional contact therewith.

The stand **10** is provided within its lower portion with a transverse aperture **20**, containing a bearing **21**. At one end the bearing is secured to a plate **22** which is mounted on the inner side of the stand, being attached thereto by means of screws **23**. Disposed within the bearing is a shaft **24** which at one end projects outwardly of the stand and is connected to a hand crank **25**, this being effected by means of a cross pin **26**. The other end of the shaft extends from the bearing inwardly, towards the opposite stand, and terminates with a diametrically reduced threaded end **29**.

Axially mounted on the last named end of the shaft is a ratchet wheel **27** which at its hub portion is provided with a spacer or washer **28** between the said wheel and the plate **22**, while the threaded portion **29** of the shaft is threaded into the cross member of a U-shaped bracket **30**. The bracket includes two parallel arms **31** extending at right angles from the wheel **27**, each of the arms containing a hole for reception of a cross bolt **32**.

The mounting plate **22** includes a leg **33** extending radially from the center of the ratchet wheel **27** and carries a rocking, two-arms pawl **34**, which is pivotally connected to the leg by means of a pin **35**, and which permits rotation of the ratchet wheel only in one direction.

Held within the bracket **30** and connected to it by means of a cross bolt **32**, is one end of a cylindrical core **36** which is provided with an axial bore **37**. The opposite end of the core fits into a tubular member **38** extending in the direction of the other stand **10***a*.

The stand **10***a* is provided with a transverse aperture **20***a*, which is alined with the aperture **20** in stand **10**, and which contains a bearing **39**. At one end, which is its inner end, facing the opposite stand, the bearing is secured to a mounting plate **40** which in turn is affixed to the stand **10***a* by screws **41**. The plate includes a leg **42** which extends downwardly from the bearing and is bent upon itself in a hairpin loop **43** (Fig. 2), to form an upwardly turned member **44**. The last named member supports a pawl **45**, which being mounted pivotally by means of a pin **46** includes to one side of the pin, a ratchet engaging claw **47**, and to the opposite side of the pin an arm **48**, by means of which the claw is to be actuated.

Laterally extending from the member **42** is a horizontally disposed strip **42***a*, carrying on its front surface a layer **42***b* of soft metal for a sliding contact with the lower end of a bar **55**.

Disposed in the bearing **39** is a shaft **49**. Axially mounted upon the shaft in a spaced relation to the mounting plate **40** on the side facing the stand **10**, is a ratchet wheel **50**, which at its central portion carries a U-shaped bracket **51**. The parallel arms **52** of the bracket extend at right angles from the wheel **50** and hold therebetween a cylindrical core **53** to which they are connected by a bolt **54**. The cylindrical member **53**, which is provided with an axial bore **53***a*, fits axially into the tubular member **38** at the end opposed to that which holds the cylindrical member **36**.

Mounted on the same shaft **49** between said ratchet wheel **50** and the mounting plate **40** is a diametrically disposed bar **55** which includes midway its length, a hub portion containing a bearing **57** embracing said shaft **49**. The hub portion of the bar includes two diametrically opposed tabs **58** which are bent towards the mounting plate **40** for a sliding contact therewith. The object

of the arrangement is to keep the bar form being deflected from the plane of its operation and to keep the areas of contact with the plate to a minimum. Normally the bar is disposed in a substantially vertical position and is equipped at its upper end with an arm 59. The arm is affixed to the bar by bolts 60, and extends upwardly therefrom, the upper portion 61 of the arm being forked so as to provide a vertical slot 62. Fitting into said slot, as shown in Fig. 4, is a pin 63, which projects from one end panel 16 of the bed 14 towards the stand 10*a*.

Mounted upon the lower end of the bar 55, is a pawl 64 which is pivotally secured to it by a pin 65. The pawl includes a claw 66, which is disposed to one side of the pin for engagement with the ratchet wheel 50, and a finger 67 to the other side of the pin, both the finger and the claw including top portions bent at right angles to the direction of the mounting plate 40.

Located between the bar and the mounting plate 40, and seated upon the shaft 49 for a rocking movement thereon, is a plate 68 which will be called a rocking plate, best shown in Fig. 6. The plate has in general, the appearance of an inverted letter V, the apex of the plate being the portion which is provided with a hole 69 for engagement with the shaft 49, while the expanded lower portion of the plate is formed to include a downwardly extending tongue 70, and a downwardly turned thumb 71, which is laterally spaced from the tongue. An arcuate wire spring 72, anchored at one end to the plate 40 to one side of the shaft 49, as shown at 73, is connected at the other end to an integrally formed lug 74 of said plate 68 to the other side of the shaft. The spring is used to keep the thumb 71 bearing against the arm 48 of the pawl 45 to keep the claw 47 tilted into engagement with the ratchet wheel 50. The tongue 70 is adapted to cooperate with the inwardly turned portion of the claw 66.

To complete the description of the escape mechanism, I wish to add that numeral 75 indicates rubber washers mounted on the respective elements of the mechanism to dampen the sound of contact of parts brought together in the course of its operation.

Returning now to the shaft 49, it will be noted that it projects outwardly of the outer surface of the stand 10*a*, as shown in Fig. 2, and that it is held against displacement by means of a diametrically disposed pin 76.

Disposed partly in the bore 37 of core 36, which is connected to the bracket 30, and partly in the bore 53*a* of member 53, is a rod 76, which is located axially in said tubular member 38. Coiled about said tubular member is a long spring 77, one end 78 of which is inserted into a diametrical hole in said member 36, as shown in Fig. 2, while the opposite end of the spring is connected to the bolt 54 in the bracket 51.

I shall now describe the operation of the cradle:

First, the spring 77, which is to supply the driving power for the operation of the cradle, has to be wound up. This is done by means of a crank 25. As the crank is turned, rotary movement is imparted to the bracket 30 and the cylindrical core 36 held thereby. With the rotation of said core, the spring 77, which at the opposite bracket 51 is held in a stationary position, is wound up. The ratchet wheel 27 and the pawl 34 which are mounted on the stand 10 prevent uncoiling of the spring after it has been wound up.

At the opposite end, namely at the stand 10*a*, the ratchet wheel 50, which carries the bracket 51, is held against rotation by claw 47 of the pawl 45. The claw is in engagement with the teeth of the said wheel 50. This is so by reason of the fact that the thumb 71, under the action of spring 72, bears against the arm 48, tripping the pawl 45 and holding the claw 47 in engagement with the wheel.

To start the cradle rocking, an initial swing is imparted to it manually. As the cradle is swung from its perpendicular position, the pin 63, on the end panel of the bed 14, will move the arm 59, mounted on bar 55, in the direction of the arrow shown in Fig. 4, while the pawl 64 will be carried by the lower end of the bar 55 in the opposite direction. The horizontal portion of the finger 67, will encounter the tongue 70 of the plate 68. The finger will be tipped downwardly by said tongue, causing the claw 66 to engage the ratchet wheel 50 as shown in Fig. 4 to prevent unwinding of the coil spring. Simultaneously the finger 67 will also swing the plate 68 in the direction of the movement of the bar and disengage the thumb 71 from the arm 48. As a result, the claw 47 under its weight, will be disengaged from said ratchet wheel 50, permitting its rotation against the action of the coiled spring 77, while the impulse of the wheel to rotate under the action of the spring will be checked by the pawl on said bar 55.

As in the couse of its pendulum swing, the bed 14 will swing back towards its initial position, the finger 67 will recede from the tongue 70, permitting claw 66 to drop down by gravity out of engagement with the ratchet wheel 50. At this stage the thumb 71 of the plate 68 will again tip the pawl 45 to cause the claw 47 to engage the ratchet wheel. However, the action of the pawl 45 is sufficiently delayed to allow the coil spring 77 to supply sufficient impulse to the return swing of the bed 14 of the cradle, to compensate for the gravity pull which tends to gradually diminish the extent of the pendulum swing of the cradle.

It will be obvious that some changes may be made in the structure of the spring motor described by me, and in the relative positions of the component elements of said cradle without departing from the inventive concept disclosed herein. What I therefore wish to claim is as follows:

1. In a spring motor driven by a coiled spring and adapted to actuate a suspended object for a pendulum-like movement, an escape mechanism including a stationary mounting plate, a horizontal shaft journalled in said mounting plate, a rocking plate mounted upon the shaft for a limited reciprocating swing about the shaft, an escapement wheel mounted upon the shaft, a vertical bar mounted intermediate its end upon said shaft for a limiting reciprocating swing thereon, a pawl pivotally mounted upon the mounting plate for engagement with the escapement wheel, another pawl pivotally mounted upon the lower end of the bar for engagement with said escapement wheel, each pawl having a flange adapted to be brought into encounter with the rocker plate and to be tipped out of engagement with the escapement wheel, and spring means responsive to the movement of the bar in a direction against the tension of the coil spring to cause the pawl on the bar to check the rotation of the escapement wheel under the tension of the coil spring and to operate the pawl on the mounting plate to permit a limited rotation of the escapement wheel under the tension of the coiled spring on completion of the return swing of the bar.

2. In a spring motor driven by a coiled spring, an escape mechanism including a stationary mounting plate, a horizontal shaft journalled in said mounting plate, a rocking plate mounted upon the shaft for a limited reciprocating swing about the shaft, an escapement wheel mounted upon the shaft, a vertical bar mounted intermediate its end upon said shaft for a limited reciprocating swing thereon, a pawl pivotally mounted upon the mounting plate for engagement with the escapement wheel, another pawl pivotally mounted upon the lower end of the bar for engagement with said escapement wheel, each pawl having a flange adapted to be brought into encounter with the rocker plate and to be tipped out of engagement with the escapement wheel, and spring means responsive to the movement of the bar in a direction against the tension of the coil spring to cause the pawl on the bar to check the rotation of the escapement wheel under the tension of the coil spring and to operate

the pawl on the mounting plate to permit a limited rotation of the escapement wheel under the tension of the coiled spring on completion of the return swing of the bar.

References Cited in the file of this patent

UNITED STATES PATENTS

579,256	Bukolt	Mar. 23, 1895
630,894	Josefkowicz	Aug. 15, 1899
1,585,161	Magidson	May 18, 1926
2,063,799	Fornelius	Dec. 8, 1936
2,557,907	Cranfill	June 19, 1951
2,559,939	Carlson	July 10, 1951
2,568,136	Weimer	Sept. 18, 1951

FOREIGN PATENTS

275,513	Italy	June 25, 1930
307,010	Italy	Apr. 7, 1933
484,528	Italy	Sept. 15, 1953